

magma. The various magmas solidified sometimes underground as laccolites, sometimes as dykes, sometimes as superficial flows, and induced contact-metamorphism of diverse characters. Broegger could not determine any definite sequence in the separation of the component minerals, but was able to add many observations bearing upon this point.

A later publication by the same author is entitled *The Eruptive Rocks of the Christiania District*, and comprises two volumes. The first, published in 1894, is devoted to the rocks of the Grorudite-Tinguaite series. Broegger thinks these take an intermediate position between deep-seated bosses and eruptive flows, and represent members of a connected series of protrusions from the same magma, which either solidified underground in massive form or occupied crust-fissures.

The second volume, published in 1895, instituted a comparison between the succession of eruptive rocks in the Christiania district and that in the eruptive district of Monzoni and Predazzo in South Tyrol. On the basis of his own observations in both districts, Broegger explains the famous Triassic monzonite, granite, and hypersthene as deep-seated laccolitic expansions of the eruptive flows in the same neighbourhood (melaphyre, augite, porphyrite, and plagioclase porphyrite), and views them as a series of differentiations from an originally uniform magma, analogous with the differentiations presented in the Christiania district.

From the foregoing pages it is apparent that Rosenbusch, Broegger, Iddings, Williams, and others are inclined to minimise the petrographical contrast between the so-called plutonic and volcanic rocks, and to recognise in underground and superficial occurrences of eruptive rock only different facies of the same magma, consolidated under different conditions. On the other hand, Zirkel (1893) strongly emphasised the differences between the granitic, deep-seated rocks and the porphyritic or glassy flows, and brings forward many objections to the laws enunciated by Rosenbusch regarding the successive separation of minerals from fused masses. In general, petrographers may be said to be still actively investigating the ground-masses, in the study of which there are many problems awaiting solution.

Microscopic researches have fully elucidated the composition and the origin of the sedimentary strata. There is no longer