two distinct systems of classification may be followed, the one based on chemical and mineralogical, the other on geological considerations.

From a chemical point of view, rocks may be grouped according to their composition; as Oxides, exemplified by formations of quartz, hæmatite, or magnetite; Carbonates, including the limestones and clay-ironstones; Silicates, embracing the vast majority of rocks, whether composed of a single mineral, or of more than one; Phosphates, such as guano and the older bone-beds and coprolitic deposits. A classification of this kind, however, pays no regard to the mode of origin or conditions of occurrence of the rocks, and is not well suited for the purposes of the geologist.[106]

From the mineralogical side, rocks may be classified with reference to their prevailing mineral constituent. Thus such subdivisions as Calcareous rocks, Quartzose rocks, Orthoclase rocks, Plagioclase rocks, Pyroxenic rocks, Hornblendic rocks, etc., may be adopted; but these terms are hardly less objectionable to the geologist, and are in fact suited rather for the arrangement of hand-specimens in a museum, than for the investigation of rocks *in situ*.

From the standpoint of geological inquiry, rocks have been classified according to their mode of origin. In one system they are arranged under three great divisions: 1st, *Igneous*, embracing all which have been erupted from the heated interior of the earth; 2d, *Aqueous* or *Sedimentary*, including all which have been laid down as mechanical or chemical deposits from water or air, and all which have resulted from the growth and decay of plants or animals; 3d, *Metamorphic*, those which have undergone subsequent

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[106] The eruptive rocks are susceptible of a convenient, though not strictly accurate, chemical classification into *acid*, *intermediate* and *basic* (see p. 273).