

Society", and S. E. Toulmin's "Crucial Experiments: Priestly and Lavoisier". This admiration of only four papers out of 33 does not mean at all that the others are less good. It merely reflects the personal preference of one reader. The wide diversity of the subjects and viewpoints makes interesting reading, whichever part of the book you may open.

The individual contributions are handled with a great deal of originality. This may go so far that one contributor is accused by another of "Marxist leanings". My own knowledge of this aspect of the subject is not sufficiently developed to resolve the controversy; at least in the published excerpts of the accused writer's paper these "leanings" were not immediately apparent to me.

I would like to mention one more paper which is slightly different from all the others. It is the last paper of the series by I. Bernard Cohen, entitled: "Some Recent Books on the History of Science". I pick it out separately because it can be used as an excellent introduction to the reading material on the history of science. I don't know of any other introduction to that material which is as good as this particular one.

It is customary to include also some adverse critical material in the description of any book and here is a little bit of such criticism. In vain I looked several times for any indication about the date of the appearance of the papers in the original publication. I think it would have added to the value of the book if references had been given. Nevertheless, carping aside, this book can be very warmly recommended to anyone who is interested in the history of science and the history of ideas.

Progress in Nuclear Physics, Vol. 6. Edited by O. R. Frisch. 297 pp. Pergamon Press, London and New York, 1957. \$14.00. *Reviewed by Kamal K. Seth, Duke University.*

The present volume of *Progress in Nuclear Physics* has admittedly a definite "reference book" bias and this may be said without implying that that in any manner compromises the objectives of this excellent review annual. Nearly half of the volume is devoted to isotopes. On isotope enrichment there is an elementary article on multistage methods by T. F. Johns, and after four intervening articles (162 pages later) a somewhat more elaborate article on electromagnetic methods by M. L. Smith. Similarly, on atomic masses there are two articles: H. E. Duckworth on masses of atoms of $A > 40$, and again, with about 100 intervening pages, an article by J. Mattauch and F. Everling on masses of atoms of $A < 40$. The merit of these articles, in spite of recent publication of more detailed surveys of the subject lies in the fact that they are much more readable and concise, and yet as complete and comprehensive as any others. After the masses come moments and spins, and K. F. Smith, in a very elegant article, reviews the up-to-date experimental knowledge of nuclear moments and spins as well as the basic theoretical concepts in-

volved. G. N. Walton writes on the not-so-well-known subject of fission recoil and its effects and M. B. Stearns reviews the experimental status of the spectroscopy of mesonic atoms. R. J. Eden discusses nuclear models and, at a time when the multiplicity of nuclear models is beginning to be quite confusing, his excellent and clear and essentially nonmathematical review of the subject is most opportune and may be recommended to every experimental physicist. The concluding article of the book can hardly be called a review article because the subject of parity nonconservation is scarcely ripe enough for it; both experimental and theoretical developments are still continuing at too rapid a rate. Yet, O. R. Frisch and T. H. R. Skyrme have done a timely service in writing on parity nonconservation in weak interactions in a style which is lucid and easily understandable.

The articles in this volume, as in the preceding ones, are uniformly scholarly and readable and are provided with fairly complete bibliographies.

Nuclear Reactions I. Vol. 40 of *Handbuch der Physik*. Edited by S. Flügge. 553 pp. Springer-Verlag, Berlin, Germany, 1957. DM 128.00 (subscription price DM 102.40). *Reviewed by S. Gorodetzky, Université de Strasbourg.*

This volume, the first in a series on nuclear reactions, contains four articles, the first two of which treat the entire subject of low energies. All of the articles are directed to experimentalists, who are likely to find them of considerable interest.

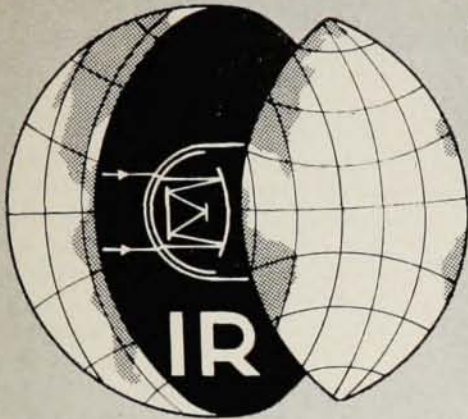
In the article on light nuclei (202 pages), W. E. Burcham first briefly discusses nuclear energy, or rather, in his own terms, the nuclear forces which one expects to influence the structure of a nucleus in a manner susceptible to experimental study. He then discusses the nuclear models as well as the various transitions, and the characteristics of nuclear reactions, which introduce the study of the properties of excited levels.

An explanation of the experimental methods by which these properties can be obtained as well as the brief theory of each method is given. Beginning with reactions classified according to different types the author analyzes at length the experimental results achieved. Finally, the author arranges his results by groups of isobars.

In the article on heavy nuclei (170 pages), B. B. Kinsey first examines the theory of the compound nucleus and nuclear reactions. He indicates some experiments which enable verification of the different hypotheses of interactions. The author then develops the experimental methods with some selected examples and discusses the nuclear reactions, which are classed according to their types.

