rence of lavas from basic to acid in the continuance of a single volcanic period, and by the repetition of a similar cycle in successive periods. Observations are yet needed from a larger number of ancient volcanic districts and in greater detail, before these problems can be satisfactorily discussed and solved. It is obvious that in such a great series of eruptions as that of Central France, where over a comparatively limited area an alternation of basic and acid lavas has been many times repeated, the subterranean magma must have undergone a succession of changes in composition. Perhaps a definite cycle of such alternations may be made out. The sequence from basic to acid protrusions, observable among the British Palæozoic volcanic rocks, is suggestive of a separation of the more basic constituents of the magma with consequent increasing acidity of the residue. The earliest lavas mark the more basic condition of the magma, while the latest felsite and quartz-porphyry intrusions show its impoverishment in bases at the close of a volcanic period. During the interval before the next period the magma had in some way been renewed, for when eruptions began anew they were once more basic. But by the close of the volcanic activity the magma had again lost a large proportion of its basic constituents and had become decidedly acid.

Reference has already (p. 114) been made to the speculation of Durocher as to the existence within the crust of an upper siliceous layer with a mean of 71 per cent of silica, and a lower basic layer with about 51 per cent of silica. Bunsen also came to the conclusion that volcanic rocks are mixtures of two original normal magmas—the normal trachytic (with a mean of 76·67 silica), and the normal pyroxenic (with a mean of 47·48 silica). The varying proportions