The reader is first introduced to the representation of visco-elasticity by means of models of the spring-and-dashpot type, to the equations of such rheological models and their canonical forms, and to their utilization in analysing relaxation in static and dynamic stress fields. The main part of the book is devoted to: subsonic relaxation as typified, for example, by the damping of oscillations of a torsion pendulum; methods of measurement applicable at sonic frequencies, for example, the vibrating reed; and spectrometry in the ultrasonic range. A short account of dielectric relaxation is also given, and the analysis of complex spectra by the linear superposition of relaxation-times, as well as the thermodynamic implications of the spectra, are briefly discussed.

It is clear from the book that, while experimental methods for measuring relaxation spectra are comparatively well advanced, little is as yet known of the significance of the spectra, particularly in solids. Some modern techniques, such as the introduction of a 'blue-shift' into the relaxation spectra by neutron bombardment and, on the theoretical plane, the mathematics of stochastic processes may, however, soon fill some of the major gaps in the science.

Irrespective of the actual pattern of future development, a sound knowledge of what has already been achieved will remain the research worker's indispensable prerequisite for successful work. Prof. Richardson's book provides this information. It is sure to be well received by all concerned with this branch of physics.

P. Feltham

An Introduction to the Cathode Ray Oscilloscope

By Harley Carter. (Popular Series.) Pp. viii+100. (Eindhoven: N.V. Philips' Gloeilampenfabrieken; London: Cleaver-Hume Press, Ltd., 1957.) 12*s*. 6*d*.

THIS little book explains the general principle of the oscilloscope, and the associated time-base, amplifier, and power-supply circuits. So far as the 'popular' aspect of the book goes, it is written simply and without any mathematical theory, and it should be quite useful to the kind of reader who wants to know merely how oscilloscopes work, and why people use them. But Mr. Carter goes a good deal further than this, and is really writing for the beginner who is prepared to work his way solidly through the book and to go so far as making up various circuits for himself in order to see how they work. He discusses the characteristics of the various standard types of tube, and gives detailed instructions for the assembly of four complete oscilloscope circuits; at least two of these are simple enough to appeal to relatively inexperienced hands. The book is handsomely produced and finished, and while it does seem rather expensive for its size it is not extravagantly so. Indeed, experimenters who are thinking of building an oscilloscope will probably find it very good value.

Probability

An Intermediate Text-book. By M. T. L. Bizley. Pp. viii+230. (Cambridge: At the University Press, 1957. Published for the Institute of Actuaries and the Faculty of Actuaries.) 20*s*. net.

THIS book, designed to meet the requirements of actuarial students, is concerned solely with classical probability theory, although the importance of relating this to statistics is emphasized. The development is elementary, but sound within the limits of an acknowledged incompleteness of discussion of the fundamental nature of probability. The general account of alternative definitions of probability is indeed good, and the subsequent presentation of standard theory of combinations of probabilities is excellent. The solution of certain types of problem by difference equations is well illustrated, and the reader is introduced to the theory of runs and other Markov chains. The final chapter, on continuous variates, is less satisfying, in that it scarcely goes beyond somewhat unexciting geometrical problems. The book, despite the aridity that is perhaps inseparable from its subject, can be recommended to a student skilled in algebraic manipulation, or to a teacher in search of a modern text with a good systematic plan and an abundance of examples. It is unfortunate that so many of the examples, good though they are as exercises in probability calculus, are either explicitly based on random drawings from bags and urns or have the irritating pseudo-realism of relating to people who form random committees and keep large numbers of indistinguishable pairs of gloves in a drawer; more use might have been made of actuarial problems and of applications of probability theory to science and industry.

D. J. Finney

Tables of Integrals and Other Mathematical Data

By Prof. Herbert Bristol Dwight. Third edition. Pp. x+288. (New York and London: The Macmillan Company, 1957.) 21*s*. net.

THE fact that a third edition of this collection of formulæ and tables has been called for is an indication of its usefulness. The first 193 pages consist of lists of formulæ, including those of derivatives and integrals, relating to the elementary functions, elliptic and Bessel functions, and surface zonal harmonics (Legendre polynomials). The next two sections consist of a ten-page list of definite integrals and a five-page set of notes on ordinary differential equations. The last 75 pages contain tables of numerical values of elementary functions, complete elliptic integrals, the probability integral and the Kelvin functions *ber*, *bei*, *ker*, *kei*, in the tabulation of which the author was a pioneer.

For engineers, physicists and practical mathematicians this is an excellent reference book, very well classified. The first sentence of the preface to the first edition is a glimpse of the obvious: "The first study of any portion of mathematics should not be done from a synopsis of compact results, such as this collection". The objection which some teachers have to the existence of such collections seems to result from a misunderstanding of their purpose. After all, it is largely because practical use is made of such formulæ that much mathematics is taught, and no one can be expected to remember them all, or work them out every time they are wanted.

In the third edition there are a few unimportant additions to the formulæ, and useful tables of sines, cosines, tangents and cotangents of angles in degrees and hundredths have been added. It is a pity that the opportunity was not taken to bring the table of references up to date. The most recent reference is dated 1947–48, and many relevant tables have been published since then.

The printing and binding are very good.

G. A. Garreau