nificantly than the compressional transit time—a fact which is consistent with the observations. We thus conclude that shear-to-compressional transit time ratio measurements provide a method for estimating variations in the sand-shale ratio of a formation.

MCELVANY, RICHARD A., Stephen F. Austin State Univ., Nacogdoches, TX

Depositional Environment of Eocene Queen City Formation in East Texas

Lithostratigraphic correlation of the Eocene Queen City Formation in Anderson, Cherokee, and Upshur Counties reveals three distinct facies indicative of a clastic shoreline environment: (1) flood-tidal delta, (2) lower shoreface and shelf, and (3) coastal barrier-island complex. These facies were identified on the basis of diagnostic physical structures.

The Eocene flood-tidal delta in Cherokee County is dominated by landward-dipping (northwest) foreset beds. This delta probably formed at the mouth of a microtidal estuary and was affected by storm processes and tidal currents. Lower Queen City shoreface and shelf structures are found in northern Cherokee County revealing the enigmatic feature of hummocky cross-stratification. These undulating sets of low-angle cross-beds are commonly affected by storm-wave processes and indicate a fairly shallow fairweather wave base during their Eocene deposition. Exposures of the Eocene coastal barrier-island complex in Upshur County reveal a regressive sequence with a back-barrier coastal marsh at the base. Successively overlying the coastal marsh are lagoon, coastal mud flat, tidal channel, and bayhead-delta facies. Preservation of the vertical succession of these facies beneath the transgressive Weches formation implies continued subsidence and sedimentation.

MCGOOKEY, D. A. and R. T. BUDNIK, Bur. Econ. Geology, Univ. Texas, Austin, TX

Tectonic History and Influence on Sedimentation of Rhomb Horsts and Grabens Associated with Amarillo Uplift, Texas Panhandle

The Amarillo uplift consists of an en echelon series of fault blocks separating the Anadarko basin from the Palo Duro basin. The uplift is part of a northwest-southeast zone of basement weakness that extends from the Wichita Mountains in Oklahoma to southeastern Colorado.

Initial faulting, related to the opening of the southern Oklahoma aulacogen, took place from late Precambrian through Middle Cambrian time. Renewed movement in the Late Mississippian or Early Pennsylvanian, probably of a left-lateral transcurrent nature, broke the Amarillo uplift into a series of rhomb grabens and rhomb horsts. The Lefors basin, for example, in Gray County is a small rhomb graben 4 mi (6.4 km) by 8 mi (12.8 km) that contains in excess of 4,000 ft (1,200 m) of Pennsylvanian and Wolfcampian arkose ("granite wash"). The Amarillo uplift continued to subtly affect depositional patterns following its burial in Wolfcampian time.

Salt beds in the Clear Fork Formation (Leonardian) are purer and thicker in grabens where salt deposition proceeded at a faster rate relative to horsts. Recurrent motion on the Potter County fault in northern Potter and northeastern Oldham County produced cumulative displacements of 1,600 ft (488 m) on top of the Pennsylvanian, 800 ft (244 m) on Wolfcampian strata, 600 ft (183 m) on top of the Clear Fork Formation, and 450 ft (137 m) on the Dockum Group (Triassic). Post-Permian displacements are the result of both salt dissolution and minor structural movement. There is no direct evidence for Quaternary faulting, although the uplift is seismically active.

MCKNIGHT, CLEAVY L., Baylor Univ., Waco, TX

Structural Evolution of the Guadalupe Mountains, South-Central New Mexico and West Texas

The Guadalupe Mountains of south-central New Mexico and west Texas occupy a unique physiographic and structural position. Physiographically, the mountains lie on the boundary between the block-faulted Basin and Range province to the west and the stable Great Plains province to the east. Structurally, the mountains form the northwestern margin of the Delaware basin, a prolific petroleum-producing region.

A combination of field observation, subsurface correlation, and map and photo interpretation has revealed four important phases in the complex structural evolution of the Guadalupe Mountains and adjacent Delaware basin.

Pennsylvanian to Early Permian (Wolfcampian) faulting and folding created the Huapache monocline and initially defined the limits of the Delaware basin.

Permian flexing and differential subsidence accentuated the shelf-to-basin transition and resulted in deposition of the prograding carbonate shelf sediments now exposed in the Guadalupe Mountains.

Late Cretaceous to early Tertiary (Laramide) deformation created the Carlsbad and Guadalupe Ridge folds, a series of anticlines and synclines in the eastern mountains.

Late Tertiary (post-Ogallala) to Pleistocene uplift and tilting brought the mountains to essentially their present configuration. The western border of the uplift is defined by Basin and Range-type normal faulting, whereas the eastern margin is both faulted and monoclinally folded. Minor faulting has been active into Holocene time.

MCLEAN, RICHARD, and DAVID W. STEARNS, Univ. Oklahoma, Norman, OK

Fault Analysis in Wichita Mountains

Analysis of a large population, but small displacement, fault array in the Wichita Mountains of southern Oklahoma strongly supports the hypothesis of left-lateral wrench faulting as a major tectonic control for the region. Middle Cambrian granites make up most of the exposed core of the Wichita uplift. Because these granites were implaced prior to the development of the Anadarko basin structures, they should reflect Anadarko tectonics. In addition, the granites would have behaved in a brittle manner so that abundant faulting is practically the only mechanism of deformation within them; this permits uncomplicated structural analysis. Offset and trend measurements were made both in the field and from aerial photographs, and the collective data show statistically significant groupings with respect to trend and sense of shear. The fault fabric is consistent with a left-lateral wrench system that trends N70°-80°W, but also contains strong elements of the entire Riedel system (R, R′, and P shears). In addition to the wrench motions indicated by the analysis of small displacement faults, there is also a large component of vertical displacement in the region. A fault system known as the Wichita front, separates the Wichita uplift from the Anadarko basin and has 9 km (5.5 mi) of differential vertical relief across a zone 10 to 20 km (6 to 12 mi) wide. The relationship between the lateral and vertical motion is essential in understanding the types and distribution