

During this season, additional tidal observations have been taken in Northumberland Strait and in Cabot Strait. The observations in Northumberland Strait at Pictou, Charlottetown and Summerside, supplement those of 1896 and 1897; and will serve to extend the basis from which the tide tables for this region are calculated; and also to secure better tidal data for Summerside harbour. The tidal observations in Cabot Strait were taken with the object of obtaining the best tidal relation between St. Paul Island, and one or other side of the strait; because of the severe exposure at that station, and the difficulty of maintaining the gauge there. These relations with the two sides of the strait will also serve to define more correctly the nature of the oceanic tidal undulation at its entrance into the Gulf of St. Lawrence; as it is this undulation which gives rise to the whole of the tides in the Gulf area and throughout the St. Lawrence river.

Extended levels were taken in September around the head of Cumberland Basin, on the Bay of Fundy, with the object of reducing to the same basis of comparison a number of valuable observations of the extreme height of the tide which have been recorded at different points there in different years. The result of this work is given in the present report; and it is of the first importance with relation to the protection of the extensive dyked marshes in this region.

A considerable amount of tabulation from the tidal record already secured, has been done during the year; as noted below. This will be submitted to analysis as the means to do so will allow; in order to extend the basis from which the tide tables are calculated, which will be of permanent benefit in improving the accuracy of the tide tables in all future years. In the office work of this Survey, and in the erection of the summer tidal stations, I have had the assistance of Mr. R. Angus and Mr. S. C. Hayden.

The total expenditure on this Survey during the fiscal year from June 30, 1900, to June 30, 1901, was \$7,060.20. This total expenditure is classified as follows:—

(1) General expenses: maintenance of the seven principal tidal stations, with repairs, heating and supplies; salaries of observers and assistants; office work and travelling expenses; \$2,910.35.

(2) Summer tidal stations; on the Lower St. Lawrence in 1900, and in Northumberland Strait in the early part of the season (up to June 30), 1901; erection of gauges, salaries of observers, and inspection, \$1,503.25.

(3) Tide tables; calculations and printing; analysis of further tidal record to improve their accuracy, which is of permanent benefit for all future years, \$2,646.60.

THE PRINCIPAL TIDAL STATIONS.

The seven principal stations in Eastern Canada, established by this Survey, are at Quebec, Father Point, Belle Isle Strait, St. Paul Island in Cabot Strait, Halifax, Yarmouth, N.S., and St. John, N.B. These have all been maintained in continuous operation throughout the past year, with some minor interruptions. The stations inspected this season by myself, were St. Paul Island, Halifax, Yarmouth and St. John, N.B. At all these stations, careful instrumental levels were taken to insure the continuity of the datum to which the height of the tide is referred; and at all four, auxiliary Bench-marks were established for future reference. The detailed levels it is unnecessary to give at present; their eventual use being the determination of the low water datum, and mean sea level at these localities. Several adjustments and improvements were also made; to insure correct time for the observations; and for the barographs or self-recording barometers there used. The cribwork at Forteau Bay in Belle Isle Strait, also required repair, by a heavy sheathing of hardwood. The chief trouble has occurred at St. Paul Island from threatened chokeage of the inlet to the tide pipes. This station was visited by Captain Douglas, R.N.R., early in the spring, to make sure that everything was in good working order before the comparative observations in Northumberland Strait were begun. This autumn, special inlet fittings have been made, in the hope of averting this chokeage in future.

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