

united by their ligament, in company with other littoral shells, such as *Mya arenaria* and *Littorina rudis*, and evidently not thrown up from deep water. Yet the northern character of the Norwich Crag is not fully shown by simply saying that it contains 12 Northern species now no longer found in British seas, since several boreal shells which still linger in the Scottish deeps do not abound there as they did in the latter days of the Crag Period. It is the predominance of certain genera and species which satisfies the mind of a conchologist as to the Arctic character of the Norwich Crag. In like manner, it is the presence of such genera as *Pyrula*, *Columbella*, *Terebra*, *Cassidaria*, *Pholadomya*, *Lingula*, *Discina*, and others, which give a southern aspect to the Coral-line Crag shells.

In conclusion, it may be observed that the cold which had gone on increasing from the time of the Coralline to that of the Norwich Crag continued, though not perhaps without some oscillations of temperature, to become more and more severe after the accumulation of the latter, until it reached its maximum in what has been called the Glacial epoch. The marine fauna of this last period contains, both in Ireland and Scotland, recent species of mollusca now living in Greenland and other seas far north of the areas where we find their remains in a fossil state.

It is not in reference to the two older formations above alluded to, but when we attempt to classify the lacustrine and fluviatile deposits (some contemporaneous with the marine Norwich Crag and others posterior to it), that we encounter in the East and South of England the greatest difficulty. When treating of the Newer Pliocene and drift formation in the Valley of the Thames, I have acknowledged the perplexity in which this subject is still involved, and have hinted at the causes of it (chap. xiii. pp. 152, 153). Every year, however, removes some of this ambiguity; for the true relative position of distinct sets of superficial strata becomes more clearly understood, and the specific characters of the fossil mammalia and shells better ascertained. In the first place, the occurrence in the Norwich Crag of many marine shells of Northern species, as before described, in company with land and freshwater shells, and some mammalia of a more Southern character, may possibly be explained by supposing the sea of the Norwich Crag to have been opened towards the Pole, with islands interspersed, while the land of the same period was continuous far to the South. In that direction a Continent may have existed, from which rivers flowed northwards, in whose waters the hippopotamus and such shells as the *Cyrena consobrina* flourished.

The Mastodon found in the Red and Norwich Crag (p. 155, and fig. 135, p. 165) was till lately regarded as a Miocene or Tertiary species; and under this persuasion, calling it *M. angustidens*, on the authority of Professor Owen, I suggested that its remains might have been washed out of older strata into the Crag, just as we sometimes observe London Clay and Chalk fossils occasionally introduced into the same deposit. Many teeth of this Mastodon, together with numerous ear-bones of