

REPORT OF PROGRESS.

SURVEY OF TIDES AND CURRENTS IN CANADIAN WATERS.

OTTAWA, 26th January, 1897.

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SIR,—I have the honour to submit the following report on the progress of the Survey of Tides and Currents in Canadian waters. During the year, substantial progress has been made in both branches of this survey. The principal tidal stations have been maintained; and they have also been utilized for the determination of tidal differences in an important region in the Gulf of St. Lawrence. A series of tidal differences for the St. Lawrence River has been worked out, and supplied with the tide tables for publication in the leading almanacs for 1897. In the other branch of the survey, an examination of the currents has been made in the north-eastern half of the Gulf of St. Lawrence from Anticosti to the Strait of Belle Isle; and for this work the SS. "Iansdowne" was again placed at my disposal for three months during last season. It may be best to describe first the progress made in the "Tidal branch" of the work; and then give the results obtained in the "Survey of the currents" this season, and also some account of the general movements of the water in the Gulf, with relation to the Gulf-entrances.

THE PRINCIPAL TIDAL STATIONS.

In establishing these stations originally, a careful selection was made of the most commanding points on the Atlantic coast, at the Gulf entrances, and on the St. Lawrence. The stations, therefore are not only of direct value to our principal harbours, but they also serve as reference stations from which to determine tidal data in the regions lying between them. There are now seven stations in operation, situated at St. John, N.B., Halifax, St. Paul Island in Cabot Strait, Forteau Bay in the Strait of Belle Isle, South-west Point of Anticosti, Father Point and Quebec. The tide-gauges at these stations are so designed that they can be heated in winter to secure a continuous record of the tide throughout the year. They are provided with self-recording tidal instruments, and other necessary appliances; and the more isolated stations are also furnished with diploidoscopes, where there is no means of obtaining the time except by telegraph from some distant observatory, which during the first two years entailed considerable expense. These stations have been in continuous operation during the past year, without any interruption of consequence, and the tidal record obtained will serve to improve the accuracy of the tide tables, as soon as the expense for the necessary calculations can be met.

The recording instrument at the station in the Strait of Belle Isle was replaced by another in September; as its driving clock required cleaning. Also at St. Paul Island, the hair-spring of the clock of the instrument broke; and with the type of tide-gauge now in use, any such accident involves the entire removal of the recording instrument, and interruption to the record. In this instance, it was imperative to avoid interruption, as the gauge was being used at the time for comparison with simultaneous observations at Picton and Charlottetown. St. Paul Island can only be reached fortnightly, and then a landing can only be made in fine weather; it