composition, that it is useful in geology to regard them as distinct rocks, and to assign names to them, such as basalt, greenstone, trachyte, and others presently to be mentioned.

Basalt.—As an example of rocks in which augite is a conspicuous ingredient, basalt may first be mentioned. Although we are more familiar with this term than with that of any other kind of trap, it is difficult to define it, the name having been used so comprehensively, and sometimes so vaguely. It has been generally applied to any trap rock of a black, bluish, or leaden-gray color, having a uniform and compact texture. Most strictly, it consists of an intimate mixture of felspar, augite, and iron, to which a mineral of an olive-green color, called olivine, is often superadded, in distinct grains or nodular masses. The iron is usually magnetic, and is often accompanied by another metal, titanium. The term "Dolerite" is now much used for this rock, when the felspar is of the variety called Labradorite, as in the lavas of Etna. Basalt, according to Dr. Daubeny, in its more strict sense, is composed of "an intimate mixture of augite with a zeolitic mineral which appears to have been formed out of Labradorite by the addition of water, the presence of water being in all *zeolites* the cause of that bubbling up under the blowpipe, to which they owe their appellation."* Of late years the analyses of M. Delesse and other eminent mineralogists have shown that the opinion once entertained, that augite was the prevailing mineral in basalt, or even in the most augitic trap rocks, must be abandoned. Although its presence gives to these rocks their distinctive character as contrasted with trachytes, still the principal element in their composition is felspar.

Augite rock has, indeed, been defined by Leonhard as being made up principally or wholly of augite,† and in some veinstones, says Delesse, such a rock may be found; but the greater part of what passes by the name of augite rock is more rich in green felspar than in augite. *Amphibolite*, in like manner, or *Hornblende rock*, is a trap of the basaltic family, in which there is much hornblende, and in which this mineral has been supposed to predominate; but Delesse finds, by analysis, that the felspar may be in excess, the base being felspathic.

In some varieties of basalt the quantity of olivine is very great; and as this mineral differs but slightly in its chemical composition from serpentine (see Table of Analysis, p. 475), containing even a larger proportion of magnesia than serpentine, it has been suggested with much probability that in the course of ages some basalts highly charged with olivine may be turned, by metamorphic action, into serpentine.

Trachyte.—This name, derived from τραχυς, rough, has been given to the felspathic class of volcanic rocks which have a coarse, cellular paste, rough and gritty to the touch. This paste has commonly been supposed to consist chiefly of albite, but according to M. Delesse it is variable in

* Volcanoes, 2d ed. p. 18.

† Mineralreich, 2d ed. p. 85.