ences are given to original or summary papers. The theoretical development of most of the topics treated is reasonably complete, and pains have been taken not to omit difficult transition steps in the analysis.

The plan of this book follows that which has become virtually standard in both verbal and written presentations of theoretical nuclear physics. Part I, consisting of two chapters, describes the approach to the subject matter and the character of the information concerning nuclear structure and forces that can be obtained from the general properties of nuclei. Part II consists of five chapters, and is a good, adequately detailed discussion of the two-nucleon problem in all of its ramifications. Part III includes the remaining four chapters, and deals with the structure, electromagnetic interactions, and nuclear reactions of heavier nuclei, with one chapter on beta decay. There are also five short appendices on special problems.

The book seems admirably suited to a short course in nuclear theory, preceded or accompanied, as the author suggests in the preface, by a second semester course in quantum mechanics. The modest size of the book (less than 400 pages) makes itself felt partly in the omission of several specialized topics such as fission and angular correlations, and partly in the relative lack of detail in Part III. While these qualities will detract somewhat from its value as a reference work, they should if anything enhance its value as a text book, where formidable size and price are often a disadvantage.

In addition to being clear, the treatment is authoritative throughout, as would be expected from an author who not only has a high scientific reputation but has also contributed much to the clarification of this field.

L. I. Schiff
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The Revolution in Physics. By Louis de Broglie (translated by R. W. Niemeyer). 310 pp. The Noonday Press, New York, 1953. $4.50.

The jacket of this book calls it "a survey of quanta for the layman", but it doesn't say what kind of "layman". The book can be recommended to graduate students in physics preparing for general oral doctor's examinations and to bright undergraduates specializing in physics; it can be suggested as stimulating fare for the serious reader who is already somewhat familiar with the vocabulary of physics and who is willing to work; but it is not for the general reader with little scientific background. It is not the equivalent of the popular books of Eddington or of Banesh Hoffman (*The Strange Story of the Quantum*) or of Gamow (whether this is a compliment or a criticism will be left to the reader).

But these comments are really only a criticism of the book's jacket. The book itself is a readable, usually lucid review of the fundamental developments which have taken place in physical theory in the last century. The first third of the book gives the background of classical physics, ending with relativity; the middle third on the developments from Planck to Sommerfeld and the last third to a discussion of the "standard" or "classical" quantum mechanics. Much of the book was written more than ten years ago, but sections have been inserted on nuclear physics, second quantization and other recent developments. In the main it discusses, clearly and logically, those developments of the past fifty years which can now be considered to be "noncontroversial".

In company with Einstein and others, de Broglie is not too satisfied with the probabilistic interpretation of wave mechanics. He discusses some of the recent suggestions of Bohm, together with some earlier ideas of his own, in this connection, though it is rather doubtful whether a "layman" could make much out of the whole argument.

The book, in fact, illustrates the dilemma involved in making modern physics understandable to the nonphysicist; either the wording is so vague that the real concepts are not got across or else so many specialized words and parenthetic definitions are thrown at the reader that he becomes confused before he gets to the concepts. This reviewer feels de Broglie's book errs somewhat in the latter direction, but it is a worthy and readable effort. More thought and hard work should be spent by more physicists on the job of persuading people that there is more to physics than making H-bombs.

Philip M. Morse
Massachusetts Institute of Technology

An Introduction to Symbolic Logic (Second Revised Edition). By Susanne K. Langer. 368 pp. Dover Publications, Inc., New York, 1953. Clothbound $3.50, paperbound $1.60.

The preface to this edition explains that the only changes from the first (1937) edition are a few corrections, some bibliographic additions, and an appendix on truth tables. The author believes that her book is still alone in its class; and in the following respect, at least, that is true. Mrs. Langer is eager to impart to her readers her enthusiasm for symbolic methods; to accomplish this, she at each stage tries to win the reader over with persuasive words before she starts operating with the symbols. If you are a layman unused to symbols, you may find this discursive treatment helpful. If you are a physicist, you will sometimes wish that the lecture would end and the demonstration begin.

For example: "Yet nothing we have stated is *abstract;* a house, no matter how little we say about it, or how generally we say it, is still something perfectly concrete". At this linguistic level, a debate can continue for some time before the participants find out that they are talking about different things: that such words as *abstract* have different connotations to different persons. I think it would be better to introduce the symbols first. In algebra and in physics, we do not try to develop each law in words and then translate it into symbols; we try to develop it in symbols and then, perhaps, interpret it in words. After a tentative symbolic

language (object language) has been introduced, it can be criticized and improved by discussing it in the language of everyday speech (metalanguage). The distinction between metalanguage and object language is carefully maintained by some writers on symbolic logic; in this book it is never explicitly made. That seems to me a serious omission.

