Book reviews

Geology and Radwaste by A. G. Milnes

A. G. Milnes is a geologist in the Department of Earth Sciences at the Swiss Federal Institute of Technology in Zurich. He has advised on matters of radwaste disposal and in that capacity has read widely and thought deeply on the wisdom of using the ground as an effective final barrier to the migration of radioactive waste. His work is the product of this research.

The book is divided into three parts: Background where the nature of radwaste and proposed methods for its disposal are introduced, Earth science perspectives where geological aspects of the subject are considered, and Applications where the approaches adopted to predictive geology and site selection are discussed. Individual chapters are split into manageable sections that present digestible portions of information and each concludes with a sensible bibliography of selected literature, which Milnes tells us represents a fragment of the great volume of literature he has read.

His approach to the text is that of the classical teacher: theory is introduced, illustrative quantities are inserted, consequences are explored and case histories in support of such a thesis are described, creating a powerful mix requiring a strong mind to remain unmove by the line of argument pursued. Part 2 shows this most clearly. Here we are reminded of the structure of the crust, of its movement and evolution, and of the nature of geological time (and its all important and much neglected derivative, rates of change). There follow chapters on sedimentary rocks, volcanic process and products, natural and synthetic crystalline rocks, fluid–rock interactions, ocean processes and climatic changes. Nothing new here, you may think, apart from Synrock (and that is not so new), except that every example skilfully uses familiar data to illustrate a particular feature of the ground in its role as a final barrier. Herein lies one of the most attractive features of the book, for although Milnes has attempted to write for a general audience, his text is essentially a treatise written from one geologist to another and founded upon an appreciation of natural geological processes. This enables his readers to view geology from a new perspective. In brief, it makes you think, not vertically as in a book of exercises, but laterally. It is a clever approach that encourages readers to use their existing knowledge of geology (to become better geologists for doing so) and to ponder thoughtfully the processes that must be quantified if the effectiveness of the final barrier to radwaste is to be defined.

On this score alone the book can be recommended even though it possesses other advantageous features which by themselves would make it equally attractive. Not least amongst these is a clear, personal and focused view of the data presented: you know where you stand with Milnes and this is a great relief at a time when we are constantly offered the fudged and soulless rehashed potage of the plagiarist that masquerades as a ‘review’. It is inevitable in a field such as this where so much research is currently under way that some aspects of the book, particularly certain statements of present achievements, will soon become dated. However this is unlikely to detract from the intrinsic value of the book and its basic lines of thought. Certainly a book for the library of any college where graduate and postgraduate degrees are taught, and a book that many professional geologists would do well to read.

M. H. de Freitas

A Handbook of Engineering Geomorphology edited by P. G. Fookes and P. R. Vaughan

This is an ambitious book with a very important aim. In the editors’ own words the aim of the book is to present a basic, yet authoritative, handbook of geomorphology for geotechnical engineers and others working in similar disciplines. It is a book written by leading geomorphologists and geologists to help engineers understand geomorphology and to appreciate the role of geomorphology in geotechnical engineering. The book should be of most value at the project planning and site investigation stages. Coates, in his book Geomorphology and Engineering (1976), was one of the first to attempt a formal link between geomorphology and engineering; journals such as the Quarterly Journal of Engineering Geology have fostered this link. The Engineering Group 1982 Birmingham Conference on the engineering implications of earth surface processes, some of the papers being published subsequently in the Quarterly Journal of Engineering Geology vol. 16, no. 4 for 1983, kept the momentum going and this book has firmly established engineering geomorphology as an important sub-discipline within the earth sciences.

The book is divided into Part 1: Controls and Part 2: Environments and landforms. Each chapter is
copiously illustrated and summarizes the particular types of geomorphological processes and their influence on engineering design and construction. The book is completed by a series of Appendices, a checklist of engineering problems and an engineering bibliography. The chapters in Part 1 deal with Climate and weathering, Sedimentology, Tectonics, Stratigraphy and the Quaternary. Part 2 covers Glacial, Periglacial and temperate environments, Hot drylands and hot wetlands, Savanna, Mountains and highlands, Fluvial and estuarine environments, Coasts, Continental shelves, Volcanic landscape, Soluble rock terrains, Loess, Urban geomorphology and Subsidence. This list alone demonstrates the considerable scope of the book. It is not possible to list the contributors individually but each chapter is written by a worldwide authority in that particular topic with considerable practical experience.

As the chapters are built around the illustrations it is important that these are relevant and clear. In general the illustrations are excellent, both line drawings and well chosen photographs, and the authors and publisher are to be commended on their design. Block diagrams of landform assemblages provide a good indication of what to expect in different environments and should be of great value to geotechnical engineers.

It is not surprising that, in a book which combines geomorphological controls, landforms and processes, there is some overlap between chapters. But the overlap is not serious and in some cases is useful in order to define important factors. One of these crucial issues is climatic change which is discussed in several chapters. If the book has a weaker section it is the geological sections of Part 1 where the engineering problems are understated. Perhaps it is felt that engineers are more aware of geological than geomorphological problems. Some of the tables in the Appendices might have been better placed in chapters where relevance can be stressed, such as joint characteristics in the Tectonics chapter. Treatment of subduction zones and the trench marginal model would seem better placed in the Tectonics chapter rather than under the heading of Stratigraphy. But these are minor points when set against the scope and achievement of the book.

Unfortunately there are a number of minor distractions such as some references in the text not matching those in the reference lists at the end of the chapters. In some cases the full references are missing completely which is slightly annoying if one wishes to follow up the literature. The bibliographies at the end of each chapter could be more comprehensive. There is certainly much spare space available. However, these last comments do not detract from the book’s important contribution to engineering geomorphology. It deserves to become the standard against which all future treatments of engineering geomorphology are judged. All geotechnical engineers should possess a copy. Although not specifically aimed at geomorphologists, it would also be of value to all geomorphologists who take the applied aspects of their subject seriously. As the editors conclude in their introduction, the application of geomorphological knowledge to civil engineering will come about by the education of both engineers and geomorphologists. This book will make a substantial contribution to this process.

John Gerrard