

BOOK REVIEWS

PEDIATRIC NUCLEAR MEDICINE (SERIES—CURRENT PRACTICE IN NUCLEAR MEDICINE). J. R. Sty, R. J. Starshak, J. H. Miller, Eds. Norwalk, Connecticut, Appleton-Century-Crofts, 1982, 209 pp, \$42.50

The comprehensive manner in which the authors review the pediatric applications of radionuclide imaging makes this book useful both as a teaching text and a reference. Organized in the standard format by organ system, each section presents a technical discussion and review of common pediatric pathology, but with sufficient mention of differential subtleties and uncommon disorders to hold the interest of the experienced imager. Two outstanding features of the material are the thorough bibliography that supports each discussion and the ample number of figures that illustrate the text. The figures are of high quality, showing that such images can be obtained in pediatric patients when proper care and techniques are used. The material is up-to-date with a thorough discussion of newer applications, such as hepatobiliary imaging and cardiac function studies.

While some discussion of alternative imaging modalities appears throughout the book, and radiographs, sonograms, and TCT scans are presented to complement radionuclide images, the text does not deal at length with the question of integrating multiple modalities. The text is honest, however, in that the limitations of radionuclide studies are pointed out.

There is material in this book for people involved at all levels of pediatric nuclear medicine. The trainee will find discussions of techniques and an overview of pediatric disorders; the experienced nuclear physician will find that reference that he or she vaguely recollects, but can't quite recall exactly. This comprehensiveness is a measure of the care taken in the text's preparation.

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PROGRESS IN RADIOPHARMACOLOGY 3 (SERIES: DEVELOPMENTS IN NUCLEAR MEDICINE 2). P.H. Cox, Ed. The Hague, The Netherlands, Martinus Nijhoff Publishers, 1982, 285 pp, \$44.00

The symposium proceedings deal with only three areas of interest to nuclear medicine physicians and scientists—namely, those dealing with the kidney, endocrinology, and the brain. Though the editor notes in the introduction that the symposium proceedings published in this book present the "state of the art in a European setting," the coverage of the topics at the symposium is selective and limited in scope. In addition, with the exception of one or two, the articles presented lack detail and depth. Even those persons involved in the specific areas of nuclear medicine covered in the publication will perhaps find the articles of only marginal interest in view of the lack of extensive coverage of the topics.

The high cost of the publication is another deterrent for personal ownership of the book. It could be recommended, however, for stocking the departmental library.

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THE PHYSICAL PRINCIPLES OF COMPUTED TOMOGRAPHY. W. R. Hendee. Boston, Massachusetts, Little, Brown and Company, 1983, 192 pp, \$32.50

Writing a nonmathematical treatment of a subject as complex and extensive as transmission computerized tomography (TCT) is no trivial task, yet Dr. Hendee has accepted the challenge and succeeded admirably. The book is divided into 16 chapters, one dealing with the history of x-ray computerized tomography, 11 dealing with various aspects of x-ray CT, and one each covering the subjects of TCT in radiotherapy treatment planning, emission CT, CT in ultrasound, and nuclear magnetic resonance imaging. The chapter on the history of x-ray CT is particularly interesting, not only for the neophyte, but also for those who have worked in the field over the past decade. Although some will no doubt quibble with credits in this section, it is interesting and engaging to follow the unfolding of ideas that effected faster and more versatile imaging machinery.

As outlined in the preface, this book is written as an introductory text for physicians using the technique, for physicists and engineers responsible for proper operation of the equipment, and for technologists working in the clinic. To this list I would add lay persons who have an understanding of basic physics and a curiosity to learn more about TCT imaging techniques. The text is written in a didactic manner, paragraphs are clear and concise in communicating their ideas, and emphasis is on establishing a succinct and direct interface with the reader. The audience the author addresses should have no difficulty in following the presentations.

While the book has few flaws in fulfilling its mission, some should be mentioned. The coverage of material is heavily weighted toward transmission CT. Although this may be justified, readers with primary interests in emission CT, ultrasound CT, or NMR may be disappointed. In addition, the layout of the book (half-page vertical text) encourages the use of illustrations. Indeed many are used, but several principles could have been better conveyed with different or improved illustrations. These include back projection reconstruction, NMR image formation, and the angular sampling problem in reconstruction from projections. Illustrations are often used to communicate these fundamental concepts, but they are sometimes not the best ones for the purpose at hand. Some chapters are sparsely referenced; however, it is fair to say that interested readers will be sufficiently thrust into the stream of appropriate literature by the references that are presented. A brief, annotated bibliography would be a welcome addition to this text. This reviewer would prefer to see the term, "longitudinal" tomography replaced by "limited-angle" tomography, a semantic difference that seems to clarify the physical characteristics of many so-called "longitudinal" tomographic systems. The problem of paucity of angular sampling in these systems is not really emphasized in the explanation, and this may leave fuzzy concepts in the minds of readers unfamiliar with the subject. On page 72 the normalized, percent version of the definition of full width at half maximum is used in a description of spatial resolution. This formula no doubt was meant to appear in the section on energy resolution, and escaped notice in editing. Finally, while advances in this rapidly changing field are discussed, some are covered in more detail than others, e.g., dual kVp work receives little more than a

paragraph.

For physicians who wish a clear, succinct, nonmathematical explanation of the principles of computed tomography, I recommend this book. It would be valuable for training technologists, and engineers and physicists will find it useful as an introduction to the subject matter, although their background and interest will likely carry them beyond the level of the material presented. Because of the clarity of the writing style and the well-organized presentation of ideas, the book may also be of interest to scientists and lay persons working outside the radiological sciences.

