BOOK REVIEWS


This book, which considers the question of handling radioactivity from many angles, is written by a chemist for bench chemists in the nuclear industry. The first chapter is a discussion of the nuclear literature with citations that includes the names and addresses of the major sources. The second chapter treats radiation protection in a factual manner, but unfortunately, with little material concerning the burning issues of low level radiation. The relevant portions of ICRU and ICRP publications, 10 CFR sections, etc. are cited so that the reader can pursue his or her interests. In the next four chapters the chemist’s point of view is very evident. Dr. Stewart’s practical experience is presented in a long chapter on radioisotope laboratory design, which covers all topics necessary for the planning of a facility to treat and isolate quantities of radioactive materials. The following chapter deals with shielding as one of the considerations that allow the quantities of activity to be raised yet further.

This is a radiochemist’s book, not a radiopharmacist’s, so no concern for biological purity or any discussion of laminar flow hoods, etc. are included. Monitoring and decontamination equipment and certain general kinds of equipment, such as balances, adapted for use in the special environment, are merely touched upon. There is a chapter on the radiation effects on materials that are used in the laboratory and in full-scale operations. A chapter on criticality makes plain the author’s interest and expertise in this area. Transportation and waste disposal are handled less thoroughly at the end of the book. The book is written from the United States point of view with most reference to U.S. law and practice. The most recent references cited are from 1979; the old references cited come from a very important era in radiochemistry.

The book contains many helpful hints to practitioners. I would recommend it to radiochemists, especially those who are working with large quantities of radioactivity and those who are planning a new facility. I would hope that someone as knowledgeable and practical as Dr. Stewart, with over 30 years of experience, might find the opportunity to write such a practical book as this applicable to nuclear medicine.

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During the past 10 years bone scanning has become an important diagnostic tool for the evaluation of numerous diseases that involve bone. Although detection of bony metastases is the most frequent application, scintillation bone imaging is useful in the evaluation of many other disorders. Moreover, unsuspected abnormalities in bone or soft tissue may be revealed although the study was performed for a different purpose. The nuclear medicine physician must be aware of these abnormalities and their scintigraphic presentation in order to render appropriate interpretations. Doctor Sy and his co-authors have directed these two volumes toward classifying and describing these disorders and demonstrating the appearance of the accompanying bone abnormalities on scans, scintiphotos, and radiographs. They are to be commended for their efforts because the book provides an opportunity to review the changes produced in bone scans by disorders encountered both frequently and infrequently, which have not been brought together before in such depth.

The readers of this book would want to know what nonmalignant diseases have characteristic bone imaging patterns, to understand the pathophysiology of the abnormal accumulation of bone-seeking radionuclide, and to view numerous illustrations demonstrating the abnormalities. The authors have met these needs and have included a comprehensive list of disorders with individual chapters devoted to Paget’s disease; osteomyelitis; benign bone tumors; osteoporosis; osteomalacia; extraskeletal manifestations; and the effects of endocrine, hematologic, and renal disease. Chapter 2 of Volume I presents an interesting and concise review of the development of bone-seeking radiotracers with emphasis on the technetium-labeled stannous phosphate complexes currently in use. The chapters, “Trauma and Other Orthopedics Related Conditions,” “Joints and Joint Diseases,” and the 86-page chapter with atlas devoted to presentation of various diseases in the hand, knee, and foot, are particularly helpful. Each chapter is accompanied by an extensive list of references.

If each entry had been limited to pathophysiology and presentation on scintiphotos and radiographs, it would have resulted in a slim, one-volume text, satisfactory for many readers. Instead, Dr. Sy chose to include considerable additional information about each disease entity, adding greatly to the length of each chapter. The etiology, pathophysiology, and clinical manifestations of each disorder are discussed at length, accompanied by descriptions of the laboratory and radiologic features, as well as the presentation on radionuclide bone scans. This background material serves as a review that will interest some readers, but others will find some of the additional material irrelevant from the standpoint of imaging. For example, two pages are devoted to the statistics and methods of performance of hemodialysis at the author’s hospital and a listing of the symptoms and physical signs of chronic renal failure. The table of contents at the beginning of each chapter also adds to the number of pages but serves no real purpose.

The text is fairly clear on most points but some sentences will leave the reader bewildered as to meaning; for example, “In the absence of disease, despite their contiguous but differently oriented dynamic physiology (which, by the way, is governed by many variables existing within the internal milieu), equilibrium between the systems prevail.” Occasionally the background material is factually wrong: the defect in sickle cell disease is attributed to a specific amino acid substitution of the beta polypeptide chain of the gene whereas the amino acid substitution described is actually in the beta polypeptide chain of hemoglobin; Treponema pallidum is classified as a nonbacterial cause of osteomyelitis. One also finds peculiar terminology, such as the use of “gamma bone lesions” and “photon accumulation” to refer to bony abnormalities that take up gamma-emitting radiopharmaceuticals and “nonoutline” to indicate nonvisualization of a bone that has not ossified.

