

divisible into five formations. In ascending order they are named the Atco Chalk, Vinson Chalk, Jonah Limestone, Dessau Chalk, and Burditt Marl. The group as a whole is characterized in this area by medium- to massive-bedded chalk and marly chalk with distinct, laterally persistent key beds and a general absence of fragmental limestone.

From Travis County south to Bexar County, on the southwest flank of the San Marcos arch, the Austin Group thins to approximately 100 ft. Formations recognized in the Roundrock syncline lose their identity as the entire section changes facies to a thin- to medium-bedded, slightly fragmental, commonly glauconitic, dense biomicrite. Diastems occur within the unit and a disconformity separates the Austin Group from the overlying Anacacho Limestone.

From Falls County north through McLennan County the Austin Group thins over the Belton high to less than 150 ft, and facies changes occur which are similar to those on the San Marcos arch. A disconformity separates the Austin and Taylor Groups in the area.

From Hill County north to Dallas County the Austin Group thickens into the Dallas basin to more than 600 ft and can be subdivided into three informal units called the "lower," "middle," and "upper chalk." Farther north in Grayson and Hunt Counties another positive element, the Preston anticline, separates the carbonate sequence of the Austin Group from its clastic equivalents in northeast Texas.

General criteria that may be useful in the recognition of positive areas that existed during deposition of the Austin Group include the following: (1) thinning of the group; (2) a facies change from massive-bedded chalk and marly chalk to thin-bedded, commonly fragmental, and glauconitic chalk; (3) loss of identity of formations and key beds recognized in adjacent negative areas; and (4) the appearance of local diastems in the section.

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DELTA-FRONT DIAPIRS OFF MAGDALENA RIVER, COLOMBIA, COMPARED WITH HILLS OFF OTHER LARGE DELTAS

Exploration of the slope off the Magdalena River with reflection profiling has shown a series of large diapiric intrusions with hills rising as much as 600 ft above the sea floor. These diapirs mostly are bordered by down-bent formations in contrast to the usual, but not invariable, upbending around salt domes. Because salt domes are unknown in the entire area, and because plastic mud layers must be common in the delta-front beds, it seems likely that these are mud diapirs or possibly some type of underwater mud volcanoes.

The mud lump islands off the Mississippi delta generally have been considered rather unique. However, the finding of diapiric intrusions, which are probably mud, off the Magdalena delta and the finding of many hills off other deltas suggest that such intrusions may not be unusual.

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ENVIRONMENTAL RELATIONSHIPS OF RECENT OSTRACODA IN MESQUITE, ARANSAS, AND COPANO BAYS, TEXAS GULF COAST

(No abstract submitted.)

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SUBSURFACE UPPER CRETACEOUS STRATIGRAPHY OF SOUTHWESTERN ARKANSAS

The subsurface Gulf Series of southwestern Arkansas is characterized by uniformity in lithologic features, a minimum of facies variations except on a local scale, general eastward thinning of units toward a shoreline area, and features typical of neritic, eulittoral to sublittoral, and alluvial to prodeltaic environments.

The Woodbine Group of southwestern Arkansas consists of the Lewisville Formation of fluvial to littoral varicolored shale and sandstone and the overlying Eagle Ford Formation of dark gray to black littoral to sublittoral shale. The Woodbine is unconformable on Comanchean rocks throughout the area studied. The Austin Group in this area is represented by the Tokio Formation of littoral to sublittoral ashy sandstone and shales and the Brownstown Formation of more offshore calcareous, glauconitic shale and sandstone.

The Taylor Group here consists of the Ozan Formation of slightly calcareous shale and glauconitic sandstone with a basal glauconitic sandstone (Buckrange Sand Lentil) followed above by the neritic Annona Chalk, Marlbrook Marl, and Saratoga Chalk. The Ozan Formation tends to thin southwestward in contrast to the underlying Gulf deposits which generally thicken in that direction. The chalk formations of the Taylor Group mark the onset of large numbers of Senonian planktonic coccoliths and foraminifers in this region. In northeastern Texas the Austin Chalk (Tokio equivalent) represents an earlier Senonian invasion of calcareous planktonic organisms. In this region the Austin and Taylor planktonics are associated with typical benthonic fossils and require a neritic environment.

The Navarro Group of southwestern Arkansas consists of the Nacatoch Sand and Arkadelphia Marl. The Nacatoch is neritic, littoral, and sublittoral glauconitic sandstone and shale whereas the Arkadelphia is neritic calcareous shale and marl, in part glauconitic.

The base of the Paleocene marine Midway Group is distinct throughout the area studied but there is little or no evidence of an unconformable relation with the Gulf Series. There is some evidence of a paleontologic break at the contact, and it probably should be termed a paraconformity.

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FAULTS OF SOUTH AND CENTRAL TEXAS

The map entitled "Faults of South and Central Texas" shows the location, depth of trace, and approximate vertical displacement of the various normal faults located in the area covered by the investigation. The information on the faults was derived from: published sources (listed in text); various individuals including especially, William Pittman, Wilford Stapp, and Porter Montgomery; and studies in company files.

The writer found that most reports on a particular area were broadly about the same, but might differ considerably in detail. Certainly, no two maps were identical; each geologist seems to have his particular style of fault interpretation. Additional faults undoubtedly will be discovered in the future and the interpretations presented will require alteration.

Most of the faults in the region occur within the