

glacial period, which we shall shortly have under consideration, many shells, previously established in the temperate zone, retreated southwards, to avoid an uncongenial climate. The Professor gives a list of fifty which inhabited the British seas while the Coralline and Red Crag were forming, but which are all wanting in the glacial deposits;* from which he infers that they migrated at the approach of the glacial period, and returned again northwards, when the temperate climate was restored. †

In the Upper or Mammaliferous (or Norwich) Crag, of which there is a good exposure in a pit near the asylum at Thorpe, bones of Mammalia are found with existing species of shells. The greater number of the Mammalian remains have been supposed, until lately, to be extraneous fossils; but they are now considered by Mr. Prestwich as truly contemporaneous. The peculiar mixture of southern forms of life with others of a more northern type lead to the inference that, at this early period, a lowering of temperature began gradually to set in from the period of the Coralline Crag to that of the Forest Bed, which marks the commencement of the Glacial Period.

The distinction between the Mammaliferous Crag of Norwich and the Red Crag of Suffolk is purely palæontological, no case of superposition having yet been discovered, and they are now generally considered as contemporaneous. Two Proboscidiæ abundant during the Crag period were the *Mastodon Arvernensis* and the *Elephas meridionalis*. In the Red Crag the Mastodon is stated by the Rev. John Gunn to be more abundant than the Elephant, while in the Norwich beds their proportions are nearly equal.

At or near the base of the Red Crag there is a remarkable accumulation, varying in thickness from a few inches to two feet, of bones, teeth, and phosphatic nodules (called coprolites), which are worked for making superphosphate of lime for agricultural manure.

The foreign equivalents of the older Pliocene are found in the *sub-Apennine strata*. These rocks are sufficiently remarkable in the county of Suffolk, where they consist of a series of marine beds of quartzose sand, coloured red by ferruginous matter.

At the foot of the Apennine chain, which forms the backbone, as

* For full information on these deposits the reader is referred to the "Memoirs on the Structure of the Crag-beds of Norfolk and Suffolk," by J. Prestwich, F.R.S., in the *Quart. Jour. Geol. Soc.*, vol. xxvii., pp. 115, 325, and 452 (1871). Also to the many Papers by the Messrs. Searles Wood published in the *Quar. Jour. Geol. Soc.*, the *Ann. Nat. Hist.*, the *Phil. Mag.*, &c.

† Lyell's "Elements of Geology," p. 203.