Environmental Geology—Geology and the Human Environment. M. R. Bennet & P. Doyle. Wiley, Chichester, 1997. £18.99 softback; x + 501pp. ISBN 0-471-97459-5.

What is Environmental Geology? Few aspects of the environment are untouched by geology and many books are available that claim to inform us about this fashionable area of interest. The authors define environmental geology as ‘a meld of economic geology, engineering geology and applied geomorphology’ and proceed to deal with the topic in terms of earth resources (minerals, construction, water, aesthetic and scientific), engineering geology, waste and pollution management, geohazards and urban geology. Their viewpoint leans more to the geographical than the geological or geotechnical. For example, they devote more space to ‘aesthetic and scientific geological resources’ than to landslides and slope instability. They do not include geochemistry as a main topic and mention neither the biological consequences of trace element deficiency or excess (an extremely significant aspect of the geological environment in large parts of the world) nor the importance of background level studies in the determination of threshold levels of contamination. Much of this volume falls within engineering geology, particularly within the international understanding as defined by the International Association of Engineering Geology. However, the book should be judged on what it contains, and it contains much of current interest and significance.

The book is intended as an undergraduate text and is densely packed with information, with sufficient black and white line drawings to illustrate important points and a few black and white photographs where appropriate. Case histories are highlighted in text boxes to illustrate the theory and each chapter finishes with a summary of key points and suggestions for further reading. References are generally up to date and to the point though there are some surprising omissions. No reference was found to the Department of the Environment Planning Policy Guidance Note—PPG14—‘Development of unstable land’, to British Standards 5930 (site investigation) or 1377 (materials testing) or the Engineering Group of the Geological Societies Working Party Report on weathering (or most of the other Working Party Reports). Other recent books on environmental geology have included relevant world wide web sites in their suggestions for further study and perhaps this could be considered when a second edition is produced.

The book succeeds very well in its aim as a student text by giving a great deal of relevant information in an easily readable and understandable style and represents excellent value for money compared with other books of similar scope and quality. Thus it is to be recommended as a student text. It is also is worth considering as an addition to the library of more advanced practitioners who wish to broaden or update their knowledge in areas other than their own speciality but they must bear in mind that it is primarily an academic text covering a broad topic and not a practical guide to dealing with environmental problems. Consequently the references tend to be general or reviews and some significant aspects such as geochemistry, legislation regarding contaminated land and health and safety issues must be looked for elsewhere.

A. Forster

Geotechnical Engineering for the Preservation of Monuments and Historic Sites. C. Viggiani (ed.). Balkema, Rotterdam, 1997. Hfl 195.00 hardback; xviii + 880pp. ISBN 90-5420-871-1.

This book is the proceedings of an international Symposium held in Napoli, Italy in October 1996 which explored the role that geotechnical engineering can have in the preservation of archaeological monuments and historical sites. The Symposium was organised by the International Society for Soil Mechanics and Foundation Engineering, whose Technical Committee TC19 is on the Preservation of Historical Sites.

The Symposium Proceedings contains one hundred papers and general reports, under the headings of Investigation, Monitoring, Intervention Techniques, and Case Histories. Italian authors dominate the Proceedings, but there are papers from throughout Europe and further afield, including the Americas and Asia. The United Kingdom is poorly represented. However, for British readers this is perhaps an advantage as the mix of authors and topics makes the Proceedings a useful source of information on world-wide practice. Most of the papers deal with particular projects. Although comparatively few cover the methodology and philosophy behind preservation work, or provide wider reviews of techniques, many of the individual project descriptions have a wider application. They provide many varied insights into the problems faced and often overcome by those responsible for the preservation of our ‘heritage’.

The papers also illustrate the need for geotechnical specialist to co-operate successfully with other interested parties who may have different objectives and methods of work (archaeologists and architects, for example).
Only by doing this can the full value of geotechnical engineering be realised for the preservation of monuments and historic sites.

