necessary to eliminate this confusion. As an example, the name Cottage Grove is recommended for the section of erratic sandstones variously called "Layton," "Upper Layton," "Osage Layton," "Layton of Ponca City," "Peoples," and "Mussellem"; however, the name Layton should be retained for the sandstone below the Hogshooter.

The most conspicuous aspect of the stratigraphy is the near parallelism of all of the beds, except the erratic sandstones and limestones, in the marine Permian and Pennsylvanian. Local disconformities probably occur in this part of the section, but there are no major angular unconformities, even between series and systems. The two major unconformities shown on the cross section are at the base of the Pennsylvanian and at the base of the Woodford or the Misener.

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Geology of Northwestern Anadarko Basin

This paper reports the results of several years concentrated study of the northwestern Anadarko basin. Work commenced high on the southwestern flank of the Central Kansas uplift. Although the stratigraphic section of the Lower Pennsylvanian, Mississippian, and Upper Ordovician rocks is not complete in that area, rock units are easily recognized, well defined, and general agreement exists for their precise age and correlation.

Numerous problems, particularly in the Pennsylvanian and Lower Permian, are involved in correlating into the basin, determining age of sediments, and deciphering structural and depositional history. Abrupt facies changes near regional structural features and marked basinward divergence accentuate these difficulties. Series problems are encountered in recognizing, defining, and establishing the boundaries between stages. This is particularly true of the age of the sedimentary sequence subjacent to recognizable Des Moinesian, including strata variously called "Atokan," "Morrowan," "Derryan," "Lampassan," and possibly "Springeran," The boundaries between the Missourian and overlying Virgilian, and the Virgilian and superjacent Permian Wolfcampian, are also confusing. The structural and depositional history inferred in the area is dependent to a large degree on the definition of these stages. Introduction of names or terms, many local in usage, from various parts of the central United States adds to the confusion.

Regional subsidence into the Pennsylvanian Anadarko basin, the later Permian basin of West Texas, and subsequent pronounced tilting into the Mesozoic Denver basin, coupled with at least two major unconformities, numerous less important regional and local unconformities, disconformities, and hiatuses, further complicate the geology of the region.

Structural maps on several readily identifiable markers over most of the basin disclose its present structural configuration. However, the structural and depositional history is best revealed by a series of isopachous maps of the Mississippian, stages of the Pennsylvanian, and Lower Permian. Regional downwarping into the Anadarko basin continued from late Mississippian through the Pennsylvanian into Lower Permian.

Four general but distinct regional structural forms controlled deposition, including the central Kansas uplift and the Souixan landmass characterized by deposits of primarily carbonate rocks; a shelf area with rapid transition from carbonates to clastics along its edges; a deep basin area with finer clastics; and finally high areas such as the Apishapa-Sierra Grande features yielding coarse clastics and washes during much of the time. Reefoid deposits are present along the shelf edges and around major positive elements. Early and Middle Pennsylvanian sediments progressively onlapped onto truncated pre-Pennsylvanian rocks on the flanks of positive tectonic features. Younger Pennsylvanian sediments progressively overlapped those previously deposited as the basin area expanded. These conditions afford the widest variety of traps for accumulations of oil and/or gas. Production has been established in various types of stratigraphic and permeability traps, including biostromes, and structural traps in sandstones and limestones, including Wolfcampian, all Pennsylvanian stages, Chesterian, Meramecian, and Ordovician. No firm conclusions can be reached presently regarding precise age, correlation, and boundaries of many stratigraphic units. The writer deplores confusion resulting from introduction of local terminology from other areas, and urges restricting terminology to that of classic Pennsylvanian stages until more precise terminology can be justified. Cooperation of local geological societies can define and solve many of the stratigraphic problems.

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ABSTRACTS

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Radiation Surveying for Oil and Gas

For many years geologists and chemists have been aware of the presence of certain significant density patterns developed by analyzing surface soils over oil and gas reservoirs. Geochemists have