

it was always surrounded by a flat pool of semi-fluid lava, into which scoriæ and sand were thrown.

In the steep semicircular escarpment of Somma, which faces the modern Vesuvius, we see a great number of sheets of lava inclined at an angle of about  $26^{\circ}$ . They alternate with scoriæ, and are intersected by numerous dikes, which, like the sheets of lava, are composed chiefly of augite, with crystals of leucite, but the rock in the dikes is more compact, having cooled and consolidated under greater pressure. Some of the dikes cut through and shift others, so that they have evidently been formed during successive eruptions. While the higher region of Somma is made up of these igneous products, there appear on its flanks, for some depth from the surface, as seen in a ravine, called the "Fossa Grande," beds of white pumiceous tuff, resembling the tuff which, at Pausilippo, and other places, near Naples, contains shells of living Mediterranean species. It is supposed by Pilla, Von Buch, and others, that the tufaceous beds, which rise in Somma to more than half the height of that mountain, are, in like manner, of submarine origin, because a few sea-shells have been found in them, here and there, together with serpulæ of recent species attached to included blocks of limestone.\*

It is contended, therefore, that, as these strata were once accumulated beneath the sea, they may have been subjected as they rose to such an upward movement as may have given rise to a conical hill; and this hypothesis, it is said, acquires confirmation from the fact, that the sheets of lava near the summit of Somma are so compact and crystalline, and of such breadth individually, as would not have been the case had they run down a steep slope. They must, therefore, have consolidated on a nearly level surface, and have been subsequently uplifted into their present inclined position.

Unfortunately there are no sections of sufficient depth and continuity on the flanks of Somma, to reveal to us clearly the relations of the lava, scoriæ, and associated dikes, forming the highest part of the mountain, with the marine tufts observed on its declivity. Both may, perhaps, have been produced contemporaneously when Somma raised its head, like Stromboli, above the sea, its sides and base being then submerged. Such a state of things may be indicated by a fact noticed by Von Buch, namely, that the pumiceous beds of Naples, when they approach Somma, contain fragments of the peculiar leucitic lava proper to that mountain, which are not found in the same tuff at a greater distance.† Portions, therefore, of this lava were either thrown out by explosions, or torn off by the waves, during the deposition of the pumiceous strata beneath the sea.

We have as yet but a scanty acquaintance with the laws which regulate the flow of lava beneath water, or the arrangement of scoriæ and volcanic dust on the sides of a submarine cone. There can, however, be little doubt that showers of ejected matter may

\* Dufrénoy, Mém. pour servir à une  
Descrip. Géol. de la France, tom. iv.  
p. 294.

† Descrip. Phys. des Iles Canaries,  
p. 344.