

## Steamboat Inspection.

The density sections referred to are given in Tables E and F ; and from these it will be seen that between Fame Point and Ellis Bay the water of least density occupied the middle of the passage for a width of 20 miles. This width is greater than usual, as the current was there running in the direction of the section itself. In Table F, the water of least density is seen to lie immediately off Cape Gaspé, which corresponds with the position of the out-flowing water in that vicinity.

During the following week, from September 16th to 21st, the current was examined in the offing of Griffin Cove and the vicinity of Gaspé. The weather was broken and rough, and although continuous observations could not be made for long at a time, a good deal of information was obtained from careful tracking while it was too rough to hold at anchor. From September 13th to 21st the meteorological conditions were as follows: The low barometer of the 13th when the mean height was only 29.58 rose rapidly to 30.13 on the 15th, fell again to 29.50 on the 18th, and rose a little above 30.00 by the 20th. The winds were northerly on the 13th and 14th while the barometer was rising ; and these gave place to south-westerly winds while it fell. When at its lowest there were heavy winds from the N.N.W. amounting to a total mileage of 1179 miles from that direction alone during the 17th, 18th, and 19th ; and averaging as high as 29 miles per hour for 24 hours on the 18th. On the 20th and 21st the winds became moderate and variable.

Although repeated endeavours were made to hold at anchor, the only observations of this kind were obtained at a station 5 miles E.N.E. from Griffin Cove, during 7 hours on the 17th, and again during 17 hours from noon on the 20th throughout the following night. The current on the first occasion was found to veer from E.S.E. through E. to N.N.E. and back to E. ; and again on the second occasion it veered from N.N.E. through N. and W. as far as S. As the shore line here lies N. by W. some of these directions are directly on-shore and off-shore ; and the current when running thus was often near its greatest strength. The current was at times quite slack, but was usually between half a knot and one knot, and did not exceed 1.36 knots per hour. No definite relation to the turn of the tide could be found for either the direction or the variation in velocity ; but a careful analysis of the directions showed that during the rise of the tide the current ran from directions on the south side of a line lying W. by N. and E. by S. and during the fall of the tide from directions on the north side of that line. This is in general accord with the direction of the rising and falling tide ; and the only exceptions occurred when the current was weak and vacillating.

The under-current, however, did not follow the surface current in these extreme variations, but maintained directions which were fairly parallel to the shore. From this station the extreme bearings to the coast line in the two directions were N.E.  $\frac{1}{2}$  N. and S.S.W., and the direction of the under-current kept within the limits of these bearings and their opposites, and did not therefore have directions which tended on and off shore. While the surface current ran from north-westerly or south-easterly directions, the under-current had the same direction within one or two points ; but when the surface current tended on shore, the under-current changed gradually in direction with the depth, and from about 30 fathoms downward it was practically parallel with the shore line. Hence the body of the movement was along shore, and the cross-currents were relatively superficial.

From information obtained on the courses run, the prevalent direction of the current during these days was from the N.N.W. in the offing of Griffin Cove, and from the N. off Cape Gaspé itself. The velocity ranged usually from 1.00 to 1.80 knots per hour ; but on September 19th immediately after the heavy north-westerly wind of the 18th, the current had a velocity off Cape Gaspé of 2.60 knots per hour, which was one of the highest speeds observed. The general direction of the current as thus determined, and its greater strength near Cape Gaspé, accords with the density contours as shown in Plate V.

*On-shore and off-shore directions of the current.* On account of the importance of these directions, it may be well to group together all the instances which were met with during the course of the observations. The most noteworthy instance off the Gaspé coast, occurred on September 17th at a station 5 miles E.N.E. from Griffin Cove. The