

ranging from problems in design and development of vacuum arc melting furnaces to the design and operation of a hypersonic low-density wind tunnel. This section is probably of more interest to practicing engineers than to the research or student physicist. However, the latter will find these papers interesting as an introduction to the type of commercial application to which vacuum technology often leads the practical physicist or engineer.

The reviewer has one quarrel with terminology as used in this volume which the American Vacuum Society should recognize in future publications. Many of the papers include in their titles the words "high vacuum," by which the authors mean vacua in the order of magnitude of 10^{-7} mm Hg. Modern vacuum technique has progressed to a stage where 10^{-7} mm Hg is considered a very poor vacuum by the physicist, and high vacua run from 10^{-8} to 10^{-13} . Although none of the papers given at this symposium cover the region of modern high vacua, one hopes that some of the future vacuum technology reported by this group will begin to explore this area. It is essential to have a firm and uniform notation about the term "high vacuum".

Abhandlungen aus dem Fritz-Haber-Institut. Vol. 33, 1956. 384 pp. Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin-Dahlem, Germany, 1957. Paperbound. Reviewed by L. Marton, National Bureau of Standards.

On a previous occasion I had a chance to review an earlier volume of this yearly publication of the Fritz-Haber-Institut of the Max-Planck-Gesellschaft. The present volume is again an indication of the same basic mixture of different disciplines as in the previous volume. The Fritz-Haber-Institut, as pointed out earlier, is primarily devoted to physical chemistry. As a consequence, the papers presented in the yearly volume are somewhat varied in character. As in previous years, there is a collection of reprints put together in alphabetical order according to the authors' names. Of the thirty-two papers, nineteen deal with physical subjects, two more are on electron microscopy and may be vaguely called physical, and the rest are strictly chemical. A few of the subjects treated are x-ray optics, electron optics, field emission microscopy, solid-state physics, and theoretical topics of Hosemann and collaborators. These last range from the small-angle scattering theory to the problem of "hidden variables" in quantum mechanics, to diffraction microscopy, and related subjects. A common denominator is a somewhat abstract application of folding operations and of folding polynomials. About forty percent of the whole volume is taken up by the theoretical papers by Hosemann and his collaborators.

Until now, I failed to mention the contribution to this volume which I liked best. This is a paper by Max von Laue entitled "Einstein and the Theory of Relativity". This paper is a reproduction of a talk given at the German Physical Society in Wiesbaden and is, in a

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manner of speech, an obituary of Einstein. I say it is "in a manner of speech", because it is much more than just an obituary. It is an evaluation of the man and of the scientist Einstein, by a man who stood very close to him and who, by his accomplishments and by his knowledge and his friendship, was probably best qualified to make that evaluation. It is a gem of its kind. The life and the times of Einstein stand out with remarkable clarity in this presentation. He describes the early years, the background against which the accomplishments of Einstein stand out so remarkably. He speaks of the later years and the growing isolation in which Einstein found himself. It is truly an unusual portrait of a great scientist and I recommend that all those who have an interest in reading something about Einstein read this "obituary" which appeared originally in the first issue of the 1956 volume of *Die Naturwissenschaften*.

The Space Encyclopaedia: A Guide to Astronomy and Space Research. Edited by M. T. Bizony. 287 pp. E. P. Dutton & Co., Inc., New York, 1957. \$6.95. *Reviewed by J. R. Pierce, Bell Telephone Laboratories.*

This 287-page book appears to be intended chiefly for space fans who want to go beyond the scattered facts of the public press but who have little technical background. It brings together a good deal of material on astronomy and rocketry. It has information concerning uncommon names and terms and figures on planetary sizes, distances, and albedos. It gives the address of the American Rocket Society and the organization of the American satellite program (but where is the Jet Propulsion Laboratory, who got theirs up first?).

In a determined effort not to tax the mathematical ability of the reader, *refraction* and *lenses* are discussed without a statement of Snell's law, and the discussions of *Doppler effect* and *relativity* are strangely qualitative. We find at one point *angular momentum* defined as "the product of the mass of the body and its rate of rotation", which seems to be wrong even within the limits of its ambiguity.

Finally, some of the articles are highly argumentative and dogmatic. Thus the space on *space station* is devoted to a 6-point attack on the usefulness of such an installation. Under *ion rocket* we read "its weak thrust renders it impractical".

In all, this book is useful but careless. Some good long articles, including that on astronomy by Sir Harold Spencer Jones, add to its interest.

