

Books

Careers in Physics. By Alpheus W. Smith. 271 pp. Long's College Book Co., Columbus, Ohio, 1951. \$4.00.

There are now more than 15,000 physicists in the United States, and if the present trend continues there will be more than 30,000 within eight years. Many of the new physicists-to-be will be interested in this book by Professor Smith, for here at last we have an excellent over-all view of what physicists are and do. A long lifetime spent as a professor of physics and as head of a large and flourishing physics department has fitted Professor Smith admirably to discuss physics as a profession. He goes very thoroughly into his subject, discussing at length the supply of physicists and the demand for their services, and the various types of careers open to them in education, in industrial research, in federal civilian research agencies, in military research agencies, and in research institutes and foundations. Again he discusses possible careers in physics from the standpoint of its branches, such as those dealing with illumination and vision, with communications, with transportation and mobility, with photography, with instrumentation, and with "materials and products for better living". Still again he attacks the problem from the standpoints of the contacts between physics and its neighboring sciences, devoting chapters to atmospheric physics, to food and health physics, to chemical physics, to astrophysics, to biophysics, and to geophysics. Two chapters are devoted to consideration of the development of physics in its classical phase and in its modern phase, and these should be very helpful in orienting the young student.

The book is well illustrated and has an excellent index. It concludes with two useful appendices, one listing industrial research laboratories which employ physicists, and the second giving references to the literature which bear on the subject matter of the book.

The entire work gives evidence of careful and thoughtful preparation. High school teachers will wish to use this book as a reference for students who want to know what branch of science they should choose, and the college undergraduate will find it helpful in sharpening his understanding of what physics is as a profession. Prospective employers of physicists, whose number is now legion, will welcome *Careers in Physics* as a timely aid in helping to bring the supply of physicists closer to the demand.

George R. Harrison
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Atomic Physics. By Wolfgang Finkelburg. 498 pp. McGraw-Hill Book Company, New York, 1950. \$6.50.

The tremendous growth of atomic physics in this century, together with its multitude of separate aspects, has led very naturally to an ever-increasing degree of specialization within its limits. This is evident in the advanced texts on the subject, where, rather than emphasizing the essential unity of the various elements of experimental and theoretical knowledge of the atom, these are for the most part isolated and treated individually with only the most cursory reference to each other. A procedure of this sort has many attractive features for an author or an instructor, but the needs of the beginning graduate student in physics probably would better be met today with an integration of the various bits and pieces of information thrown at him in his courses into a coherent whole. A book which "deals with our knowledge of the structure of matter, its constituent elementary particles, its properties and behavior" would therefore be a very desirable addition to the literature of physics if it accomplished such an integration, and *Atomic Physics*, from whose Introduction the above quotation was taken, attempts to do just this.

An idea of the scope of the book may be gained from a listing of its contents, which include, after a brief but valuable introduction, chapters on "Atoms, Ions, Electrons, Atomic Nuclei, Photons", "Atomic Spectra and Atomic Structure", "Atomic Theory According to Quantum Mechanics", "Nuclear Physics", "Molecular Physics", and "Atomic Physics of the Liquid and Solid State". Lest there be any fear that these all-inclusive topics are discussed in too abbreviated a fashion it might be mentioned that there are chapters of 98 and 124 pages and none contains less than 57 pages. The order selected for the various chapters follows from both historical and didactic considerations, with the part on quantum mechanics appearing after a discussion of atomic structure and spectra based upon the Bohr theory. This arrangement was chosen to convince the reader of the necessity of employing more sophisticated techniques for describing the atom completely and also to demonstrate the very considerable insight and information to be found in the older approach. Similarly, while nuclear physics should precede atomic physics in a strictly logical treatment, its dependence upon quantum-theoretical concepts necessitates the present inverted order.

The author presupposes comparatively little advanced knowledge on the student's part, and the greater portion of the text stresses a conceptual and logical approach to the subject matter rather than a more rigorous mathematical one. Accordingly *Atomic Physics* will probably find its widest application on the senior-first-year graduate student level and should ultimately replace a number of the older books now in use. The illustrations and tables have been selected to complement the text, succeeding in this most of the time, and the latter are in some cases quite extensive.

Atomic Physics is a translation by George Brown from its 1948 original, and both its author and translator are to be commended for an excellent job. The publishers have done wisely in adding this volume to their International Series in Pure and Applied Physics. It is to be hoped that, despite its unorthodox arrangement and treatment of the material, this book will be widely used in the future.

