Ichthyology Transformed

Interrelationships of Fishes. MELANIE L. J. STIASSNY, LYNNE R. PARENTI, and G. DAVID JOHNSON, Eds. Academic Press, San Diego, 1996. xiv, 496 pp., illus. $84.95 or £65. ISBN 0-12-670950-5.

Were C. Tate Regan and David Starr Jordan to step down from the pantheon of ichthyology, they would recognize few landmarks on today's map of fish classification. There would be unrecognizable names, and even familiar ones would represent unfamiliar and seemingly bizarre groupings; minnows would be seen closest to herrings and eels to tarpons. Although concepts had been changing, the paradigm shift that produced this result can be dated from the publication of "Phyletic Studies of Teleostean Fishes, with a Provisional Classification of Living Forms" by P. H. Greenwood, G. S. Myers, D. S. Rosen, and S. H. Weitzman (*Bull. Amer. Mus. Nat. Hist.* **131**, 339–446 [1966]). The ferment introduced by this paper, mixed with the discipline of the cladistic method, was instrumental in the production of the influential 1973 book *Interrelationships of Fishes* (P. H. Greenwood, R. S. Miles, and C. Patterson, Eds.; Academic Press). The editors of the present book view theirs as building on that foundation. (It is therefore curious that they cite neither work in their preface.) Of the 15 contributors to the earlier *Interrelationships* (each of whom authored a chapter), four are represented in the present one. As a sign of the times, the 16 data chapters are the work of 31 authors. Four chapters are devoted to the phylogeny of recent elasmobranchs. Perhaps the conclusion most surprising (and accessible) to the nonspecialist will be that "shark" is descriptive only of a body shape; dogfish, for example, are more closely related to the manta ray than to the white shark (De Carvalho, chapter 3). The remaining chapters with one exception deal with non-acanthomorphs (thus complementing the contents of the volume "Proceedings of the Symposium on Phylogeny of Percomorpha," *Bull. Mar. Sci.* **52**, no. 1, 1–620 [1993]). A chapter on sarcopterygians by Cloutier and Ahlberg among other things convincingly demonstrates that tetrapods are most closely related to the osteolepiforms, not the dipnoiforms, but that lungfishes, not the coelacanth, are the closest living relatives of tetrapods. Grande and Bemis review the fossil and extant sturgeons and define and delimit the Chondrostei. De Pinna presents a cogent discussion of the evidence for teleost monophyly, much of which will gratefully be incorporated into my lecture notes. Johnson and Patterson define the Euteleostei as a major group, and remove the Ostariophysi from it. Other chapters cover most of the pre-percomorph groups. They vary in scope and detail, but none are less than excellent. The conclusions are based on detailed morphological analysis, although molecular data are judiciously used when available. This is a volume written by specialists, for specialists, and will profoundly affect the nature of future hypotheses of fish phylogeny. However, the nonsystematic ichthyologist, let alone the physiologist or behaviorist in search of guidance, may become lost in a welter of unfamiliar names and morphological detail. All chapters, however, have summaries, a few perfunctory, most informative, and most discussions provide explicit hierarchical classifications as well as cladograms. Anyone needing to understand the evolutionary relationships of fishes will find the information and conclusions in this volume essential. Interpretations may change, but the information presented here will be permanently useful.

This volume is an excellent example of the adage "you can't judge a book by its cover." The cover illustration is of a school of perciform fishes, which are not the subject of any chapter. The caption of the inset photo has the middle and bottom photos reversed, and *Parasudis* is misspelled. Fortunately, the contents, if not the cover, are worth the price.

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Browsings

Circular Dichroism and Linear Dichroism. Alison Rodger and Bengt Nordén. Oxford University Press, New York, 1997. x, 150 pp., illus. $60 or £29.95. ISBN 0-19-855897-x. Oxford Chemistry Masters, 1.

Introducing a series of books, edited by Richard G. Compton, Stephen G. Davies, and John Evans, "designed to provide clear and concise accounts of important topics—both established and emergent—that may be encountered by chemistry students as they progress from the senior undergraduate stage through postgraduate study to leadership in research."

Ethnomathematics. Challenging Eurocentrism in Mathematics Education. Arthur B. Powell and Marilyn Frankenstein, Eds. State University of New York Press, Albany, 1997. xxii, 440 pp., illus. Paper, $22.95. ISBN 0-7914-3352-8. Reform in Mathematics Education.

Eighteen reprinted papers in which mathematics educators and others discuss the origins of mathematics, styles of mathematical problem-solving in different cultures, and social and cultural aspects of mathematics education.

Exploring Genetic Mechanisms. Maxine Singer and Paul Berg, Eds. University Science Books, Sausalito, CA, 1997. xxii, 674 pp., illus. $86.50. ISBN 0-935702-70-9.

The authors of an earlier textbook, *Genes and Genomes* (see *Science* **254**, 1664 [1991]), bring together 15 other experts in various fields to provide "case studies" of specific genetic systems representing "the enormous variety of biological mechanisms used to convert genotypes into successful organisms."

Introduction to Mesoscopic Physics. Yoseph Imry. Oxford University Press, New York, 1997. xiv, 234 pp., illus. $49.95 or £37.95. ISBN 0-19-510167-7. Mesoscopic Physics and Nanotechnology.

An exposition for physicists, chemists, and optical and electronic engineers of the "rather young branch of science" that deals with the properties of systems of matter intermediate in size between the molecule and the "bulk."

Life in the Ancient Near East, 3100-332 B.C.E. Daniel C. Snell. Yale University Press, New Haven, CT, 1997. xviii, 270 pp., illus., + plates. $30 or £21. ISBN 0-300-06615-5.

A social and economic history, addressed to lay readers, of the area encompassing Mesopotamia, Egypt, Israel, and Anatolia "from the beginning of writing to the coming of Alexander the Great."

No Other Gods. On Science and American Social Thought. Charles E. Rosenberg. Second edition. Johns Hopkins University Press, Baltimore, 1997. xxiv, 311 pp. $48.50, ISBN 0-8018-5608-6; paper, $16.95, ISBN 0-8018-56-8-6.

A 1976 collection of historical essays on themes of eugenics, medicine and public health, and agricultural research, reprinted with a new preface and three additional chapters addressing more recently emergent issues, including the influence of Thomas Kuhn and the current "science wars."

The Rain Forests of Home. Profiles of a North American Bioregion. Peter K. Schoonmaker, Bettina von Hagen, and Edward C. Wolf, Eds. Island Press, Washington, DC, 1997. xvi, 431 pp., illus., + plates. $50, ISBN 1-55963-479-0; paper, $27, ISBN 1-55963-480-4. Based on a conference, near Vancouver, BC, Canada, Aug. 1994.

Fifteen papers describing aspects of the ecology and environmental history of a coastal area stretching roughly from Anchorage, Alaska, to San Francisco, California, along with brief accounts of 22 specific conservation initiatives within the area.