

being north-eastward along the Atlantic coast of Nova Scotia. At Station F, twelve miles off Cape Sable, the ebb setting E. S. E. was slightly stronger than the flood when the under-current is included. When these indications are balanced against each other, there is little evidence of a general movement of the water in any one direction, as this cannot be inferred with certainty from the present observations.

THE UNDER-CURRENT.

At all the stations the maximum strength of the under-current, at each flood and ebb, was carefully measured. These observations afford direct simultaneous comparisons with the surface current from which the proportional strength of the under-current can be found. The movement of the under-current is always of much assistance in determining the relative strength of the flood and ebb, and it thus helps to indicate any tendency of the water to make in a dominant direction.

The observations were taken with the appliances described, at a standard depth of 30 fathoms; and if the depth of the water did not admit of this, which was quite exceptional, a depth of 15 fathoms was adopted. In such observations it is always easier to obtain the relative or comparative strength than the absolute velocity; but the experimental comparisons with measured velocities, enabled very satisfactory results to be arrived at.

Relation to the surface current.—The relation between the strength of the under-current and the surface current is the question of most importance. The most trustworthy results were those obtained at the more outlying stations, which were free from any local influences. The final percentages at these stations, found from the average of eighty-one comparative observations at half-tide, are given in the following list. It thus appears that almost everywhere, the velocity of the under-current varies only within the limits of 7 per cent. more or less than the surface velocity. As this is not more than the usual irregularity in such currents, it may therefore be said that the whole body of the water moves with the same speed to a depth of at least 30 fathoms. This proves the depth as well as the strength of the currents in this region, which is important with relation to wind disturbance, and will be referred to again under that heading.

Station F.	Off Cape Sable.	Under-current at 30 fathoms.		95 per cent. of surface current.		
"	H. Off Blonde Rock.	"	15	"	98	"
"	B. Off Seal island.	"	30	"	104	"
"	C. Off Lurcher shoal.	"	30	"	93	"
"	A. At mouth of Bay.	"	30	"	105	"
"	M. Grand Manan ch'l.	"	30	"	107	"

Time of the turn of the under-current.—It was found from the longest series of observations obtained at stations which were occupied on several different occasions, that the turn of the under-current was practically simultaneous with the turn on the surface. On the average it was within five or ten minutes of the same time; and it rarely exceeded half an hour. This result was obtained at five stations which were the best adapted for securing such a comparison.