

LITERATURE REVIEWS

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THE SEARCH FOR RELATIVES

THE EARLY EVOLUTION OF METAZOA AND THE SIGNIFICANCE OF PROBLEMATIC TAXA. 1991. A.M. Simonetta and S. Conway Morris (eds.). Proceedings of an International Symposium held at the University of Camerino, Italy, 27-31 March 1989. Cambridge and NY: Cambridge University Press. 296 p. Cloth, \$69.95.

Reviewed by L. J. Gibson, Geoscience Research Institute

Evolutionists have spent a great deal of effort attempting to determine the interrelationships of the invertebrate phyla. This effort has been plagued by difficulties, but the quest continues. The present book contains much of interest for those concerned with the question of invertebrate interrelationships. The book is a symposium volume containing 24 different articles ranging in length from a single paragraph on Cambrian medusiforms (Sun Weiguo) to a 56-page discussion of Paleozoic arthropods (Simonetta & Delle Cave). The latter paper contains a large number of excellent drawings of reconstructions of the animals. The book's emphasis is fossils, but a phylogeny of recent invertebrates based on ribosomal RNA sequences is included (Christen et al.).

The inclusion of different opinions gives the reader opportunity to evaluate opposing arguments and adds to the usefulness of the book. For example, Schram uses the cladistic method to propose a hypothesis of invertebrate relationships, concluding that it may not be correct, but at least is scientific. Simonetta and Delle Cave begin their discussion (p 189) with the statement that "the principles of Hennigian cladism have been falsified and can be largely discounted." Another difference of opinion concerns the relationships of the extinct conulariids. Babcock (p 133) concludes they are an independent lineage with no known rela-

tives, while Van Iten (p 145) groups them with the cnidarians (coelenterates).

Another example concerns evolutionary process. Conway Morris maintains (p 19) that microevolutionary processes are sufficient to explain invertebrate evolution, while Bergstrom (p 25) argues that invertebrate phyla arose by macroevolutionary processes.

Two papers describe the Lower Cambrian Chengjiang fauna. This is a Burgess Shale type fauna recently found in China. Chen & Erdtmann (p 57-76) summarize the fossil biota. Algae are predominant, including a green alga, *Yuknessia*, also known from the Canadian Burgess Shale. The largest group of invertebrates are the arthropods, which include at least two genera shared with the Burgess Shale. The enigmatic animal, *Anomalocaris*, is also shared with the Burgess Shale. The next largest group is the sponges, with 25 or more species known. In addition, the fauna includes medusiforms, sea anemones, priapulid worms, brachiopods, and other types. The other paper, by Hou & Bergstrom (p 179-187), discusses the Chengjiang arthropods. Bivalved arthropods are especially common. Some are tiny, and others are larger. Numerous trilobites and smaller numbers of other groups are also present. The authors comment on the surprising similarities between the Chengjiang and Burgess Shale faunas. The close similarity of the two groups is difficult to reconcile with the great difference in their supposed ages.

Several other topics are considered, such as the relationships of proturan "insects," reef-building sponges, and various groups of problematica. Bernini reports that Lower Devonian mites are so similar to modern species that they give no clue to the origins of the group. Bruton's paper on jellyfish taphonomy is particularly interesting. Using beach and laboratory experiments to study the taphonomy of jellyfish, he determined that dead jellyfish which sink to the ocean floor do not leave identifiable impressions. He concludes that this casts doubt on the interpretation of Upper Precambrian "medusoid" traces as jellyfish.

Overall, the book contains much of interest. I noted a few inconsequential typos, but the book is generally well done. Coverage is uneven, as one would expect from an edited compilation, but there is something in it for nearly anyone interested in invertebrate paleontology.