ing secondary tidal undulations at St. John, N.B., which he is investigating. Professor Duff obtained these data last season while at his country residence on the St. John River.

Tidal information from the gauges at Quebec, Father Point and Halifax has been supplied to Mr. R. Steckel to facilitate the work of geodetic levelling which he is carrying out for the Department of Public Works; and copies of the tide curves from those stations have been of value to him in the determination of mean sea level.

SURVEY OF THE CURRENTS.

The region examined this season was the north-eastern portion of the Gulf of St. Lawrence, from the eastern end of Anticosti to the Strait of Belle Isle. It forms an arm which lies between Newfoundland on the south-east, and Saguenay County in the province of Quebec on the north. This north shore is often termed "Labrador," which is both incorrect and misleading; as no part of the Gulf is bordered by Labrador, and it is also a territory belonging to Newfoundland and not to Canada. The length of this arm of the Gulf is 220 miles, and in area it is nearly equal to the English channel. It is traversed by all the steamship lines which use the St. Lawrence route; which makes the investigation of its currents of the first importance.

The region under consideration has a width of 100 miles between Cape St. George (Newfoundland) and East Cape (Anticosti) and runs in a north-eastward direction to the Strait of Belle Isle, where its width narrows down to 10 miles. From this main arm of the Gulf, a side channel runs off to the north-westward, between Anticosti and the north shore. This channel has a width of 60 miles between the east end of Anticosti and Natashquan Point, and narrows down to 16 miles at the Mingan Islands, in a length of 115 miles. Around the greater part of the shores which bound these areas, the water increases gradually in depth to 60 or 80 fathoms at about 20 miles from the shore; and along the middle of the main arm and the channel north of Anticosti, there is a deep channel of 100 to 150 fathoms in depth. This deep channel continues through Cabot Strait with increasing depth to the Atlantic. (See outline chart, Plate 1).

For the investigation of the currents in this region the SS. "Lansdowne," of the lighthouse and buoy service, was placed at my disposal for three months—July, August and September, 1896. From this time considerable deduction has to be made for interruption to the work in obtaining supplies, and for rough weather; and also a necessary visit to the tide-gauge in the Strait of Belle Isle. The nearest port for coal and supplies was North Sydney, C.B., but there were places along the shore where water could be obtained from the natural streams. When shelter was required it was usually necessary to make a long run to obtain it. The investigation of the currents was carried on by myself, with the assistance of Mr. G. G. Hare, who also took continuous meteorological observations. The commander of the vessel, Captain G. W. J. Bissett, and the first officer, Mr. J. B. Sutherland, gave valuable co-operation in furthering the work; and also the second and third officers, N. McKellar and A. Lane, in noting the direction of the current during the night.

As the steamship route traverses the region in question on a direct line from Heath Point, Anticosti, to the Strait of Belle Isle, it was decided to give most attention to the study of the currents met with along this route itself. It was important to ascertain whether any general set existed either with or against vessels on this route: and also whether there was any cross-set making out or in through the channel north of Anticosti. A set of either character, if found to exist, might put a vessel seriously out of position in rounding Anticosti or making the Strait of Belle Isle. Little was known with respect to what currents were likely to be met with in this region, beyond what had been already ascertained by this survey. It was thus known that the current in the Strait of Belle Isle itself was tidal in its character, with a flow nearly equal in each direction, and that the difference of flow inwards towards the Gulf was very slight; and consequently it was not to be expected that a constant current of any considerable strength would be found