

15. H. B. STENZEL, Bureau of Economic Geology, Austin, Texas  
*Sedimentary Cycles in Eocene of Texas Gulf Coastal Plain*

A typical sedimentary cycle of the Gulf Coastal Eocene consists of cross-bedded sands, well bedded sands, silty brown shale, unctuous brown shale, glauconitic brown shale, massive glauconite marl, gray calcareous shale, impure limestone, gray calcareous shale, unctuous brown shale, silty brown shale, well bedded sands, and cross-bedded sands listed in ascending order. Cycles of this type are rarely complete, most of them are broken or interrupted by disconformities. Most of the disconformities occur either at the base of the cross-bedded sands at the beginning of the cycle (regressional hiatus) or at the base of the massive glauconite marl (transgressional hiatus). The positions of the disconformities in the stratigraphic section of eastern and central Texas are shown. The magnitude of the hiatuses is estimated with the aid of new methods.

#### WEST TEXAS

16. TAYLOR COLE, University Lands, Midland, Texas  
ROBERT I. DICKEY, Forest Development Corporation, Midland, Texas  
EDGAR KRAUS, Atlantic Refining Company, Carlsbad, New Mexico  
*Developments in West Texas and Southeastern New Mexico*

Development in West Texas continued at about the same rate as during the previous two years, with 1,747 field wells being completed, and 119 wildcats. The percentage of wildcat strikes was unusually high in that 47 were producers while the percentage of dry holes was only 5.6%. Eighteen new discoveries (twice as many as during 1939) were recorded with fourteen from Permian rocks ranging from the Yates sand (upper Whitehorse) down to the upper portion of the Clear Fork. The four pre-Permian discoveries included one each from the Lower Pennsylvanian, Silurian, Simpson (Middle Ordovician), and Ellenburger (Lower Ordovician). Five of the new discoveries are in Crockett County. Many of the fields were extended considerably, and several geologically important wildcats were drilled.

The trend in exploration seems to be toward more and deeper wildcatting with probably a slow orderly development of the new discoveries except where near-expiration leases are held.

There have been very few improvements in drilling and production practices. Activity in geophysical exploration was at a high level in the central and southern portions of the Midland Basin and along the Eastern platform.

Development in southeastern New Mexico was less than the previous year with 542 wells being drilled. The percentage of dry holes (13.5%) ran higher than previously because of hazardous development in lenticular, irregularly cemented "sands" flanking the Artesia-Maljamjar nose on the south and north. Few deep exploratory tests were drilled in spite of contiguous areas of West Texas being productive from pre-Permian formations. Only two new discoveries were recorded from southeastern New Mexico, but several fields were extended considerably.

17. W. T. SCHNEIDER, Honolulu Oil Corporation, Midland, Texas  
*Geology of Wasson Field, Gaines and Yoakum Counties, Texas*

The Wasson field is near the central part of the Staked Plains or "Llano Estacado," in southern Yoakum and northwestern Gaines counties. At present it occupies a triangular-shaped area 15 miles long and 14 miles wide containing approximately 59,000 acres or 93 square miles. It is still in an active state of development and has been defined at only a few points by dry holes.

Geologically, the field lies on the extended axis of the Central Basin platform, but appears to be separated from it by a trough in northern Gaines County. For the purpose of this paper the structural-stratigraphic feature under discussion will be referred to as part of North Basin platform.

Two major axes, one trending N. 60° W., the other N. 30° E., combine with several minor parallel axes to form a compound structure. The combined effect of the structural elements gives the whole the appearance of a terraced platform which has been tilted to the northeast by post-Permian movement.

The problem of stratigraphy is typical of West Texas in that massive, porous dolomites with fewer clastics form the highs and grade basinward into thicker sections of interbedded dolomite and anhydrite containing more clastic materials.

The section penetrated by wells consists of: Recent, Tertiary, Cretaceous, Triassic, and Permian deposits. The reservoir is in porous dolomite 300 to 600 feet below the top of the San Andres. Detailed examination and recording of the well-cuttings show the body of the reservoir to have a reef-like cross section which may be accounted for by (1) chemical deposition on a marine high, or (2) reef-growth with attendant chemical deposition.

The combination of Permian structure and stratigraphy appears to have controlled the permeability, porosity, and the accumulation of fluids. Later folding modified the position of these fluids somewhat. For the field as a whole there is no direct relationship between the present structural elevation and the ability to produce oil.

The discovery well, Honolulu Oil Corporation and Davidson Drilling Company No. 1 Bennett, was drilled into oil on September 28, 1935. Development has been continuous since that time and 16,388,981 barrels of oil had been recovered from the field on September 1, 1940.

18. W. M. OSBORN, consulting geologist, Midland, Texas  
*Stratigraphic Trap of Slaughter Field of West Texas*

The Slaughter field of Cochran, Hockley, and Terry counties, Texas, covers approximately seventy squares miles and on February 1, 1941, it contained 162 producing oil wells.

Present control shows no structural closure. The field is situated on a series of noses dipping gently south-southeast but these do not control production.

The pay section, which is about 100 feet thick, is the Permian San Andres dolomite. The pay is a brown granular dolomite having inter-crystalline porosity. In some parts of the pay section larger openings also occur. The depth to the top of the pay, which is about 800 feet below the top of the San Andres, ranges from approximately 4,900 to 5,000 feet. The southern and eastern limits of the field are mainly determined by the structural position of this pay with reference to the water table.

Production to the west seems to be limited by contamination of the pay section with silt and anhydrite. Two structurally high dry holes on this side of the field showed large amounts of silt and anhydrite in the beds equivalent to the pay section.

The northern limits of production have not been defined but indications point to a breaking down of the section in this direction also.

19. W. A. WALDSCHMIDT, Colorado School of Mines, Golden, Colorado  
*Progress Report on Microscopic Examination of Permian Crude Oils*

Studies of several samples of Permian crude oil were made for the purpose of determining the source, character, and amount of the included organic residues. The method of obtaining the residues was similar to that used by Sanders. Diatoms, spines, plant remains, and fragments of other organic materials were observed in the residues examined, but further studies will be necessary before the source of these remains can be determined.

20. TAYLOR COLE, University Lands, Midland, Texas  
*Subsurface Study of Ellenburger Formation in West Texas*

Various portions of the Ellenburger (Cambro-Ordovician) formation have been penetrated throughout the West Texas area bounded by Latitude 32° and 30° and Longitude 101° and 103°. The formation consists of fine to coarsely crystalline dolomites and dense limestones. These lithologic units are of no value even in local correlations when accurate work is desired.

A careful study has been made of the insoluble residues from most of the well cuttings available. The chief criterion for correlations is chert. Four main classes of chert are recognized: smooth, granular, chalky, and drusy. Each class may have several secondary characteristics, and gradational types are present. From this work the complete Ellenburger section, which is approximately 1,335 feet thick in western Crane County, has been divided into five zones. These zones when fitted into the section worked by geologists familiar with the Missouri section have approximately the following relationship.

Silt zone.....	Cotter
Smooth Chert zone.....	Jefferson City Roubidoux Gasconade