shore wind regimes rather than simply ancient trade-wind circulations.

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Facies and Development of the Colorado River Delta in Texas

The Recent delta of the Colorado River of Texas is an exceptional model for analyzing sediment and faunal facies relationships in environments associated with deltas. The small size facilitates close spacing of cores, which is essential for detailed facies study. Moreover, air photographs document growth from a straight shoreline to the lobe-shaped deposit formed prior to artificial channeling of the river through a barrier island. A 6- to 8-foot platform of deltaic sediments now dividing Matagorda Bay was deposited in the 6-year period following removal of an upstream log jam. Continuous cores (37) and borings (10) define the deltaic facies complex and the underlying bay facies in the northeastern section of the delta, which is unaffected by man-made modifications. The sequence of facies and environments encountered in sections is: (1) clays and silts, 1 to 5 feet thick (delta plain), including silty clays and clayey silts containing numerous roots and root fibers (natural levee), silty clays with roots and "algal-encrusted" washout pans (marsh), and massive to burrowed clays (channel fill); (2) sands, 2 to 6 feet thick, characterized by small-scale cross bedding (delta front); (3) laminated silty clays, 1 to 5 feet thick, (prodelta); and (4) laminated to burrow-mottled silty clays and clayey silts, 10 to 14 feet thick (bay), unconformably overlying the Pleistocene. Color variations, together with X-ray radiographs recording laminations and burrows, are most useful in distinguishing between facies of bay and prodelta environments. The faunas characterizing the facies and environments are more variable than are the sediments; juvenile and small mollusks, less than $\frac{1}{4}$ inch, seem more definitive of environments here than do Foraminifera. Subsidence of 1 to 2 feet is estimated to have resulted from compaction since initial delta formation.

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Sedimentary Environments in the Malacca Strait, Malaysia

A preliminary investigation of the waters and bottom sediments in the Malacca Strait and southern portion of the Andaman Sea, made in 1961 by the U. S. Naval Oceanographic Office, resulted in the collection of bottom sediments as well as salinity, temperature, and water transparency observations at 23 stations. Current measurements were made at selected sites for periods of 24 to 36 hours. The Malacca Strait is a narrow, shallow passage between the Malay Peninsula and Sumatra with oceanographic and bottom sediment characteristics closely related to the strong currents, debouching rivers, climatic variation, and the close proximity of bordering land masses. The strait assumed its present configuration as a result of the post-glacial rise of sea level which drowned the Sunda Shelf. The strait is located in a typical equatorial climate although the monsoonal effects are not as severe as in the more open neighboring areas. A northwest current flow, essentially tidal, prevails in the strait throughout the year, and is largely responsible for the hydrographic and oceanographic conditions in the area. Surface salinities and temperatures are found generally to be lower than in the surrounding seas. A wedge of cold, high-salinity bottom water extends from the Andaman Sea into the Strait. Bottom sediments primarily consist of muddy sands, with large areas of mud occurring in the vicinity of debouching rivers and in the Andaman Sea Basin. Calcium carbonate, primarily in the form of mollusk shells and foraminiferal tests, and organic carbon are found only in minor amounts in the Strait. Higher concentrations of calcium carbonate generally were associated with the finer sediments of the Andaman Sea, while the higher concentrations of organic carbon were found in the vicinity of debouching rivers. The non-calcareous detrital fraction is dominated by quartz, with minor amounts of orthoclase and plagioclase feldspars. The heavy mineral suite is complex due to the varied geology of the bordering land areas. The heavy minerals present consist primarily of leucoxene, ilmenite, magnetite, biotite, and amphiboles.

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Paleocurrents and Oceanography

The rationale of paleocurrent studies suggests that directional current structures identify the provenance, transport direction, basin architecture, and paleoslope of sedimentary sequences. Numerous examples from fluvial deposits have reinforced this view.

In marginal marine environments, directional current structures are fashioned by a combination of tidal, wave, and wind-driven currents which flow randomly with respect to slope and sediment source. Directional structures formed by these currents are oriented perpendicular or parallel to both slope and sediment source. The resulting structures, therefore, reveal only the direction of transport of the last current to act upon the sediments prior to burial.

The direction of flow of bottom-scouring currents in continental shelves and deep ocean basins is determined by changes in density, temperature, and salinity, by wind action, and by the rotation of the earth. Such changes tend to drive currents in random directions in the ideal case, but because of the earth's rotation, most ocean currents flow parallel to topographic strike. Resulting directional current structures of shelf and deep marine sediments cannot define paleoslope or provenance, but they do define topographic strike.

Because the direction of flow of ocean currents depends on many variables, several combinations of current systems can be recognized, including converging systems, diverging systems, and stratified systems. Where two currents converge, one system will override the other system because of differences in density. Converging directional data have been reported from ancient turbidites, indicating that similar converging current systems existed in the past. These data also suggest that many "turbidite" directional criteria were formed by bottom scouring ocean currents.

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Attenuation of Seismic Waves in the Mantle

Field and laboratory measurements of attenuation in metals, non-metals, and rocks over a wide range of frequencies indicate that the specific attenuation factor, $1/Q$, is substantially independent of frequency in homogeneous material, whereas it varies as the first power of frequency in liquids. This suggests that the mechanism