fluence on deposition became minor. The upper Frio and overlying beds dip normally southeastward toward the Gulf of Mexico. The crests of structural closures within the miniature basins shift with depth due to the rather abrupt changes in the thickness of the middle and lower Frio sections.

7. REVIEW OF HITCHCOCK FIELD, GALVESTON COUNTY, TEXAS, Jesse O. Reiter, c/o Hershal C. Ferguson, Houston, Texas.

The stratigraphy and structure of Hitchcock field, located about 40 miles southeast of Houston, are discussed in light of the 27 wells drilled there since Halbouty and Simmons' original study in 1941. The producing structure appears to be an east-west anticline, the crest of which has been down-faulted to form a graben. Maximum stratigraphic throw of the faults in the field is 280 feet. The large regional strike fault that passes north of the field has a stratigraphic throw of 830 feet. The greatest structural growth seems to have occurred during late Miocene or early Pliocene time.

The sand in which oil was first discovered (5,100-foot sand) is still the most important reservoir in the field. It is absent over the crest of the anticline, but is present on the west, south, and east flanks.

Cumulative production from Hitchcock field through 1957 was 4,115,421 barrels of oil, 1,889 barrels of condensate, and 1,180,919 MCF of gas. All of the oil and most of the gas come from the Miocene. Some gas is produced from the Pliocene. Three wells drilled to the Oligocene Frio sands failed to find production in that section.

8. TURTLE BAY FIELD, CHAMBERS COUNTY, TEXAS, R. P. Akkerman, Gulf Oil Corporation, retired.

Turtle Bay field, about 40 miles due east of Houston, produces oil and gas from upper Frio and *Marginulina* sands (Oligocene). Structurally, the field is an anticline formed not by uplift but by subsidence of its north flank into rim synclines around the Moss Bluff, Lost Lake, and Hankamer salt domes, plus regional tilting toward the southeast. The area of the field remained stable as the southerly regional dip was reversed by subsidence into the rim synclines on the north. A thicker than normal *Heterostegina* limestone is observed on the electric logs of wells drilled in the area, showing reversal of regional dip, and may be used as a criterion to localize the search for more such fields in the district.

9. *Heterostegina* REEF ON PIERCEMENT SALT DOMES, WITH SPECIAL REFERENCE TO NASH AND OTHERS IN NORTHWESTERN BRAZORIA COUNTY, TEXAS, Ralph B. Cantrell, J. C. Montgomery, and A. E. Woodard, Houston, Texas.

Reef limestone as much as 300 feet thick occurs in the *Heterostegina* zone in part of northwestern Brazoria County about 40 miles south-southwest of Houston, between Damon Mound, Nash, and West Columbia piercement salt domes. This locally developed limestone is completely surrounded by normal *Heterostegina* calcareous shale or shale with one or more very thin limestone beds.

At Nash dome the upper part of the limestone is porous, consisting chiefly of "honeycomb" corals, and the lower part is more dense. Indications are that the *Heterostegina* reef developed in a near-shore, shallow-water environment, and that its growth did not stop at the end of Anahuac time but continued even into the early Miocene.

Large-diameter conventional cores are recommended for evaluating the production potential of the *Heterostegina* limestone. Although the best porosity is found in the top of the limestone, it may develop also in other intervals. The limestone production at Nash field does not have a common oil-water contact.

Substantial oil production has been obtained from the *Heterostegina* limestone and more may be expected at Nash, Damon Mound, and West Columbia fields, at depths ranging from approximately 2,000 feet at Damon to 4,350 feet at Nash.

10. LOG INTERPRETATION IN BRACKISH-WATER FRIO TREND, Terry Walker, Welex, Inc., Houston, Texas.

The interpretation of logs in the Frio trend of the Texas Gulf Coast is complicated by thin sands laminated with numerous shale and dense streaks. Such conditions require measurements of Rxo and porosity over very short vertical intervals. Coupled with the higher-resistivity formation water, these conditions, however, offer the ideal application for the FoRxo-Guard combination in that fluid content can be resolved in stringers as thin as 1½ feet. The combination of logs offers rapid formation fluid determination in addition to reliable saturation and porosity calculations.

Correlation between the Guard Log and conventional logs in the area can be made without difficulty. In addition, correlations between Guard Logs from well to well are such that stratigraphic changes can be located closely.

11. STRUCTURE OF KARNES COUNTY AREA, TEXAS, AND ITS RELATION TO JACKSON SEDIMENTATION, D. Hoye Eargle, United States Geological Survey, Austin, Texas.

12. EROSIONAL CHANNEL IN MIDDLE WILCOX NEAR YOAKUM, LAVACA COUNTY, TEXAS, William V. Hoyt, consulting geologist, Yoakum, Texas.