

lic and make them understand what is "good and bad science".) If I were to recommend a book to a lay reader on the subject of "good and bad science", I doubt if I would recommend Martin Gardner's book. There is too much in it. The average lay reader would have a hard time reading through it.

It is, however, an excellent book in the hands of a prepared reader, somebody who has already sufficient basic training to bring an understanding mind to its contents. I think its greatest value would be in the hands of the devoted people who are willing to go out and preach to the lay public. I would recommend it highly to science teachers in high schools and to college instructors who are faced with the task of going out and talking to people and trying to make them understand "what is good science and what is bad science". In the hands of such devoted people, this book can be of enormous value as a source book.

The review copy came accompanied by a circular written by the president of Dover Publications. He states, "the book was first published in 1952 and of the original 3000 copy press run about a 1000 were remaindered. During the same period of time it is estimated that the aggregate sale of pseudo-scientific books on flying saucers, reincarnation, health fads, eccentric theories, etc. is over two million." I am afraid that it is the nature of things that a book of this type does not sell too well. I would not expect that the present edition in spite of its excellent presentation and its low price, being a paperback, will have the same sales as the corresponding book on flying saucers. Nevertheless, the publishing house has made a very valorous effort and has to be complimented on its presentation of this book.

An Introduction to Reactor Physics (2nd Revised Edition). By D. J. Littler and J. F. Raffle. 208 pp. Pergamon Press, London & New York, 1957. \$5.50. *Reviewed by E. R. Rae, Columbia University (on leave from Atomic Energy Research Establishment, Harwell, England).*

This little book is a revised edition of a text which appeared in 1955 and was reviewed in these pages in July, 1956. It is based on a set of lectures given by the authors to the students attending the Reactor School of the United Kingdom Atomic Energy Authority. It is intended as a text for the graduate engineer or physicist who wishes to understand the basic principles of reactor design. The style is simple and direct; only present-day ideas are discussed and no attempt is made to describe the historical development of the subject. Since the book is aimed at the relatively unsophisticated reader, the style is probably very suitable. General references and suggestions for further study are given at the end of each chapter.

The second edition is 12 pages longer than the first, but has one less chapter, the material formerly presented in the final chapter on "Diffusion Length Measurements and Exponential Experiments" being now in-

corporated in earlier sections of the book. Several other chapters have been modified, enlarged slightly, and brought more nearly up-to-date by the inclusion of data released at the Geneva Conference of 1955. The general layout, however, has been preserved and the first six chapters lead the student, through a discussion of atomic and nuclear physics, to the subject of the chain reaction. The next six chapters deal with the problems of calculating the behavior of a reactor, the discussion being concerned mainly with thermal reactors, while the last three chapters deal with the allied subjects of shielding, radiation detectors, and irradiation damage in bulk matter.

There can be little doubt that this book is useful to the student who is making his first acquaintance with reactor physics.

On Nuclear Energy: Its Potential for Peacetime Uses. By Donald J. Hughes. 263 pp. Harvard U. Press, Cambridge, Mass., 1957. \$4.75. *Reviewed by H. Mendlowitz, National Bureau of Standards.*

It is usually difficult to express the knowledge acquired in a technical field in terms that would make it intelligible to the layman. D. J. Hughes in his book *On Nuclear Energy* has done just this. In giving us a clear treatment of a highly specialized field, he has made intelligible to the layman important aspects of our present-day technology. There are very few instances when the author lapses into a style of writing suitable only for a technical journal. This book is valuable also to those whose background in nuclear physics or nuclear engineering is very meager. He ably recreates great moments in the history of the subject so that the reader finds himself living through the disappointments and triumphs of the scientists and engineers.

The author first introduces the reader to the fundamentals of atomic and nuclear physics and then leads the reader through a series of steps to reactor physics and engineering. He also treats some of the problems involved in the nonmilitary applications of fusion. There is also a discussion of the economic and political aspects involved in the peacetime applications of nuclear physics.

