
PERMIAN BASIN/MID-CONTINENT EXPLORATIONISTS

Permian Basin and Mid-Continent Exploration Meeting Tuesday, October 16, 1990 5:30 p.m. - Westin Oaks

The second dinner meeting of the Houston Geological Society Permian Basin and Mid-Continent group will feature an exciting talk by Michael T. Roberts and David L. Read. The results of the Interest Survey from the first meeting will be reported and there will be an opportunity for recommendations from those attending.

Michael T. Roberts will present his highly acclaimed paper, *Geology of the Cottonwood Creek Field, Carter County, Oklahoma*.

Reservations must be made by Friday, October 12, 1990, by calling Margaret at Houston Geological Society before 4:00 p.m. Dinner is \$20 and no-shows will be billed.

GEOLOGY OF THE COTTONWOOD CREEK FIELD CARTER COUNTY, OKLAHOMA

In late 1987, the Cottonwood Creek field, Carter County, Oklahoma, was heralded by flows of nearly 4,000 BOPD and 3 MMCFGD from the upper Arbuckle Group. The field structure is part of the buried Criner uplift along the southwest flank of the Ardmore basin. The uplift formed during a Late Mississippian/Early Pennsylvanian episode of bidirectional thrusting (northeast and southwest) probably related to convergent strike-slip faulting. The basic field structure formed as a northeast-directed thrust plate, cored with Arbuckle Group carbonates and cut by a backthrust. The Cottonwood Creek anticline was near the crest of the uplift. It was erosionally denuded of its Simpson through Caney cover and karsted to depths of at least 1600 ft. Subthrust strata include the Woodford source rocks.

In the Middle to Late Pennsylvanian the uplift was buried by clastics (about 8,000 ft. thick over Cottonwood Creek). Culminating in the late Pennsylvanian, a second episode of wrench faulting sliced through the Criner uplift. About 3 mi. of left-lateral slip occurred on this Criner-Healdton fault, which also dropped the anticline about 3,000 ft. relative to the block to the south, completing the trap at Cottonwood Creek field.

Fourteen wells have found oil in the anticline over an approximately 2.5 by 0.5 mi. area. The oil column is at least 900 ft. thick. Eight of the wells tested for 1,200-3,700 BOPD plus associated gas from a complex of fractures, Brown Zone dolomite, and karst-enhanced porosity in the West Spring Creek and Kindblade formations.