

The Purbeck beds, which are sometimes subdivided into Lower, Middle, and Upper, are mostly fresh-water formations, intimately connected with the Upper Portland beds. But there they begin and end, being scarcely recognisable except in Dorsetshire, in the sea-cliffs of which they were first studied. They are finely exposed in Durdlestone Bay, near Swanage, and at Lulworth Cove, on the same coast. The *lower beds* consist of a purely fresh-water marl, eighty feet thick, containing shells of *Cypris*, *Limnæa*, and some *Serpulæ* in a bed of marl of brackish-water origin, and some *Cypris*-bearing shales, strangely broken up at the west end of the Isle of Purbeck.

The *Middle series* consists of twelve feet of marine strata known as the "cinder-beds," formed of a vast accumulation of *Ostrea distorta*, resting on fresh-water strata full of *Cypris fasciculata*, *Planorbis*, and *Limnæa*, by which this strata has been identified as far inland as the vale of Wardour in Wiltshire. Above the cinder-beds are shales and limestones, partly of fresh-water and partly of brackish-water origin, in which are Fishes, many species of *Lepidotus*, and the crocodilian reptile, *Macrorhynchus*. On this rests a purely marine deposit, with *Pecten*, *Avicula*, &c. Above, again, are brackish beds with *Cyrena*, overlying which is thirty feet of fresh-water limestone, with *Fishes*, *Turtles*, and *Cyprides*.

The *upper beds* are purely fresh-water strata, about fifty feet thick, containing *Paludina*, *Physa*, *Limnæa*, all very abundant. In these beds the Purbeck marble, formerly much used in the ornamental architecture of the old English cathedrals, was formerly quarried. (See Note, page 274.)

A few words may be added, in explanation of the term *oolite*, applied to this sub-period of the Jurassic formation. In a great number of rocks of this series the elements are neither crystalline nor amorphous—they are, as we have already said, oolitic; that is to say, the mass has the form of the roe of certain fishes. The question naturally enough arises, Whence this singular oolitic structure assumed by the components of certain rocks? It is asserted that the grinding action of the sea acting upon the precipitated limestone produces rounded forms analogous to grains of sand. This hypothesis may be well founded in some cases. The marine sediments which are deposited in some of the warm bays of Teneriffe are found to take the spheroidal granulated form of the oolite. But these local facts cannot be made to apply to the whole extent of the oolitic formations. We must, therefore, look further for an explanation of the phenomena.