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ATLAS OF TOPOGRAPHICAL ANATOMY OF THE BRAIN AND SURROUNDING STRUCTURES FOR NEUROSURGEONS, NEURORADIOLOGISTS, AND NEUROPATHOLOGISTS. W. Seeger. Vienna, Springer-Verlag, 1978, 544 pp, \$164.00

This book represents a prodigious amount of work on the part of the author. Remarkably, not only did he write the text, but also drew the illustrations. In the atlas, he has integrated basic neuroanatomy, radiology, and microsurgical techniques. This approach is applied, in consecutive chapters, to the following areas of the brain: frontal lobe and upper brainstem, temporal lobe and upper brainstem, parietal lobe, occipital region and lamina quadrigemina, supratentorial structures near the ventricles, and cerebellum and lower brainstem.

The illustrations are high density, pen and ink, line drawings. Much of this artistic endeavor is of superb quality. Some of the more complex drawings, however, attempt to incorporate more detail than is easily possible with this particular technique, resulting in a loss of clarity. The book is so encyclopedic and detailed that it must be studied and digested in small pieces. It represents a valuable reference text that should be considered for every neurosurgery department library.

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REEVALUATION OF DOSIMETRIC FACTORS: HIROSHIMA AND NAGASAKI. V. P. Bond, J. W. Thiessen, Eds. DOE Symposium Series 55, CONF-810928, Washington, D.C., Technical Information Center, Department of Energy, 1982, 306 pp, \$15.75

This 300-page paperback is an intriguing synopsis of 30 yr of effort directed toward a dosimetric reconstruction of the events immediately following the bombing of Hiroshima and Nagasaki in 1945. This report is from the DOE symposium held in Germantown, Maryland, in September of 1981 and published in October of 1982. The purposes of the symposium were to (1) determine the current status of research efforts, and (2) assess the levels and directions of research efforts in the immediate future. The major concern of the group is to provide dosimetric support for the Radiation Effects Research Foundation (RERF) of Hiroshima and Nagasaki. Research in this area has been in a state of turmoil in the last few years because of the series of recalculations of the neutron and gamma dose rates at ground level in the two cities. In particular, new transport code calculations of the attenuation in the rather severely disturbed air around the explosion, and Monte Carlo calculations of the effects within the two very different devices have led to a reduction in the estimated neutron dose in the low-dose regions. This has brought all of the predictions about both neutron- and gamma-induced effects (e.g. leukemia, chromosomal aberrations, solid tumors, etc.) to an impasse while the dosimetry

question is settled, which may take several years. In the meantime, such questions as the RBE of low dose rate neutrons are left without much supportive data. One pressing issue, for example, is how to include body and structure shielding effects.

As with most symposia, the best part of the published proceedings comes in the discussion sessions. This is particularly true in this instance since most of the material presented in the formal presentations has appeared in *Science* or *Nuclear Engineering* over the past several years. There is also some good discussion of the principles of radiation biology and microdosimetry, but no conclusions are reached.

There are several legal and ethical questions raised, which stimulate the reader's mind beyond the confines of physics and dosimetry. For example, the reassessment of dose may greatly affect the government expenditures to survivors, which are based on those doses. In another discussion, it was mentioned that one 12 Kton explosion in the atmosphere, under the proper conditions, would answer a lot of the dosimetry questions at a fraction of the cost of ongoing studies. It was also mentioned that many of the parts (presumably spare parts) of the original "little boy" and "fat boy" bombs still exist.

I recommend this book on the basis of its discussion sessions and as a review for those who are not intimately involved in this work.

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RADIATION: WAVES AND PARTICLES/BENEFITS AND RISKS. L. Pringle. Hillside, New Jersey, Enslow Publishers, 1983, 62 pp, \$8.95

This is a nontechnical book about radiation directed toward a nonscientific audience. Its author is a wildlife biologist who, according to remarks on the dust jacket, has written "many outstanding science books for children," and, indeed, the level and style of the book seem to be about right for high school students.

The book comprises some 60 pages, divided into five chapters, plus a glossary of terms, an index, and recommendations for further reading. The five chapters are: "The Range of Radiation," discussing the nature of radiation and the place of x-rays in the electromagnetic spectrum; "It's Only Natural," describing environmental sources of ionizing radiation; "X-rays," describing different uses of x-rays, including TCT scanning, and containing representative examples of TCT scans and other x-ray images; "Radioactivity," discussing various sources of nuclear radiation, including nuclear power, nuclear weapons, and two pages on nuclear medicine imaging and therapy; and, finally, "Low Level Risks," discussing the various risks of radiation exposure with emphasis on cancer, genetic mutation, and teratogenic effects. Sources of risk-data, such as the Japanese A-bomb survivors, are mentioned, but the presentation generally is nonquantitative, with attention focussed on cataloging and describing risks and effects, rather than on quantitative discussion of the actual magnitudes or risks.

A book on radiation and its effects, directed toward a younger audience, could be a useful addition to school libraries, waiting rooms in doctors' offices, and perhaps even some home libraries. Because of the style and intended audience and because I thought the topic would be an interesting one, I decided as a first experiment to ask my teenage daughter to read the book and give her impressions of it. Alas, the experiment was unsuccessful, because she could not complete more than two pages at a sitting without dozing off, or recalling a more urgent priority, such as "fixing her hair." This, I fear, reflects more on the subject matter of the book than on its literary style, and, for the moment, I am resigned to the