A notable and highly constructive feature of the work is the list of about a score of " Topics for discussion ", with which each chapter closes. Any reader who conscientiously sets out to investigate, for example, " Fermat's contributions to the calculus compared with those of Cavalieri, Barrow and Roberval " or " The mathematics of England in the 14th century; in what ways did the science meet the needs of the time? " will soon find himself reading both widely and deeply, guided by the bibliography and the excellent footnotes with which the text is liberally provided. The appeal of the work is greatly enhanced by the large number of illustrations which are included in the text, mainly portraits, maps and reproductions of text or diagrams from early manuscripts or printed books.

This remarkable and eminently " usable " work is written with a refreshing gusto and a continual awareness of the many points at which mathematics touches human life. The author, never weighed down by his wide erudition, has succeeded admirably in communicating to the reader something of his own enthusiasm for a fascinating subject. The paper and printing are excellent, and the binding, sewn sections in a shiny plastic cover of somewhat flamboyant colour and design, is durable and serviceable, a necessity for volumes each well over an inch in thickness.

By comparison, Dr J. F. Scott's book is on more sober and conventional lines, both outwardly and inwardly. Dr Scott has already written books on Wallis and Descartes (which he modestly omits from his bibliography) and has now given us a history of the whole subject from antiquity to the beginning of the nineteenth century. Although the work is planned on a smaller scale than Professor Smith's, it covers rather more than elementary mathematics, and manages to pack a surprising amount of detailed information into its pages. The book is more self-contained; there are fewer footnotes, and they do not range so widely. Two useful appendices are included, the first containing short biographical notes on many of the mathematicians whose work has been referred to, and the second briefly summarising some fifteen topics mentioned in the last four chapters of the book, such as Complex Numbers, Complex Variable, Descriptive Geometry, Elliptic Integrals and Functions, Invariance, Isoperimetry, Least Action and so on. There is also a bibliography of source material containing about seventy items.

The book is admirably written, and is scholarly and accurate in detail. Only trifling errors have been noted; on p. 41 Nicomachus should be Nicomedes, and on p. 237 Colin Maclaurin is said to have died at York, instead of Edinburgh, a mistake which Professor Smith has also made. On p. 168 it is implied that James Gregory's independent discovery of the binomial theorem took place some three or four years after the date (1676) of Newton's Epistola Posterior. Actually Gregory died in 1675. In the account of the binomial theorem one might question Dr Scott's interpretation of Newton's remark to the effect that after he had discovered the extraction of square roots *more arithmetico*, he entirely disregarded the interpolation of series, and employed these operations (*has operationes*) exclusively as a more genuine foundation. Dr Scott differs from other authorities, including Turnbull, in taking " *has operationes* " to refer to the binomial theorem.

But these are minor points; Dr Scott has written a most useful and eminently readable book, which can be studied with profit and enjoyment by students and teachers alike. R. SCHLAPP

RUTHERFORD, D. R., *Fluid Dynamics* (University Mathematical Texts Series, Oliver and Boyd, 1959), ix+226 pp., 10s. 6d.

This book, based upon lectures given by the author in the University of St Andrews, should prove extremely useful to students of mathematics as a first course of reading in fluid dynamics. The exposition is very clear, an essential feature when so much is put into a book of such limited size. There are chapters on basic concepts, on the

complex variable method for two-dimensional problems, on other methods for non-viscous incompressible flow (including Stokes' stream function, hodograph methods, and a short description of the relaxation method for the solution of Laplace's equation), on compressible flow and on viscous flow. There is an Appendix on vector formulæ, which are used freely in the text. One appreciates the carefully chosen examples of the use of the complex variable method, which, although mathematically elegant, is of limited physical importance. The chapters on compressible and viscous flows are very welcome in a new textbook at this level. The reviewer would like to point out, however, that the solution proposed for flow at supersonic speed into a concave corner is incorrect. An examination of shock polars based on pressure and flow direction shows at once that the postulated regions of uniform flow separated by vortex sheets cannot be found. The author also states that in the limit of a continuously curving wall the envelope of the Mach lines represents a shock-wave; in fact, it indicates only the presence of a shock-wave, the solution of the problem being much more complex than is suggested in the text.

The book is the first printed by Messrs Oliver and Boyd on their new "4-line mathematical" Monotype machines. The type is pleasing to the eye and the formulæ are well displayed. D. C. PACK

WIGNER, E. P., *Group Theory and its Application to the Quantum Mechanics of Atomic Spectra* (Academic Press Inc., New York, 1959), translated by J. J. Griffin, xi+372 pp., 80s.

This translation of the well-known book published by Wigner in 1931 is to be warmly welcomed. Of the first half of the book about 60 pages are devoted to matrix theory and to a résumé of the relevant parts of quantum mechanics and about 120 pages to the theory of groups and their representations. The remainder of the book is concerned with the application of group theory to atomic spectra and includes three additional chapters dealing with developments, such as time inversion and the Racah coefficients, which have been made since the original publication of the book.

The whole book is written with the utmost clarity, and a student wishing to acquire, for any purpose whatever, a knowledge of elementary group theory including the theory of the symmetric and the rotation groups, could not do better than read the 120 pages referred to above. The translation, too, is excellent; one or two slips have been made, but they are of a very trivial nature and do not warrant mention here.

The printing and layout of the book are first-class. D. MARTIN