

Pennsylvanian History of the Chautauqua Arch, Oklahoma and Kansas

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The Chautauqua Arch experienced maximum uplift during Late Devonian Acadian movements, and again much later during the Pennsylvanian. The Chautauqua Arch was uplifted episodically and eroded during the Pennsylvanian, a phase usually omitted on many Pennsylvanian tectonic maps. This arch separates the northern ramp of the Arkoma Basin in southeastern Kansas and closely straddles the northeastern Oklahoma and Kansas border. These later uplifts coincide with tectonic movements of the evolving Ouachita Mountains and Ozark Uplift. Consequently, the Lower to Middle Pennsylvanian sedimentary pile along the Chautauqua Arch is about half the thickness of this interval in the Kansas Cherokee Basin and one-fifth or less of a similar chronological interval in the Oklahoma Arkoma Basin.

Numerous Lower Pennsylvanian beds of northeastern Oklahoma are missing over this arch. Middle Pennsylvanian unconformities in southern Montgomery and Labette counties result in complete absence of the Hepler Sandstone, Lost Branch Formation, Canville and Stark Shale Members of the Dennis Limestone, Cherryvale Shale, Corbin City Limestone of the Drum Limestone, and Dewey Limestone. In addition, much *thinning of other stratigraphic units exists over the arch, including the Iola, Plattsburg, and Stanton Limestones.* In contrast, thick silty to sandy sediments of the Bandera and Chanute Shales were deposited during brief periods of deltaic accumulation.

The Chautauqua Arch may be considered as a Pennsylvanian forebulge that separates the Arkoma foredeep basin and northward adjoining foreslope from the Cherokee backbulge basin.