

Short notes and reviews

The evolution of fossil ecosystems

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Review of: Evolution of Fossil Ecosystems, by Paul Selden and John Nudds, Manson Publ. Ltd., London, UK, 2004, 160 pp., ISBN 1-84076-040-0 (hardback), ISBN 1-84076-041-9 (paperback).

The title of this book is a little misleading. It tries to accomplish its goal of instruction on the evolution of ecosystems by presenting surveys of some of the fossil Lagerstätten localities from around the world. Most fossil localities produce material that preserves hard shell organisms, and sometimes tracks and trails as well. One gets only a limited and rather biased view of past life from these kinds of fossil sites; all the soft-bodied species are generally excluded. However, the saving grace for paleontologists is that they are blessed with a few special localities where virtually whole biotas are preserved. These sites were termed Konservat-Lagerstätten by Professor Adolph Seilacher many years ago. The remarkable thing about these places is that, while they all are characterized by the preservation of a cross-section of most, if not all, the species living in those places in those times, these localities are quite varied in the modes of preservation that achieve this. Nevertheless, these Lagerstätten constitute a series of windows on the past wherein we can catch glimpses of what was living then. Hence, this book is not so much a treatise on paleoecology, but rather is a family photo album of the past.

Contrary to popular belief, there are actually a great many of these Lagerstätten in the fossil record – at least one or more for every geologic period. Furthermore, in addition to the truly comprehensive sites that are most famous, there are often many other localities in these time periods that have the same sort of preservation but for some reason lack the all encompassing diversity of their better known contemporaries. In short, one can spend

one's time in less productive ways than in making a living from the study of Lagerstätten alone.

However, only some 14 of the most famous such sites are included in this book. The chapters are all quite similar in format, and I found this a strong point of the volume. We first get a short section that sets the tone for the geologic period in which the particular Lagerstatt is found, e.g., the Cambrian explosion for the chapter on the Burgess Shale, or the rise of vertebrates in the chapter on the Hunsrück Slate. Then the authors provide a short history of the discovery of the locality itself with an overview of the stratigraphic setting and modes of preservation seen in the fossils of these places. The chapters then go on to provide a survey of the fossils associated with these Lagerstätten. While these surveys are attractively done with lots of illustrations, I really missed more comprehensive overviews in this regard. Each chapter then closes with a summary of the current understanding of the paleoecology of these localities and a very short comparison of the Lagerstatt with other biotas of the time period in question. It is in connection with this last that one gets some hint as to what other Lagerstätten lurk out there in the fossil record. However, a lot is left out. For example, in connection with the Mazon Creek biotas of the Carboniferous we learn about other ironstone concretion localities in the UK and some non-nodule sites in central Europe, but we don't get a mention of the true Lagerstätten of the Carboniferous to be found at Eskdale in Scotland or Bear Gulch in Montana. The famous Solnhofen fossils of Germany are linked with the increasingly famous Liaoning fossils from China, but we miss any comparison to the similarly preserved lithographic limestones of Lebanon. Each chapter closes with a list of some suggested further readings.

All these localities have produced some really spectacular fossils, and the attractive and abundant color photographs in this book provide ample opportunity to see why these sites are so justifiably well known. However, these illustrations are really just frosting on the cake, and the limitations of space unfortunately constrain what the reader is offered. One wishes that the authors had provided more references in the reading lists that could lead the interested reader into the literature on these sites.

It is hard to characterize the book. It is not a complete survey of Konservat-Lagerstätten. Moreover, because of the limited sample of the total array of Lagerstätten in the world, I don't think it provides anything other than a most general overview of the history of life, let alone real insight into the evolution of fossil ecosystems. However, that said, the book is very attractive, with high quality production, sharp clear photos, and colorful and helpful

graphics. The price is very reasonable, so if anyone is looking for a general introduction to the fossil Lagerstätten, you could do a lot worse. However, I think that the people who may most benefit from this book, oddly enough, will be people who already know a fair amount about the subject. These people will know what is not covered in the biota surveys, but will nonetheless be able to use the suggested readings to get more information quickly. The non-expert on fossil Lagerstätten will be able to enjoy the pictures and maybe get a general appreciation for such types of localities.

I have a feeling, and sincerely hope, that future editions of this book will expand on what is included here and thus become more useful not only to the specialist, but perhaps the general reader as well.

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