dynamic interpretations of fracture and fault assemblages are to be found in Cloos,[82] Dawson-Grove,[83] Price,[84] Harris et al.,[85] Muehlberger,[69] and Donath.[86]

Melton's reconnaissance study of the fracture systems in the Ouachita Mountains and Central Plains of Oklahoma[87] can be used to illustrate how dynamic inferences are made from geometric data. The geology of the area is sketched in Fig. 15. In general the intensity of the deformation decreases northwestward from the Ouachita Mountains through the Open Fold zone to the nearly flat-lying strata of the Central Plains. Melton measured the attitudes of fracture sets in outcrops distributed throughout this region (Fig. 16). He concluded

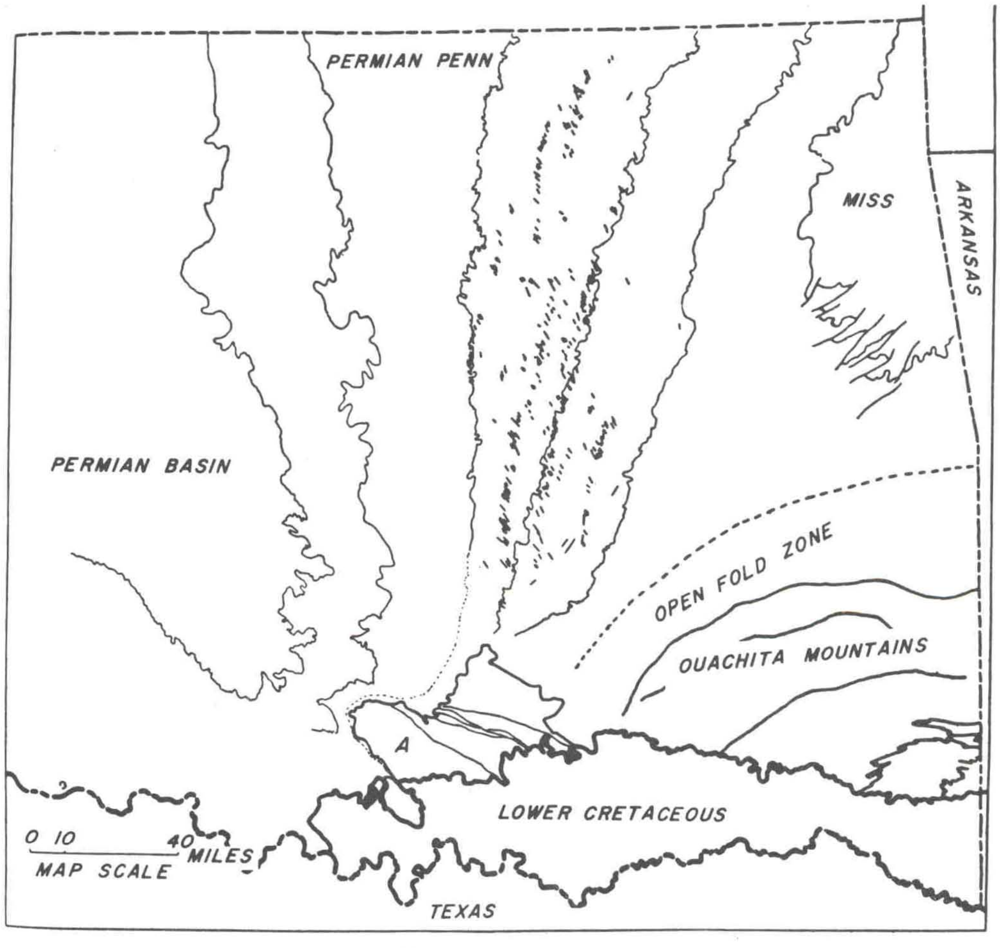

Fig. 15—The major structural units of Oklahoma. The Arbuckle Mountains (A), the Ouachita Mountains, the Permian (Anadarko) Basin, the Mississippian rocks of the southwestern part of the Ozark Dome, and the "belts" of en échelon faults in the Central Plains are shown (from Melton, Ref. 87, Fig. 1).

