16. "Results of Studies of Ordovician Rocks East of Allegheny Front in Pennsylvania," *by C. E. Prouty.*

The Ordovician rocks adjacent to the Allegheny Front consist of 6,500 feet of limestones, dolomites, and shales. The rocks become increasingly clastic upward, reflecting the growing movement that culminated in late Ordovician orogeny on the southeast. The Lower Ordovician consists of 2,775 feet of dolomite with two relatively thin limestone members. The homogenous lithology does not permit as detailed zoning as middle Ordovician limestones. However, a few lithic and faunal zones persist over fairly wide areas and are useful as mapping units. Some units may be helpful in subsurface geology in the adjacent Allegheny Plateau area. Middle Ordovician rocks, 1,375 feet thick, are divided into 15 major units which may be subdivided. Upper Ordovician clastics, 2,350 feet thick, consist largely of thick shales, claystones, siltstones, and sandstones which are not readily subdivided into characteristic zones.

Favorable reservoir rock in the Ordovician is limited. However, coarse calcarenites of the Trenton and Black River may offer some promise. The foetid odor of hydrocarbons is noticeable throughout much of the Ordovician, especially in some of the clastic limestones. Coarse-grained limestones and dolomites are generally darker than the denser carbonates, the darkness of color roughly proportional to increasing grain size. The relationship of the hydrocarbon content to grain size in these rocks deserves further study. Beekmantown and Upper Cambrian dolomites show small carbonate-lined cavities having foetid odor, a few showing oil stains. The Upper Cambrian Gatesburg contains numerous coarse sandstone beds which probably offer better potential reservoir rock than Ordovician units.

Several conclusions regarding the nature of the Ordovician rocks beneath the Allegheny Plateau may be based on outcrop data and paleogeographic probabilities. Gatesburg sandstones likely thicken and coarsen westward beneath the plateau. The Beekmantown dolomite probably thickens for a short distance beneath the plateau, with the limestone phases becoming more dolomitic. The Chazy probably thins and disappears in the central plateau area. Lower Black River units thin while upper Black River units thicken beneath the plateau for a short distance. Most Middle Ordovician units become more magnesian westward beneath the plateau. Upper Ordovician units become less clastic and thin westward.

17. "Subsurface Upper Devonian Sections in Southwestern Pennsylvania," *by R. E. Bayles.*

With the exception of small inlier areas along the axes of Chestnut Ridge and Laurel Ridge anticlines, the Upper Devonian rocks of southwestern Pennsylvania are concealed beneath a mantle of Mississippian, Pennsylvanian, and Permian sediments. Thus, the study of this very important group of rocks becomes a problem for the subsurface stratigrapher over a third of the surface area of Pennsylvania. Drilling, in recent years, along Chestnut Ridge and Laurel Ridge anticlines, and also in the broad plateau area between Laurel Ridge and the Allegheny Front, has yielded many excellent sections based on detailed examinations of drill cuttings. Some of these sections, in a generalized graphic form, together with additional ones located in the oil- and gas-producing area west of Chestnut Ridge, are assembled into cross sections which illustrate the facies variations in the Upper Devonian sediments of southwestern Pennsylvania. The Conewango (uppermost Upper Devonian) age of the Devonian rocks exposed in the inlier areas of Chestnut Ridge and Laurel Ridge anticlines is confirmed. With the exception of the Huntersville chert and Oriskany sandstone, which are Lower Devonian in age, the producing sands of southwestern Pennsylvania all appear to be younger than the highest sub-Catskill marine beds exposed along the Allegheny Front, which are generally considered as being late Chemung in age.

18. "Aerial Magnetic Survey of Appalachian Plateau in Central Pennsylvania," *by H. R. Joesting, F. Keller, and E. King.*

The aeromagnetic map of central Pennsylvania, covering 1,800 square miles, is dominated by two large positive anomalies which apparently originate within the deep-lying crystalline rocks. Minor magnetic irregularities also occur, and these are attributed to shallower sources.

In the comparatively small area under consideration, the anomalies are essentially unrelated in position and form to the sedimentary structures which trend northeast-southwest. Their probable causes are discussed and estimates of their depth of origin are made.

19. "Evolution of Thought on Structure of Middle and Southern Appalachians," *by John Rodgers.*

The first men to comprehend the structure of the Appalachian Mountains were the brothers, Henry D. and William B. Rogers, who from 1835 to 1842 studied them from northern New Jersey