1. A decided decrease in wildcat activity with only approximately one half the number of wells completed as during 1940.
2. The continuation of a curtailed geophysical program comparable to the last months of 1940 with a slight upturn toward the end of the year.
3. The inception of core drilling programs by eight major companies with more emphasis placed on this type of explorarion, as well as on surface geology.
4. A continuation of the leasing program in south Mississippi and its extension into Alabama and Florida.
5. The review and revision of geological and geophysical data with an attempt to eliminate the sources of error as revealed by negative results of exploration in 1940.

There were several additional events of importance in the area. Development in the Tinsley field seemingly outlined the limits of production from the shallow sands. A new sand, the McGraw, was discovered on the north edge of the field in the basal part of the Eutaw formation.

Two new fields were discovered in Mississippi, the Sharpsburg field in T. 11 N., R. 3 E., Madison County, and the Cary field in T. 11 N., R. 7 W., Sharkey County. The Sharpsburg field, which may be an extension of the near-by Pickens field, was discovered by C. L. Morgan's Johnny No. 1 in Sec. 4, T. 11 N., R. 3 E. The producing sand is known as the Wilburn sand and is the first sand in the Eutaw formation. The Cary field was opened by the British-American Oil Co. Houston No. 1 and the production is from Selma gas rock of Navarro age. Neither area has had sufficient exploration to evaluate its future.

Of geological importance was the limiting of the Mississippi salt basin on its northeast side by the Union Producing Co. Waite No. 1 in Clarke County, Alabama, and the Magnolia Petroleum Co. Culpepper No. 1 in Lauderdale County, Mississippi. The Union Producing well drilled to a total depth of 12,399 feet and near the bottom penetrated formations which are correlated with the Buckner, Smackover, and Eagle Mills formations of Louisiana and Arkansas. In the Eagle Mills formation, interbedded shale and salt was cored suggesting proximity to the edge of the salt deposit. The Magnolia well in Lauderdale County encountered rocks of Paleozoic age at a depth of 6,060 feet so that the limit of the salt deposit is between these two wells. Of first importance geologically is the presence of the Smackover limestone indicating its presence across the Mississippi basin into Alabama. This suggests the possibility of production in porous horizons comparable to producing areas in Arkansas and Louisiana.

In Alabama and Florida there was extensive geophysical and leasing activity. In the latter state many of the large tracts were taken under geophysical option or otherwise leased. The same was true of southern Alabama and to a less degree, southern Mississippi. Nothing of importance occurred in Georgia.

Two new salt domes were discovered in Mississippi. Kings dome was found by the Magnolia Petroleum Co. Hall No. 1 in T. 7 N., R. 4 E., Warren County. The Halifax dome was discovered by the Plains Producing Co. in T. 7 N., R. 4 W., Hinds County.

The Magnolia Petroleum Co. Hall No. 1 encountered a saturated section in the top of the Wilcox formation. A test resulted in showing the presence of low-gravity asphaltic oil and water. Although this had no commercial value, the presence of oil in the top of the Wilcox formation was indicative of its productive possibilities elsewhere.

56. BERNERD A. RAY, Tide Water Associated Oil Company, Midland, Texas
WILLIAM T. SCHNEIDER, Honolulu Oil Corporation, Midland, Texas
CHARLES TAYLOR COLE, University Lands, Midland, Texas
EDGAR KRAUS, The Atlantic Refining Company, Carlsbad, New Mexico
RONALD K. DEFORD, Argo Oil Corporation, Midland, Texas

West Texas and Southeastern New Mexico Development in 1941

Development in West Texas was greater than in any year since 1937. A total of 2,325 wells were drilled, including those deepened and recompleted. Of these 2,190 or 94 per cent were producers. The most active field was the Slaughter field which accounted for 678 wells or more than $\frac{1}{4}$ of the producers drilled. A total of 135 wildcat wells (i.e., wells over one mile from production) were drilled, of which 27 were producers and 108 were dry holes. Nine of the wildcat wells established new areas of production; the remainder were produced from new levels in established areas or were considered extensions. Fifteen of the wildcats were completed from the various known Permian levels while two new levels, both in the lower Permian, were disclosed. Permian exploration was scattered over 43 counties and was more inclusive in the number of zones tested than in previous years.

