PRE-CAMBRIAN ROCKS

original form of this material may not have been andesitic and basaltic lava flows. The composition of the present material, excluding the great volume of introduced silica, which of course raises the total silica content, is such that the material might have been originally of flow origin. The considerable linear extent of this formation, although certainly not excluding the diorite or diorite gabbro origin, would conform very well to the flow hypothesis.

If it could be shown that the Pochoek gneiss has been derived by the metamorphism of flow rocks of intermediate and basic character, it might be thought to be equivalent in age to one of the pre-Cambrian lava series of the northern Great Lakes area. It may be suggested that the Pochoek be correlated with lavas of the Huronian.

In answer to the suggestion that the Pochoek has been derived from the lavas of Keewanan age, the close association with the Franklin and Moravian Heights formations and the more definite metamorphism of the Pochoek than the Byram granitic material have been the deciding factors in arriving at a tentative conclusion that the Pochoek, if of lava flow origin, is more likely to be correlated with the Huronian than the Keewanan.

Stratigraphic and structural relations.—Little field evidence is available to indicate the relative stratigraphic position of the Pochoek gneiss with either the Franklin formation or the Moravian Heights. It has been tentatively assumed that the latter two are older than the Pochoek. They may occur in adjacent areas but they are not exposed in contact in stream valley, road cut, or quarry.

The relations with the Byram granitic material are very definite. The Pochoek is the older rock and has been invaded and assimilated in varying degrees by the younger formation. This invasion occurred at a depth in the earth's crust sufficient to result in a plastic state of the Pochoek at the time of the entrance of the Byram. Contorted schlieren of the Pochoek material are found in the Byram near the contact with definite Pochoek gneiss. All stages are found from 100 percent Pochoek material composed of hornblende and andesine to 100 percent Byram composed of quartz, microcline, microperthite, and orthoclase. In this range there are, of course, types which show the entrance of small amounts of quartz and orthoclase into the Pochoek, types in which the rock is a typical mixed material with about equal amounts of invading and invaded minerals, and types in which scattered grains of hornblende and saussuritized andesine in Byram material are the evidence of incorporated Pochoek. The structural relations, therefore, of the Pochoek and the Byram are those chiefly of the invasion and assimilation of the former by the latter; this invasion being extensive and intimate.

Petrography and petrology.—In thin section the Pochoek gneiss is found to be more variable than one would expect from an examination of the hand specimens in the field. Megascopically, the material is characteristically a speckled granulose type of rock possessing a rude structural alignment. The minerals observed in the hand specimen are recognized as hornblende and plagioclase feldspar. In addition, certain phases contain biotite with or without hornblende and