

sometimes marine, as *Pholadomya*, *Modiola*, *Ostrea*, *Neæra*, &c.; at other times fresh-water shells, as *Cyrena*, *Unio*, &c., and he correctly states that 'all the characters presented by the beds of the *Upper Estuarine Series*, point to the conclusion that they were accumulated under an alternation of marine and fresh-water conditions, such as takes place in the estuaries of rivers.' These strata between Northampton and Grantham are rarely more than about 25 feet in thickness.

When we think of the meaning of these phenomena, it is evident that, while from Gloucestershire to the south coast, all the strata from the base of the Lower Lias to the top of the Oolitic series are marine, in the middle area of Northamptonshire, Rutland, and Lincolnshire, a set of conditions prevailed in the time of the deposition of the Lower Oolites that indicated filling up of the area, and temporary elevation of the old marine deposits, in places, quite above the level of the sea, so that swampy terrestrial surfaces were formed, through which wandered minor streams inhabited by fresh-water shells. Further north this fact becomes still more plain.

After crossing the Humber, and passing the unconformable overlap of the Cretaceous rocks of the Yorkshire Wolds, a series of Liassic and Oolitic strata appears in the North Riding, forming a great tract of beautiful hilly country, the sections of which are best seen on the coast cliffs that lie between the mouth of the Tees and Filey Bay. That part of the cliffs of which the strata are of Oolitic age, more or less includes *representatives in time* of all the so-called formations from the Inferior Oolite to the Kimeridge Clay inclusive. The lithological characters, and mode of formation, of all the strata that are presumed to lie between the horizon of the base of the inferior Oolite and the Cornbrash, are, however, of a