

hydropressed, sandy, updip facies of the Tuscaloosa. Thus, reverse osmotic effects are probably unimportant. The head peak above the Lower Cretaceous shelf edge, although characterized by relatively low hydraulic gradients, could be a locus of membrane filtration at the top of Tuscaloosa sandstone if bypassing of reverse osmosis by fluid escape along faults has been minimal. The role of permeable Tuscaloosa sandstone as a sink for fluids near the top of geopressure may have localized gas along the producing trend.

MCNULTY, CHARLES L., DANIEL S. NEYBERT, and DONALD F. REASER, Univ. Texas at Arlington, Arlington, TX

Foraminifers of Lower Ojinaga Formation (Cretaceous), Southern Quitman Mountains, Hudspeth County, Texas

Three partial sections of the lower Ojinaga Formation were measured in the southernmost Quitman Mountains, near the Rio Grande. The lower Ojinaga is composed largely of medium-gray to black, variably calcitic shale, except for dark, flaggy, calcarenitic limestone and shale in the basal 20 m and for a few thin limestones and a dolomite above. Thirty-two residues and 75 thin sections were studied.

The foraminiferal populations are overwhelmingly planktonic; plankton-benthos ratios exceed 99:1 without exception. The fauna consists primarily of *Hedbergella amabilis* Loeblich and Tappan, *H. brittonensis* Loeblich and Tappan, *H. delrioensis* (Carsey), *H. planispira* (Tappan), *H. simplex* (Morrow), *Rotalipora cushmani* (Morrow), *R. montsalvensis* Mornod, *R. brotzeni* (Sigal), and *R. greenhornensis* (Morrow), although *Heterohelix* occur sporadically and poor preservation obscures possible *Praeglobotruncana* and *Whiteinella*. In addition to foraminifers, calcispheres and radiolarians equal or exceed the foraminifers in many samples. In varying proportions, the three taxa form minute laminae, commonly microscopically cross-bedded and disconformable in the calcarenitic biogenic limestones. Juvenile ammonites and protoconchs are common at the top of the section. Inoceramid prisms, oyster fragments, and fish debris occur in the coarser and thicker laminae.

The sequence sampled is generally correlative with the middle and upper Cenomanian and the lower Turonian. A more precise correlation suggests middle Cenomanian and lower Turonian with an intervening unconformity, although the taxonomic foundation is questionable.

The microfauna is markedly pelagic and typical of midbathyal or deeper depositional environments. The dark color and general lack of bioturbation suggest the possibility of bottom anoxia and consequent absence of benthic forms, but tests for organic carbon show only a modest elevation of total organic carbon, with a maximum of 2.7%.

The microscopic sedimentary structures of the biogenic flaggy limestones testify to gentle but definitely tractional current action at bathyal depths.

MITCHELL-TAPPING, HUGH J., Sun Expl. & Prod. Co., Dallas, TX

Petrology of Sunniland, Forty Mile Bend, and Bear Island Fields of South Florida

The Sunniland and Forty Mile Bend fields were the first two oil producing fields of south Florida. The Sunniland field was discovered in 1943, and the Forty Mile Bend field was discovered 10 years later. These two fields are oil productive from the Cretaceous Sunniland formation, and their pay zones are biostratigraphically and lithologically similar. A similar lithology is also found in the pay zone of the Bear Island field, discovered in 1972. The relatively great time span between field discoveries is indicative of the slow pace of exploration in south Florida at that time. In the early 1970s, increased drilling (from 2 to more than 15 wells/year) resulted in the discovery of eight more fields. Since exploration started 73 years ago, only a little over 200 wells, both wildcat and development, have been drilled in this basin. Although exploration methods initially relied on gravity and magnetics, subsequent geophysical methods have proved disappointing. Effective exploration in this area applies to petrology, sedimentology, and electric-log response. Because the biostratigraphy of the Sunniland formation pay zone is not the same in all fields, three fields having similar biostratigraphic pay zones were investigated.