The Proceedings are aimed at professional practitioners, researchers and advanced students. They will be a useful resource, but one that requires perseverance by the reader due to a number of unfortunate handicaps. Firstly, the absence of a technical index means that it is not possible to search for particular topics or combination of topics. The reader is thus left to browse through the contents pages in search for the item of interest. There must be a wide range of ways in which such an index could have been provided, perhaps as a detailed introduction or an appendix. Secondly, the English of some papers is sometimes unclear due to incorrect usage or vocabulary. Native English speakers will find this annoying, but it may well hinder the understanding of those for whom English is a second language. And lastly, the style and format of some of the figures is inappropriate for publication, being too small or crowded. All of these shortcomings could have been corrected at the editorial stage. It would have been an additional effort, but would have made the Proceedings a much more valuable reference book.

In conclusion, these published Proceedings provide a large source of information for an increasingly important field of geotechnical engineering. The editorial shortcomings are more than compensated for by the wealth of case history and (to a lesser extent) methodological information they contain. Individual specialists may wish to own a copy of the Proceedings. Specialist libraries covering civil engineering, architecture and ‘heritage’ should certainly have a copy on their shelves.

D. T. Shilston

Empirical Rock Failure Criteria. P. R. Sheorey. Balkema, Rotterdam, 1997. £35.00 softback; xii + 176pp. ISBN 90-5410-6719.

This is a text devoted entirely to empirical rock failure criteria (only stress-based criteria are covered), and hence is aimed at a specialist audience. It will be of interest mainly to practitioners using rock deformation modelling approaches. In Chapter 1 an introduction to stress based failure criteria is provided, and the concept of Factor of Safety is discussed in detail. In Chapter 2, failure criteria for intact rock are presented, and their range of applicability is assessed using a very large amount of triaxial data taken from the literature. The approach is rigorous, and the data support the conclusions drawn. In Chapter 3, failure criteria for jointed rock masses are reviewed, after which the author presents his own criterion. Here the approach is less rigorous (the criteria are not assessed by comparison with measured behaviour). Methods for failure prediction in anisotropic rock are discussed in Chapter 4, followed by three case studies of underground excavation construction in Chapter 5.

Several aspects of the organization of the text do not facilitate comprehension. Firstly, it is often difficult to appreciate the objectives of individual sections, which are not usually stated explicitly. Secondly, the main body of the text contains extensive sets of tabulated data, sometimes running to several pages, which would have been better included in the appendices. For the non-specialist the text might be difficult to follow; algebraic terms defined in one part of the book are referred to in other sections without reminding the reader of their significance. Although detailed mathematical proofs are given, the significance of the results is rarely fully explained. Inexact and ambiguous statements also present problems for comprehension by the non-specialist. In the opinion of the reviewer, in order to increase appeal the text needs to be longer, to provide more explanation.

A number of general comments on the content can be made. The lithological descriptions given in the data tables are restricted to single words (e.g. sandstone) which must restrict the usefulness of the data presented. Although the reviewer appreciates that it was not the intention of the author to cover theoretical aspects of rock failure, the lack of any reference to fundamentals may be unhelpful. This applies particularly in the section where the behaviour of anisotropic specimens is discussed, where more description of the physical causes of behaviour might facilitate the reader’s understanding.

On a positive note, it can be stated that the text contains material that is of interest to researchers and specialist practitioners and that the typesetting and figures are of very high quality. Providing the book can be understood, it will allow practitioners to make better choices of which failure criterion to use in specific circumstances. The overall approach recommended—selecting a strategy for prediction of rock failure according to extent of jointing and anisotropy in the rock mass—is very appropriate. Table 4, which outlines how this should be done, is extremely useful and should have been placed in a much more prominent position in the text (more explanation of the correct use of this Table would have been helpful). The comments on the correct use of the two dimensional and plane strain approximations and on the various definitions of Factor of Safety should be read by anyone who attempts to model rock mass behaviour. The reviewer also found the case studies very interesting, although the level of detail provided (e.g. the description of rock mass characteristics) is not really sufficient.

L. J. West