

## Evolution of Fossil Ecosystems

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Volume 34, Number 3-4, September 2007

URI: [https://id.erudit.org/iderudit/geocan34\\_3\\_4rv01](https://id.erudit.org/iderudit/geocan34_3_4rv01)

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### Publisher(s)

The Geological Association of Canada

### ISSN

0315-0941 (print)

1911-4850 (digital)

[Explore this journal](#)

### Cite this review

Morgan, A. (2007). Review of [Evolution of Fossil Ecosystems]. *Geoscience Canada*, 34(3-4), 155–155.

# REVIEWS

## Evolution of Fossil Ecosystems

Paul Selden and John Nudds

*The University of Chicago Press, 2005*

ISBN: 0-226-74641-0

Price: US\$40.00, Trade Paperback, 192 p.

Reviewed by A.V. Morgan

*Evolution of Fossil Ecosystems* is a well prepared and delightfully illustrated, 160 page paperback that documents various fossil lagerstätten scattered through the geologic record from different parts of the world.

As Earth scientists all of us are — or should be — aware of lagerstätten; peculiarly rich deposits of fossils that have remarkable preservation. The best known Canadian example is the Burgess Shale locality near Field in BC and perhaps the most famous lagerstätten are the deposits near Solnhofen in southern Germany that have produced nine *Archaeopteryx*, “feathered dinosaurs”, over the past 150 or more years.

Paul Seldon and John Nudds, Reader and Senior Lecturer, respectively, in Paleontology at the University of Manchester, England, have taken the view that a close examination of these peculiar deposits allows constructive insights into the evolution of ecosystems through time.

Their method is to describe a number of lagerstätten in moderate detail. The Introduction explains the different types of lagerstätten; for example, the differences between “concentration lagerstätten” (large numbers of individuals in a sequence) and “conservation lagerstätten” (preservation of soft parts of individuals). The argument is made that each lagerstätten

provides a snapshot in time of the ecological assemblage at that location.

The following chapters deal with fourteen different assemblages. Chapter one describes the late Neoproterozoic fauna at Ediacara, South Australia and then in five succeeding chapters Paleozoic lagerstätten, commencing with the Burgess Shale (BC, Canada), the Soom Shale (South Africa), the Hunsrück Slate (Germany), the Rhynie Chert (Scotland) and the Mazoon Creek fauna (Illinois, USA). The Mesozoic lagerstätten assemblages include the Grès à Voltzia sequence (NE France), the Holzmaden Shale (Germany), the Morrison Formation (Western USA), the Solnhofen Limestone (Germany) and the assemblages of the Santana and Crato formations in Brazil. The Grube Messel deposits (Germany), the Baltic amber assemblages (Baltic coastline) and the Rancho La Brea (“tar pit”) sequences in Los Angeles, USA, round out Cenozoic lagerstätten.

I have had the good fortune of visiting many of these sites and I found the approach taken in each chapter to be extremely enlightening. The section usually commences with a general introduction to the site, the location and a brief synopsis of previous work and why the site is important. This is backed up with the stratigraphic setting and the taphonomy of the site, followed by a description of the main elements of the fauna. In turn, this is followed by a site synopsis, a comparison of the site to other similar deposits of allied age and a list of further readings. The text is made readable by many well drafted illustrations in the form of location maps, easily understood stratigraphic diagrams, excellent images of the fossils mentioned and diagrammatic or photo-



graphic reconstructs of the depositional events that led to the formation of the lagerstätten. Additional images of the sites as they exist today and, in some cases, extra photographs of the local areas provide an excellent and informative “aside” to the science.

At the end of the text, the authors provide even more useful information with an Appendix on “Museums and Site Visits”. For example the Burgess Shale Chapter is supplemented by a list (not comprehensive) of “Burgess Shale Museums” that can be visited to look at specimens, a description of where the sites are located, details on how to access them (through the Yoho-Burgess Shale Foundation); brief comments on the severity of the hike, warnings about collecting and contact information. This format applies to most of the other localities in the book.

In summary, “The Evolution of Fossil Ecosystems” is a superb reference and teaching text for university professors dealing with paleontology, and with biostratigraphy. The price is right at \$40 (US). The text is ideally suited for students at second, third and fourth year levels and would make an excellent book for interested amateur collectors and fossil enthusiasts.