

granted, however, that this is clearly reviewed and is the most fundamental way we would expect to be able to understand the optical model.

Dr. Hodgson's book is a well-balanced presentation, it satisfies a need and is coherent. Proof reading has been generally thorough, notwithstanding the two different spellings of the name Mottelson which were noticed and the incorrect reference date for Wolfenstein (1956 should be 1954) on p. 161. I would make one criticism concerning the symbol  $k$  which is used throughout the book both for momentum and wave number. In Appendix C, headed "Numerical Relations",  $k$ , said to represent the wave number, is defined as a quantity with the dimensions of momentum. On p. 161  $k$  is used for momentum, but in equation 5.16 it is the wave number again, this time having the correct dimensions. Also in Appendix C the units of  $E$  are not stated.

Paper, printing and binding of this book are all of the excellent standard one has come to expect from the publisher and the price is very reasonable.

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## THE 'FORE AND AFT' OF SEDIMENTARY ROCKS

### Paleocurrents and Basin Analysis

By Prof. Paul Edwin Potter and Prof. F. J. Pettijohn. Pp. viii + 269 + 30 plates. (Berlin: Springer-Verlag, 1963.) 40 D.M.

**I**N any rapidly advancing subject a valuable contribution can be made by a timely review of existing knowledge. Profs. Potter and Pettijohn have attempted such a survey of one aspect of sedimentology, namely, the usefulness of directional properties in determining current patterns and analysing sedimentary basins.

There are ten chapters. The first outlines the use of palaeocurrent investigation, shows how this is related to other aspects of geology, and itemizes the directional properties concerned. A historical review of palaeocurrent investigations follows. Chapters 3-8 deal with the directional properties themselves. Arrangement of fabric elements and the geophysical properties resulting from preferred arrangements are examined first. Cross-bedding, ripple marks, other linear structures and deformation structures follow in sequence. Chapter 7 relates internal directional structures to the geometry of the sedimentary bodies containing them. Dispersal patterns and the current systems they reveal are discussed. Chapter 9 covers the more theoretical aspects of basin analysis. The model concept of sedimentary basins is developed and illustrated with examples. A final chapter reviews methods of investigation, including the collection, processing and statistical analysis of data, and presentation of results.

In layout the book is thus sound and logical, and a vast amount of useful information is assembled. The authors' main thesis and their views on integrating various lines of investigation are worth while and sometimes illuminating. Unhappily, however, the book as a whole is disappointing, mainly due to weaknesses in choice and presentation of material. There are many signs of hasty preparation, the standard sometimes falling short of that expected in a scientific treatise.

The most obvious weakness was perhaps self-imposed. In their preface the authors state that "much of what has been written about the environmental significance of sedimentary structures is omitted; that which pertains to their relation to transport direction and to basin analysis is emphasized". Obviously, over-concentration on environments would have detracted from the main topic. But the treatment of environments and the origin of structures is too slender and lacking in rigour. This allows, even encourages, a rule-of-thumb approach. A more exhaustive

examination of origins in place of the repetitive and irrelevant parts of the text would make the book twice as useful. Irrelevancies certainly exist. For example, in the section on deformation structures, features having no known or inferred directional significance are described at length. Sometimes the text reads like a manual of sedimentary structures—not a review of a limited topic.

Balance between detail and generalization is uneven. Sometimes there is too much detail: sometimes relatively uncritical generalizations obscure unsolved problems. Surprisingly little reference is made to hydraulics and only a few Recent examples are taken.

Any review must rely heavily on published work. Here, too much of it is presented uncritically and some important references are omitted. In contrast, unpublished theses are referred to—a growing habit these days.

Ease of reading is impaired by the style ('catalogue English') and the profusion of bibliographic references in the text. This is exasperating because, being a reasoned whole, the book should read from cover to cover. Increase in the number of page cross-references and improvement of subheading and paragraph styles would help.

Occasional textual mistakes, such as spelling, can be excused where the intention is obvious. But misspelt names cause confusion (for example, Forgotsson and Fergotson for Forgotson) or misunderstanding (for example, Nairn is always rendered as Narin). At least 9 spellings in the text differ from those in the reference list. More serious errors concern publication dates. No fewer than 18 dates in the text disagree with the bibliography. Generally the discrepancy is a few years, but ranges up to a century. At least 8 references in the text do not appear in the bibliography. Such carelessness inevitably casts doubt on the accuracy of the volume and page numbers listed. Blame is not always attributable to the printers. For example, (1) "Old Red Sandstone" appears where "New Red Sandstone" is intended, and (2) a reference to the work of Donner and West in a large area of south-eastern England leads the reader to a publication by Donner and West on a small area in Spitsbergen!

The statistical section in the last chapter is weak. Too much prior knowledge is assumed. Those able to understand will find most of this unnecessary. Obvious slips feature in 3 formulæ. More surprising is the calculation of an arithmetic average where 3 out of 9 numbers are wrong.

Text figures, generally clear and informative, are plentiful. Some are beautifully drawn, but many described as "modified from" previously published illustrations lack indication of the nature or extent of the modification. Some of the inconsistencies could have arisen from this. For example, a map showing cross-bedding directions is accompanied by a rose diagram which gives their frequency distribution but contains a northerly component not on the map. Many of the legends need amplification. Figures and textual statements about them do not always tally.

The plates are good, generally illustrating the points discussed. A few of them, however, lack scales. The method used for indicating current directions is occasionally ambiguous. Currents are variously described as "parallel to top of page", "from lower right to upper left", etc. Confusion inevitably arises when the photographs are mounted sideways on the page. Arrows marked on the pictures would have avoided this.

Intended for "both the student new to the subject and for the experienced geologist whose work leads him to the study of sedimentary basins", the book falls short of the mark. Students new to the subject will find it heavy going and must be warned of the imperfections. Experienced geologists able to detect and avoid such pitfalls will value the compilation while lamenting its deficiencies.

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