

large amount of southern neritic species (Didymus-plankton), made up to a great extent of forms of distinctly foreign origin. As the dark months of winter approach, however, their numbers rapidly decline.

In the open sea, too, our investigations appear to indicate that the southern forms reach farthest north in the autumn, say about November, while during the months of spring, from April to May, northern forms extend very far south. We have not as yet made investigations at different seasons in the tropical parts of the Atlantic ; consequently we cannot say whether there is an annual cycle of plant-development in a region where the conditions of existence seem to vary so little. It would be an excellent thing if researches of this nature could be undertaken.

Flora of the
open sea.

Supposing that the ocean-currents do exercise a direct influence upon the character of the plankton in the tropics, it is fair to imagine that it must be in the direction of periodicity. Lohmann has put forward the suggestion that the changes in pelagic animal life near the coasts of South Europe are connected with a cyclic movement of the water-masses. When these reach their northernmost point the conditions of existence will affect the organisms, so that the water-masses that pass through this region in the winter are likely to have a different fauna from that of the water passing through in summer. Elsewhere it is very difficult to tell what changes in the plankton are due to the direct influence of ocean-currents, and what changes are the result of altered conditions of existence partly due to ocean-currents and partly to other causes. It has often been observed, not only by Cleve and Hensen, but also during previous researches made by the "Michael Sars" and during the "Challenger" and "Valdivia" Expeditions, that the plankton changes its character the moment one passes the boundary between two currents. Thus an examination of the plankton may serve as a check on purely hydrographical investigations, which aim at ascertaining the boundaries of currents by means of observations of their temperatures and salinities. Perhaps the best guiding forms are the species of *Ceratium*, and strangely enough it is very often the species that systematically are the nearest related, which replace each other as we pass from one area to another. Many of them are so closely related that it is only for the sake of convenience that we regard them as distinct species, and there is always the possibility that they may be able to pass directly from one form into the other, even if we cannot actually prove

Ocean-
currents and
the plankton.