

The Production and Use of Technical Reports.

Edited by Bernard M. Fry and Reverend James J. Kortendick, S.S. 175 pp. The Catholic University of America Press, Washington, D. C., 1955. \$1.75. Reviewed by W. E. Jorgensen, U. S. Navy Electronics Laboratory.

Technical reports as media for publishing advances in science and engineering are becoming increasingly important: more than 100 000 research and development reports are issued annually by industrial and university contractors and by government laboratories. For many aspects of security-classified scientific and engineering work, technical reports have replaced the scientific journals as primary sources of information.

Because of the many problems posed by this new form of reporting scientific progress, it has been necessary to develop new techniques for their production, use, and bibliographic control. In recent years several meetings have been held to investigate and promote better techniques and practice. One of the more significant of these was the Workshop on the Production and Use of Technical Reports held at the Catholic University of America in Washington, D. C., April 13-18, 1953, under the sponsorship of several national associations and government agencies which have an important interest in advancing the knowledge and art of reports literature.

This book is a compilation of the fifteen papers presented at that meeting by nationally recognized specialists in various aspects of reports literature. Mr. Fry and the Reverend Mr. Kortendick are to be complimented for their efforts in promoting this Workshop and in making the proceedings generally available through this publication. The several papers are factual, concise, and practical. They constitute an invaluable collection of data pertinent to this new form of scientific literature.

Elements of Statistical Mechanics. By D. ter Haar. 468 pp. Rinehart and Company, Inc., New York, 1954. \$8.50. Reviewed by M. H. Cohen, University of Chicago.

The author's stated purpose in writing this book was to create an outline of the elements of statistical mechanics and to combine and balance it with a discussion of successful applications. The book is intended to serve as a textbook at the graduate level.

The material is presented in four sections: (a) statistics of independent particles; (b) ensemble theory; (c) applications; and (d) appendices devoted to material considered by the author to be too advanced for inclusion in the main body of the text. The fundamental material in sections (a) and (b) is largely conventional both in choice and presentation, but the serious student should find the bibliographical notes at the end of each chapter very useful. The detailed discussion of the H-theorem and the ergodic theorem in appendix one is, however, not conventionally included in texts or monographs and is quite welcome.

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As for the choice of applications, no objection can be made to the inclusion of chapters on the equation of state, on condensation phenomena, and on cooperative phenomena. One can perhaps be ambivalent about the very brief chapters on the electron theory of metals and semiconductors, subjects well-traveled in standard texts. But despite their indication of the range of statistical mechanics, I think one can object to the chapters on nuclear topics on the grounds that they are more appropriate to a book on nuclear physics which takes statistical mechanics for granted, rather than the reverse. In place of these chapters one might ask for amplification of the appendices on irreversible processes and on the third law of thermodynamics, as well as applications to problems of solid-state physics and chemical physics. In this way the author might better illuminate the conceptual elements of statistical mechanics, though at the expense of his present demonstration of the wide applicability of the methods of statistical mechanics.

Government and Science: Their Dynamic Relation in American Democracy. By Don K. Price. 203 pp. New York University Press, New York, 1954. \$3.75. Reviewed by Charles Süsskind, Stanford University.

This is perhaps one of the most serious studies made of the subject to date. The author, formerly a senior civil servant and at present a vice president of the Ford Foundation, based the book on a series of lectures on political science delivered at New York University in 1953. He remarks at the very outset how frequently he has been impressed with the way that a professional consensus, based on the results of research, can bring about the adoption of a new public policy. The interdependence of government and science has a long history in America, with the scientific services being frequently placed under the wing of the military departments. (Items: West Point was the first engineering school in the U. S.; the Naval Observatory supported basic science when it commissioned Ensign Michelson to measure the velocity of light.)

The recurrent basic problem facing scientists can be stated quite simply: How can science continue to be supported by government funds (the annual rate currently runs in excess of \$2 billion) without government control, and without a continuing emphasis on applied research at the expense of basic work? In attempting to answer this question satisfactorily, Mr. Price traces the development of modern scientific agencies of the military type from the National Research Council of World War I down to OSRD, NSF, AEC, ONR, ARDC, RDB, and a whole alphabet of their sister agencies. He considers the new "federalism by contract", the variegated system by which the U. S. Government conducts research through private institutions. This system has many features that appear to be beneficial. It makes for independence, for dynamic flexibility, for consider-

able freedom from political interference; it provides better career opportunities for scientists with an administrative bent. At the same time, the government's stake in higher education is continually increasing. The author quotes the result of the 1952 study on "Financing Higher Education in the U. S.", which states that "there is scarcely a first-rate physics or chemistry department providing graduate instruction in our universities which could maintain its present standing or personnel without federal income."

The book is almost completely free from the jargon that makes many works in this field unintelligible to all except political scientists. Mr. Price does not seek to give an unequivocal answer to the pressing question of how to provide state support of science without state control, but he does see good hope to accomplishing just that by the intelligent application of the proper restraint on the part of both science and government, and he presents a clear and well-reasoned argument in support of his optimism.

The most pressing current need is for a capable body of civil servants to administer the government's research and development program. The author, a former Rhodes Scholar, by no means thinks that we should imitate the British Civil Service, which has been traditionally staffed by men with a liberal arts background. His prescription is one with which few scientists will disagree: more competent men with scientific training must be attracted into government service.

The book should be of more than passing interest to every scientist engaged in federally supported research—and in this day and age, who isn't?

New Cosmogeny

Some unusual new ideas are proposed by Hannes Alfvén in *On the Origin of the Solar System* (194 pp.; Oxford University Press, New York, 1954; \$4.80), whose thesis is that the planets arose from a gas cloud surrounding the sun. "Owing to electromagnetic action this gas was ionized and stopped at certain distances which roughly correspond to the present situation of the main groups of planets. . . . At a late stage of the formation of the giant planets a similar process occurred around these which led to the formation of the satellites." A preliminary version of these ideas was published some years ago, and the present treatment, besides being more detailed, is somewhat different in order to meet certain objections that were raised to the earlier one.

Books Received

X-RAY DIFFRACTION BY POLYCRYSTALLINE MATERIALS. Edited by H. S. Peiser, H. P. Rooksby, and A. J. C. Wilson. 725 pp. The Institute of Physics, London, England, 1955. 63 s.

TRANSACTIONS OF THE SYMPOSIUM ON COMPUTING, MECHANICS, STATISTICS, AND PARTIAL DIFFERENTIAL EQUATIONS (Chicago, April 1954). Editorial Committee: F. E. Grubbs, F. J. Murray, and J. J. Stoker. 216 pp. Interscience Publishers, Inc., New York, 1955. \$5.00.