

neering Department and Director of the Reactor Facility at the University of Virginia. He was in the Aircraft Nuclear Propulsion program at Oak Ridge in the 1950's which led to his interest in nuclear space applications. He attended the Advanced Institute on Nuclear Rockets in Gainesville, Florida in the summer of 1962, and was a Visiting Staff Member at the Nuclear Rocket Development Station in Nevada in the summer of 1965. He teaches a graduate course in nuclear rockets at the University of Virginia and has served as a consultant with NASA, Lockheed, Westinghouse, and the Air Force.

RE RADAPPERTIZATION, RADICIDATION, AND RADURIZATION

Title Microbiological Problems in Food Preservation by Irradiation

Publishers International Atomic Energy Agency, 1967

Pages 148

Price \$3.00

Reviewer Durwood B. Rowley

The papers incorporated in this volume are of high scientific quality and of great interest to readers concerned with radappertization, radication, and radurization. Good judgment was used in selecting papers concerned with a variety of microorganisms of public health concern. I was especially impressed with the recommendations as to further research areas of importance. Such emphasis will help direct interested scientists toward the pertinent problem areas and thus lead to concentrated research effort and more hope of success.

One major criticism of the book was that it included a few papers that consisted largely of data previously published in other scientific journals. It would have been preferable to have the authors publish a summary of such work with reference to the original data.

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TOO MANY COMPROMISES

Title Introduction to Nuclear Theory

Author I. E. McCarthy

Publishers John Wiley & Sons, Inc., 1968

Pages xv + 555

Price \$13.95

Reviewer Leonard S. Kisslinger

It is very difficult to write a textbook on nuclear theory at the present time, since the subject itself is complex and is changing rapidly as are graduate courses in nuclear theory. Therefore, one can try either to write monographs which treat fairly completely important new aspects of the field, such as A. Lane's book on *Nuclear Theory*, or else devote an extraordinary amount of time and talent to try to cover most of the material out of which all possible courses in nuclear theory can be taught, such as the forthcoming volumes by A. Bohr and B. Motelson.

As is stated in the Preface, the book by I. E. McCarthy is a compromise, in fact a collection of compromises such as a professor might make in preparing notes for a course to be taught during one particular year. In order of increasing thoroughness, the main topics treated are nuclear structure, nuclear matter and the two-nucleon interaction, and nuclear reactions.

The treatment of nuclear structure is so incomplete that one can question the value of including in the book the three chapters (3, 5, and 7) in which this material is discussed. Most single-particle aspects of nuclear structure not contained in many other texts are repeated in Chap. 11 in the treatment of optical

potentials. The main chapter which deals with nuclear structure (7) leaves out essentially all of the topics which have made nuclear structure physics truly exciting during the past decade. I believe that it would have been better to have referred to other books which are now available to the students and to have omitted at least Chap. 7.

There are five chapters in which the two-body problem and two-nucleon interaction and nuclear matter are treated. There is a brief heuristic treatment of the two-nucleon force in which the range is related to the mass of the pion. Since a considerable effort is expended on the many-body methods (often known as Brueckner Theory) which were developed to get around the difficulty of the hard core in the nucleon-nucleon force, further treatment of the origin of two-body force in terms of meson exchanges would have been most appropriate.

The reader can find a discussion of some of the early work on nuclear matter that is not contained in other texts in nuclear theory. The author includes some work on Hartree-Fock calculations and the relation to the results obtained by Brueckner Theory. Unfortunately, since there is little discussion of symmetries in the book, and no treatment of the symmetries associated with the Hartree fields, the main purpose of the recent Hartree-Fock calculations in nuclear physics could not be treated very well. For example, the connection of the results of a Hartree-Fock value of the quadrupole moment to what might be interpreted as an intrinsic quadrupole moment of the nucleus is, at best, oversimplified in the text.

The last seven chapters of the book treat nuclear reactions. Chapters 8 and 9 review various theories and discuss their applications. This could be especially useful for experimentalists who wish to learn something about the treatment of their data. The author gives a fairly thorough description of the optical model and the properties of the wave functions which result from the optical model.

There is a useful chapter collecting the results of $(p, 2p)$ reactions. The pickup and stripping reactions are discussed in some detail; however, the application of these reactions for studies of nuclear structure