

sections and nine appendices. A few example exercises are given at the end of many sections, together with answers in most instances. The references given are not voluminous in number, but apparently quite adequate for the purpose. Only the more aggressive students will find need or opportunity for use of them.

Indeed, the book should prove a welcome addition to any library which wishes to have an excellent source-book on light, including a somewhat novel treatment of this elderly but still virile subject.

Urner Liddel

Bendix Aviation Corporation

Everyday Physics. By Ole A. Nelson and John G. Winans. 614 pp. Ginn and Company, Boston, Massachusetts, 1952. \$4.36.

There is a mirthless, standing joke among teachers of college physics to the effect that it is difficult to tell which students have studied physics in high school and which have not—except that the latter usually show signs of knowing more physics! An examination of the present book may reveal one of the reasons.

The publisher's brochure promises "a *new* and *different* kind of physics book that approaches physics from the *practical* side." This it seeks to do by using familiar machines and household devices ("What a boy or girls learn here about such things as an electric motor or gas range will be helpful throughout life"). With this, no one can quarrel. After all, with school systems demanding that courses be "student centered" and "geared to real life situations", a book having such aims would seem ideal. But a closer look behind the scenes of the slick, handsome, copiously illustrated production left this reviewer (notoriously no conservative in such matters) with the impression that a course for which this book might be suitable would be some new kind of dilute socio-technology, but certainly not physics.

"To understand physics as this book teaches it, the student doesn't need to work a great many problems." True, the textbooks of past decades tended to overdo the type of problem that amounted to mere numerical substitution, but the few quantitative questions to be found in the Nelson-Winans book deal with nothing more basic than computing the cost of operating a radio set or figuring out how many years it takes for an automatic stoker to pay for itself.

"Many illustrations facilitate grasp of principles." Some of the halftones, picked at random, show a "strike" in bowling, a "well arranged bathroom", a fire-alarm box (exterior), an airplane sailing into the dusk, a man fishing (full page cut), and a streamlined young woman standing in front of a streamlined car.

In the index, Newton is listed only under the Laws of Motion, which merit a scant two pages of text. A short excerpt from this passage is illuminating: "Mass can be measured by its resistance to a change of motion. Without the aid of friction or mechanical advantage, it would be impossible for you to move an object which weighed more than you. Your most heroic force on the object would be met with an equal but opposite

force of the object on you." Other index entries include "Chronotherm", "Humidiguide", and "Washing machine, buying of". Einstein, Galileo, Maxwell, Kelvin do not appear.

In preparing a textbook intended to introduce a branch of science to a boy or girl of sixteen or seventeen, one would wish to avoid becoming too abstruse or recondite, but in the experience of the reviewer, this is a much more readily condoned fault than looseness or slovenliness of statement. A number of writers have succeeded in demonstrating that there need be no antagonism between clarity and accuracy in the exposition of scientific material; it is sometimes cruelly hard work, to be sure, but it pays off. The authors of the book under consideration might easily have avoided defining torque as "a force which produces rotation", or the coulomb as a "unit used to express quantity of electric current". And what does it do to a student's appreciation of logic when he reads that "when we recall that an eye suffering from astigmatism produces images that are not clear at all points, we realize that a lens without this defect must produce clear images"? The astigmatic image is obviously not the only thing that is unclear here.

Textbooks, if they are to serve their purpose, must change with the changing times, particularly in a field where the subject itself is so heavily responsible for the developments that characterize the age in which we live. Still, no serious science educator can be blamed if he rebels at teaching physics from a combination of the Boy Scout Manual, Consumers' Guide, and the Sears-Roebuck catalog.

Ira M. Freeman

Rutgers University

Annual Review of Physical Chemistry. Volume III. Edited by G. K. Rollefson and R. E. Powell. 416 pp. Annual Reviews, Inc., Stanford, California, 1952. \$6.00.

This is the third in a series of annual reviews of the important area of subject matter common to physics and chemistry sponsored by a group whose similar ventures in biochemistry have survived for 21 years. They have also edited and published annual reviews for 24 years in physiology, for 6 years in microbiology and for 3 years in medicine, plant physiology, psychology, and physical chemistry.

The review contains 19 chapters, each having a title sufficiently broad to cover the entire field yet permitting the reviewer to dwell at length if he chooses on some especially important area. The editors, in fact, encourage the natural variations resulting from the interests of the various authors to whom reviews are assigned. As indicated in the preface, the combination of reviews for two or three years will provide a well-balanced survey.

Although all of the reviews are prepared primarily for the chemist, the physicist might be more interested in the following: quantum theory, theory of molecular structure and valence, by C. A. Coulson; radioactivity and nuclear theory, by M. G. Mayer; isotopes, by J.

WILEY**BOOKS**

INTRODUCTION TO SOLID STATE PHYSICS

By CHARLES KITTEL, *of the University of California, Berkeley*. This is the only text on an introductory level to cover a large part of the field of solid state physics. It gives a basic, concise discussion of representative areas of the physics of solids written specifically to fill a void in existing textbooks on the subject. "Arrangement of the material in the book is admirable. In this reviewer's opinion, Professor Kittel has done an excellent job of orderly, logical exposition; his book is certain to be widely used."—G. D. O'Neill, in *Electronics*, 1953. 396 pages. \$7.00.

