

Trap rocks, on the contrary, are found on the surface in overlying, unconformable masses, or are imbedded in other rocks, or intersect them, rising like a wall, and breaking the continuity of the strata. Such walls are called dykes. Trap rocks that are imbedded, seldom preserve the form of regular strata for any great extent, but are extremely variable in their thickness; in many instances, they appear to have been laterally protruded between regular strata. These different positions of trap rocks are represented Plate III. fig. 2. It is obvious, that these unconformable rocks were formed at a period subsequent to that of the rocks which they cover or intersect.

As the mineral composition of trap rocks is nearly the same as that of rocks whose igneous origin is now undisputed, we can have little difficulty in admitting, that the overlying masses of trap have been poured over the surface of the conformable rocks in a state of fusion, like streams of lava from recent volcanoes; with this difference, that they were not erupted from one opening or crater, but from fissures of great width and many miles or leagues in extent, and that they were formed under the ocean. I say we can have little difficulty in admitting this, particularly as such rents or fissures, filled with similar matter to that of the overlying unconformable masses, are often discovered in their vicinity.

Trap rocks, however, are not unfrequently observed imbedded between strata of aqueous formation: here their origin appears more obscure. In many of these instances we may, without difficulty, admit, that these trap rocks were formed by submarine volcanoes, which have poured beds of lava over the limestone; another bed of limestone may have been subsequently formed over the lava, and this limestone may also have been covered by the lava of a later eruption. In this manner the alternation of beds of basalt, or basaltic amygdaloid, with limestone in Derbyshire, may admit of a probable explanation. See Plate IV. fig. 5. *e. e.* beds of trap between beds of mountain limestone *a. a.*

On the southern side of Etna there are several beds of undoubted lava alternating with limestone, as will be more fully stated hereafter. In some instances, however, the basalt or trap has, evidently, been protruded between the strata, after the period when the latter were deposited.

Before we proceed, it may be proper to remark, that there are certain porphyritic rocks bearing the general character of trap rocks, which are associated with slate rocks, and appear to pass by gradation into them. We cannot suppose that they have been erupted like lava, or protruded into slate: they have probably been softened by subterranean heat with the slate *in situ*; but from difference of composition, or different degrees of temperature, these beds may have had a greater facility in acquiring a porphyritic texture. A remarkable instance of the passage of slate into porphyry will be noticed hereafter.