Age and Regional Significance of Marine Triassic Rocks at O’Neil Pass, Northeastern Nevada

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ABSTRACT

More than 900 m of Lower and Middle Triassic marine rocks was examined along the O’Neil Pass Road in the northeastern Snake Mountains of Elko County as part of a regional conodont biostratigraphic study in northeastern Nevada. The basal 313 m of the tripartite sequence measured here disconformably overlies Permian strata, and consists of resistant conglomerate lenses interbedded with calcareous siltstone containing exotic blocks and a few thin limestones. These rocks record episodes of rapid, chaotic sedimentation in a basin or slope environment. A thick interval (512 m) of laminated, calcareous siltstone overlies the basal unit. The uppermost 68 m consists of carbonate interbedded with siltstone, recording basinal sedimentation that extended into the earliest Middle Triassic (Anisian). About 200 m of younger Triassic rock is present near the measured section.

Based on conodont collections, the lower 305 m of the section is of Smithian (middle Early Triassic) age. This fauna consists primarily of Neospathodus waageni and N. pakistanensis. An Anisian (earliest Middle Triassic) fauna consisting of Neogondolella timorensis unaccompanied by neospathodid species was recovered from a limestone 890 m above the base of the succession. This fauna is significant because it records the first unequivocal evidence of marine Middle Triassic rocks in the Cordilleran miogeocline of the western United States. In addition to providing biostratigraphic information, the color alteration index of the conodonts indicates that the sedimentary rocks in this area were subjected to temperatures from 190° to 300°C.

Acceptable stratigraphic nomenclature for Lower Triassic units has not been established for some areas of northeastern Nevada, including the O’Neil Pass locality, because age-diagnostic fossils are rare and lithologies vary laterally. The dominant lithology near O’Neil Pass is calcareous, argillaceous siltstone that resembles the older Triassic Dinwoody Formation to the northeast and east, rather than the age-equivalent, carbonate-rich Thaynes Formation that overlies the Dinwoody. Detailed work establishes that distribution of the lower Lower Triassic (Griesbachian-Dienerian) Dinwoody Formation is restricted to northeasternmost Elko County, Nevada. South and west of this area, younger Triassic rocks of Smithian age, which lithologically resemble the Dinwoody, disconformably overlie Permian rocks.

Conglomerates and large blocks of Permian strata associated with contorted siltstones in the lower part of the O’Neil Pass section are evidence that a significant positive feature was in close proximity to this depositional area during the Smithian. This uplift may be regional in extent, and could be part of a continuous barrier that restricted the Dinwoody sea from spreading westward. An east-west structure, possibly the Cortez - Uinta axis, restricted the Dinwoody sea from flooding southward from northeasternmost Nevada and adjacent western Utah.