

separated areas of the deep sea. And so, too, we could mention deep-water types of particular structure in the case of most of the invertebrate classes.

Now as these types are distributed over a large portion of the great oceans, and occur there sufficiently generally to give the deep-sea fauna its character, it is fair to assert that this fauna is more uniform than the fauna of the littoral and sub-littoral zones. As is well known, we get great differences in the physical conditions of the different areas of both littoral and sub-littoral zones, consequently we find there greater variations of the fauna than in the deep sea, where physical conditions are uniform, or, in other words, there are more coastal faunal areas than there are deep-sea faunal areas.

We may briefly characterise the deep-sea fauna as follows: It is largely composed of groups of forms, which morphologically differ in many essentials from the types of the littoral fauna. These groups are distributed over very extensive tracts of the deep sea, but the different species (genera, families) within the groups may be limited to more circumscribed areas. It is evident, therefore, that we can distinguish between the various faunal areas of the deep sea, though we may not yet be able to fix their boundaries.¹

Deep-sea
fauna of the
North
Atlantic com-
pared with
that of the
Norwegian
Sea.

The second question is how far the deep-sea fauna of the Atlantic resembles that of the Norwegian Sea, or in other words whether the Atlantic area with its higher bottom-temperatures shares many species with the "cold area" of the Norwegian Sea. As indicated on p. 13, Murray in 1886 summarised the results obtained in the Faroe Channel by the "Lightning," "Porcupine," "Knight Errant," and "Triton" Expeditions, and showed that of 385 species recorded from the "warm" and "cold" areas, only 48 species (or 12½ per cent) were common to both areas.²

The Lycods are especially characteristic of the cold area of the Norwegian Sea, whereas the Macrurids are typical of the deeper parts of the Atlantic, and Jungersen has drawn attention to the abundant horn-corals and joint-corals (Gorgonids and Isids) as well as the "star-corals" (*Oculina*, *Amphihelia*) and other corals of the Atlantic deep water, none of which occur in the Norwegian Sea deep basin.

The finding of such differences in the general character of

¹ In regard to the boundaries, however, the cold area of the Norwegian Sea forms an exception, and the same may possibly be true of the Antarctic deep sea (Chun, *Aus der Tiefe des Weltmeeres*; Mortensen, *Echinoidea of the "Ingolf" Expedition*).

² See also Murray and Tizard, *Proc. Roy. Soc. Edin.*, vol. xi. p. 638, 1882.