



regions of Spain. As noted above, it will also be of use to specialists, notably as a handy introduction to the abundant primary literature on those Spanish dinosaurs and their environments.

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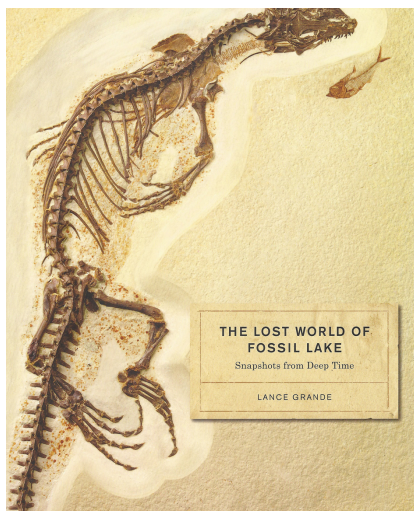
The Lost World of Fossil Lake: Snapshots from Deep Time

Lance Grande. 2013. The University of Chicago Press. 425pp.
£31.50 (hardback). ISBN: 978-0-226-92296-6.

This book focuses on the 52 million-year-old (Eocene) Fossil Butte Member (FBM) of the Green River Formation in Wyoming, USA, providing the earliest comprehensive window on a post-dinosaur contemporaneous community spanning a period of probably only a few tens of thousands of years. The short preface explains how the author, a researcher at the Field Museum of Natural History, Chicago – which holds the most important collection of fossils from this locality – became involved with this deposit. It ends with him hoping the book may attract a few new students to palaeontology. I expect it will attract many.

The preliminary chapters include excellent coverage of the geological history of the deposit, contextualizing the locality, age and depositional environment with reference to proximate fossil localities and the most recent literature. Apparently more than 200,000 fossils are excavated annually, so there is still scope for massive quantitative data collection for palaeoecological studies and for new interesting fossil discoveries. There is a detailed account of the history of the site from the 1870s until the present, including the colourful characters who have worked it and the less than ethical means employed by some of those in competition. I enjoyed the account of the thieves at the visitor centre who had signed the visitor book while ‘casing the joint’ a few days earlier. The conflict between commercial/private collector and scientist is also discussed, but fortunately, FBM seems to represent a case of mutually beneficial equilibrium. The techniques used by the author and his team for excavating fossils are also discussed and well illustrated, followed by a couple of pages explaining how the fossils are prepared for study. The introductory section finishes with a brief explanation of hierarchical taxonomy, phylogenetic trees and the basic rules of nomenclature in order to set the stage for what is referred to as the ‘field guide’ that follows.

The majority of the book (pages 55–350) documents the palaeobiota under the following headings: Bacteria, Arthropods, Mollusks, Vertebrates, Cartilaginous Fishes, Ray-Finned Fishes, Abundance





and Distribution of Fish Species, Tetrapods, Amphibians, Non-Avian Reptiles, Birds, Mammals, Plants, Green Algae, Ferns and Horsetails, Conifers, Non-Eudicot Flowering Plants, Eudicot Flowering Plants, and Trace Fossils. Each section (apart from Bacteria) contains a wealth of information on identification, historical taxonomy, the presumed palaeoecology of the known fossils, extant biodiversity of the relevant groups and their fossil record in general. This entire section contains many exquisite photographs of the fossils. The book includes 221 figures, mostly photographs, of the fossils, and many of the figures include more than one photograph, often of several different specimens. Included are photographs of 25 holotype and five paratype specimens. Some of the remarkable fossils illustrated include a probable mated pair of stingrays, a female stingray with a baby ray curled up inside her, various fishes swallowing other fishes, mass mortality slabs, some huge turtles, and a smaller specimen with evidence of crocodile predation. The photographs include complete skeletons of snakes, a monitor lizard and lots of different birds (some with feathers preserved) and several mammals including some very nice bats. There is also a massive palm frond with a man standing next to it for scale.

The take home message here, other than the great diversity of the palaeobiota, is that some groups (*e.g.* vertebrates) are much better studied than others (*e.g.* insects, arachnids and plants, many of which are figured in this book for the first time). Three undescribed spiders are illustrated for the first time and my suspicions (as a palaeoarachnologist) are that none of them is correctly identified, although the overall superficial morphology resembles that of the proposed families to which they are tentatively assigned. Clearly there is great scope for research on the invertebrate palaeobiota and this book provides a basis for such studies.

In the final pages, the palaeobiota is used to reconstruct the palaeoecosystem within the lake and its surrounding landmass. Various reasons for the numerous regional mass mortalities that have led to this fossil assemblage are proposed and discussed, including: volcanic activity, excessive algal blooms, overgrowth of cyanobacteria, and hydrogen sulphide poisoning from stratified water turnover. The Asian affinities of the palaeobiota are also briefly mentioned. The text culminates with two paragraphs of concluding remarks, a short postscript and the acknowledgments. Six appendices: A – Key to the Major FBM Localities (includes topographic maps); B – Summary List of FBM “Fish” Species; C – Summary List of FBM Bird Species; D – FBM Fossils That Have Been Enhanced, Restored, Inset, or Faked; E – Using This Book and Comments on Bulletin 63; F – Sources of Phylogenies Used in This Book; are followed by a Glossary, References Cited and both taxonomic and subject indices.

It is hard to find fault with this book. One minor quibble is that two new taxa are proposed in the volume: the monotypic family Asterotriginidae, and on p. 169, the new genus *Hypsiprisca*. This is not really the place for new taxonomy, and despite the author’s justification (p. 96) as illustrating some of the concepts of classification, this will be misleading to the novice as the new taxa appear seamlessly within the running text and no formal diagnosis is proposed for the new genus.

In summary, this is a wonderful book. The production is of a very high quality and the copy-editing is excellent. The text is accessible to a broad readership and will be of interest to amateurs and professionals alike. You will not be disappointed if you buy this book.

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