

ing data obtained in the registration program for physicists conducted by the Register two years ago with the cooperation of the American Institute of Physics. Two articles that have appeared in recent issues of *Physics Today* ("Earnings of Physicists, 1951" by Laure M. Sharp and Helen Wood, November 1952, and "The New Physicists", by Theresa R. Shapiro and Helen Wood, February 1953) were based on preliminary results of the survey. The final study, which was conducted jointly by the Register and the Bureau of Labor Statistics, U. S. Department of Labor, provides data on the training, specialization, age distribution, and employment of the 6600 physicists in the survey, among whom were included about eighty percent of those with PhD's in physics in the United States and a substantial proportion of those with masters' degrees. The staff of the National Scientific Register, which functions under the policy direction and fiscal control of the National Science Foundation and is operationally administered by the Office of Education, Federal Security Agency, had primary responsibility for the collection of the basic data, preparation of administrative and technical procedures, development of the classification structure and coding techniques, and the preparation of basic machine tabulations. The Register staff also served as the coordinating agency for the various cooperating groups. The questionnaires were edited and coded by the Bureau of Labor Statistics, and the report was written by Theresa R. Shapiro of the Bureau, under the supervision of Helen Wood. The report is listed for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. at 20 cents per copy.

Probability and Statistics

Introduction to the Theory of Probability and Statistics, by Niels Arley and K. Rander Buch (236 pp.; John Wiley and Sons, Inc., 1950; \$4.00), is an excellent, concise treatment of the subjects at an intermediate level. Modern developments in the epistemological implications, the mathematical foundations, and the mathematical theory of probability and statistics are indicated, as is their significance in all branches of modern science. The first three chapters are elementary; the remaining chapters require calculus, and the last requires knowledge of linear equations. The first eight chapters deal with probability theory; the remaining four consider the relation of probability to experience and its applications. The applications of probability theory to statistics, the theory of errors, and the theory of adjustment are treated in detail. ("Statistics" may be defined as the science of reduction and analysis of observations; "errors" is that branch of statistics which deals with the numerical determination of physical quantities; "adjustment" differs from "errors" in that the latter considers a number of independent measurements of one physical quantity and the former considers the more general problem of independent measurements of different physical quantities which are known to be related.) The treatment of statistics and errors follows

that of Fisher in taking into account the fact that conclusions may have to be based on a small number of observations. Various statistical tables and a list of references are included.

Revision

The second edition of *College Physics*, by Francis W. Sears and Mark W. Zemansky (912 pp.; Addison-Wesley, Inc., 1952; \$8.50), differs from the first in containing a completely new set of problems and the following material: surface tension, kinetic theory of gases, convection coefficients, physics of music, Kirchhoff's laws, Ampere's law, simple algebraic derivations of mirror and lens formulas, interference of light with Lloyd's mirror and Pohl's mica plate, applications of convergent polarized light to mineralogy, and optical activity. We hear from the publisher that more than two hundred colleges are using either this text or its companion, *University Physics* (the edition which uses calculus). Many use *College Physics* for the first semester, and then switch to the calculus edition for the second. Two-volume editions of each text are also published, which simplifies the change-over; the first volume treats mechanics, heat, and sound, while the second treats electricity, magnetism, and optics.

Experimental Design

The Design and Analysis of Experiments by Oscar Kempthorne (631 pp.; John Wiley and Sons, Inc., 1952; \$8.50) is written for the experimenter who needs to understand the theory and practice of statistical designs, the consulting statistician who wants a description of basic theory and methodology, and the mathematical statistician who is concerned with the validity of the application of statistical techniques to the analysis of data. It is assumed that the reader is familiar with elementary probability and statistics. Techniques are presented in such a way that they can be employed by those with little mathematical training, but mathematical justification is also included. Among the topics treated in detail are the analysis of multiple classification data, the procedure of randomization, randomization tests, factorial designs, fractional replication, incomplete block designs, and the validity of current methods of analysis of experiments. This text is an excellent reference for anyone concerned with experimental designs.

Heat Transfer, 1940-50

The Proceedings of the General Discussion on Heat Transfer (496 pp.) have recently been published in Great Britain by the Institution of Mechanical Engineers, the host organization for the meeting held in London from September 11th to 13th, 1951. The discussion was intended to provide a review of developments in the understanding of the principles of heat transfer and in the design of related apparatus during the period 1940-50, and was arranged by the Institution of Mechanical Engineers with the cooperation of some fifty other professional scientific and engineering

societies and institutions in the United Kingdom, the British Commonwealth of Nations, Europe, and the United States. Both the American Institute of Physics and the American Physical Society were among the co-operating organizations from this country. The program was divided into the following five main sections: 1. heat transfer with change of state; 2. heat transfer between fluids and solids; 3. conduction in solids and fluids; 4. radiation, instrumentation, measurement techniques, and analogies; and 5. special problems. A total of ninety-three papers were presented during the several sessions, each of the latter being followed by a discussion period. Some weeks after the London meeting these discussions were continued in Atlantic City on the occasion of the 1951 Annual Meeting of the American Society of Mechanical Engineers (November 26-28). The present volume includes the papers, summary reports of the separate sessions and of the discussions in London and Atlantic City, and brief reviews of related communications and the replies made by authors. The Proceedings (\$10.00) may be ordered from the American Society of Mechanical Engineers, 29 West 39th Street, New York, N. Y.

