

THE GREAT PALEOZOIC CRISIS: LIFE AND DEATH IN THE PERMIAN. *The Critical Moments in Paleobiology and Earth History Series.*

By Douglas H. Erwin; Series Editors: David J. Bottjer and Richard K. Bambach. Columbia University Press, New York. \$55.00 (hardcover); \$26.00 (paper). xi + 327 p.; ill.; index. ISBN: 0-231-07466-2 (hc); 0-231-07467-0 (pb). 1993.

In all the brouhaha over the mass extinction at the Cretaceous-Tertiary, it's easy to lose sight of the fact that the Permo-Triassic extinction is indeed, as Erwin says, "The mother of mass extinctions" (p. 223). With estimates of species-level extinction at 96%, the Permo-Triassic well exceeds the 76% extinctions of the end-Cretaceous. So why has there been so little focus on the biggest extinctions of all time? As Erwin explains, the fossils are often poorly preserved and little studied, the key outcrops are in remote and often politically unstable places, and correlations necessary for establishing the timing of the extinctions are still uncertain.

Erwin's introduction is a mix of historical perspective and a primer on stratigraphic principles. This will satisfy neither historians nor stratigraphers, but it is sufficient for establishing some common background for the rest of the book. The first chapter then sets the stage, but it's a crowded one: evolutionary faunas, guilds, the quality of the record, cladistics, Pangea, and climate. If you don't know any of this, it might be overwhelming; if you're an expert, it will appear superficial. But a book as ambitious as Erwin's is bound to run into such trouble. You can't please everyone and still keep within 330 pages.

In Chapters 2 through 7, Erwin hits his stride with informative reviews of boundary sections, marine and terrestrial groups, paleogeography, climate, and geochemical environmental indicators. The bibliographies alone are worth the price of the book. The next two chapters consider the hypotheses and models that have been offered to explain the extinctions. Erwin is fair-minded and thorough, but doesn't hesitate to say what he thinks.

The book not only considers the causes of this great extinction, but also discusses the consequences. How did this extinction shape the subsequent history of life? The evolutionary effects of extinctions are important, yet the topic has been too little studied. This book will help.

Erwin writes in an informal, engaging, and sometimes flip style. While this might annoy readers expecting a more scholarly tome, his approach makes the ideas and information accessible to a wider audience.

This book will be a major stimulus to research on Permo-Triassic extinctions. Erwin has done an excellent job of assembling a vast and difficult literature, and has performed a major service by focus-

ing attention on unresolved problems and promising hypotheses. This inexpensive book should fuel many graduate seminars, bring teachers up to date, and move research in productive directions.

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## MOLECULAR BIOLOGY

UNRAVELING DNA.

By Maxim D. Frank-Kamenetskii; translated by Lev Liapin. VCH Publishers, New York. \$24.95. ix + 205 p.; ill.; no index. ISBN: 1-56081-617-1. 1993.

Forty years after the discovery of the structure of the DNA molecule by Watson and Crick, Frank-Kamenetskii's *Unraveling DNA* is published in an updated and revised English version. For the past ten years, this book has already had immense success in the former Soviet Union. This success is easy to understand when looking at the way the book is written. The different chapters can be read independently, allowing the reader to skip some chapters and to focus on others.

The first chapter retraces the history of the discovery of the DNA molecule. Anecdotes and Russian humor make this part of the book as lively as a novel. The ensuing chapters go into the details, among other topics, of the DNA structure, gene organization, and the genetic code, and are very informative for the more demanding reader. Those persons interested in the philosophical and ethical implications of the field will be drawn to the chapters on the hazards and hopes of genetic engineering, and on DNA and cancer. Forty years after the elucidation of its structure, the DNA molecule has retained all its magic, and this book will fascinate anyone interested in its development. In *Unraveling DNA*, Frank-Kamenetskii gives a personal answer to Schrödinger's most famous question, "What Is Life?": Life is the DNA molecule.

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