BOOK REVIEWS

Selection of books for review is based on the editors' opinions regarding possible reader interest and on the availability of the book to the editors. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.

Basic Thermodynamics

Authors A. S. Morton and P. J. Beckett

Publisher Philosophical Library, Inc.

Pages 300

Price $15.00

Reviewer Robert O. Parker

This little book ($7\frac{1}{2} \times 5$ in.) has six chapters, seven appendixes, and one index. The basic thermodynamics is presented in three chapters: Pressure and Temperature, Energy, and Entropy (107 pages); the remainder is concerned with applications.

The authors' presentation is excellent with many clear figures, illustrative examples, and experiments. Their objective of simple experiments to suit a low budget has been attained—and the experiments are good. In their examples, the parallel treatment in SI, fps, and cgs units is excellent.

In the discussion of temperature, Fig. 1.3 indicates that a person would feel pain as a result of a two-minute skin contact with an object at 40°C; this is not so. Only on p. 220 is it mentioned that the perfect gas law is inadequate under some circumstances. The definition of "fugacity" was sought in vain. Although this writer objects to reference to the activity coefficient as a correction factor, the authors are right. There is no treatment of vapor-liquid equilibria.

In spite of the minor shortcomings mentioned above, this is a good little book and should prove useful in a freshman course of an engineering science program. Finally, the price seems a bit high.

Robert O. Parker (BS, Carnegie Institute; MS, Columbia University; ScD, New York University) is a professor of Chemical and Nuclear Engineering and, as such, is a member of both the Chemical and Nuclear Engineering Departments, School of Engineering and Science at New York University. He teaches and advises thesis students in both departments. Before joining New York University in 1957 he worked for 20 years in the heat exchanger industry.

Topics in Light Water Reactor Physics: Final Report of the NORA Project

Author International Atomic Energy Agency

Publisher UNIPUB, Inc., New York

Pages 110

Price $3.00

Reviewer W. H. McCorkle

This final report on the NORA Project is a companion document to one in the International Atomic Energy Agency (IAEA) Technical Report Series No. 67 that summarized research performed during the first three years of the NORA Project.

The present review report presents a very comprehensive summary of knowledge and techniques, including development or refinements to the state-of-the-art as used in the NORA Project and having wide general application.

The techniques discussed for utilizing solid-state Nuclear Track detectors such as phosphate glass disks and polycarbonate plastic foil (Makrofol) are particularly interesting. The refining and development of these techniques for fission density, as well as fast neutron flux distributions in zero power or critical assembly reactor studies, is one of the more exciting accomplishments summarized in this report.

The references listed and the reports cited in the bibliography also provide a useful catalog of documented literature in reactor physics with application to many nuclear power reactor systems.

This report should be of interest and useful to nuclear engineering departments for suggestions of techniques applicable to exponential pile, critical assembly, and zero power reactor measurements. For reactor design guidance it is doubtful that its value would be very important. It could, however, serve to remind code users of some pitfalls of which to be aware.

Willard H. McCorkle (PhD, 1935, University of Iowa) is presently professor of metallurgy at Iowa State University and senior physicist in the reactor division of Ames Laboratory.

Previously, he served for several years as chief, Reactor Division, Ames Laboratory. Prior to that he was director, Research Reactor Division, Argonne National Laboratory

(ANL), for about fifteen years. At ANL he conducted the training program (for a team of Belgian Scientists) that initiated effort at ANL that later became the International School of Nuclear Science and Engineering. He was active in scientific applications to the nuclear reactor field during the Manhattan Project. For many years his principal interests have been in nuclear reactor research, design, and operation.

A. Plasma Physics and Controlled Nuclear Fusion Research, Vol. I

B. Plasma Physics and Controlled Nuclear Fusion Research, Vol. II

C. Nuclear Fusion—Special Supplement 1970 World Survey of Major Facilities in Controlled Fusion

Author International Atomic Energy Agency

Publisher Unipub, Inc.

