

# REVIEWS

## Early Silurian Trilobites of Anticosti Island, Québec, Canada

By Brian D. E. Chatterton and Rolf Ludvigsen

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The latest instalment of *Palaeontographica Canadiana* contains 85 plates, making it the largest in the series since its inception in 1983. It is adorned with a fine drawing of an ornate odontopleurid trilobite and the cover is a beautiful dark green, adding one more band to the spectacular rainbow these monographs make on the book shelf. Allow me to say from the outset that this review is surely biased, for not only was the second author my doctoral supervisor, but also I have been intimately involved from the beginning with this now venerable monograph series. *Pal Can* is so wonderfully a feast of Canadian palaeontology and a tribute to Canadian palaeontologists.

Publication of the first monograph in the series was a singular event, a splendid volume in pewter-coloured wraps by Brian Chatterton on silicified Silurian trilobites and edited by Rolf Ludvigsen. Its launch was celebrated boisterously at the Mining Building of University of Toronto by the city's palaeontological elite with beakers and coffee mugs of fine wine (carefully

selected by this reviewer from the plonk precinct of the cellars of LCBO). Since then, volume after volume has appeared, dealing with trace fossils, spores, conodonts, sponges, plants, graptolites, foraminifers, brachiopods and, yes, more trilobites (according to some, too many, but never mind). Almost all monograph-length publications on Canadian fossils have been in this series, apart from a few Geological Survey of Canada bulletins and National Research Council books. I can attest that the appearance of every number has been big news across the land, that the quality of editing and production has been high, and that the science is second to none.

This monograph is the fruit of palaeontological labours that began in the middle 1800s with collections made by explorer James Richardson. Elkanah Billings, Canada's first government palaeontologist, studied these collections. That his name pulses through this book, as it does in almost any work on lower Palaeozoic invertebrate fossils of eastern North America, is a testament to his fine powers of observation and his intuitive grasp of taxonomic principles. This is remarkable for a self-taught scientist whose reputation was respected by no less a personage than Charles Darwin.

As recounted in the Introduction, Chatterton and Ludvigsen built on the Richardson collections with material collected during the expedition led by W. H. Twenhofel in the 1920s, and from many later geologists, along with specimens from several seasons of their own field work. This monograph describes and illustrates 52 species belonging to 30 genera, one of which is new. Quite amazingly, two-thirds of the species - 32 - are new, which might surprise the reader who could have assumed that the early 21<sup>st</sup> century

would find trilobite palaeontology in its twilight years.

There are 16 pages of text in this monograph dealing with background geology, biostratigraphy, biofacies and biogeography, with the remaining 58 pages being taxonomic description. The writing is generally good, and the style is quite personal, with scattered asides and liberal use of "we". Some may object to this, but I very much enjoy the conversation, as it were, with the two authors in their dealings with the rocks, their systematic struggles and their quests for historical collections. There are only a few, trivial typographical errors. 'Scotch whisky' is misspelled, but you will have to check the text to find out what this libation is doing in a supposedly dry scientific monograph.

The material is exquisite and the standard of preparation is peerless. Dextrous use of the pneumatic engraving tool was required because many of these trilobites occur on bedding planes that are covered with silty and clayey dolomite. The only way to prepare them is with pressurized air and gentle abrasives like baking soda, an exacting task. The result is plate after plate of superb photographs showing marvellous detail of many whole specimens, both outstretched and enrolled.

The occurrence of each species is pinned to a generalized stratigraphic section to produce a biostratigraphy consisting of six successive "faunas" that are quasi-biozones. Because the nearly flat-lying stratigraphy and nature of the inland exposures governed the way in which most specimens were collected, species ranges are not tied precisely to measured sections but are linked to lithostratigraphic units (members); collection information is in the appendices.

The palaeoecological theme is

picked up with a different slant by using trilobite associations in the form of relative abundances of the various genera. This approach pioneered by Ludvigsen in the 1970s, and rests on the assumption that all species of each genus would have had the same ecological requirements, more or less.

