



Figure 63. View northward along axis of north-plunging anticline (described in fig. 62), showing upward passage from sharp-crested anticline (Z) to a structural terrace (U) and bifurcation of original fold into anticlines X and Y. Note localized disharmony (D).



Figure 64. Minor second-order fold in Cool Creek limestone. Structure plunges northward. Note cleavage in bed H.

spicuous flattening parallel to cleavage. Ratios of flattening indicated by these pellets vary from 2:1 to 5:1, that is, similar to values obtained from bed-thickness ratios (see above).

Interpretation of the Structure

The study area coincides with part of the hinge between the eastern part of the Lawtonka Graben and the Blue Creek Canyon Horst (Harlton, 1951, 1963, 1972). The southern boundary of the Lawtonka Graben is the Meers Fault.

All major folds and faults in this area trend between N. 5° E. and N. 30° W., whereas over most of the graben area the majority of the folds trend N. 50° W. (fig. 66). This latter direction is more or less parallel to the Blue Creek Canyon Fault as mapped in the subsurface to both the north and south of Blue Creek Canyon (Havens, 1977) (fig. 67). However, this trend is about 10° north of the Meers Fault trend.

Anomalous Trend of Blue Creek Canyon Fault

Sudden deflections in fault trends are usually of interest because they may afford insights into the

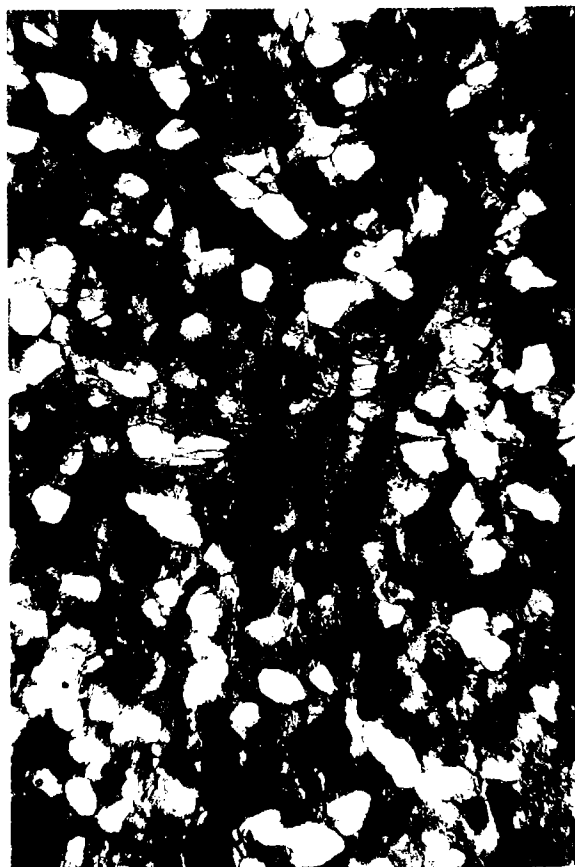


Figure 65. Axial-plane cleavage in axis of minor second-order anticline. Rock is a silty pelsparite in Cool Creek Formation. Bedding is horizontal, cleavage perpendicular. Note how pellets (dark areas) are flattened in plane of cleavage, whereas quartz grains are shattered along tension cracks perpendicular to cleavage (cracks are sparite-filled). Ordinary light; view 2 × 1 mm.

geometry. In the Blue Creek Canyon area, the following departures from regional attitude are noted (figs. 66, 67):

1. The fault trend changes from N. 50° W. to north.
2. Axes of first-order folds trend N. 20° W. as opposed to N. 50° W. elsewhere in the Lawtonka Graben and Blue Creek Horst.
3. Fold limbs steepen toward the fault. As a consequence, the axial planes of the folds adjacent to the fault dip to the east, whereas folds elsewhere are upright.
4. Northwestern fold plunge is consistent in direction close to the fault and less so elsewhere.
5. Cleavage is developed close to the fault but is rare elsewhere.

In addition, fold limbs are truncated by the fault, and field observations show that the fault is a high-angle reverse structure. It is worth noting that, although the Oklahoma Geological Survey (Havens, 1977) connects the fault that crops out in Blue Creek Canyon with faults in the subsurface north and south of the canyon, there is no direct field evidence to support this interpretation.