

errors. The few photomicrographs reproduced in the book would have benefited from being published on glossy paper. In summary, it presents a broad spectrum of data and opinions of molluscan evolution and clearly sets the challenges and benchmarks for the next century of molluscan systematics.

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*Interrelationships of Fishes*. M. L. J. STIASNY, L. R. PARENTI, AND G. D. JOHNSON, eds. Academic Press/San Diego/1996. xiii + 496 pp., illustr., systematic index, US \$84.95 (ISBN 0-12-670950-5).

In 1973, at the dawn of the era of modern phylogenetics, the Linnean Society of London published the results of a symposium on the interrelationships of fishes. The book of that name has been one of the most influential works on fish phylogeny published this century; it set the stage for modern phylogenetic research on fishes. The special character of the 1973 *Interrelationships of Fishes* was the diagnosis of many higher clades of fishes for the first time by synapomorphies. Prior to that book, our understanding of fish phylogeny, while greatly advanced by an influential paper published seven years earlier by P. H. Greenwood and co-authors, still lacked traits to characterize major clades. Many purported clades, instead of being characterized by shared derived traits, were variously described by evolutionary trends, qualitative character descriptions, or simply by general agreement. Many of the papers in that 1973 volume have become classics in fish phylogeny, and initiated a search for characters ushering in a more quantitative era in ichthyological systematics. Perhaps more importantly, many of the hypotheses raised in 1973 represented bold challenges to previous notions and greatly stimulated a new and broader thinking about the interrelationships of fishes.

With a predecessor of such influence, it can well be imagined that any attempt to follow with a new, 1996 version of *Interrelationships of Fishes* might suffer by comparison. And, given the enormous progress that has been made over the last 25 years, it is perhaps unfair to expect that a new volume could match the impact of its antecedent. But there is still much that is not known about the relationships among major clades of fishes, and this new book makes a substantial contribution to key areas of controversy.

This edited collection is fittingly dedicated to Colin Patterson, who has made so many outstanding contributions to our understanding of fish interrelationships. It summarizes the relationships within major clades of fishes and generally follows the format of the 1973 book in considering each major clade in a separate chapter. More speciose clades such as chondrichthyans and ray-finned fishes are treated in multiple chapters, while an overview of basal sarcopterygian interrelationships concludes the book. The majority of the text is devoted to the major clades of ray-finned fishes (Actinopterygii), and while

many current views are reaffirmed (such as monophyly of the teleost, euteleost, and osteoglossomorph clades), there are several new suggestions and reevaluations that emerge. Lecointre and Nelson, for example, present evidence that the Clupeomorpha (herrings) and Ostariophysi (milkfishes, catfishes, characins, minnows, and gymnotids) are sister taxa. Johnson and Patterson provide a scathing evaluation of past work on the relationships of lower euteleostean fishes and suggest a new, better-supported phylogeny in which esocids (pikes) are the sister taxon to the neoteleost fishes. The Euteleostei is a major clade of ray-finned fishes that has been supported in the past only by weak evidence, and a fundamental contribution of this volume is the presentation of convincing synapomorphies for this clade and the interrelationships of some of its basal members. Each chapter in this book contains new evidence for fish relationships, presents character data in a manner that provides a clear foundation for future phylogenetic work, and hence marks the most coherent picture of the interrelationships of fishes available to date.

Not surprisingly, however, some areas of fish interrelationships still lack strong support, and several major groups (such as the large clade of percomorph teleosts) are barely treated here. Sarcopterygian intrarelationships seem to be an area of near perpetual controversy (although the chapter by Cloutier and Ahlberg shows that considerable progress has been made). And I do not regard the present view of the interrelationships of the major basal clades of extant teleost fishes as well established; further work may well cause a reassessment of how osteoglossomorph, clupeomorph, elopomorph, and euteleostean fishes are related to each other.

Given these uncertainties, there clearly is room for a third volume on the interrelationships of fishes sometime in the future. Such a volume would benefit from a greater inclusion of molecular data, as most chapters in this book address molecular evidence only peripherally. In addition, a new book on fish interrelationships would benefit from chapters devoted to an overview of relationships within major clades, with evidence for monophyly presented before detailed analyses of individual groups; such an organizational schema would also benefit non-ichthyological readers. For example, in this volume an analysis of asipenseriform (sturgeon) relationships is preceded by a presentation of batoid (ray) relationships without an intervening overview of the Actinopterygii as a whole. In this light, the chapter on teleostean monophyly is particularly successful as an entree into the subsequent nine chapters on individual teleost clades.

Progress over the last 25 years in our understanding of fish interrelationships has been substantial, and this volume provides a clear marker of just how far we have come. If the next quarter century is as productive as the last, our understanding of fish interrelationships will provide a solid foundation on which comparative biologists of all kinds can frame their investigations of diversity.

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