

SURVEY
OF
TIDES AND CURRENTS
IN
CANADIAN WATERS

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I have the honour to submit the following Report on the progress of this Survey. The principal tidal stations have been maintained in operation, and some progress has been made in the reduction of the results, as far means have permitted. The two principal tidal stations which command the two entrances to the Gulf of St. Lawrence have been put in thorough repair this season. The station at St. Paul Island in Cabot Strait, commands the main entrance by which the tides enter the Gulf from the ocean; and its advantage as a port of reference for an important part of the Gulf area, has come out in a clearer light than ever, from the comparative observations secured in 1901.

An important step in advance is being made, in the information supplied to aid navigation on the St. Lawrence route. A part of the tidal record from Father Point is being submitted to harmonic analysis, which will enable tide tables to be calculated directly for that locality. The advantage of this step has become apparent from the tidal observations of 1900 on the Lower St. Lawrence; as they showed that both tide and current in the open estuary below the Traverse, could better be referred to Father Point than to Quebec. So far, the Father Point tide tables have been calculated indirectly from Quebec, by means of the double series of variable differences described in last Report. This elaborate method was devised to save the expense of analysis at an additional station. But it has now been ascertained that the complicated relation between the two places, is chiefly due to the river influence at the upper end of the run of the tide near Quebec; while the tide in the open estuary itself is very regular. Hence the tide tables calculated from the analysis, in conjunction with the other data which have been secured, will enable the turn of the strong tidal currents of the estuary to be readily and accurately known from the tide tables.

On the Pacific coast, good progress has been made, both in the improvement of the tide tables through the analysis of further tidal record from the principal stations, and also in the establishment of additional tidal stations, to extend the information available.

In the present Report, all the information yet obtained is summarized, with regard to the tide and current in Northumberland Strait; and its relation to Cabot Strait where the Gulf of St. Lawrence opens to the ocean. The levels of datum planes, heights of extreme tides, and the effects of wind disturbance, have also been carefully and fully worked out. These are of primary importance with relation to works of construction in the harbours of the strait, as well as for uniform reference levels in any future observations.