

cur under tolerably distinct and definite conditions, other petrographers divide the felspar-bearing Massive rocks into two series: (1) the Orthoclase rocks, having orthoclase as their chief silicate, and often with free silica in excess, and (2) the Plagioclase rocks, where the chief silicate is some species of triclinic felspar. The former series corresponds generally to the acid group above mentioned, while the plagioclase rocks are intermediate and basic. It has been objected to this arrangement that the so-called plagioclase felspars are in reality very distinct minerals, with proportions of silica, ranging from 43 to 69 per cent; soda from 0 to 12; and lime from 0 to 20.¹⁶¹ In addition to the felspar-rocks, there must be noted those in which felspar is either wholly absent or sparingly present, and where the chief part in rock-making has been taken by nepheline, leucite, olivine, or serpentine.

From the point of view of internal structure, a classification based upon microscopic research has been adopted by other writers, who recognize three leading types of microstructure—*Granular*, *Porphyritic* and *Glassy*, or *HolocrySTALLINE*, *Hemi-crystalline* and *Vitreous*. MM. Fouqué and Michel-Lévy, pointing out that most eruptive rocks are the result of successive stages of crystallization, each recognizable by its own characters, show that two phases of consolidation are specially to be observed, the first (porphyritic) marked by the formation of large crystals (phenocrysts), which were often broken and corroded by mechanical and chemical action within the still unsolidified magma; the second by the formation of smaller crystals, crystallites, etc., which are molded round the older series. In some

¹⁶¹ Dana, Amer. Journ. Sci. 1878, p. 432. The modern methods of separating the felspars remove some of the difficulty above referred to.