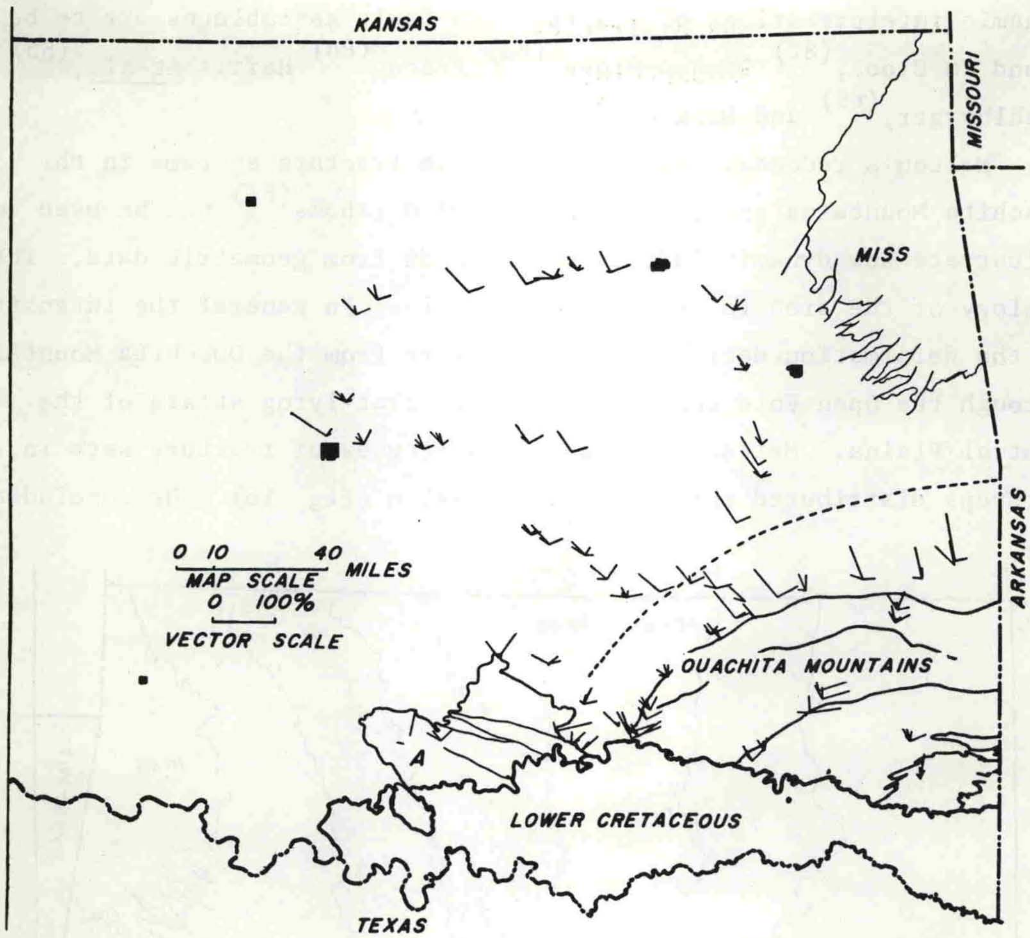

Fig. 16—Fracture trends in southeast Oklahoma shown with the bedding at each station unfolded to the horizontal position (from Melton, Ref. 87, Fig. 3). The length of each line is proportional to the number of fractures at that station with the indicated strike.

that (1) the prominent systems in the Central Plains radiated in a fan-like manner from the Ouachita Mountains and originated from the forces of the Ouachita orogeny, (2) the Ouachita Mountains were probably formed after the Middle Permian, and (3) the short faults of the en échelon belts east of Oklahoma City (Fig. 15) correlated closely in strike with the dominant fracture set in the Central Plains, thereby tying their genesis to the Ouachita Mountain orogeny more closely than was theretofore recognized.

If the fracture array at each station (Fig. 16) is examined closely, one can distinguish individual elements of a four-set pattern (Fig. 17). This pattern is repeated throughout the region, even though