

Dikes in the recent cone, how formed.—The inclined strata before mentioned which dip outwards in all directions from the axis of the cone of Vesuvius, are intersected by veins or dikes of compact lava, for the most part in a vertical position. In 1828 these were seen to be about seven in number, some of them not less than four or five hundred feet in height, and thinning out before they reached the uppermost part of the cone. Being harder than the beds through which they pass, they have decomposed less rapidly, and therefore stand out in relief. When I visited Vesuvius, in November 1828, I was prevented from descending into the crater by the constant ejections then thrown out; so that I got sight of three only of the dikes; but Signor Monticelli had previously had drawings made of the whole, which he showed me. The dikes which I saw were on that side of the cone which is encircled by Somma. The eruption before mentioned, of 1828, began in March, and in the November following the ejected matter had filled up nearly one third of the deep abyss formed at the close of the eruption in 1822. In November I found a single black cone at the bottom of the crater continually throwing out scorix, while on the exterior of the cone I observed the lava of 1822, which had flowed out six years before, not yet cool, and still evolving much heat and vapour from crevices.

Hoffmann, in 1832, saw on the north side of Vesuvius, near the peak called Palo, a great many parallel bands of lava, some from six to eight feet thick, alternating with scorix and conglomerate. These beds, he says, were cut through by many dikes, some of them five feet broad. They resemble those of Somma, the stone being composed of grains of leucite and augite.*

There can be no doubt that the dikes above mentioned have been produced by the filling up of open fissures with liquid lava; but of the date of their formation we know nothing farther than that they are all subsequent to the year 79, and, relatively speaking, that they are more modern than all the lavas and scorix which they intersect. A considerable number of the upper strata are not traversed by them. That the earthquakes, which almost invariably precede eruptions, occasion rents in the mass is well known; and, in 1822, three months before the lava flowed out, open fissures, evolving hot vapours, were numerous. It is clear that such rents must be injected with melted matter when the column of lava rises, so that the origin of the dikes is easily explained, as also the great solidity and crystalline nature of the rock composing them, which has been formed by lava cooling slowly under great pressure.

It has been suggested that the frequent rending of volcanic cones during eruptions may be connected with the gradual and successive upheaval of the whole mass in such a manner as to increase the inclination of the beds composing the cone; and in accordance with the hypothesis before proposed for the origin of Monte Nuovo, Von Buch supposes that the present cone of Vesuvius was formed in the

* Geognost. Beobachtungen, &c. p. 182. Berlin, 1839.