

sea. Supposing the coexistence of two different periodical variations, one with a period of about twelve and a half hours, the other with one of about fifteen hours, an infinite number of variations would ensue, to which might be added the more casual influence of the wind and other factors, causing among other things incessant dislocations of the boundaries between the different water-layers or currents.

Wind-
produced
currents.

The wind may produce a current, particularly in the surface layers, thus altering the direction and velocity of the existing current. We know very little, however, about the relation between wind and current, through lack of detailed observations, although the question is naturally of the first importance from an oceanographical point of view, as well as from its bearings on the conditions of everyday life. This is one of the principal tasks for the oceanographer of the future; such observations are difficult to make, no doubt, but with modern methods much can be done.

A wind blowing over the sea will carry the surface water along with it. In the open ocean the current thus produced is generally somewhat deflected from the direction of the wind itself.

During the drift of the "Fram" over the North Polar Sea, Nansen found that the ship, as a rule, was carried to the right of the wind's course. V. W. Ekman has studied the question theoretically, arriving at the conclusion that such a deflection is a result of the earth's rotation. Later, Forch, by extracting the records from a number of ships' journals, found the same deflection to the right in the Mediterranean and in the North Atlantic, while, as might be expected, there is a deviation to the left in the southern hemisphere. Now, as the surface-water is carried along by the wind, the deeper layer will approach the surface at the place of origin of the wind-current. In Fig. 184, which represents one of Sandström's experiments, we see how the wind may raise the boundary between the upper and lower water-layers. When the wind ceases this rise again subsides, producing a boundary-wave which will proceed farther. A wave like this may attain a considerable height, without being perceptible at the surface; its dimensions will depend on the distribution of density. A boundary-wave in the Norwegian

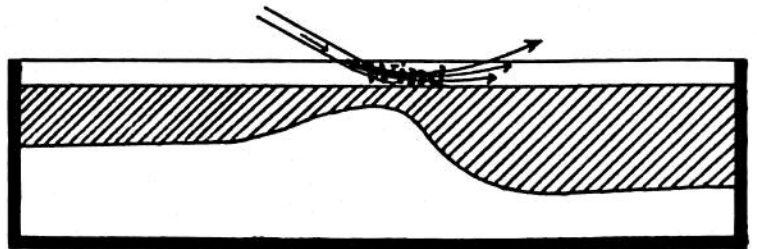


FIG. 184.—SANDSTRÖM'S EXPERIMENT FOR PRODUCING A SUBMARINE WAVE BY A GUST OF WIND.

Boundary-
waves.