Using this approach, six "biofacies" are defined. Four of them consist of diverse associations but are dominated by species belonging to a single genus, which co-occur with several subordinate genera and a bunch of rare taxa. The two *Stenopareia* species, for example, are present in several biofacies but overwhelmingly dominate the reef-associated *Stenopareia* Biofacies, which is the least diverse of the six. This analysis of biofacies is compared to other Early Silurian associations, especially in Scandinavia and Great Britain. What governed all these distributions is not yet clear, and it would be unreasonable to decouple them from the other faunal and algal elements and sedimentological characteristics. In any case, the observations here stand in stark contrast to some lower Palaeozoic sedimentological work in which marine fossils are lumped together at the class or even phylum level - the palaeontologist winces at this kind of generalization.

If you still adhere to the view that trilobites are virtually exclusively Cambrian, this monograph should dispel that misconception. However, they certainly are different, mostly belonging to quite unrelated families, and are commonly flamboyant with prominent bumps, spines, furrows, knobs and lobes. This fauna occurs with brachiopods and other elements, which have been described by a number of distinguished palaeontologists: the Ordovician and Silurian of Anticosti Island is famous for its fossils and quality of preservation - a good thing that it is a protected area as otherwise naturally weathered slabs would soon vanish.

The historically minded geologist is in his/her element because the synonymies and discussion of each species present a wide-ranging, quasi-legal and historical justification for the pedigree of all species. Higher level taxa are discussed at length. Almost all species entries contain a diagnosis, and many, especially the newly named ones, are backed up by exacting formal descrip-

tions. Discussions are detailed and authoritative. All species turn out to be indigenous to North America, but many genera contain representatives from other continents. Some species are illustrated with handsome line drawings. Unfortunately though, a few of these were scanned before printing which washed out the stippling. The six-page reference list cites virtually everything written on Early Silurian trilobites going back to the early 1800s, and everything about Anticosti Island geology since the 1700s (except, curiously, the excellent sedimentological study on the Lower Silurian by T. Sami and A. Desrochers, published in 1992).

This fine monograph is not just a tour de force by the authors but also an honour to Canadian palaeontology itself: out of the 32 new species fully 23 are named for Canadian palaeontologists and geologists (including field assistants). The one named after me is very handsome indeed; the plate is suitable for framing. I did admit, did I not, that this review would be perceived as biased? But I do know that every trilobite enthusiast, professional and amateur, and just about any person dealing with Ordovician and Silurian marine faunas anywhere on the planet will be thrilled with this tome. With this in hand you could finally convince your impecunious library to pick up the back issues and start subscribing!

## Stereographic Projection Techniques for Geologists and Civil Engineers (2<sup>nd</sup> Edition)

By Richard J. Lisle and Peter R. Leyshon

Cambridge University Press, New York, 2004  
ISBN 0-521-53582-4

US \$35.00, softcover, 112 p.

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When I read this book, it brought to me pleasure and sorrow. It was a pleasure to surf through the simply explained and well-illustrated problems and it was sorrow to remember what I had to endure as a student to acquire sufficient understanding of the stereographic method, without having such a book. I remember well those years back in my native country, when I tried to study the stereographic method from a crystallographic manual, simply because there was not a good book on the geological applications of the projection techniques. Later, I discovered many structural geological manuals with introductory chapters on stereographic projection techniques, but found most of them unsatisfactory.

This lack of satisfaction is not just a personal view. My interactions with geologists of different nationalities and backgrounds indicate that only a few retain any working knowledge of the subject two or three years after graduation, even though all of them studied it; the reason for this is that they had not learned it properly in the first place. This method, no matter how simple it may look to the practicing structural geologist, requires a lot of work and concentration to be perfected and converted into an everyday tool.

Lisle and Leyshon's textbook is a carefully worded and well-illustrated introductory course in stereographic visualization of three-dimensional geological data. It is designed to satisfy the needs of the undergraduate geoscience students, but it also addresses many problems of interest for the practicing geologist. The selection of topics and the order of presentation of the practi-