particularly noxious materials such as high-level radioactive wastes.

DONALD S. MARSZALEK, Univ. Illinois, Urbana, Ill., and Inst. Marine Sci., Miami Univ., Miami, Fla., RAMIL C. WRIGHT, Beloit College, Beloit, Wisc., and WILLIAM W. HAY, Univ. Illinois, Urbana, Ill., and Inst. Marine Sci., Univ. Miami, Miami, Fla.

FUNCTION OF TEST IN FORAMINIFERA

Although the tests of foraminifers are used extensively by paleontologists as paleoecologic indicators, very little is known of the ecology of modern foraminifers, and virtually nothing is known of the function of the test.

Investigation of test-protoplasm relations have been hampered by lack of suitable techniques for making meaningful observations. Now the scanning electron microscope provides a means of examination of the test on a scale which permits understanding of spatial relations of the test and the living organism. Coupled with experiments and observations on specimens in laboratory culture, the information yielded by studies of test structure and of fixed, frozen and dried protoplasm suggests a general theory of test function.

1. The most primitive tests are constructed of arenaceous material to provide weight to counteract bouyancy of the protoplasm. The simplest arenaceous tests seem to serve only this function.

2. The test upon elaboration into a long tube or series of chambers separated by narrow openings, serves as an effective barrier to retard the effects of unfavorable changes in environmental chemistry.

3. Further specialization may adapt the test for growth under special physical conditions, such as a certain substrate, or for particular symbiotic conditions, such as the greenhouse function of the test of *Elphidium*.

The role of the test as a protective device against predation is not understood, but may account for some specialized forms.

The great variety of test form in the foraminifers suggests that many taxa are particularly well adapted for specialized ecologic niches. The fact that the foraminifers are among the hardiest of marine protozoa and almost unique in their ability to withstand changes in the environment indicates that they have developed a highly efficient means of controlling their immediate environment without encystment or metamorphosis; that means is the test.

B. B. MASON, Humble Oil & Refining Co., Houston, Tex.

POSSIBLE FUTURE PETROLEUM PROVINCES OF WESTERN GULF BASIN

A task force of industry geologists working in Region 6, Western Gulf basin, for the National Petroleum Council study, "Possible Future Petroleum Provinces of the United States," has attempted to answer whether additional significant crude oil reserves will be added in the Western Gulf basin. The potential of nonproducing areas is stressed, however, possible extensions to producing trends also are analyzed from a geologic and production-controls standpoint. The thoughts and ideas from eight industry papers covering the Western Gulf basin are summarized.

J. A. McCARTHY, Consultant, Houston, Tex.

MIOCENE TREND OF CALHOUN AND MATAGORDA COUNTIES, TEXAS

(No abstract submitted)

DONALD F. McNAMEE, Union Texas Petroleum, Houston, Tex.

LOWER CRETACEOUS GLEN ROSE REEF COMPLEX OF EAST TEXAS AND CENTRAL LOUISIANA

The massive limestone sections of the Lower Cretaceous Glen Rose of East Texas and central Louisiana are considered to be clastic carbonate barrier reefs. A hypothesis of cause, sequence, and depositional form of a reef complex is presented and supported by examples. Basinal subsidence, a regressive pattern of deposition, and subsequent forereef leveling during periods when the sea was restricted in front of the barrier reefs develop a typical depositional form.

At least three separate reef complexes have developed in the Lower Cretaceous of Sabine County, Texas, and Sabine Parish, Louisiana. Subsequent Tertiary regional tilting has altered original reservoir conditions but there remains great potential for hydrocarbon accumulations in stratigraphically controlled traps.

EDWARD P. MEISBURGER and DAVID B. DUANE, Geology Branch, U.S. Army Corps of Engineers, Coastal Engineering Research Center, Washington, D.C.

SHALLOW STRUCTURAL CHARACTERISTICS OF FLORIDA ATLANTIC SHELF AS REVEALED BY SEISMIC-REFLECTION PROFILES

A sand-resources survey off eastern Florida by the U.S. Army Corps of Engineers' Coastal Engineering Research Center (CERC) in 1965–1966 resulted in the collection of 2,600 mi of seismic-reflection profiles. With a penetration depth range of 0 to -500 ft MLW the profiles extend from nearshore (approximately 15-ft water depth) to 15 mi offshore.

The records show several prominent acoustic reflecting horizons at shallow depth which can be traced across large areas of the nearshore continental shelf off east Florida. These areally extensive reflectors indicate some shallow structural features beneath the shelf surface; some tentative stratigraphic correlations have been made with logged wells onshore.

In the section revealed by CERC reflection records the dominant structural feature is an almost universal eastward dip of strata. Below about -100 to -200 ft MLW broad low-relief undulations are common and appear to be of structural origin. Shallower subbottom strata are characterized by internal bedding features, erosional surfaces, and a generally gentler eastward dip than the deeper section. The records show little apparent evidence of faulting.

Subbottom acoustic horizons on the CERC records are judged to represent a stratigraphic range from Eocene to Holocene. Erosion surfaces and shallow-water bedform features in the uppermost section are interpreted as resulting from Pleistocene sea-level fluctuations.

JOHN D. MILLIMAN, Woods Hole Oceanographic Inst., Woods Hole, Mass.

CARBONATE SEDIMENTATION ON FOUR SOUTHWESTERN CARIBBEAN ATOLLS AND RELATION TO "OÖLITE PROBLEM"[1]

Courtown Cays, Albuquerque Cays, and Roncador Bank are small atolls in the southwestern Caribbean, encompassing areas between 22 and 29 km^2. The shallow open lagoons contain sediments rich in *Halimeda*, coral, and coralline algae debris, apparently derived from peripheral reef flats and lagoonal patch reefs. Oölite and other nonskeletal carbonates are present only in small amounts.

