which the faults cut. The increase in throw with depth is principally a result of lengthening of stratigraphic section in the downthrown block relative to the same section in the upthrown block. This lengthening of section is caused by thickening of downthrown beds, and by preserved wedges below unconformities in the downthrown block which are absent in the upthrown block.

As the unconformable contact between the Upper and Lower Cretaceous is the only horizon at which a large increase in throw on faults is evident, it appears that this unconformity is the only one of significant hiatus between Wilcox to basal Hosston time.

The crest of structures at Lower Cretaceous horizons through this area are commonly located near one side of a graben system. The faults on this side, termed *axial faults*, generally bisect the anticlinal crest so that closure is present on both their upthrown and downthrown sides. Lower Cretaceous production is most commonly found along the structural crest on both sides of the axial faults.

Faults with opposing dip on the opposite side of the graben, termed *flank faults*, are farther removed from the structural crest and exhibit closure only on the upthrown side. Flank faults provide potential traps if upthrown reservoir beds remain against impervious strata in the downthrown segment during growth of the fault.

Lateral changes in the throw of faults takes place more rapidly on progressively older horizons. The lateral termination of a primary fault off the flanks of a deep-seated salt dome appears to take place on all horizons approximately the same distance from the apex of the dome.

RICHARD R. McLEOD, Gulf Coast Corporation, New Orleans, Louisiana

Theory for Formation of Limestone Cap Rock of Salt Domes

Osmosis, a new concept in subsurface fluid flow, is applied to the field around a shallow piercement-type salt dome. In the process, ground water circulating under the influence of osmotic pressure deposits the limestone cap rock on the top of the dome. Limitations of the osmotic theory are discussed.

GENE B. MARTIN, paleontologist, Gulf Oil Corporation, New Orleans, Louisiana

Prelimiary Investigation of Upper Ordovician Bryozoa of Northwestern Alabama

An attempt is made to clarify the subdivision of the upper Ordovician strata in northwestern Alabama by the use of Bryozoa and associated fauna. The upper Ordovician limestone exposed in northwestern Alabama (and extending into the northeastern Mississippi subsurface) contains abundant fossils, mainly Bryozoa. These may be used to subdivide this section and to correlate the subdivisions with named units recognized in Tennessee.

The upper part of the "Chickamauga" limestone a catch-all term, may be divided into the Leipers and Fernvale formations on the basis of diagnostic bryozoan species. The Leipers formation is recognized by the diagnostic species *Monticulipora molesta* Nicholson and the absence of *Richmond* species. The Fernvale formation is charaterized by the presence of six species that are restricted to that formation out of twenty-four species identified. The writer recommends that the use of the name "Chickamauga" be avoided in favor of the more specific Leipers and Fernvale formations.

The geographic area of study has been restricted to Limestone County, Alabama, which lies within a section of the Black Warrior Basin.

Measured sections of six outcrops are presented as a columnar section. A description of the Fernvale and Leipers formations of northwestern Alabama is given with a list of Bryozoa species identified at each collecting locality.

HAROLD OWENS, Humble Oil and Refining Company, Tallahassee, Florida

Florida-Bahama Platform

The Florida-Bahama platform covers 200,000 square miles, encompassing the Bahama Islands and most of the Florida peninsula and shelf. The 35,000 square miles of emerged surface has little relief; however, relief found in deep-water channels on the submerged part of the platform exceeds 6,000 feet. Geologically, the area is bounded by the Ocala uplift, the overthrust sheet of the Greater Antilles, the possibly faulted west edge of the Florida shelf, and the North Atlantic Ocean deep.

Mesozoic and Cenozoic carbonates and evaporites form a southward-thickening wedge of sediments that attain maximum known thickness of 19,000 feet in the Cay Sal Bank area. The youngest Paleozoic rocks encountered have been identified as Devonian; however, Ordovician clastics are usually found directly underlying Cretaceous sediments in north Florida. Total thickness of the flat-lying unmetamorphosed Paleozoic section is estimated at slightly more than 6,000 feet. Pre-Cambrian age determinations have not been made on igneous rocks encountered in the province: however, in some places igneous rocks probably pre-date the early Paleozoic sediments.

Major structural features within the province are the South Florida basin and the Bahama basin; these are separated by a more stable area that may be the southeast extension of the Ocala uplift. Local structures in Mesozoic and Cenozoic sediments should be of the basin type as there are no indications of major post-Paleozoic orogenic movements within the province.

The Sunniland field in south Florida, the only producing oil field in the province, has produced about 6 million barrels of oil from a Lower Cretaceous bioclastic zone at 11,600 feet. Problems confronting the oil seeker include shallow high-velocity and cavernous formations that make seismic and core-drill prospecting difficult.

CLYDE A. PINE, Plymouth Oil Company, Midland, Texas

Subsurface Structure of Lake Arthur Field, Jefferson Davis Parish, Louisiana (By title)

Lake Arthur field is in T. 10 S., R. 4 W., Jefferson Davis Parish, Louisiana, just north of the city of Lake Arthur. This field was discovered as a result of the drilling of the Joe Sturdivant No. 1 by the Shell Oil Company in 1937. During World War II and immediately thereafter the principal development of the field took place. The discovery of the "Main *Camerina* sand" in 1953 initiated the greatest drilling activity in the history of the field, and it became the most important producing sand.

The sediments encountered by wells drilled in the field are all Cenozoic in age, ranging from Recent to Miocene.

Subsurface studies of the field show it to be a deep-seated domal structure, fractured by many normal, down-to-the-basin faults; the complexity of which increases with depth.

It is a combination of the domal uplift and the complex fault patterns that form structural traps for petroleum. Much of the production is from beds on the downthrown side of the faults, where the sands are thicker because of rapid deposition of sediments con-