

retical physicist have more in common with Archimedes and Aristarchus than with Robert Boyle?—a most thought-provoking proposition. Is physical science—in its more ethereal regions—becoming an art? This would bring it into line with the biological, geological, and medical sciences, which have never entirely lost all of their “art” characteristics.

All the interesting features of this book cannot be presented in a short review. The chapter on Science and Philosophy has a brief but delightful imaginary dialogue between a scientist and a philosopher. The 20th-century lag of philosophical interpretation behind scientific concepts is dealt with most skillfully. One is reminded of the adage that it takes twenty years to get a new idea into a textbook and another twenty to get it out again when obsolete.

As a trained historian, the reviewer finds the discussion of scientific objectivity in historical writing disappointing. History has to deal with documentary sources after a process of natural selection by time. It is well known that there are many gaps, particularly in intellectual history, and no amount of “scientific” investigation will return that which is known to have been destroyed. The matter of acquiring a *feel* for a period of time, such as the Restoration England of Newton's prime, is not so difficult to acquire as Lindsay suggests, and understanding a science in its own frame of reference may often be achieved better by those who are trained not to read modern meanings into ancient words.

The chapter on Science and Communication, which is the longest in the book, will be of greater interest to scientists than to nonscientists. That on Science and Technology is a neat little history of technology. Science and the State concerns the applications of science as they come under political control, as well as recent developments in governmental support of science in the United States. Science and Human Behavior touches upon a field still in its infancy.

This is an interesting and timely book. It should be required reading

for all scientists, for those who would understand the deeper purposes of modern science, and for students of intellectual history.

Selected Problems in Physics with Answers. By M. P. Shaskol'skaya and I. A. El'tsin. Transl. from Russian by W. J. F. Reynolds. English Transl. Edited by F. Castle. 246 pp. (Pergamon, Oxford) Macmillan, New York, 1963. Paper, \$3.75.

Reviewed by T. Teichmann, General Atomic Division, General Dynamics Corp., San Diego.

Elementary courses in physics (high-school and first-year college) are so often treated merely as the foundation for more sophisticated and complex things that the problems in such courses tend to be rather artificial. This need not be, for there are many phenomena in life, and for that matter in science, which are described fairly completely by the concepts of elementary physics, and whose study is both interesting and entertaining, and some times even educating!

The problems in this book are largely of this character. They have been chosen to cover the ground of what seems to be a Russian school-leaving exam in physics, though they include a number of topics which would only be covered by a beginning college course or by some judicious independent reading. They are not designed to be tricky or complicated, but they do call for the ability to see the concepts underlying the form. Almost all branches of physics are covered (except, obviously, quantum mechanics) and more than two thirds of the book consists of answers, often given in several ways. Both the format and the style are very readable. Since the cost is relatively modest, this book can be unhesitatingly recommended to both the neophyte and the expert.

Handbook of High Vacuum Engineering. By H. A. Steinherz. 358 pp. Reinhold, New York, 1963. \$14.75.

Reviewed by Björn Bergsnoy-Hansen, Stanford Research Institute, Menlo Park, California.

In the relatively new field of vacuum technology, pertinent information is widely distributed over the literature. A concise handbook would therefore

be extremely welcome. Looking at the table of contents of Steinherz's book raises big expectations; however, examination of the text leaves one somewhat disappointed. In some chapters a wealth of information is given in the form of abstracts of papers published in the field. However, the book would have gained considerably if the author had attempted to evaluate the material and place the facts in focus. As it is, in large sections of the book the significant information is hidden in short and partly incomplete descriptions of experiments. Furthermore, detailed description of commercially available equipment is almost exclusively limited to that manufactured by the author's company.

The book would have benefited from more careful editing. The text contains imprecise expressions and concepts; in particular, some of the mathematical expressions and equations are confusing. For example, the letter *d* is used as both a differential symbol and diameter within the same paragraph; the letter *l* denotes both length and liter within the same equation; total differentials are given finite values.

In spite of these objections, the book may be considered a worthwhile addition to the bookshelf. Several useful tables and especially the extensive literature references (almost four hundred) make it a useful source of information.

Strange Particles. By Robert Kemp Adair and Earle Cabell Fowler. Vol. 15 of Tracts on Physics and Astronomy, edited by R. E. Marshak. 151 pp. Interscience, New York, 1963. \$4.75.

Reviewed by Herman Feshbach, Massachusetts Institute of Technology.

It is unfair to this excellent volume and to its most able authors to start this review with a complaint on the current use of the word “strange”. To be sure the properties of the *K* particles, and of the hyperons Λ , Σ , and Ξ were strange when they were first discovered, but there seems to be no reason to perpetuate this memory of our initial ignorance which after all is always present when a whole new range of phenomena comes into view.

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We can be grateful that the discoverers of quantum theory didn't dub it "strange" physics and we can expect hopefully that when the properties of these new particles become as familiar to us as those of atomic nuclei that other new and initially strange worlds will have already made their first appearance.

Be that as it may this volume records the very considerable progress which has already been made toward obtaining an understanding of the properties and interactions of hyperons and K mesons. The emphasis is mostly on phenomenological aspects toward which the authors have themselves made notable contributions. Other tracts in this series present the theoretical point of view. How are the spin, the parity, the hypercharge, the isotopic spin, and so on, determined and, of course, what are their values? How are these particles made and how do they interact? How do they decay, particularly the K_0 and $\bar{K}_0$? The discussions of these matters is very clear but the level is quite sophisticated. It is then not a book for a beginner.

