

or augite and felspar, are intimately combined and finely granular, they form basalt. The French geologists make a distinction between the basalt in which augite prevails, and that which is composed of felspar and hornblende; but it is admitted that where the structure is finely granular, or nearly compact, it is difficult, if not impossible, to distinguish them.

Basalt has a greenish or brownish black colour, is difficult to break, and possesses a considerable degree of hardness; it will, however, yield to the point of a knife. On examination with a lens, even the more compact varieties of basalt are seen to be composed of minute crystalline grains; it frequently contains yellowish grains of a mineral called olivine; it contains also grains of iron-sand, and a considerable portion of the black oxide of iron. Basalt is fusible into a black glass, and is magnetic. The iron which it contains passes into a further state of oxygenation when exposed to the air: hence basaltic rocks are generally covered with a reddish brown incrustation. Very black basalts are chiefly composed of augite.

Soft earthy basalt, intermixed with green earth, forms the rock called *wacke*; it has frequently a greenish colour. When basalt or wacke contains rounded cavities, filled with zeolites, chalcedony, or calcareous spar, it forms amygdaloid.\* When the felspar greatly prevails, and the texture becomes nearly compact, basalt passes into the rock called phonolite or clinkstone, from its yielding a metallic sound when struck: the prevailing colour is gray and greenish gray; it is fusible. Clinkstone, when it has a more earthy texture, passes into the rock called by English geologists claystone. Clinkstone often contains imbedded crystals of felspar, and then becomes a trap-porphry, which varies in colour according to the prevailing ingredients of its base. Between felspar-porphry and trap-porphry there is an almost imperceptible transition; in the former, the base or paste is felspar, nearly pure. Some felspar porphyries pass, gradually, into granite, by an intermixture with quartz and mica.

Pitchstone has a blackish green, or a nearly black colour; it is a semivitreous substance, having the lustre and appearance of pitch, and does, in fact, contain a portion of bitumen; its other constituent parts are the same as those of basalt; it approaches nearly to the black volcanic glass called obsidian, which is a lava suddenly refrigerated and perfectly vitrified. Pitchstone and obsidian are, sometimes, porphyritic. Hence, we have, on the one hand, a series of rocks, (varying only in the increase of felspar, and state of induration,) from granular basalt to clinkstone and claystone, from clinkstone to trap-porphry, from trap-porphry to trachyte and felspar-porphry, and from felspar-porphry, with the further admixture of

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\* The names Porphyry and Amygdaloid rather represent modes than substances, and convey no precise ideas, unless the nature of the base be specified.