

This book deals with the origin of the diversity of marine invertebrate animals. A brief review of the early stages in the history of life includes discussions of the time scale of relevant geological periods and of present views of the sequence of corresponding biological evolutionary events. These views on the early history of life are confronted with its documentation in the fossil record. Discoveries of abundant remains of various soft-bodied animals in South Australia have led to similar finds in more than 20 other regions, in rocks which only 25 years ago were regarded as too ancient to contain animal fossils. For the first time an overview of the early diversification of marine animal life is attempted, based not only on conjectures from the living fauna but also on all available fossil evidence. Much of it has been described or critically examined by the author. Transitions to the succeeding assemblages of shell-bearing fossils in Palaeozoic rocks – no longer the oldest known faunas – are discussed in some detail. Adjustments are made to the stratigraphic scale for the time of possibly the greatest impact of evolutionary events on oceans and marine rock strata. The new discoveries lead to the conclusion that the history of our total environment will be better understood when the interactions of the emerging biosphere with the evolution of the atmosphere, the oceans and the crust of the earth become the objects of truly inter-disciplinary studies.

The book is intended mainly for graduate students in evolutionary and marine biology, historical geology and palaeontology (palaeobiology) and their teachers, and for research workers in these fields. It may require no more than introductory (first- and second-year) geology, palaeontology and invertebrate zoology (biology). Readers with general interest in scientific advances in these fields may follow the text with the aid of one or two of the listed dictionaries of scientific terms. It may be used for special honours and postgraduate lecture courses.

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