

THE AGE AND ENVIRONMENT OF THE CROW CREEK MEMBER, PIERRE SHALE (LATE CRETACEOUS), CROW CREEK SIOUX INDIAN RESERVATION, CENTRAL SOUTH DAKOTA, UNITED STATES

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The Crow Creek Member of the Pierre Shale of central South Dakota has received notoriety as being the result of a tsunami associated with a meteor impact in adjacent Iowa. This event, the Manson Impact, has been cited as the source of this light-colored calcareous unit interbedded within thick units of black shale members. Interestingly, two light-colored units, informally termed the upper and lower Crow Creek units, occur in the Big Bend area of Crow Creek Indian Reservation near the type area. The upper Crow Creek unit is characterized by a basal ferruginous sandstone overlain by a yellow-brown marl. This unit has been considered by others to represent the Crow Creek Member in areas where only a single unit occurs. Reptilian assemblages appear to dramatically change at about the Crow Creek interval. Samples were collected throughout the Crow Creek units and studied in order to explain and date this change more precisely. Calcareous nannofossils were found in both units, but are particularly abundant in the upper Crow Creek unit. Determination of the ages have been constrained by the first occurrence of *Ceratholithoides aculeus* near the base of the lower Crow Creek Member, indicating a late early Campanian age, and the first occurrence of *Quadrum trifidum* near the top of the upper Crow Creek Member, indicating an early late Campanian age. The presence of *Braarudosphaera bigelowi*, *Gartnerago*, and *Kamptnerius*, from the upper part of the unit would normally suggest shallow water, associated with a marginal marine setting or restricted marine environment.