biology and covers all aspects from the interaction of a photon with an atom to the ecological effects of radiation. For undergraduates and laymen, it reveals the broad spectrum of events that occur in all types of organisms from viruses to plants and man, and it notes the useful applications of radiation for society as well as the potentially detrimental effects that have received so much attention in the media. Needless to say, the radiologist and nuclear medicine specialist will find this text too thin on details pertinent to the biological effects arising from the medical uses of radiation. In fact, the limited discussion may juxtapose thoughts in such a way as to lead to misinterpretation. For example, on page 185, two sentences point out that diagnostic radiation exposure to pregnant women should be avoided when possible, and these are followed by: "If an irradiated human embryo or fetus is not aborted, the baby could be abnormal. Figure 10.6 shows a case of severe developmental damage." The unwary reader may conclude falsely that diagnostic radiation always causes gross developmental abnormalities, irrespective of the dose or gestational age. Fortunately, such instances of juxtaposition are few in the book. The reviewer feels that too much space is devoted to very high dose radiation effects, which were much studied in the past but which are now thought to have little biological relevance, e.g., depolymerization of DNA, spindle disorganization, and changes in protoplasmic viscosity. Notwithstanding these criticisms, the authors have admirably surveyed for the intended audience the many and complex phenomena of radiation biology and their impact on society. There is indeed a place for such a book today.

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COMPUTER TECHNIQUES IN RADIATION TRANSPORT AND DOSIMETRY. Walter R. Nelson and Theodore M. Jenkins, Eds. New York, Plenum Press, 1980, 521 pp, $55.00

This book is a compilation of papers presented at the Second Course of the International School of Radiation Damage and Protection held in October 1978, at the Ettore Majorana Center in Erice, Sicily. It contains 28 lectures and three invited student papers dealing with computer applications in the areas of low- and medium-energy neutron and gamma-ray transport, electromagnetic cascade showers, hadronic cascades, unfolding methods, and spectrum analysis. The school was attended by 41 scientists from 14 countries, and its intent was to present background and state-of-the-art information in these areas in a form appropriate to the users and potential users of such programs. In this effort, the resultant book is very successful.

Each section of the book, covering one of the areas mentioned above, has a concise and well-illustrated introductory lecture describing the general theoretical background necessary to that particular specialty. These introductory lectures and the more detailed developments that follow are presented at a level that is readily comprehended by graduate and upper level undergraduate students in the fields of radiation physics, health physics, or medical physics as well as by the program users to which the school was directed. Mathematical background at the level of integro-differential equations and physics background, including the details of radiation interactions and some experience with radiation detectors, is required. In keeping with the user orientation, the programming aspects of this work are minimized except as it pertains to user understanding of the power and limitations of the various codes. The codes are well referenced, however, so that further details are readily accessible.

Applications of a large variety of long-used and recently synthesized codes to radiation dosimetry and shielding needs in medical physics and health physics are amply covered, including discussions of solid, gaseous, and liquid dosimeter design, high-

energy accelerator design, and shielding, electron dosimetry, spectrum unfolding, activation analysis, synchrotron radiation, brewstrablung production, and the general requirements and limitations of computer simulation in these areas. In general, these lectures reflect the strong drift toward the use of Monte Carlo techniques with the continued development and improvement of faster computers with larger memories, but the material on Boltzman transport theory, its discrete ordinate and iterative solutions, as well as a section on approximate solutions based on slowly varying buildup factors are given careful and detailed exposition. The introductory lecture on the transport equation is, in fact, one of the better presentations for teaching that this reviewer has found.

The sections on hadronic cascades will be of special interest to those studying fundamental physics at high energies, medical physicists, and health physicists associated with high-energy accelerators producing fast neutron, pion, and heavy-charged particles, and to those who are interested in cosmic ray showers or reactor shielding, and fusion containment. Here, too, the introductory material is very readable and informative to one whose knowledge in this area is limited or dated, and the material would be useful also as a secondary teaching reference to supplement basic material in high-energy nuclear interactions. Both this section and the section on spectrum unfolding are long on general theoretical approach and short on specific applications, although the more important applications are illustrated and generally well referenced.

