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.

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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.

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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-

temporaneous with faulting. The primary example of this is the Main *Camerina* sand.

T. H. PHILPOTT, Olin Oil and Gas Corporation, New Orleans, Louisiana

Lower Cretaceous Trend of South Arkansas, North Louisiana, Mississippi, and Alabama

The Lower Cretaceous trend extends from South Arkansas through North Louisiana, Mississippi, and into southwestern Alabama. To date, oil and (or) gas production has been established in 142 fields (43 in Arkansas, 69 in Louisiana, and 30 in Mississippi).

All of the fields are within the salt basin and salt movement is believed responsible for many of the producing structures. In most places, the structures increase in complexity with depth. A simplified stratigraphic section is shown. Major unconformities occur both above and below the Lower Cretaceous.

One of the most striking unconformities is that caused by uplift after Lower Cretaceous and prior to the deposition of the Upper Cretaceous.

Regional structural maps delineate the configuration on top of the Lower Cretaceous and on the base of the Perry Lake anhydrite. Structural maps and cross sections are included on the following pools: in Arkansas—Fouke, Smackover, Spirit Lake, Wesson; in North Louisiana—Ada, Haynesville, East Haynesville, Logansport, and Sugar Creek; in Mississippi—Bolton, Magee, Martinville, Raleigh, Soso; and in Alabama—Citronelle.

HARBANS S. PURI, Florida Geological Survey, Tallahassee, Florida

Recent Ostracoda from the West Coast of Florida

Recent ostracode fauna from these localities (Alligator Harbor, Tampa Bay, Crane Key, Bahia Honda, Mollasses Reef, and Key Largo Dry Docks) are described and illustrated. Seventy species, distributed over 37 genera, occur in the bays and inner neritic zone. Three genera, *Megacythere* (type species: *Megacythere robusta* Puri, n. sp.), *Neocaudites* (type species: *Neocaudites nevianii* Puri, n. sp.), and *Reticulocythereis* (type species: *Reticulocythereis floridana* Puri, n. sp.), and eighteen species (*Actinocythereis subquadrata* Puri, n. sp., *Acuticythereis tuberculata* Puri, n. sp., *Bradleya hornibrooki* Puri, n. sp., *Bythocypris laeva* Puri, n. sp., *Caudites angulata* Puri, n. sp., *Caudites howei* Puri, n. sp., *Cyprideis floridana* Puri, n. sp., *Cytheropteron howei* Puri, n. sp., *Cytherelloidea sars* Puri, n. sp., *Hulingsina sulcata* Puri, n. sp., *Kangarina bradyi* Puri, n. sp., *Leptocythere cranekeyensis* Puri, n. sp., *Leptocythere yoni* Puri, n. sp., *Loxoconcha postdorsoalata* Puri, n. sp., *Megacythere robusta* Puri, n. sp., *Neocaudites nevianii* Puri, n. sp., *Platella mulleri* Puri, n. sp., *Reticulocythereis floridana* Puri, n. sp.) as described as new.

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Discovery and Development of Person Field, Karnes County, Texas

The Person field is significant principally because it has proved the presence of oil accumulation in commercial quantities in the downdip part of the Edwards trend.

The field is similar to other well known Edwards limestone fields of South Texas, in that it produces on the upthrown side of a north-dipping fault which faults the upper Edwards against the impervious Georgetown limestone. The productive section in the Person field consists of the upper 200–350 feet of the Edwards. This section is characterized by streaks of porous limestone with considerable fracturing and vuggy to intergranular porosity separated by sections of hard dense limestone with no measurable porosity or permeability. Three productive sections tested in the discovery well had average porosities of 11–13 per cent and average permeabilities of 11–12 millidarcys. A definite gas cap approximately 200 feet thick has been established. The oil column appears to have a thickness of 100 to 150 feet. With the existence of the thick gas cap, high ratio problems have been fairly common and thus have complicated completions.

The field is still in the process of development and the limits have not been defined; however, as this paper is written, the field extends 4 miles northeast-southwest and approximately 1-1½ miles northwest-southeast.

Sixteen wells have been completed, five wells are drilling, and one is testing.

JACK W. SHIRLEY, Marr Company, Lafayette, Louisiana

Structure and Stratigraphy of Rayne Field

The Rayne field is in east-central Acadia Parish, Louisiana. The primary production from this field is gas condensate from multiple Frio sands ranging from *Marginulina texana* to *Nodosaria blanpiedi*. The important geological significance of this field lies in the pronounced effect on the stratigraphy and structure of two major down-to-the-south depositional faults. Pronounced thickening of the stratigraphic section occurs on the downthrown side of both faults. The northernmost fault on the north flank of the *Nodosaria* structure is the older and influences the older sediments from *Nonion struma* time to *Nodosaria blanpiedi* time, and the southern fault is the southern boundary of *Nodosaria* production and influences primarily the younger sediments from *Cibicides hazzardi* time into *Nonion struma* time.

HUBERT C. SKINNER, associate professor of geology, Tulane University of Louisiana, New Orleans, Louisiana

Comparison of Mississippi Submarine Trench with Iberian Trough

The Mississippi submarine trench differs from other submarine valleys in being "trench-like" with a broad, flat floor rather than "V-shaped." Domes and ridges stand out in topographic relief along the southwest margin of the trench; others, less prominent, lie along the northeast margin. These domes and ridges may be related to underlying salt structures.

The Iberian trough is flanked by the "Five Islands" along its southwest margin and by another series of domes along the northeast flank. The "Five Islands" are unique among onshore South Louisiana salt domes in having pronounced topographic expression. They are described briefly to illustrate the similarity of the Five Islands and the Iberian trough to the Mississippi submarine trench and the salt domes along its mragin. The two major structural troughs have the same trend and are in alignment. This similarity and their probable common or related origin are discussed.

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Correlation of Gulf Coast Jackson

All the names of Jackson formations, members, and other subdivisions described in the area from the Rio Grande River of Texas through Louisiana and Mississippi to eastern Alabama with part of Arkansas are given with a history of the nomenclature. A correlation