

GEOLOGY OF APACHE MOUNTAINS, TRANS-PECOS TEXAS

by

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ABSTRACT

The Apache Mountains of southeastern Culberson County, Texas, are composed of Permian marine rocks deposited over truncated Paleozoic formations along part of the southwest margin of the Delaware Basin.

The western sector of the range, a broadly developed half-dome, is dominated by modified horst-and-graben structure superposed on shelf, shelf-margin, and basin facies ranging in age from Leonardian to Ochoan. The eastern two-thirds of the range is an exhumed Guadalupian reef complex, the surface structure of which is the elongate, southeast-plunging Apache anticline.

The oldest exposed rocks are Leonardian in age and compose the upper part of the Victorio Peak Limestone. The Victorio Peak crops out in an isolated ridge at the western end of the range. The siltstone, dolomite, and limestone within the unit probably formed as shallow-watershelf-margin deposits. In the same ridge, the Victorio Peak is conformably overlain by shale, silt stone, and limestone of the Cutoff Shale. The age of at least the upper part of the Cutoff is Guadalupian. As a result of uplift, erosion, and subsequent subsidence a tongue of Cherry Canyon basin-facies oversteps truncated Cutoff beds.

The Munn Formation crops out along the western base of the range and makes up the southwestern ridges. The two members of the Munn are composed of dolomite, siltstone, and limestone deposited as shelf and shelf-margin facies.

The "backbone" of the Apache Mountains is a southeast trending, massive carbonate lithosome, the Capitan Limestone, which is flanked on the northeast by a fault-line scarp and on the southwest by ridges composed of bedded back-reef dolomite and siltstone of the Seven Rivers, Yates, and Tansill formations. The Seven Rivers and lower part of the Yates merge northeastward into the Capitan reef. In contrast to the dolomite and limestone of the Seven Rivers, alternating siltstone or very fine-grained sandstone and dolomite characterize the Yates in the backreef lagoonal area. Abrupt facies changes are common within the Yates Formation. Dolomite beds composing the Tansill Formation crop out only in the eastern third of the Apaches, because erosion has stripped it from the topographically and structurally higher parts of the range to the northwest.

Small, downfaulted segments of the Castile and unconformably overlying Rustler formations of Ochoan age occur at the northwest base of the range in the Seven Heart Gap area; here also the Capitan reef talus intertongues with Bell Canyon basin facies.

South of the Apache range, the Yearwood Formation oversteps progressively

older Permian units from east to west. Pre-Cretaceous uplift resulted in the beveling of older rocks. The age of the Yearwood Formation is probably Cretaceous, of the Cox, Finlay, and Boracho formations, definitely Cretaceous. The cross-bedded Cox sandstone and conglomerate probably were shoreline deposits of an advancing sea; the Finlay limestone and Boracho marl were probably deposited in somewhat deeper water.

Tertiary tectonism formed most, if not all, of the present surface structural features of the Apache Mountains and adjacent areas. Large-scale block faulting formed the ranges and intermontane basins of the present landscape. Subsequent erosion and deposition, during the Quaternary Period, were largely climate-controlled.

The major economic resource of the Apache is ground water. Seven Heart Gap just north of the map area has the largest known barite deposits in Texas.