

J. John Sepkoski Jr. (1948–1999)

Paleontologist J. John (Jack) Sepkoski Jr. died May 1st, 1999 of sudden heart failure. He was 50. Sepkoski's death represents a tremendous loss to paleontology. His research and activity in the profession played a major role in reshaping the discipline during the last twenty-five years. By the late 1980s, he was already so influential and well known that nearly everyone in the paleontological community referred to him simply as 'Jack'. During the 1980s and 1990s, there were many professional meetings of paleontologists in which every speaker showed one of Jack's diversity curves. He was not only a brilliant scientist but also a devoted mentor and teacher.

Jack Sepkoski was born July 26, 1948, in Presque Isle, Maine. He had a desire to become a paleontologist from the time he began fossil collecting and building model dinosaurs at the age of 10. He earned his B.S. degree from the University of Notre Dame in 1970 and his Ph.D. from Harvard University in 1977, working with Bernhard Kummel and Stephen Jay Gould. His Ph.D. research was on the Upper Cambrian stratigraphy and paleontology of South Dakota, Montana, and Wyoming, and he developed his interests in global diversity and mathematical modeling while still a student. He often attributed the success of his diversity research to Kummel's impressing upon him 'the importance of accurate stratigraphy'. He taught at the



University of Rochester from 1974 to 1978, then at the University of Chicago from 1978 until his death. In 1988, he lectured in Warsaw at the Polish Academy of Sciences, where he was elected a foreign member in 1997. His other awards included the Charles Shuchert Award of the Paleontological Society (1983) and the medal of the University of Helsinki (1997).

Sepkoski generously served the paleontological profession throughout his career. He was president of the Paleontological Society from 1995 to 1996, co-editor of *Paleobiology* from 1983 to 1986, associate editor of *Paleobiology* from 1987 to 1989, and from 1996 a member of the editorial board of *Acta Palaeontologica Polonica*. Jack was of Polish origin and had many friends and colleagues in Poland. One of the contributions of which he was most proud was his founding of the *Paleontological Society International Research Program*, or *PalsIRP*, the Society's program for assisting paleontologists in Eastern Europe and in the former Soviet Union. His family have asked that donations in his honor be made to *PalsIRP*, c/o Dr. Thomas W. Kammer, Treasurer, Paleontological Society, Department of Geology and Geography, West Virginia University, P.O. Box 6300, Morgantown, WV 26506-6300.

Sepkoski's major contributions included documenting and analyzing large-scale patterns of origination and extinction, major changes in the diversity of life over time, and the environmental and ecological context of biotic diversification. His work was marked by meticulous collection of data on a monumental scale and by an interplay between mathematical modeling and rigorous, insightful data analysis. He had a rich sense of what he called the 'natural history of data', how the ecological and evolutionary properties of different groups, the quirks of their fossil record, and the habits of their monographers, combined to yield synoptic, global signals in the data.

His research on taxonomic diversity included the description of global diversity patterns through the Vendian and Phanerozoic in the context of simple demographic models. He showed that the long interval of low diversity followed by a Cambrian burst is consistent with the expectation of exponential growth, suggesting that our attention should be focused not exclusively on the Cambrian trigger but also on the preceding events. He found that, despite biases in the fossil record, different measures of diversity show concordant patterns. His other work on overcoming paleontological bias included the analysis of taxonomic survivorship, the measurement of paleontological completeness, and the evaluation of major stratigraphic gaps implied by the molecular clock hypothesis.

Sepkoski decomposed the global diversity pattern for marine animals into the 'Three Great Evolutionary Faunas', assemblages of higher taxa that show correlated histories of diversity. He showed that the successive faunas, Cambrian, Paleozoic, and Modern, are characterized by successively lower rates of origination and extinction. He used a simple model to show that the observed onshore-offshore transition of the three faunas is consistent with known differences in taxonomic turnover rates among the faunas and among environments. He also described the diversity of the three faunas in terms of a coupled logistic model interrupted by mass extinction episodes. He later explored rigorous ways of testing for large-scale competitive replacements in the history of life.

Sepkoski's work on extinction, much of it carried out with Chicago colleague David M. Raup, documented the decline in background extinction rate through the Phanerozoic and the apparent 26-million-year periodicity of mass extinctions through the last half of the Phanerozoic. The periodicity hypothesis helped to prompt a major research program on extinction events and on possible links to extraterrestrial phenomena. Although the mechanism for periodic extinctions is still unknown, the statistical analyses have withstood repeated attacks over the years. Toward the end of his life, Sepkoski focused more on rates of origination in order to determine whether documented rates of speciation would be adequate to offset present-day rates of anthropogenic extinction.

Jack Sepkoski is survived by his wife, Christine M. Janis; his son, David Sepkoski; his father, Joseph J. Sepkoski; two sisters, Carol Sepkoski and Diane Karl; and his former wife, Maureen Meter. Jack will be sadly missed by hundreds of friends, students, and colleagues around the world.

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