Petroleum Geology of the Taloga-Custer City Area
Dewey and Custer Counties, Oklahoma

by HOUSTON L. SLATE

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INTRODUCTION
The Taloga-Custer City area is near the center of the western half of Oklahoma within Tps. 15-18 N. and Rs. 14-19 W. (Fig. 1). Most of the area is in the Gypsum Hills physiographic province with a narrow strip of the High Plains along the western border.
Geologically, the area is on the northern flank of the Anadarko basin, an asymmetrical sedimentary basin occupying most of western Oklahoma, part of the Texas Panhandle north of the buried Amarillo Mountains, and part of southwestern Kansas. The syncline was created as a separate tectonic province by the Wichita orogeny in Late Mississippian or Early Pennsylvanian time.
Pre-Pennsylvanian deposits accumulated in a trough extending northwestward from the Ouachita geosyncline on the continental side of the mobile belt. Several authors, including King (1959), have noted the resemblance between the early Paleozoic sedimentary units on the continental side of the Appalachian system and the time-equivalent sediments of the Anadarko basin.
Through most of early Paleozoic time the area lay under a shallow epeiric sea with sedimentary interruptions resulting primarily from local changes in sea level. Epeirrogenic warping during post-Hunton time elevated the Hunton above sea level farther to the north where it has been truncated, but truncation of this unit is not evident in the Taloga-Custer City area.
Slow subsidence resumed during Woodford and Mississippian time. Another period of regional epeirogenic upwarping exposed most of the area to erosion at the close of Mississippian time.
The tectonic activity which resulted in the formation of the Pennsylvanian Anadarko syncline began in late Mississippian time as part of the Wichita orogeny. The final period of tectonism in middle and late Pennsylvanian time completed the shape and gross structural features of the syncline.
Deposition through Pennsylvanian time was marked by spasmodic advance and retreat of the sea, depositing a succession of marine sandstone and shale with some limestone. Deposition of marine beds and later red beds with evaporites continued throughPermian time followed by erosion and peneplosilation during the Triassic and Jurassic. Cretaceous and Tertiary rocks, which may have extended over the area, have been removed. In the Taloga-Custer City area the Cloud Chief and Rush Springs Formations (Permian) are at the surface except where Quaternary sand and silt has been deposited in areas adjacent to the South Canadian River.

Problem and Procedure
The investigation was undertaken to determine the stratigraphic and structural relationships which govern the occurrence of oil and gas in the Taloga-Custer City area. The writer also wished to become familiar with the stratigraphy and structure of the Anadarko basin in general, with a view toward possible future work in that region.
Compilation for the report began with the construction of a base map. A preliminary survey of the area was completed by using electrical logs. This survey revealed the sparse control between the Oakwood field (T. 17 N., R. 14 W.) and the main area of study which led the writer to exclude the former area from the report.
Electrical well logs were used to determine tops and thicknesses of formations. Mobil Oil Company furnished samples from six key wells in the area for lithologic determinations. The remaining lithologic descriptions were obtained from S. R. Williamson.
During the course of the study, electrical-log cross sections, structure maps, and thickness maps were constructed to illustrate significant geologic features necessary to understand the petroleum