

controlled by the lenticular and lithologic character of the sands. Some structural control is indicated. Gas is found in the structurally higher parts of the sands.

5. "Geology and Occurrence of Natural Gas in Oriskany in Faulted Anticlines with Particular Reference to Northern Pennsylvania and Southern New York Producing Area," by *F. H. Finn*.

The Oriskany sandstone, which has been important as a source of natural gas in the Appalachian area, has been productive in 66 different pools throughout the Appalachian area. Many of the pools are small, and some of them were discovered many years ago when the Oriskany was not recognized as the producing formation. Most of the pools have resulted from structural trapping, although more than half of the total reserve of gas has been found in a large pool in West Virginia which is productive chiefly because of an interruption in porosity in an updip direction. Over  $1\frac{1}{2}$  trillion cubic feet of gas reserves have been discovered in the Oriskany since 1930.

In northern Pennsylvania and southern New York a producing province including 34 pools has been developed between 1930 and the present. Practically all of these pools result from structural traps caused by doming and thrust faulting along a series of prominent anticlines.

The province is described and a structure map of the area is presented. One of the most prominent producing trends (the Hebron-Harrison-Woodhull area), involving a complicated faulting pattern and the merging of two anticlines, is described in detail by means of surface and subsurface structure maps and cross sections.

6. "Structural Accumulation of Natural Gas in Oriskany Sand of Tri-State Area," by *John T. Galey*.

In the Tri-State area, comprising east-central Ohio, southwestern Pennsylvania and northern West Virginia, between the highly folded structures (Chestnut Ridge anticline) on the east, and the area in which the Oriskany sand becomes patchy in its distribution on the west, seven gas pools have been found in the Oriskany sand on low-relief domes. The history of discovery, stratigraphy, structure of the surface rocks, structure of the Berea sand, convergence between the Berea and Oriskany sands, and structure on the Oriskany sand, together with development, operation, and reservoir data, are discussed for the three most important of these pools, which are Blackhawk, located in South Beaver Township, Beaver County, Pennsylvania, and the Knox and Round Knob located in Knox and Madison townships, Columbiana County, Ohio, respectively.

7. "Oriskany Sand in Ohio," by *J. R. Lockett*.

The Oriskany is a somewhat regular sand body in an area comprising parts of fourteen counties in eastern Ohio. The western limit of this consistent deposit can be plotted as a very irregular line between Trumbull and Meigs counties. Although relatively large lenses of sandstone have been encountered at this horizon as far west as Knox County in the central part of the state, only two small fields have been discovered in western outliers.

The Cambridge field, discovered in 1922, was developed along the western pinch-out of the Oriskany in a typical stratigraphic trap extending from southwestern Guernsey County into south-central Tuscarawas County. The sand was absent west of the field, oil has accumulated immediately below the gas and a definite water horizon was encountered on the normal southeast dip below the oil at a depth of 2,600 feet below sea level. Although hard and sharp, the sand was exceptionally open in texture. Virgin rock pressure was 1,150 pounds. Gas wells were large in volume but relatively short lived. At its peak in 1926 the field produced 190,000 MCF per day.

During 1935 a small gas field with a virgin pressure in excess of 1,600 pounds was discovered on a closed structure in Madison and Wayne townships, Columbiana County, at an average depth of 3250 feet below sea level. The few wells drilled were soon ruined by water and the field was of no commercial importance. During 1946 a gas field was developed on a similar structure and at approximately the same depth a few miles east in Madison Township. High pressures and large initial volumes encouraged development but water encroachment ruined these wells within a year. These two small gas fields are the only producing areas developed in Ohio where accumulation in the Oriskany sand was definitely controlled by anticlinal structure.

In 1944 a gas field was discovered along the western limit of the Oriskany in eastern Knox Township, Columbiana County, at an average depth of 2,400 feet below sea level. Initial rock pressures were in excess of 1,300 pounds. Although no oil was discovered downdip, high permeability of the sand and large initial volumes of the wells indicate that their history will be comparable with that of the Cambridge field.

A gas well with an open flow capacity of 2,500 MCF was recently completed at a depth of approximately 2,100 feet below sea level near the Pennsylvania line in Vernon Township, Trumbull County. It is one location west of two small oil wells which are located immediately up the normal dip from