

the writer's view, lies not in the application of scientific method to such complex phenomena as war, since scientific method has already been often successfully applied, in the form of social studies, to the equally or still more complex phenomena of society. The novelty, in my view, is in the organisational level at which the work was done. The essential point is that the work was carried out in close contact with executives and had an immediate practical relevance. This fact coloured the whole organisation and personal relations of the people concerned. The authors do bring out clearly the very important point of the relation between the operational research workers and the executives, and the fact that they have two different tasks to do and that these must never be confused. I personally am convinced that both the organisational patterns evolved empirically for the operational research groups during the war and the methods they developed are directly applicable to very many peacetime problems. The single proviso is, of course, that the groups must build up that intimate background of knowledge of the whole field of activity of what they are investigating before they attempt to give advice to busy and usually harrassed executives.

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A Portrait of Newton

Isaac Newton. By E. N. Da C. Andrade. 111 pp. Chanticleer Press, New York, 1950. \$1.75.

Printed in a size that will enable the reader to carry it in his jacket pocket, this short biography of Isaac Newton will appeal to all physicists who are intrigued by the personalities of great discoverers. In a certain real sense, Professor Andrade has not written so much a biography as a portrait of Newton. The limitation of space and the adulatory tone of the book do not allow for a full critical analysis of all that Newton did and all that Newton was. In this connection we must remember that Newton is one of the most enigmatic figures in the history of modern science. The intensity of his creative effort during a short period of his youth continued to bear fruit until he forsook the career of scientist for one of public service in the Mint. Of this we are given a simple lucid account by Professor Andrade in a book that is gracefully written and that provides a more intimate portrait of Newton the man and Newton the creator than is to be found in many larger works.

In this book the reader will find more than a picture of Newton the physicist. Professor Andrade does not neglect Newton's other activities and presents Newton the alchemist, the theologian—wrestling with problems of the Trinity and a kind of Unitarianism, and the critic of the Bible for whom every aspect of human existence and the universe provided material for a great hermeneutic exercise on "the meaning of it all". Here too are presented Newton's abhorrence of controversy and the difficulty his contemporaries had to get anything out of him, his dislike of women, and his generosity on occasion.

Professor Andrade has written a number of studies on various aspects of science in the seventeenth century, especially in England, and possesses one of the finest private collections of books in older science. Not only does he know the science of the seventeenth century well, but he has—in addition—consummate literary skill which he has exhibited in splendid nontechnical accounts of modern physical science and also in verse. As a literary venture, this small book is a gem, evoking memories of other short biographies of English men of science by Englishmen, such as Tyndall's *Faraday as a Discoverer*. Yet, on the critical side, it must be pointed out that the character of the book is also its weakness; while Newton's predecessors are mentioned briefly, as are some of his contemporaries, one gets the impression a little too much that Newton—so to speak—did it all himself. A number of minor slips mar the text; e.g., all the learned men of Kepler's time did not write in Latin (Galileo, for one, wrote also in Italian); Newton was not the first to extend gravity from the surface of the earth to the moon; etc. But these are minor matters and critics can be too carping in reviewing books for general reading that make no pretence of advancing scholarship.

For the busy physicist who wishes to spend a few hours in his study or on a train in reading a most pleasant and engaging book, Professor Andrade's *Newton* can be highly recommended. Handsomely printed and beautifully illustrated, it is a volume in a series entitled "Personal Portraits", edited by Patric Dickinson and Sheila Shannon; let us hope that other members of the series will be forthcoming on such figures as Boyle, Hooke, Priestley, Cavendish, Clerk Maxwell, J. J. Thomson and Rutherford, and that they will be as excellent in their way as this one is.

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Briefly Noted

Physics in France

The French Bibliographic Digest, No. 7, *Physics* (87 pp.) was edited and published this year by the Cultural Division of the French Embassy, 934 Fifth Avenue, New York City. Copies may be secured without charge by writing to the above address.

For those having some special interest in French physics books published during the period between 1940 and 1948, the booklet is certain to be of considerable value. Others, provided they bring with them at least a casual curiosity, will find this pamphlet rewarding—if for no other reason than its introductory essay, a review of wartime and postwar French physics written by Ives Rocard, professor of physics at the Ecole Normale Supérieure de Paris. Professor Rocard's summary of the period places particular emphasis upon the effects of the German occupation on French research and pays homage to several of the more notable French physicists whose lives were lost during the war, some in the campaign of 1940, some in concentration camps or during

resistance activities. The picture given of French research before the Liberation is one of quite continuous activity under conditions of almost complete isolation from the outside world, and against this background the bibliography contained in the *Digest* gains a particular interest since many of the books listed were written and published between 1940 and 1945.

The titles in the bibliographical listing are of books considered to be the most significant published during the nine-year period following the outbreak of World War II, including several written by Belgian and Swiss scientists. Many of the titles are amplified by reviews, reprinted either in full or in part, which had originally been published in one or another of a number of professional scientific journals, including the *Review of Scientific Instruments*, *Science*, and *Nature*. The volumes listed, according to the Foreword, are of at least university level. A few popular works of special interest have been included.

