ford, and Sycamore, which have been brought to the surface along the southwest flank of the complexly faulted and eroded, NW-trending Mannsville anticline. The Paleozoic strata are overlain unconformably by beds of Early Cretaceous age (Pl. 1).

Lower Cretaceous rocks are divided into the Trinity, Fredericksburg, and Washita Groups. The Trinity Group in this area contains the Antlers Formation, which includes the Baum Limestone Member and the overlying Antlers sandstone facies; the Fredericksburg Group includes the Goodland Limestone and the Kiamichi Formation; the Washita Group is represented by the Caddo Formation (Duck Creek and Fort Worth Members), the Bokchito Formation (Denton Clay, Soper Limestone, Weno Clay, McNutt Limestone, and Pawpaw Sandstone Members), the Bennington Limestone, and the Grayson Marlstone.

The Antlers Formation contains a sandstone which is a time-transgressive, nearshore marine deposit. Locally the Baum Limestone Member of the Antlers is the basal Cretaceous deposit; it is believed to be a restricted-lagoon deposit representing fresh to brackish water. Succeeding strata represent shallow-water marine and deltaic deposits. Basal Cretaceous beds lie on eroded Paleozoic rocks in Marshall County and onlap the Precambrian Tishomingo Granite northward in Johnston County.

The Woodbine Formation (basal Upper Cretaceous) lies disconformably on Lower Cretaceous strata; it is limited in distribution to two outliers southeast of Kingston in the trough of the Kingston syncline, where only the lower 35 ft of the formation is present. These beds represent the Dexter Member, the basal unit of the Woodbine.

Several distinct terrace levels have been recognized along the Red River Arm and the Washita River Arm of Lake Texoma. These levels have been correlated with corresponding levels in other parts of Oklahoma and Texas and have been assigned to terraces Qt_2 (Ambrose level), Qt_3 (intermediate level), and Qt_4 (Hardeman level), of Wisconsinan, Illinoian, and Kansan age, respectively.

Cretaceous strata were deposited upon and locally draped across preexisting Paleozoic structures that have undergone Cretaceous and possibly post-Cretaceous movement. Subsequent erosion of Cretaceous strata has developed an outcrop pattern that delineates such structural features as the Cumberland syncline, Oakland anticline, Madill anticline, Kingston syncline, and Preston anticline. In the subsurface of southeastern Marshall County, Cretaceous strata lie on the Ouachita-facies rocks of the Bryan basin.

Paleozoic Rocks

Cretaceous sediments conceal the underlying Paleozoic rocks (Pl. 1) in all parts of Marshall County except for isolated exposures along Turkey Creek (now inundated by Lake Oteka) in the north-central section of the county (secs. 34 and 35, T4S, R4E), ~7 mi northwest of Madill (Holtzman, 1978, p. 19). Paleozoic exposures were described by Tomlinson (1926) as "buried hills." On a detailed map, Tomlinson (p. 140, fig. 2) indicated the location of one outcrop of the Sycamore Limestone, four of the Woodford chert, four of the "Hunton Formation," and three of the "Viola Limestone" (Viola Group of this report). All of these outcrops are limited to the beds and lower walls of ravines occupied by Turkey Creek and its tributaries where erosion has partially removed the overlying Cretaceous rocks. Strike-and-dip readings indicate a NW-trending anticline, the exposed beds dipping 40–65° SW. The northernmost Viola exposure makes a distinct semicircular swing around the end of the Mannsville anticline, changing strike from NW to NE.

Tomlinson (1926) described the Sycamore as including ~100 ft of drab, massive, blocky, finely crystalline limestone (partially concealed), a 2-ft bed of green shale, and a 1-ft bed of basal sandstone. The Woodford in the southern exposure includes 100 ft of black and white chert, whereas the northernmost exposure consists of 40 ft of black chert and white, siliceous clay or clayey chert in thin bands. The "Hunton" was described as including 6 ft of white, massive, coarsely crystalline, glauconitic limestone and 18 ft of white to drab, blocky to platy, noncrystalline limestone. Viola exposures include 250 ft of bluish-gray, finely crystalline limestone in well-defined beds with several layers of cream-colored chert.

Bullard (1926, p. 13–16) discussed the Turkey Creek exposures, depending primarily on the map and description furnished by Tomlinson.

Tomlinson and others (1952, plate 2) presented a slightly revised version of the 1926 Tomlinson map; they also gave the following description:

> Outcrops of all the formations from the Sycamore limestone (Mississippian) to the Viola limestone (Ordovician) in the core of the Mannsville anticline, in a gorge cut through the nearly horizontal strata of the Trinity group (Comanchean). Facies items of interest include chert seams in the Sycamore, green shales in the Sylvan, and silicified fossils in the Fernvale. Beautiful exposures of angular unconformity including subsoil penetration by the younger formation, the Baum limestone at the base of the Trinity. The Baum here is unusually massive with local jointing more conspicuous than bedding.

Considerable controversy has arisen concerning the age and relationship of the so-called "Hunton" strata along Turkey Creek. Walters (1958, p. 14–21, pls. 1,3) demonstrated that Hunton strata were removed by pre-Woodford erosion along the Mannsville–Madill–Aylesworth anticline and that a detrital section of the "Misener(?)" interval, at the base of the Woodford, is present along the