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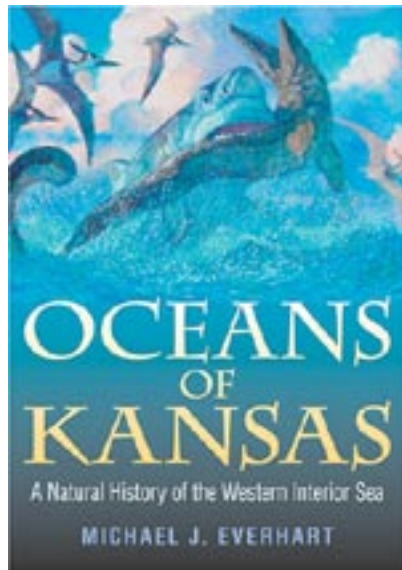
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Oceans of Kansas – a Natural History of the Western Interior Sea

Michael J. Everhart (2005). Indiana University Press, Bloomington and Indianapolis, 322pp. ISBN 0-253-34547-2, \$39.95 (cloth).

Don't go into the water! I'm told that when faced with the unfortunate and rather grizzly event of a shark attack, my best chance of survival comes from calmly and collectedly poking the fishy foe in the eye. But if I were to take a plunge in a Cretaceous ocean, sharks would be just one of many ferocious marine predators I may be attempting to prod in the face. I don't know if the same course of action applies to a fifteen metre long mosasaur, but luckily for keen surfers, these terrors are of course now prehistory. Yet they are not forgotten ... as revealed by Michael J. Everhart in his new book: *Oceans of Kansas – a Natural History of the Western Interior Sea*.

The book was borne out of popular demand. Mike Everhart's website, Oceans of Kansas (<<http://www.oceansofkansas.com/>>) went online almost ten years ago in 1996, yet it remains to this day a valuable and popular online resource for all manner of information on the fossil-bearing rocks of Kansas and the extinct fossil animals they yield. The strength of the website lies in the depth and scope of the material, and particularly in the emphasis on visuals – a picture does, after all,



say a thousand words. “But where is the book?” visitors to the website would ask, and Mike has endeavoured to create one for us. It forms a part of the Indiana University Press’ extensive *Life of the Past* series, edited by James O. Farlow.

Like the website, *Oceans of Kansas* is dedicated to the inhabitants of the depths and shorelines of the Western Interior Sea. This inland sea completely covered what is now known as the state of Kansas during the Late Cretaceous. It stretched across the middle of North America from the Gulf of Mexico in the south to the Arctic Circle in the north, dividing the continent, and formed a home for a wide diversity of marine organisms. The faunal list includes invertebrates, fishes, marine reptiles, pterosaurs and marine birds, which frolicked in these ‘oceans of Kansas’ during the deposition of the Upper Cretaceous, Smokey Hill Chalk Member (the focal point of the book), and the over- and under-lying horizons.

Oceans of Kansas the book occupies a more-or-less empty literary niche. Existing popular literature is sparse with regard to fossil marine reptiles, which form a large proportion of Everhart’s book. Richard Ellis’ (2003) *Sea Dragons – predators of the prehistoric oceans* was the first popular volume dedicated to fossil marine reptiles since Williston’s (c.1914) ‘Water Reptiles of the Past and Present’ (downloadable for free as a PDF from Arment Biological Press (<<http://www.herper.com/ebooks/titles/Water.html>>). Yet, where Ellis interpreted fossil marine reptiles purely as living creatures, Everhart concentrates on the actual fossils too. In this respect, the volume benefits the active researcher by consistently providing institution and specimen numbers, and by figuring fossil specimens.

After an introductory chapter, and a chapter describing the historical discovery of the deposits and the stratigraphy, the book is nicely structured taxonomically as Everhart runs through each of the groups living in and around the ancient oceans. We begin with a review of the invertebrates, plants and trace fossils (chapter 3) and move quickly into the vertebrates – sharks (chapter 4) and fishes (chapter 5). Some of the shark remains belong to the ginsu shark (*Cretoxyrhina*) pictured on the front cover attacking a medium sized mosasaur. The first group of marine reptiles to feature are the relatively rare turtles (chapter 6), followed by the mysterious long-necked elasmosaurid plesiosaurs (chapter 7), the short-necked plesiosaurs (polycotylids and pliosaurs) (chapter 8), and the mosasaurs (chapter 9), including the giant *Mosasaurus* and the durophagous *Globidens*.

