synthesis methods, the authors quote publications from 1962 and 1964, in spite of the long list of publications which have appeared since and still appear today. Therefore, the reviewer is inclined to believe that the book was actually written around 1966-1967. Did editing the book require five to six years or did the authors find no interest in supplying it with more recent information on the subject? For example, point 7.1 (pp. 107-109) could have been illustrated with calculations done by Mingle (1967), while the time-dependent response functions calculations (only a short appendix in the book!) could have been supplemented with the publications of Mockel (1967). In the preface, the authors clearly point out that . . . "the present monograph describes the application of the method of invariant imbedding to radiation shielding and to criticality calculations of atomic reactors." However, the title of the book suggests applications of invariant imbedding theory to reactor physics in general. In fact, the book would be more complete, and its title would have been fully justified, if the very interesting thesis of W. Pfeiffer (1969) or at least the article in *Nuclear Science and Engineering* by Pfeiffer and Shapiro (1969) had been included and discussed. The reader would then be better informed about the usefulness of the theory in other branches of reactor physics, for instance, the possibilities of using response functions for the evaluation of cross-section measurements.

I would not like to seem too critical. As a matter of fact, I have merely pointed out what the book should contain in order not to mislead the reader with its title and monographic character, which according to the definition of the word should contain a rather "exhaustive presentation of the chosen subject." Thus, although the book is rather old in material, it is nevertheless, to the reviewer's knowledge, the first book on invariant imbedding applications to reactor physics; therefore, it will serve the purpose of spreading this interesting method beyond the narrow group of specialists in this field. Furthermore, it can be considered a source book on response matrix theory, written by the commonly recognized inventors of the method. In the near future the reviewer expects a strong development in this area and an avalanche of publications devoted to response function calculations of various compound subassemblies used in large power reactors, analogous to the days when thermal neutron cross sections were evaluated for compound molecules and crystals. The book is definitely the valuable first step towards this development and it can be used as an introductory course since it contains the numerous publications of the authors collected in one volume.

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About the Reviewer: Zbigniew Weiss has been reactor physicist at ASEA-ATOM, Sweden, since 1966 and as visiting professor, taught reactor physics at Kansas State University in the academic year 1968-69. His current research interests are power reactor physics, nuclear safety, transport theory, and, in particular, reactor computational methods as response matrix theory, nodal models, and finite element methods. He received his PhD in theoretical physics from the Polish Academy of Science in 1963. Prior to 1966 he was reactor physicist at the Institute of Nuclear Research, Warsaw, Poland, for seven years and at the Institutt for Atomenergi, Kjeller, Norway, for two years. His earlier graduate training was at the Polytechnic of Wrocław, Poland (1950-1955), and at the University of Wrocław, Poland, in mathematics and theoretical physics (1955-1959).

Radioisotope Engineering. By G. G. Eichholz (Ed.). Marcel Dekker, Inc. (1972). 418 pp. $26.50.

"It is the purpose of this book to discuss many of the engineering aspects of the use of high-level radioisotope sources in medicine and industry and to present in convenient form much information and data material that until now were accessible only through the report literature." The objective stated by the editor in his preface is fulfilled. He and his colleagues have produced a useful book. However, I wish *Radioisotope Engineering* were a different kind of book.

First I will describe the kind of book it is. Following a 40-page introduction, there are 130 pages devoted to radioisotope source production and encapsulation, 45 to teletherapy units, 135 to high level gamma source irradiators for industrial processes, and a concluding chapter of 20 pages, comparing the relative merits of accelerators and radioactive sources. The general level is elementary so that the book may serve as an "introduction to the field for radiologists, health physicists, and food technologists." Only three pages contain mathematical material that would tax the abilities of a high school senior. There is an appendix which defines such elementary terms as "accelerator," "radioactivity," and "Z."

But don't let this apparent simplicity fool you. Despite the minimal use of mathematics, much of the descriptive material is highly concentrated, and it can be tough going for an engineer, much less a novice. In addition, for the reader interested in a detailed quantitative approach, there are many useful references which direct him to computer programs and other information at the forefront of the field.

The reader should also know what the book is not. It is not a textbook. While the chapters on "Gamma Irradiation Systems" (Bradburne) and "Design of Teletherapy Units" (Shewchenko) contain several illustrative examples and sample calculations, the others do not meet this educational requirement. There are no student exercises. Despite the attempt to cover a wide range of topics, too much is missing. There is some discussion of the absorption of gammas but it is inadequate. The absorption of alphas, betas, and electron beams is almost ignored. So is the whole of radiation chemistry. The applications of high level radiation to industrial processes are listed, but not one is discussed in sufficient detail. There are only a few simple formulas and rules-of-thumb for back-of-the envelope calculations.

To understand the reviewer's point of view, the reader should know that I have been teaching a two-semester graduate course in radiation engineering for twelve years. The course covers the transport of ionizing radiation, radiation source technology, radiation chemistry, and radiation processing. Other topics (such as gauging, activation analysis, and radiotracer applications) are covered but the principal emphasis is in the areas cited. I have no textbook and am constantly searching for educational materials which will serve my interests and make my job easier. While this book "is valuable as a complement to theoretical texts used in courses in radioisotope training and mechanical design of radiation systems," it does not have the coverage or the style that would make it the primary text for my course. Yes, the book fulfills its purpose and will be valuable to us as a reference, particularly the two chapters devoted to large gamma-source process irradiators. It will be even more valuable to its primary audience, but I wish it were a different book.

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