coral reefs and shelly limestones, after proceeding without interruption for ages, was liable to be stopped suddenly by the deposition of clayey sediment. Then, again, the argillaceous matter, devoid of corals, was deposited for ages, and attained a thickness of hundreds of feet, until another period arrived when the same space was again occupied by calcareous sand, or solid rocks of shell and coral, to be again succeeded by the recurrence of another period of argillaceous deposition. Mr. Conybeare has remarked of the entire group of Oolite and Lias, that it consists of repeated alternations of clay, sandstone, and limestone, following each other in the same order. Thus the clays of the lias are followed by the sands of the inferior oolite, and these again by shelly and coralline limestone (Bath oolite, &c.); so, in the middle oolite, the Oxford clay is followed by calcareous grit and "coral rag;" lastly, in the upper oolite, the Kimmeridge clay is followed by the Portland sand and limestone.* The clay beds, however, as Sir H. De la Beche remarks, can be followed over larger areas than the sands or sandstones.† It should also be remembered that while the oolitic system becomes arenaceous, and resembles a coal-field in Yorkshire, it assumes, in the Alps, an almost purely calcareous form, the sands and clays being omitted; and even in the intervening tracts, it is more complicated and variable than appears in ordinary descriptions. Nevertheless, some of the clays and intervening limestones do, in reality, retain a pretty uniform character, for distances of from 400 to 600 miles from east to west and north to south.

According to M. Thirria, the entire oolitic group in the department of the Haute Saône, in France, may be equal in thickness to that of England; but the importance of the argillaceous divisions is in the inverse ratio to that which they exhibit in England, where they are about equal to twice the thickness of the limestones, whereas, in the part of France alluded to, they reach only about a third of that thickness.‡ In the Jura the clays are still thinner; and in the Alps they thin out and almost vanish.

In order to account for such a succession of events, we may imagine, first, the bed of the ocean to be the receptacle for ages of fine argillaceous sediment, brought by oceanic currents, which may have communicated with rivers, or with part of the sea near a wasting coast. This mud ceases, at length, to be conveyed to the same region, either because the land which had previously suffered denudation is depressed and submerged, or because the current is deflected in another direction by the altered shape of the bed of the ocean and neighboring dry land. By such changes the water becomes once more clear and fit for the growth of stony zoophytes. Calcareous sand is then formed from comminuted shell and coral, or, in some cases, arenaceous matter replaces the clay; because it commonly happens that the finer sediment, being first drifted farthest from coasts, is subsequently overspread by coarse sand, after the

* Con. and Phil. p. 160.

† Geol. Researches, p. 337.

‡ Burat's D'Aubuisson, tom. ii. p. 456.