number of deep rents and ravines, which diverge on all sides like the spokes of a wheel, from near the central axis to the circumference or base of the cone, as in the case of Palma, Cantal, and Teneriffe. Yet the entire absence of such divergent fissures or ravines, in such cases as Monte Nuovo, Somma, or Etna, is passed by unnoticed, and appears to have raised in their minds no objection to their favourite theory.

It is, indeed, admitted by M. Dufrénoy that there are some facts which it is very difficult to reconcile with his own view of Porzio's record. Thus, for example, there are certain Roman monuments at the base of Monte Nuovo, and on the borders of Lake Avernus, such as the temples of Apollo and Pluto, which do not seem to have suffered in the least degree by the supposed upheaval. "The walls which still exist have preserved their vertical position, and the vaults are in the same state as other monuments on the shores of the Bay of Baiæ. The long gallery which led to the Sibyl's Cave, on the other side of Lake Avernus, has in like manner escaped injury, the roof of the gallery remaining perfectly horizontal, the only change being that the soil of the chamber in which the Sibyl gave out her oracles, is now covered by a few inches of water, which merely indicates a slight alteration in the level of Lake Avernus."* On the supposition, then, that pre-existing beds of pumiceous tuff were upraised in 1538, so as to form Monte Nuovo, it is acknowledged that the perfectly undisturbed state of the contiguous soil on which these ancient monuments stand, is very different from what might have been expected.

Mr. Darwin, in his "Volcanic Islands," has described several crateriform hills in the Galapagos Archipelago as composed of tuff which has evidently flowed like mud, and yet on consolidating has preserved an inclination of twenty and even thirty degrees. The tuff does not fold in continuous sheets round the hills as would have happened if they had been formed by the upheaval of horizontal layers. The author describes the composition of the tuff as very similar to that of Monte Nuovo, and the high angles at which the beds slope, both those which have flowed and those which have fallen in the form of ashes, entirely removes the difficulty supposed by M. Dufrénoy to exist in regard to the slope of Monte Nuovo, where it exceeds an angle of 18° to 20°.† Mr. Dana, also, in his account of the Sandwich Islands‡, shows that in the "cinder cones" of that region, the strata have an original inclination of between 35° and 40°, while in the "tufa cones" formed near the sea, the beds slope at about an angle of 30°.

I shall again revert to the doctrine of the origin of volcanic cones, by upheaval, when speaking of Vesuvius, Etna, and Santorin, and shall now merely add, that in 1538, the whole coast, from Monte Nuovo to beyond Puzzuoli, was upraised to the height of many feet

* Dufrénoy, Mém. pour servir, &c. p. 277.

† Darwin's Volcanic Islands, 106. note.

‡ Geology of the American Exploring Expedition, in 1838—1842, p. 354.