

space for beam holes, the excess reactivity needed to support experiments, the advisability of providing a thermal column, and so on—yet these aspects are not even mentioned. As for superficiality, consider the fact that reactor control is covered by a whole chapter and more, without mention of the neutron regeneration time, or of delayed neutrons, or of prompt criticality! On the positive side, it can be said that institutional administrators can derive information from the comparatively good chapters on health physics, the cost estimate for a typical university installation, and the legal aspects involved, but here again there are important omissions. Space, power and water requirements—ignored. Operating costs—not mentioned. Possible hazard to neighboring buildings through major radioactive spills or reactor running wild—not even suggested. The undertaking of an institutional reactor has deeper technical and administrative implications than this book would indicate.

Physics Principles. By Stanley S. Ballard, Edgar P. Slack, and Erich Hausmann. 743 pp. D. Van Nostrand Company, Inc., New York, 1954. \$7.50. *Reviewed by F. Bitter, Massachusetts Institute of Technology.*

This is a new edition of Hausmann and Slack's *Physics*, somewhat revised and expanded. Its virtues are those of the old edition. In a word, one might say that they are the clear expositions, with little recourse to mathematics, of the main phenomena of physics. Its main fault, it seems to this reviewer, is that of most elementary texts. No way has been found to indicate to the student that there has been a revolution in physics, and that modern physics really is more significant for the educated man, and for the professional scientist or engineer, than is indicated in a 50-page summary of facts about atoms and nuclei tacked on to the end of a 700-page book.

Some idea of the changes in the new edition may be acquired from the following examples: In the old edition in the section on mechanics, simple harmonic motion was treated before elasticity which then provided an example of how simple harmonic motion may be produced. In the new edition elasticity is treated first and simple harmonic motion is then introduced as a property of elastic systems. Displacement, velocity, and acceleration in simple harmonic motion are discussed, but the section on energy relations has been dropped out.

In the section on heat, radiation has been transplanted to the last section on modern physics.

In the section on electricity and magnetism the order of presentation used to be electric circuits, magnetism, resistance, electric charges, . . . , and this has been changed to electrostatics, current and electromotive force, resistance, electromagnetism. . . . At the end of this section, thermoelectricity, thermionics, and communications (chiefly telegraph, telephone, and radio) has been changed to electronics and radiation (including sections on microwaves and radar).

In the section on wave motion and sound, the discus-

sions of spectra and x-ray diffraction have been transplanted to the final section on modern physics, and a discussion of ultrasonics has been added.

The final paragraphs of the old edition, eight pages on radiation and atomic structure, have been expanded into a new section containing two chapters, "Quantum Optics" and "Nuclear Physics". The first of these takes up Planck's Law, the photoelectric effect, the production of x-rays, the hydrogen spectrum and the Bohr atom, the exclusion principle, x-ray spectra and diffraction, the Compton effect, and the wave aspect of electrons. The final chapter includes the mass-energy relation, radioactive decay, mass spectrographs, counters and cloud chambers, high energy machines, cosmic rays, positrons and mesons, neutrons and nuclear structure, and nuclear energy.

Optical Instrumentation. Edited by George S. Monk and W. H. McCorkle. 262 pp. McGraw-Hill Book Company, Inc., New York, 1954. \$3.75. *Reviewed by W. T. Wintringham, Bell Telephone Laboratories.*

With the publication of *Optical Instrumentation*, the scientific world is given notice that the National Nuclear Energy Series will contain a volume on each and every declassified phase of the wartime development leading up to the atomic bomb.

One cannot doubt the importance of being able to observe the operations taking place in reactors, behind baffles, or in other physically remote locations. Some phases of these problems are outlined in Part I of *Optical Instrumentation*, occupying 71 pages of this book. The remainder of the volume contains 37 abbreviated papers describing solutions to these problems. They are written so briefly, however, that they can serve no purpose except as a historical record of the accomplishments of the Optics Section of the Metallurgical Laboratory of the Manhattan District.

Electrolyte Solutions

The second edition of the well-known monograph, *Elektrolyte*, by Hans Falkenhagen, has been revised to include many of the advances in the theory and experiments on electrolytes which have taken place during the twenty-one years since the first edition. Significant changes involve the theoretical treatment of viscosity, diffusion, and conductivity of electrolyte solutions and the extension of Debye-Hückel theory to intermediate concentrations. (263 pp.; S. Hirzel Verlag, Leipzig, Germany, 1953; DM 15.60.)

Books Received

PHYSICAL CHEMISTRY. By A. J. Rutgers. 804 pp. Interscience Publishers, Inc., New York, 1954. \$8.50.

PRINCIPLES OF ENGINEERING THERMODYNAMICS (Second revised edition). By Paul J. Kiefer, Gilbert Ford Kinney, and Milton C. Stuart. 539 pp. John Wiley & Sons, Inc., New York, 1954. \$7.75.