At the end of the article there is a systematic study of some low-lying energy levels, especially in the deformed nuclei and in the tight-layered nuclei.

In the third article (75 pages), J. Rainwater discusses neutron resonances. He explains the theory, of-



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fers a detailed development of the Breit-Wigner formula, and gives evidence well provided with experimental results.

Finally, A. Wattenberg examines nuclear reactions at high energies (87 pages). After a summary account of data which can be obtained from such reactions and from the theoretical concepts useful for the understanding of experiments of this type, the author explains the techniques of neutron production and detection which are involved and reviews the relevant methods and the experimental results.

Solid State Physics: Advances in Research and Applications, Vol. 5. Edited by Frederick Seitz and David Turnbull. 455 pp. Academic Press Inc., New York, 1957. \$11.00. *Reviewed by Robert W. Hellwarth, Hughes Aircraft Co.*

The very excellent and ambitious series of volumes on solid-state physics edited and planned by F. Seitz and D. Turnbull continues with the appearance of Volume 5. The five articles contributed to this volume display quite well the editor's intended balance among theoretical, experimental, introductory, and advanced material.

The most extensive section of Volume 5 is one by M. H. Cohen and R. Reif on Quadrupole Effects in Nuclear Magnetic Resonance Studies of Solids (117 pp.). This section deals quite exhaustively with the "high field" case of interactions where the nuclear magnetic dipole Zeeman splitting is large. (The "low field" case will be treated by T. P. Das and E. L. Hahn in a separately published supplement to this volume.) The theory of quadrupole interactions and line shapes and intensities is developed from scratch and used to discuss many important classes of experiments and results in this field. Crystal structure, bonding, imperfections, and phase transformations are among the topics treated.

Three of the four remaining articles, all under one hundred pages each, treat other experimental fields. Galvanomagnetic and Thermomagnetic Effects in Metals by J.-P. Jan clearly outlines the bewildering array of independent coefficients which describe conductors in magnetic and thermal fields and discusses their relation to the many experimental effects. Although the approach is mainly phenomenological and experimental, some important theoretical results are mentioned. Probably all of the various effects suggested by the title are discussed here with emphasis on Hall and magnetoresistive effects.

C. C. Klick and J. H. Schulman in Luminescence in Solids give a lucid account of the application of modern investigative techniques and concepts of solid-state physics to this technologically important field. The article is primarily concerned with inorganic phosphors whose luminescence either involves single centers, co-operating centers, or charge carriers. The illustrative material is well chosen to stress the physical principles involved. The technology of phosphors is mentioned

only when it is germane to the understanding of the basic mechanisms involved.

Most progress in the study of impurity states in semiconductors has been accomplished through the research with germanium and silicon whose impurities can be most easily controlled over the widest ranges. W. Kohn reviews Shallow Impurity States in Si and Ge with emphasis on the "shallow" states because they are more easily understood by present-day solid-state theory. This section, as those mentioned above, provides a clear introduction to the material as well as a useful reference to workers in the field.

With Space Groups and Their Representations, G. F. Koster contributes the more mathematical part of Volume 5. This monograph brings together a summary of the general theory of space groups and their irreducible representations with tables, diagrams, and physical examples of many specific results. A fairly firm grasp of group-theory concepts is prerequisite for the study of this section. This section is especially valuable in that the author has contributed much of his own in coordinating the methods for finding the irreducible representations for various space groups.

The author and subject indexes round out the considerable value of this volume as a reference and text in these several fields of the diverse body of solid-state physics.

Lectures on Nuclear Theory. By L. Landau and Ya. Smorodinsky. Translated from Russian. 83 pp. Consultants Bureau, Inc., New York, 1958. Paperbound \$15.00. *Reviewed by E. M. Henley, University of Washington.*

This translation of a series of lectures on nuclear theory given by Landau in Moscow in 1954 should prove a decidedly worth-while addition to any experimental nuclear physicist's library. The book will also appeal to the specialist in other fields who desires insight into the problems of nuclear physics, and should be highly recommended to all physics graduate students. It is thus a pity that the book is so expensive. (Students can obtain it at a special discount price, if it is ordered in quantity.) The lectures, originally given to experimental physicists, are lucid presentations of some of the more important underlying concepts of nuclear physics. The emphasis is on clarity of physical ideas and on the relation of experiments to theoretical interpretation. Experiments that should be carried out to clarify various aspects of nuclear theory are often suggested directly or indirectly. The authors also attempt to point out pitfalls to which hasty generalizations can lead, even though they themselves make a few categorical assertions that do not seem too well founded.

The first three lectures discuss nuclear forces and the two-nucleon problem at low and at high energies. Here, as throughout, physical insight is emphasized rather than rigor or completeness. Nevertheless there is ample discussion of such topics as exchange potentials and isotopic spin, which is introduced in a very natural manner. The meaning of virtual level is clearly given,