STRATIGRAPHY OF THE UPPER CRETACEOUS AUSTIN GROUP, CENTRAL TEXAS

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ABSTRACT

The Austin Group in central Texas represents a distinct cycle of carbonate deposition that consists predominantly of soft, white, sparse to well packed, pelecypod and foraminiferal biomicrite, popularly called chalk. The abundance of biomicrite and the general absence of biosparite suggests deposition below wave base on a broad carbonate shelf.

Between Dallas and San Antonio the Austin Group can be divided into four geologically distinct areas based on facies changes and thickness. These changes reflect the presence of two slightly positive areas, the San Marcos arch and the Belton high, that represented a more stable part of the shelf than the adjacent, more rapidly subsiding areas. The negative area between the San Marcos arch and the Belton high has been named the Roundrock syncline and the negative area north of the Belton high is referred to as the Dallas basin.

In the Roundrock syncline, from the type area in Travis County north through Bell County, the Austin Group varies from 350 to 550 feet in thickness and is 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 northeast flank of the San Marcos arch, the Austin Group thins to approximately 100 feet. 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 feet, and facies changes occur similar to those seen on the San Marcos arch. A disconformity separates the Austin and Taylor Group in the area.

From Hill County north to Dallas County the Austin Group thickens into the Dallas basin to over 600 feet 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) formations and key beds recognized in adjacent negative areas lose their identity, and (4) local diastems appear in the section.