

signalling, not referring to it as a tool in marine geology. The basic difficulty of preparing elementary book about scientific subjects is illustrated by the first of his five useful appendices, which starts by describing how large and small numbers can conveniently be written as powers of ten and giving rules for multiplying and dividing them. Dr Gross seems to have overcome the difficulties as well as anybody could, producing a balanced introduction which will be useful to many

non-specialists. Perhaps in a third edition he will correct the few remaining errors, including the statement that the longest waves in the Pacific are 34 m long and those in other oceans 15 m. Of course, he meant wave heights but even then the statement is surely overdefinite and quite probably false.

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Geomorphological basics

THE appearance of yet another general text on geomorphology raises several questions: is there a need for it? Does it compare favourably with its competitors? Is it good value for money? The answer to all these is undoubtedly yes. R. J. Rice has built on his experience in teaching geomorphology to first-year undergraduate geographers at the University of Leicester to produce a book that aims "to build on the foundations normally provided by sixth form studies at school". *Fundamentals of Geomorphology* (Longman: Harlow, UK, £6.50) is therefore chiefly written with the British student in mind, to form a bridge between school and more advanced university studies in geomorphology.

Unhappily, there exist few texts that adequately review the subject at this level and combine an up-to-date treatment with a concise and readable style. The past 10 years have seen the appearance of at least seven or eight general geomorphologies, even if one excludes American undergraduate texts, translations and second editions, yet the problem of what to recommend to one's first-year students in geomorphology has remained. A. L. Bloom's *The Surface of the Earth* (Prentice-Hall, 1969) is admirably readable but, at 152 pages, too slight; A. F. Pitty's *Introduction to Geomorphology* (Methuen, 1971) presents a full treatment but suffers from a complex layout and the inclusion of some material more appropriate for second-year students; K. W. Butzer's *Geomorphology from the Earth* (Harper and Row, 1976) is too expensive; R. J. Chorley and B. A. Kennedy's *Physical Geography: A Systems Approach* (Prentice-Hall, 1971) offers a new approach but one that many first-year students find difficulty in understanding; and so one could go on. Moreover, not one of these texts offers anything more than a perfunctory treatment of endogenous processes, and many omit this important field entirely.

Rice devotes one-quarter of the book to the Earth's first-order relief features and structures and to global tectonics. It is worth commenting that even this proportion is small compared with the

attention given to this topic by geomorphological texts published in the Soviet Union, where great importance is attached to morphostructures and morphotectonics in understanding the Earth's relief. Rice describes his approach as "quantitative but non-mathematical". Numerical data and analysis are not lacking; relationships such as the Bernoulli equation for the energy of a stream and Glen's flow law for glacier ice are introduced as appropriate, but always in a clearly explained manner.

The book contains seventeen substantial Chapters, and there is no space here to set out the contents in detail. As already mentioned, Part I (five chapters) is basically concerned with the application of geophysics to an understanding of the primary relief features. Plates and plate tectonics figure largely in this, but there is also discussion of localised crustal movements and of geochronology (with particular emphasis on the Cenozoic). Part II takes the student through various aspects of subaerial denudation: weathering, slope description and measurement, mass movements, stream flow and sediment transport, drainage basin analysis, and models of landform evolution from Davis to Hack. It is a pity, however, that there is very little mention of aeolian processes in arid environments, and deserts in general receive only minor attention.

Part III covers glacial and periglacial phenomena (four chapters); Part IV looks at coastal processes, sea-level change and the evolution of coastal forms (three chapters). The arrangement is logical and leads on easily from work of advanced level school standard. There are clear sub-headings and it is easy to find one's way around, even without recourse to the list of contents or the index. The style of the maps and diagrams does not greatly appeal to this reviewer: there tends to be too much use of thick lines and dark shading, but the selection of illustrations is well judged. Instead of a massive reference list at the end of the book, selected references and recommendations for further reading are set out at the end of each chapter.

Although the geomorphological specialist will find many cases of oversimplification in presentation and points to disagree with, the book succeeds well in compressing a broad field of study into a limited space, conveying some idea of

the directions of modern research in the subject and stimulating the student to further reading. It fits the market for which it is designed admirably, and its cost compares favourably with competing texts.

Landscape Processes: An Introduction to Geomorphology (Allen and Unwin: London, £2.50), by D. & V. Weyman, is a slim volume designed to cater for the needs of sixth-formers, and aims to introduce them to some of the important concepts of modern geomorphology. Processes rather than landforms are emphasised, and the reader is shown how measurement of process has assisted the development of geomorphological theory. Most attention is paid to humid environments: nearly one-third of the book overall is concerned with the movement of water in river or ground-water systems. On the other hand, endogenous processes and volcanic activity are dismissed in one page, "because these topics are dealt with at length in many other books". This is not a very convincing excuse, for there is a notable lack of concise up-to-date accounts of these topics at this level of treatment, and it is a pity if the sixth-former goes out with the idea that geomorphology is solely concerned with exogenous processes.

The arrangement of the book is clear and logical. After a brief introductory chapter, there are sections dealing with "Humid Landscapes" (37 pages), "Arid and Semi-Arid Landscapes" (8 pages), "Glacial and Periglacial Landscapes" (13 pages), "Coastal Landscapes" (10 pages), and "Landscapes of the Past" (10 pages). Illustrations are plentiful and attractively produced, and there is a short list of recommended further reading at the end, though this consists mostly of relatively advanced texts.

The style of writing is, on the whole, reasonably clear, but there are exceptions. Assuming that the book is being used by a student who has just been through an ordinary level course, the explanations of some ideas, such as the development of convexo-concave slopes (p32), of the long-profiles of rivers (p35), and the rotational movement of cirque glaciers (p64) may prove difficult to grasp. Indeed, there might be something to be said for using this book in conjunction with, or subsequent to, the reading of some more traditional textbook of geo-

morphology, such as B. W. Sparks' *Geomorphology* (Longman, 1960), M. J. Selby's *The Surface of the Earth*, Volume I (Cassell, 1967) or A. L. Bloom's *The Surface of the Earth* (Prentice-Hall, 1969).

The book is well produced, with few errors, but a little expensive compared with some other recent texts.

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