

Chemistry Popularization

Chemistry for the Modern World.

George Porter. Barnes and Noble, New York, 1962. ix + 116 pp. Illus. \$2.

This small book is one of three that constitute the "Science for the Modern World" series. Of the other two, that by E. N. da C. Andrade presumably treats physics in the way that this treats chemistry and the third volume, on biology, is by C. H. Waddington. All of them are intended as introductory volumes for laymen who have not studied the subject before.

In view of its briefness, *Chemistry for the Modern World* accomplishes its objective reasonably well. The author begins with a description of a small number of the most important elements, moves quickly on to atomic structure and chemical combination, and finishes with chapters on organic chemistry, energy sources, and industrial chemicals. An amazing amount of factual material is compressed into eight short chapters. Surprisingly, for so short a book, the development is very logical and the descriptions are clear. The only inaccuracies that I noted are on page 99 where the author confuses Chile salt-peter with potassium nitrate and where he gives the impression that nitrogen is still fixed by the arc process. Of course, a great deal of oversimplification is inevitable in an elementary book of this sort.

This book presents nothing new for those who have had a secondary school or college course in chemistry. For the youth or the adult who has had neither, this is a well-balanced and well-written introduction.

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Civil Engineering

Groundwater and Seepage. M. E. Harr.

McGraw-Hill, New York, 1962. xv + 315 pp. Illus. \$12.50.

A thorough discussion of the seepage problems encountered in designing dams, canals, and drainage structures is contained in this book, but calculations of well discharges, familiar to most Americans interested in groundwater,

are not treated in detail. Although the book is directed primarily to civil engineers, it will also be useful to pedologists, petroleum engineers, hydrogeologists, and others concerned with broader aspects of the flow of fluids through natural material. Introductory sections on hydrodynamic equations, boundary conditions, nonisotropic media, and conformal mapping should be of particular interest. The presentation has been carefully planned so that many of the important parts can be understood by those who have only a nominal background in college mathematics.

A unique aspect of this book is the inclusion of the results of modern Russian research in fluid flow. With the exception of a translation of P. Ya. Palubarinova-Kochina's classic *Theory of Groundwater Movement* (Princeton University Press, 1962), little of this material is available in English. Harr has also covered much of the older German literature, thus making his book a valuable secondary source of European knowledge about groundwater flow.

In reading this book, one cannot help commenting on the lack of uniform terms for use in the general field of fluid flow in porous media. *Permeability* is used by some writers to indicate that property of a medium which determines the ease with which fluids can pass through the medium. Others include effects of fluid density and viscosity as well as the gravitational field within the definition of permeability. Harr uses *physical permeability* and *coefficient of permeability*, respectively, to properly differentiate between the two concepts. Authors of other recent books have used *intrinsic permeability*, *specific permeability*, *fluid conductivity*, or simply *permeability* for the first concept and *fluid conductivity*, *hydraulic conductivity*, or simply *permeability* for the second concept. Still other authors have used some of the terms interchangeably, greatly adding to the confusion. The problem also extends to other terms such as *discharge velocity*, which is dimensionally but not physically a velocity in the sense that Harr uses it. For this reason, others have used *specific volume discharge* or *volumetric flux*. Although Harr threads his way through the modern babel with some skill, his choice of terms is not necessarily the best.

The bulk of the book is suitable for use as a general reference or as an ad-

vanced textbook in soil engineering and related courses. Ample illustrations, numerical examples, and sets of problems, as well as the clear style of the book, suggest that it should be in wide use for many years.

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Parasites

Ticks and Disease. Don R. Arthur.

Pergamon, London, 1961; Harper and Row, New York, 1962. xvi + 445 pp. Illus. \$14.

The ticks are members of a homogeneous group of acarines, which is comprised of about 600 species distributed in three families and about 15 genera. All are parasites of vertebrates, and a number are serious pests of man and animals in their own right. Because they transmit pathogenic microbes of various types, ticks are recognized as the most damaging parasites of domesticated animals, and, with the exception of mosquitoes, they are the most serious vectors of disease to man. They loom large in the history of medical entomology, for the discovery that Texas cattle fever was transmitted by ticks, reported by Smith and Kilborne in 1893, was the first demonstration of an arthropod as the vector of disease agents. *Ticks and Disease* is a review of the author's concept of the current general knowledge of ticks, to which he has appended a brief account of the diseases known to be transmitted by ticks and a short chapter on control of ticks, mostly on domestic animals.

The book has value primarily as an introduction to a knowledge of the structure, physiology, classification, distribution, ecology, behavior, and disease-carrying potential of the economically more important species of ticks. With rare exceptions, the type of detailed information needed for coping with specific problems in specific areas is not given. A few peculiar statements are made, for example: "Among the better known examples [of viruses transmitted by arthropods] are yellow fever transmitted by tsetse flies, dengue by *Phlebotomus* and Colorado fever by ticks." These do not detract importantly from the book,