

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-