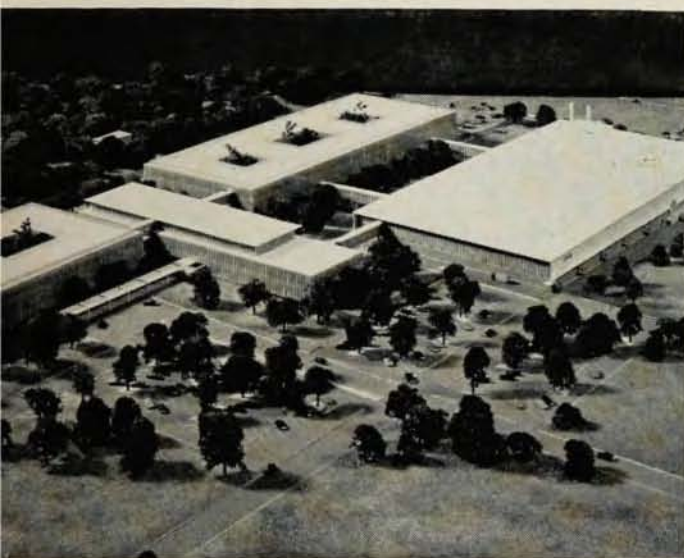
This then is a book that will be useful not only to the scientist and engineer because of its treatment of the political and economic aspects of nuclear physics but especially important to those whose interest lies in the nonscientific fields, thanks to the author's able and thorough handling of this important subject.

Solid State Physics: Advances in Research and Applications. Vol. 4. Edited by Frederick Seitz and David Turnbull. 540 pp. Academic Press Inc., New York, 1957. \$12.00. *Reviewed by Robert T. Beyer, Brown University.*

The amazing mushrooming of that growth known as solid-state physics requires the annual publication of more than a single review volume. As a result, the edi-



Dennis W. Holdsworth



Pictured above is our new Research and Development Center now under construction in Wilmington, Massachusetts. Scheduled for completion this year, the ultramodern laboratory will house the scientific and technical staff of the Avco Research and Advanced Development Division.

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Avco Research and Advanced Development Division,
20 South Union Street, Lawrence, Massachusetts.

IDEALS AND PRACTICALITY

"Science and Philosophy mutually criticize each other and provide imaginative material for each other."... Alfred North Whitehead

In the increasing preoccupation of science with material things and progress, the truth of this statement by one of our great philosophers is often overlooked and forgotten. The scientific philosopher is a rare being and is becoming rarer still, nor can he be adequately replaced by the group technique or 'brainstorm' session.

It should be one of the noblest aspirations of all our scientists to provide for the true contemplation of the inner meaning of facts and to stimulate that interplay of mind on mind which alone we may progress.

In all these things, however, we cannot forget the problem peculiar to research and development in private industry. The obligation to work to otherwise-determined time-scales poses a nice problem in balancing ideals against the practicalities of everyday life.

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Dennis W. Holdsworth

Manager, Computer and Electronic Systems Department

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tors of this series are producing (and intend to continue to produce) two such review volumes a year.

There are five articles in the present volume, two of them being of considerably greater length than the others. In the first of these, Werner Känzig treats the subject of "Ferroelectrics and Antiferroelectrics". This is a field in which the accumulation of experimental data has kept well ahead of virtually any theoretical attempts at the construction of an over-all view. Dr. Känzig has assembled this experimental information in systematic fashion, and introduces theoretical analyses wherever possible. At the same time, he has not hesitated to point out—at nearly every turn of the page—the avenues along which fruitful research is possible. The result should be a continued growth of the field.

The article "Theory of Mobility of Electrons in Solids" by Frank J. Blatt, the second of the long papers, is a truly excellent account of electronic motions in both metals and semiconductors. The mathematical details of many standard calculations are given, and the results compared with experiment. The article is well worth a careful study by any physicist interested in the solid state.

In "The Orthogonalized Plane Wave Method", Truman O. Woodruff outlines the basic procedures involved in this method, working out a series of problems in numerical detail for the silicon crystal.

"Bibliography of Atomic Wave Functions", by Robert S. Knox is just what it claims to be, the completest possible bibliography of atomic and ionic wave functions. In each case, the character of the calculations (relativistic, with exchange, etc.) is specified.

The final article in the volume, "Techniques of Zone Melting and Crystal Growing", by W. G. Pfann is an elaborate account of what appears to the reviewer to be a much narrower field than those touched on earlier in the volume. Nevertheless, the problem of controlled crystal growing is of such fundamental importance to experimental solid-state work that a study of the techniques involved deserves a place in a review volume of this sort.

While these five articles do not themselves cover the entire range of solid-state physics, so that the review volume (like all such today) cannot claim completeness, they do form a part of the larger whole that is the review series, so that, over a period of several years, all pertinent topics will be treated.

