

groups. Of these, the lowest (95 to 160 feet) consists of fresh-water limestones and clays, with layers of ancient soil ("dirt beds") containing stumps of the trees which grew in them; the middle comprises 50 to 150 feet of strata with some marine fossils, while the highest (50 to 60 feet) shows a return of fresh-water conditions. Among the indications of the presence of the sea is an oyster-bed (*Ostrea distorta*) 12 feet thick, with *Pecten*, *Modiola*, *Avicula*, *Thracia*, etc. The fresh-water bands contain still living genera of lacustrine and fluviatile shells (*Paludina*, *Limnæa*, *Planorbis*, *Physa*, *Valvata*, *Unio*, *Cyrena*). Numerous fishes, placoid and ganoid, haunted these Purbeck waters. Many insects, blown off from the adjacent land, sank and were entombed and preserved in the calcareous mud. These include coleopterous, orthopterous, hemipterous, neuropterous, and dipterous forms (Fig. 395). Remains of several reptiles, chiefly chelonian, but including the Portlandian crocodile *Gonipholis*, and likewise some interesting dwarf crocodiles (*Theriosuchus* is computed to have been only 18 inches long), have also been discovered. The most remarkable organisms of this group of strata are the mammalian forms already noticed (p. 1474), which occur almost wholly as lower jaws, in a stratum about 5 inches thick, lying near the base of the Middle Purbeck sub-group, these being the portions of the skeleton that would be most likely first to drop out of floating and decomposing carcasses.

The zone of *Belemnites lateralis* in the Speeton Clay of the Yorkshire coast and the Spilsby Sandstone of Lincolnshire, are considered by Prof. A. Pavlow and Mr. G. W. Lamplugh to represent in part the Purbeck and Portland beds of the southern districts.⁷⁶

France and the Jura.—The Jurassic system is here symmetrically developed in the form of two great connected rings. The southern ring incloses the crystalline axis of the centre and south; the northern and larger ring encircles the Cretaceous and Tertiary basin and opens toward the Channel, where its separated ends point across to the continuation of the same rocks in England. But the structure of the two areas is exactly opposite, for in the southern area the oldest rocks lie in the centre and the Jurassic strata dip outward, while in the northern region the youngest formations lie in the centre and the Jurassic beds dip inward below them.

⁷⁶ Bull. Soc. Imp. des Nat. Moscou, 1891.