

direction in relation to the River and Gulf of St. Lawrence; and there was good reason to believe that they were both of a constant character.

It was accordingly proposed this season to examine into the nature of the current in the Gaspé region; and also to ascertain whether any general set or drift could be traced across the width of the gulf to connect this with the out-flowing water at Cape North.

The entrance to the St. Lawrence between the Gaspé coast and Anticosti Island lies on the line of a deep channel which connects them with the ocean. This channel runs in from the Atlantic between the Grand Banks on the east and Banquereau and Misaine Bank on the west, with a width of some 40 miles, and a continuous depth of nearly 250 fathoms. After passing through Cabot Strait, it maintains its width and depth entirely across the gulf; passing north of the Magdalen Islands and between the Gaspé coast and Anticosti. It then penetrates the Lower St. Lawrence nearly to the mouth of the Saguenay, where the depth has only diminished to 150 fathoms at a distance of 420 miles from Cabot Strait. A branch of this deep channel also extends from the Magdalen Islands for a certain distance towards the Strait of Belle Isle.

At the beginning of this season, the region at the mouth of the St. Lawrence between the Gaspé coast and Labrador and around the west end of Anticosti, was examined to ascertain what characteristics of the water could be relied upon for the purpose of tracing its movements with the best hope of success. Although the colour of the water had been found to be appreciably different in different parts of the gulf, this is not an indication of a very definite character, though it may sometimes be helpful. The two characteristics chiefly relied upon in tracing currents are the temperature and the density of the water.

In examining the temperatures in this region and comparing them with the numerous observations which had now been obtained in other parts of the gulf area, it soon became evident that for the purpose in view this could not be relied upon as any definite indication of the direction of the movement of the water. The surface temperature in the summer season usually ranges from about 50° to 65°, and in proceeding downwards this temperature gradually falls, until at a depth of 40 or 50 fathoms it is only 30° to 34°, or practically at the freezing point. Where the greater depths are met with, the water below this again is found to be appreciably warmer. There are considerable areas, however, in which the depth is less than 50 fathoms, and where the conditions are accordingly restricted.

It appears, therefore, that in general, the temperature of the surface water merely rises with the progress of the season; and it is also natural that the water should become warmer to a greater depth as the season advances. Even this has its limitations, however; as at a depth of 50 fathoms no greater rise in temperature has yet been found than from 32° to 34°, between the month of June and the end of September.

In the Gaspé region, as well as in Cabot Strait, the coldest water forms a layer between the depths of 30 and 50 fathoms. Also in the vicinity of the Strait of Belle Isle the same low temperatures are found at these depths; although there the temperature towards the surface is relatively lower, as a rule, than in the other regions. As these conditions, therefore, occur at all three angles of the gulf, and have also been found at a few intermediate points where observations have been obtained, it appears not at all impossible that this cold layer may extend very generally over the gulf area; and it cannot, therefore, be taken as an indication of direction of movement of the water.

Below this cold layer, in the deeper water of the channel above referred to, the temperature from 100 to 200 fathoms is found to range very constantly from 35° to 41°. This result was obtained last season in Cabot Strait; and the constancy of the actual temperatures obtained at different dates at these depths, as well as the precautions taken to insure accuracy in the observations are given in detail in last year's report. During the present season, the same temperatures have also been found at these depths between the Gaspé coast and Anticosti, which is 220 miles further in than Cabot Strait, along the deep channel leading from the Atlantic,