A restored stratigraphic dip section illustrating downdip thickening, and a stratigraphic strike section demonstrating the essentially horizontal nature of the beds, were constructed. A structural cross section through the Golden Meadow field illustrates a graben and fault pattern typically associated with a deep-seated salt mass.

As defined in this study, the "*Eggerella* wedge" and the "second" *Cibicides carstensi* zone are useful horizons south of a zone of flexure found between the west flank of the Golden Meadow field and the south flank of the Bully Camp field. This zone of flexure may be traced downdip. Sediments above the trace are "plate-like" continental shelf deposits and are easily correlated; those below the trace are continental slope deposits and extremely difficult to correlate because of the great thickening and gross lithologic changes which take place in this zone.

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PALYNOLOGY OF THE MIDWAY-WILCOX BOUNDARY IN SOUTH-CENTRAL ARKANSAS

In south-central Arkansas, sediments of the lower Eocene Wilcox group rest on the eroded upper surface of the Porters Creek Clay of Paleocene age. An investigation of the palynomorphs present in these stratigraphic units disclosed a sharp change in spores, pollen and dinoflagellates across the Midway-Wilcox boundary.

The most abundant pollen in the Porters Creek Clay is a *Taxodium*-like form. Triporate pollen and psilate, monolete spores are also common. *Aquilapollenites* and *Classopollis*, genera common in Cretaceous rocks, are also present in the Porters Creek Clay. Dinoflagellates are abundant, but hysterichosphaerids are rare. A varied palynomorph assemblage is present in the Wilcox sediments of the area. Tricolporate pollen, a type rare in the Porters Creek Clay, is the most abundant form. The Wilcox pollen flora has a more modern aspect than that of the Porters Creek Clay. *Aquilapollenites* and *Classopollis* have not been found. Dinoflagellates and hystrichosphaerids are rare in the Wilcox sediments.

The sharp change in palynomorphs across the Midway-Wilcox boundary in this area apparently reflects both evolutionary changes in Tertiary floras and changes in the nature of the environment.

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SOME "MARKER" FORAMINIFERIDA FROM THE MIOCENE OF SOUTHEAST LOUISIANA

Effecting reliable regional correlations in the complex stratigraphic sequence of southeast Louisiana requires the recognition of index species of Foraminiferida. The use of such "marker" fossils in subsurface correlations is illustrated in a paper by the junior author, "Biostratigraphy of South-Central Lafourche Parish, Louisiana," which appears in the G.C.A.G.S. volume.

Foraminiferida representing thirty-four species-groups from twenty-five genera are illustrated and discussed. Six of these forms have not been reported previously from the Miocene sediments of this area. Two new taxonomic combinations, *Pseudonodosaria comatula* (Cushman) and *Lenticulina* (*Robulus*) *lacerta* Garrett, appear here for the first time, in conformity with recent generic revisions in the nodosarine Foraminiferida.

GARY L. SPRAUL, Amerada Petroleum Corpn., Tulsa, Okla.

CURRENT STATUS OF THE UPPER EOCENE FORAMINIFERAL GUIDE FOSSIL, *Cribrohantkenina*

All the known species of the genus *Cribrohantkenina* have been refigured. The genus *Cribrohantkenina* is monotypic with *Hantkenina inflata* Howe, 1928, the type species. *Hantkenina mccordi* Howe and Wallace, 1932; *Hantkenina danvillensis* Howe and Wallace, 1934; and *Hantkenina* (*Cribrohantkenina*) *bermudezi* Thalman, 1942; are junior synonyms. The genus is confined to the upper Eocene (Priabonian) and is an important, world-wide, index fossil.

WILLIAM F. TANNER, Florida State University, Tallahassee, Fla.

FALLING-WATER-LEVEL RIPPLE MARKS

Ripple marks produced in shallow water, especially when the water level is falling, are more varied, more complex, more easily interpreted, and more valuable in paleogeographic studies than ripple marks developed under other conditions. Shallow-water and falling-water-level ripple marks are conveniently studied on sand-floored tidal flats as well as in wave tanks. Tidal flats have the advantage that a variety of wave systems, moving from different directions, can be studied, both singly and in combination.

