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INFLUENCE OF PREEXISTING BEDROCK TOPOGRAPHY ON BARS OF "LIME" MUD AND SAND, BISCAYNE BAY, FLORIDA

Two distinct geometries of "lime" mud and sand bars (parallel with and transverse to topographic restriction) have formed in association with a linear bedrock ridge of Key Largo Limestone along the eastern (seaward) border of Biscayne Bay, Florida.

On the south the bedrock ridge forms an emergent chain of keys, and currents are restricted to natural channel passes. Narrow, elongate sand "stringer shoals" extend from 2 of these passes into the bay, transverse to the trend of the bedrock ridge.

The bedrock ridge on the north is submerged 1–3 m below MLW, and a well-developed mud-bar belt (8 m long and 1–3 mi wide) parallels the bedrock ridge and lies mostly along its bayward side. Tidal channels 300 ft wide have formed perpendicular to the belt. Storm spillover lobes have extended the belt seaward of the now-covered ridge.

The crest of the bedrock ridge is 0–1 m below MLW in a central zone. There, relic transverse "stringer shoals" are incorporated into a presently developing mud-bar belt which parallels the bedrock ridge and lies entirely along its bayward side. Tidal channels cutting the mud-bar belt are irregular in form. The relic "stringer shoals" became inactive during the latter stages of the Holocene as sea level encroached over the bedrock ridge permitting unrestricted circulation of tidal currents.

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PETROLEUM EXPLORATION AND ORGANIC GEOCHEMISTRY

Petroleum industries and exploration started and grew large without the use of organic geochemistry. Today, however, organic geochemistry has its place in the petroleum industry. Geochemistry is needed to explain and understand the problems of petroleum generation and migration. In recent years the enormous refinement of analytic tools and their higher speed resulted in a steadily growing flux of information about the chemistry of petroleum and its precursors. This information combined with geologic knowledge produced a fair, but by no means complete, understanding of the complex processes of petroleum generation, maturation, and to some extent of petroleum migration. We can predict fairly well where to expect heavy or light oil. We can establish maturity sequences. We have means to differentiate between marine and nonmarine oils and we can recognize migrational directions. This basic knowledge is a prerequisite to finding a solution for the problems of oil-oil and oil-source bed correlation, source-bed identification, and a better understanding of petroleum migration. Modern organic geochemistry is prepared to attack these problems.

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FACIES IN ORGANIC BUILDUPS IN EPEIRIC SEAS AND ALONG SHELF MARGINS

A study of various types of banks, mud accumulations, and organic reefs in the geologic record hopefully permits some generalizations about them. As an example, several ancient organic buildups are compared on the basis of development relative to the photic zone and wave base, their shape or trend, and their biologic potentials for framework construction. These range from Cambrian algal mounds to Siluro-Devonian stromatoporoid-coral masses, to late Paleozoic carbonate mudstone and algal-foraminiferal accumulations, to Mesozoic coral and rudist buildups. Petrographic criteria useful in categorizing organic buildups include sedimentary structures in biohermal cores and "reef walls," an ecologic-morphologic classification of the biota, microfacies of the flanking or interreef beds, criteria for recognizing exposure surfaces and intertidal sediments, and special criteria for depth recognition.

Processes of (1) true organic frame-building reef formation, and (2) trapping and binding of fine-grained material by organisms have operated from Cambrian time on. Organic framework construction is known to be important in the middle Paleozoic and in some situations from Jurassic to Holocene times. However, binding and trapping of carbonate mud and silt by organisms account for practically all the late Paleozoic organic buildups and for many of those in the Cambro-Ordovician and Mesozoic. Most organic buildups in the geologic record are in no sense organic frame-built reefs. Further, many began development in downslope positions below wave base, some even below the photic zone. Whether there are modern analogues to such bodies of sediment, and how far downslope such organic buildups can form are questions that are unanswered.

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CRETACEOUS STRATIGRAPHY OF SOUTHERN MADISON AND GALLATIN RANGES, SOUTHWESTERN MONTANA

(No abstract submitted)