Geometry

Geometry and the Imagination, by D. Hilbert and S. Cohn-Vossen (357 pp.; Chelsea Publishing Co., 1952; \$5.00), is an able translation of the famous *Anschauliche Geometrie*. The German title means clear geometry, and this is the objective of the book. Geometry today is as complex and, to the layman, as obscure as most of higher mathematics. However, being based upon intuitive concepts of form, it can be presented in such a way that the visual and imaginative faculties of the reader rather than the formal calculations of the mathematician give insight into the nature of the problems involved and their significance. The present volume succeeds very well in this form of presentation, and the result is a readable exposition of modern geometry and its relation to other branches of mathematics.

Stochastic Processes

A new NBS monograph, consisting of a series of invited lectures by Henry B. Mann, gives the fundamental concepts, principal theorems, and some detailed discussions of the theory of stochastic processes. A random variable is considered to be a symbol with which a distribution function is associated, and a stochastic process is then defined as a set of random variables. This approach leads to a theory which for many practical purposes is equivalent to the direct measure-theoretical approach, but which is claimed to have the advantage that the technicalities of abstract measure theory seem less obtrusive at the outset. *Introduction to the Theory of Stochastic Processes Depending on a Continuous Parameter*, by Henry B. Mann, National Bureau of Standards Applied Mathematics Series 24, v, 45 pp., 30 cents. (Order from Government Printing Office, Washington 25, D. C.)

Books Received

MARX AND SCIENCE. By J. D. Bernal. 48 pp. International Publishers, New York, 1952. \$1.00.

ADVANCED MATHEMATICS IN PHYSICS AND ENGINEERING. By Arthur Bronwell. 476 pp. McGraw-Hill Book Company, Inc., New York, 1953. \$6.00.

METADYNE STATICS. By Joseph Maximus Pestarini. 415 pp. The Technology Press, Massachusetts Institute of Technology, and John Wiley and Sons, Inc., New York, 1952. \$9.00.

THE EXPANSION OF THE UNIVERSE. By Paul Couderc. 231 pp. The Macmillan Company, New York, 1952. \$6.00.

LOW-TEMPERATURE PHYSICS. Proceedings of the NBS Semi-centennial Symposium on Low-Temperature Physics, March 1951. National Bureau of Standards Circular 519, U. S. Government Printing Office, Washington, D. C., 1952. \$1.75.

FERROELECTRICITY. By E. T. Jaynes. 137 pp. Princeton University Press, Princeton, New Jersey, 1953. Paperbound, \$2.00.

HIGH SPEED PHOTOGRAPHY. By George A. Jones. 311 pp. John Wiley and Sons, Inc., New York, 1952. \$6.50.

L. FARKAS MEMORIAL VOLUME. Edited by Adalbert Farkas and Eugene P. Wigner. 309 pp. Research Council of Israel; Interscience Publishers, Inc., New York, 1952. \$6.00.

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

MESON PHYSICS. By Robert E. Marshak. 378 pp. McGraw-Hill Book Company, Inc., New York, 1952. \$7.50.

GRAVITY WAVES. Proceedings of the National Bureau of Standards Semicentennial Symposium, June 1951. 287 pp. NBS Circular 521, Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., 1952. \$1.75.

ELECTROMAGNETICS. By John D. Kraus. 604 pp. McGraw-Hill Book Company, Inc., 1953. \$9.00.

CONFORMAL MAPPING. By L. Bieberbach. 234 pp. Chelsea Publishing Company, New York, 1953. \$2.25.

MICROMETEOROLOGY. By O. G. Sutton. 333 pp. McGraw-Hill Book Company, Inc., New York, 1953. \$8.50.

ANNUAL REVIEW OF NUCLEAR SCIENCE. Vol. II. Edited by C. D. Coryell, L. F. Curtiss, L. I. Schiff, E. Segrè, and R. E. Zirkle. 429 pp. Annual Reviews, Inc., Stanford, California, 1953. \$6.00.

THE COMPOSITION AND ASSAYING OF MINERALS. By John Stewart-Remington and Wilfrid Francis. 127 pp. The Philosophical Library, Inc., New York, 1953. \$5.50.

THE ATOM STORY. By J. G. Feinberg. 243 pp. Philosophical Library, Inc., New York, 1953. \$4.75.

VOLUME AND INTEGRAL. By Werner W. Rogosinski. 160 pp. Oliver and Boyd, London; Interscience Publishers, Inc., New York, 1952. \$1.75.

DIGEST OF THE LITERATURE ON DIELECTRICS. Vol. XV, 1951. Prepared by the Committee on Digest of Literature of the Conference on Electrical Insulation. Edited by Hans Thurnauer and Shepard Roberts. 203 pp. Publication 231, National Academy of Sciences, National Research Council, Washington, D. C., 1952.

CHARBONS ACTIVÉS. Adsorption des Gaz et des Vapeurs. By C. Courty. 534 pp. Gauthier-Villars, Paris, France, 1952. \$13.18.