14. LEE H. MELTZER, Consultant, New Orleans, La.

GEOLOGY OF WEST BASTIAN BAY FIELD, PLAQUEMINES PARISH, LOUISIANA

West Bastian Bay field, one of the largest gas fields in the south Louisiana Gulf Coast area, produces from beds of late Miocene age between 6,950 and 15,500 ft. Structurally, the field is an anticline on the southern downthrown side of a fault whose throw exceeds 3,000 ft. The center of uplift moved progressively northwestward for a distance of 2 mi. from its "X" Sand position near the southeastern edge of the field. The fairly recent development of a new locus of uplift near the eastern edge of the field has given the field a double closure at the level of the uppermost Miocene beds. A small, long-quiescent fault with 60–100 ft. of throw across the axis of the fold and the eastern part of an axial fault separate the deep reservoirs in the northeastern segment of the field from the deep reservoirs in the other segments. The fact that gas columns in this area are thinner than elsewhere along the apex of the fold is believed to be the result of the presence of the nearby East Bastian Bay field and the eastward shaling out of the "W" and "X" Sands.

15. ARTHUR S. DICKINSON, Goldrus Drilling Company, Houston, Tex.

PALEOSTRUCTURAL ANALYSIS AND APPLICATION OF LATER STRUCTURAL TILTING

It is reasonable to conclude that hydrocarbons begin to form soon after the organisms from which they are derived are buried with the sediments that constitute both source rock and reservoir bed. Therefore, structural-mapping methods used to define likely areas of accumulation should be used to reconstruct the geologic history from the time of deposition by analyzing both the initial structural growth and the later structural tilting that influenced the migration and entrapment of the hydrocarbons.

Structural mapping methods, commonly used today, locate "structure" as it presently appears without regard for (1) initial local structural uplift which influenced the movement of hydrocarbons as they began to migrate, or for (2) later structural tilting which tended to breach the original "paleostructural" trap and possibly caused the original accumulation to move to another place. Therefore, it is possible, using customary structural mapping methods, to map a high properly that has no accumulation because no trap existed at the critical time of initial migration. Likewise, it is also possible that the initial structural closure has no accumulation today because it was breached by later structural tilting.

The purposes of this paper are (1) to demonstrate a logical method of paleostructural mapping by use of carefully selected isopachous intervals, and (2) to define *later structural tilting* and to present a practical method of applying it to understand and define better the likely areas of accumulation.

Examples of application at North Francitas field, Jackson County, Texas, and at Rayne-Bosco-Ossun fields, Acadia and Lafayette Parishes, Louisiana, are presented.

16. B. ROSS WHITE AND JERRY R. SAWYER, Placid Oil Company, Shreveport, La.

BLACK LAKE FIELD—BEFORE AND AFTER

The conditions of the surface and subsurface in and around the area now encompassed by the Black Lake field, Natchitoches Parish, Louisiana, are reviewed. Numerous dry holes had been drilled in the vicinity of the field before the discovery; the dry holes are in close proximity to the now-established productive limit. The factors leading to the discovery in an area long thought to be barren of oil or gas possibilities by most oil men are presented.

The production in the Black Lake field comes from a biohermal-type reef of the Pettit Formation, which is of Early Cretaceous (Sligo) age.

The unique aspect of this field is the manner in which the operators have handled the development. Unitization was established before competitive production was allowed. The field has been shut-in since discovery, and facilities are being installed in preparation for inauguration of a full pressure-maintenance gas-cycling operation.

The discovery of the Black Lake field has triggered a flurry of exploration activity across central Louisiana. There have been numerous exploratory wells drilled along the Pettit trend since Black Lake field's discovery—all without success. Even with the new activity, subsurface control is sparse and the existence of additional Black Lake field-type accumulations is possible.

17. JACK LEE GREGORY, Tenneco Oil Company, Houston, Tex.

LOWER OLIGOCENE DELTA IN SUBSURFACE OF SOUTHEASTERN TEXAS

A lower Oligocene (middle Vicksburg) delta is delineated in the subsurface of southeastern Texas. The middle Vicksburg delta, composed of interbedded sandstone, siltstone, and shale, has an areal extent of approximately 1,100 sq. mi. and a maximum thickness of 300 ft. It is now buried beneath 2,500 ft. to more than 9,000 ft. of younger deposits, mainly sandstone and shale.

The sandstone distribution suggests that the sediment was brought into the Vicksburg basin from the north by two rivers or by a single river that frequently changed course. A broad deltaic plain existed at the mouth of the river and prograded much farther seaward than the adjacent contemporaneous alluvial and inter-deltaic sandstone beds on the east and west.

Two major axes of thickening are apparent: the axis normal to the shoreline represents the sand-filled alluvial valleys and the seaward extension of the delta; and the axis parallel with the shoreline represents longshore current deposition (beaches, barrier islands, and dunes). The data suggest that longshore currents flowed westward and deposited considerably more sand on that side of the delta.

Production from sandstone beds of the middle Vicksburg is restricted to the seaward extension of the delta, the area most favorable for oil and gas generation and preservation. The most favorable traps in the marine extension of the delta are positive structures that existed during Vicksburg deposition.

18. B. J. SLOANE, Monrich Oil & Gas, Inc., Lafayette, La.

STRUCTURAL HISTORY OF HOUMA EMBAYMENT

The Houma embayment is a structural downwarping of the middle Miocene continental shelf which was filled contemporaneously with a northward-thickening wedge of deltaic-plain sandstone and deep-marine shale. The embayment wedge is terminated on the north by an arcuate, down-to-the-coast, growth-fault