GEOLOGY OF THE WHITE PINE MOUNTAINS ALONG HIGHWAY 50, EASTERN NEVADA

1999 GEOLOGY FIELD CAMP Department of Geology Humboldt State University, Arcata, CA, 95521

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Paleozoic formations mapped, all marine, include crinoidal grainstones and wackestones of the Joana Limestone (Mississippian), mixed siliciclastics of the Antlerland-derived Chainman and Diamond Peak Fms (Mississippian), carbonate mudstones, wackestones and grainstones of the Ely Limestone (Pennsylvanian), and carbonate mudstones (with craton-derived quartz silt), wackestones and grainstones of the Arcturus Fm (Permian). Diamond Peak coarse clastics exhibit both graded bedding and cross-bedding. Tertiary units include basal red siliciclastics interpreted as fanglomerates, succeeded by finely laminated and interbedded white, tuffaceous calcareous lacustrine sandstone and mudstone of the Sheep Pass Fm. Younger volcanic and volcaniclastic rocks include several ignimbrites, basalt and basaltic andesite flows and dikes, vitrophyre flows and a variety of airfall tuffs, epiclastic sandstones and lahar-emplaced diamictites. At least three generations of Quaternary fan deposits are present.

Unconformable relations suggest that Paleozoic formations were folded prior to deposition of basal Tertiary sediments. Folds trend north-south, have wavelengths of one half to several km, vary from open and generally upright to tight with east-vergent axial surfaces, and plunge moderately both to the north and south. The tightest structures, on Antelope Mt. and the southern half of Joana Ridge, exhibit fault-propagation fold geometry with overturning to the east. A strange mesa (Efin Mesa), at the north end of Joanna Ridge, exhibits excellent fault-bend fold geometry with east-west trending cross faults separating the two folding styles along the ridge. East-northeast trending normal faults crosscut Tertiary formations, and in turn are crosscut by north-south trending normal (Basin & Range) faults, some of which offset Quaternary fans. On the southern flanks of Joana Ridge, dense varicolored jasperoid is developed along the Joana-Chainman Fm contact. However, on Efin Mesa extensive coeval (?) silicification of flat-lying Diamond Pk. (Newark Valley sequence?) calcareous chert pebble conglomerate, breccia and guartzose sandstone suggests that the zone of alteration migrated nainman/Diamond Peak clastic wedge. The fault-bend fold geometry of the mesa suggests that here a decollment is stepping up from a deeper horizon to the Pilot Shale, which stratigraphically underlies the Joana Limestone.

Bibliography

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115 22' 30"

Joana Ridge

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