

## BOOK REVIEWS

CAMINA, A.R. and JANACEK, G.J. *Mathematics for Seismic Data Processing and Interpretation*. Graham and Trotman Ltd., 66 Wilton Road, London SW1V 1DE. 1984. 250 pp. ISBN 0 86010 512 1 (hardback) £25.00 plus postage. ISBN 0 86010 576 8 (paperback) £13.50 plus postage.

The title gives the game away immediately. This is a Mathematics book, and, moreover, it is aimed at the applications in seismic data processing and interpretation. But those with an interest in seismic processing or interpretation, be it amateur or professional, need not be too dismayed for this text is aimed at clarifying what is an increasingly complex area. I am pleased to say that it accomplishes this daunting task remarkably well.

Geophysical data processing has advanced dramatically with the recent rapid developments in digital recording and computing power. These developments mean that far more mathematics is now applied to physical problems than previously, and as a consequence many of the mathematical concepts involved are beyond either novices entering the field of processing or non-mathematicians using the data output at the interpretation stage. This problem was identified by a group of companies and institutions, notably RACAL Geophysics, who together devised a series of short courses to cover the groundwork and processing concepts. Part of this series involved the mathematics presented in this volume and so formed the basis of the text.

In arranging the mathematical presentation the authors have taken great care to gradually progress through various stages and levels. The text contains numerous worked examples to illustrate the concepts, while a suite of computer programs written in BASIC are included in an appendix. These enable the ideas presented to be worked through by the reader and thus help in communicating the message. The main text itself is grouped into eight chapters, each dealing with a different mathematical aspect. In turn these fall into three groups. The first covers what is essentially 'A'-level material, that is Special Functions; Differentiation; and Integration. The middle section considers both Complex Numbers and Matrices, two topics frequently excluded from basic courses, but happily covered here. Then comes the material, for which the previous five chapters have been preparing the reader, with substantial accounts of Stochastic Processes, Probability and Statics; Fourier Analysis; and Time Series. The text closes with a brief discussion of applications in Wavelet Analysis and Predictive Deconvolution. Useful appendices follow with references, formulae and the collection of twenty two computer programs.

It must be re-emphasised that the book is very much a mathematics book. It requires careful consideration to extract the precise and concise information contained in the formulae, and as such it must be regarded as a reference text for periodic examination and re-examination as the concepts reveal themselves. Bearing that in mind, it is well written and the information is clearly presented. As such the volume covers much of the groundwork necessary to enable the reader to gain access to data processing concepts and fills a much neglected vacant niche. The student paperback edition (£13.50) is certainly excellent value and to be recommended to would-be processors and interpreters alike.

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N.B. This book may be obtained at the prices given above, plus postage, directly from Graham & Trotman Ltd., Sterling House, 66 Wilton Road, London SW1V 1DE. Telephone 01 821 1123. Telex: 298878 Gramco G.

COATES, Donald R. *Geology and Society* 1985 Chapman and Hall, New York. 408pp., Index. £30 Hardback; £12.95 paperback. ISBN 0 412 25170 1.

Professor Coates has set himself a very large and difficult task of trying to review the interaction of Geology and Human Society in one volume. The first chapter catalogues some of the disastrous consequences of ignorance of geological processes, he draws his examples from both ancient history and the 20th century; he then proceeds to a detailed discussion of the major geological processes that affect man.

Chapters two to five concentrate on the resources required by an industrial society. The approach in these chapters is very good; Professor Coates systematically records the resources required, methods of exploration, methods of recovery and impact on the environment of the extraction. These chapters are well illustrated with fascinating case studies. The next five chapters deal with the more spectacular aspects of geological activity, comprising chapters on Volcanic Activity, Earthquake, Landslide, Flood and Coastal Environment. The tenth chapter is dedicated to soils and I welcome the discussion of this subject in a geology text. However, I would have liked to have seen this chapter placed amongst the 'resource' chapters at the front of the book. The remaining chapters of the book deal with society's reaction to the geological problems that it encounters and include chapters on Geoenvironment, Environmental Contamination, Management and Law. The book is concluded by a series of appendices cataloguing the major geological disasters in history.

Overall the book is well illustrated with many diagrams and the liberal use of black and white photographs. The text is well written and easy to follow, the subject matter is divided up logically into the component parts of the subjects. One of the attributes of the book is the wide use of illustrative case histories to support the discussion.

This volume is comparable to other books in the field. Professor Coates' own 'Environmental Geology' 1981 and his earlier 'Environmental Geomorphology' and 'Landscape Conservation' Volumes I and II, 1972 and 1974 are clearly predecessors to this volume. E.A. Keller's, 'Environmental Geology', 1982, now in its 3rd edition, is an equally polished text. 'Geology in Environmental Planning' by A.D. Howard and I. Remson, 1978, and 'Cities and Geology' by R.F. Legget, 1973, are also valuable contributors to the field. Each book covers broadly the same topics but tends to emphasise the particular interests of the authors. This book, *Geology and Society*, tends to concentrate on the more spectacular aspects of "disastrous geology" with five chapters on Earthquake, Fire and Flood whilst other important but less spectacular subjects are ignored or dealt with in relatively small spaces. For example, although chapter Twelve is entitled Environmental Contamination, only three pages deal with the major Geological/Social problems of Solid-Waste Disposal. Similarly the effects on human health of naturally occurring contaminants in the environment is ignored. I also regret the failure to discuss remote sensing, especially as the front cover of the book is a superb infra red aerial photograph of Leviathan sulphur mine, California.

