

ably inevitable that some aspects of the presentation will not please everyone. For example, a laudable effort to emphasize the geologic pacing of the Cambrian Explosion could be read to imply that nothing interesting happened during this interval. Nevertheless, these and other objections are minor, and they are more than compensated by the clear prose, abundance of excellent figures (many of them newly drafted), and extremely reasonable pricing of this volume, all of which make it easy to recommend with enthusiasm.

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**EPIGENETIC PRINCIPLES OF EVOLUTION: WITH EMPHASIS ON DEVELOPMENTAL MECHANISMS OF EVOLUTIONARY CHANGE IN METAZOANS.**

By Nelson R. Cabej. *Dumont (New Jersey): Albanet Publishing.* \$89.00 (paper). xviii + 880 p.; ill.; taxonomic and subject indexes. ISBN: 978-0-9710746-8-2. 2008.

This book takes a stance on evolution that goes beyond natural selection and the Modern Synthesis to incorporate the emergence of new forms through epigenetic processes, which are referred to as the “user” of the “genetic toolkit.” It is a massive volume—880 pages—written by someone who appears not to be in academia, but who nonetheless possesses extensive knowledge of the subject.

The volume is separated into five parts. The first part, Epigenetic Basis of Metazoan Heredity, discusses the role of control systems in the determination of phenotypic traits, gametogenesis, and early development. Part Two, Neural-Developmental Premises of Evolutionary Adaptation, describes the physiological and behavioral responses to environmental change. The next part, Epigenetics of Circumevolutionary Phenomena and the Mechanism of the Evolutionary Change, considers intragenerational and transgenerational developmental plasticity. Part Four, Epigenetics of Metazoan Evolution, discusses the evolution of metazoan control systems and the computational origins of evolutionary novelty. The final part, Epigenetics of Speciation in Metazoans, examines the role of epigenetic mechanisms in allopatric and sympatric speciation.

Despite its length, the book remains focused on presenting the evidence without theorizing extensively about implications or philosophical issues surrounding the reported findings. I would have been interested to see research on non-Darwinian views on the origin and evolution of very early life

(e.g., recent work by Woese and colleagues), but this is not included. Population issues are also not addressed; the emphasis is squarely on developmental mechanisms of evolutionary change.

In summary, *Epigenetic Principles of Evolution* provides a convincing, comprehensive compilation of evidence for the importance of epigenetic processes in metazoan evolution. I recommend it.

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**HOW LIFE BEGAN: EVOLUTION'S THREE GENESES.**

By Alexandre Meinesz; translated by Daniel Simberloff. *Chicago (Illinois): University of Chicago Press.* \$27.50. viii + 282 p. + 8 pl.; ill.; index. ISBN: 978-0-226-51931-9. 2008.

The essence of this book is to elucidate three geneses in the evolution of life, constrained by four types of chance events. The different geneses are the emergence of the first bacteria and their preeminence, the emergence of the first animal and plant cells, and the emergence of multicellular organisms. The fortuitous contingencies driving the story were genetic mutations, genetic recombination via sexual reproduction, natural selection, and cataclysmic events, thus combining the ideas of Charles Darwin and Stephen Jay Gould.

The story is well told and documented. The book also contains several interesting developments, such as admiration by the author for Vermeer's painting *The Astronomer*, which depicts Antoni van Leeuwenhoek. However, several semantic aspects may puzzle readers—for example, the sentence: “It [the book] covers the origin of the major stages in the elaboration of life” (p. 3). Is it appropriate to call “geneses” steps in a continuum? Should “the elaboration of life” be understood as modern life? Chapter 2, entitled On the Origin of Life on Earth, describes prebiotic chemistry (two pages), the oldest vestiges of life (five pages), and panspermia and the so-called Martian nanobacteria in ALH84001 (17 pages). Obviously, the chapter heading does not reflect the content.

This book is well written and well illustrated with pictures and cartoons. It is easy to read and will be of interest to anyone with elementary knowledge of biology. Unfortunately, readers who will purchase the volume only on the basis of the title will probably feel frustrated when discovering that just two pages are dedicated to the origin of life in a book entitled *How Life Began*.

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