

**CONJECTURED MIDDLE PALEOZOIC HISTORY
OF CENTRAL AND WEST TEXAS**

JAMES LEE WILSON¹ and O. P. MAJEWSKE¹
Houston, Texas

Regional Siluro-Devonian faunal correlations between outcrops in the Llano uplift of Texas, the Arbuckle Mountains of Oklahoma, and the trans-Pecos Texas-southern New Mexico mountains are made with strata of the west Texas subsurface whose faunas have recently been studied. It is important for establishing reasonable correlations and ultimately geologic history that both types of provinces be studied: (1) shelf areas with fossiliferous shelly limestones but thin and interrupted sections and (2) the more complete but less fossiliferous sections of thicker strata in the marginal cratonic basins. If regional unconformities can be traced from surface outcrops into basinal sections and if recognition is possible of widespread distinctive lithic units in certain parts of the section, conjectural correlations can be made which reinforce those tied down by paleontology.

The chart and maps outline the following major segments of middle Paleozoic strata in the southwestern states:

(1) A widespread thin pure carbonate sequence of Lower Silurian (Alexandrian) and lower Niagaran age—the subsurface Fusselman of west Texas, Chimney Hill of Oklahoma, and St. Clair and older Silurian of the Ozarks.

(2) A lithologically diverse and thicker unit of Middle and Upper Silurian (Niagaran) age represented by marls and thin limestones except in parts of west Texas and all of New Mexico where it is massive dolomitized pure carbonate platform type sediment. (Outcrop Fusselman, Silurian of southeastern New Mexico, Mid-Silurian clastics of west Texas, Henryhouse-Brownspout of Oklahoma and Tennessee.)

(3) An unconformity above the Silurian at the position occupied by the evaporites of the Michigan and New York basins. This is present even in west Texas and Anadarko basins. Its importance is difficult to assess because in areas of outcrop much of the overlying evidence has been removed by an equally important intra-Devonian erosion period. Nevertheless, its significance is evidenced by the total absence of Silurian on the Texas craton and in the frontal parts of the Marathon-Ouachita foldbelt. (In the Llano uplift the Middle Devonian in scattered places rests on such different parts of the Ellenburger that hundreds of feet of pre-Middle Devonian of the top of this unit is demonstrable.) The importance of the break is also evinced by the major shift in areas of preserved thickness between Silurian and Devonian time in the west Texas basin.

(4) A widespread unit of fossiliferous, generally limestone, strata of Lower Devonian through Onondagan age very incompletely represented in the Ozark, Arbuckle, and Llano uplift areas but as much as 1100 feet thick in the west Texas basin. This unit contains a widespread light colored chert unit of Oriskany-Schoharie age which is developed in the Ouachita-Marathon trough as the lower part of the Arkansas novaculite and Caballos formations (Stribling in Llano uplift and Camden in Tennessee).

¹Shell Development Company.

(5) A second major unconformity fully as widespread as the Siluro-Devonian one, of late Middle Devonian age (pre-Woodford). During this period some additional shifting of depositional basins probably occurred, for the areas of thickest Woodford are not located exactly where the Lower and Middle Devonian carbonates are thickest.

(6) A widespread sheet of relatively thin argillaceous and siliceous deposits typical of the Devono-Mississippian black shales of the Mid-Continent. Recent correlations using conodonts and brachiopods can demonstrate equivalence of practically all of the New Mexico and trans-Pecos Texas outcrop Devonian to the Woodford formation of west Texas and Oklahoma, and show that the unit ranges from lower Upper Devonian (Frasnian) through Famennian strata to Lower Mississippian. The fossiliferous shales and siltstones of New Mexico give way eastward to the black shales of the West Texas and Anadarko basins, and in turn to the cherts and novaculities of the Ouachita-Marathon foldbelt.

The limited extent of preserved Silurian over the Texas craton and in the continentward side of the Ouachita-Marathon belt, plus the different biota of the west Texas Silurian compared with that of the Arbuckle Mountains Niagaran, may be considered evidence that the Silurian seas were more restricted than either the Ordovician or Devonian and probably did not cover the Texas craton. It appears probable that the Lower and Middle Devonian carbonate deposits never reached very far west into trans-Pecos Texas. Their faunas are correlative eastward, and Devonian this old is not known across southern New Mexico and Arizona. However, eastward from west Texas both the older Devonian and Woodford deposits may have been continuous over the Texas craton with thicker depositional areas south and west of the Llano uplift and north of the later Red River-Wichita uplift. Faunas of both Lower-Middle and Upper Devonian (Woodford) sequences permit fairly good correlation from the Ozarks all the way west to New Mexico.