

Books

The Principles of Cloud Chamber Technique. By J. G. Wilson. 131 pp. Cambridge University Press, New York, 1951. \$2.75.

This book is exactly what its title says—a treatment of the principles of cloud chamber technique—with negligible mention of the mechanical details of the art. Although cloud chambers have been used extensively and effectively by many investigators with not too much attention to the finer points of the physics of their operation, nevertheless in more exacting research these finer points may be important. The theory of the stability of charged drops, worked out by J. J. Thompson long before the invention of the cloud chamber, gives a surprisingly good account of the critical supersaturation required for condensation on charged nuclei. This treatment is summarized, followed by the case of uncharged nuclei and later sections on the rate of growth of drops, the persistence of supersaturation and other topics. The principal points which are not particularly well understood seem to be the phenomena of the re-evaporation nuclei, well-known to everyone who has used a cloud chamber, and the effect of contaminants, at best a messy subject and only one of the manifold curses of cloud chamber operation—not a serious one to be sure, except under unusual conditions of operation. Most of the material on the physics of the cloud phenomena has been covered in more detail in a review article by Gupta and Ghosh (*Reviews of Modern Physics*, April, 1946), to which reference is not made in this book.

A discussion of the results of ionization and scattering theory, both so basic to most cloud chamber work, is interposed, the former in a chapter by itself, and the latter in the longest and most important chapter on the technique of precision measurement. The basic principles of operation and photography including a discussion of contamination and the cleaning process, the need for temperature control, the scattering of light by drops, and the lens requirements are treated briefly, followed by a chapter on the advantages and technical problems of counter control. The technique of precision measurement is treated fairly fully but concisely, including estimates of the various errors, their relative importance and methods of minimizing them. The fact that the writer stays rather meticulously within the stated aim of the book may be disappointing to a reader who is looking for detailed suggestions about how to build a cloud chamber for a particular application, but

here the best way is to use one's own ideas after getting a few suggestions by consulting the literature. However, it might not have entailed too great expansion of the text to include a few basic points of technique, such as the problem of mounting thick absorbers in a cloud chamber, some methods for achieving a fast and uniform expansion, and a more extended discussion of magnet design. In view of the great importance of emulsion techniques, which have achieved such a high state of development in the last few years, a brief comparison with cloud chambers might have been appropriate. The last chapter on the interpretation of cloud chamber photographs struck the reviewer as having a rather ambitious title for so brief a treatment. It contains a useful qualitative discussion of many of the ordinary points of interpretation, but it can't tell the reader how to make the best use of a complex of elements that may constitute a new discovery in physics!

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Briefly Noted

Annual NBS Report

Summarizing the scientific investigations conducted by the National Bureau of Standards during the fiscal year 1950, an illustrated booklet, published last summer by the NBS, contains accounts of the Bureau's current activities as well as more detailed descriptions of especially important scientific developments. The scope of research and development at the NBS, both theoretical and practical, is indicated by the names of the thirteen scientific and technical divisions: electronics, atomic and radiation physics, chemistry, mechanics, organic and fibrous materials, metallurgy, applied mathematics, mineral products, building technology, heat and power, electricity and optics, metrology, and radio propagation. The *Annual Report of the National Bureau of Standards for 1950*, National Bureau of Standards Miscellaneous Publication 200, 113 pp., 28 halftone illustrations, 50 cents, may be ordered from the Government Printing Office, Washington 25, D. C.

Mathematical Statistics and Probability

The *Proceedings* of the Second Berkeley Symposium on Mathematical Statistics and Probability, held in the Statistical Laboratory at the University of California in Berkeley from July 31st to August 12th, 1950, have just been published by the University of California Press. Edited by Jersey Neyman of the Statistical Laboratory, the *Proceedings* include a total of forty-six papers grouped under eight different subject headings: Mathematical Statistics, Probability, Astronomy, Biometry, Econometrics, Physics, Traffic Engineering, and Wave Analysis. The five papers included in the section dealing with physics were presented by Richard P. Feynman (The Concept of Probability in Quantum Mechanics); Harold W. Lewis (Statistical Questions in Meson Theory); J. Kampé de Fériet (Statistical Me-

chanics of a Continuous Medium—vibrating string with fixed ends); Victor F. Lenzen (Philosophical Problems of the Statistical Interpretation of Quantum Mechanics); and George Placzek (Correlation of Position for the Ideal Quantum Gas). Copies of the *Proceedings* (700 pp., \$11.00) may be obtained from the University of California Press, Berkeley 4, California.

The Press has also announced that less than fifty copies of the *Proceedings* of the First Berkeley Symposium on Mathematical Statistics and Probability remain of the first printing, and that if enough orders are received the book will be reprinted. Also edited by Dr. Neyman, the *Proceedings* of the earlier symposium, held in Berkeley in 1949, consist of thirty papers covering the applications of mathematical statistics and probability to philosophy, astronomy, economics, agriculture, biology, forestry, psychology, and entomology. The volume is priced at \$7.50.

