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THE ATOMIC NUCLEUS

By ROBLEY D. EVANS

Massachusetts Institute of Technology

*McGraw-Hill International Series in Pure and
Applied Physics*

950 pages, \$15.50

This graduate text and reference in fundamental nuclear physics is characterized by unusually broad coverage, involving most of the present field of nuclear physics, both "intra-nuclear" and "extra-nuclear." In the discussion of each sub-topic, the book deals both with the experimental facts and with their interpretation on contemporary theories. The discussion of each topic is begun at the introductory level, then carried through intermediate levels of difficulty to advanced areas of current research.

SOME MATHEMATICAL METHODS OF PHYSICS

By GERALD GOERTZEL and NUNZIO TRALLI

both of the Nuclear Development Corporation
of America

Ready in May

This modern book presents a common set of mathematical techniques as useful background for a variety of fields of theoretical and applied physics: quantum mechanics, acoustics, electromagnetic theory, reactor physics, etc. The authors do not try to cover the entire field of mathematical methods of physics. Rather, they attempt to give non-mathematicians a well-rounded and thorough indication of the basic concepts involved in the study of linear systems.

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be had. Accordingly, the authors feel that a modern book in this field can no longer be a mere collection of recipes, but must fulfill certain important objectives.

The authors were motivated to compile this work through their own experience with various phases of scientific photography. The late Professor Joos was on the staff of the Optical Research Institute at Boston University in the years following the war. Dr. Schopper was formerly connected with the German photographic industry and has done considerable nuclear-emulsion work in connection with his cosmic-ray investigations.

The main divisions of the book deal with photo-sensitive emulsions; instruments, sources, and filters; applications to x-ray techniques; and applications to atomic physics. In the more fundamental portions, the exposition ranges from the production of emulsions to their behavior with respect to particles. The theory of the latent image is presented from the modern point of view, and in a way that will be understandable even to nonphysicists. Instrumentation and the theory of image formation are treated very compactly, but with great clarity.

The section on atomic physics is handled in a particularly thorough manner. The reference material is especially good. The main chapter of this part of the work deals with nuclear tracks. The authors give considerable space to the subject because they feel that it is so complicated and so much in a state of flux that a mere general introduction would not suffice. The result is that they have compiled a treatment which should be most helpful to those working in the field. It is doubtful whether any other survey of the subject that has appeared up to the present contains as much practically useful material.

Advances in Electronics and Electron Physics, Vol. 10. Edited by L. Marton. 320 pp. Academic Press Inc., New York, N. Y., 1958. \$10.00. *Reviewed by R. L. Sproull, Cornell University.*

THE tenth volume in this series reviews a broad spectrum of mathematics, physics, and engineering. W. G. Dow (Michigan) analyzes flow in long, magnetically focused electron beams in which the flow and space-charge density are nonuniform. E. Billig and P. J. Holmes (AEI) describe the various types of imperfections in diamond-lattice semiconductors. J. Brown (University College, London) develops the parallel between optics and microwaves and summarizes the current situation in those microwave instruments that have optical analogues. W. J. Lawless (IBM) discusses developments in the logical organization of computers, without the benefits that might accrue from the use of symbols, equations, or illustrations. E. G. Rowe (STC) considers the influence of design, manufacturing methods, installation, application, and test procedures on the reliability of vacuum tubes. J. E. Day (Tektronix) gives current practice in the design of cathode-ray oscilloscopes.

These subjects have only one thing in common: They are all of interest to the development physicist or engineer in the electronics industry. It appears to this reviewer that it will be increasingly difficult to maintain depth in such a series which serves a rapidly diverging industry. For example, the semiconductor article in the present volume is much broader (and therefore necessarily less deep) than the reviews in preceding volumes by Brooks and by Burstein and Egli. The tendency may be to drop from the level of the *Journal of Applied Physics* to, say, that of *Electronics* magazine, with consequent reduction in interest by physicists.

Concise Dictionary of Science. By Frank Gaynor. 546 pp. Philosophical Library, Inc., New York, 1959. \$10.00. Reviewed by E. R. Rae, *AERE, Harwell, England*.

IN these days of extreme specialization in science, the production of up-to-date dictionaries and encyclopedias at many different levels of complexity is a necessity if even popular scientific literature is to be comprehensible to more than the privileged few. The current boom in the publication of such works is therefore very welcome.

The present book, while claiming on its flyleaf to cover all sciences, in fact appears basically to cover mathematics, physics, and chemistry up to graduate level, with a leavening of other related subjects. The biological sciences are not, however, included. The definitions given are accurate, but since they are mainly obtained from other rather older works, they sometimes fail to refer to modern or more general usages. For example "Energy Levels" occurs in atoms, with no mention of nuclei, molecules, or other quantum mechanical systems. Such restriction of the definitions is doubtless aggravated by the relative brevity of the text.

This dictionary could be of considerable use to the student or layman, and would doubtless have a large sale if its price were \$3 rather than \$10.

Thermodynamics and Statistical Thermodynamics. By John Geldart Aston and James John Fritz. 556 pp. John Wiley & Sons, Inc., New York, 1959. \$8.25. Reviewed by R. E. Street, *University of Washington*.

SINCE this book is intended as an intermediate textbook for chemistry students, it will not serve the same purpose for all students, in particular students of physics. Yet the instructor who tends to include some chemical applications in his thermodynamics course may find this text quite suitable, since it does not overemphasize chemistry but includes most of the physical applications as well. Because of the great number of topics covered the result is that many of them are but briefly considered. Still the book is a good introduction to the more advanced treatises which is clearly its purpose.

This is a practical book in the sense that it puts

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