

The Chalk crops out from beneath the tertiary sands and clays of the Paris basin, near Epernay, and the Gault from beneath the Chalk and Upper Greensand at Clermont-en-Argonne; and passing from this place by Verdun and Etain to Metz, we find two limestone ranges, with intervening vales of clay, precisely resembling those of southern and central England, until we reach the great plain of Lias at the base of the Inferior Oolite at Metz.

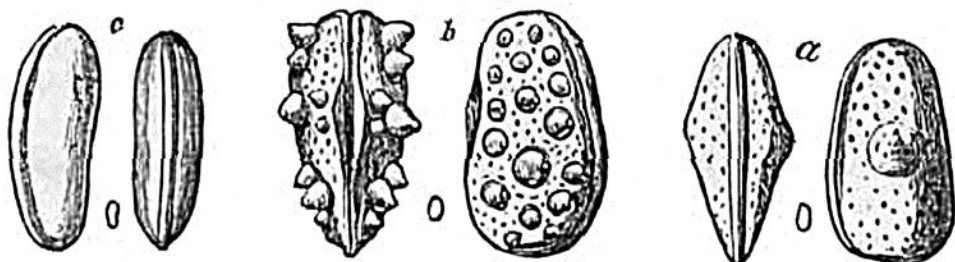
It is evident, therefore, that the denuding causes have acted similarly over an area several hundred miles in diameter, sweeping away the softer clays more extensively than the limestones, and undermining these last so as to cause them to form steep cliffs wherever the harder calcareous rock was based upon a more yielding and destructible clay.

UPPER OOLITE.

Purbeck beds (*a*, Tab. p. 291).—These strata, which we class as the uppermost member of the Oolite, are of limited geographical extent in Europe, as already stated, but they acquire importance, when we consider the succession of three distinct sets of fossil remains which they contain. Such repeated changes in organic life must have reference to the history of a vast lapse of ages. The Purbeck beds are finely exposed to view in Durdlestone Bay, near Swanage, Dorsetshire, and at Lulworth Cove and the neighboring bays between Weymouth and Swanage. At Meup's Bay, in particular, Professor E. Forbes examined minutely in 1850 the organic remains of this group, displayed in a continuous, sea-cliff section; and he added largely to the information previously supplied in the works of Messrs. Webster, Fitton, De la Beche, Buckland, and Mantell. It appears from these researches that the Upper, Middle, and Lower Purbecks are each marked by peculiar species of organic remains, these again being different, so far as a comparison has yet been instituted, from the fossils of the overlying Hastings Sands and Weald Clay.*

Upper Purbeck.—The highest of the three divisions is purely fresh-water, the strata, about 50 feet in thickness, containing shells of the genera *Paludina*, *Physa*, *Limnæus*, *Planorbis*, *Valvata*, *Cyclas*, and *Unio*, with *Cyprides* and fish. All the species seem peculiar, and among these the *Cyprides* are very abundant and characteristic. (See figs. 334, *a*, *b*, *c*.)

Fig. 334



Cyprides from the Upper Purbecks.

a. *Cypris gibbosa*, E. Forbes. *b*. *Cypristuberculata*, E. Forbes. *c*. *Cypris legumtnella*, E. Forbes.

* "On the Dorsetshire Purbecks," by Prof. E. Forbes, Brit. Assoc. Edinb. 1850.