

with crude bedding, (2) interbedded fine gravel and plane-bedded sand and some large-scale planar crossbeds, and (3) a repeated sequence of large-scale festoon crossbeds overlain by sandy ripple-drift capped by a silt drape. Although absent on the upper-central fan, overbank deposition is present as sandy ripple drift on the lower-central fan, and is important on the lower fan as silty ripple drift, undulatory bedding, and silty-clay laminations.

The outwash plain is in a positive tectonic area (except possibly the Copper River delta) and may be viewed as a regressive series of coalescing fan-deltas.

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RHYTHMS IN DEEP-SEA SEDIMENTS FROM GULF OF MEXICO AND CARIBBEAN

Rhythmic patterns observed in unconsolidated marine deposits in cores, collected from the western abyssal plain of the Gulf of Mexico and from the Beta Straits in the Caribbean, are based on sedimentary structures rather than on lithology.

From the present knowledge of contourites, nephelites, pelagites, and turbidites, it is believed that the silty clay intercalations from the Gulf cores, as well as the sandy intercalations from the Caribbean cores, can be interpreted best as incomplete turbidite sequences. This interpretation is based primarily on the incomplete sedimentary facies model as developed for ancient turbidites. The thin clay seams commonly found in recent deposits, as well as some other features not known in ancient turbidites, normally become invisibly thin from the effect of consolidation.

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CORRELATION OF NEAR-SURFACE SEDIMENTARY STRATA BY ELECTRIC LOGGING

Instruments and techniques to measure the electrical resistivity of unconsolidated marine sediments have been developed at Texas A&M University. Electrical logging can be performed *in situ* and upon extruded cores.

The *in-situ* device using several electrodes makes point resistivity measurements while stationary within the bottom sediments and is thus independent of ship's motion. A minimum number of cores is required to establish the stratigraphy and to calibrate the probe resistivity measurements. The shipboard or laboratory logging system can be used to take continuous readings along a core and also can be used to measure the resistivity of discrete sample units.

The comparison of electrical resistivities of sediments, in particular the formation resistivity factor, with the geotechnical properties of the sediments reveals correlations which indicate that some of these geotechnical properties may be predicted from future resistivity measurements. A series of rapid *in-situ* measurements then can be made, greatly reducing the number of cores necessary to complete the survey.

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DIAGENESIS OF CARBONATE MUDS IN LAGOONS OF NORTHEAST YUCATÁN PENINSULA, MEXICO

Carbonate muds deposited in extensive coastal la-

goons bordering the northeast Yucatán Peninsula have been subjected to a variety of diagenetic environments. The sediment in each of these environments is characterized by a particular suite of diagenetic features which provides additional insight for determining the early processes involved in carbonate-mud diagenesis.

Several finely crystalline cements are present in the supratidal and back-lagoon sediments associated with the lagoons. Those formed in the vadose zone are typically calcite and include calichelike cryptocrystalline cement, microstallactitic druse, and "needle-fiber" (whisker crystal) cement. Submarine cements are composed of Mg-calcite and consist of grain-skin druse and void-filling blocky spar. Coalescent neomorphism results in the gradation from micrite to microspar in both subaerial and submarine environments; in the submarine environment the mineralogy apparently remains Mg-calcite, whereas a conversion from Mg-calcite to calcite occurs in the vadose zone.

Dolomitic and Mg-calcite cemented crusts have formed on the beaches, on tidal-flat surfaces, and in the subsurface in sediments influenced by hypersaline waters. In places, fresh water draining from the mainland and flowing through the lagoonal sediments has resulted in the formation of pisolithlike calcite concretions.

Aragonite constituents are being leached from sediments in contact with hypersaline interstitial waters rich in Mg, whereas Mg-calcite grains are dissolved in sediments affected by fresh water. Dissolution of fine mud and corrosion of coarser skeletal grains also occur in association with mangrove peats.

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SEDIMENTOLOGY OF A MIDDLE DEVONIAN SHALE, ERIE COUNTY, NEW YORK

The predominance of clay minerals, pelleted texture, burrow traces, and pyritized material in the Wanakah Shale member of the Ludlowville Formation suggests a soft, granular sediment. An analysis of the fossil assemblages reveals a relation between the distribution, growth, and persistence of animals and the character of the substrate. Several brachiopod species are aggregated on bedding surfaces and some microcommunities are present, largely composed of suspension feeding epifauna. A detailed study of taxonomic composition, functional adaptations, and taphonomy of 3 microcommunities leads to the conclusion that the depositional site received continuous rather than episodic addition of sediment.

The high brachiopod mortality in early growth was the consequence of smothering in the soft, "floc" zone covering the sediment. The sizes of brachiopods involved (2.0 mm) suggest a minimum thickness of approximately 1-2 mm for this zone. Survival to maturity of 2.0-mm brachiopods was high, setting a maximum floc thickness and annual sedimentation increment of approximately 2 mm/yr. The preservation of large, articulated brachiopods in positions normal to substrate requires a minimum annual sedimentation rate of approximately 1 mm/yr. The sea bottom was sufficiently oxygenated for benthic life, but the presence of penecontemporaneous sulfide suggests that the interface between oxidizing and reducing environments was very near the sediment-water interface. Turbulence was very low.