

fossil from the Chalk ; and a remarkable group of irregular urchins, clustering round the genus *Pourtalesia*, and recalling such cretaceous forms as *Infulaster*, *Holaster*, *Micraster*, and *Ananchytes*. The curious group of HOLOTHURIDEA, the Elasmopoda, to which I have already referred. A large family of Crustacea having a strong general resemblance to the fossil genus *Eryon* (fig. 22), and a group of gigantic schizopods, such as *Petalophthalmus* and *Gnathophausia*. The fishes include many marvellous and grotesque species, chiefly referable to the Ophidiidæ, the Macruridæ, and the Scopelidæ (fig. 24).

We have already seen that the fauna of shallow water is roughly mapped out into zoological areas ; resembling, and to a certain extent following the land in this respect. A fauna so uniform and so continuous as that of the abyssal region cannot be directly derived from the faunæ of the marine Provinces, which form its littoral fringe, even although these are somewhat laxly defined. It has all the appearance of having been derived from a genetic source dating much further back than the minor oscillations which have from time to time during the latest geological periods produced great changes of level in the land, sufficient to raise effective barriers to distribution, and to produce local changes of climate and changes of level in the sea-bottom to a considerable, if to a much more limited, degree.

The question therefore remains to be solved, and it is one of the highest interest, whence, and from what genetic source is this uniform and apparently independent fauna derived ?

*The Source of the Abyssal Fauna.*—I suppose I am now entitled to regard the view as widely accepted by geologists, that the age of the most obvious depressions in the crust of the earth, which are now filled by the sea, is much greater than we were at one time led to believe. I long ago expressed the opinion that the primary meridional grooves of the earth's crust dated from its original cooling ; whether this be so or not, there seems to be sufficient evidence that all changes of level since the close of the Palæozoic period are in direct relation to the present coast-lines.

There does not seem to be a shadow of reason for supposing that the gently undulating plains, extending for over a hundred millions of square miles at a depth of 2500 fathoms beneath the surface of the sea, and presenting like the land their local areas of secular elevation or depression, and their centres of more active volcanic disturbance, were ever raised, at all events in mass, above the level of the sea ; such an arrangement, indeed, is inconceivable. If, then, such a condition did not at any time exist, a continuous ocean must always have extended over the greater part of the earth's surface, and must have occupied continuously any secular areas of depression due to the assumption by the world of its present physical features.

Without entering into the vexed question of recurrent glacial epochs, there is certainly no evidence from palæontology that the temperature conditions of the sea at