

distinctive character chiefly to the low temperature of its bottom water, and to its isolated position due to the submarine ridges, which are responsible for the low temperature.

Formerly
homogeneous
fauna in the
deep water
of the
Norwegian
Sea and North
Atlantic.

Though the cold area of the Norwegian Sea must be regarded on these grounds as a separate faunal region, it undoubtedly had formerly more direct connection with the deep water of the Atlantic. The many closely allied species in both areas point to a common origin. Most probably the fauna was at one time homogeneous in both areas, and the bottom water of the Norwegian Sea had then the same temperature as we find in the Atlantic nowadays. When physical conditions changed in the Norwegian Sea, either owing to the formation of the submarine ridges or from other causes, the fauna responded in two ways. Some of the warm water forms, including a number of present Atlantic forms, died out, while others were able to adapt themselves to the altered physical conditions and survived. Their adaptation, however, led to morphological alterations in the species, and in some cases these alterations were considerable enough to produce distinct species differing from the primitive Atlantic forms. Naturally, the isolation brought about by the submarine ridges had much to do with the development and establishment of their characteristics. In fact, it seems like an experiment carried out by nature herself on a large scale, and shows that external conditions can probably alter the bodily structure of a species, and consequently give rise to the formation of new species and varieties.

To understand properly the composition of the fauna in the Norwegian Sea at the present time we must go back to the Glacial Age, when uniform arctic conditions prevailed, and the fauna was everywhere arctic. This is confirmed by the marine deposits of the Glacial Age, containing exclusively arctic animal forms, met with in what are now boreal areas. When subsequently the ice melted, and the climate became milder, southern forms were able to immigrate, gradually distributing themselves throughout the boreal (and boreo-arctic) waters.

Origin of the
present-day
fauna of the
Norwegian
Sea.

The question as to what happened to the arctic fauna of the Glacial Age admits of a thoroughly satisfactory answer. In areas which at the present day are arctic, we still find arctic species, but in boreal areas the changes have been great. Some of the arctic forms which formerly inhabited what are now boreal areas have gradually died out from failure to adapt themselves to the new conditions; their remains may