theory that are not found except as scattered throughout the literature. This book could be used as a text or main reference book in a course in advanced reactor theory. Problems are provided at the end of each chapter to test the understanding of the student and an extensive list of excellent references are given at the end of each chapter to supplement the reading material. If this text were to be used as a text book, adequate coverage of the material would require at least two semesters.

There are ten chapters in the book. The first chapter considers the derivation of the neutron transport equation from simple balance considerations and the last two chapters treat reactor dynamics.

The derivation of the transport equation is followed by a discussion of its limitations and the general methods of solution. Chapter 2 introduces the reader to the solution of the one-speed transport equation with emphasis on exact methods using Case's method of separation of variables and singular eigenfunctions.

While the emphasis in Chap. 2 is on analytical methods of solution to the one-speed transport equation, Chap. 3 treats the same problem using numerical methods. Difference equations are derived for the diffusion equation in both one-and two-dimensional rectangular geometries.

Multigroup methods are then discussed in Chap. 4 with emphasis on diffusion theory. The problem of obtaining suitable multigroup cross sections is discussed, although not in sufficient detail for the average reader to understand in depth the theory and numerical analysis of present reactor codes for preparing group constants.

A fairly brief treatment of discrete ordinates and S_n methods is provided in Chap. 5, which comes as somewhat of a surprise because of the strong emphasis on this method of solution in present day research.

The adjoint equation with its application to perturbation theory and variational methods is discussed in Chap. 6. Relevant application of both techniques are given which aid to a better understanding of the theory.

Chapter 7 provides a fairly comprehensive treatment of neutron thermalization. A knowledge of quantum mechanics is essential to a more complete understanding of this section. There are 123 references given at the end of this chapter; therefore, anyone studying thermalization theory in depth can consult the references for complete details of the derivations and an in-depth understanding of the material.

Resonance absorption is treated in Chap. 7 with 130 references provided at the end of this chapter. This reviewer succeeded in extracting certain parts of Chap. 8 into a second semester course in reactor theory at the undergraduate level, thus introducing the students to problems of resonance absorption in homogeneous and heterogeneous systems.

Finally, in the last two chapters reactor dynamics is treated, Chap. 9 studying the point reactor model and Chap. 10 treating spatial reactor dynamics. This last chapter treats the important problems of xenon oscillations and long-term reactor burnup.

The Appendix provides a discussion of some nonelementary mathematical functions used more or less extensively in the body of the text.

In summary, this book is a useful addition to the worker in reactor theory. The writing style and format is well presented which is typical of previous writings of these authors. The content of the book is extensive although there are numerous places where the development is not as complete as one might desire. Normally adequate references are cited for a more thorough treatment of the subject under discussion.

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PUBLICATIONS COMPILED BY STAFF EDITORS OF IAEA

Publisher Unipub, Inc.

Reviewer Stanley J. Malsky

Directory of Whole-Body Radioactivity Monitors

(1970 Edition: International Atomic Energy Agency, Vienna, 1970)

Pages 900

Price $25.00

This directory should be of interest to health, medical, and nuclear physicists; architects; administrators of whole-body counting facilities; and instrumentation and construction engineers.

The data as reported in this world directory were obtained from persons operating (182) or having advanced (24) plans for the operation of whole-body counters and ancillary systems.

The present directory is to be supplemented with additional information as the need develops for new information or systems.

The directory makes use of floor plans, tables, charts, and lists of and types of equipment in use for each of the establishments presented therein. Data sheet information on individual monitors is broadly defined into the following main sections:

1. general data
2. methods
3. monitoring room specifications
4. detectors and geometry considerations
5. ancillary equipment
6. calibration data
7. shielding and room dimensions
8. heating, cooling, ventilation, etc.

Each of the main categories is subdivided into specifics as related to each laboratory.

Uses of the monitors include human-natural activity studies, human-artificial activity studies, and animal, food, and physical studies.

The detailed and specific information contained in this directory

makes it a valuable addition and reference in the field of whole-body counting. The Committee and contributing investigators to this publication have truly presented a complete compilation of data for others in the field to compare or for those agencies contemplating entry into the field.

