Cenozoic Stratigraphy of Roger Mills County, Oklahoma — A Preliminary Report[1]

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The Tertiary sediments covering the western portion of Roger Mills County are continuous with sediments, in the Texas panhandle, which are of Pliocene age and have been assigned to the Ogallala formation.

The Pliocene section exposed in the northern part of the county consists of over 300 feet of largely unindurated clays, silts, and fine sands. Coarse sediments are extremely rare. There are a few local channel deposits which contain some coarse sand. Beds in the lower part of the section consist largely of clays and silts, many of them reddish and apparently of local origin. Beds in the upper part of the section consist of fine light gray and white sands. The Pliocene beds were deposited on an eroded surface of Permian sandstones and shales (Cloud Chief and Quartermaster formations). Over the northern part of the county the Permian-Pliocene contact is remarkably constant in elevation, being everywhere close to the 2,300 foot level. There is some evidence that in the northwestern part of the county the contact is a little lower. In central Ellis County to the north the Permian-Pliocene contact occurs at about 2,400 feet.

Within 30 feet of the bottom of the Roger Mills County Pliocene section is a layer of cross-bedded sand which has yielded twelve species of vertebrates including an advanced species of *Merychippus* and a primitive species of *Neohipparion*. The occurrence of these horses indicates middle Clarendonian (Valentine) age. In a fine calcite-cemented sandstone 25 feet below the top of the section, fossil seeds of the genus *Biorbia* have been found. In the High Plains, *Biorbia* is believed to be restricted to Hemphillian (Ash Hollow) time. *Biorbia* has been found as low as 50 feet below the top of the section, and a channel sand 120 feet below the top has yielded specimens of *Neohipparion* which are probably Hemphillian. It is doubtful that the Hemphillian sediments extend much below this level. Hemphillian deposits are at few places thicker than 150 feet in nearby areas of the Texas panhandle where the entire Ogallala section is apparently preserved. The Blancan (Kimball) beds and some late Hemphillian beds have probably been removed by erosion. In the vicinity of Canadian, Texas, the complete Ogallala section is about 400 feet thick. The top 60 feet of this section is of Blancan age.

There are no deposits of known Nebraskan age in the area. At one locality in Roger Mills County very coarse gravel fills a channel that has been cut through the Ogallala and into the Permian. It is known to be pre-Kansan and post-middle Hemphillian, and consequently it may well be Nebraskan. There are three well-developed terraces along the Canadian river. These terraces occur at 50, 90, and 220 feet above the present flood plain. Fossil assemblages have been collected from the terrace deposits but as yet their age has not been determined.

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