To carry out this general plan it was necessary to provide appliances for deep anchorage, which were necessarily of a special character. Anchorages were made in all depths up to 90 fathoms. The observations were continuous day and night. During the day time, the direction and velocity of the current were taken every half hour; and at night the direction only was observed, with an estimate of the relative strength at different times. Captain Thos. G. Taylor gave valuable co-operation in facilitating the work. Mr. L. Keller acted as technical assistant; and the night observations were taken by the first and second officers, Mr. John Smith and Mr. Reginald Clarke.

Nature of the currents.—The currents were almost invariably less than one knot. As a rule, they veered widely and were irregular in direction; and with so low a speed they were readily influenced by the wind. There were three elements to distinguish:—(1) Any general tendency to set in one direction more than in others. (2) Any tidal influence, which might show itself either as a marked change in the direction of the set, or as a period in which a variation in velocity would recur. (3) The influence of the wind in disturbing the usual behaviour of the current. From our observation, the effect of any storms which occur during the summer season seldom extends to a greater depth than 5 or 10 fathoms; and it was therefore found that the behaviour of the under-current at 15 to 30 fathoms afforded a most valuable indication of the normal character of the current. In these currents, the tidal element is almost invariably present in some form, more or less distinct; and this is almost always combined with a tendency to make on the whole in some one direction. It is not therefore possible to maintain an arbitrary distinction between 'constant currents' and 'tidal streams'; but the only natural distinction is to use the term *current* for all horizontal movements of the water, and *tide* for the vertical movement between high and low water levels.

Current measurement.—The speed of the current was measured by a current-meter, registering electrically on board and read every half hour. For use at sea, the chief desideratum is to keep the meter as steady in the water as possible. To do so, the meter was supported by a line which was carried completely over the steamer, through pulleys fitted with patent sheaves, to a water anchor on the opposite side. The steamer could thus roll under the whole apparatus without disturbing it too seriously. The meter was also placed amidships to avoid the pitching. Allowance was made by experiment for the increased record due to the movement remaining. Even when it was too rough for the absolute record to be relied on, the relative velocities obtained were of value, especially in detecting tidal influence. With a larger steamer, the motion would have been less serious; but with these arrangements the meter could still be used to advantage in waves 6 feet to 8 feet high and 60 feet to 80 feet in length, which was the usual proportion. In all cases the measurement of velocity was made at a depth of 18 feet, which was well below the keel of the steamer, and below superficial disturbance.

Surface direction.—This was obtained by a float built of board, and weighted to bring its surface awash with the water. It was thus unaffected by the wind. The chief difficulty in obtaining the correct direction, was the sheer of the steamer while lying at anchor, which at times was very troublesome. At night, a small electric light was attached to the float, which eventually was made to work satisfactorily and proved very convenient.

Under-current.—The direction of the under-current was found by means of a fan, made of two sheets of galvanized iron passing through each other at right angles, and