11. ROBERT LANKFORD, Rice University, Houston, Tex.

PATTERNS OF FORAMINIFERAL DISTRIBUTION, NORTHWEST GULF OF MEXICO

Within the past 30 years, several investigators have collected material and reported on Recent Foraminifera in the northwest Gulf of Mexico. The investigations include lagoon, delta, shelf, slope, and abyssal environments. Each report, however, includes only a limited area of investigation. This report is an attempt to evaluate and integrate the existing data in the form of geographic-distribution patterns. The species reported in approximately 1,200 samples form the basis of this study; environmental data come from sedimentologic and oceanographic investigations.

Marginal marine environments.—Faunas reported primarily from Texas bays and lagoons change geographically in composition. On the southwest, the Laguna Madre and lower Corpus Christi and lower Aransas bays are dominated primarily by miliolids and secondarily by species of *Elphidium* and *Streblus*. The miliolids are replaced by the *Elphidium-Streblus* fauna in Aransas, lower San Antonio, Matagorda, and Galveston Bays and in the pass area of Sabine Lake. These areas contain the so-called "Lower Bay" fauna. The landward parts of these same water bodies contain an "Upper Bay" fauna, usually dominated by the arenaceous *Ammotium salsum;* where streams enter the bays, *Eponidella* usually is characteristic. Sparse data from Louisiana bays indicate that the "Upper Bay" fauna predominates throughout the coastal area. The southwest-to-northeast changes occur in response to changing climatic zones, increasing stream discharge, and sediment type.

Marine environments.—The continental shelf extending from the Gulf beach to about 70 fm. contains a variety of geographically bounded faunas. Despite the emphasis on "depth facies," many shelf genera show a pronounced change along strike. For example, the inner shelf from the beach to about 20 fm. generally is dominated by species of *Elphidium* and *Streblus*. Offshore from south Texas, a band of *Elphidium* is dominant nearshore and is succeeded by a band of *Streblus* in somewhat deeper water; the bands are reversed offshore from southeast Texas and Louisiana.

The middle shelf, 20–50 fm. deep, is characterized by a laterally diverse system of dominant taxa. *Hanzawaia, Virgulina,* and *Proteonina* occur in elongate and commonly interfingering bands. These dominant forms, however, are replaced in the vicinity of the Mississippi delta by *Nonionella, Buliminella,* and *Epistominella.*

The outer shelf contains dominant abundances of *Cibicides, Uvigerina,* and *Bigenerina;* species of *Bolivina* occur mainly on the outer shelf off southeastern Louisiana.

The continental slope, in contrast to the shelf, is characterized by more uniform lateral distributions of genera. The upper slope from 70 to approximately 500 fm. is strongly dominated by species of *Bolivina.* This genus is replaced by *Bulimina* from 500 to 900 fm. and can be considered as indicative of the middle-slope environment. The lower-slope and abyssal environments deeper than 900 fm. are characterized by *Pseudoparrella, Eponides,* and *Glomospira.*

The number of species per sample increases from a low average of about 10–12 in the bays and nearshore zone to a maximum of more than 55 at or near the shelf-slope break. The faunal diversity decreases again on the slope reaching a minimum of 10–15 species in abyssal samples.

Planktonics increase uniformly in abundance from the beach into the Sigsbee Deep. Their increase is related directly to decreasing rates of dilution by sediments and other organisms.

12. HERBERT C. EPPERT, JR., Tulane University, New Orleans, La.

STRATIGRAPHY OF UPPER MIOCENE DEPOSITS IN SARASOTA COUNTY, FLORIDA

The presence of undisputed upper Miocene sedimentary rocks in Sarasota County, Florida, is not widely known. Most authors have stated that the middle Miocene Hawthorn Formation is overlain by Pliocene to Recent deposits. The upper Miocene is represented in southern Florida by the Tamiami Formation. The late Miocene age determination is based on the characteristic faunal assemblage, *Ostrea disparalis, Chione ulocyma,* and *Ecphora quadricostata umbilicata.* Fossil mollusks, echinoderms, and bryozoans collected from outcrops, quarries, and sinkholes in this area definitely confirm the presence of upper Miocene sedimentary rocks in Sarasota County. Typical upper Miocene species include *Anadara* cf. *A. idonea, Chione ulocyma, Ostrea* cf. *O. tamiamiensis, O. tamiamiensis monroensis,* and *Encope macrophora tamiamiensis.*

In the upper Miocene deposits, an impermeable but porous bed is present and is characterized by a decrease in radioactivity and electrical resistivity. These characteristics are indicative of the presence of clay and the interpretation of X-ray diffraction patterns verified the predominance of clay minerals in the aquiclude. Montmorillonite is the dominant clay mineral with lesser amounts of attapulgite and alpha sepiolite.

Based on evidence presented in this paper, the upper Miocene deposits in Sarasota County are considered to be a lithosome of the Tamiami Formation.

13. H. H. HAM, Schlumberger Well Surveying Corporation, New Orleans, La.

A METHOD OF ESTIMATING FORMATION PRESSURES FROM GULF COAST WELL LOGS

Conventional resistivity and sonic well logs now are used to determine formation pressures in Gulf Coast wells. These determinations are based on observations that log characteristics of shale vary nearly uniformly with depth through zones of normal pressure. When abnormally pressured formations are found, they usually are associated with shale that departs from the established trend.

Shale exhibits log characteristics along the normal trend when the contained fluids are free to escape at a normal rate during accumulation of overburden. However, when the formations are sealed so that further fluid loss is prevented, continued accumulation of overburden leads to overpressuring. In such formations, the shale exhibits log values typical of the depth at which the formations were sealed.

The apparent depth of formation sealing is obtained by relating the shale log values to the normal trend. For this sealing depth, a normal pressure of the fluids in the pores is computed assuming 0.465 psi. per 1 ft. of depth. Fluid pressure in the zone of interest is then computed assuming an *increase* at 1.0 psi. per 1 ft. of overburden accumulation subsequent to sealing. Charts simplify these computations and provide values for both the estimated pore pressure and the mud weight needed for a balance.