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Extensional Tectonics in the Great Basin: Bristol Range Thrust, Pioche District, Nevada, an Example?

Reexamination of 'low angle' normal (listric) faults in the Great Basin and the advent of COCORP sections has led to a widely held concept of extensional deformation in the Basin and Range calling upon widespread, detachment surfaces at depth, low-angle normal faults at intermediate depth and 'regular' normal faults at shallow depths. Offsets on the detachment surfaces are thought to involve tens of miles. Those on the listric faults several miles and those on the normal faults in thousands of feet. As this concept has gained support, the decollements described by Misch and his students in the 1950's have generally been reinterpreted as tensional detachment surfaces. Other features described as major landslides or normal faults in blocks tilted subsequent to faulting have been reinterpreted as listric faults. This new synthesis, however, does not readily explain all field relationships, and critical description and evaluation of field relationships is still required.

The Bristol Range 'Overthrust', apparently a decollement or detachment surface, is exposed in two separate thrust slices in the northern part of the Bristol Range. These slices consist of large blocks of Ordovician to Silurian rocks ranging from a few yards to more than 1000 feet across. Although separated from one another by fractures and having random, slightly differing attitudes, stratal units in each sheet appear in normal succession in a shaken, but coherent, structural frame. Plastic deformation and hydrothermal alteration are absent. In the West Range, rocks assigned to the 'overthrust block' mostly consist of repeated, attenuated and thoroughly brecciated Ordovician stratal sequences in normal order. An interbedded 'megabreccia', however, closely resembles the 'thrust slices' of the Bristol Range and there is an interbedded lens of undeformed volcanic sandstone.

The Bristol Range 'Thrust' appears to be an accumulation of debris resulting from repeated landslides derived from an uplift in and east of the present Bristol Range. The rocks of the 'Thrust' exposed in the West Range apparently invaded an intermontane basin in which sediments accumulated during the intervals between sliding events. I have no satisfactory explanation for the repeated sequences of brecciated and attenuated Ordovician rocks in the West Range.

These events occurred subsequent to eruption of Oligocene rhyolitic rocks in the West Range and preceded the faulting delineating the present mountain ranges. Rocks tentatively assigned to the Pliocene Panaca Formation overlap the slide debris in the West Range.