Flat-topped ripple marks, in many different patterns, are formed when the water level drops to, or below, the ripple-mark crests. When the rate of water level fall varies systematically, terraced flat-topped ripple marks are produced. Two parallel ripple-mark systems, having smaller ridges centered in the troughs between larger ridges, developed as a result of the adjustment of wave orbit diameters during the fall.

Helical cell ridges ("rib-and-furrow"), windrow ridges and other long down-current ridges are produced primarily by direct current flow, or by a vector combination of waves and currents, in shallow water. Composite ripple marks arise when the motions of two in-phase wave systems are added vectorially. Out-of-phase combination yields a wavy map pattern. Additional ripple-mark types found on the tidal flat or in very shallow water have sharply pointed troughs and gently rounded crests, or are flat-bottomed despite an abundance of sand. These types may be caused by a combination of wave action and mass flow of shallow water.

The catalog given here does not exhaust the list. New varieties are being found with some regularity. Many of these varieties have been observed in the lithified rock column, and can be interpreted with relatively great confidence.

ROBERT P. WALDRON, consulting geologist, Kenner, La.

SEASONAL ECOLOGICAL STUDY OF FORAMINIFERA FROM TIMBALIER BAY, LOUISIANA

Within the last decade, considerable attention has been directed toward understanding the ecological habits of Foraminifera. This study has ventured deeper than previous ones in an attempt to learn the habits of living Foraminifera in Timbalier Bay, Louisiana, over a period of a year.

Ten monthly collections of samples were made from seventeen locations in the bay. Data relating to salinity, temperature, pH, eh, and other chemical and physical properties of the waters were recorded at this time.

Upon examination of the samples, it was determined that twenty-three species of Foraminifera could be con-

sidered common in the bay. Two facies zones were recognized within this polyhaline bay by the restriction of certain species to characteristic areas.

Reproduction of the Foraminifera appeared to be dependent upon the environmental factors of salinity and temperatures. The use of water chemistry, other than salinity, to explain the reproductive habits of the Foraminifera was unsuccessful.

Availability of nutrients is believed to be the principal cause of differences in total populations of living Foraminifera in the bay. These nutrients are probably derived from the land areas and transported around the bay by the normal water flow. Three periods of inflow of these materials into the bay were noted.

There has been no comparable foraminiferal study of this bay. A recent foraminiferal study of several bays in Texas (Phleger and Lankford, 1957) is similar, but the periods between collections were longer, and no attempts were made to correlate the Foraminifera with the chemical properties of the bay. Myers (1943) studied the effects of food, substratum, depth, temperature, pH, oxygen tension, turbulence, turbidity, animal associations, parasites, and enemies of a single species, *Elphidium crispum*, over a period of a year.

PLANNING 1964 ANNUAL MEETING IN TORONTO

Groundwork for the first joint international convention of the American Association of Petroleum Geologists (AAPG), Society of Economic Paleontologists and Mineralogists (SEPM) and Geological Association of Canada (GAC) was recently begun in a meeting at Kellogg Center, Lansing, Michigan. Co-hosts of the convention which will be held in Toronto, May 18–21, 1964, are the Geological Association of Canada and the Michigan Basin Geological Society. Standing, left to right: Francis D. Shelden, chairman, publicity committee; William F. Brown, member-at-large; Kenneth Vanlier, member, publicity committee; R. David Matthews, chairman alumni meetings and student housing committee; Elmer W. Ellsworth, business manager, AAPG. Seated, left to right: Stephen H. Howell, chairman, convention theater committee and president, Michigan Basin Geological Society; John T. Sanford, general vice-chairman of the convention; Beverly L. Champion, member, central committee; and Louis I. Briggs, chairman, technical program committee.

1967 ANNUAL MEETING, LOS ANGELES

President ROBERT E. RETTGER announces the Executive Committee's acceptance of the invitation of the Pacific Section to convene the 52d Annual Meeting in Los Angeles, April 10–13, 1967. This will be the fifth National Convention sponsored by the Pacific Section. The most recent of these, in 1958, attracted a total registration of 3,152.

Selection of Los Angeles as the site of the 1967 Annual Meeting culminates months of Convention Department negotiations with local convention bureau and hotel officials in covering essential guarantees and policies relating to housing, convention services, and exhibits.