Chapter 10 takes us into the sky above the oceans to meet the pterosaurs, particularly the genus *Pteranodon*, and here we stay in part for a look at the flying and swimming toothed birds (chapter 11). The last group of animals are the dinosaurs (chapter 12), of which a few must have been washed out to sea from the surrounding shorelines. The book is neatly tied up in the final chapter (13), ‘the big picture’, which reminds us, this time in a stage by stage setting, of all we have learned.

Each chapter is interlaced with tales of historical and personal discovery, with insights into the excitement of excavation. We are told the more infamous tales from history: the discovery of the first Maastricht mosasaur, Cope’s erroneous reconstruction of *Elasmosaurus* with the head on the end of the tail, and the fish-in-a-fish specimen of *Xiphactinus* for example. But we are also relayed a number of equally binding but less well-known anecdotes: how he has discovered new specimens in the field, how parts of the same specimen have been matched up after many years, and the feud between Williston and Eaton regarding the anatomy of pterosaurs also comes to mind.

The volume comes complete with a gallery of 12 colour plates: a showcase of Dan Varner's palaeoart. These paintings are complemented by many (black and white) palaeo-restorations throughout the text (by Russell Hawley), and succeed in portraying the fauna of the oceans as dynamic living creatures. There are also many useful photographs and scientific illustrations/reconstructions accompanying the text.

Minor flaws (typos and figures without scale bars) are few and far between, and are ultimately of little consequence on the impact of the book. Due to the wide taxonomic diversity covered by this book, I recommend it to anyone with a general interest in marine vertebrate palaeontology, but especially (of course) to anyone with an interest in these deposits in particular, and the organisms they yield. It is also perfect for anyone with an interest in the history of North American palaeontology. *Oceans of Kansas – A Natural History of the Western Interior Sea*, is an informative and enjoyable read and it is certainly a welcome addition to my bookshelf!

Adam Stuart Smith

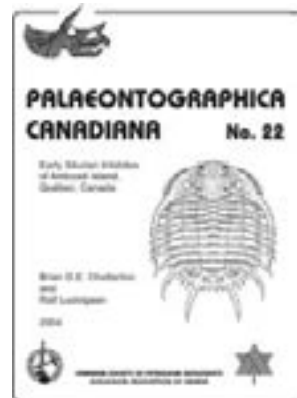
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Early Silurian trilobites of Anticosti Island, Québec, Canada

Chatterton, B. D. E. and Ludvigsen, R. (2004). *Palaeontographica Canadiana* No. 22. Canadian Society of Petroleum Geologists and Geological Association of Canada, Calgary, 264p. ISSN 0821-7556, ISBN 0-919216-93-5. Canadian Orders CDN\$109.00 (shipped by Canada Post). US Orders US\$90.00 (shipped expedited parcel). International Orders US\$90.00 (shipped small packet surface mail).



Over 20 years ago I reviewed the very first issue of *Palaeontographica Canadiana* and, highly impressed by the quality of production, I expressed the view that if a steady supply of good contributions could be maintained then the monograph series would gain an important place in the palaeontological literature. Happily, that hope has been realised, especially for those of us interested in Lower Palaeozoic fossils, and Brian Chatterton, one of the authors of that first issue and of four others along the way, has produced a veritable *tour de force* with Rolf Ludvigsen in this, the 22nd in the series.

Some 52 species, 32 of which are new, belonging to 30 genera (one new) are described and superbly illustrated in 84 plates

and, in some instances, very clear line drawings. An 85th plate shows the fauna of the uppermost Ordovician formation on Anticosti. The work will justifiably become a standard trilobite taxonomic monograph, but there is much else that will be of wider interest to Silurian workers. In addition to historical reviews of the island and of previous work on the trilobites and a summary of the lithostratigraphy, the introductory parts of the work place the Silurian (Llandovery and possibly lowest Wenlock) faunas in their temporal and palaeoenvironmental context both locally and globally.

