

and W.N.W. From the best indications obtained, the thickness of the current ranged from 30 fathoms to 50 fathoms or over, while running from the more usual directions.

From courses carefully run on the afternoon of the 27th from the above station to Cape Gaspé, it was found that between 12 and 4 miles from shore in the offing of Fame Point, the current was running from the south-east, or contrary to its usual direction. There was no appreciable current in either direction off Fox River and Griffin Cove; and it was only from Cape Rosier to Cape Gaspé and within two miles of the shore, that a current from the northward was found.

These indications were followed up from July 30th to August 2nd at two stations 4 miles and  $9\frac{1}{2}$  miles from Fame Point, on a line running N.E. by N., and where the total depth ranged from 150 to 205 fathoms. (The station 4 miles from Fame Point was nearly in the same position as those of July 2nd to 5th, when the current ran steadily from the north-west.) On this occasion it ran continuously from the south-east at both stations; and the conditions were so nearly alike that they may be described together. On July 30th during 23 hours, and on August 1st and 2nd during 27 hours the current ran constantly from directions between E.S.E. and S. The velocity during these periods ranged from 0.51 to 1.40 knots per hour at one station, and 0.48 to 1.38 at the other.

Although the current ran constantly from the one direction, its strength varied regularly with the tide, and was greatest about the time of high water, and least about low water; which is the converse of its former behaviour, and corresponds with the contrary direction of the current itself. The direction of the under-current was taken at five different times at each of these stations, or ten times in all, and while the surface current was both strongest and weakest. There was no current from the usual north-westerly direction as far down as 50 fathoms; but the under-current ran from the same direction as the surface current or within two points of it. When weakest the strength of the under-current fell off rapidly below 20 fathoms; and at the most the thickness of the current did not probably exceed 40 fathoms.

This current from the south-east was found to extend to two miles from the shore; and within that distance it was replaced by the usual inshore tide in the two directions, as found at an anchorage one mile off shore on the night of the 31st, when it was too rough to hold in the open.

On returning to the middle of the passage on the afternoon of August 2nd, where an anchorage was again made at 24 miles N.E. from Fame Point, it was found that the current was then running from north-easterly directions. During 9 hours the current ran from directions between N. by W. and N.E. by E. with a velocity which averaged 1.34 knots per hour. The direction of the current was thus directly across the passage at this time, and also at right angles to the line of "Constant current" there shown on the chart. This direction probably corresponds with the direction of the bend of the current, between its north-westerly and south-easterly direction; and the north-westerly current itself may have moved nearer to the Anticosti side since the 26th.

The variation in the density of the water during this period helps to indicate the nature of the circulation which was going on. At the middle of the passage on July 26th, where the flow was from the north-west, the water of least density as already mentioned, occupied a width of 17 miles. This belt had a mean density between the surface and 10 fathoms of 1.0217; while the water flowing from the south-east between this belt and Fame Point, had a mean density to the same depth of 1.0221. A few days later on July 31st and August 1st, the density of the water flowing from the south-east between 4 and 10 miles from Fame Point, and between the surface and 10 fathoms, was only 1.0208; and on August 2nd at the middle of the passage, the water then flowing from the north-east had a mean density to 10 fathoms of 1.0215. The water of least density which occupied the middle of the passage, must therefore have circled round and run back in the south-easterly current in the offing of the Gaspé coast; as this water continued to decrease in density during the time. This circling movement of the water is further confirmed by a density section across the passage further to the eastward, which was run on August 3rd from Salt Lake Bay, Anticosti, to Cape Gaspé. On this whole width, as shown in Table B, the mean density between