The reason most probably is that the surface of the water is more directly affected and disturbed by the influence of the wind; while the under-current may continue to follow the law which dominates in any particular locality. A noteworthy **example** of this has already been described in the case of the current in the Strait of Belle Isle. (See annual report, Department of Marine, for 1894; page 99.) The usual tidal character of the current in that strait is maintained by the under-current, at times when the surface current is gradually acquiring a constant set in one direction under the influence of heavy and continuous wind.

It is thus essential to give careful attention to the investigation of the undercurrent in order to understand the surface current itself; for if it is the movement of the under-current which is more in accordance with the normal conditions of the locality, it will come up to the surface as soon as the disturbing influences which have been acting on the surface of the water, cease to operate. The study of the under-current is therefore also necessary, if any hope is entertained of arriving at the general circulation in this portion of the Gulf, or the true relation of its currents to the causes which influence them.

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The general causes which act upon both the surface and the under-current, and often affect them so differently are :—1. Tidal influence. 2. The influence of the wind and barometer. 3. A cause of a wider character which shows itself as a tendency in the current to set constantly in some one direction.

In describing the actual behaviour of the currents as ascertained from the observations taken, and from the information which was collected during the season, we will have occasion to refer to the effects of these influences upon the currents, so far as they can be traced. The observations will also show the limiting speed of the currents; their prevailing directions; and the range of direction in which they may possibly set; all of which is of direct practical value.

## NATURE OF THE CURRENTS AS OBSERVED.

The positions of the stations at which the observations were made, are shown on the outline chart, Plate I. The actual directions of the surface current at the various stations are shown in Plates II. and III., in which the times of high water and low water from the tidal station at South-west Point, Anticosti, are also given for comparison. In Table I., a summary is given to show the time during which the current set in each direction at the various stations, and the time during which there was no current. This table is made from the observations of the current set in each direction. It serves to show whether the current has any dominant direction; and also the directions through which it may veer and in which it is most prevalent. The same result is shown graphically on the chart, Plate I.; where the arrows radiating from each station in the eight leading directions, indicate the prevalence of the current ran in its direction, as a percentage of the total time that the station was occupied. Hence the total length of the arrows at each of the stations is the same, if the time during which there was no current, is allowed for ; as this length makes up 100 per cent in each case.)

The observations of the under-current are given in Table II. The direction and velocity at the surface and three fathoms, were obtained from the surface float and the meter record. From three fathoms downwards, the results were obtained by the deep fan as already explained. Many of the individual results given at the different depths, were careful averages, or were taken twice, or checked by both meter and fan. Any results in which there was any uncertainty, from the swinging of the ship or other causes, are omitted; and in this way some of the longer intervals of time for which no observations are given, are accounted for.

In reviewing the results obtained at the different stations we may first notice those at station  $C_i$  as this is a typical station in the central part of the region under consideration. It will thus serve to illustrate the nature of the currents in the open waters, as this station lies 18 miles off Cape Whittle. It was also occupied twice,