

Bogen, N. L.; Girty, G. H.; Hanson, R. E.; Merguerian, Charles; and Schweickert, R. A., 1980, Contrasting styles of deformation during the Nevadan Orogeny, Sierra Nevada, California.

Our structural studies of areas from the lower Kings River to the Northern Sierra reveal a major contrast in behavior between pre-Nevadan metamorphic terranes and Mesozoic slate-graywacke and volcanoclastic sequences during late Jurassic and Cretaceous orogenesis. The upper Jurassic Mariposa Formation has been tightly to isoclinally folded, penetratively cleaved, and reached chlorite grade during the Nevadan Orogeny, and also contains sets of weaker structures that may not occur in the older terranes to the east. Tobisch and others (1977) have documented similar penetrative structures in Mesozoic pyroclastic rocks in the Ritter Range pendant. Pre-Nevadan structures in the Calaveras and Shoo Fly Complexes in Tuolumne County are characterized by penetrative, ductile fabrics and isoclinal folds in amphibolite grade rocks. In the Shoo Fly north of I-80, pre-Nevadan fabrics consists of folds and faults and locally a ductile shear zone in chlorite to zeolite (?) grade rocks.

In both the Calaveras and Shoo Fly Complexes, Nevadan and younger structures are domainal and non-penetrative solution, slip, crenulation, and fracture cleavages and open, conjugate folds. Locally, where Nevadan structures parallel earlier fabrics, the older structures have been reactivated. Despite the contrasts in style, the Jurassic and Cretaceous structures have similar orientations throughout the entire range. The major contrasts in response of the older deformed "basement" and Mesozoic rocks during the Nevadan tectonism is the result of differences in mechanical behavior. We suggest that strain hardening and dewatering had already occurred in the pre-Nevadan terranes, while Jurassic rocks may have undergone compaction and dewatering during the orogeny.

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