

Book Reviews

Conodont Paleoecology

Edited by C. R. Barnes

*Geological Association of Canada,
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\$12.00 (members, \$10.00)*

Reviewed by Peter G. Telford
*Geological Branch
Ontario Ministry of Natural Resources
77 Grenville Street
Toronto, Ontario*

During the past decade the Pander Society, an informal association of paleontologists interested in conodonts, has held a series of symposia devoted to these enigmatic microfossils. Proceedings of symposia dealing with taxonomy, biostratigraphy, and paleozoology of conodonts have been published. The present volume, on conodont paleoecology, resulted from a symposium held at the University of Waterloo, in 1975, in conjunction with the annual meetings of the GAC and GSA (North-central Section).

Nineteen papers and an editorial preface are contained within the book, presenting a wealth of the most recent information and ideas on the life habits and ecological distribution of conodonts. Except for the first two contributions, a general review of the title subject by M. Lindstrom and a provocative article by L. E. Fahraeus relating conodont distribution and plate tectonics, the papers are arranged in a chronological order ranging from S. M. Bergstrom and J. B. Carnes' careful examination of Middle Ordovician Appalachian faunas to H. Kozur's discussion of Triassic Eurasian conodont paleoecology. The papers are mostly brief and easy to read although, in some cases, attainment of

brevisity has produced unwarranted complexity. For example, text-figures in the paper by B. D. E. Chatterton are overendowed with data and are difficult to appreciate, while R. L. Austin's paper on Dinantian (Carboniferous) conodonts reads disjointedly, perhaps as a result of reduction from a large original manuscript.

A disappointment to the nonspecialist in conodonts may be the lack of illustrations of the microfossils. Even line drawings are absent and one of the only two plates is poor. Generally, however, this book is a fine production and rare typographical errors detract only slightly from the high overall quality.

A most interesting aspect of the book is the variety of angles from which the problem of deciphering conodont paleoecology has been approached. Methods range from the detailed evaluation of Silurian sedimentological criteria and conodont occurrences by J. Lefevre *et al.*, to the speculative paleozoological models of L. Jeppsson, to the mathematical analysis of Permian conodont distributions by L. C. Babcock. The well known distribution of associated macrofossil communities was used by R. J. Aldridge to interpret the environmental preferences of British Silurian conodonts. The standard approach that emerges from this collection of papers involves examination of conodont distribution through a stratigraphic interval whose sedimentology is well known and whose age limits are well defined. Papers by P. H. von Bitter on Carboniferous conodonts of Nova Scotia and D. L. Clark and S. V. Rosser on Triassic conodonts of Utah and Nevada exemplify this type of basic research.

Five papers concerned with Devonian faunas in Europe and North America provide conflicting ideas on the manner of segregation of conodont

communities. These basic differences of opinion show that ecological studies of conodonts are at a very preliminary stage. Indeed, this entire book is really only a beginning - a signpost indicating some of the directions for future conodont research.

The book does not produce any general consensus on the ecology of conodonts; the argument over depth stratification versus lateral segregation of conodont faunas continues to rage. The difficulty of interpreting the life habits of a fossil of unknown zoological affinities remains a problem. Nevertheless, students and senior researchers grappling with paleoecological uncertainties should benefit by this assembly of case histories, centered about a particular fossil group, but illustrating the various methods that can be employed in study of any fossil group.

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Circum-Pacific Energy and Mineral Resources

Edited by Michel T. Halbouty,
John C. Maher and Harold M. Lian
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608 p., 1976
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Reviewed by Roy Y. Watanabe
*Cominco Ltd.
2200-200 Granville Square
Vancouver, B.C. V6C 2R2*

The first Circum-Pacific Energy and Mineral Resources Conference was held August 26th to 30th, 1974 in Honolulu, Hawaii. The proceedings of this

conference are reported in this AAPG Memoir, and comprises 126 papers and abstracts of papers posthumously dedicated to John Charles Hazzard, a prominent petroleum geologist and one of the conference organizers. The meeting was deemed an overwhelming success. The next Circum-Pacific conference will be held in August, 1978. In essence, this book review is equally a conference report.

The Circum-Pacific region encompasses a vast area of ocean and bordering countries representing roughly one-half of the world's surface area. This conference represents the first large-scale international cooperative effort to consolidate the potential energy and mineral resource picture of the off-shore and on-shore regions of the Circum-Pacific, with special emphasis on the exploration and development facets of these resources.

