

were given the preference. Consideration was also given to places at which there were wharves extending to low water; but the best information that could be obtained in advance as to this, was found to be quite misleading when the places were visited.

The positions of the stations, and the points at which Establishments had previously been determined by the Admiralty, are shown on the accompanying map, Plate I. The stations chosen were all equipped with self-registering instruments, in order to obtain a continuous record of the tide.

*Tidal Stations in the lower part of the Bay of Fundy.*—In this part of the bay below St. John, four stations were established; at Yarmouth, at Westport on Bryer Island, and at Digby, on the Nova Scotia side; and at Campobello, on the New Brunswick side. Tidal data at Yarmouth are not only important for that harbour itself, but they will also enable comparisons to be made in the two directions with Halifax and St. John, as above mentioned, to show how far tidal differences from those two ports of reference should be extended along that coast. Westport may properly be considered as at the mouth of the Bay of Fundy; and the tidal data at Yarmouth and Westport should prove to be the most closely related to the strong tidal currents at the mouth of the bay, when these come to be investigated. The station at Digby is at the new pier at the town of Digby, inside Annapolis Basin. Although the Admiralty Establishment was determined at the entrance to Digby Gut, the practical advantage of this position had the greater weight; as the Digby pier is now used by the recently established steamship service, which makes through connection from St. John to Halifax.

To obtain comparisons with the tide of the open bay, measurements of the range of the tide were made during two periods of spring tides at Prim Point, outside of Digby Gut, on the south side. These measurements were made by William Ellis, light-keeper at the Point. They were taken from a beam set to project over a vertical cliff at the lighthouse, the level of the water being measured directly from it with a standard tape. The comparison with the simultaneous tidal record at Digby within the Basin will show the effect of the narrow entrance in modifying the tide in the basin relatively to the tide in the open.

On the New Brunswick side there was more difficulty in the choice of a position for a tidal station. The western part of the New Brunswick coast, which is the limit of Canadian territory next to the State of Maine, is broken into islands forming channels which lead into large water areas enclosed behind them. These occasion much local interference with the general course of the tides, and give rise to irregularities which are already manifest from the Establishments which have there been determined. The southern end of Grand Manan Island would have been very suitable, as it is nearest to the mouth of the bay, and stands in best relation to Westport on the other shore. Unfortunately, however, there is no wharf there which extends to low water. The choice of Campobello Island was finally made, as giving on the whole the best advantages, and the tide gauge was placed at Welchpool. This was formerly the residence of Admiral Owen, and the Establishment is there well determined from tidal observations which extend from October 13th, 1845, to October 21st, 1847, with less than three months' interruption in all. Welchpool is also on a channel directly opposite Eastport in the State of Maine, where tidal observations have been obtained during one complete year in 1862, by the United States Coast Survey, and the present observations there will thus serve to make connection with the United States series. There is also a good depth of water at the wharf at the lowest tides, contrary to the information obtained before the place was visited.

The chief disadvantage of this station from a tidal point of view, is its proximity to the large area of Passamaquoddy Bay, which may have a very appreciable effect in modifying the tide. This may account for the difficulty already met with in the endeavour to determine a constant difference in the time of the tide between Eastport and St. John. A comparison between the tide as calculated for Eastport and the tide as observed at St. John, was made for a period of eight months in 1893; and the difference in absolute time with the omission of some extreme values, was found to have the following range:—High water at Eastport, 37 minutes earlier to 29 minutes later than