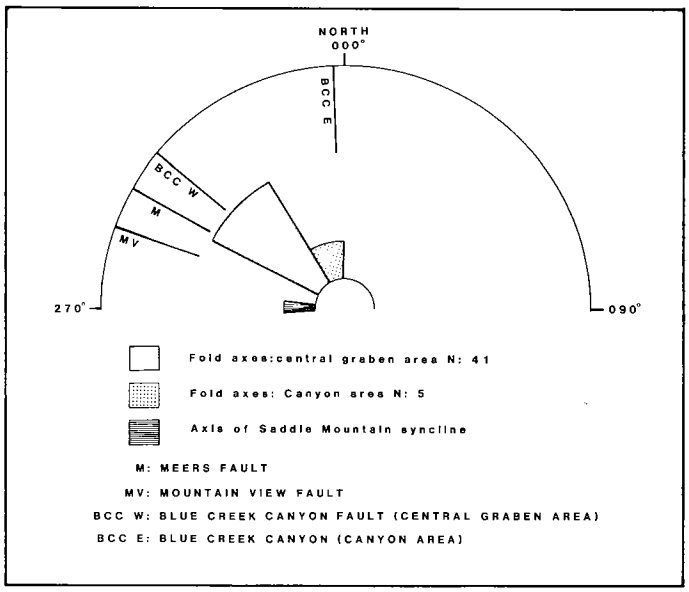

Figure 67. Synopsis of trends of major structures in the area.

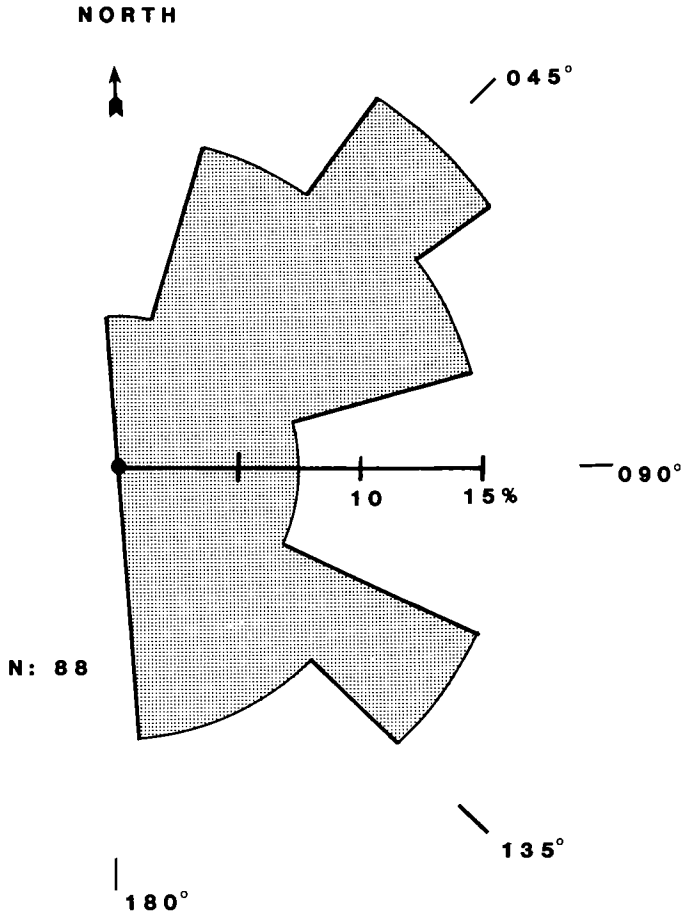

Figure 68. Joint directions in granitic terrain 5 miles west of Meers (replotted from Miller, 1981).

Oklahoma. Thus, it is probable that a principal stress oriented N. 40° E. is of local significance only. If the Meers Fault is considered to be a reverse fault involving simple vertical displacement, a regional maximum principal stress oriented N. 20° E. is indicated.

Recent work (Brewer, this guidebook) has shown that the Meers and Mountain View Faults are thrusts of considerable magnitude, involving basement, that have moved the Wichita Mountains block over the southern margin of the Anadarko Basin. This interpretation is consistent with the analysis of crustal shortening discussed above.

An alternative model is one that involves left-lateral wrench movement on principal faults in the region (Pruatt, 1975; Wickham, 1978). If theoretical resolutions of stress for this model are applied, the maximum principal stress was oriented at about N. 80° E. Studies of major wrench-fault zones (for example, Groshong and Rodgers, 1978) indicate that a common element of the basic wrench pattern is *en-echelon* folds inclined at a low angle to the wrench zone. Such fold patterns and related phenomena have been recognized in the Arbuckle Mountains, and certainly occur in parts of the Lawtonka Graben (Wickham and others, 1978). However, there is some difficulty in applying this model to all folds in the Lawtonka Graben; in particular, the Saddle Mountain Syncline (one of the principal folds in the graben) shows a variation in trend that could be consistent with either left- or right-lateral movement (figs. 46, 66, 67). Furthermore, this model cannot account for the deep-seated thrusting that occurs at depth on the Meers and Mountain View structures (Brewer, this guidebook).

It is now pertinent to discuss the anomalies in structural trend associated with the Blue Creek Canyon Fault (see above). The simplest interpretation of these anomalies is that, in this area, the fault is a high-angle reverse structure involving movement of the Blue Creek Canyon Horst over the Lawtonka Graben. This movement postdates folding in the graben and, as a result, folds adjacent to the fault have been distorted. In particular, fold limbs are disturbed, truncated, and steepened nearer to the fault. Furthermore, both a decreasing stratigraphic throw to the north and a consistent northwestward plunge are consequences of reorientation of fold-axis trends from N. 50° W. to N. 20° W. (fig. 69). The maximum principal stress required for this movement is a vector from approximately N. 80° E. This stress could have induced left-lateral wrench movement on both the Meers Fault and the "nonanomalous" Blue Creek Canyon Fault.

Conclusions

The preferred interpretation of pre-Permian structure in this region involves two stress orientations. An early compression, oriented N. 20° E. and more or less at right angles to the Southern Oklahoma Aulacogen, produced folding along N. 50° W. axes, particularly in the Lawtonka Graben, and substantial thrust movements along major bounding faults. Subsequently, compression oriented N. 80° E. produced