

43. W. J. HILSEWECK, Gulf Oil Corporation, Fort Worth, Texas
Walnut Bend Pool of Cooke County, Texas

The Walnut Bend pool is the first major deep discovery in the Marietta-Sherman syncline, a northwest-southeast trending feature which extends from southwestern Carter County, Oklahoma, to southeastern Grayson County, Texas, parallel to the Criner Hills axis and the Muenster Arch. In this pool 1,000 feet of Comanche rocks overlie the 4,200 feet of Upper and Middle Pennsylvanian (Canyon and Strawn) sediments, and beds of lower Simpson (Oil Creek) age underlie the Pennsylvanian rocks. Pre-Pennsylvanian rocks show the Walnut Bend structure as an elongate anticline. This structure was formed on an arch folded in early Pennsylvanian (pre-Bostwick) time and the Marietta-Sherman syncline was formed in late Deese time by the down-warping of the middle part of this arch. Over one and one-half million barrels of oil have been produced from 6 sandstone zones between the depths of 4,100 and 5,100 feet, and from 2 dolomite beds in the Simpson group. Occurrence of oil in the sandstone zones at 4,900 and 5,100 feet is controlled by anticlinal structure over the closely folded Ordovician beds. Electrical log cross sections are presented to indicate that oil in the 4,100-, 4,600- and 4,700-foot zones occurs in a stratigraphic trap formed by gradation of sandstone into shale.

44. H. N. FISK, Louisiana State University, University, Louisiana
Midway-Wilcox Deltaic Mass

The lithologic unit previously considered to be of Sabine (Wilcox) age in the Sabine uplift area of Louisiana is divisible on the outcrop into conformable beds carrying Wilcox fossils and upper Midway fossils. The Midway fauna occurs throughout several hundred feet of section above the typical Midway shale reflection on electrical logs. Isopach maps and cross sections developed from electrical logs and paleontological reports of deep test wells from east Texas to southern Alabama show that during the time of deposition of the marine Midway and Wilcox of Texas and Alabama, a great deltaic mass, reaching a thickness in excess of 3,000 feet, was accumulating in the Mississippi Embayment of eastern Louisiana and central Mississippi. The presence of interpretable fossil assemblages appearing in beds which interfinger with the deltaic mass along its northwestern margin is important in determining the age of the mass and in field mapping in the Sabine uplift area.

45. J. O. BARRY, Louisiana Geological Survey, University, Louisiana
Correlation of Wilcox Faunal Units of Louisiana

The discovery of forty new fossil localities permits a better definition of the three faunal units of the Louisiana Sabine (Wilcox): the Sabinetown (youngest), Pendleton, and Marthaville beds (oldest). Fossils were collected from three Sabinetown outcrops, twenty localities of Pendleton age, and from seventeen localities which carried a Marthaville fauna. The study of these fossils substantiates the long-standing correlation of the Louisiana section with the marine Wilcox of Alabama. The presence of *Ostrea multilirata* Conrad, a guide fossil of the basal Wilcox Seguin formation of Texas, associated with *Ostrea thirsae* (Gabb) in the Marthaville beds is of importance because it establishes a connecting link between the basal Wilcox faunas of Alabama and Texas.

46. R. J. LE BLANC, Louisiana Geological Survey, University, Louisiana
Correlation of Upper Midway Fauna of Louisiana

The lower Eocene sediments below the basal Sabine (Wilcox) *Ostrea thirsae* zone have a surface thickness of approximately 800 feet in the Sabine Uplift region of northwestern Louisiana. The upper 300 feet of the sediments contain a very limited fauna. The lower 500 feet of sediments carry a varied fauna which is older than the Solomon Creek fauna of Texas (basal Wilcox or upper Midway in age) and correlated with the upper Midway faunas of the Alabama Naheola formation and the Kerens member of the Wills Point formation of Texas. This correlation is based on the results of a detail study of over ninety species from fifteen previously undescribed localities in Sabine, Natchitoches, and DeSoto parishes.

