

coverage is given to a group of analytical methods devised for predicting the gamma-ray absorption distributions in the complicated geometry of a reactor at a time when high-speed computing machinery techniques were not applied commonly. These methods should still be valuable for preliminary design studies in their direct approach, as well as at sites not having ready access to the machine calculations. The last part reviews briefly some measurements pertinent to the kinetic behavior of the reactor. The treatment is not in sufficient detail for ready assimilation, however.

Missing from the volume is a detailed discussion of criticality calculations on the various experimental assemblies constructed in simple geometry as well as the multigroup cross sections employed. While references to some such calculations are supplied, their lack, coupled with the complete absence of more recent work on intermediate systems, makes this volume more a project summary of historical interest than a clear exposition of the physics of intermediate reactors.

Introduction to Neutron Physics. By L. F. Curtiss. 380 pp. D. Van Nostrand, Co., Inc., Princeton, N. J., 1959. \$9.75. *Reviewed by J. E. Lynn, A.E.R.E., Harwell.*

IT was the aim of the author in writing this book to present a survey of the experimental facts concerning the neutron and of the experimental methods used in observing its behavior. The author appears to have aimed the book at the graduate-student level.

An account of a branch of physical science, which is heavily biased towards the experimental side, inevitably has its difficulties. The author realizes this and includes brief descriptions of the theoretical framework where necessary. This is particularly the case in the sections on neutron interactions with nuclei and with matter. The theoretical parts of the book, however, are rather superficial. One feels that the student who reads them will learn some of the jargon but will obtain little feeling for the physical principles of the subject. There are also a number of definite mistakes. For instance, modern theories do not allow the neutron to be considered as a combination of a proton and an electron as is stated in the book (although diluted by the words "as a first approximation"). A neutron resonance is not associated with levels of the *target nucleus*; the statement on p. 40, to the effect that it is, is corrected in later parts of the book but the result of this careless writing can only be that the newcomer to the subject becomes confused. In a later part of the book the meaningless phrase "channel spin of the compound nucleus" occurs.

The most satisfactory parts of the book are those on technique. There are useful surveys on neutron sources, detectors, monochromators, calibrations, and standards. There are occasional rather significant omissions in these sections, however, such as spontaneous fission sources and, in the section on pulsed neutron sources, the use of high-current linear electron accelerators. This last omission is particularly curious in

that a fairly detailed description is given in the book of a neutron detector whose main application has been in conjunction with linear accelerators.

The safety aspects of the experimental techniques are everywhere emphasized and there is a special chapter on health physics. This is as it should be, for with the increasing use and spread of radiation sources safety cannot be too strongly stressed.

On the whole this is a satisfactory book for the graduate student, but it cannot be said that it is excellent.

Basic Physics of Atoms & Molecules. By U. Fano and L. Fano. 414 pp. John Wiley & Sons, Inc., New York, 1959. \$10.00. *Reviewed by T. H. Edwards, Michigan State University.*

U. AND L. FANO'S *Basic Physics of Atoms and Molecules* is the first edition of a book which goes a long way towards filling the need for a good text on elementary quantum mechanics. The authors have made a successful effort to tie together classical and quantum phenomena and have included many valuable facts, not usually brought out, in their discussions of the various phenomena covered. There are a few problems at the end of each chapter (sufficient to please me) and the answers are given in a very fine form, complete with a brief explanation. Some of the more difficult and more specialized parts of the work are in the ten appendices. Appendix X on resonance is particularly worthwhile.

My principal criticism of this work concerns the authors' English and use of words. In addition, such difficult concepts as complementarity, correlation, correspondence, and incompatibility are not all clearly defined when first met and the index, while helpful in this regard, is less complete than desirable. A careful teacher can easily overcome these difficulties and they can be repaired in future editions. Unaccountably, a figure belonging to chapter 18 was bound into chapter 12 in the review copy. Despite these things, *Basic Physics of Atoms and Molecules* is a very good text for a course in elementary quantum mechanics and students who use this text should have much less difficulty than usual understanding how quantum mechanics applies to real physical situations.

High Altitude and Satellite Rockets: Symp. Proc. (Cranfield, England, July 1957). Sponsored by Royal Aeronautical Soc., British Interplanetary Soc., and Col. of Aeronautics. 136 pp. Philosophical Library, Inc., New York, 1959. \$15.00. *Reviewed by Robert E. Street, University of Washington.*

PUBLICATION almost two years later of papers read at a symposium in 1957, before Sputnik and the IGY, produces a volume which is essentially of historical interest. Almost all of the ideas, conjectures, and proposals have appeared elsewhere and the plans for the IGY have been carried out by now or have