

St. Paul Island to Cape North.

Average of surface water (17 Aug., '94).....	1.0227
At Station N, 8 miles off Cape North:—Surface water, (23 Aug., '94).....	1.0218
Surface water (25 Aug., '94).....	1.0221
At 40 fathoms (25 Aug., '94).....	1.0249

The lesser density of the surface water between St. Paul Island and Cape North is evident; while at 40 fathoms its density is nearly equal to the average in the wider part of the Strait, where the density of 1.0242 is the average for both the outgoing and incoming water. In comparison with this, the mean density of 1.0220 at Station N., between Cape North and St. Paul Island, would indicate an admixture of 9 per cent. of fresh water. Although this result is based upon a few observations it affords an indication of importance, as it points to the presence of river water, and therefore a possible connection between the Gaspé current and the current flowing outwards at Cape North; and thus furnishes a clue which should be followed up and further investigated.

GENERAL REMARKS.

One of the aims in this season's work, was to ascertain the nature of the currents in the two entrances to the Gulf of St. Lawrence as a basis for the examination of the currents throughout its area. From this point of view a few general remarks may now be made.

In the Strait of Belle Isle, while the current maintains its tidal character, there is only a difference in favour of inward flow from the east; and during the summer months the actual balance of flow does not probably give more than a moderate percentage in favour of the inward direction. The influence therefore on the Gulf as a whole cannot be very great. During times however when the current runs predominantly in one direction for several days with a velocity which may attain a maximum of three knots, the effect upon the gulf must be more marked, and the distance to which its influence extends may be considerable.

A predominant current running inwards through the strait in the early spring, may not have a very marked influence so far as temperature is concerned; because at that season the water in the north-eastern end of the gulf must be nearly as cold as the water entering through the strait. This incoming volume of water may help however to account for the increased velocity which the outward current on the west side of Cabot Strait is reported to have in the spring. Even if the water itself does not reach Cabot Strait, it may still act by displacement as the total volume of the gulf must remain nearly the same. This is much more probable than the explanation often made that this increased velocity is due to the spring floods in the tributaries of the St. Lawrence River. The influence of the St. Lawrence upon the currents in the gulf is usually much exaggerated. It may therefore be well to mention that a current of only half a knot per hour through the Strait of Belle Isle, would admit a volume of water 40 times greater than the discharge of the St. Lawrence as measured between Montreal and Lake St. Peter.

The two main currents at the two sides of Cabot Strait are the most important with reference to the interior of the gulf. It is possible that the current on the western side may have some relation to the current running outward along the Gaspé coast, and the reported direction of the current near the Magdalen Islands seems to make this the less improbable. The current along the west coast of Newfoundland might possibly prove to be a continuation of the inward current on the eastern side of Cabot Strait. Further to the north-east, in the narrower part of the gulf towards the Strait of Belle Isle, the current was also found on one occasion to be running from the westward at both sides simultaneously; but the circumstances appear then to have been exceptional, as already pointed out.