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The Stratigraphy and Depositional Environments of the Jurassic Gypsum Spring and Sundance Formations, Sheep Mountain Anticline Area, Big Horn County, Wyoming

The Sheep Mountain anticline, between Lovell and Greybull, Wyoming, allowed three-dimensional control for studying the Jurassic Gypsum Spring and Sundance Formations. The Gypsum Spring Formation in this area is composed informally of lower, middle and upper members. The lower member is an interbedded sequence of red shale and gypsum, which ranges in thickness from 40 feet to 120 feet. The middle member is a cyclic sequence of variegated shales, mudstones and wackestones. The upper member is a red shale unit.

The contact between the underlying Upper Triassic Chugwater and the Gypsum Spring Formation is unconformable as evidenced by an erosional surface on which the Gypsum Spring was deposited.

The Gypsum Spring is overlain by the Sundance Formation which can be divided into an "upper" and "lower" member in the Sheep Mountain anticline area. The "lower" Sundance is predominantly green shale with some limestone-shale interbeds near the Gypsum Spring-Sundance contact and again near the contact between the "lower" and "upper" Sundance. The limestones range from mudstones through oolitic packstones with many of the packstones containing fossils. The "upper" Sundance is also a predominantly green shale unit. Toward the top of the "upper" Sundance are beds of glauconitic sandstones which grade upward into fossiliferous limestones.

The deposition of the Gypsum Spring was greatly influenced by paleohighs, specifically the Belt Islands and the Sheridan Arch. The lower member was deposited in a restricted basin. The middle and upper members were deposited as a result of subsequent deepening and freshening of the Jurassic seas.

The Sundance was deposited in an open marine environment, with channel-filling fossiliferous limestones and shoaling sequences.