

and Yorkshire. Thus a distinctly defined series of beds of an estuarine character is in the north homotaxially representative of the marine formations of the southwest. At the close of the Lower Oolitic period the estuary of the northern tract was submerged, and marine deposits were laid down across England.

The English Lower Oolites show considerable local variation in their subdivisions. They are typically developed in the southwestern counties, but the limestones and clays pass laterally into sands. The lowest group, that of the Midford Sands, is sometimes placed with the Lias. It consists of yellow micaceous sands, with some concretionary sandstone and sandy limestone, and ranges from 25 to 200 feet in thickness. A ferruginous limestone at the top contains so many Ammonites, Belemnites, and Nautili, that it has been called the "Cephalopoda bed." Two Ammonite zones may be recognized in this group, viz.:

Zone of Ammonites (*Harpoceras*) *opalinus*.
 " " (*Lytoceras*) *jurensis*.

Among the other characteristic fossils are *Ammonites aalenensis*, *A. hircinus*, *A. radians*, *A. variabilis*, *Belemnites compressus*, *B. irregularis*, *Gresslya abducta*, *Trigonia formosa*, *Gervillia Hartmanni*, *Rhynchonella cynocephala*, *R. plicatella*, etc.

The Inferior Oolite (Bajocian) attains its maximum development in the neighborhood of Cheltenham, where it has a thickness of 264 feet, and consists of calcareous freestone and ragstone or grit. It presents a tolerably copious suite of invertebrate remains, which resemble generically those of the Lias. The corals include species of *Isastræa*, *Montlivaltia*, and other genera. The crinoids are represented by *Pentacrinus*; the star-fishes by species of *Astropecten*, *Goniaster*, *Solaster*, and *Stellaster*; the sea-urchins by species of *Acrosalenia*, *Cidaris*, *Hemipedina*, *Clypeus*, *Pygaster*, etc. The predominance of *Rhynchonella* and *Terebratula* over the rest of the brachiopods become still more marked. *Lima*, *Ostrea*, *Pecten*, *Pinna*, *Astarte*, *Cucullæa*, *Myacites*, *Mytilus*, *Pholadomya*, *Trigonia* are the most common genera of lamellibranchs. The gasteropods are abundant, especially in the genera *Pleurotomaria*, *Alaria*, *Trochus*, *Turbo*, *Nerinæa*, *Cerithium*, and *Pseudomelania*. *Ammonites*, *Nautili*, and *Belemnites* are of frequent occur-