

BOOK REVIEWS

LOW-LEVEL RADIATION EFFECTS: A FACT BOOK. A. B. Brill, S. J. Adelstein, E. L. Saenger, E. W. Webster. New York, The Society of Nuclear Medicine, 1982, 136 pp, \$25.00, \$2.50 postage and handling

Any physicist or physician working in the field of radiology is expected to have some knowledge of the effects of radiation upon humans. In the minds of the public the absence of a succinct statement of the health effects of small amounts of radiation is taken to imply that scientists don't understand or, what is worse, are attempting to "cover up" those effects. Of course, there is no "cover up," and there is also no lack of scientific understanding. The health effects of small amounts of radiation are better understood than those of correspondingly small amounts of almost any potentially harmful environmental chemical. Relevant scientific study is not lacking. What is lacking is the dissemination of the results.

We are frequently asked to give immediate answers to questions regarding the significance of patient and personnel exposure to radiation. Also we are asked to speak to groups of health care professionals or the general public on the subject. *Low Level Radiation Effects: A Fact Book*, prepared by the Society of Nuclear Medicine Subcommittee on the Risks of Low-Level Ionizing Radiation, attempts to meet both of these needs. For immediate questions, this work provides a well-organized brief summary of recent radiologic data from refereed scientific literature and from the publications of advisory groups such as the National Council of Radiation Protection and Measurement (NCRP), the International Commission on Radiological Protection (ICRP), the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), and the National Academy of Sciences (NAS). Since it consists almost entirely of tables and graphs from the above-mentioned sources along with summary paragraphs, the *Fact Book* is very useful in the preparation of lectures. Most of the material is not suitable for direct slide reproduction because the tables reproduced from original sources are too "busy" to project well for the audience. This may be an advantage, however, since it forces the lecturer to edit and organize the material to tailor a presentation to the level of understanding of the audience.

The book is divided into seven sections. Chapter One, "Glossary, Units and Conversion Factors," is useful because nearly all data given in the rest of the book is in conventional units and should be converted to SI units for future technical audiences. Chapter 2, "Radiobiology," covers the fundamental principles of the field and provides a conceptual framework against which the data, provided in later sections, may be compared. Bearing in mind that one of the most important uses of this *Fact Book* is to provide material for presentation to general audiences, slides from this Chapter might be conveniently inserted in discussions of embryonic effects or studies of populations exposed to high background levels. Chapter 3, "Radiation Doses," can be used to help an audience appreciate the relative magnitudes of radiation exposures they may read about or encounter. Many individuals in the general public do not understand that the statement "He was exposed to radiation." should be met with the question "How much?" This point must be made before the need for the more subtle, but no less important, questions such as "What type?, over how much of his anatomy? over what interval of time?," etc. might be introduced.

Chapter 4, "Late Somatic Effects of Low Doses of Ionizing Radiation," gives data concerning cancer induction and embryonic effects, and Chapter 5 provides data on genetic effects. Chapter 6, "Risks, Statistical Facts and Public Perception" can be used to compare the risks of radiation exposure with more commonly encountered risks. For example, tables that list the risk of death or loss of life expectancy due to eating a slice of pie or smoking a single cigarette are certainly stimulants for audience discussion. The hypothetical fractionation of large doses of hazardous substances may not be appropriately correlated with a similar fractionation of the risk. There is evidence to show, however, that this procedure is also inappropriate for radiation exposure and risk. To do so is to make extremely conservative assumptions and the material in this chapter may be used to illustrate the point. Chapter 7, "Questions and Answers," is the most potentially useful chapter on a day-to-day basis for physicians and physicists. Its success depends upon the readers. It consists of three sets of questions and answers on the subject of x-ray pelvimetry, diagnostic radiology in women of childbearing age, and cardiac catheterization exposure. Each of these sets appeared in the *Journal of the American Medical Association*. It is hoped that physicians, physicists, and other interested parties will submit questions they have encountered in their professional experience along with suitable answers. Apparently the committee felt that a series of stock responses to commonly encountered questions are beyond the scope of this report. Rather, it was felt that a growing body of anecdotal material would lead to flexibility. Those who are interested in sharing their experience with questions related to radiation exposure are encouraged to contact the Subcommittee on Risks of Low-Level Ionizing Radiation.

In summary, *Low Level Radiation Effects* is a useful reference source for both physicians and physicists. The American Association of Physicists in Medicine is in the process of assembling a book that will contain similar material but will include more data on patient exposure and risk from areas of radiology other than nuclear medicine. In any case, the *SNM Fact Book* is a useful reference for a variety of situations. If seen as a fluid document to be updated at intervals, it could well be a very important vehicle for sharing information that is not necessarily part of current training programs but that is of great interest to technologists, physicists, and physicians, as well as patients.

E. RUSSELL RITENOUR

University of Colorado Health Sciences Center
Denver, Colorado

DIGITAL NUCLEAR MEDICINE. J. J. Erickson, F. D. Rollo, Eds. Philadelphia, J. B. Lippincott, 1982, 240 pp, \$19.50

The authors have attempted to "provide the most comprehensive presentation of the technical as well as the clinical aspects of computerized nuclear medicine;" however, it is difficult to cover such an extensive subject in 240 pages (16 chapters). The authors have succeeded in providing a comprehensive description of computers in nuclear medicine with clear descriptions of the more technical aspects and mention a number of clinical protocols although the quantity of information supplied is superficial. The references are not extensive enough for the reader to implement

the discussed protocols. Since the book assumes the reader has little background in computers it covers the topics from a binary number representation up to a description of a typical nuclear medicine operating system. The descriptions, although by necessity are wide in latitude, they are shallow in depth.

