

## **SOUTHERLY VERGENCE ASSOCIATED WITH NORTHERLY DIRECTED THRUSTS OF THE OUACHITA MOUNTAINS OF OKLAHOMA**

NIELSEN, Kent C., and YANG, Qinming, Programs in  
Geosciences, The University of Texas at Dallas, Box  
688, Richardson, Texas 75083-0688

Regional stratigraphy, structure, and geophysical surveys outline large-scale northerly directed thrusts characterizing the late Carboniferous deformation of the Ouachita Mountains in Oklahoma. Yet within the oldest rocks of the Broken Bow uplift southerly verging structures dominate. The Broken Bow uplift has been subdivided into four structural domains: Hochatown Dome, Carter Mountain anticlinorium, Linson Creek synclinorium, and Cross Mountain anticlinorium. Detailed mapping indicates a history of progressive deformation in which four phases have been described. The earliest folds are tight, overturned, southerly verging and associated with a well-developed slaty cleavage. These folds are documented as far north as the Linson Creek synclinorium. Second generation folds are best preserved in the southern part of the uplift where the folded slaty cleavage is apparent. These folds are coaxial with the first generation, are open to tight, are inclined revealing southerly vergence. Faults are also associated with the second generation folds. In the south these faults dip toward the north and in the north they dip towards the south, forming a fan like distribution. Third phase structures are interpreted to be related to flattening of the succession, producing recumbent buckles, pencil structures, and a rough cleavage. The fourth phase is associated with a crenulation cleavage development and a family of open, nearly upright northeast-trending folds. A model involving initial basin shortening is proposed to explain the first generation folds. Subsequent detachment and translation of this deformed sequence is believed to have produced the second and third generation structures. The structural fan is interpreted to be associated with the emplacement of the Boktukola fault to the north and consequently associated with the regional northerly directed thrusting.