craters to be formed by a partial sinking down of the summits, when the mountains were still softened by heat. It may, however, deserve the future enquiry of geologists, whether the red felspathic trachyte on one side of the crater of High Stile, which forms Red Pike, and extends over the mountain, may not at once have flowed as lava.

Many mountains in Cumberland and Westmoreland are composed of porphyritic trap, passing into clinkstone. In a deep ravine of Swarthfell in Cumberland, opposite the seat of J. Marshall, Esq. the mountain, which is here composed of clinkstone, presents the columnar structure on a magnificent scale; the columns are slightly bent and inclined.

Porphyry, from an intermixture with hornblende, frequently passes into sienite; when this is the case, the latter rock generally forms the upper part of the mass. Porphyry and basalt, in enormous masses, often cover the primary mountains in the Andes. According to Humboldt, "they are arranged in regular columns, which strike the eye of the traveller like immense castles lifted into the sky." Some geologists describe four formations of porphyry; but this division is purely theoretical, as those who admit it, agree that the different formations of porphyry frequently pass into each other; and, from the evident connection of porphyry and basaltic with igneous rocks, it naturally follows, that such transitions must take place. Many porphyritic rocks may be regarded as more ancient than basaltic rocks, as porphyry frequently occurs intermixed with, or covering, transition rocks, and basalt is most commonly associated with the secondary strata. I am informed by Professor Sedgwick, that the porphyry of the Cheviot Hills has produced frequent and great dislocations of the beds in its vicinity. We have few instances, beside, that I am acquainted with, in England or Wales, of eruptions of well defined porphyry: they are not uncommon in Scotland and in the Alps. We shall proceed to describe the phenomena presented by trap rocks, of which there are numerous striking examples in Great Britain and Ireland.

In describing the phenomena presented by any of the trap rocks, we describe those peculiar to every member of the trap family. Were it allowed to express a geological fact in familiar terms, it might be said, that all the members of this family give indications of a fiery character, and of having been troublesome neighbors to the adjacent rocks, disturbing them, and even changing their nature, when they are closely associated. Beside occurring in overlying unconformable masses, all trap rocks, with porphyry, which may be placed at their head, are occasionally found intersecting other rocks like vertical walls. It has been before stated, that these vertical walls are called *dykes*,—the term dyke and wall being synonymous in North Britain. The substance which most commonly occurs in dykes is basalt; and as these basaltic dykes are well known, from their frequently intersecting coal strata, we shall now give a description of basaltic dykes, and their effects on the adjacent rocks or strata.