Accelerators

The four papers presented here as part of the *Physics in Industry Series*, covering cyclotrons, betatrons, synchrotrons, electrostatic generators, and linear accelerators, are, together with the discussion of the papers also included, based upon talks given at the 1949 Institute of Physics convention at Buxton, England. Brief but fairly thorough descriptive treatments of the various accelerators are contained, going as far as possible in the limited space provided. The authors include details on a number of existing machines, as well as short bibliographies of the more important publications on their particular subjects. (*The Acceleration of Particles to High Energies*. J. Rotblat et al. 54 pp. The Institute of Physics, London, 1950. 10s. 6d.)

Electrical Insulation

The *Conference on Electrical Insulation*, under the sponsorship of the Division of Engineering and Industrial Research of the National Research Council, held its nineteenth annual meeting at Pocono Manor, Pennsylvania, in November 1950. The program and abstracts of the papers presented have been issued as an *Annual Report* (108 pages) by the NRC.

Acoustical Terminology

The latest edition of the American Standards Association publication, *American Standard Acoustical Terminology*, Z24.1-1951, sponsored by the Acoustical Society of America in cooperation with the Institute of Radio Engineers, represents the combined efforts of a number of special committees to revise standards on acoustical and electroacoustical terminology since the appearance of the first edition in 1942. The section on speech and hearing, in particular, has undergone a thorough revision in order to be brought into agreement with the most recent experimental results. Copies of the new *Standard* may be obtained from the American Standards Association, 70 East 45th Street, New York 17, N. Y. (50 pp., \$1.50.)

Books Received

ÉLECTRICITÉ. By Y. Rocard. 538 pp. Masson et Cie, Éditeurs, Paris, France, 1951. 2200 Fr.

DIRECTORY OF INTERNATIONAL SCIENTIFIC ORGANIZATIONS. 224 pp. Unesco Publication 619. Unesco, Paris, France, 1950.

ELEMENTS OF MODERN PHYSICS. By Walter C. Michels and A. L. Patterson. 659 pp. D. Van Nostrand Company, Inc., New York, 1951. \$6.50.

SPECTROCHEMICAL ANALYSIS. By L. H. Ahrens and George R. Harrison. 269 pp. Addison-Wesley Press, Inc., Cambridge, Massachusetts. \$10.00.

PHOTOMETRIC ATLAS OF THE NEAR INFRA-RED SOLAR SPECTRUM $\lambda 8465$ TO $\lambda 25,242$. By Orren C. Mohler, A. Keith Pierce, Robert R. McMath, and Leo Goldberg. University of Michigan Press, Ann Arbor, Michigan, 1951. \$4.00.

THE BEHAVIOR OF ENGINEERING METALS. By H. W. Gillett. 395 pp. John Wiley & Sons, Inc., New York, 1951. \$6.50.

THE ORIGIN OF THE EARTH. By W. M. Smart. 239 pp. Cambridge University Press, New York, 1951. \$2.75.

ARTIFICIAL FIBRES. By R. W. Moncrieff. 313 pp. John Wiley & Sons, Inc., New York, 1951. \$4.50.

FROM THE LIFE OF A RESEARCHER. By William Weber Coblentz. 238 pp. Philosophical Library, New York, 1951. \$4.75.

JACOBIAN ELLIPTIC FUNCTION TABLES. A Guide to Practical Computation with Elliptic Functions and Integrals Together with Tables of $\text{sn } u$, $\text{cn } u$, $\text{dn } u$, $Z(u)$. By L. M. Milne-Thomson. 132 pp. Dover Publications, Inc., New York, 1951. \$2.45.

APPLIED ELECTRONICS ANNUAL 1951. Edited by R. B. Blaise. 263 pp. British-Continental Trade Press, Ltd., London, England. J. D. Griffiths, 2 Clark Court, Rutherford, N. J., American representative. \$8.00.

METAL SPECTROSCOPY. By F. Twyman. 569 pp. Charles Griffin & Co., Ltd., London, and Jarrell-Ash Co., Boston, Massachusetts, 1951. \$8.75.

SHORT WAVE WIRELESS COMMUNICATION. Including Ultra-Short Waves (Fifth Edition). By A. W. Ladner and C. R. Stoner. 717 pp. John Wiley & Sons, Inc., New York, 1951. \$8.00.

THE ACCELERATION OF PARTICLES TO HIGH ENERGIES. Based on a Session arranged by the Electronics Group at the Institute of Physics Convention in May, 1949. 58 pp. The Institute of Physics, London, 1950. 10s. 6d.

GLASS. A Handbook for Students and Technicians. Edited by J. Home Dickson. 300 pp. Hutchinson's Scientific and Technical Publications, New York, 1951. 25s.

METALLURGICAL THERMOCHEMISTRY. By O. Kubaschewski and E. L. Evans. 368 pp. Academic Press, Inc., New York, 1951. \$6.00.

SERVOMECHANISMS AND REGULATING SYSTEM DESIGN. Volume I. By Harold Chestnut and Robert W. Mayer. 505 pp. John Wiley & Sons, Inc., New York, 1951. \$7.75.

HIGH SCHOOL PHYSICS. By Oswald H. Blackwood, Wilmer B. Herron, and William C. Kelley. 671 pp. Ginn and Company, Boston, Massachusetts, 1951. \$3.76. Accompanying WORKBOOK AND LABORATORY MANUAL with TESTS. \$1.40.

MECHANICAL MEASUREMENTS BY ELECTRICAL METHODS (Second Edition). By Howard C. Roberts. 357 pp. The Instruments Publishing Co., Inc., Pittsburgh, Pennsylvania, 1951.