However, it will present no difficulties for a physicist who has worked with reaction theory, and for him it provides an excellent introduction into the subnucleonic world.

High-Pressure Measurement. ASME Symp. Proc. (New York, Nov. 1962). A. A. Giardini and E. C. Lloyd, eds., 409 pp. Butterworths, Washington, D.C., 1963. \$10.75.

Reviewed by Norman H. Nachtrieb, University of Chicago.

This volume comprises the proceedings of the Symposium on High Pressure Measurement, sponsored by the American Society of Mechanical Engineers in New York City in November, 1962. Twenty-four papers are presented, together with the comments and discussions which arose out of each. They reflect the over-all present state of the art of generating and measuring pressures in the 10 to 500 kilobar range. There is general agreement on a pressure scale based upon fixed transition points up to 59 kilobars (the lower transition point of barium), but much less consensus for

the region above 100 kilobars. Apart from the hysteresis and inherent sluggishness associated with certain transformations (e.g., the alpha-gamma transition in iron at about 88 kilobars and 548°C), there are major problems in the mapping of the stress gradients that exist within the volume that is confined between anvils. As a consequence, many of the papers deal with practical aspects of calibrating various kinds of high pressure devices (Bridgman opposed anvil, tetrahedral, cube, and belt configurations) and with such variables of the investing medium as size, composition, geometry, and shear characteristics. The empirical approach necessarily dominates these studies at the present stage of development, although some progress is reported in the derivation of analytical expressions for the stress distribution in short cylinders compressed between rigid anvils when limiting simplifying assumptions are made.

This is an important addition to the growing literature of high pressure technology.

BOOKS RECEIVED

CHEMISTRY AND CHEMICAL PHYSICS

Digital Computer Programs for Physical Chemistry, Volume I. By Paul A. D. de Maine and Robert D. Seawright. 423 pp. Macmillan, New York, 1963. \$18.00.

Mathematical Methods in Chemical Engineering. By V. G. Jenson and G. V. Jeffreys. 556 pp. Academic, New York, 1963. \$15.50.

Metallic Solid Solutions. Symp. Proc. (Orsay, July 1962). J. Friedel and A. Guiner, eds. 52 Chapters. Benjamin, New York, 1963. \$19.75.

The Role of Diffusion in Catalysis. By Charles N. Satterfield and Thomas K. Sherwood. 118 pp. Addison-Wesley, Reading, Mass., 1963. \$4.75.

The Chemistry of Imperfect Crystals. By F. A. Kröger. 1039 pp. North-Holland, Amsterdam, 1964. \$30.80.

General Science: Chemistry. By C. W. Wood. 179 pp. (Pergamon, Oxford) Macmillan, New York, 1964. Paper \$2.45.

Applications of Neutron Diffraction in Chemistry. By G. E. Bacon. 141 pp. (Pergamon, Oxford) Macmillan, New York, 1963. \$6.50.

Electronic Spectra and Quantum Chemistry. By C. Sandorfy. 385 pp. Prentice-Hall, Englewood Cliffs, N. J., 1964. \$14.95.

Azeotropy and Polyazeotropy. By Wojciech Świątowski. K. Ridgway, ed. 226 pp. (Pwn, Warsaw) (Pergamon, Oxford) Macmillan, New York, 1964. \$10.00.

ELECTRICITY & MAGNETISM

Elektrizitätslehre. By Robert Wichard Pohl. (19th ed.) 342 pp. Springer-Verlag, Berlin, 1964. DM 29.80.

Electricité. Vol. I. Electrostatique, Magnétostatique, Electromagnétisme, Phénomènes quasi-stationnaires. By M. Rouault. 246 pp. Masson, Paris, 1963. Paper 30 F.

Précis d'Electromagnétisme théorique. By Paul Poincelot. 456 pp. Dunod, Paris, 1963. 76 F.

Electricity and Magnetism for Electrical Engineers. By Alan T. Craven. 462 pp. (Pitman & Sons, London) Addison-Wesley, Reading, Mass., 1963. \$7.75.

The Scattering of Electromagnetic Waves from Rough Surfaces. By Petr Beckmann and André Spizzichino. 503 pp. (Pergamon, Oxford) Macmillan, New York, 1963. \$15.00.

ELECTROMAGNETIC WAVES & ELECTRONS

Propagation of Radio Waves at Frequencies Below 300 KC/S. W. T. Blackband, ed. 478 pp. (Pergamon, Oxford) Macmillan, New York, 1964. \$20.00.

EXPERIMENTAL TECHNIQUES

1963 Transactions of the Tenth National Vacuum Symposium of The American Vacuum Society. (Boston, October, 1963). George H. Bancroft, ed. 510 pp. Macmillan, New York, 1964. \$23.00.

GEOPHYSICS & EARTH SCIENCES

An Introduction to The Hydrodynamical Methods of Short Period Weather Forecasting. By I. A. Kibel'. Translation edited by R. Baker. 383 pp. (Pergamon, Oxford) Macmillan, New York, 1963. \$14.50.