

BOOK REVIEWS

CARDIOVASCULAR NUCLEAR MEDICINE, CURRENT METHODOLOGY AND PRACTICE. Leonard Freeman and M. Donald Blaufox, Eds. New York, Grune & Stratton, 1980, pp 29, \$37.50

This book represents another in a series of reprints from the quarterly journal *Seminars in Nuclear Medicine*. For those who subscribe to that journal, this volume would consequently be redundant. For those who do not and who have an interest in cardiologic diagnosis, however, especially cardiopulmonary internists and surgeons, this volume is recommended as one of the best current collections of papers on nuclear cardiology.

The book begins with a comprehensive overview of nuclear cardiology by R. N. Pierson and colleagues who give an intelligent review of special problems to be solved. Two subsequent chapters on radiopharmaceuticals by L. R. Chervu and instrumentation by S. L. Bacharach, et al. provide a good technical foundation for the extensive clinical material that follows. There are good general discussions of the techniques and clinical indications for first-pass and gated-blood pool imaging, thallium perfusion, and Tc-99m pyrophosphate myocardial scans. In addition, there are excellent discussions of less commonly performed tracer studies, such as cardiovascular shunt detection and myocardial blood flow studies using particulate and diffusible tracers. The authors have been carefully chosen both for their authority and their ability to communicate.

There is one particular fault with this volume that stems from multiple authorship in a narrow segment of nuclear medicine, redundancy. Even in the seminars, one wishes that the editors used sharper scissors to extirpate much background information many authors include for completeness but have been already amply developed by other contributors. It is even more noticeable in these composite works. Nevertheless, the information that lies beyond is worth seeking.

JOHN C. HARBERT

Georgetown University Hospital
Washington, D. C.

REAL-TIME ULTRASOUND IN OBSTETRICS. M. J. Bennett and S. Campbell. Oxford, New York, Blackwell Scientific Publications, 1980, pp 147, \$42.50

The inevitable chapter on physics, instrumentation, and artifacts is written by a physicist, R. J. Blackwell, who is an experienced teacher, and who presents a simplified and copiously illustrated chapter that is easy to read and to comprehend. The "Chinese hat" (spurious echoes due to grating lobes) and the "zoo effect" (bars due to the time baselines), add some colorful new nomenclature for North American readers. I am not as positive as the author that Rayleigh scattering is of any consequence in generating a B-scan. The chapter is well worth reading, and my major criticisms would be the absence of any discussion on TGC and the poor quality of the illustrations, even allowing for the fact that they come from real-time instruments.

Chapter 2 reviews the clinical potential of real-time ultrasound and gives invaluable advice to the would-be purchaser of real-time devices. It is refreshing to find an experienced obstetrician-ultrasonologist who appreciates the value of mechanical, rotating scanners in addition to the ubiquitous linear arrays with their poor

resolution. The authors advocate routine screening in pregnancy, once at 16-18 wk, and again at 32 wk. Many obstetricians in this country would feel that the cost-efficacy of this program is unproven.

In chapter 3, Drs. Adam and Robinson from Glasgow evaluate real-time scanning in the first trimester of pregnancy. Chapters 3 and 4 provide some of the best scans, which were obtained from a rotating mechanical scanner. Of course, varying equipment alters the point of the text, and I would feel that fetal life can be visualized on a real-time scanner before 10 wk: without linear arrays we would be very concerned about the absence of fetal heart activity at 7 wk. The authors advocate crown-rump estimation on patients with an empty bladder attending an antenatal clinic and have found excellent correlation between this estimation and the conventional technique. One major omission from this chapter is the absence of any discussion of the diagnosis or exclusion of ectopic pregnancy.

Dr. Bennett reviews the use of real-time ultrasound in the second and third trimesters, and covers the diagnosis of pregnancy and gestational age, multiple gestation, fetal viability, and placental localization. Some of the problems of the first trimester are inexplicably repeated in this chapter. It ends with the ultrasonic evaluation of fetal growth and mentions IUGR rather briefly.

The chapter by Drs. Devore and Hobbins on ultrasound in fetoscopy is one of the most fascinating and as with the rest of the book, it is brief and informative.

Chapter six by Dr. Wladimiroff and his coworkers is a fascinating exposition on the changes in cardiac dynamics in the fetal and neonatal period. Although there is no immediate clinical value to this, the ability to monitor noninvasively the changes in relative ventricular size of such openings as the foramen ovale and ductus arteriosus as they close, adds significantly to our knowledge of neonatal cardiac hemodynamics.

In Chapter 7, Dr. Little compares the results of BPDs obtained by real-time with those produced on static scans and reports an equal accuracy. The message is clear: gestational age can be obtained accurately by real-time scanning in the antenatal clinic and does not require static scanning on "large, expensive machines . . . located in separate departments."

Chapter 8, written by G. Gennser, describes the use of real-time and M-mode recordings of fetal respiration with clarity, and Chapter 9 summarizes Dr. Lewis' work and that of others on the effect of drugs on fetal breathing movements. This fascinating chapter suggests that the human fetus is not as sensitive to CNS depressants as has been considered hitherto.

Another of the King's College group's follows and describes activity, this time comparing normal with growth-retarded fetuses. Fetal respiration and total fetal activity was significantly decreased in growth-retarded fetuses compared with normals.

The final chapter in the book is by Hylton Meire, the only nonobstetrician (radiologist) contributor. Dr. Meire, a highly experienced and skilled ultrasonologist, attempts to predict the future trends of ultrasonic instrumentation.

