

A striking example of this structure occurs in a resinous trachyte or pitchstone-porphry in one of the Ponza islands, which rise from the Mediterranean, off the coast of Terracina and Gaeta. The globes vary from a few inches to three feet in diameter, and are of an ellipsoidal form (see fig. 638). The whole rock is in a state of decomposition, "and when the balls," says Mr. Scrope, "have been exposed a short time to the weather, they scale off at a touch into numerous concentric coats, like those of a bulbous root, inclosing a compact nucleus. The laminae of this nucleus have not been so much loosened by decomposition; but the application of a ruder blow will produce a still further exfoliation."*

Fig. 638.



Globiform pitchstone. Chlaja di Luna, Isle of Ponza. (Scrope.)

A fissile texture is occasionally assumed by clinkstone and other trap rocks, so that they have been used for roofing houses. Sometimes the prismatic and slaty structure is found in the same mass. The causes which give rise to such arrangements are very obscure, but are supposed to be connected with changes of temperature during the cooling of the mass, as will be pointed out in the sequel. (See chaps. xxxv. and xxxvi.)

Relation of Trappean Rocks to the products of active Volcanoes.

When we reflect on the changes above described in the strata near their contact with trap dikes, and consider how complete is the analogy or often identity in composition and structure of the rocks called trappean and the lavas of active volcanoes, it seems difficult at first to understand how so much doubt could have prevailed for half a century as to whether trap was of igneous or aqueous origin. To a certain extent, however, there was a real distinction between the trappean formations and those to which the term volcanic was almost exclusively confined. A large portion of the trappean rocks first studied in the north of Germany, and in Norway, France, Scotland, and other countries, were such as had been formed entirely under water, or had been injected into fissures and intruded between strata, and which had never flowed out in the air, or over the bottom of a shallow sea. When these products, therefore, of submarine or subterranean igneous action were contrasted with loose cones of scoriæ, tuff, and lava, or with narrow streams of lava in great part scoriaceous and porous, such as were observed to have proceeded from Vesuvius and Etna, the resemblance seemed remote and equivocal. It was, in truth,

* Scrope, Geol. Trans. 2d series, vol. ii. p. 205.