In common with so many of those who follow in Einstein's footsteps, Dr Edelen appears to be familiar only with the fields of macroscopic physics: apart from a brief reference in the text to quantisation and the appearance in Chapter VII of a " vector meson field ", contact with field theories of microscopic physics is confined to some strangely selected (and often even more strangely spelt!) items in the bibliography. The criteria used by people with this point of view in assessing the acceptability of theories seem to a theoretical physicist a little odd, to say the least.

If one accepts that the relevance of a book of this sort to physics is bound to be dubious, then one should at least expect to find some depth in the mathematical treatment of the subject. In the same area of mathematical physics Hlavatý's *Geometry of Einstein's Unified Field Theory* stands as an example of a work of this character. But a glance at some of the key sections of Dr Edelen's book dashes one's hopes. For example, in Chapter III equations appear which purport to be the analogues of conservation of angular momentum for a Lagrangian with no invariance; they contain a vector function v_λ which is a solution of another system of equations. There is no discussion of whether this system of equations admits any but the trivial solution, $v_\lambda = 0$, for some or all of the solutions of the field equations. So much for mathematical profundity!

It is difficult to understand how the University of California Press came to publish such a book.

P. W. HIGGS

BURLAK, J., AND BROOKE, K. *Russian-English Mathematical Vocabulary* (University Mathematical Texts, Oliver and Boyd, Edinburgh, 1963), 311 pp., 21s.
NIDDITCH, P. H., *Russian Reader in Pure and Applied Mathematics* (University Mathematical Texts, Oliver and Boyd, Edinburgh, 1962), x+166 pp., 10s. 6d.

This vocabulary is intended for the reader of Russian books and papers in pure mathematics, although it also contains terms from applied mathematics and statistics. It is preceded by an excellent summary of the basic grammar needed for a reading knowledge of the language. Grammatical irregularities are noted in the vocabulary and parts of irregular verbs are listed in their alphabetical place with cross-references to the infinitive. Even if a language is only to be read it is desirable to have some knowledge of its pronunciation and the chief difficulty in Russian is knowing where the stress falls. This is marked in the vocabulary. Abbreviations and phrases are included and the vocabulary also contains the names of a number of mathematicians who are sometimes difficult to recognise in Russian transliteration (including the twelfth-century astronomical author Johannes de Sacrobosco, who will probably not be met very frequently in most people's reading). The book should prove very helpful to the mathematician with little or no knowledge of the language who has to tackle a Russian paper.

The reader contains one hundred extracts from standard Russian textbooks in pure and applied mathematics. All but the last six have a word-for-word interlinear translation and brief notes on grammatical difficulties are given after each extract. There is no general grammatical introduction and the reader is assumed to have already studied a summary such as that given in the vocabulary above. I am doubtful about the value of a word-for-word translation. Having to look up each word in a dictionary is tedious but helps to fix the words in the memory and also enables one to see what other meanings the word has besides the one in the given context. The grammatical notes are rather too brief and occasionally incorrect (for example, the statement on p. 115 about the cases of adjectives after numerals), and leave many points unexplained which might well puzzle a beginner. The desire to produce a word-for-word translation has sometimes obscured the meaning and hidden an important point of grammar which is left unexplained in the notes (for example,

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on p. 36 *ni pri kakom znachenii* is translated by *even for some value*; it is not pointed out that *nikakom* is basically a single word which is split round the preposition *pri* and the beginner is left wondering why *ni* means *even*). The system of numerical subscripts used to indicate differing word order in Russian and English is never explained anywhere.

However the book does provide reading practice in a wide variety of subjects including real and complex variable theory, projective and differential geometry, algebra, electromagnetic theory and mechanics.

C. J. SHADDOCK

HALMOS, PAUL R., *Lectures on Boolean Algebra* (Van Nostrand, Princeton, 1963), 147 pp., 23s. 6d.

This booklet is No. 1 of a new series of paperbacks entitled *Van Nostrand Mathematical Studies* " intended to provide a setting for experimental, heuristic and informal writing in mathematics that may be research or may be exposition ". The series under the joint editorship of the author and Professor F. W. Gehring is planned to include " lecture notes, trial manuscripts, and other informal mathematical studies ". Informality is the keynote of this racy booklet based on lecture notes given by the author in the University of Chicago. In this case the result is an undoubted success, which is not surprising since the author, already a well-known expositor, is also an editor, but one wonders at the temerity of editors who encourage authors to submit lecture notes and trial manuscripts for publication. The style of the presentation is indeed unconventional. Where else in mathematical literature would one find statements such as " the juicy existence and characterisation theorems follow in later sections "? The text is interspersed with provocative queries such as a lecturer might put to his class and the reader is carefully guided past possible pitfalls. " The trouble with the union of two regular open sets is that there might be a crack between them."

This book is not elementary in the sense that the books by Whitesitt and Goodstein are elementary. For instance, there is no mention of Hasse or Venn diagrams. The reader is expected to be familiar with set theory, rings, topology and measure theory, but otherwise it is self-contained and makes delightful reading. Here and there one feels that the lecture notes might have been revised with just a little more care. For instance, on p. 7 we read " Let m be an integer greater than 1, . . . Define . . . $0 = 1$, $1 = m$, . . ." Even if, as seems likely, the printer had a limited number of founts at his disposal, one might have expected some distinction to have been made between the integers 0 and 1 on the one hand and the null and universal elements of the Boolean algebra on the other.

The applications of Boolean algebras dealt with in this book lie mainly in the fields of topology and measure theory. Amongst the thirty-two section headings the following titles are to be found: Boolean rings, Fields of sets, Free algebras, Ideals and filters, Boolean σ-algebras, Measure algebras, The representation theorem, Completion, Incomplete algebras, Isomorphisms of factors, Retracts, Projective algebras, Injective algebras, Epilogue. This is a stimulating and unconventional book which will be a delight to the mature reader.

D. E. RUTHERFORD

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