Unesco Report

Program-Making in Unesco, 1946-1951 is a pioneer report on the processes of international administration, written by Charles S. Ascher, a political scientist, and formerly executive officer for program. It depicts the roles of the Secretariat, the Executive Board, and the General Conference in formulating and determining the program of Unesco, evaluates the processes followed, and offers proposals for their improvement. The report, No. Sp59, was published by the Public Administration Service, Chicago 37, Illinois, and is available for \$2.50.

50 Years of British Standards

Half a century of scientific progress is recorded in a new publication of the British Information Services, the *National Physical Laboratory Jubilee Book*, by John Langdon-Davies (104 pp., \$1.00). Profusely illustrated, it describes the growth of the National Physical Laboratory from its foundation in 1900 to the present day, when it is responsible for all kinds of scientific work from the testing of screw threads to the development of advanced electronic calculating machines. The extension of its work and responsibilities as custodian of the national standards of measurement is traced from small beginnings to the important part it now plays in British life and industry. Copies are available from the Sales Section, British Information Services, 30 Rockefeller Plaza, New York 20, N. Y.

Color Slides of the Atoms

A set of one hundred 2" x 2" color slides made directly from the well-known Hubbard Chart of the Atoms, which has been brought up to date by W. F. Meggers of the National Bureau of Standards, is now available for lectures and class discussion, according to the W. M. Welch Scientific Company, Chicago. The complete set of glass-mounted slides comes in a black leatherette case with fastener and hinged cover. (No. 3975, complete with forty-eight page *Key*, \$75.00.)

Books Received

SELECTED TOPICS IN X-RAY CRYSTALLOGRAPHY FROM THE DELFT X-RAY INSTITUTES. Edited by J. Bouman. 375 pp. Interscience Publishers, Inc., New York, 1951. \$11.00.

DIMENSIONAL ANALYSIS AND THEORY OF MODELS. By Henry L. Langhaar. 166 pp. John Wiley & Sons, Inc., New York, 1951. \$4.00.

THERMODYNAMICS (Second Edition). By George A. Hawkins. 348 pp. John Wiley & Sons, Inc., New York, 1951. \$6.50.

THE NEW PHYSICS. Talks on Aspects of Science. By Sir C. V. Raman. 144 pp. Philosophical Library, New York, 1951. \$3.75.

ADVANCES IN BIOLOGICAL AND MEDICAL PHYSICS. Volume II. Edited by John H. Lawrence and Joseph G. Hamilton. 348 pp. Academic Press, Inc., New York, 1951. \$7.80.

WAVEGUIDE HANDBOOK. Edited by N. Marcuvitz. 428 pp. McGraw-Hill Book Company, Inc., New York, 1951. \$7.50.

THE FOURIER INTEGRAL AND CERTAIN OF ITS APPLICATIONS. By Norbert Wiener. 201 pp. Dover Publications, Inc., New York, 1951. \$3.95.

PHYSICS OF LUBRICATION. A symposium held jointly by the British Rheologists' Club and the Manchester and District Branch of The Institute of Physics in Manchester from 29 June to 1 July 1950. Supplement No. 1 to *British Journal of Applied Physics*. 96 pp. The Institute of Physics, London, 1951. 15s.

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

SCIENTIFIC RUSSIAN. A Textbook for Classes and Self-Study. By James W. Perry. 816 pp. Interscience Publishers, Inc., New York, 1950. \$7.50.

FUNDAMENTALS OF ELECTRICAL ENGINEERING. By Fred H. Pumphrey. 668 pp. Prentice-Hall, Inc., New York, 1951. \$5.75.

OPTICAL CRYSTALLOGRAPHY (Second Edition). By Ernest E. Wahlstrom. 247 pp. John Wiley and Sons, Inc., New York, 1951. \$4.50.

JOHANNES KEPLER: LIFE AND LETTERS. By Carola Baumgardt. 209 pp. Philosophical Library, New York, 1951. \$3.75.

PRINCIPLES OF CHEMICAL THERMODYNAMICS. By Martin A. Paul. 740 pp. McGraw-Hill Book Company, Inc., New York, 1951. \$7.50.

A NEW THEORY OF GRAVITATION. By Jakob Makelker. 25 pp. Philosophical Library, New York, 1951. \$2.75.

INTRODUCTION TO THE STUDY OF AIRCRAFT VIBRATION AND FLUTTER. By Robert H. Scanlan and Robert Rosenbaum. 428 pp. The Macmillan Company, New York, 1951. \$7.50.

SYNCHRONOUS MACHINES: Theory and Performance. By Charles Concordia. 224 pp. John Wiley and Sons, Inc., New York, 1951. \$5.50.

MODERN INTERFEROMETERS. By C. Candler. 502 pp. Hilger & Watts Ltd., London, England, 1951. 57/6.

THE ELEMENTS OF THERMODYNAMICS. By Charles Fabry. 229 pp. Frederick Muller Ltd., London, England, 1951. 15s.

TIME BASES (SCANNING GENERATORS): Their Design and Development with Notes on the Cathode Ray Tube (Second Edition). By O. S. Puckle. 387 pp. John Wiley and Sons, Inc., New York, 1951. \$5.00.