A trilobite biostratigraphical scheme is established largely for correlation of the latest Ordovician and Silurian on Anticosti Island. It comprises six 'faunas' (considered equivalent to biozones) based on the stratigraphical distribution of species. These are mapped onto the lithostratigraphy and stage-level chronostratigraphy, but beyond a few notes in the text on the conodont zones, there is no direct indication of the equivalence of the faunas to the biostratigraphical schemes based on other groups on the island. A few of the trilobite species are known from successions elsewhere, but the correlation potential of the Anticosti trilobites and the possibility of the wider applicability of the biostratigraphical divisions seem very limited at present.

A taphonomic discussion assesses the occurrences of the trilobites in a range of carbonate and mudrock settings from low energy environments to (most commonly) tempestites and rare mass flow deposits. There are good links between probable modes of life and environmental perturbations, including the recognition of tightly enrolled specimens below thick storm-generated obruption deposits. There are also important observations of the effects of abrasion and diagenesis on the preserved surface microstructure of some species; cautionary tales for the recognition of taxonomic character states.

The assessment of taphonomy and a clear statement of the sampling strategy (in most cases aimed in the field at maximising species numbers and obtaining the best preserved material) provide the necessary background to a consideration of the recurring generic associations of trilobites in the faunas. Four main biofacies are defined and illustrated by histograms and pie charts of representative samples. They are named on the basis of the numerically dominant genera: *Calymene*, *Acernaspis*, *Encrinurus* and *Proetus*. In the case of the first of these, four component assemblages also of presumed ecological significance are defined. A further two, rarer, biofacies are also defined and represent the shallowest (<30 m) and deepest (80–100 m) water environments yielding trilobites in the Anticosti succession. On a larger scale, the palaeogeographical significance of some of the trilobites (and some notable absences from the succession on Anticosti) is also described. The consideration of the palaeoecology includes a very useful discussion of Silurian trilobite associations described in the literature from around the world, and a comparison of the Anticosti biofacies with them. All this is particularly important as it helps document the recovery of trilobites after the Hirnantian extinctions and a return to alpha diversities that are comparable to those of the preceding Cambrian and Ordovician. The value of this monograph thus extends beyond its undoubted taxonomic strength and it is a very welcome addition to an excellent monograph series.

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The Department of Earth Sciences offers world-leading education and carries out innovative and ground-breaking research, using excellent facilities in a dynamic, welcoming and inclusive environment. Natural Sciences. Natural Sciences (NST) is the framework within which most science subjects are taught at Cambridge. If you want to study any of the biological and physical sciences, this is the course for you. Read more. Earth Science Courses. The present Department of Earth Sciences was formed by an amalgamation of the Department of Geology, Department of Geodesy and Geophysics and the Department of Mineralogy and Petrology in 1980, and has its main building on the Downing Street site, where the Sedgwick Museum is also located. Notable alumni include David Attenborough, Charles Darwin and Adam Sedgwick. The latter giant of this school is the subject of two of the 11 portraits in the department, one by Samuel Lawrence and one by T. Philips. Edward Bullard, former member of staff was painted by Ruskin Spear.Â Downing Street, Cambridge, Cambridgeshire CB2 3EQ England. sedgwickmuseum@esc.cam.ac.uk. 01223 333 400. <http://www.esc.cam.ac.uk>. Study at Cambridge. About the University. Research at Cambridge. Search site. Home. Study at Cambridge. Undergraduate. Courses.Â Cambridge women pioneers in Earth Sciences. Suggestions for Equality and Diversity Committee. Disabled Access.Â njb1005@cam.ac.uk. Professor Michael A. Carpenter. +44 (0) 1223 333483. mc43@esc.cam.ac.uk. Dr Alex Copley. +44 (0) 1223 748937.Â marian@esc.cam.ac.uk. Professor James Jackson. +44 (0) 1223 337197.