usually concealed by talus. The presence of these faults is determined by formations younger than the Hardyston in contact with the pre-Cambrian rocks or by discordant dips or strikes. Many of these faults are marked by springs or seepages.

The general structural pattern of the region, where the crystalline rocks and Paleozoic sedimentaries are both present, consists of ridges of pre-Cambrian rocks separated by generally narrow steep-sided valleys, although there are a few fairly wide flat-bottomed valleys. These valleys are normally floored by Paleozoic strata which have been down-folded or down-faulted or both.

Where only sedimentary rocks are present, such as prevail north of the Lehigh River, with the exception of Chestnut Ridge and Pine Top-Camels Hump, faults are indicated by lack of alignment of the outcropping formations. The structure, however, is of the same essential type.

The heterogeneous character of the rocks of the region and their consequent varying strengths have resulted in numerous modifications of the structural pattern. Even if the compressive force from the southeast were everywhere uniform, which is an improbable assumption, the resolution of forces due to unequal resistances of the rocks would cause buckling and breaking of the rocks along other directions than the major ones. This is seen in several places where folds and faults of varying trends are present. In places close folding, crumpling and faulting are so complex that it is difficult to explain the sequence of events even in good exposures, and impossible where outcrops are infrequent. Although dip and strike have been determined at practically every outcrop of the sedimentary strata, these have not been placed on the map as they are apt to confuse rather than to clarify. If the surface cover could be removed, it is probable that axes of folds and directions of faults placed on the map would produce an almost inextricable tangle. A much larger scale than that of the present map would be necessary in order to represent them.

Whenever any company proposes to make any considerable use of any of the rocks of the county it usually becomes necessary to make a detailed investigation of the structure by surface trenching or by drilling. The information available from surface outcrops is generally too meagre in a region with such complicated structure.

It might seem that the greatest complexities would be in the weaker Paleozoic strata adjacent to the stronger metamorphic rocks of the pre-Cambrian. This is not always the case, as is shown in the illustration (pl. 18) of the intricately folded Beckmanton limestone at Northampton.

The periods of folding and faulting in the district that occurred