

Setting Time Limits on the Deposition and Erosion of Cambrian and Ordovician Strata in the Western Canada Sedimentary Basin

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Cambro-Ordovician strata in the Western Canada Sedimentary Basin represent a highly discontinuous record of deposition and erosion through about one hundred million years of Earth history. Detailed work in the subsurface of Alberta, Saskatchewan and Manitoba has elucidated correlation of Cambrian and Ordovician strata throughout the region.

The lowest Cambrian strata (the “basal sandstones” of the Sauk II sequence) are not fossiliferous and their age remains enigmatic. The oldest biostratigraphically diagnostic fossils are from the Stephen Formation of Middle Cambrian, *Bathyriscus - Elrathina* Trilobite Zone, age. Late Cambrian inarticulate brachiopods from the Deadwood Formation in Alberta and Saskatchewan and provide valuable correlations in the Deadwood Formation. The upper Deadwood Formation is well correlated on the basis of conodonts, with four widely correlative zones recognized, and the uppermost beds have been shown to be of varying latest Cambrian or Early Ordovician age. Evidence for more extensive Lower Ordovician strata is recorded by reworked conodonts in the basal Devonian.

A gap of about 40 million years separates the top of the Sauk sequence from the Tippecanoe sequence. Although the age of the Winnipeg Formation remains enigmatic in Saskatchewan, detailed correlations are available for Upper Ordovician strata in the Williston basin area. The Red River, Stony Mountain and Stonewall formations are correlated from Alberta to Hudson Bay based on conodont biostratigraphy. Conodont paleoecology combined with Neodymium isotopic studies provides new insight into interbasinal correlation. Detailed studies have pinpointed the Ordovician - Silurian boundary to within a few centimetres in several sections of the Stonewall Formation.