PROCEDURES IN EXPERIMENTAL METALLURGY

By A. U. SEYBOLT and J. E. BURKE, *both with the General Electric Company*. This is the first complete reference book to deal directly and comprehensively with the equipment, materials, and processes of laboratory metallurgy. The techniques of the major unit operations, melting, heat treatment, mechanical fabrication, and powder metallurgy are discussed as they are used on a laboratory scale. Included is a description of the techniques of vacuum metallurgy, a summary of the methods for growing single crystals, a list of pure metals and their sources of supply, and a description of high temperature techniques. 1953. 340 pages. \$7.00.

TEMPERATURE MEASUREMENT IN ENGINEERING

Volume I

By H. DEAN BAKER, *Columbia University*, E. A. RYDER, *Pratt & Whitney Aircraft*, and N. H. BAKER, *Columbia University*. This book provides all the engineering information you need to design, construct, and operate a temperature measurement installation most effectively. It deals with the thermocouple technique—the most widely useful method of measuring internal temperatures of solid bodies—and presents the proven methods of analysis, a survey of designs, the information required for execution, and numerous well-developed procedures of applicability. 1953. 179 pages. \$3.75.

INTRODUCTORY CIRCUIT THEORY

By ERNST A. GUILLEMIN, *of The Massachusetts Institute of Technology*. Introduces the basic concepts and interpretations needed to keep up with the modern approach to advanced problems involving circuit theory. Beginning with first principles, the author provides thorough discussions of the methods of steady-state and transient circuit analysis, plus concepts essential to synthesis procedures. The book is complete with valuable graphic interpretations and computation aids. 1953. 550 pages. \$8.50.

PRINCIPLES OF TRANSISTOR CIRCUITS

Edited by RICHARD F. SHEA, *with eight co-authors. All with the General Electric Company*. 1953. 535 pages. \$11.00.

CHEMISTRY OF THE DEFECT SOLID STATE

By A. L. G. REES, *of the Commonwealth Scientific and Industrial Research Organization. A Methuen Monograph. In preparation.*

Send for on-approval copies of these books.

JOHN WILEY & SONS, Inc.

440 4th Avenue

New York 16, N. Y.

JANUARY 1954

*The first book on upper-air
research with rockets . . .*

HIGH ALTITUDE ROCKET RESEARCH

By HOMER E. NEWELL, Jr.

*Head, Rocket-Sonde Research Branch
Naval Research Laboratory, Washington, D.C.*

**December 1953, xiv, 298 pages,
37 tables, 93 figures, \$7.50**

This book describes the use of rockets for studying

Ionosphere
Earth's magnetic field
Solar radiation
Cosmic rays
Atmosphere

For each subject, sufficient background information is provided so that the reader can fully understand the experiments and appreciate their significance. Research and instrumentation techniques as well as experimental difficulties peculiar to rockets are surveyed.

Contents:

Introduction
The Rocket as a Research Vehicle
Recovery of Data
Pressures, Densities, and Temperatures in the Upper Atmosphere
Winds in the Upper Atmosphere
Rocket Measurements of Solar Radiation
Composition of the High Atmosphere
The Ionosphere and the Earth's Magnetic Field
Cosmic Rays
High-Altitude Photography
Name Index—Subject Index.

Academic Press, Inc., Publishers
125 East 23 Street
New York 10, N.Y.

Bigeleisen; radiation chemistry, by A. O. Allen; thermochemistry and the thermodynamic properties of substances, by R. F. Newton; bond energies and bond distances, by G. Glockner; spectroscopy, by N. S. Bayliss; solutions of nonelectrolytes, by G. Scatchard; theory of ionic crystals, semiconductors, and dielectrics, by F. E. Williams; experimental crystallography, by W. H. Zachariasen; and experimental molecular structure, by L. O. Brockway. It may be of interest to note that one-third of all the citations in the above fields are to publications of the American Institute of Physics. In the field of radiation chemistry and nuclear theory, the percentage goes to 80, and in the section on isotopes, to 57%—mostly in *The Physical Review* and the *Journal of Chemical Physics*.

Other reviews in the volume include: polymeric electrolytes, ion exchange, heterogeneous equilibria and phase diagrams, photochemistry, photosynthesis, polarography and electrode processes, solution of electrolytes, and reaction kinetics. In general the reviews cover the data published in the year preceeding the date of the volume. Earlier works are sometimes cited either because they were overlooked in previous surveys or are required to put recent contributions in their proper perspective. The volume contains an author and subject index.

While the section on thermochemistry in this volume, as in the earlier ones, has attempted citation of all papers published containing thermodynamic data, the other sections do not attempt such completeness. Rather they attempt to interpret for the reader the more significant contributions which have been made in the specified fields. One would wish that the topics assigned to the reviewers were less broad, thereby enabling them to dwell in greater detail on the recent advances. In such a case the reviews will be found useful by the expert in the field as well as the nonspecialist.

Joseph Hilsenrath
National Bureau of Standards

Elasticity and Plasticity

Theory of Elasticity and Plasticity, by H. M. Westergaard (176 pp. Harvard University Press and John Wiley & Sons, 1952, \$5.00), represents the completed portion of the manuscript for a more comprehensive textbook on the theories of elasticity and plasticity left unfinished at the time of the author's death in 1950. An introductory exposition of fundamental concepts and theories is given from an engineering point of view. The treatment is theoretical and in some respects unconventional. In addition to a concise historical review of the field the topics discussed include: stress, strain, Hooke's law, the laws of elasticity and plasticity, strain potential and its applications to hollow cylinders and spheres, rotating disks, and thermal stresses, the Galerkin vector, twinned gradient, and various applications to the effects of a single force. The lucid exposition of the author's point of view and his treatment of interesting problems are sure to be stimulating to workers in this field.