Genetic Relationship between Lower Mesozoic Continental Strata of the Colorado Plateau and Marine Strata of the Western Great Basin: Significance for Accretionary History of Cordilleran Lithotectonic Terranes

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INTRODUCTION

The purpose of this paper is to point out a basis for establishing a sediment-source relationship between Lower Mesozoic strata of the Auld Lang Syne Group in northwestern Nevada and the Chinle Formation of the Colorado Plateau (Fig. 1) and to discuss the implications of this relationship for interpreting the age of nonmarine strata of the western interior and the accretionary history of Cordilleran lithotectonic terranes.

Strata of the Auld Lang Syne and Chinle are, respectively, shallow- to deep-marine deposits formed along the Late Triassic continental margin and nonmarine red beds representing the upper part of an extensive alluvial plain. A genetic relationship between these widely separated sets of rocks was postulated previously. Silberling and Wallace (1969, p. 40) suggested that the derivation of the large volume of terrigenous clastic sediments within the Auld Lang Syne Group in northwest Nevada was by river "drainage from some large portion of the eastern Great Basin, . . . Colorado Plateau, and Rocky Mountain provinces." Supporting this conjecture, Poole (1961, p. 140), Stewart et al (1972, p. 76), O'Sullivan (1977, p. 145), and Lupe (1977, p. 369), among others, demonstrated strong westward to northwestward fluvial transport during Chinle deposition that would have carried sediment from the region into Nevada. Although a genetic relationship between the Auld Lang Syne Group and Chinle Formation is thus reasonable, demonstration of such a relationship has remained elusive because the principal exposures of these two rock units not only represent exclusively different depositional settings but also are about 500 km (310 mi) apart (Fig. 1). Moreover, combined with the almost total absence of outcropping Upper Triassic strata within the intervening region of the eastern Great Basin, nothing else about the geologic record in this region provides evidence for inference about its Late Triassic paleography.

Recently, however, well-defined depositional cycles in the Chinle Formation of east-central Utah have been...