gregate of quartz, which will be described in connection with the schistose rocks among which it generally occurs (p. 311).

II. Massive—Eruptive—Igneous

Almost all the members of this important subdivision have been produced from within the crust of the earth, in a molten condition. Nearly all consist of two or more minerals. Considered from a chemical point of view, they may be described as mixtures, in different proportions, of silicates of alumina, magnesia, lime, potash, and soda, usually with magnetic iron and phosphate of lime. In one series, the silicic acid has not been more than enough to combine with the different bases; in another, it occurs in excess as free quartz. Taking this feature as a basis of arrangement, some petrographers have proposed to divide the rocks into an acid group, including such rocks as granite, quartz-porphyry and rhyolite, where the percentage of silica ranges from 60 to 75 or more, a basic group, typified by such rocks as basalt, where the proportion of silica is only about 50 per cent or less, and an intermediate group represented by the andesites with a proportion of silica ranging between that of the other two groups.[160]

In the vast majority of igneous rocks, the chief silicate is a felspar—the number of rocks where the felspar is represented by another silicate (as leucite or nepheline) being comparatively few and unimportant. As the felspars group themselves into two divisions, the monoclinic or orthoclase, and the triclinic or plagioclase, the former with, on the whole, a preponderance of silica; and as these minerals oc-

[160] See a paper on the chemical relations of the eruptive rocks by Prof. Rosenbusch, Tschermak's Min. Mittheil. xi. (1889), p. 144, also the paper quoted in footnote ([163]) on p. 272, and a Memoir on "the origin of Igneous Rocks," by J. P. Iddings, Phil. Soc. Washington, 1892, p. 90.