

TIDE TABLES, RECORDS, AND PUBLICATION.

The record obtained from the self-registering tide gauge at Quebec was found to be sufficiently extended to serve for the calculation of tide tables for that harbour. The record from November, 1893, to January, 1895, or a little over a full year, was carefully tabulated and reduced to datum; and any exceptionally high or low tides due to storms were eliminated. The digest thus prepared from the record was transmitted to the Nautical Almanac Office, London, where the best possible advantages exist for the analysis and computation of the tides. Tide tables for both Quebec and Halifax for 1896, have there been prepared by Mr. E. Roberts, by the aid of the tide-predicting machine designed primarily for the prediction of the tides in India.

The Halifax tables are based at present upon old records taken at Her Majesty's Dock Yard during the years 1860 and 1861. There exist also still older records, obtained at the same site in 1851 and 1852, which it is very desirable to incorporate with those from which the tide tables are now calculated, in order to extend the basis on which they rest, and thus to make the tables more accurate. It has not been possible to do this, however, for lack of funds; and another year must therefore pass before this advantage can be obtained.

Since 1891 tide tables for Halifax have been issued by this department, in the form of a small booklet; but it has not been possible to obtain adequate circulation for them in this form. It has therefore been decided to supply the tide tables direct to the leading almanacs, without charge; in the endeavour to make them widely available to masters of vessels and to the pilot service. The tide tables for both Halifax and Quebec for 1896 have accordingly been supplied to the Canadian Almanac, published in Toronto; to the Star Almanac, published in Montreal; and also to Greenwood's Nautical Almanac, an English publication in which tidal information for all parts of the world is given. The tide tables for Quebec will also be issued by the Harbour Commissioners of Montreal, especially for the Pilot service; and the Halifax tables have also been supplied to Cogswell's Almanac, in which the information is principally for the province of Nova Scotia itself. With these tables, tidal differences are given which extend their application to the Atlantic coast of Nova Scotia, and to the Lower St. Lawrence respectively.

It is to be noted that such tide tables as have been published in the past, have been based upon a fixed difference from some distant port, usually on the other side of the Atlantic; and consequently they have been very much in error, especially at certain parts of the lunar month. This will therefore be the first time that tide tables are published for any Canadian port which are based upon direct observation; the only exception being the booklet above mentioned, issued since 1891. These tables also give the height of the tide as well as the time of high and low water. This is very important with reference to the depth of water in the St. Lawrence Ship Channel; and also to show the depth of water available at any tide for vessels entering the dry docks at Lévis and Halifax.

In reducing the tidal observations to a definite plane of reference, great difficulty has been experienced from the want of satisfactory datum levels in our cities. In St. John, N. B., there are no reference marks extant, or any other means of determining correctly at the present time the original low water level on which the Admiralty chart of the harbour is based; nor the low water level adopted for the more recent survey of the harbour by the Department of Public Works. A satisfactory low water datum must therefore be determined afresh, by means of the tidal observations now in progress. At Quebec the bench mark still exists, which was cut on the building of the Department of Marine and Fisheries at the time that the Admiralty surveys were made. The height of the tide in the present tide tables is therefore referred to the original low water datum of the Admiralty chart. This is of direct practical importance to shipping; as the tide tables thus show at once the depth of water which may be counted upon in addition to the soundings given on the chart. In obtaining this result, advantage was taken of the