shortcomings, which reflect mostly the state of the art, calcareous nannofossils are increasingly important in Gulf Coast Early Cretaceous exploration.

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ATCHAFALAYA BAY, LOUISIANA—REGIONAL SUBSIDENCE AND CONTEMPORARY DELTA FORMATION

Approximately 30% of the lower Mississippi River presently is diverted into the Atchafalaya distributary. As a consequence, lacustrine deltas rapidly are filling Atchafalaya basin lakes, increasingly coarse-grained sediments are entering Atchafalaya Bay, and a new delta—though probably geologically short-lived—is beginning to form. Understanding the geologic and hydrologic processes giving rise to this newly born delta might provide a clearer insight into the evolution of deltas as recorded in ancient sediments.

In the initial subaqueous phase of deltaic development (between 1952 and 1962) more than 120 sq km of Atchafalaya Bay had been covered by at least 0.5 m of new sediment. Local filling near the delta apex exceeded 2 m. The following phase, an estimated 50-year period of rapid subaerial expansion and shoreline accretion, has just begun. Comparison with modern Mississippi River subdeltas suggests the Atchafalaya delta eventually will deteriorate because of subsidence, compaction, and probable abandonment of the lower river course for a more direct, higher gradient route to the sea.

Analysis of tide records from Eugene Island and other Louisiana coastal stations indicates that in the last 30 years the rate of sea-level rise in Atchafalaya Bay ranged from 0.80 to 1.32 cm/year, almost exclusively because of regional subsidence. This exceeds even the rapid glacio-eustatic sea-level rise 6,000–10,000 years ago—an estimated 0.07 cm/year. Despite deposition into this rapidly subsiding trough, the Atchafalaya delta is still prograding; its ultimate internal form will reflect an interaction of sediment supply, wave energy, and regional tectonism. Unless modified by man, the Atchafalaya delta will expand across its bay 14.2 to 16.9 sq km/year until about the year 2020, creating approximately 950 sq km of new coastal land.

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CALCAREOUS NANNOFOSSIL APPLICATIONS IN GULF OF MEXICO–CARIBBEAN REGION

Preliminary investigations of the stratigraphic utility of calcareous nannoplankton in the Gulf of Mexico–Caribbean region were begun prior to 1954. Most of the applications of these minute forms, however, have been published during the last decade. Their stratigraphic occurrences have been documented for the Late Cretaceous and younger sections of the region, but, insofar as is indicated through publication, they have not gained the status of routine application in onshore and nearshore subsurface studies.

However, the stratigraphic value of calcareous nannofossils has been demonstrated amply. They are second to no group for the rapid evaluations needed routinely in the shipboard work connected with geologic oceanographic studies. Their worldwide applications, particularly in the Joint Oceanographic Institutes Deep Sea Drilling Program, include the Caribbean and Gulf of Mexico. Late Cretaceous through Holocene species occurrences have been calibrated for the Gulf region with the planktonic foraminiferal-based zonation scheme on Leg X of the Deep Sea Drilling Project. Current work in or applicable to the Gulf of Mexico–Caribbean region is summarized in this symposium volume.

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ERRORS IN PRE-HOLOCENE CARBON-14 SCALE

Carbon-14 dates more than about 10,000 years old are subject to at least one serious error, which is (at the moment) not amenable to correction.

Wood pebbles from a single thin clay layer, in western Florida, give C-14 dates which range from 22,000 to 29,000 years, with no assurance that either of these dates is correct. C-14 dates from different wood fragments and other material in coastal zones appear to provide a data for a high stand of mean sea level during the Wisconsin at almost any time desired from 20,000 to 40,000 years ago or more. Not all of these dates can be correct, or there would have been no Wisconsin glaciation. For reasons having to do with the growth and decay mechanisms affecting continental glaciers, it is unlikely that any of these dates are correct. Regardless, there is no standard by which "good" dates can be distinguished from "bad" dates.

A suite of samples which has been dated by both C-14 and K-Ar methods yields dates which differ by 1 order of magnitude or more; either the "young" C-14 dates represent much older materials, or the "older" K-Ar dates represent much younger material. With no additional method of dating, one cannot be certain which type of date—if either—is correct. The likelihood of contamination is higher for the C-14 results, however, and therefore this suite of dates may include mid-Wisconsin numbers for mid-Pleistocene events.

Mörner has reported that a small contamination of late Wisconsin or Holocene carbon may provide mid-Wisconsin dates for pre-Wisconsin materials.

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WEST LOUISIANA CHENIER PLAIN HISTORY

The "a-b-c . . ." model, which is based on littoral transport of sand, provides a powerful method for coastal analysis. Where long-parallel beach ridges are present, however, it may not be applicable: the two-dimensional map-view model requires that dq/dx (a numerical evaluation of changes in the littoral drift load) not be zero, except at 3 sharply defined points, whereas long-parallel beach ridges were built under conditions where dq/dx was essentially zero at all points.

These parallel beach ridges, then, do not represent an important littoral-drift system. Study of many sets of such ridges shows that they were built by onshore movement of sand which came from deeper water. The equilibrium which they achieve, with the passage of time, must be considered primarily in a vertical plane, taken at right angles to the beach, rather than in the map plane. They represent a steepening, with time, of an initially very gentle slope offshore from the beach, and leading to the suggestion that the present steeper slope is closer to equilibrium than the original gentle slope.

The chenier plain of Cameron Parish, Louisiana, is composed mainly of parallel ridges. Because of the parallelism, as well as the large content of shell debris, it is thought that these cheniers were built of material which must be attributed to an offshore source. Because of local departures from parallelism, and the