

lapses; the level here is roughly junior secondary. Later in this section a full discussion is given of each illustration, a procedure which is followed all through the book.

Chapter III is algebraical and far more extensive in scope. It contains, in addition to many instances of blunders due to division by zero in varied disguises, or to faulty handling of inequalities, examples exhibiting the necessity for rigour in mathematics, a necessity which many students fail to appreciate. The chapter ends by elucidating common sources of confusion in elementary complex algebra, and the level extends from "O" minus to "A" plus.

Geometrical fallacies have a long history, and, although Chapter IV is on mainly traditional material to "O" level, it is stimulating and is probably the most complete such collection in English.

Trigonometrical howlers, at level "O" plus, are dealt with scantily in Chapter V, and approximate computation at the same level even more sketchily in Chapter VI.

It will be seen that the standard of matter treated is far from uniform, reaching a considerable maximum in Algebra, to which is devoted the longest and most interesting chapter in the book. In general the treatment, while less arresting than, say, that of Northrop, is very thorough everywhere, and is sufficiently detailed for the needs of those studying alone. The variation in level of topics selected is chiefly responsible for the book just missing completeness as an anthology at Grammar School standard, of mathematical error and its correction. Many teachers, as well as pupils, will benefit from its study: it should be in every school and training college library.

SELWYN READ

Studies in Mathematical Analysis and Related Topics: Essays in Honor of George Pólya, edited by G. Szegő and others (Stanford University Press; London: Oxford University Press, 1963), xxi + 447 pp., 80s.

This volume, published on the occasion of his 75th birthday, contains sixty original papers by leading mathematicians of the United States and Europe who have been inspired by the teaching or researches of Professor Pólya, together with a list of Pólya's publications and a preface by the editors on his distinguished career. Most of the papers are in fields to which Pólya himself has contributed, and many of the authors indicate Pólya's influence on the development of their subjects and give fuller historical backgrounds than are usual in research papers. Predictably one finds the names of Boas, Erdélyi, Hayman, Littlewood, Szegő, Titchmarsh, Zygmund and others in the list of authors, but the presence of such names as Brauer, Coxeter and Davenport is a striking reminder of the breadth of Pólya's interests and his contributions to pure and applied mathematics.

It was not to be expected that every one of the authors could produce a specimen of his most memorable work to order for the occasion, but this well-produced volume is a worthy tribute to one of the most outstanding mathematicians of our time.

P. HEYWOOD

RYSER, H. J., *Combinatorial Mathematics* (Carus Mathematical Monographs, No. 14; published by The Mathematical Association of America, distributed by John Wiley and Sons, 1963), xiv + 154 pp., 30s.

Beginning with sets, permutations and combinations, the very first principles of the subject, the author leads us to the forefront of modern combinatorial analysis. Inevitably in a compass of some 140 pages, the account is compact and has to be read with careful attention, but this is a small price to pay for the convenience of a self-contained monograph. The author leads us to such heights as an extremely elegant construction of pairs of orthogonal Latin squares of order $12k + 10$, part of

the work of Bose, Shrikhande and Parker in their recent refutation of Euler's conjecture (which was that no such pairs exist for any order $4k+2$ and is now known to be wrong for all orders $4k+2 > 6$). Other fine results are on the existence and non-existence of balanced incomplete block designs and perfect difference sets.

The author has himself made many distinguished contributions to the subject, and his authority is evident throughout the book. Extensive references after each chapter, excellent book production and accurate printing combine to make this a worthy addition to this distinguished series of monographs.

JOHN LEECH

CHORLTON, F., *Textbook of Dynamics* (D. van Nostrand Co. Ltd., London, 1963), 263 pp. Paper 25s., Cloth 45s.

This book is a straightforward treatment of some topics of classical dynamics based on vector methods and on the analytical methods deriving from Lagrange's equations of motion. It is obviously designed as a textbook to be used by undergraduates attending "conventional" courses in dynamics as part of an honours degree in applied mathematics. Some parts of it would be useful to students reading for a general degree or for a degree in physics or engineering.

Within this framework it is a carefully written book. The basic physical principles are clearly stated, the necessary mathematical techniques are developed and the theory is fully illustrated by worked examples. At the end of each of the eleven chapters there are problems for the student to work for himself. These are carefully selected from examination papers set in the Universities of Cambridge, London and Reading; answers are given to these problems.

The only sense in which we should quarrel with the author is with his claim that his treatment is "modern". It is in fact no more modern than the classic treatise of Lamb, published many years ago, and much less modern than well-known treatises by Whittaker and Birkhoff. There are many students of the present generation requiring a modern course of dynamical theory because of its own intrinsic merits or because they wish to go on to do research in quantum theory, astronomy or the mechanics of continua. Unfortunately the course outlined in this book will not give them what they want; if it is of use to some British students it is only because they have to sit examinations on syllabuses which bear no relation to their subsequent careers.

I. N. SNEDDON

MAXWELL, E. A., *Fallacies in Mathematics* (Cambridge University Press, 1963), 95 pp., 6s. 6d.

Dr Maxwell's little book on fallacies in mathematics is already well known—indeed it is so widely recognised as a minor classic that it comes as a surprise to realise that the first edition was published only in 1959. The present edition is described as the "First Paperback Edition". It is a reprint of the first edition but is now available at a much reduced price. It is to be hoped that this will lead to its being acquired by many sixth-formers and students as well as by those who are entrusted with the task of teaching them, for it is difficult to think of any other book which so fully achieves the author's aim "to instruct through entertainment".

I. N. SNEDDON

AUSLANDER, L. AND OTHERS, *Flows on Homogeneous Spaces*, *Annals of Mathematics Studies* 53 (Princeton University Press, 1963), vii + 107 pp., 22s.

This is a series of papers presenting recent results of the authors concerning the action of a one-parameter group of transformations on a homogeneous space G/H of a connected Lie group. Here H is a closed subgroup, and the transformation group