MUNCEY, J. G., and W. J. EHNI, Geotronics Corp., Austin, TX

Magnetotelluric Soundings in Ouachita Thrust Belt of Central Texas

A 25-station, 84-line-mi, remote referenced magnetotelluric (MT) traverse across a portion of central Texas has been recorded and analyzed. Among the geologic and geophysical elements crossed are the Ouachita foreland, the frontal and interior zones, and the rimming gravity maximum.

MT signatures of the allochthonous Ouachita facies have been established with the aid of well control and are correlated along the traverse. Both conductive foreland facies and the underlying resistive Precambrian can be traced beneath the resistive frontal thrust zone, but become indeterminate along the central part of the traverse, owing to abrupt thinning of the Precambrian resistor. Well control suggests that this resistive basement is correlative with the Grenville-age granitic basement of the nearby Llano uplift. A thick conductive interval of metasedimentary(?) basement material underlies Paleozoic rocks along the central portion of the traverse. This conductive basement appears to dip steeply beneath the Llano-type resistive basement and subcrops on the foreland flank of a basement antiform coincident with the rimming gravity maximum.

Still another resistive basement interval appears deep within the basement near the central portion of the traverse, and shallows abruptly to the southeast to form the core of the basement antiform coincident with the rimming gravity maximum. Stratigraphic relationships within the Precambrian basement suggest that the resistive basement, which cores the basement antiform, may be older than the conductive metasedimentary(?) and resistive Llano-type basement, and that the basement beneath the Ouachita trend is of North American affinity at least as far south and east as the rimming gravity maximum.

The MT signature of the subthrust foreland facies is truncated on the crest of the basement antiform coincident with the rimming gravity maximum. The geometry of the truncation suggests that the frontal thrust zone may have detached from the age-equivalent foreland facies near the present crest of the basement uplift, and that the distance between the foreland facies truncation and the foreland facies-frontal thrust zone boundary may serve as a crude minimum estimate of frontal thrust zone translation (about 60 mi).

PITTMAN, JEFFREY G., Centenary College Louisiana, Shreveport, LA

Correlation of Beds Within Ferry Lake Anhydrite of Gulf Coastal Plain

The Lower Cretaceous Ferry Lake Anhydrite is one of the most distinctive, widespread sedimentary units within the Gulf coastal plain. The formation extends from east Texas across southern Arkansas, northern Louisiana, central Mississippi, and southern Alabama, all the way to south Florida where it has been correlated with anhydrite beds of the Punta Gorda formation. The formation consists of alternating carbonates, claystones, and sulfate beds (altered from original gypsum to anhydrite during burial) deposited in a predominantly subaqueous environment within a broad lagoon located shoreward of an extensive reef fringing the shelf edge.

Highly resistive anhydrite beds within the Ferry Lake Anhydrite, and within formations above and below, may be correlated across east Texas, Arkansas, Louisiana, and Mississippi, using a network of closely spaced electrical logs. The geographic distribution of these anhydrite beds is variable. Some anhydrite beds may be traced across the entire area, whereas other beds are less widespread. The difference in geographic distribution of these beds reflects the variation in size and configuration of the extensive lagoonal sea in which they were deposited. Water depth, positive conditions around stable areas, subsidence, duration of each evaporative pulse, and areal salinity variation are among the factors that controlled the thickness of individual beds accumulating within the lagoon.

PLITNIK, MARILYN A., U.S. Environmental Protection Agency, Philadelphia, PA, and PAUL R. KRUTAK, ARCO Expl. Co., Lafayette, LA

Modern Foraminiferal Species Diversity Patterns vs. Tidal Response: Louisiana-Mississippi Salt Marshes

Twenty-eight modern bottom samples from marshes in Hancock County, Mississippi, and Pearl River, Louisiana, yielded variable foraminiferal populations (total = live plus dead) during May and June 1981. Fourteen stations were sampled twice—at "peak" high and low tides.

We identified 22 benthic species of foraminifera in the samples (counts of approximately 300 specimens/sample); no planktonic species occurred. Diversity patterns [ $S$  = number of species,  $H(S)$  = Shannon-