

floras (ante, pp. 1096, 1111) we may here take marine shells as our guide, and place the Pikermi beds in the Pliocene series.

## § 2. Local Development

**France.**—True Miocene deposits are not known to occur in Britain. In France, however, in the district of Touraine, traversed by the rivers Loire, Indre, and Cher, there occurs a group of shelly sands and marls, which, as far back as 1833, was selected by Lyell as the type of his Miocene subdivision. These strata occur in widely extended but isolated patches, rarely more than 50 feet thick, and are better known as "Faluns," having long been used as a fertilizing material for spreading over the soil. They present the characters of littoral and shallow-water marine deposits, consisting sometimes of a kind of coarse breccia of shells, shell-fragments, coral, polyzoa, etc., occasionally mixed with quartz-sand, and now and then passing into a more compact calcareous mass or even into limestone. Along a line that may have been near the coast-line of the period, a few land and fresh-water shells, together with bones of terrestrial mammals, are found, but, with these exceptions, the fauna is throughout marine. Among the fossils are numerous corals, and upward of 300 species of mollusks, of which the following are characteristic: *Pholas Dujardini*, *Venus clathrata*, *Ostrea crassissima*, *Pecten striatus*, *Cardium turonicum*, *Cardita affinis*, *Trochus incrassatus*, *Cerithium intradentatum*, *Turritella Linnæi*, *T. bicarinata*, *Pleurotoma tuberculosa*, with species of *Cypræa*, *Conus*, *Murex*, *Oliva*, *Ancillaria*, and *Fasciolaria*. This assemblage of shells indicates a warmer climate than that of southern Europe at the present time. The mammalian bones include the genera *Mastodon*, *Rhinoceros*, *Hippopotamus*, *Chœropotamus*, deer, etc., and extinct marine forms allied to the morse, sea-cow, and dolphin. Similar faluns, perhaps slightly later in age, are found in Anjou and Maine.

In the region of Bordeaux and the plains of the Garonne southward to the base of the Pyrenees, a large area is overspread with Oligocene deposits, equivalents of the younger Tertiary series of the Paris basin. Above these fresh-water and marine beds lie patches of faluns like those of Touraine, containing a similar assemblage of marine fossils. Other marine deposits of Miocene age are found running up the