Serrana Bank is almost an order of magnitude larger (191 km^2) than the other three atolls, but has similar morphologic and hydrographic environments. Because of their relatively small area, peripheral reefs at Serrana Bank do not contribute a significant amount of sediment to the lagoon. In the eastern lagoon, sediments are derived from nearby patch reefs, but in the western lagoon, where hermatypic growth is limited, the dominant sediments are nonskeletal, and include oölite, cryptocrystalline lumps, and pelletoids. The reason that such nonskeletal carbonates can form in open lagoon conditions at Serrana Bank and yet are almost entirely absent in similar environments at the smaller atolls, may be related to the lack of biogenic carbonate sedimentation at Serrana Bank.

DONALD R. MOORE, Inst. Marine Sci., Univ. Miami, Miami, Fla.

SYSTEMATICS, DISTRIBUTION, AND ABUNDANCE OF WEST INDIAN MICROMOLLUSK *Rissoina catesbyana*

The common West Indian micromollusk *Rissoina catesbyana* is the most abundant species of the family Rissoinidae in shallow inshore waters. Little is known about its distribution largely because of taxonomic confusion with other species of the genus. Most reports of the species in the United States have been under the name *Rissoina chesneli*, a species known only from Jamaica.

The small (3-4 mm) gastropods thrive in dense *Thalassia* beds in sheltered bays and lagoons. They are not found on the reef tract only a short distance away.

Although basically a tropical species, *R. catesbyana* is able to withstand reduced salinity and temperature. This adaptability has enabled the species to spread along the western Atlantic seaboard from southern Brazil to North Carolina. The young hatch as free swimming veligers and may be carried for a distance by currents. They are most abundant in areas like Biscayne Bay, Florida, where salinity is somewhat reduced, and may number several thousand live animals per square meter.

R. catesbyana is an indicator of inshore slightly brackish waters. It is not found in the coral reef tract nor can it penetrate very far into waters of low salinity. Its abundance should make it an excellent animal for further study as an environmental indicator, and its presence in the fossil record should prove to be an excellent clue to past environmental conditions.

DAVID NICOL, Univ. Florida, Gainesville, Fla.

DEPOSIT-FEEDING PELECYPODS IN RECENT MARINE FAUNAS

All epifaunal and most infaunal pelecypods are suspension feeders, but all protobranchs, including the solemyids, and almost all tellinids and semelids are deposit feeders. The protobranchs are the more diverse in cold and temperate water, and the tellinids and semelids are the more diverse in warm water. The 20°C isotherm divides those pelecypod faunas dominated by protobranchs from those dominated by tellinids and semelids. The abyssal fauna has a larger percentage of deposit feeders than any shallow-water fauna because of the greater diversity of protobranchs. The Antarctic fauna is the only one devoid of tellinaceans.

ERVIN G. OTVOS, Dept. Earth Sciences, Louisiana State Univ., New Orleans, La.

MOREAU-CAMINADA CHENIER COMPLEX, SOUTHEASTERN LOUISIANA

The Moreau-Caminada chenier complex south of New Orleans is the only sub-Holocene chenier system on the surface in Louisiana east of the classic western Louisiana cheniers. It occupies an area 16 km long and up to 5 km wide east of the mouth of Bayou Lafourche. About 60 ridges, 50–120 m wide and up to 7.5 km long, form the complex; the highest ridge elevation is only 1.2 m. Large new exposures along Louisiana Highway 1 revealed that the sand, which at places is at least 30 ft thick, is very fine grained and very well sorted. Detrital lignite grains make up as much as 7.6% of this chenier sand. Shell fragments, abundant in the western Louisiana cheniers, are absent. Autochthonous and detrital peat layers and laminae 1 mm or more thick are interlayered with the sand. Dating of three autochthonous peat samples from the Louisiana Construction Company and Plaisance Dragline and Dredging Company sand borrow pits revealed 2,940±120 to 2,340±120 years B.P. ages. Thus the cheniers are much older than the surrounding Lafourche- and Lafourche-Terrebonne subdelta sediments. After the last Lafourche distributary stream lost its water supply, substantial erosion started the destruction of the chenier complex. A coastal strip up to 2 km wide was eroded between 1890 and 1934, due to the closing off of the Bayou Lafourche discharge.

New information about the Mississippi deltaic plain stratigraphy refutes suggestions that the southwest Louisiana chenier ridges formed during periods when the active delta lobes were on the other end of the deltaic plain. Seven sets of chenier ridges formed in the southwest Louisiana chenier plain between 2,800±600 B.P., while not only the distant St. Bernard distributaries were active but also the much closer Lafourche distributaries. The Moreau-Caminada cheniers were forming also in the proximity of one of the active Lafourche subdeltas. Cyclicity in chenier progradation should be attributed to fluctuations in local sediment supply and hydraulic conditions. Enough sediment must have been present in the littoral drift to prevent the wholesale erosion of the shore and to allow the construction of ridges. Low ridge elevations in the Moreau-Caminada area are attributed to the great thickness of underlying post-Pleistocene sediments in contrast to the shallow Pleistocene surface in southwestern Louisiana.

Shore recession in the chenier plain was accompanied by the reversal of littoral drift directions. The Moreau-Caminada cheniers indicate westward drift whereas the presently prevailing drift direction in the area is eastward. The present drift direction may date back to the construction of the Plaquemines subdelta

[1] Contribution No. 2364 from the Woods Hole Oceanographic Institution.