

# Journal of Sedimentary Research

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Colin P. North and Kitty L. Milliken, Editors

A.J. (Tom) van Loon, Associate Editor for Book Reviews

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***Encyclopedia of Geology***, edited by Richard C. Selley, L. Robin M. Cocks, and Ian R. Plimer, 2005. Elsevier Academic Press, P.O. Box 211, 1000 AE Amsterdam, The Netherlands; 5 volumes, 2750 pages, hardbound; complete set US\$ 1,200.00; GBP 775.00. ISBN 0-12-636380-3 (set of 5 volumes), 0-12-636381-2 (volume 1), 0-12-636382-X (volume 2), 0-12-636383-8 (volume 3), 0-12-636384-6 (volume 4), 0-12636385-4 (volume 5).

Due to an ever increasing in-depth approach of research topics, science has changed in the course of time. Nowadays we educate specialists rather than generalists. One has to go back in time a century to find a scientist who was worldwide considered—at least at some point in his life—to have a complete overview of the then available scientific knowledge. The knowledge of this man, Henri Poincaré (1854–1912), was incredible, indeed; yet, it must be considered an exaggeration that he was aware of all scientific data available at his time: already in the 18<sup>th</sup> century one needed a large group of scientists to cover the then knowledge!

This is shown by the characteristics of the first—and probably the best—encyclopedia ever published: the “*Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers*” produced by a “Société de Gens de Lettres” and published under the direction of Diderot (although it might be justified to state that d’Alembert played an equally important role; the encyclopedia is therefore also known as “The encyclopedia of Diderot and d’Alembert”). This first encyclopedia consisted of 17 volumes of text and 11 volumes of plates, and was published between 1751 and 1772. It contained some 72,000 articles (with totally over 20 million words) written by more than 140 contributors. Thus it can be considered as a truly massive reference work for the arts and sciences. Because the encyclopedia was successful in its attempt to classify learning and to open all domains of human activity to its readers, its impact on society was very large, and it can be considered to have expressed many of the most important intellectual and social developments of its time. The objective of the encyclopedia was clearly expressed by Diderot,

Le but d’une encyclopédie est de rassembler les connaissances éparses sur la surface de la terre; d’en exposer le système général aux hommes avec qui nous vivons, et de le transmettre aux hommes qui viendront après nous; afin que les travaux des siècles passés n’aient pas été inutiles pour les siècles qui succéderont; que nos neveux devenant plus instruits, deviennent en même temps plus vertueux et plus heureux; et que nous ne mourions pas sans avoir bien mérité du genre humain. (The objective of an encyclopedia is to collect all knowledge that is distributed over the earth; to reveal its general framework to all the people with whom we live, and to transfer it to the people who will come after us; so that the works of the past centuries will not remain useless for the centuries that will follow; so that our children will be better educated, and simultaneously will be more honorable and happy; and so that we will not die without having served the human race).

Nobody will ever more be able to prepare successfully a work with such an ambitious objective. The preparation of an encyclopedia dealing with a specialism of restricted size is already an immense task. It is therefore amazing that science publishers still manage to attract editors for encyclopedias of disciplines so wide and so varied as geology in its totality. Yet, Elsevier managed to do so. They attracted a triumvirate of which Richard Selley and Ian Plimer have already a great reputation. The third editor, Richard Cocks (a paleontologist from the Natural History Museum in London), will probably become equally well known soon, thanks to this work.

The editors had, without doubt in consultation with the publisher, to work out a framework for the encyclopedia. Then they had to find authors, and to take care that they delivered their contributions in time. These tasks must, however difficult, have been the easiest of all; a much greater effort must have been the reading and reviewing of the submitted texts. The three editors must have worked through all the manuscripts, or at least all the articles in their specific fields. And it seems that they read the texts with pleasure, as they state in the Introduction,

While preparing the 'Encyclopedia of Geology' we have ourselves learned a great deal about geology, both within and beyond our own specialties. We invite you to read this encyclopedia and join us in the fieldtrip of a lifetime.

This quote clarifies that, like Diderot's encyclopedia, this work can be used for learning. Few encyclopedias can be used for such a purpose, because most consist of an alphabetically arranged flow of thousands of small lemmata. Not so this 5-volume work: its basic concept is different. The editors did not prepare a thesaurus with an incountable number of lemmata, but restricted the text to 340 composite articles that contain all information, obviously commonly in the form of several sub-articles with several sections. The great advantage of this concept is that all data are placed within a relevant context, so that a good insight into the subject is obtained easily. I happen to have been the editor of the earth-sciences section of a 25-volume general encyclopedia with the same basic concept, so I am well aware of the pros and cons of this concept. The main advantage is, indeed, that readers, particularly if they are not specialists in the field, can easily understand the material without searching for dozens of directly related terms in several of the volumes. There is also a great disadvantage, however, and this is that one does not know automatically where to look for some specific information. This 'problem' is solved by a 217-page index at the end of volume 5; it is absolutely necessary to consult this index before searching for information in the encyclopedia itself. The essential role of the index requires an optimum structure with a complete coverage of the various topics. In this respect, unfortunately, the encyclopedia shows failures. The index is fairly difficult to read (among other things due to the subdivision—into 4 levels—of terms), and I did not manage to find terms that are fairly common (such as "Weichselian" in stratigraphy and Quaternary geology; "nanobacteria" (or "nannobacteria" as they are commonly named by biologists) in clay mineralogy and weathering; and "heavy minerals" in sedimentology and petrology).

