Outside these three main categories, Professor Anderson deals with classification problems and tests of the hypothesis of independence of sets of normal random variables. In a final chapter he reviews briefly various developments of multivariate analysis not included in the main text, including, in particular, factor analysis.

All the mathematical theory (both " population " and sampling theory) underlying the methods discussed is included. Naturally much use is made of matrices and while an appendix summarises the matrix theory involved, a fairly thorough knowledge of this theory is a prerequisite for the study of the book. The main inference methods adopted are maximum likelihood estimation and the likelihood ratio test and here knowledge of the properties of these methods for univariate situations is assumed. (In the problem of classification some use is made of decision function theory but a very clear and concise account of the necessary part of this theory is given in the text).

Professor Anderson's book is notable for clarity of exposition. Overall clarity is maintained by his classification of multivariate methods. Each chapter has an excellent introduction providing motivation. Illustrative numerical examples are included wherever necessary, and there is an adequate supply of problems for solution. There is no doubt that this book will be of great use to statisticians both for teaching and for reference. S. D. SILVEY

SCARBOROUGH, JAMES B., *The Gyroscope—Theory and Application* (Interscience Publishers, New York and London, 1958), pp. xii+257, $6.50.

There is at the present time a considerable reawakening of interest in the gyroscope and its applications, aroused no doubt by the widespread use of gyroscopes in guidance and stabilisation mechanisms. Equally it must be admitted that, possibly on account of other demands on their time, students of applied mathematics, physics and engineering are today, on the whole, not so well trained in three dimensional rigid dynamics as their predecessors of thirty years ago. In his book, which is for the most part a specialist treatise on the gyroscope, Professor Scarborough recognises a possible lack of preparation in basic mechanics on the part of his readers, and his first two chapters are accordingly devoted to a quite adequate account of the necessary vector algebra, and of the dynamics of a rigid body rotating about a point. There follow two chapters on the elementary theory of the gyroscope both free and moving under the action of gravity.

The remaining and principal part of the book is devoted to a description of various applications of gyroscopic principles—grinding mills, the gyroscopic compass, gyroscopic steering and various gyroscopic stabilisation systems. Thus part of the book abounds in practical examples, in which typical modern gyroscopes are used to provide the numerical values. Essentially this is an elementary book on the single gyroscope, not touching on general problems such as the stability of systems containing gyrostats.

Within its limits it certainly provides an excellent and very readable account of the subject. The publishers are rather unfair to the classic treatise of Andrew Gray, however, when they refer to the present book as " for the first time in the English language a sound, reliable account of the fundamental theory of the gyroscope and its more important applications ". J. C. GUNN

MAXWELL, E. A., *Fallacies in Mathematics* (Cambridge University Press, 1955), 95 pp., 13s. 6d.

The professed aim of this book is to instruct through entertainment. The author takes a number of interesting fallacies in mathematics, gives the argument

of each, and subsequently analyses the point at which the error intrudes, the analysis sometimes leading to mathematical considerations of some depth.

Mathematical textbooks have been criticised on the grounds that they are solely devoted to the proofs of true propositions and that students are never asked to disprove false ones. Dr Maxwell, while he has given the disproofs of the fallacies, has gone some way in his latest and novel production to meet that criticism.

The book is well produced and can be recommended to all students and teachers of mathematics.

W. CRAIG

DEAUX, R., *Introduction to the Geometry of Complex Numbers*, translated by H. Eves (Ungar Publishing Co., New York, 1957) pp. 208.

The object of this book, which is based on lectures given to electrical engineers, is to show how complex numbers can be profitably used for the solution of certain geometrical problems. The book begins with an account of the geometrical representation of complex numbers and, after an excellent treatment of anharmonic ratio, passes on to consider circles, conics, cycloids, and certain cubic and quartic curves in the Argand diagram. The book concludes with a chapter on bilinear transformations. The exposition is everywhere clear, the printing is good and the book can be recommended for any sixth form or University library.

D. MARTIN