known, little is gained by examination of additional sections.

4. Type sections, usually considered the objective basis of chronostratigraphy, define the level of confusion which will exist in a stratigraphic system and serve only an archival function in probabilistic stratigraphy.

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SIGNIFICANCE OF PALEONTOLOGICAL RECORD OF DEEP SEA

The cores recovered by the Deep Sea Drilling Project provide a reservoir of material for paleontologic investigation offering unparalleled opportunities to learn about the global aspects of biostratigraphy, paleobiogeography, paleoecology, paleoclimatology, paleoproductivity, changes in ocean-water chemistry, and diagenetic processes. At the time of inception of the Deep Sea Drilling Project, marine plankton fossil groups were generally poorly known except for planktonic forams. In the last few years, the calcareous nannoplankton have also been used to establish zonations for Jurassic to Holocene strata and a radiolarian zonation of the Cenozoic has been worked out. It is now feasible to evaluate differences in age-equivalent fossil assemblages in the different areas of the ocean, in different climatic zones, at different depths, and in different sediment types. Biogeographic differences, particularly between the southern ocean and the North Atlantic and North Pacific, have been detected. Distinct climatic zonation of the oceans became well established during the Late Cretaceous and has been subject to periodic intensification during the Cenozoic. The end of the Cretaceous, end of the Eocene, and the Pliocene were times of especially rapid change and evolution. The accumulations of siliceous ooze indicate regions of high productivity. Dissolution of calcareous pelagic fossils is selective, removing some species from the assemblage before others are attacked; this phenomenon offers a method of determining fluctuations of the calcium carbonate compensation depth and a means of investigating diagenetic processes in deep-sea sediments.

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GULF COAST PHOTOGEOLOGIC APPLICATIONS

A practical approach to air photo interpretation for subsurface geologists and geophysicists working in the Gulf coastal plain documents the dynamic nature of the Gulf coast surface. Surface-subsurface relations include up- and down-to-coast fault situations and their surface expressions and an explanation is given for the surface indications of deeper structure where it is not reflected in the shallow beds by seismic and well data.

The specific photogeologic criteria used for recognition of surface structure in the Gulf Coast can be demonstrated by air photos of oil fields from South Texas, North and South Louisiana, Mississippi, Alabama, and Florida. These air photos are from areas of current exploration interest such as Flomaton in southwest Alabama, the Cretaceous reef trend in central Louisiana, and the Sunniland field in south Florida, as well as some undrilled prospect situations. There are practical ways in which surface information can be used to advantage in geophysical and geological prospecting.

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DIAGNOSTIC SEDIMENTARY STRUCTURES OF MESOTIDAL BARRIER BEACHES

Depositional shorelines can be subdivided conveniently into 3 groups on the basis of tidal range: hypotidal, 0–5 ft; mesotidal, 5–10 ft; and hypertidal, > 10 ft. In terms of worldwide distribution, the 3 groups are relatively equal in occurrence. This paper deals only with mesotidal barrier beaches and is based on field studies in New England and southeastern Alaska and on a literature survey of the barrier beaches of the world.

Tidal range is significant in the formation of beach structures in that it determines the distribution and concentration of wave energy over the beach profile and generates topography that affects ebb- and flood-current systems. Beach profiles change markedly with changes in tidal phase. The most dramatic changes in the beach profile, and the most rapid sediment migration (exclusive of storm conditions), occur at spring tides. Neap tides produce unique morphologic features such as neap berms and berm-ridges.

A large diurnal inequality of the tides, such as occurs in southeastern Alaska, has a striking effect on beach morphology and on the disposition of primary structures over the beach profile. This inequality results from 4 levels of concentration of wave energy during a 24-hour period.

The most fundamental unit in producing primary structures on mesotidal beaches is the ridge-and-runnel system. High-angle beds that dip landward are produced as the ridge migrates toward shore. A complex association of structures is affiliated with the migrating ridge. Some models of the associations of primary structures produced under differing conditions of tide, beach composition, and wave climate are derived from these field and literature studies.

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COASTLINE SEDIMENTATION IN TECTONICALLY ACTIVE GEOSYNCLINAL BASIN, GLACIAL OUTWASH-PLAIN SHORELINE OF NORTHEASTERN GULF OF ALASKA

The outwash-plain shoreline of southeastern Alaska consists primarily of 2 types of coastal morphologic areas: (1) places where outwash streams border the shore, and (2) beach-ridge plains. The outwash streams provide an abundant supply of sediment to the longshore drift system. Beach-ridge plains develop as a series of prograding spits, most of which indicate sediment transport from east to west. The spits trail away from the streams that originate at the termini of large piedmont glaciers, such as the Bering and the Malaspina. Once a stream channel is abandoned, or a new outlet is found, the beach-ridge plain is eroded back at the rate of several feet per year.

The beach processes are dominated by southeasterly storms which generate exceptionally strong longshore drift from east to west. The cycle of erosion-deposition on the beaches is similar to that of the New England coast; that is, the post-storm profile is flat to slightly concave upward, the beach recovers by the landward migration of a series of ridge-and-runnel systems, and the maximum constructional phase is a broad depositional berm. The cycle is shorter on the Alaskan coast, presumably because of greater storm frequency. The