Does this imply that the encyclopedia shows hiatuses? Impossible to check, if only because the index would have become impractical if unduly detailed; not all terms in a book are present (or can be expected to be present) in an index. A book reviewer should read the book that he reviews. In this case, this was—obviously—impossible, so I had to find other ways in my search for omissions. I decided to browse through some articles, after having made up my mind about my expectations with respect to the data that I wanted to find in these articles. This approach strengthened my first impression is that the encyclopedia is fairly complete. I also came to the conclusion, however, that the balance between various topics is sometimes lost. Why, for

instance, in the article “Tertiary to Present” a sub-article “Pleistocene and the Ice Age” that provides all British stages of the Pleistocene, but not the more common general American, nor the Western European stages? It seems that some detailed aspects have not been recognized as hobby horses by the editors and their 26-person Editorial Advisory Board. Such a large group of advisors is almost prohibitive when a balance has to be reached. It is the task of the editors, however, to make at least a balanced list of contents before specialists are approached with the request to contribute. I think that the over 300 contributors have not been instructed in sufficient detail about what to write exactly and into what depth, and that the advisors and editors were not capable in maintaining a good overview of the incoming flow of manuscripts. It may be easy to find such shortcomings, particularly because each new contribution in a semi-systematic encyclopedia like this affects other texts (both already submitted ones and texts still being prepared). One should not forget either that contributing specialists will most probably have found themselves that an original list of contents prepared by the editors is incomplete, and they may have felt it necessary to fill up the gaps. Such initiatives, which are most welcome from the points of view of readers and fellow specialist, are a nightmare for the editors, however, because each change in the original list of contents reduces the balance that may originally have been present in the framework.

However understanding one can—and should—be with respect to the almost inhuman task of the editors of such an immense work, there is some reason to blame the editors for mistakes that could easily have been avoided. A Chinese saying - that is well known in Western countries, but that was unknown to the Chinese whom I asked about it during my last trip to China!—states that predicting is difficult, particularly if it concerns the future. The editors should have realised that it is highly dangerous to predict the outcome of a scientific discussion, and to publish a text that conforms the discussion’s outcome that they expect themselves. This happened apparently nevertheless, and - unfortunately—it may greatly reduce the value of a most important contribution: the article “Time Scale” (by Gradstein and Ogg). Both authors are known for their activities in the International Commission on Stratigraphy, where they advocate since last year a new time scale (without Quaternary, with many changes in the most commonly used names of series/epochs and stages/ages, and with a fairly drastic revision of the Precambrian). The new stratigraphic chart that has already been published by the ICS—and that conforms the proposals for a new time scale—is, however, still a proposal. Discussions about it (among others at the 2004 conference of the International Union of Geological Sciences in Florence) seemed to point in a direction that several of the Commission’s proposals will not be accepted. It is therefore unfortunate that the new proposal is presented in the Encyclopedia as the state-of-the-art, even more so because a simplified time scale on this basis is present on the inside back cover of each volume. Moreover, the various authors of contributions still use the currently commonly used terms, so that there is a discrepancy between the time scale printed in the volumes and the texts presented in them.

Fortunately, shortcomings like the above ones do not prevail: on the contrary. My first reaction when I inspected the set of books was: “What a beautiful books.” They are well bound, very well printed, and the illustrations (the book is fully printed in 4 color, but there are, of course, some black-and-white photographs and drawings) are almost all attractive and informative. Most of the line drawings seem to have been prepared specially for this encyclopedia, which nowhere gives the impression that some old stuff is being recycled; where “old” figures are used, they have commonly been redrawn to make them consistent with the other line drawings. And, as mentioned before, it seems that most relevant topics are covered; and the topics covered are, as a rule, covered well by logical texts that are well readable. One exception exists with respect to the coverage of topics: the editors have deliberately decided not to pay much attention to the newest technologies and apparatuses in geophysics and geochemistry: such information would have become outdated soon. I think that such a decision is highly justifiable.

An important question with respect to reference works like this encyclopedia is whether it is practical, and easy to use. My experience is that the works are most useful, particularly if you are working in a field where several earth-science disciplines meet, and where a lot of specialist literature has to be consulted that is not always easily understandable. I certainly do not use the encyclopedia daily, but frequently enough to have it placed in my study within easy reach. With some exaggeration I might even say that I have already become addicted. I use the volumes not only to find factual data, but also to see the topic that I'm interested in within a wider context. Many earth scientists, both professionals and graduate students, will beyond any doubt have the same experience if they get the chance to own this work. Unfortunately, the price will be prohibitive for most earth scientists in private. One should realize, however, that the high price is certainly not too high for this immense work that, indeed, provides an excellent opportunity to learn "*a great deal about geology, both within and beyond [your] own specialities.*" Where the price may be fairly high for private acquisition, it is certainly not too high for libraries. Librarians will find out that, as soon as people know about the presence of this work in an institute, too (?) many earth scientists will frequently want to use it. Stuff to become addicted to.

A.J. van Loon  
Dept. of Earth Sciences, University of Silesia  
Bedzinska 60, 41-200 Sosnowiec, Poland  
e-mail: tvanloon@ultra.cto.us.edu.pl



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