

Sea 100 metres in height would manifest itself as a surface-wave about 5 cm. high, that is, practically imperceptible, as the wave is very long and proceeds slowly. Several of the "Michael Sars" investigations indicate such boundary-waves, but here also precise observations are lacking. They are, however, known in one particular form, viz. as the boundary-wave producing "dead water." When a comparatively fresh and light water-layer, 2 or 3 metres thick, rests on a salt and heavy layer, a passing ship may give rise to a boundary-wave between the two layers. This wave may stop the ship, so that it lies in dead water hardly able to move at all. Ekman, who has investigated these phenomena, has demonstrated the dead-water wave by the following experiment (see Fig. 185). He put salt water, coloured dark, into a long basin, and on the top he poured a thinner layer of fresh water; when he slowly towed a small model of a ship through the upper layer, a

"Dead water."

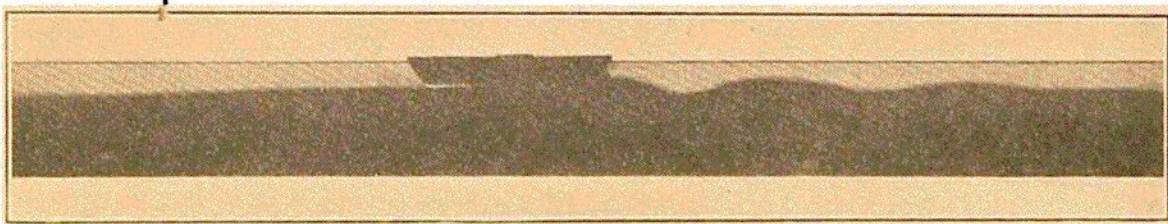


FIG. 185.—EKMAN'S EXPERIMENT TO SHOW THE WAVE PRODUCING DEAD-WATER.

boundary-wave arose, as seen in the figure, which, when strongly developed, checked the speed considerably.

Naturally when a wave like this passes a certain spot on the sea, the undulating boundary between the two water-layers will at one moment be vertically nearer to that spot, at another moment farther down. Similar vertical oscillations may arise in other ways, as we shall now briefly indicate before describing some observations made during the cruises of the "Michael Sars," which prove that such undulations do exist in the sea.

We may first mention one of the effects of the rotation of the earth. By reason of the earth's rotation a body moving freely in the northern hemisphere in any direction will be deflected to the right, and with great velocities this deflection is quite considerable. There are many examples of it: a swinging pendulum constantly turns; the wind does not blow straight towards a cyclonic area, but in a spiral direction, bending to the right in the northern, and to the left in the southern, hemisphere; the effect of the earth's rotation is also

Effect of the earth's rotation