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**Pennsylvanian sinistral strike-slip reactivation history of basement faults at the southwest
boundary of the Uncompahgre uplift, Ancestral Rocky Mountains**

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Late Paleozoic basement fault systems separate the Ancestral Uncompahgre uplift from the Paradox basin on the southwest. A thick, late Paleozoic clastic succession (Pennsylvanian-Permian Hermosa and Cutler Groups) fills the basin and borders Precambrian basement rocks on the Uncompahgre uplift. Several subparallel, east-striking faults of the southwestern boundary system are exposed in the Laramide San Juan dome. Part of the system of faults is within the late Paleozoic fill of the Paradox basin, and synsedimentary fault movement is documented in Pennsylvanian stratigraphy.

Along the east-striking Snowdon fault, stratigraphic separation and vertical separation within the Pennsylvanian Hermosa Group decrease abruptly westward along strike, and the fault ends westward along strike in the crest of a chevron-like, symmetric anticline. The large-scale geometry, splay faults, and horses of diverse stratigraphy combine to indicate strike-slip displacement. In Pennsylvanian strata in the northern (downthrown) fault block, northwest-plunging folds diverge from the fault in a geometric pattern that indicates sinistral strike-slip. Near where the Snowdon fault ends westward in the chevron-like, symmetric anticline, upward-diverging splay faults define a flower structure. At the present outcrop level, no strata younger than Pennsylvanian Hermosa Group are preserved along the Snowdon fault.

Local angular discordances within the Hermosa Group on both sides of the Snowdon fault indicate fault movement and growth of the associated anticline during Pennsylvanian deposition. On the block north of the fault, measured stratigraphic sections and map tracing of successive units within the Hermosa Group document progressive southward thinning of the succession toward the fault, consistent with synsedimentary growth of the flower-structure anticline during Hermosa deposition. Successive stratigraphic units of sandstone, shale, and limestone can be traced toward the fault, and the traceable units converge in stratigraphic thickness in that direction. Outcrop quality is not sufficient to discriminate between angular unconformities at several levels and progressive thinning of several stratigraphic units; nevertheless, the interval thickness decreases by ~40% within a distance of 600 m toward the Snowdon fault. A similar convergence of sedimentary units is shown by an angular unconformity on the block south of the Snowdon fault on the south limb of the flower-structure anticline. The angular discordance is coincident with the dip of the south limb of the anticline. Stratigraphic thinning and angular discordance on both limbs of the flower-structure anticline along the Snowdon fault are consistent with synsedimentary progressive growth of the anticline, implying progressive strike-slip displacement on the fault. Geometry of structures along the Snowdon fault indicates sinistral strike-slip during Pennsylvanian time.

In addition to the thinning and angular discordance along the Snowdon fault, sedimentary slump structures in the vicinity indicate slope instability and/or seismic shock. A set of asymmetric to isoclinal folds in a thin interval of sandstone-mudstone beds demonstrates slump-

slide adjacent to the Little Molas Lake fault (north of and parallel with the Snowdon fault). The folds have amplitude of ~1 m and wavelengths of a few meters. The folded beds are underlain and overlain by shales that conform to the larger scale dip. In other outcrops, local disharmonically slump-deformed beds are exposed near fault traces. The sedimentary slumping might have been driven simply by depositional slope on a delta front; however, the sandstone-shale succession is interlayered with laterally extensive, relatively thin shallow-marine limestone beds that indicate very low depositional slopes. Local steepening of slopes by structural movement and/or seismic shock are more likely causes of the sedimentary slumping.

Successive reactivation of the southwest-boundary faults of the Uncompahgre uplift is indicated by juxtaposition of contrasting Precambrian rocks beneath the sub-Cambrian unconformity and by stratigraphic variations in Cambrian to Mississippian stratigraphic units. The stratigraphic record in the Pennsylvanian Hermosa Group indicates sinistral strike-slip reactivation of the old basement faults during Ancestral Rockies deformation.