Microbiological Specifications and Testing Methods for Irradiated Foods

(Technical Report Series No. 104, Report of a Panel of Experts Organized by the FAO and IAEA in Collaboration with IAMS, International Atomic Energy Agency, Vienna, 1970)

Pages 121

Price $4.00

This monograph should be of interest to biologists, radiation biologists, public health and radiological physicists, microbiologists, food processors, bacteriologists, and food and drug personnel (administrators and staff on Federal, state, and city levels).

This monograph is an effort on the part of a panel of experts from diverse areas of specialization to compare the microbiological methods being used in most countries of the world to consolidate this microbiological information into a limited number of acceptable, reproducible methods that could form a basis for evaluating "(a) the effectiveness of the different levels of radiation processing of foods and feeds; (b) the microbiological quality of the resulting products; (c) the microbiological safety for foods and feed use; and (d) the closeness with which regulations should comply with microbiological requirements." The criteria as listed are related to proposed legislation.

Consideration of the microbiological problems to be anticipated with irradiation relate to the destruction of all organisms with the potential capacity to proliferate within the food and those specific pathogenic organisms, and particular group(s) of spoilage organisms. Considerations were also given to packaging, labeling, storage, and shelf life of irradiated foods.

A second section of this report deals with recommended methods for microbiological analysis of irradiated foods and considers various tests and techniques that might gain international acceptance as related to these irradiated foods. These tests are presented in detail, and formula(s) with considerations and limitations (if any) are noted.

A third section describes culture media, formulas, preparation, and storage abilities of some 69 preparations. In a similar manner the fourth part describes some 18 reagents with accompanying notes, directions, and concentrations.

This technical report is well prepared and should serve those in the field as a ready source of information. For those contemplating entry into the field of irradiated foods it might have been desirable on the part of the Committee to have included, perhaps as an appendix, the various dose levels for the popular foods considered for irradiation and/or sterilization.

A future work that might be considered by the Committee might include formal megarad dosimetry techniques for food irradiation.

Isotope Techniques for Studying Animal Protein Production from Non-Protein Nitrogen

(Technical Report Series No. 111, International Atomic Energy Agency, 1970, Vienna)

Pages 29

Price $2.00

This report should be of interest to veterinarians, argronomists, animal breeding and research agencies, biochemical nutritionists, and radiobiologists.

This brief 23-p. report deals with three main concerns:

1. the role of nonprotein nitrogen (NPN) in the feeding of ruminants
2. the economic feasibility of NPN as a food additive and/or supplement for certain nations
3. the use of isotopes for evaluation of NPN function.

This report is designed to provide a review of the latest information on approved methods to evaluate the feeding value of NPN with particular emphasis on those methods requiring the use of isotopes. Three isotopes were considered as especially useful:

"1.a. ^{15}N for rate of NH_3 production in rumen, b. rate of incorporation of N compounds into microbial protein, c. overall conversion of NPN to tissue or milk protein,

2.a. ^{14}C for rate of hydrolysis of C-containing NPN, b. turnover and entry rate of amino acids, c. estimates of protein synthesis,

3.a. ^{35}S for estimates of microbial protein synthesis, b. estimates of microbial contribution to synthesis of milk, wool, muscle."

Within the framework of this report the main areas of study of NPN use are outlined, with consideration given to world-wide study. This report indicates the need for study and provides those groups or individuals directly involved in this work with the latest conclusions regarding the use of NPN methods and areas for continued study.

Isotopes and Radiation in Parasitology—II

(Proceedings of a Research Coordination Meeting, Vienna, June 1969)

Pages 139

Price $4.00

These proceedings should be of interest to investigators in medical parasitology and veterinary medicine, physiologists, immunologists, radiation biologists, agriculturists, and animal scientists.

Discussed in the 17 papers of this third meeting is the use of radiation (conventional x rays and accelerators) and radioisotopes as it relates to

1. the study of the mechanism of immunity to helminth infections
2. the pathophysiology of helminthiasis with particular reference to anaemias and hypoproteinaemias so characteristic of many of these diseases
3. developments in the study of immunity to protozoal diseases.

The papers vary in length, are generally well documented, and contain suitable tables, illustrations, and