The book is very American. Although I found the case histories a great attribute of the book, I would have liked to see a few more European examples. Likewise the chapter on Environmental Law briefly mentions English Common Law and then extensively discusses United States Legislation, briefly describing over forty five acts and bills.

One further criticism of the volume is that the text is poorly referenced, which lessens its value as an introduction to the literature of the subject. The list of "References and Source Materials" at the end of the book stands at over 350 entries, but this is deceptive as many entries refer to United States Case Law and numerous others to publications that would not normally be available in a European academic library.

In conclusion the book is a comprehensive treatment of a diverse and difficult subject. No book so far has successfully tackled the whole subject but this is a good attempt to look at the broader issues. However, I must make one plea to a British Publisher and that is to sponsor a book more suited to the British Market reducing the number of pages spent on the spectacular aspects of Earthquakes and Volcanoes and concentrating on the legacy of over 200 years of industrialisation.

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ROBINSON, E. *London illustrated geological walks* Book Two, 1985. Scottish Academic Press Ltd., for the Geologists' Association, i-vi + 142 pp. including 125 photos, 17 street maps and a double page key map of London, references, 3pp. glossary, 5pp. indexes plus 4pp. blank for readers notes. ISBN 7073 0416 4. £4.95p.

This volume is the same price, shape (115 mm × 225 mm) and format as the strongly recommended Book One (cf *Mercian Geologist*, 1984, 9 no. 4 p. 248) but with several important improvements which ensure that it is of even better value for money.

Gone are the one column (45 mm) width photographs of buildings: almost all are now either 70 mm or 95 mm giving better resolution of architectural detail than that achieved in many of the smaller photographs in Book One. Curiously a few of the photographs of stone textures and structures which, to the geologist, require greater magnification, are still printed at 45 mm width sometimes as little as one fifth (linearly) of the natural size. One wonders if the decision to produce smaller prints of geological detail than occurs in any of the architectural photos was the author's or the publisher's choice! It may also be noted that the proportion of illustrations of predominantly geological interest is less than in the previous volume (11% v 15%). In fairness it must be admitted that the photographs (again by Mike Gray) are at least as good as in Book One and, moreover, there are more of them, a greater proportion of which are larger than previously.

Similarly the text, succinct, lucid and comprehensive as ever, is also slightly greater than in the previous volume. In short the reader gets more photographs, maps and text, of the same or better quality, for the same price.

One criticism of the previous volume has now been corrected and a double page map of central London showing both the location of the walks described in this volume and in Book One, is included. A further improvement is effected by including an index of Stone Names with references to pages in both Book One and Book Two. Unfortunately, although the page numbers for stones referred to in Book One are indeed in italics, with this particular type it is quite difficult, initially, to distinguish between normal and italicised figures—an insignificant criticism perhaps but one which could easily have been avoided by using, for example, bold type instead of italics. An index of principal buildings is also a welcome addition but this is restricted to those buildings cited in Book Two.

Doubtless those amateurs and professionals who have already purchased Book One will invest in this volume without further recommendation. For those who hesitated after reading my previous review there is a case for buying Book Two before considering Book One. Not only is it complete in itself and better value for money but covers parts of London likely to be frequented by visitors from 'Mercia'. Included are the rail termini most likely to be used by most of our readers; Bloomsbury, Picadilly, St. James', Trafalgar Square, the Strand, Fleet Street, Holborn Viaduct and Ludgate Circus as well as the Moorgate and Barbican areas.

The account of the building of St. Pancras station is of particular interest to *Mercian Geologist* readers for here the visitor will see the impressive high-arch single span roof of 243 feet supported by girders made by the Butterley Ironworks, Derbyshire and the magnificent hotel and station facade designed by George Gilbert Scott, serving as a 'cathedral to the High Gothic' and made predominantly of red bricks from Mapperley, Nottingham. Here also, excellently displayed, are the Ketton and Ancaster Limestones from Rutland and Lincolnshire; the Magnesian Limestone of Nottinghamshire and New Red Sandstone from Mansfield. In fact, for anyone who knows their East Midlands stones and industrial archaeology, there is no better place to start to explore London's streets, architecture and building materials. Since St. Pancras is the last building described in this book such a starting point will necessitate reading the book backwards; but it is so well written and illustrated that it is possible, though difficult, to do just that! In fact one of the delights of these volumes is that it is possible to start almost anywhere and complete short or long walks depending on the time available.

On my many visits to London I now permanently carry these two volumes amongst my meetings and committee papers—Eric Robinson has already greatly enhanced my appreciation of London's architecture and will long continue to do so as more in this excellent series are published.

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