

# History of the Earth Sciences during the Scientific and Industrial Revolutions with Special Emphasis on the Physical Geosciences

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*Geologic Time*, but it is less specific in its focus, and as an even briefer treatment of an even vaster topic, inevitably it is more limited in scope and is deficient in depth. It is suitable only for a junior undergraduate readership. *Geologic Time*, some sections substantially reorganized compared to the first edition of 1968, is lucidly written, liberally laced with informative, simple illustrations, well bound, and reasonably priced. It should be required reading for students; it could be profitable reading for many practising geologists.

MS received January 6, 1977

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## History of the Earth Sciences during the Scientific and Industrial Revolutions with Special Emphasis on the Physical Geosciences

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By D. H. Hall  
Elsevier Scientific Publishing Co.,  
297 p., 1976.  
Soft cover \$19.95

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The steadily increasing costs of printing, and in consequence of book prices, must inevitably cause changes in publication styles and methods. A deterioration in the quality of books may be an inevitable, though unwished-for, result.

Any assessment of the book here reviewed necessitates consideration of the fashion in which it has been produced. Only the 11 preliminary pages were typeset, all the rest are photographic reproductions of typescript. Unfortunately the pages have been over-reduced, so that the lettering is too thin and small and the pages too light, making the book very hard to read. This will unquestionably deter many readers.

Unfortunately, the book suffers also from inadequate editing and equally inadequate proof-reading. There is much duplication between sections (for

example, the third paragraph of pages 96 and the last of page 98); some misspellings are consistent (e.g., "Edmund" for "Edmond Halley") and some clearly unintentional (e.g. "Ptolmaic", p. 101); and more major mistakes have also survived uncorrected (e.g., the nearly identical sentences on p. 60, the second quite incomprehensible!). Such inconsistencies as the citation of the same reference as "Crowther, 1960a" on page 92 and as "Crowther, J. G., 1960a" on page 93 should surely have been eliminated well ahead of publication. Other faults include wrong conjunctions (p. 12, "It is in fact doubtful that the pace of science could be halted"), tautology (p. 48, "Lunar geology and geophysics on the moon..."), faulty punctuation (e.g., near the foot of p. 86) and confused imagery: "Sometimes the thread is strong and continuous; at other times it diminishes in size and may even die out. If it dies out, it may reappear unexpectedly at another time or place" (p. 97). Prime responsibility for the elimination of such faults rests with the publishers and their readers. Since their survival into publication will inevitably reflect most heavily on the author, he deserves our sympathy.

Having successfully surmounted all these handicaps to reading and comprehension, one perceives that the title of the book is decidedly misleading. This is *not* a history of the earth sciences during the Scientific and Industrial Revolutions. Instead, it is a discursus on the philosophy of science as applied to the earth sciences, with a heavy overt reliance on the opinions of Crowther and Bernal. A history is indeed given of some aspects of geophysics, but that is all.

In this regard, the reference list is revealing. Of 123 works cited - a slim total for a work thus titled - the vast majority are either general works on the history and philosophy of science or works concerned with those aspects of geophysics. The author cites only six other references on the history of geology - the classic texts of Adams, Geikie and Zittel, plus three biographical works on Hutton - and only two on the history of geography. Was this, then, the extent of his reading?

The single aspect of the history of earth sciences that is thoroughly treated - the story of the development of the magnetic compass and its use, along with the pendulum, in determining the

figure and structure of the earth - is handled well and interestingly. Other historical material is meagre indeed.

Do not, then, expect this work to fill out your knowledge of the general history of the earth sciences, for it will not do so. Do not expect to agree with all the author's judgements. I do not personally consider "geomagnetism, the first of the earth sciences" (p. 106) in point of time or in importance (and indeed it is an effect, not a science!). Nor do I believe that the oceans have yet been thoroughly explored, as the author claims on p. 46; their exploration is surely only beginning.

However, the author's reflections on the course of the development of science are controversial enough to be stimulating; some of his comments strike a responsive chord. When he comments (p. 13) that "a consideration of the history of his subject is rapidly becoming a necessary part of a scientist's education and professional development", one can wholeheartedly agree and wish that Canadian Universities in general were aware of this fact!

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## Stress and Strain

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By W. D. Means  
Springer-Verlag, New York, Inc.  
339 p., 1976  
\$14.80 paperbound

Reviewed by P. M. Clifford  
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To understand structures, we still need clear descriptions and definitions, as of old. But nowadays structural geologists borrow freely from physicists, metallurgists and engineers, applying their ideas with some success. When we do this, however, we run into a language barrier, namely, *our* understanding of *their* concepts and mathematics. Means' book is designed to alleviate part of this bilingual problem. It provides an outline of the elementary notions of continuum mechanics, by considering