The book should serve as an introduction to computers in nuclear medicine as well as provide a better understanding of the applications of computers in this specialty. It is not a comprehensive work for the education of the user, and it cannot serve as a resource for developing new protocols or for implementing the protocols as described by the authors. The illustrations support the material and were well chosen. In conclusion, the book is recommended as an *introduction* to the applications of digital computer techniques to nuclear medicine at all levels.

J. W. FROELICH
University of Michigan
Ann Arbor, Michigan

CHEMISTRY FOR NUCLEAR MEDICINE. M. W. Billingham, A. R. Fritzberg. Chicago, Year Book Medical Publishers, 1981, 328 pp, \$24.95

Nuclear medicine is, by its very nature, a field requiring some knowledge of a wide range of specialist disciplines. No individual can possibly obtain a full understanding of the entire scope of topics required. This is as true in chemistry, where the four major branches each have undergraduate texts that run to thousands of pages, as it is in physics, biochemistry, physiology, and medicine. *Chemistry for Nuclear Medicine* is a text designed for those involved in the field who do not have a specialist education in chemistry. Since it covers both theory and techniques in just 300 pages, it must inevitably skim, touching lightly on many areas where the specialist would demand much detail and analysis. The skimming is highly successful, however, collecting the "cream" for its readers and leaving the "milk" for those who would feed on such a diet.

The book, based on the Canadian syllabus, is aimed at technologists and will provide a valuable text for a student or teacher involved in technologist training. In addition, anyone who works in nuclear medicine and requires some understanding of the theory and practice of radiopharmaceuticals will find it useful. It touches briefly on basic chemical theory of structure and reactions, passes through equilibria and pH to the chemistry of metals, covers the basic organic chemistry of biochemically important compounds, and describes basic laboratory techniques. No one will become an expert chemist from reading this book, but anyone who read, marked, learned, and inwardly digested the entire book would be both comfortable and familiar with the tools of the chemist's trade.

The book is easily read and accessed, with specific items being readily obtained from the index of the chapter headings. A non-chemist in nuclear medicine could afford to devote shelf space to this book, and even a chemist could profitably allocate an inconspicuous corner to it.

TIMOTHY TEWSON
University of Texas Health
Science Center
Houston, Texas

ULTRASOUND ANNUAL 1982. R. C. Sanders, Ed. New York, Raven Press, 1982, 353 pp, \$48.00

In the 1982 *Ultrasound Annual* ten topics, each comprising a chapter, have been chosen for discussion and review. These topics include those areas where ultrasound has an established role, such

as in studies of the pancreas, gallbladder, kidney, and in obstetrical measurements. The remainder of the chapters consist of newer applications of ultrasound such as the study of the neonatal brain, duplex scanning of the carotids, intraoperative application, puncture techniques, breast ultrasound, and fetal cardiac evaluation. The choice of topics is timely because they reflect the developments and interests in the field of diagnostic ultrasound that have occurred in the past year.

The chapter on the pancreas, which includes a discussion of the relative roles of ultrasound and transmission computerized tomography, is a thoroughly researched, in-depth review of pancreatic disease. In the discussion of renal disorders, the author provides excellent clinical-pathologic correlations. The pathologic physiology of intracranial hemorrhage is reviewed lucidly in the chapter on neonatal intracranial ultrasound, and the author provides a good, practical guide to the diagnostic value of ultrasound and transmission computerized tomography. Anyone interested in an informative, clear explanation of duplex carotid ultrasound would be rewarded reading this chapter in the *Annual*. The discussion on puncture techniques provides important practical suggestions for the use of ultrasound as a guide to interventional procedures.

In the chapter on the gallbladder there is a lengthy discussion of gallbladder wall thickness. Because of the nonspecificity of this finding, one could question the relevance of including this material. The author fails to discuss the limitation of cholelithiasis in visualizing the gallbladder neck region and, specifically, its inability to demonstrate cystic duct obstruction, the single most important diagnostic feature associated with acute cholecystitis. There is no mention of the relative role of Tc-99m IDA cholelithiasis in this important diagnostic area.

All the chapters in this book are well referenced, and the illustrations are, for the most part, excellent. The text will be of great interest and value to nuclear medicine physicians involved in correlative imaging, since it provides further insight into this important, complementary, diagnostic modality.

RUTH ROSENBLATT
LEONARD FREEMAN
Montefiore Medical Center
Bronx, New York

ACTUALITÉS EN RADIODIAGNOSTIC—NOUVELLES TECHNOLOGIES. M. Amiel, D. Doyon, H. Fischgold, R. Schmidt. Paris, Masson, 1982, pp 118, \$42.00

This book is a short monograph on the latest advances in imaging. An introductory chapter is devoted to the concepts of basic computer and image analysis. In the following chapters the principles and technology of digital angiography, transmission computerized tomography, single-photon emission tomography, nuclear magnetic resonance, thermography, and diagnostic ultrasound are discussed in turn. Each topic is well organized, adequately referenced, and approached in a concise but scholarly manner that stresses the practical and fundamental aspects of the technology. There are many excellent illustrations that are informative and facilitate the understanding of the subject matter. The overall result is quite successful. This monograph is best suited for those individuals who require a quick update on the latest in the physics and basic principles of each of the specialties. For a more detailed and elaborate treatment of the concepts involved, reference to source texts will be required.

ROBERT LISBONA
Royal Victoria Hospital
Montreal, Canada