

the clearer water in which they were laid down, and in some cases actually representing former coal-reefs.¹³¹ The upper series is more variable: being in some tracts composed of sandstones and shales, in others of shales and limestones, but everywhere presenting a more shaly thin-bedded aspect than the subdivisions beneath it. Considerable masses of diabase, tuff (schalstein), and other associated volcanic material are intercalated in the Devonian system in Devonshire and in Germany. As a rule, the rocks have been subjected to more or less disturbance, and have in some places been plicated and cleaved, and even metamorphosed into schists, quartzites, etc. In some districts, they have been invaded by large masses of granite and other eruptive rocks.

Among the economic products, the most important in Europe are the ores of iron, lead, tin, copper, etc., which occur in veins or lenticular masses through the Devonian rocks (Devon and Cornwall, Harz, etc.). In North America the Devonian rocks of Pennsylvania contain bands of "sand-rock" charged with petroleum.

LIFE.—An abundant cryptogamic flora covered the land during the ages that succeeded the Silurian period. As the remains of this vegetation are chiefly preserved in the Old Red Sandstone facies of deposits, it is described at p. 1316. But the true Devonian rocks contain remains of marine vegetation, of which *Haliserites* is a frequent seaweed in the Lower Devonian rocks of the Rhine. The fauna of the Devonian rocks is unequivocally marine. Among the more

¹³¹ Dupont, Bull. Acad. Roy. Belgique (3) ii. ; Comptes Rend. Feb. 18, 1884. The frequent singularly lenticular character of Paleozoic limestones is explicable on the assumption that in many cases they grew up in patches after the manner of modern coral-reefs. The interrupted bands of shale in the Belgian Devonian limestones are regarded by M. Dupont as representing the lagoons that were filled up with muddy sediment.