

NUCLEAR MEDICINE AND ULTRASOUND. Leonard M. Freeman and M. Donald Blaufox. New York, Grune & Stratton, 1976. 169 pp, \$13.50.

This short book (which is a reprint from the October 1975 *Seminars in Nuclear Medicine*) provides an excellent and up-to-date review of those studies in which both ultrasound and nuclear medicine are of diagnostic value. Systematic consideration of all organ systems in which there is any application of both ultrasound and nuclear medicine is presented, with one exception, that is the combined use of ultrasound and radiogallium in the diagnosis of abdominal abscesses. In our laboratory we have found that in the appropriate clinical setting, questionable masses can often be resolved by both gallium scanning and ultrasonic scanning of the abdomen where there is convergence of both examinations.

The introductory chapter to the use of diagnostic ultrasound is short and concise but gives an adequate review of the physics of the various modalities in ultrasound. Each of the remaining chapters that discuss the combined use of ultrasound and nuclear medicine in the evaluation of the thyroid, liver and biliary tract, pancreas, kidney, and cardiovascular system are excellent in their systematic attention to the technical aspects, interpretation, and in the interrelation of the diagnostic modalities in evaluating a particular problem.

The chapter on radionuclide and ultrasonic evaluation of the placenta gives a well-documented and comprehensive review of placental localization using radionuclides. In light of improved technology in gray scale ultrasound and real-time techniques, however, placental localization by radionuclides has little to offer in the modern practice of obstetrics.

Recent technologic improvements in gray scale ultrasound that result in less dependence upon technician expertise, make the addition of ultrasound to the nuclear medicine laboratory desirable and should improve diagnostic accuracy. This book should be very useful as a handy reference to anyone who has or plans to be involved with ultrasound or nuclear medicine.

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THE BASIC PHYSICS OF RADIATION THERAPY, 2nd ed. J. Selman. Springfield, Ill., C. C. Thomas, 1976. 715 pp, \$25.75.

The *Basic Physics of Radiation Therapy, 2nd ed.*, follows the first edition by 13 years, and has been updated to include the physics of megavoltage radiotherapy and the introduction of ultrahigh energy therapy, including high LET radiation. Quoting from the author, "The purpose of this book is to explain the fundamental physical principles underlying radiation therapy in as comprehensive and comprehensible a manner as possible, without sacrificing accuracy for simplicity." Dr. Selman accomplished his purpose by understandably placing emphasis in the following areas:

simple mathematics in radiation therapy, basic physical concepts, radiation quality, radiation exposure and dosage, therapy planning, newer modalities in radiotherapy, and radioactivity and radionuclide therapy.

Two of the introductory chapters on radiation physics cover the nature of radiation and the interactions between radiation and matter. A detailed discussion of the origins and properties of x-ray and gamma rays follows a simplified introduction to electromagnetic radiation and quantum theory. The areas discussed are the major attenuation interactions of photons with matter, classical scattering, photoelectric effect, Compton scattering, and pair production, and the dependence of these interactions on energy requirements and absorbing media. Also included are the properties, energy requirements, and interactions with absorbing media of particulate radiations.

The author has presented an excellent review of radiation exposure measurement and dosage calculations necessary for treatment planning. Information is given on chamber requirements and applicable correction factors necessary for ionization measurement and subsequent calibration of conventional megavoltage therapy units. The concepts of scatter, given dose, tumor dose, percentage depth dose, tissue-to-air ratio, and isodose curves are presented as functions of the therapy parameters: beam quality, treatment distance, tumor depth, and treatment area. A chapter on treatment planning provides information on tumor localization and verification and examples of single, parallel-opposed wedge, and multi-field techniques in therapy for kilovoltage x-ray, Co-60, betatron, and linac units.

The chapter entitled "Radioactivity and Nuclear Physics" presents an outstanding discussion on the topics of nuclear stability, types of radioactive decay, radioactive decay processes, equilibrium, and the nuclear activation of atoms. The uses of radionuclides in implant therapy are also presented with emphasis on radium and radon. The therapy planning guidelines and rules of the Quimby method and the Patterson-Parker method are discussed, and appropriate tables for each are included in the text material. Mention of the use of radionuclides in both diagnostic and therapeutic procedure in nuclear medicine is included; however, the major emphasis is placed on radionuclide absorbed dose calculations and counting instrumentation.

The text also includes chapters devoted to radiobiology and health physics. Of particular merit in the radiobiology section is the information on time-dose relationships and tissue recovery and their applications to radiotherapy, and the time-dose concept proposed by Frank Ellis. A separate chapter covers common acceptable health physics practices with particular emphasis on shielding requirements and shielding calculations necessary in a megavoltage therapy department.

This new edition of *Basic Physics of Radiation Therapy* is highly recommended as a general reference text in radiation physics and refresher guide for both practicing radiotherapists and medical physicists in a radiation therapy

program. It could serve as a basis of study for the physics sections on national board examinations.