Farther on in the book, however, Mrs. Langer takes up the history of the subject, the various ways in which symbolic logic has been approached, the various ways in which it can be approached, and the attempt in *Principia Mathematica* to construct all mathematics on it as a foundation. This discussion is quite illuminating. I hope a third edition will include more of it at the expense of some of the metaphysics. In this edition I suggest reading selectively; then you can get from the book a good introductory idea of the content and applications of symbolic logic.

William Fuller Brown, Jr.
Sun Oil Company

A Bibliography on Meteorites. Edited by Harrison Brown, assisted by Gunnar Kullerud and Walter Nichiporuk. 686 pp. The University of Chicago Press, Chicago, Illinois, 1953. $10.00.

This book is exactly what the title states, a compendium of over 25 000 articles on meteorites. The articles are listed chronologically, starting in 1491 and going through 1950. Needless to say, approximately half the references are to articles published in the last thirty years. It is indeed a welcome sight to see such an excellent compendium. It has been this reviewer's experience that a great deal of time can be consumed in the library trying to locate what someone, whose name one knows, wrote at some time in some journal of whose name one is not quite sure. The book will certainly be an important time saver to any serious student of the subject.

The last pages of the book contain an author index, thus providing a cross reference by name. Also included is a list of abbreviations of the journals referred to. The introduction gives credit for assistance to many persons. The bibliography is competently put together, and is an important contribution to the subject. It is a scholarly and exceedingly useful piece of work, and belongs on the book shelves of all libraries and of all those seriously interested in the subject.

Serge A. Korff
New York University

Sulfur

Gmelin's Handbook of Inorganic Chemistry: *Schwefel, System No. 9,* Section A 2 of the eighth edition of *Gmelin's Handbuch der Anorganischen Chemie* is a modern review of the scientific literature (through 1949) on sulfur and its compounds in the style and with the thoroughness which has so long characterized the encyclopedic Gmelin Handbook. These comprise two of five sections devoted to sulfur and its compounds with hydrogen, oxygen, nitrogen, fluorine, chlorine, bromine, and iodine. Section A 1 which has already appeared covers the history of sulfur. Section A 3, covering the formation and preparation of sulfur and the sulfur system, will appear this year as will also Section B 2, covering the compounds of sulfur with nitrogen, fluorine, chlorine, bromine, and iodine.

Section A 2 contains a section on occurrence in the earth and outside of it, a section on the technology of dressing of sulfur ores and the derivation of sulfur compounds. Here no phase of the recorded technology is overlooked and special emphasis is placed on such things as physicochemical principles, new oxidation or reduction methods for sulfur derivation from H_2S and SO_2, and the purification and concentration of SO_2. This is followed by a chapter on colloidal sulfur and a concise treatment of the physiological hazards and problems in the handling of sulfur compounds.

Section B 1 treats the sulfur hydrites and oxides. The physical properties, chemical behavior, formation, combustion, reactions are given for hydrogen and deuterium sulfides, and the polysulfides. The radicals HS and DS, the hydrate of H_2S and its aqueous and nonaqueous solutions, and SO_2, SO_3 and the higher oxides of sulfur are treated similarly. Among the physical properties treated are: molecular structure, equations of state, critical constants, vapor pressures, thermodynamic and transport properties, optical, magnetic, and electrical properties. (Verlag Chemie, Weinheim, West Germany, 1952. Section A2, 450 pp., $35.30; Section B1, 372 pp., $29.40. Available through W. J. Johnson, Inc., 125 E. 23 St., or Stechert-Hafner, Inc., 31 E. 10 St., New York, N. Y.)

Progress in Physics

Reports on Progress in Physics, Vol. XVI (407 pp.; published by The Physical Society, London, 1953; nonfellows, £2, 10s; fellows, 27s. 6d.) contains the following articles: Neutron Diffraction by G. E. Bacon and K. Lonsdale; Physical Properties and Atomic Arrangements in Crystals by W. A. Wooster; Raman Effect in Solids by A. C. Menzies; Paramagnetic Resonance by B. Bleaney and K. W. H. Stevens; Semiconductor Circuit Elements by J. S. Blakemore, A. E. De Barr, and J. B. Gunn; Electrical Discharges by F. Llewellyn Jones; Fluctuation Theory in Physical Measurements by C. W. McCombie; Cosmology by W. H. McCrea; and The New Unstable Cosmic-Ray Particles by G. D. Rochester and C. C. Butler.

Dielectric Constants and Dipole Moments

The *Table of Dielectric Constants and Electric Dipole Moments of Substances in the Gaseous State,* by Arthur A. Maryott and Floyd Buckley, includes approximately 350 substances, and is prefaced by a brief discussion of the procedure used in its preparation. This 29-page booklet is the National Bureau of Standards Circular 537, and may be obtained for twenty cents from the U. S. Government Printing Office, Washington 25, D. C.