Correction:

In B. T. Feld's review of *Elementary Theory of Angular Momentum* by M. E. Rose (*Physics Today*, Nov. 1957, p. 30) the next to last sentence should have read: "Indeed, a thorough treatment of what, adopting the standards of this text, might be called 'Elementary Elementary Theory of Angular Momentum' would still be a useful addition to the literature." The second "Elementary" in the above was inadvertently omitted in printing the review.

Books Received

ATOMIC ENERGY IN AGRICULTURE. By William E. Dick. 150 pp. Philosophical Library, Inc., New York, 1957. \$6.00.

ROCKET. By Sir Philip Joubert de la Ferté. 190 pp. Philosophical Library, Inc., New York, 1957. \$6.00.

THE FUNDAMENTAL CONSTANTS OF PHYSICS. Vol. 1 of Interscience Monographs in Physics & Astronomy. By E. Richard Cohen, Kenneth M. Crowe, Jesse W. M. DuMond. 287 pp. Interscience Publishers, Inc., New York, 1957. \$7.50.

THE ELEMENTS OF PHYSICS (6th Revised Edition). By Alpheus W. Smith and John N. Cooper. 671 pp. McGraw-Hill Book Co., Inc., New York, 1957. \$7.50.

TABLES DE CONSTANTES ET DONNÉES NUMÉRIQUES (IUPAC). *Diamagnétisme et Paramagnétisme* by G. Foëx and *Relaxation Paramagnétique* by C. J. Gorter and L. J. Smits. 317 pp. Masson et Cie, Paris, France, 1957. Clothbound 9.700 fr.; paperbound 8.800 fr.

THÉORIE SYNTHÉTIQUE DE LA RELATIVITÉ RESTREINTE ET DES QUANTA. By O. Costa de Beauregard. 200 pp. Gauthier-Villars, Paris, France, 1957. Paperbound \$9.30.

X-RAY CRYSTAL STRUCTURE. By Dan McLachlan, Jr. 416 pp. McGraw-Hill Book Co., Inc., New York, 1957. \$15.00.

STATISTISCHE MECHANIK. Vol. 5 of Einführung in die Theoretische Physik. By Werner Döring. 114 pp. Walter de Gruyter & Co., Berlin, Germany, 1957. Paperbound DM 2.40.

ABHANDLUNGEN AUS DEM FRITZ-HABER-INSTITUT. Vol. 33, 1956. 384 pp. Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin-Dahlem, Germany, 1957. Paperbound.

INDUSTRIAL ELECTRONICS HANDBOOK. By R. Kretzmann. 298 pp. (Philips Technical Library, Holland) Philosophical Library, Inc., New York, 1957. \$12.00.

INDUSTRIAL ELECTRONICS CIRCUITS. By R. Kretzmann. 194 pp. (Philips Technical Library, Holland) Philosophical Library, Inc., New York, 1957. \$10.00.

WATER WAVES: The Mathematical Theory with Applications. By J. J. Stoker. 567 pp. Interscience Publishers, Inc., New York, 1957. \$12.00.

RECEIVING AERIAL SYSTEMS: For Broadcast and Television. By I. A. Davidson. 152 pp. Philosophical Library, Inc., New York, 1957. \$4.75.

TECHNICAL REPORT WRITING. By James W. Souther. 70 pp. John Wiley & Sons, Inc., New York, 1957. Paperbound \$2.95.

A HISTORY OF TECHNOLOGY. Vol. 3, From the Renaissance to the Industrial Revolution. Edited by C. Singer, E. J. Holmyard, A. R. Hall, T. I. Williams. 766 pp. Oxford U. Press, New York, 1957. \$26.90.

HANDBOOK OF NOISE CONTROL. Edited by Cyril M. Harris. 40 sections. McGraw-Hill Book Co., Inc., New York, 1957. \$16.50.

THE TAO OF SCIENCE: An Essay on Western Knowledge and Eastern Wisdom. By R. G. H. Siu. 180 pp. The Technology Press of Mass. Inst. of Technology and John Wiley & Sons, Inc., New York, 1958. \$4.25.

ELECTROSTATIQUE, COURANTS CONTINUS, MAGNÉTISME. By P. Fleury and J.-P. Mathieu. 552 pp. Editions Eyrolles, Paris, France, 1957. 6.225 fr.

HEAT TRANSFER, Vol. 2. By Max Jakob and Stothe Peter Kezios. 652 pp. John Wiley & Sons, Inc., New York, 1957. \$15.00.