

(1) The practical equality of the strength of the current in the two directions, is in accord with the nature of the tidal movement in the Bay as already ascertained. At the head of the Bay, the rise of the tide above mean sea level is equal to its fall below that level. This results from measurements by the Engineers of the proposed Baie Verte canal, made on the two sides of the isthmus of Chignecto; in Cumberland basin and Northumberland strait. The reduction of these measurements and a diagram illustrating them, are given in the Report of Progress of the Tidal Survey, December 1898, pp. 29 to 32, and Plate. III.

It thus appears that the filling and emptying of the Bay with the tide, is equally above and below the plane of mean sea level. There is no large volume of fresh water discharge at the head of the Bay, to disturb this equality, as there is in some estuaries. It is thus evidently to be expected, that the strength of the flood and ebb should be equal in the two directions, if the tidal influence is the only one to be considered. This conclusion is confirmed also by the behaviour of the under-current at Station A, as explained under that heading. The inequality of the flood and ebb which is found at some stations, should probably be considered therefore as a local feature; because the current is obliged to take different courses on the flood and ebb, on account of some obstruction in its way.

(2) In the case of currents so distinctly tidal in their character, a difference between the strength of the flood and the ebb is the only indication to show that the water makes in one direction rather than in the other. In a comparison for this purpose, it is necessary to take the under-current into account also, as it is a question of the movement of the whole body of the water. It appears from the observations at all the more outlying stations that, with the exception of Station B, the relative strength of the surface current in the two directions varies less than fifteen per cent. from equality. Also, at Station C, off Lurcher shoal, where the longest series of observations were obtained, the average strength in the two directions, when the surface and under-current are taken together, is just equality.

At Station B, off Seal island, where unusually high velocities were found, both the surface and under-current were much stronger during flood tide. There was little diurnal inequality at the time to account for this, nor sufficient wind disturbance to occasion it. It may thus be an indication of some balance of flow in the westward direction, unless it is due to a local strengthening of the flood, which is not impossible; as this station is within four miles of a well marked projection from the edge of the 30-fathom bank. It was also noticed at Stations A and K, south of Grand Manan island, that the direction of the ebb veered more to the westward than the flood, by one or two points. To follow up these indications, a station was occupied on the coast of Maine; namely, Station D, six miles off Moose Peak light, in 42 fathoms. It was there found that the ebb, setting westward, is 38 per cent. stronger than the flood, when the under-current is included. Also, the directions of both flood and ebb bear two points on the shoreward side of a line parallel with the coast; and at slack water the current in turning, veers to the landward side in both cases. The water has thus a tendency to bear against this coast, which would correspond with a westward movement across the mouth of the Bay of Fundy.

On the other hand, at Station E, off Shelburne, from observations at the spring tides, it appears that the ebb is 6 per cent. stronger than the flood; the ebb direction