Pages A. 993
B. 836
C. 250

Price A. $23.00
B. $19.50
C. $ 6.00

Reviewer W. M. Farr

Periodically, most disciplines have a meeting which is definitive in the sense that the state-of-the-art is defined by the papers and discussion that transpire. Meetings which fit into that class are the triennial conferences on plasma physics and controlled nuclear fusion research sponsored by the International Atomic Energy Authority. First held in 1961 at Salzburg, then again in 1965 at Culham and in 1968 at Novosibirsk, these meetings bring together at one time and in one place representatives from almost the entire controlled fusion community of the world. Here we have one of the few opportunities for a meeting of minds by physicists and engineers from all the countries involved in fusion research on both sides of the iron curtain. Considering the importance of such a meeting, a copy of the proceedings is a necessity for anyone seriously interested in controlled fusion research. The proceedings are essentially an encyclopedia covering every aspect of the subject.

Roughly speaking, there are three basic areas covered in the course of the meeting: toroidal devices, open-ended devices, and basic plasma physics. Each receives an excellent review paper in the introduction to Vol. I by L. A. Artsimovich, S. J. Buchsbaum, and M. Trocheris, respectively. These are highly recommended to the more casual reader who would like a statement of progress in fusion research set in a historical perspective.

There are, of course, hazards associated with a state-of-the-art document. The results presented at Novosibirsk reflect the thinking of researchers at some point prior to June 1968, and this fact should be kept in mind. What was considered timely and of great significance in 1968 may or may not be so thought of today. For example, in the review paper on closed devices, the Tokamaks do not receive nearly the attention which they are currently obtaining from fusion researchers.

Another word of caution. Unfortunately, of the contributions by Russian and French scientists, only the review articles appear in translation, so that anyone wishing to study the details of the Russian or French work must have a command of the respective language.

A useful addition to the proceedings is the supplementary volume that lists, worldwide, each of the major institutions involved in fusion research. This volume is somewhat more up to date, containing information current as of the spring of 1970. Cataloged information includes the personnel and major experiments taking place at each institution.

W. M. Farr (PhD, University of Michigan) is an assistant professor of nuclear engineering at the University of Arizona. He has worked on controlled fusion problems at Oak Ridge National Laboratory and Culham Laboratory, England. His research interests are in theoretical plasma physics, particularly microinstabilities.

Neutron Capture Gamma-Ray Spectroscopy

Editor IAEA

Publisher Unipub, Inc.

Pages 708

Price $20.00

Reviewer John L. Meason

The published proceedings of the International Symposium on *Neutron Capture Gamma-Ray Spectroscopy* is a broad collection of research on this topic. A particular point of gratification is to find that one entire section of this book consists of research papers devoted uniquely to the description of experimental techniques. In addition to several theoretical papers, the bulk of the other information consists of research reports on level schemes derived from thermal, resonance, and fast-neutron capture reaction data.

The publication of the proceedings of this symposium provides an excellent source of reference on the subjects of neutron capture spectroscopy and nuclear level structure. A large portion of the information contained in this book is invaluable to the nuclear spectroscopist studying nuclear level structure from the decay of radioactive nuclides. The nuclear level structure measurements by neutron capture provides additional data to that already accumulated by radioactive decay and particle reactions.

It is interesting to note that very little attention was directed toward data processing of the Ge(Li) gamma-ray spectra, for example, such as the techniques described by Routti, UCRL-19452 (1969). There was, however, one paper (Michaelis and Horsch) that devoted two sections of their paper to the techniques of Ge(Li) gamma-ray spectrum analysis and calibration procedures.

Within the past several years a new isomer of ^{68}Cu has been identified [*Phys. Rev.*, 188, **4** (1969)] and its population of the nuclear levels in ^{68}Zn measured. The experimental work by Ottman et al. on the neutron capture of ^{67}Zn provides additional information on this particular problem.

Neutron Capture Gamma-Ray Spectroscopy would be an excellent