

characteristic structures of the rock being here easily made out with the eye.

These rocks show much variation from place to place, due in part to local differentiation during cooling; in part to mutual corrosive effects of adjacent minerals on each other, both during the original cooling of the rock and as a result of subsequent metamorphism; and in large part to varying severity of metamorphism. Where least metamorphosed, a simple original mineral constitution is usually shown, the rock consisting essentially of plagioclase feldspar (usually labradorite), augite and magnetite; to these hypersthene is frequently to be added, and rarely olivine. These primary feldspars and augites invariably hold a multitude of minute inclusions, the augite specially containing them in such numbers that it would often be impossible to make out the color of the mineral were it not for the fact that a narrow outer zone is usually free from them. Nor is the feldspar far behind in this respect. The inclusions in the augite are mainly opaque and consist probably of magnetite or ilmenite. In large part the feldspar inclusions consist of small augites. The structure is rather prominently ophitic in most cases, that is, the feldspar is in long, lath-shaped crystals, separated by and partially embedded in the stout augite crystals.

From the extinction angles shown by the feldspars from various occurrences, it is quite certain that they show a range in composition from andesin to anorthite, with labradorite the prevailing variety. The augite is of a pale, gray-green shade, nearly colorless in thin sections.

In addition to the foregoing, even the least metamorphosed rocks show much granular material, and rocks which consist mainly or wholly of this, with little or no preservation of the original character, are far more common than those of which the reverse is true. This granular material is, to some extent, due to corrosive interaction of the original minerals of the rock. This is most apt to take place between magnetite and feldspar but also occurs between the pyroxenes and feldspar. In general nothing of the sort takes place at pyroxene magnetite contacts. The main new minerals produced by this action are garnet and a peculiar brown hornblende, with some quartz and often biotite accompanying. These are found arranged zonally between the two