Especially did pre-Permian drilling and exploration exceed that of past years. A total of 106 pre-Permian wells were completed. Of this number, 21 were dry, 6 were plugged back to the Permian for producers, and one was a temporarily abandoned gas well. This gives a percentage of dry holes of 15 per cent. Twenty-five of the pre-Permian tests could be considered wildcats and of these 10 were successfully completed as producers. The center of activity was in the Abell field in north-central Pecos County. Here 56 wells were completed, including 6 wildcat producers, 1 dry hole, 6 wells which were plugged back to the newly discovered Permian zones, and the 1 temporarily abandoned gas well.

A definite trend toward deeper drilling has been accelerated by new discoveries in the lower Permian (Leonard), lower Pennsylvanian ("Crinoidal"), and Ordovician, and Cambrian (Simpson and Ellenburger) formations.

There was a decline of 31.5 per cent in the number of wells drilled in southeastern New Mexico in 1941. A total of 371 wells were drilled, of which 294 were oil wells, 7 gas wells, and 70 dry holes—the highest percentage of dry holes in the past several years. There were four new discoveries for the year. The most active area was the Maljamar pool, where 61 wells were completed including 3 which were dry. The producing formations of the 1941 discoveries are the Yates, Seven Rivers, and Grayburg.

Geophysical activity has been conducted mainly with gravimeter and magnetometer.

57. R. M. ENGLISH, Carter Oil Company, Eldorado, Illinois
R. M. GROGAN, Illinois State Geological Survey, Urbana, Illinois
The Omaha Pool, Gallatin County, Illinois

The Omaha pool was discovered in November, 1940, by The Carter Oil Company's York No. 1, SE.-SE.-SW. Sec. 33, T. 7 S., R. 8 E., Gallatin County, Illinois. The producing area is now defined and extends over 360 acres located generally southwest of the discovery well. Production is from the Palestine and Tar Springs formations of the Chester series.

The pool lies on the crest of a large dome, and is exceptional in that igneous rock is found in intrusive contact with the producing sands. Sills and low-angle dikes from less than one foot to fifty feet in thickness composed of porphyritic lamprophyric rock rich in biotite and olivine occur at many levels in the Pennsylvanian and Chester series.

Contact effects indicate that at least some of the oil was in the sands prior to intrusion of the igneous material, suggesting a structure predating the intrusion. Pronounced doming of the structure probably accompanied intrusion. Earlier minor folding occurred at the close of the Mississippian.

58. WILLARD D. PYE, University of Chicago, Chicago, Illinois
The Physical Properties of the Bethel Sandstone of South-Central Illinois

For the past 10 months the writer has been engaged in making a detailed study of the physical properties of the Bethel sandstone as they are revealed in cores from wells drilled in south-central Illinois. The investigation has been undertaken in cooperation with the Illinois State Geological Survey.

The Bethel sandstone is found to be very uniform in all of its physical properties both vertically and laterally although some gradations exist. The study has revealed that most of the sand has come from older sediments. Most of it has undergone at least one earlier period of deposition under conditions in which the cement was silica and some has undergone at least three cycles of erosion. Some of the sand has been derived from redbeds and the grains are frosted. The original source of the sand was in part from dynamically metamorphosed rocks and in part from regionally or thermally metamorphosed rocks. A large part originally came from igneous rocks, probably granites since the associated feldspar is acidic.

Heavy minerals are very rare but those found constitute about thirty species. A number of varieties of tourmaline and zircon are distinguished. Ten varieties of quartz are found which are readily distinguishable and it is proposed that more data can be derived concerning the origin and history of a given deposit by a detailed study of quartz and its varieties and inclusions, than from heavy-mineral studies and without the laborious procedure of making heavy-mineral concentrates.

A detailed discussion of the inter-relations of the physical properties of the sand, together with an analysis of the effect of these upon the porosity and permeability of the Bethel, is given. This together with certain detailed information concerning the pores and pore pattern, the relationship of the silica and carbonate periods of cementation, and soluble minerals are discussed in the relationship they have upon securing