The papers in this Memoir are grouped into several broad categories: General, 17 papers; Coal, seven papers; Geothermal Energy, 15 papers; Hydrocarbons, 28 papers; Hydrogeology, 13 papers; and Minerals, 46 papers. Not surprisingly, the papers dealing with the various energy sources are featured and predominate, but the Minerals section provides many valuable review-type papers covering a broad range of mineral commodities. Most of the papers contain an abbreviated Bibliography.

The General section comprises a series of papers which acquaints and up-dates the reader on a broad range of energy and mineral resource subjects for segments of the Pacific area, and contains forward-looking conceptual topics such as the interplay of plate tectonics and metallogenesis.

The Coal section suffers from an imbalanced and skimpy coverage both in geographical coverage and subject material.

The Geothermal Energy section reflects the recognition and growth of this energy resource during recent years. The term "Ring of Fire" refers to the prolific volcanism which characterizes the Circum-Pacific countries, and the incidence of active and dormant volcanoes might serve as a rough measure of the geothermal energy potential in these countries.

The section on Hydrocarbons is lengthy, though appropriate, and reflects

the considerable efforts by Pacific rim countries to evaluate this primary energy source. Numerous sedimentary basins with attractive, but poorly tested oil and gas potential exist along the on-shore and off-shore regions of many Pacific rim countries. Particularly interesting are the papers relating the importance of plate tectonics and subduction zones to the formation and localization of petroleum reservoirs. Furthermore, even volcanic rocks might serve as petroleum reservoirs, as reported by Japanese authors.

The Hydrogeology section deals mainly with the special problems of groundwater source and waste disposal, most studies relating to Australia, Indonesia, Japan and Hawaii.

The final section, Minerals, is far-ranging in subject material, mineral commodities and geography. Nodules on the sea floor, porphyry copper deposits, massive sulfide deposits, and many other general and specialized topics are fleetingly covered in this section. But the authors have done a credible job by usually confining their subject material while covering large individual segments of the Pacific area. The potential role and application of LANDSAT imagery and plate tectonics in mineral exploration is stressed in some papers, providing current and progressive insights in metallogenesis.

This Memoir is a valuable reference for all geologists and mineral economists who are interested and dedicated to the evaluation, exploration and development of the relatively underdeveloped raw materials and energy potential of the Pacific borderlands and off-shore areas.

As a member of the mining fraternity, I wish to say that for those seeking new natural resources in the Pacific area, this book provides quick orientation and insights in a vast spectrum of subjects covering a huge geographic area and will help to inspire additional successful exploration efforts.

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The Silurian-Devonian Boundary

Edited by Anders Martinsson
*E. Schweizerbart'sche Verlags
 Buchhandlung, Stuttgart.*
 347 p., 1977.
 Price \$42.20 (U.S.)

Reviewed by Paul Copper
*Geology Department
 Laurentian University
 Sudbury, Ontario P3E 2C6*

As stated on the front cover, this attractively bound, conveniently sized book is the final report of the Committee on the Silurian-Devonian boundary within the IUGS Commission on Stratigraphy and a state of the art report for Project Ecostratigraphy. This is a more recent, comprehensive and up-to-date version of the report submitted at the International Geological Congress in Montreal in 1972. The work clearly bears the stamp of two people long associated with the problem of settling the Siluro-Devonian boundary: the editorial work by Anders Martinsson and the organizational and 'geo-political' input by Digby McLaren, which served to settle the controversial issues.

In essence, the method finally used to fix the boundary was two-fold: 1) initial guidance for establishing as precisely as possible some boundary by means of lowermost occurrence of the graptolite *Monograptus uniformis*, and 2) a 'golden spike' driven in at the boundary stratotype section at Klouk, Czechoslovakia, where *uniformis* could be found.

The most interesting aspect of the book certainly is the final report paper presented at the beginning by D. J. McLaren. It serves as an excellent case history of the problems encountered in settling a boundary and demonstrates very clearly that the art of discussion, negotiation, bargaining and democratic polling can fetch clear results even in the world of geology. Surprisingly enough, the voting for specific opinions, e.g. settling the base of the *uniformis* zone as the base of the Devonian and the stratigraphic base of the occurrence of *uniformis* itself within bed 20 at Klouk, was nearly unanimous (80 to 90% in favour). Dissenting opinions or opinions