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COMPUTED BRAIN AND ORBITAL TOMOGRAPHY, TECHNIQUE AND INTERPRETATION. C. F. Gonzalez, C. B. Grossman, and E. Palacios. New York, Wiley, 1976. 276 pp, \$29.00.

In the burgeoning field of computerized tomography (CT) so much explicit anatomic data are generated that an author is faced with a formidable task in choosing which of his many fascinating pictures to include. This volume is an up-to-date compilation that contains approximately 525 individual photographs and 23 illustrations. Gross pathologic correlation and neuroradiologic correlates are abundantly provided.

There are high points and low points in this volume. It is first of all a practical, informative atlas that will appeal to most clinicians. The scans are excellent; only a few are in the 80×80 matrix format; the rest are 160×160 matrices. The printing quality is similarly excellent and of particular value with the air studies and angiograms. Almost all of the latter are subtracted.

The pages are large and well organized. After a very brief description of the technique, there is an extremely good section on normal anatomy and a relatively complete collection of common artifacts. Numerous case reports follow with appropriate ancillary plain films and contrast studies. The clinical histories are vanishingly brief whereas the radiologic interpretations are thorough and of the highest caliber. Fortunately, the scans are in the logical right-is-right orientation as though one were looking down from above the patient at a section of a gross neuropathologic specimen.

This book is not intended to be a scholarly treatise; only 35 scientific articles are referenced. It is puzzling that even such a brief bibliography would not include G. Hounsfield's 1972 *British Journal of Radiology* paper describing the first EMI scanner; particularly since part II of this article (by J. Ambrose) is cited. The book would be more useful if it had a glossary of CT terms in addition to the list of anatomic abbreviations which is not properly a glossary as stated by the authors.

The reluctance of many American authors to accept the term "computerized tomography" remains unexplained. This term, favored by the British, properly emphasizes the dominant role of the computer in this method. Other terms such as "computed tomography" or "computer-assisted tomography" suggest that this procedure is simply a modification of traditional radiographic tomography and, by implication, diminish the crucial and revolutionary impact of the introduction of the computer. Hopefully, the British will, in this instance, prevail over the Colonists.

This fine collection of well-organized, diverse clinical material should be most effective in convincing those few remaining skeptical physicians of the clinical usefulness of CT.

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RADIOISOTOPES IN RADIODIAGNOSIS. A. S. Bligh, K. G. Leach, and E. R. Davies. London, Butterworths, 1976. 230 pp, \$10.00.

The authors state in the preface that the aim of this concise book is to provide an introduction to the use of radioisotopes in radiodiagnosis for clinicians and for those burdened with the task of passing examinations. After a brief history of isotopic imaging, the authors devote three chapters to the fundamental concepts of radioactivity, a relatively brief discussion of radiopharmaceuticals, a more extensive review of instrumentation for isotopic imaging, and an introduction to the principles of radiation protection in radioisotopic investigations. The remaining ten chapters are directed toward a survey of the clinical use of radioisotopes in radiodiagnosis with greater emphasis on imaging application than on functional tests. The central nervous system, liver and spleen, skeleton, respiratory system, kidneys, and endocrine glands are discussed in reasonably adequate detail. Radioisotopic studies of the gastrointestinal tract, placenta, and cardiovascular systems are presented in lesser detail. Recent developments in scanning techniques (bone densitometry, profile scanning, transmission imaging) and new scanning agents (radiogallium and radioindium) are identified and very briefly discussed.

The strength of this book lies in the discussions of clinical applications. The authors emphasize essential facts, defining indications, and limitations of each technique, often reflecting their personal experience and insight in this developing field. The need to correlate radioisotopic studies with radiographic examinations and the complementary nature of radioisotopic studies, radiologic procedures, and ultrasound are stated. Representative illustrations of the various imaging procedures are well reproduced and complement the text. A notable and serious shortcoming in this review book is the absence of references.

This brief review text includes a substantial number of well-established facts and basic principles. It should provide an introduction to nuclear medicine for the general physician and serve as a general review for the radiology or medical resident in training. It can also be recommended as a concise practical overview of the clinical applications of nuclear medicine for medical students and for nuclear medicine and radiology technologists.

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MEDICAL THERMOGRAPHY, THEORY AND CLINICAL APPLICATIONS. Edited by S. Uematsu. Los Angeles, Brentwood, 1976. 196 pp, \$37.50.

This text, organized into 17 chapters, reports the proceedings of a thermography seminar held in June 1975 at the Johns Hopkins Hospital, Baltimore, Maryland. The early history of thermography is reviewed by R. Bowling Barnes, Ph.D., who was largely responsible for the development of medically useful thermography. The next three chapters deal with the basic physics and technique followed by 13 clinical chapters covering diverse topics from the effect of chronic pain, trauma, and loss of sensation to arterial and venous disease and breast disease. In most of the chapters, a spectrum of clinical cases is presented, illustrating the usefulness of thermography in specific circumstances. Unfortunately, as often has been the case in reports of thermography, the over-all efficacy of the techniques is not evaluated in some chapters. The classification of thermographic patterns in cardiovascular disease, presented by Travis Winsor and David Winsor is particularly useful.