Arthur Beiser
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Briefly Noted

Testing of Measuring Equipment

Intended for use by weights and measures officials but also of interest to commercial and industrial testing organizations, this recent publication of the National Bureau of Standards deals with commercial measures and measuring devices. The volume completes a series of four NBS handbooks designed to present in compact form comprehensive information relative to weights and measures regulatory activities. The handbook includes descriptions of commercial measures and measuring devices, recommendations for the testing apparatus needed for their official examination, instructions for their inspection and testing, step-by-step testing outlines supplementing the discussions on testing procedures, and some general comments about inspection and testing which are applicable to all classes of commercial devices. Recommending, in general, the minimum requirements of testing procedures for exercising routine regulatory controls, the handbook is based on the codes of specifications, tolerances, and regulations for commercial devices as adopted by the National Conference on Weights and Measures and suggested by the National Bureau of Standards for promulgation by the states. *Testing of Measuring Equipment, A Manual for Weights and Measures Officials*, by Ralph W. Smith, National Bureau of Standards Handbook 45, vii, 205 pp., 18 diagrams and half-tone illustrations, \$1.25 (order from Government Printing Office, Washington 25, D. C.).

Vacuum Physics

An eighty-four page supplement to the British *Journal of Scientific Instruments*, published in October by the Institute of Physics, London, contains the papers presented at the vacuum physics symposium arranged by the Institute's Midland Branch in June 1950. Uniform in size with the published report of an earlier Institute symposium on the *Physics of Lubrication*, the second supplement contains papers on modern vacuum equipment, including the vacuum system of the Birmingham proton synchrotron, and also on leak detection, gauges, and recent advances in vacuum techniques. *Vacuum Physics* is priced at \$2.25, which includes postage and packing. Orders should be addressed to The Institute of Physics, 47 Belgrave Square, London, S. W. 1.

Books Received

FOURIER TRANSFORMS. By Ian N. Sneddon. 542 pp. McGraw-Hill Book Company, New York, 1951. \$10.00.

ELECTROMAGNETIC PROBLEMS OF MICROWAVE THEORY. (Methuen's Monographs on Physical Subjects). By H. Motz. 184 pp. John Wiley and Sons, Inc., New York, 1951. \$2.00.

ELEMENTARY PARTICLES. By Enrico Fermi. 110 pp. Yale University Press, New Haven, 1951. \$2.50.

VACUUM-TUBE VOLTMETERS (Second Edition). By John F. Rider. Revised by John F. Rider and Alfred W. Barber. 422 pp. John F. Rider Publisher, Inc., New York, 1951. \$4.50.

EXPERIMENTS IN COLLEGE PHYSICS. By Bernard Cioffari. 236 pp. D. C. Heath and Company, Boston, 1951. \$2.75.

ANALYSIS OF THE FOUR-BAR LINKAGE. By John A. Hrones and George L. Nelson. 13 pp. of text and 730 pp. of charts. The Technology Press of the Massachusetts Institute of Technology and John Wiley and Sons, Inc., New York, 1951. \$15.00.

ADVANCES IN ELECTRONICS. Volume III. Edited by L. Marton. 357 pp. Academic Press, Inc., New York, 1951. \$7.50.

AN INTERNATIONAL BIBLIOGRAPHY ON ATOMIC ENERGY. Volume II, SCIENTIFIC ASPECTS. Prepared by the Atomic Energy Commission Group, Department of Security Council Affairs. Columbia University Press, New York, 1951. \$10.00.

EXPERIMENTAL SPECTROSCOPY (Second Edition). By Ralph A. Sawyer. 358 pp. Prentice-Hall, Inc., New York, 1951. \$6.65.

QUANTUM MECHANICS OF PARTICLES AND WAVE FIELDS. By Arthur March. 292 pp. John Wiley and Sons, Inc., New York, 1951. \$5.50.

FUNDAMENTALS OF PHYSICS (Revised Edition). By Henry Semat. Rinehart and Company, Inc., New York, 1951. \$6.00.

ENGINEERING THERMODYNAMICS. By Herman J. Stoevers. 457 pp. John Wiley and Sons, Inc., New York, 1951. \$5.75.

FONDAMENTI DI TERMODINAMICA. By Emanuele Foà. 254 pp. Nicola Zanichelli Editore, Bologna, 1951.

ISAAC NEWTON. By S. I. Wawilow. 214 pp. Akademie-Verlag, Berlin, 1951, DM 8.90.

SYNTHESIS OF ELECTRONIC COMPUTING AND CONTROL CIRCUITS. By the Staff of the Computation Laboratory of Harvard University. 278 pp. Harvard University Press, Cambridge, 1951. \$8.00.

SPACE-TIME-MATTER. By Hermann Weyl. 330 pp. Dover Publications, Inc., New York, 1951. \$3.95.

CREEP OF METALS. By L. A. Rotherham. 80 pp. The Institute of Physics, London, 1951. 15s.

DIELECTRIC BREAKDOWN OF SOLIDS. By S. Whitehead. 271 pp. Oxford University Press, New York, 1951. \$5.00.

AIRCRAFT JET POWERPLANTS. By Franklin P. Durham. 326 pp. Prentice-Hall, Inc., New York, 1951. \$5.00.

RADIOISOTOPES—INDUSTRIAL APPLICATIONS. By G. H. Guest. 185 pp. Pitman Publishing Corporation, New York, 1951. \$4.50.

LABORATORY EXPERIMENTS IN THE PHYSICAL SCIENCES. By Anton Postl. 72 pp. Burgess Publishing Company, Minneapolis, Minnesota, 1951. \$1.50.