

of the alternation of the beds of basaltic amygdaloid, with beds of limestone in other situations. But in both instances, we must admit that the beds were formed under the ocean, before the present islands and continents had emerged from the watery abyss. With respect to Etna, the alternation of lava and limestone affords decisive evidence, that this mountain was upheaved from the ocean, though its height may have been greatly augmented by eruptions of lava, since the period of its first elevation. Before concluding the account of interstratified basalt, it may be proper to mention, that Mr. William Hutton, in a paper lately read to the Geological Society of London, maintains, that the great bed of basalt in Northumberland, called the whinstone sill, was deposited over the limestone beds on which it rests, and not protruded laterally between them: though he admits, with Professor Sedgwick, that the basaltic beds in Teesdale were protruded in the manner before described. In some cases, it may be extremely difficult to determine whether a bed of basalt has flowed like lava, or been protruded laterally, because two strata of hard limestone, for example, are often separated by seams of soft clay, which would dispose the beds to yield to a lateral pressure in the direction of the strata, and the injected basalt would take the form of a regular stratum.

Mr. Hutton admits, that in some instances, the limestone over the basalt had suffered the same effects of igneous action as the limestone below it. These instances, I think, afford satisfactory evidence, that the basalt was protruded between the beds of limestone.

The disturbances and contortions of some of the lower beds of transition limestone, in the vicinity of trap rocks, were mentioned in Chap. VII. In such instances, though frequently no visible connection between the rocks of trap and limestone can be traced on the surface, there can be little doubt that such connection exists. The singularly bent limestone beds at Wren's Nest Hill near Dudley are at a considerable distance from the nearest basaltic hill; but I observed in the town of Dudley, where a well was sinking, that the stone thrown out was granular basalt, intermixed with calcareous spar.

Some species of trap rocks, and particularly the softer kinds of basalt, decompose rapidly, and form productive soils and marle. I am inclined to believe, that some of the most fertile soils in England were formed, by an intermixture with decomposed basaltic rocks. What has been called basaltic tufa, is a volcanic substance, and will be described among volcanic products. Some of the trap rocks, particularly the porphyritic traps, are metalliferous; but it is rarely the case with any of the British trap rocks, and it has before been stated, that the veins of lead ore in Derbyshire, are either cut off by beds of basalt, or generally cease to yield ore, when passing through basalt.

Having described the principal phenomena attending trap rocks, whether occurring in dykes, in unconformable masses, or interstrati-