

*Placentieras* evolutionary sequence and time correlations are made.

The results of the biostratigraphic analysis suggest that the Senonian strandline in Presidio and Jeff Davis Counties, Texas, and northeastern Chihuahua shifted southeastward during an extensive marine regression.

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PALYNOMORPH DISTRIBUTION AND DEPOSITIONAL ENVIRONMENTS IN GLEN ROSE FORMATION (LOWER CRETACEOUS), SOMERVELL COUNTY, TEXAS

The Glen Rose Formation (Lower Cretaceous) contains a microfossil flora which is useful as a paleoecologic tool. Examination of measured sections and three mapped terrigenous-clastic units shows that gymnosperm pollen and dinoflagellate hystrichospheres are useful in diagnosis of subtidal and supratidal conditions if coupled with lithologic evidence. Fern spores and angiosperm pollen were of limited use in paleoenvironmental interpretations.

Percentage-distribution maps of gymnosperm pollen and hystrichospheres for three units in a terrigenous clastic sequence in the Glen Rose of Somervell County show an increase of hystrichospheres and a decrease in gymnosperms toward probable open-water sediments. This suggests that palynomorph number is influenced by distance from source area.

Hystrichosphere morphologic types were found to change with depositional environment. Barb-spined forms commonly were associated with shallow-water open-marine sediments. Straight-spined forms commonly were associated with sediments deposited in shallow brackish-water.

Angiosperms, fern spores, and certain hystrichospheres were not related clearly to depositional environments inferred from lithologic evidence and other palynomorphs. Distribution of these microfossils may be explained by wind- and water-current fluctuations during deposition. Particle characteristics, such as settling velocity and size sorting, also may have influenced their distribution.

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MOLLUSCAN GUIDE FOSSILS IN LATE MIOCENE SEDIMENTS OF SOUTHERN FLORIDA

Upper and lower members of the Tamiami Formation of late Miocene age are exposed at the surface in southern Florida. Fossiliferous members contain distinctive *Pecten* species, two varieties of *Ecphora*, and other mollusks. A study of the molluscan fauna of these members indicates the presence of at least three concurrent range zones. According to age, with the youngest at the top, these zones are: (1) *Pecten tamiamiensis* zone; (2) *Pecten jeffersonius* zone; and (3) *Pecten santamaria middlesexensis* zone.

This study suggests certain time correlations between formations of southern Florida, northern Florida, and the Atlantic coast.

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SEDIMENTATION AND DISTRIBUTION OF MARINE BIOFACIES

The rate of sedimentation is considered as a major factor in the distribution of faunal facies. The conti-

nental slope is believed to be the site of the greatest accumulation of sediment, but the rate of sedimentation on the slope commonly is low. Although it is nearly impossible to determine the rate of sedimentation in the geologic section, the relative rate of sedimentation generally is easy to establish. Five concepts are needed to interpret the relative rate of sedimentation in the geologic section: (1) Moore's concept (modified): the greater the relative abundance of Foraminifera in sediments, the slower the rate of sedimentation; (2) each facies has its own "normal" rate of sedimentation; (3) given uniform conditions, each facies should be present in belts approximately parallel with the coast; (4) each fossil species is present in a belt along the coast which overlaps or coincides with those of several other species; and (5) population peaks of many species tend to recur in the geologic section whenever and wherever conditions are favorable. The masking of fossil facies resulting from high rates of sedimentation is emphasized.

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ANCIENT MISSISSIPPI RIVER

Stratigraphic evidence in the central Mississippi embayment indicates that apparently a stream of major size has occupied continuously the approximate same location as the existing Mississippi River—at least since Late Jurassic time. Significant quantities of deltaic sediments are present in the Smackover Limestone (Late Jurassic) and in most younger units. The stream which has persisted since Jurassic time is referred to here as the "Ancient Mississippi River."

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ILLINOIS BASIN, MISSISSIPPI EMBAYMENT, AND OUACHITA OROGENIC BELT

Evidence that the Illinois basin was open toward the south during the Mississippian, the geographical coincidence of a unique Ouachita lithologic province with the Mississippi embayment, the distribution of late Paleozoic sediments, interpreted paleoslopes, and interpreted structural relations suggest that the embayment existed during late Paleozoic time. Further insight into the Ouachita orogenic belt and its relation to the Appalachian belt may be gained if the age of subsidence of the Mississippi embayment and its modification from or to the Ouachita belt can be determined.

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LOWER LIMIT OF PLIOCENE AND PLEISTOCENE IN CARIBBEAN AND GULF OF MEXICO

A comparison is made between the late Neogene planktonic foraminiferal biostratigraphy of Italy and the Caribbean and Gulf of Mexico. In both regions the order of stratigraphic appearance of the species *Globorotalia margaritae* (= *G. hirsuta* auct.), *G. acmiliana*, *G. crassacrottonensis*, *G. crassaformis*, *G. tosaensis*, and *G. truncatulinoides* is closely comparable and provides a basis for interregional correlation of the Pliocene and early Pleistocene. The occurrence of *G. margaritae* defines the early Pliocene; the globorotaliid lineage of *G. acmiliana* → *G. crassacrottonensis* → *G. crassaformis* defines the middle Pliocene; and the appearance of *G. tosaensis*, *G. truncatulinoides*,