47. GROVER MURRAY, JR., Louisiana Geological Survey, University, Louisiana
Midway Stratigraphy of Sabine Uplift

The Midway sediments which crop out in northwestern Louisiana outline the highest structural portion of the Sabine uplift. They are divisible on the surface into three formations, the Naborton (oldest), the Logansport, and the Hall Summit (young-

est). Each formation is a lithologic unit which consists of a basal sand member, a middle lignitic shale member, and an upper calcareous member. The surface lithologic units can be traced locally into the subsurface by use of driller's logs and electrical logs. The practicability of employing these units for mapping is shown by the fact that detailed mapping of formations delimits the various oil fields of this area and shows the highest structural portion of the Sabine uplift to be in the DeSoto-Red River field.

CENTRAL AND EASTERN STATES

48. ALFRED H. BELL, Illinois Geological Survey, Urbana, Illinois
Oil and Gas Development in Eastern Interior Basin in 1940

Oil production in the Eastern Interior basin reached a new high in 1940, about 54 per cent above 1939. Most of this increase was due to the drilling of wells in the Devonian limestone in the Salem and Centralia pools, Illinois. Thirty new oil pools were discovered in Illinois, and several in southwestern Indiana and western Kentucky. The Indiana discoveries were within about 10 miles of the Wabash River which is the Illinois-Indiana state boundary in this area. Twelve of the 30 new pools discovered in Illinois are in counties bordering the Wabash River. Geological conditions revealed by the new drilling are discussed.

49. PAUL H. PRICE, State geologist, West Virginia Geological Survey, Morgantown, West Virginia

A. J. W. HEADLEE, chemist, West Virginia Geological Survey, Morgantown, West Virginia

Geochemistry of Natural Gas in Appalachian Province

This paper contains the results of further studies on the variations in the composition and properties of natural gas by geologic and geographic distribution.

New data corroborate the composite regional variations previously published. The regional map has been extended to include the gas and oil fields in Canada which lie in the Appalachian Province north of Lake Erie.

Well to well variations in the composition of the gas in several individual reservoirs are given. Definite relationships exist between the composition of natural gas and associated oil both areal and quantitative.

Numerous samples of near-surface gases and gases from coal seams have been analyzed.

A résumé of the geologic occurrence of methane, ethane and higher boiling saturated compounds, nitrogen, carbon dioxide, and hydrogen sulphide is given. Also the relationship of these gases to their associated constituents, i.e., sand, shale, limestone, coal, water, brine, calcium sulphate, are discussed.

The origin, migration, and natural storage of gas and oil are discussed in the light of these data.

50. E. T. HECK, West Virginia Geological Survey, Morgantown, West Virginia
Gay-Spencer-Richardson Oil and Gas Trend in West Virginia

An outstanding example of the control of oil and gas production by sand distribution is provided by the Berea sand trend extending from Gay in Jackson County, north-eastward through Spencer, Roane County, and Richardson, Calhoun County. With the exception of a few undeveloped edge areas, the producing area closely follows the extent of the sand. The producing area varies in width from less than one mile to about three miles. Cross sections show that the sand pinches out in both directions at right angles to the trend and the linear shape strongly suggests a buried beach. Although only the southwestern part of the trend is considered in the paper, the trend is known to continue northeastward to Fink Creek, Lewis County. A total length of over 55 miles.

Within the sand body the adjustment of oil and gas to structure is very good, with oil in the synclines and gas on the intervening anticlines. No areas containing only water in the Berea sand are known along the trend.

Secondary recovery of oil by means of gas drive is being tried near Spencer, on an experimental basis, with encouraging results.

51. MAX W. BALL, consulting geologist, Edmonton, Alberta, Canada
T. J. WEAVER, American Production Company, Grand Rapids, Michigan
DOUGLAS S. BALL, student, Colorado School of Mines, Golden, Colorado
Shoestring Sand Gas Fields of Michigan