accumulations have been formed. The markedly lenticular nature of these deposits has already been described (p. 860). At the present day, the sea-bottom presents here a bank of gravel, there a sheet of sand, elsewhere layers of mud, or of shells, or of organic ooze, all of which are in course of deposit simultaneously, and will as a rule be found to shade off laterally into each other. The same diversity of contemporaneous deposits has obtained from the earliest geological periods. Conglomerates, sandstones, shales, and limestones occur on all geological horizons, and replace each other even on the same platform. The Coal-measures of Pennsylvania are represented west of the Rocky Mountains by thousands of feet of massive marine limestones. The white Chalk of England lies on the same geological horizon with marls and clays in North Germany, with thick sandstones in Saxony, with hard limestone in the south of France. Mere mineral characters are thus quite unreliable, save within comparatively restricted areas.

The solution of this problem was found, and was worked out for the Secondary rocks of England, by William Smith at the end of last century. It is supplied by organic remains, and depends upon the law that the order of succession of plants and animals has been similar all over the world. According to the order of superposition, the fossils found in any deposit must be older than those in the deposit above, and younger than those in that below. This order, however, must be first accurately determined by a study of the actual stratigraphy of the formations; for, so far as regards organic structure or affinities, there may be no discoverable reason why a particular species should precede or follow another. Unless, for example, we knew from observation that *Rhynchonella pleurodon* is a shell of the Carboniferous