

There is also some reason to suppose that with severe or long continued south-westerly winds, this current is displaced from its usual course and made to set in against the south side of Anticosti. If this supposition is correct, it would help to account for the "Caution" found on the chart in this neighbourhood to the effect that "the currents are governed principally by the wind." A knowledge of the usual course of such a current, and the reasons for its change in position, would enable this vague caution to be replaced by some much more definite statement, to show mariners what they have actually to expect. In the part of the Gulf to the eastward of the Magdalen Islands and Anticosti, there are some indications that the surface water has a movement in a north-westerly direction. If this movement is found to exist either permanently or at certain times, it will furnish an example of a cross current on the route of vessels coming inwards through Belle Isle. The tendency of such a current to set them to the northward of their course, would then help to explain why so many vessels in endeavouring to round the eastern end of Anticosti are wrecked on its north-eastern shores. The great importance of ascertaining the actual facts in such cases as these, is very evident.

There are other directions also in addition to the interests of shipping, in which a knowledge of the currents may be indirectly of practical importance. The good fishing grounds on the Atlantic coasts of Newfoundland and Nova Scotia and along New England are acknowledged to be due to the cold northern current which skirts these shores. It is generally believed that the cold water which enters at Belle Isle, floods the bottom of the Gulf in its deeper parts; and some knowledge of the extent to which this is the case, may throw light indirectly on the distribution of cold water fish in the Gulf area. On the other hand the oyster is found in the warmer waters of the Gulf, along the shores of New Brunswick and Prince Edward Island; although on the Atlantic coast it does not occur much north of Portland. The water is naturally warmest in the shallow parts which are least disturbed by currents; and the relation between the movement of the water and the temperature, may therefore have a bearing on the localities which the oyster prefers.

It is well known that the height of the barometer has an effect on the height of the tide. This is explained in general terms, by saying that the decreased pressure of the air allows the tide to rise higher than it otherwise would; as the difference in pressure of an inch of mercury corresponds to about a foot in the height of water. The amount of difference likely to occur in the actual height of the tide from this cause, is of little practical importance, except in the case of a harbour with a bar across its mouth. But the effect on the tidal currents may often be much more marked. For example, a low barometer over the Bay of Fundy with a rising tide can hardly fail to increase the velocity of the currents; and the amount of this increase ought to be determined. In land-locked areas such as the Gulf of St. Lawrence, the effect of the barometer is usually quite distinct, if we may judge by such similar instances as the Baltic Sea and the Gulf of Mexico. With a high barometer over the area of that gulf, and a lower pressure over the ocean outside, the speed of the Gulf Stream is appreciably affected. The conditions are closely parallel in the case of the Gulf of St. Lawrence, when the low pressure area of a storm is passing over the outer banks, on the course which these storms usually follow. If this is also accompanied by a strong north-westerly wind across the Gulf, it is to be expected that a considerable volume of water will be driven out at Cabot Strait, by these two causes acting together, and that the general equilibrium of the Gulf will be disturbed.

On account of these effects of the changes in atmospheric pressure, the readings of the barometer are always recorded in connection with tidal stations. This is being done in all cases in which there is no neighbouring meteorological station which will serve the purpose.

TIDES AND CURRENTS OF THE PACIFIC.

On the Pacific Coast the principal harbours of Victoria, New Westminster, Vancouver and Nanaimo, are all situated on the straits or interior waters within