

layers or strata, have become, as they hardened, limestones, slates, marls, or grits, according to their chemical and mechanical composition, and contain the remains of the animals and plants which were scattered through the waters.*

459. The different strata, when undisturbed, are arranged one above the other in a horizontal manner, like the leaves of a book, the lowest being the oldest. In consequence of the commotions which the crust of the globe has undergone, the strata have been ruptured, and many points of the surface have been elevated to great heights, in the form of mountains; and hence it is that fossils are sometimes found at the summit of the highest mountains, though the rocks containing them were originally formed at the bottom of the sea. But even when folded, or partly broken, their relative age may still be determined by an examination of the ends of the upturned strata, where they appear or crop out in succession, at the surface, or on the slopes of mountains, as seen in the diagram, (Fig. 154.)

460. The sedimentary rocks are the only ones which have been found to contain animal and vegetable remains. These are found imbedded in the rock, just as we should find them in the mud now deposited at the bottom of the sea, if laid dry. The strata containing fossils are numerous. The comparison and detailed study of them belongs to Geology, of

* Underneath the deepest strata containing fossils, between these and the Plutonic rocks, are generally found very extensive layers of slates without fossils, (gneiss, mica-slate, talcose-slate,) though stratified, and known to the geologist under the name of *Metamorphic Rocks*, (Fig. 154, *M*.) being probably sedimentary rocks, which have undergone considerable changes. The Plutonic rocks, as well as the metamorphic rocks, are not always confined to the lower levels, but they are often seen rising to considerable heights, and forming many of the loftiest peaks of the globe. The former also penetrate, in many cases, like veins, through the whole mass of the stratified and metamorphic layers, and expand at the surface; as is the case with the trap dykes, and as lava streams actually do at the present era, (Fig. 154, *T. L.*)