Principles of applied geology

John Knill

Principles of Applied Geophysics. By D.S. Parasnis. Pp. 275. (Chapman and Hall: London, UK, 1979.) Hardback £8.50; paperback £4.95. *Geology for Civil Engineers.* By A.C. McLean and C.D. Gribble. Pp. 310. (Allen and Unwin: Hemel Hempstead, UK, 1979.) Paperback £5.95.

THESE two books, while illustrating quite different aspects of industrially orientated geology, have also somewhat different status as books. Parasnis' book is the third edition of a well known volume which has been reprinted three times between editions, while McLean and Gribble have written a brand new text.

Geophysics has been for many years the major large-scale exploration tool applied to hydrocarbon search, is also widely used in the mineral and construction industries and is now of increasing significance in ocean and land-based shallow crustal studies based on artificial explosions. This text has an extremely systematic approach, separate chapters dealing with magnetic, gravitational, electrical and seismic methods with additional chapters on induced polarisation, electromagnetic methods, radioactivity techniques and miscellaneous methods including borehole logging. The popularity of this book as a brief but comprehensive survey of the field of technique, processing and interpretation in applied geophysics is well justified. The new edition includes a new chapter on induced polarisation, derivation of formulae has been put into appendices to aid the flow of the text and the units and symbolism have been standardised and clarified. This book will undoubtedly continue to fulfill a need for an inexpensive but comprehensive presentation ideal for the student at undergraduate and postgraduate level.

The textbook by McLean and Gribble is primarily directed at the undergraduate civil engineer and provides a basic introduction to geology, and to those aspects of applied geology relevant to the construction industry. The book has a fresh, attractive appearance and the cover is particularly striking, tending to draw the eye, and possibly the wallet. The authors have thought carefully about the philosophy of the book but, in the event, selected the traditional balance between geology and engineering geology on an equal basis. The early chapters review minerals and rocks, engineering soils, stratigraphy and structural geology. The contents are deliberately selective, focusing on those terms believed by the authors to be of the greatest importance to the engineer. The book then turns to, and deals with, ground and surface water, site investigation including geophysics, rock classification and materials, excavations, slope stability, dams and reservoirs, and tunnels. The chapters on engineering geology draw upon several case histories which are briefly illustrated. There are many clear diagrams and photographs, and each chapter is supported by references. The authors have clearly made a careful attempt to cover the field but there are gaps, some of which are important. For example, there is no reference to soft ground boring techniques, which is surprising after the detailed consideration given to engineering soils, and foundations appear to be wholly omitted. The authors have drawn mainly upon their own experiences in developing the book and occasionally the text jars to the expert mind. A little more honing of the text in parts would have helped because, to the reviewer, occasional sections or phrases were inappropriate in relation to either conventional practice or the conclusions drawn. However, there is no doubt that the audience for whom the book has been written will find it easy to read, interesting and possibly stimulating. □

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Chemical ecology

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Introduction to Chemical Ecology. By M. Barbier. Translated by M. Ferenczi. Pp.128. (Longman: London and New York, 1979.) £3.95.

MICHEL BARBIER, a natural products chemist, attempts in this book to review our current knowledge of toxins, defensive secretions, plant allomones and sterols, and to define chemical ecology as a discipline.

My first criticism concerns Mr Ferenczi's translation, which does a disservice to the author. He frequently fails to find the appropriate English idiom, resulting in absurdly tortuous expression as, for example, in the quotation in the paragraph below. His evident lack of familiarity with entomology leads to the common silkworm (*Bombyx mori*) being described several times as a "butterfly" or as the "mulberry tree Bombyx". Worse still, the gypsy moth is described as "the predatory forest butterfly", and the boll weevil as the "predatory cotton plant beetle". It is unfortunate that the publishers did not, apparently, check the translation for syntax, idioms, or use of common names. There are also many minor errors that should have been picked up in proof.

My second argument is with Barbier's concept of chemical ecology, to which he devotes much of two chapters, a preface and an epilogue. He defines chemical ecology as "the science of chemical relationships between living organisms or between living organisms and the mineral world". This allows him to include pollution problems and aspects of nutrient cycling in the same ambit with animal secretions, hormones and allelochemicals, and to suggest that the whole can lead to a "new philosophy of man" which predicts "the absolute necessity of changing rapidly man's psychology" (that is, in his approach to environmental problems). He (and Ferenczi) make some rather trite observations in terms that render them almost incomprehensible: ". . . death is a primary condition of life . . . to develop life is akin to increase in death potentials, including various forms of pollution. In this instance, the contradiction is not thought to be fundamental, but rather to be the mirror image of a progress vector". This kind of writing will discourage and confuse any reader, but I firmly believe that such philosophical flights are unnecessary anyway.

Chemical ecology is surely a search to explain interrelationships between organisms and their environment in chemical terms, rather than in terms of traditional ecological factors like climate, niche, food resources, and so on. Chemical ecology is now at a very exciting stage: we now have a good fund of information on the chemistry of animal secretions used in communication and defence, secondary plant substances, and the like. We know very little about the adaptive function of these, but that information is beginning to accrue and the general principles for which Barbier is casting around will be found in the field in coming years. Ecology in general has been concerned for many years with pollution and its effects on natural equilibria, but the methodologies, concepts and supporting disciplines are distinct from those involved in explaining interrelationships between, say a heliconid butterfly, its food plants and its predators, in terms of chemical factors. □

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