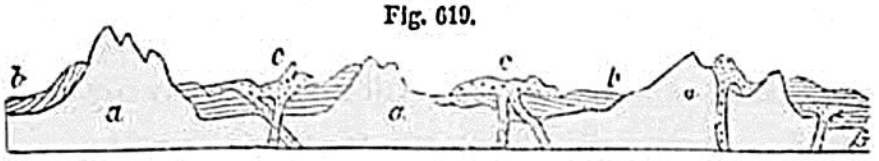
CHAPTER XXVIII.

VOLCANIC ROCKS.

Trap rocks—Name, whence derived—Their igneous origin at first doubted—Their general appearance and character—Volcanic cones and craters, how formed—Mineral composition and texture of volcanic rocks—Varieties of felspar—Hornblende and augite—Isomorphism—Rocks, how to be studied—Basalt, trachyte, greenstone, porphyry scoria, amygdaloid, lava, tuff—Agglomerate—Laterite—Alphabetical list, and explanation of names and synonyms of volcanic rocks—Table of the analyses of minerals most abundant in the volcanic and hypogene rocks.

The aqueous or fossiliferous rocks having now been described, we have next to examine those which may be called volcanic, in the most extended sense of that term. Suppose *a a*, in the annexed diagram, to represent

Fig. 619.



a. Hypogene formations, stratified and unstratified.
b. Aqueous formations. *c*. Volcanic rocks.

the crystalline formations, such as the granitic and metamorphic; *b b* the fossiliferous strata; and *c c* the volcanic rocks. These last are sometimes found, as was explained in the first chapter, breaking through *a* and *b*, sometimes overlying both, and occasionally alternating with the strata *b b*. They also are seen, in some instances, to pass insensibly into the unstratified division of *a*, or the Plutonic rocks.

When geologists first began to examine attentively the structure of the northern and western parts of Europe, they were almost entirely ignorant of the phenomena of existing volcanoes. They found certain rocks, for the most part without stratification, and of a peculiar mineral composition, to which they gave different names, such as basalt, greenstone, porphyry, and amygdaloid. All these, which were recognized as belonging to one family, were called "trap" by Bergmann, from *trappa*, Swedish for a flight of steps—a name since adopted very generally into the nomenclature of the science; for it was observed that many rocks of this class occurred in great tabular masses of unequal extent, so as to form a succession of terraces or steps on the sides of hills. This configuration appears to be derived from two causes. First, the abrupt original terminations of sheets of melted matter, which have spread, whether on the land or bottom of the sea, over a level surface. For we know, in the case of lava flowing from a volcano, that a stream, when it has