

Steamboat Inspection.

of Atlantic coast water to a moderate depth, or the density of the deeper water in the Gulf itself. Under these conditions, the fresh water of the St. Lawrence would be sufficient to furnish a stream of water of density 1.0237 which would be 12 miles wide and 84 feet deep, and moving with a velocity of one knot per hour. This would represent the average density of the Gaspé current, and would probably be an approximation to its average velocity and its volume; and such a comparison may therefore serve to illustrate the way in which the conditions may be accounted for, if the data themselves were more closely known.

A further explanation is required to show why this current is usually on the side next the Gaspé coast, and why the water of less density should keep to the south-western side of the Gulf, and finally flow out of the Gulf on the western side of Cabot Strait, instead of spreading over the surface of the Gulf generally. When a belt of water of low density lies along a coast, it is out of equilibrium and tends to spread more widely over the surface unless restrained by some cause from doing so. The direction of the Lower St. Lawrence itself, as the prevailing winds are westerly, would tend to keep the out-flowing water of less density to the south-eastern side. This reason does not hold in the open Gulf however; as the direction of the prevailing winds in summer is south-westerly, which is across the direction that the water takes, and must tend to make it extend further out into the Gulf than it would otherwise do. It may be noted however that the positions in which this water is found are in accord with the influence of the rotation of the earth. In passing down the Lower St. Lawrence it makes towards the north; and the moving water is therefore impelled to the right, or against the south-eastern shore; while after rounding the Gaspé peninsula, the southing in its course towards the ocean would make it tend from the same cause to keep towards the south-western coast of the Gulf. It is not impossible that this influence may have some appreciable effect; as the mean latitude in the regions under consideration is 48° north.

It may not be possible to do more at present than to suggest an explanation, by indicating as above such causes as are known to operate. When the conditions themselves throughout the course of the year are better known, more complete and satisfactory explanations may be found to account for them.

There is one point however, which it is important to notice in order to understand the relation of the Gulf area to the St. Lawrence River and the Ocean respectively. The volume of fresh water from the St. Lawrence as already explained, may be sufficient to dilute the sea water to the low density found in the Gaspé current or in the corresponding current flowing outward through Cabot Strait; but it is evident that the total volume of water which actually leaves the Gulf is vastly greater than the volume of fresh water which it receives from the St. Lawrence River. The volume so leaving the Gulf must therefore be replaced by water which enters it from the ocean. The investigations already made show that there is a balance of flow in favour of the inward direction at the Strait of Belle Isle; and there are also indications that the motion on the eastern side of Cabot Strait is usually inwards. It is probably from these directions that the loss to the Gulf area is supplied; and this also accords with the density of the water along the west coast of Newfoundland, which appears to be practically the same as in the neighbouring Atlantic. As already explained, the evidence is against the view that there is any return current in the underlying water of the deep channel in the Gulf.

In these circumstances it may be stated with confidence as a practical conclusion, that such currents as may be met with in the open Gulf are never likely to have a velocity which is as great as that already found in the Gaspé current and off Cape North.

CURRENTS IN THE GASPÉ REGION.

It may be stated in general, that a current is usually found in the offing of the Gaspé coast, flowing from the north-west to the south-east, all the way along from Cape Chatte to Cape Rosier. This current may therefore be termed appropriately the Gaspé Current. It occupies a width of some 10 or 12 miles; but between it and the coast the inshore current is tidal, and runs in both directions. The existence and direction of