In summary, I found this book immensely readable. It is written by obstetricians for obstetricians and, as an introduction to obstetric real-time ultrasound, achieves its purpose successfully. I would like to see, however, a greater awareness of the possible bioeffects of ultrasound, which would involve some discussion of

dosimetry, as well as some of the experimental and epidemiological results available on embryonic tissues. Real-time ultrasound provides an opportunity for prolonged observation and extensive exposure of the fetus, so that consideration of possible toxicity should be of concern to obstetricians contemplating routine screening. I highly recommend that this book be read by anyone involved in obstetrical scanning. Ideally, everyone should have a copy in his personal library.

K. J. W. TAYLOR
Yale-New Haven Hospital
New Haven, Connecticut

HEAVY PARTICLE RADIOTHERAPY. M. R. Raju. New York, Academic Press, 1980, pp 500, \$36.50

According to the author "The scientific literature on the physical and radiobiological aspects of heavy particles in radiotherapy is scattered." The objective in writing this book is to synthesize most of the available literature on the subject and to convey this information to readers with various backgrounds. Heavy particles are those that are many times heavier than electrons, and, except for protons, they are also known as high-LET radiation and are being used therapeutically at approximately 30 institutions worldwide. The appearance of such a book is, therefore, very timely and welcome.

The book is divided into eight chapters and an extensive appendix. Chapters 1 and 2 consist of an introduction to radiobiological phenomena and the biological effects of high-LET radiations, which set the main tone of the book. It is very heavily oriented toward the radiobiological aspects of this subject, and this area is further enhanced by the final chapter, 8, which is mainly a radiobiological comparison of heavy particles, and by the appendix on radiobiological techniques. The remaining chapters deal with each heavy particle in turn: neutrons, protons, helium ions, heavy ions, and negative pions. Because they have been used longer, however, there is a large amount of data on neutrons, and a section on the early experiences with neutrons and their implication for the future use of high-LET radiations in therapy. The early experience with neutrons was not too favorable, but later data on RBE versus fraction-size and a better understanding of early and late reactions could explain these results that led to renewed clinical trials.

Each chapter begins with a brief synopsis of the particle under discussion, including when its use as a treatment beam was suggested, where the particle facilities are, a brief description of the radiobiological characteristics, and their current use in radiotherapy.

Each particle has its own potential advantage over conventional radiotherapy. Neutrons have a purely biological advantage because of a reduced oxygen enhancement ratio (OER), whereas protons have a purely dose distribution advantage because of their sharp dose localization characteristics. The other heavy particles (helium, heavy ions, and negative pions) also have a dose distribution advantage but do exhibit some biological advantages. For the heavy ion, however, OERs appear to be a function of the ion (carbon, neon, argon) and were found to be higher than expected, which could be due to nuclear secondaries and a large delta-ray penumbra.

Since it is not the aim of the author to give an in-depth discussion on each subject, he includes an extensive reference list at the end of each chapter for those interested in pursuing specific subjects further. The book would be improved, however, if it contained a little more information on the concepts of LET and dosimetry. This discussion could have been included in the early chapters so that when such concepts as lineal energy, dose average LET, etc. are

introduced, the uninitiated would have a better idea of what is involved.

Upon reading the book the feeling is given that it would have been better to call it "Heavy Particle Radiobiology," but other than that, the author does an excellent job and provides an in-depth review of the radiobiology behind heavy particle radiotherapy.

PETER R. ALMOND
M. D. Anderson Hospital and Tumor Institute
Houston, Texas

PERCEPTION OF RISK: PROCEEDINGS OF THE XVTH ANNUAL MEETING OF THE NATIONAL COUNCIL ON RADIATION PROTECTION AND MEASUREMENTS. Washington, D.C. NCRP Publications 1980, pp 191

The book is a conglomerate of formal papers, discussions, and the textual minutes of a round table discussion with audience participation. The first part, and most interesting from my viewpoint, deals with the perception of risk or harm and societal attitudes. The second part contains papers that seem to be historical primers concerning radiobiology. This subject is surrounded by controversy, and it seems in part to be approached as an elephant would be by a tribe of blind zoologists. They poke and pinch, sometimes describe small parts in great detail, but never exactly circumscribe the object of the study. The purpose is to present a discussion of the harm due to radiation, specifically radiation from power sources. Closely related to this is the question of the regulatory agencies' role.

This book should be read if only for the lucid presentation by Margaret N. Maxey, who describes the difference between risk and harm and how benefits, ranging from essential or vital to peripheral, should be compared with harm. Risk, of course, is at both sides of the equation. I cannot in this brief review do justice to her paper. The book would have gained enormously if the other participants had adopted her epistemology.

Two more presentations deserve, for widely different reasons, to be mentioned specifically. Roy E. Albert explains well what the political consequences of "no threshold" are: i.e., the Delaney amendment. It does not require much imagination to see that if one consistently acts on the presumption that there is "no safe level" for a toxic substance, the situation may become a political and economical nightmare. Albert proposes that efforts be directed (a) at toxic substances that put many people at risk, and (b) toward what we can expect from regulations that will have a substantially beneficial effect. On the other hand, Ida Hoos' contribution is not a rational discussion. Her presentation contains a number of incorrect statements of industry spokesmen. Her point, however, is important—it is difficult to obtain unfiltered data on controversial subjects. Indeed, the experts tend to present the data inasmuch as they clarify their conclusion. What she fails to discuss is that the conclusion was not necessarily reached on the basis of the presented data only.

Rather than review each paper, it may be more productive to answer two questions: Does the book provide good information on the subject of the perception of risk? To this question the answer is mixed. There is information there, but it is not presented in a well-structured manner that would instruct the uninformed. Does the book increase the understanding of the question? To this, the answer is yes. We recommend the book to all those involved in the field of nuclear technology application, who will be forced at some time to leave their ivory towers and to speak with the public.

MICHAEL L. GORIS
Stanford University School of Medicine
Stanford, California