Many of the illustrations show whole-body images performed on rectilinear scanners. Although these images tend to reproduce harshly, the significant abnormalities are apparent. Spot views were obtained with gamma cameras, and their greater resolution is more satisfying. Numerous radiographs are included for comparison with scans, but a number of them are “burned in” and show little detail. The authors made little use of laterality markers or arrows to indicate the specific abnormalities. Usually the reader can identify the abnormality by reasoning and referring back to the text, but some of the illustrations defy such analysis. The illustration layout and method of reference is annoying. For ex-
ample, in Volume I, Chapter 1, Figure 10 shows age-related differences in bone scans and is extended to over six pages, but the entire legend is on the first page. As I looked through several pages of illustrations, I found it annoying to have to refer back to the first page for identification of each image. In some such illustrations, images from different patients or different diseases are combined, which may confuse rather than help the reader.

This book is comprehensive and presents many interesting images, but I question whether the material really warranted two volumes. I believe it could have been improved and reduced to one volume by prudent editing of text and more economical layout of illustrations. Because of the content, these volumes will be of primary interest to resident physicians in nuclear medicine and radiology. I anticipate, however, that many potential readers will hesitate to purchase these volumes because the cost seems disproportionate to the content.

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Since the introduction of x-ray transmission computed tomography (TCT), a number of tomographic atlases particularly on the head, have been published. The purpose of this tomographic atlas by Salamon and Huang was to provide detailed serial images in multidirectional planes—sagittal, frontal, and horizontal. Such detailed anatomy is of prime importance when images in various planes are reconstructed from axial data. All of the sections were made 1 cm thick except for the midline sagittal section, which was 2 cm. The general format of the presentation is to show the location of the section by means of a diagrammatic drawing, the transmission computerized image, an anatomical section through the same plane, a radiograph of the anatomical section, and a TCT of an isolated formalin fixed brain in the same plane.

In the first chapter five sagittal and parasagittal sections are demonstrated showing the correlation between TCT, the anatomical specimen, and a radiograph of the specimen. The roentgenograms of the anatomical specimen provides a better understanding of the computerized images and the TCT images of the isolated brain complete the correlation. The structures in the latter images are fully labeled, as are the anatomical sections, providing the detailed information so important for interpretation of tomographic studies. The second chapter covers frontal sections perpendicular to and at 60° to the orbitomeatal line; the third chapter covers horizontal sections of the head parallel to and at 15° flexion to the orbitomeatal line. The frontal and horizontal images are again presented with the same format, however, many of the TCT horizontal sections are shown with and without intravenous iodoside injection and cisternal metrazamide.

The only criticism of the atlas is that the TCT images were not obtained with the latest equipment, but in view of the rapid advances in instrumentation and the lag time involved when publishing such a work, this deficiency is inevitable. Salamon and his colleagues again have produced an excellent atlas with meticulous attention to detail, so appreciated by clinicians involved in tomography and by anatomists. This text is a highly desirable addition to the libraries of those requiring such information, particularly in light of the rapid developments in imaging by the newer modality; nuclear magnetic resonance.

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This is the second edition of the Continuing Education Review in Nuclear Medicine Technology by Eva Dubovsky and her co-workers. The first edition, published in 1976, had fewer questions (416) and was in need of revision because of significant changes in emphasis, as well as in techniques that have occurred during the past 5 years. The changes in the second edition have been extensive, and this book clearly replaces the earlier version. Only four pages were devoted to cardiovascular nuclear medicine in 1976, whereas the present edition includes a 20-page section by Joseph Logic. This is a self-study book with a question and answer format. The arrangement of answers immediately after each question will please some readers and disturb others. The questions are chiefly essay in type and the 468 questions are neatly indexed for reference.

There has been an explosive growth in the biological sciences with much of the information too fragmentary or inconclusive for retention in our memory banks. This is especially true of nuclear science, and we are in need of a review of the factual data. The contents of this book are quite inclusive; basic physics, instrumentation, radiation biology, radiopharmaceuticals, imaging, and in vitro procedures are all covered. One would learn a great deal in a methodical review program that dealt with even a few of these 20 sections. The last section describes computers and ultrasound and the material is well presented.

I needed help in reviewing this book and asked several technologists for their evaluation. The response was clearly positive; yet it is difficult to define the individual for whom the text is best suited. Perhaps this is why there is no preface to introduce the book to specific readers. There is more theoretical material here than is needed by the average nuclear medicine technician. It serves a useful purpose to all who need a review and more especially to those physicians in training or in practice who plan to take specialty board examinations involving nuclear medicine technology.

We may find many faults with registration and certification examinations, but they remain a fact of life. In the field of nuclear medicine there are an abundance of books and journals but few as good as this one dedicated to a systematic and questioning review.

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Fourteen years ago when I began radiology training, my chief resident advised me that while Paul and Juhl provided a good, fairly concise, accurate overview of diagnostic roentgenology, far more complete discussions of each area were readily available in the subspecialty “classics”—Felson for chest, Edeiken for bone, Emmet for uroradiology, etc. Despite a vigorous attempt by Dr. Juhl to update and enlarge Essentials of Roentgen Interpretation, the words of my former chief resident remain true today.

Unfortunately, while a general roentgenology text was highly useful in the 1960s, the value of such a text has sharply declined in recent years. The rise of radionuclide imaging, ultrasound, and transmission computed tomography severely weakens any textbook that limits itself strictly to roentgenology. Although Dr. Juhl's update occasionally refers to other imaging modalities, one has the feeling that the references were inserted at strategic points in already completed chapters, almost as an afterthought, without any firm attempt to really integrate the new modalities into the volume. These brief insertions primarily concern ultrasound, and