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Review of *The Hell Creek Formation and the Cretaceous-Tertiary Boundary in the Northern Great Plains: An Integrated Continental Record of the End of the Cretaceous* Edited by Joseph H. Hartman, Kirk R. Johnson, And Douglas J. Nichols

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BOOK REVIEWS

The Hell Creek Formation and the Cretaceous-Tertiary Boundary in the Northern Great Plains: An Integrated Continental Record of the End of the Cretaceous. Edited by Joseph H. Hartman, Kirk R. Johnson, and Douglas J. Nichols. Boulder, CO: Geological Society of America, 2002. vi + 520 pp. Maps, figures, tables, references, index. \$120.00 paper.

The Hell Creek Formation (especially near the Fork Peck Reservoir and the Cedar Creek Anticline in east-central Montana) has been extensively studied over the years to evaluate changes in terrestrial floras and faunas across the Cretaceous-Tertiary (K-T) boundary. The research found in this volume, however, contains important new data from the lesser-studied eastern outcrop area of western North Dakota, South Dakota, and nearby areas, along with new analyses of data from the well-studied areas around Fort Peck Reservoir. The compilation of new research is based on years of field studies that, for the most part, have not been published. This large and handy reference, therefore, provides in one place a synthesis of data currently known about the Hell Creek and should fuel further research on North American terrestrial and marine conditions at the end of the Cretaceous.

The volume presents well-supported data documenting changes in organisms (macrofossils, palynomorphs, mollusks, insects, and vertebrates) throughout the Hell Creek in a detailed stratigraphic framework including lithological, paleomagnetic, and chemostratigraphic studies. In addition, the information provides strong control on the placement of the K-T boundary in the areas studied.

Among the volume's most interesting highlights is its contention that the Cretaceous Western Interior Seaway, rather than being absent during Hell Creek time, was present just east of the present erosion-controlled eastern margins, influencing its deposition—as evidenced by several marine incursions and laterally equivalent lignite zones. Another is that palynologic and paleomagnetic data support the idea that a systematic time-transgressive younging of the Hell Creek-Fort Union contact occurs as one goes from east to west. Moreover, using magnetostratigraphic data, researchers estimate a duration of either 1.36 or 2.5 million years for Hell Creek deposition, and more precisely date the K-T boundary at 65.51 million years ago. In addition, palynological, paleobotanical, insect, and mammalian data support major floral and faunal changes at the K-T boundary. Furthermore, occurrences noted by researchers of common dinosaur taxa demonstrate

their presence throughout the entire Hell Creek, except in a well-known roughly two-meter-thick zone at the top. **Russell J. Jacobson**, *Illinois State Geological Survey*.