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Inferring Stratigraphic Position of Fossil Vertebrates from the Niobrara Chalk of western Kansas

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ABSTRACT

The stratigraphy of the Smoky Hill Chalk Member of the Niobrara Chalk of western Kansas is well understood as a result of the work of Hattin (1982) and Stewart (1988). Marker units identified by Hattin (1982) allow quick determination of the stratigraphic position of a specific outcrop. This study demonstrates that it is now possible to determine the stratigraphic positions of specimens from locality data, thus permitting one to infer stratigraphic position of specimens collected long ago. This technique is particularly useful in the upper half of the Smoky Hill Chalk Member, where biostratigraphy is not informative. The stratigraphic distribution of the type skulls of the pterosaur *Pteranodon* is examined as an example of the procedure, which in turn demonstrates that the procedure can have the power to reject hypotheses. Inferring stratigraphic positions of fossil vertebrates may be useful in further studies of the large collections of fossil vertebrates from the Smoky Hill Chalk Member. In addition, examination of the stratigraphic distribution of outcrops of the Smoky Hill Chalk Member in western Kansas suggests that most of the fossil vertebrates collected from the member came from a rather restricted stratigraphic interval between Marker Units 15 and 20.

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