Finally, there are three appropriately brief commercials for centralized radiation shielding and computation centers available to users: The ESIS (European Shielding Information Center) in Ispra, Italy, and the RSIC (Radiation Shielding Information Center) and BCTIC (Biomedical Computing Technology Information Center) at Oak Ridge National Laboratories, in the United States.

The editors and individual authors are to be commended for this text, which is clear and to the point, well organized and even in style. The care taken in presenting introductory material and the applications and limitations of existing computer codes for radiation transport and dosimetry calculations from a practical prospective make the book very valuable for teachers, students, users, and potential users.

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RADIONUCLIDE TECHNIQUES IN MEDICINE. Joan M. McAlister, New York, Cambridge, London, Cambridge University Press, 1980, 229 pages, $39.50 hard cover; $10.95, paperback

This book is a balanced presentation of information on the detection and measurement techniques used in nuclear medicine. The author covers in eleven well-organized chapters the principles of imaging, data measurement, radiopharmaceuticals, radiation biology, and computer technology.

In the first portion of the book, the basics of nuclear medicine are discussed, covering the properties of radionuclides and the principles of radiation detection and counting. The chapter on radiopharmaceuticals describes radionuclide production, general preparation methods, and tracer techniques. Quality control measures and the importance of purity factors in the isotopically labeled compounds that affect radionuclide distribution are discussed.

The instrumentation chapter is very thorough, covering all current imaging instruments. The author describes the features and complexity of each instrument in detail and with clear explanations. The concepts that determine the importance of performing metabolic studies with a positron camera and the study

of physiologic tomography with emission tomographic scanners (single photon and annihilation coincidence detectors) are discussed thoroughly. Complementing this section are quality images and detailed illustrations. A more extensive description for the application of nuclear magnetic resonance to clinical medicine would be appropriate. The section on data processing deals with a general description of hardware and software components. The author describes a variety of processing techniques, which can be utilized in the areas of nuclear medicine/nuclear cardiology. In the final chapter a discussion of radiation dosimetry, including dosimetric formulae and safety regulations governing the handling of radioactive sources in use and in disposal is presented.

The book contains extensive references in some chapters. Nuclear medicine personnel will find the text enlightening; however, owing to the level of technicality, some areas are best directed toward those with extensive technical backgrounds. This informative book succeeds in providing a comprehensive reference for an understanding of nuclear medicine.

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BOOKS RECEIVED

Computer in Ultrasonic Diagnostics. P.N.T. Wells, John P. Woodcock, Research Studies Press (P.O. Box 92 Forest Grove, Oregon 97116), 1980, 94pp, illustrated, $27.50

Acoustic Instrumentation and Characterisation of Lung Tissue. Theodore L. Rhyne, Research Studies Press (P.O. Box 92 Forest Grove, Oregon 97116), 1980, 109pp, illustrated, $27.50

Physical Techniques in Medicine. Vol 2., J.T. McMullan, Ed. Chichester, New York, Brisbane, Toronto, John Wiley & Sons, 1980, 158pp, illustrated, $45.00

*Nuclear Medicine: Hepatolienal.*Benjamin Rothfeld, Ed. Philadelphia, Toronto, J.B. Lippincott, 1980, 255pp, illustrated, $45.00

Radiation-Drug Interactions in the Treatment of Cancer. Gerald H. Sokol, Roger P. Maickel, Eds. New York, Chichester, Brisbane, Toronto, John Wiley & Sons, 1980, 235pp, illustrated, $30.00

Two-Dimensional Echocardiography. Joseph A. Kisslo, Ed. New York, Edinburgh, London, Churchill Livingstone, 1980, 201pp, illustrated, $20.50

Abdominal Ultrasound in the Cancer Patient. Donn J. Brascho, Thomas H. Shawker, New York, Chichester, Brisbane, Toronto, John Wiley & Sons, 1980, 414pp, illustrated, $39.50

ABSTRACT BOOKS

Due to the popularity of the 1980 *Abstract Book* the 1981 *Abstract Book*, including all abstracts accepted for the 28th Annual Meeting of the Society, will be available for $4.00 in advance and $5.00 at the Meeting June 16–19, 1981 in Las Vegas, NV. Advance copies may be ordered on the Meeting Registration form.

The 1980 *Abstract Book* from the 27th Annual Meeting of the Society of Nuclear Medicine is available at $4.00 per copy from the Book Order Department of the Society.