

Each of the nineteen chapters of the book is followed by a comprehensive set of numerical exercises, and the book may be commended as a careful and scholarly introduction to the subject, providing a solid foundation for further knowledge.

#### Demonstration Experiments in Physics

(Prepared under the Auspices of the American Association of Physics Teachers.) Edited by Prof. Richard Manliffe Sutton. Pp. viii + 545. (New York and London: McGraw-Hill Book Co., Inc., 1938.) 25s. net.

**T**HERE are some books that can be reviewed at first reading, others that require only a glance. But sometimes the value of a book can only be appreciated when it has been used for some time, and then comes to be appreciated more and more. The author modestly claims "Demonstration Experiments in Physics" as a 'cookbook' for teachers of physics, and in its 500-odd pages it certainly contains an enormous variety of recipes. Among them we find many already familiar to teachers of physics in Great Britain, but the majority are new, or improved variants of existing experiments. They cover all branches of physics and all stages of lectures; but, naturally for demonstration experiments, the general emphasis is on the first and second years' lectures. Here dramatic nature of the action and simplicity of construction are the chief requirements. The reviewer can vouch for the feasibility of construction and the satisfactory performance of a considerable number of the experiments in this book.

The author and his collaborators have considered very carefully the principles underlying demonstration experiments, and their statement, which starts with the elementary fact so often forgotten that demonstrations are for the student and not for the instructor, is in itself a very useful contribution to the teaching of physics. Any physics teacher who buys this book is likely to find it of ever-increasing use in his lecture preparations.

#### The Flow of Homogeneous Fluids through Porous Media

By Dr. M. Muskat. With an Introductory Chapter by R. D. Wyckoff. (International Series in Physics.) Pp. xix + 753. (New York and London: McGraw-Hill Book Co., Inc., 1937.) 45s.

**D**R. M. MUSKAT'S book is an important contribution to technical literature and will be useful not only to workers in the oil and gas industries, but also to those who have to deal with problems of fluid flow through refractories and through ceramic materials and with problems of well and dam construction.

The eleven chapters which comprise the book are collected under four main headings. Part I, which deals with fundamentals, is concerned chiefly with a discussion of Darcy's law connecting the rate of flow of water through a filter bed with the area of the sand, the thickness of the bed, and the difference between the fluid heads at the inlet and outlet faces of the bed. The law and its implications are very fully discussed, and the hydrodynamical equations for flow through porous media established. Part 2

deals with steady-state flow of liquids and contains discussions of two- and three-dimensional flow problems, of gravity-flow systems, of systems of non-uniform permeability, of two-fluid and of multiple-well systems. Part 3 is concerned with the flow of compressible liquids through porous media, and Part 4 with the flow of gases through porous media.

The treatment throughout is clear and detailed, and the whole work forms a most useful and praiseworthy contribution to a subject which had, until its appearance, scarcely been explored systematically.

#### An Introduction to Industrial Rheology

By Dr. G. W. Scott Blair. Pp. xiii + 143. (London: J. and A. Churchill, Ltd., 1938.) 7s. 6d.

**D**R. SCOTT BLAIR deals mainly with the flow of non-Newtonian liquids: that is, those whose apparent viscosity varies with the rate of shear. We may regard these cases of anomalous viscosity from either of two points of view: that the anomaly is the interference with the normal hydrodynamical flow of the solvent by the solute particles; or, we may treat the system as a close-packed 'pudding' of particles separated by the dispersion medium. The latter, which is followed in this book, automatically becomes the method of approach of many industrial problems, since these are problems of the 'body' of systems in which the concentration of disperse phase is large. It is certain that, for dilute systems, the coaxial cylinder viscometer is preferable for theoretical reasons which are fundamental and well known.

That this is not made clear in this book is almost inevitable from the treatment followed. Viscosity is described from consideration of flow of liquids through tubes. This leads to Bingham's work on anomalous systems and to the subsequent modifications of his equation. Commercial viscometers are described, but the coaxial cylinder instrument is misnamed 'concentric' throughout the book. Although attention is mainly concentrated on paste type systems, the book contains a wide survey of all the types of anomalous liquid which have been investigated. It should be of value to industrial chemists faced with problems of anomalous viscosity, the number of which increases every day.

A. S. C. L.

#### The Amplification and Distribution of Sound

By A. E. Greenlees. Pp. 254. (London: Chapman and Hall, Ltd., 1938.) 10s. 6d. net.

**T**HIS is the first comprehensive text to appear on a subject which the public is rather apt to take very much for granted, the microphone-amplifier-loudspeaker combination, the correct and original description of which is the public-address system. There is little theory which can be said to belong to the subject, except the simple calculations associated with decibels, transformers, and the power-handling capacity of power-valves. The author concentrates on the practical side, perhaps too much, with rather crude descriptions of standard types of microphones and loudspeakers. Nevertheless, he does give a very good picture of the importance of the subject and the extent of its applications.

L. E. C. H.