observers have noticed that volcanic rocks have succeeded each other in a certain order in different regions. Baron von Richthofen deduced from observations in Europe and America a general sequence of volcanic succession, which he arranged in the following order: 1. Propylite; 2. Andesite; 3. Trachyte; 4. Rhyolite; 5. Basalt.[155] This sequence he believed to be seldom or never complete in any one locality; sometimes only one member of the series may be found; but when two or more occur they follow, in his opinion, this sequence, basalt being everywhere the latest of the series. The subject has been more recently discussed by M. Bertrand, who remarks that in Europe each of the great areas of plication has given rise to the formation of eruptive rocks of every composition and structure. He recognizes a recurrence of the phenomena in successive geological periods, and speaks of a definite order of eruptions in the same series.[156]

The great volcanic series of Auvergne presents a marvellous succession of varied eruptions within a limited region during what was probably a single volcanic period. The first eruptions appear to have been basalts, and rocks of similar character reappeared again and again in later stages of the history, the intervening eruptions consisting of phonolites, trachytes, rhyolites, or andesites. The latest lavas were scoriaceous basalts.[157] Among the later Palæozoic volcanic eruptions of Britain a more definite and regular recurrence of rocks appears to be traceable. The earlier lavas of the Old Red Sandstone and Carboniferous series were generally either intermediate or basic, sometimes remarkably basic, while the late protrusions were decidedly acid. At

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[155] "The Natural System of Volcanic Rocks," Californ. Acad. Sci. 1868.
[156] Bull. Soc. Geol. France, xvi. (1888), p. 611.
[157] Carte Geol. detaill. France, Feuille 166 (Clermont Ferrand).