# BOOKS

**Handbook of Engineering Materials.** Douglas F. Miner and John B. Seastone, editors. John Wiley and Sons, Inc., New York (1955). 1,380 pages. $17.50.

The purpose of this new handbook is to provide the engineer with a rather extensive array of general information about the materials he may use in his work. The editors have compiled engineering data and descriptive subject matter for a wide variety of materials including those used in construction, manufacturing, production, and industrial research.

The contents of this volume include not only physical and chemical properties of materials, but also applications, engineering characteristics, testing procedures, availability of various types of materials, and biblographical references.

The handbook is somewhat arbitrarily divided into four sections, which cover the following topics: general information on materials, metals, nonmetals, construction materials. An authoritative presentation of data in concise, logical form has been accomplished by drawing on the skill of the fifty-one contributors to the handbook.

One of the groups for which this collection of information can be useful is those engineers who often use data in more than one particular field. The chemical engineer who requires specific information in fields such as mechanical, electrical, or civil engineering would find the handbook a good source of frequently used data. In addition, the bibliography that is given with each particular topic directs the reader to sources which supply more detailed treatments than the handbook is able to provide.

An obvious effort has been made to provide up-to-date information and to include data on materials which have only recently become of engineering importance.

ROBERT M. SECOR

**Introduction to Chemical Engineering.** Walter L. Badger and Julius T. Banchero. McGraw-Hill Book Company, Inc., New York (1955). 753 pages. $9.50.

Although the publishers do not say so on the jacket, this book is essentially a modernized version of a well-known earlier work, "Elements of Chemical Engineering," by W. L. Badger and W. L. McCabe, the most recent edition of which was published by the McGraw-Hill Book Company in 1936. The same topics are covered. A considerable part of the later book is a word-by-word reprint of the earlier text.

The present volume brings up to date the material of the older work. For example, binary distillation is now presented initially by the use of the enthalpy-concentration diagram, with the McCabe-Thiele method being subsequently developed as a special case. Although much of the old book remains in the new, large parts of this work have been completely rewritten. The growth of chemical engineering theory in the years since the issue of the earlier text is reflected in an increase in the number of pages from 660 to 753.

As an undergraduate text and a text for the engineer seeking a review of chemical

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engineering fundamentals, the book has much to recommend it. A discussion of pertinent equipment has been included with each topic covered. Many solved problems are included. Nearly every chapter contains a new set of problems for solution by the student. The development of the theory contains numerous references to pertinent recent research. Moreover, topics of which our knowledge is at present inadequate are brought to the attention of the student. Finally, the authors have, on the whole, succeeded in conforming to the notation adopted as standard by the American Institute of Chemical Engineers.

EDGAR W. SLOCUM

**X-ray Diffraction Procedures for Polycrystalline and Amorphous Materials. H. P. Klug and L. E. Alexander. John Wiley and Sons, Inc., New York (1954). 716 pages. $15.00.**

The phases of the subject emphasized by the present book are indicated in the title. First, it concentrates on the experimental or procedural aspects of the field; second, it is devoted entirely to polycrystalline or amorphous materials; i.e., it omits entirely single-crystal techniques, such as the Laue method and the rotating-crystal method. The authors contend that although the widest applications of X-ray diffraction are to polycrystalline materials, most previous treatments of this field are out of date or incomplete, especially with regard to the use of the Geiger counter spectrometer.

As a result of the concentration on techniques and on polycrystalline materials, this book is more suitable as a reference book for those who actually use X-ray diffraction methods in the laboratory rather than as a student textbook. Nevertheless, it is not entirely a reference book. In order to make the book as self-sufficient as possible, the authors have included introductory chapters on crystallography, the production and properties of X rays, and X-ray diffraction by crystals. These introductory chapters cover the first 160 pages of the book. They are well presented and in themselves constitute a handy little textbook for one who wishes to review these topics.

The principal parts of the book deal with the techniques and applications in the study of Debye-Scherrer diffraction patterns by both photographic and spectrometric methods. Topics include interpretation of powder-diffraction data, qualitative and quantitative analysis of crystalline powders, precision-lattice constant determinations, crystallite-size determination from line broadening, stress measurement in metals, and preferred orientation determination. A chapter on diffraction by noncrystalline materials is then given. The final chapter deals with small angle scattering.

The reader interested in metals may bemoan the brevity of the section devoted to preferred orientation determination and to the description of the use of the stereographic projection in such studies. Even more disturbing is the implication (page 556) that annealing removes rolling textures, without any mention of the existence of recrystallization textures.

A. S. NOWICK