

future observations, should these be indicated as desirable by this season's work. The distances of these localities each way from St. Paul Island are 35 miles westward and 68 miles eastward; the clear width of Cabot Strait itself being 75 miles.

A well established relation with one or other side of Cabot Strait will thus practically afford additional security to this principal station. These relations will also serve better to define the character of the main tidal undulation which here enters the Gulf area from the ocean. This in itself is of much importance, as it is this undulation which gives rise to all the tides throughout the Gulf area, as well as on the St. Lawrence, as far up as tidal influence is felt. This influence extends to a distance of 760 miles from its original entrance through Cabot Strait from the ocean.

The amount of tidal record secured this season for the purposes explained, at these localities, was as follows:—

St. Paul Island, permanent station, Cabot Strait..	Continuous record.
Pictou, N.S., in Northumberland Strait	May 20 to Nov. 15
Charlottetown, P.E.I. "	" 30 " 15
Summerside, P.E.I. "	June 12 " 15
Sydney, Cape Breton (one month only).....	July 4 to Aug. 6
Neil's Harbour, C.B., Cabot Strait	Aug. 9 " Oct. 30
Port aux Basques, Nfld. "	July 9 " 30

These stations were all equipped with self-registering tide gauges, with modifications to secure a scale adapted to the ranges of tide in these localities, and special details in their construction to meet local requirements which need not here be more fully described. Greater trouble also occurred from minor difficulties and accidents than in previous seasons; which necessitated much additional travel in the supervision of the stations. This also made it more difficult to find time for the extended levels in the Amherst region, and the inspection of the four principal tidal stations, which formed part of this season's programme.

Time.—At Pictou, Charlottetown and Summerside, correct time for the observations was obtained by means of the railway signals sent daily along the lines. On the Prince Edward Island railway however, it has been the custom to use time signals merely to insure uniformity throughout the Island in running the trains. Arrangements were therefore made to have this signal agree truly with standard time, as this was essential for accuracy in the tidal observations. Special time signals were secured when necessary; and time comparisons made as a check when the stations were visited.

At Sydney, the railway time signals could be depended upon; but at Neil's Harbour and Port aux Basques, special arrangements had to be made. The observer at Neil's Harbour was provided with a well-regulated watch belonging to the Survey, which was kept true by a telegraph signal every week from North Sydney. The observer at Port aux Basques was furnished with a chronometer carefully rated in advance; and the rate was further checked at the beginning and end of the season, by exchange of time with the St. John observatory.

Levels.—At Charlottetown and Pictou, Bench-marks were placed on permanent buildings and connected in level with those used during the observations of 1896, which establishes continuity in the datum for both series of observations. The Bench-mark at Charlottetown was also connected by the Engineers of the Hillsborough bridge, with their datum. At Summerside, the Admiralty Bench-mark recently established, was used; and as it is only fastened to timber piling, instrumental levels were carried to a block of buildings in the town, built of masonry and brickwork, on which a Bench-mark was established for greater security in future reference.

At Sydney, a new Bench-mark was cut on the Court-house, the nearest permanent building to the gauge site, at about half a mile distant. This Bench-mark was connected by instrumental levels with the scale of the tide gauge in the one direction, and the City datum in the other. At Neil's Harbour there was nothing of a permanent character which could be made use of, for reference levels. At Port aux Basques, a ring bolt let into the rock, at the head of the Government wharf, was made use of as a Bench-mark.