Books Received

THE PRINCIPLES OF QUANTUM MECHANICS (4th Revised Edition). By P. A. M. Dirac. 312 pp. Oxford U. Press, New York, 1958. \$5.60.

OBSERVATION AND INTERPRETATION: A Symp. of Philosophers & Physicists (U. of Bristol, Apr. 1957). Vol. 9 of the Colston Papers. Edited by S. Körner with M. H. L. Pryce. 218 pp. (Butterworth, England) Academic Press Inc., New York, 1957. \$8.00.

AN INTRODUCTION TO THE STUDY OF STELLAR STRUCTURE. By S. Chandrasekhar. 509 pp. Dover Publications, Inc., New York, 1957. Paperbound \$2.75.

THE THEORY OF GROUPS (2nd Revised Edition). By Hans J. Zassenhaus. 265 pp. Chelsea Publishing Co., New York, 1958. \$6.00.

REAKTORTECHNIK. By P. R. Arendt. 206 pp. Physik Verlag, Mosbach/Baden, Germany, 1957. DM 19.20.

ADVANCES IN BIOLOGICAL AND MEDICAL PHYSICS, Vol. 5. Edited by John H. Lawrence and Cornelius A. Tobias. 488 pp. Academic Press Inc., New York, 1957. \$12.00.

ENGINEERING COLLEGE RESEARCH REVIEW, 1957. Edited by Renato Contini. 408 pp. Engineering College Research Council of American Soc. for Engineering Education, New York U., University Heights, N. Y. 53, N. Y. Paperbound \$2.00.

EINFÜHRUNG IN DIE VEKTORRECHNUNG FÜR NATURWISSENSCHAFTLER UND CHEMIKER. By Hugo Sirk. 124 pp. Verlag von Dr. Dietrich Steinkopff, Darmstadt, Germany, 1958. DM 16.00.

EXTERIOR BALLISTICS OF ROCKETS. By Leverett Davis, Jr., James W. Follin, Jr., Leon Blitzer. 457 pp. D. Van Nostrand Co., Inc., Princeton, N. J., 1958. \$8.50.

SOURCEBOOK ON ATOMIC ENERGY (2nd Revised Edition). By Samuel Glasstone. 641 pp. D. Van Nostrand Co., Inc., Princeton, N. J., 1958. \$4.40.

DIGEST OF THE LITERATURE ON DIELECTRICS, Vol. 20, 1956. Edited by John D. Hoffman and John Hart. 237 pp. Publication 562. Nat'l Academy of Sciences—Nat'l Research Council, Washington, D. C., 1957. Paperbound \$5.00.

OPTICAL INDUSTRY DIRECTORY, 1958. 292 pp. The Optical Publishing Co., Box 326, Brewster, N. Y. Cardboardbound \$5.00.

OPTICAL AIDS FOR LOW ACUITY. By Russell L. Stimson. 43 pp. Braille Institute of America, Los Angeles, Calif., 1957. \$10.00.

MECHANICAL RESOLUTION OF LINGUISTIC PROBLEMS. By Andrew D. Booth, L. Brandwood, J. P. Cleave. 306 pp. (Butterworths, England) Academic Press Inc., New York, 1958. \$9.80.

THE THRESHOLD OF SPACE: Proceedings of Conf. on Chemical Aeronomy (Cambridge, Mass., June 1956). Edited by M. Zelikoff. 342 pp. Pergamon Press, London & New York, 1957. \$15.00.

CHEMISTRY PROBLEMS IN JET PROPULSION. By S. S. Penner. 394 pp. Pergamon Press, London & New York, 1957. \$12.50.

THE TAYLOR SERIES: an introduction to the theory of functions of a complex variable (Reprint). By P. Dienes. 552 pp. Dover Publications, Inc., New York, 1958. Paperbound \$2.75.

A TREATISE ON PLANE AND ADVANCED TRIGONOMETRY (7th Edition). By E. W. Hobson. 383 pp. Dover Publications, Inc., New York, 1957. Paperbound \$1.95.

APPLICATION OF TENSOR ANALYSIS (Reprint). By A. J. McConnell. 318 pp. Dover Publications, Inc., New York, 1957. Paperbound \$1.85.

TOEPLITZ FORMS AND THEIR APPLICATIONS. By Ulf Grenander and Gabor Szegő. 245 pp. U. of California Press, Berkeley & Los Angeles, Calif., 1958. \$6.00.

SAFETY TECHNIQUES FOR RADIOACTIVE TRACERS. By J. C. Bournsell. 68 pp. Cambridge U. Press, New York, 1958. \$1.75.