

A Chronology of Nuclear Medicine. Marshall Brucer; Heritage Publishers, St. Louis, 496 pages, 1990.

It would be hard to imagine a leisurely walk through the heritage of nuclear medicine with anyone having more first-hand knowledge of the subject than Marshall Brucer. Before there was nuclear medicine there was Brucer, a physician working on top-secret tracer physiology projects at Oak Ridge National Laboratories. Brucer's own hands-on training course for selected physicians at ORNL was the origin of today's nuclear medicine residency program. Brucer talked AEC Chairman Paul Aebersold into allowing physicians all over the U.S. to use certain radioisotopes in medical practice under AEC control, provided they first passed his course; this was the beginning of clinical nuclear medicine and licensing. Brucer became the first President of the newly formed Society of Nuclear Medicine (1958), and continued to play a key formative role in the new field. He freed up many diagnostic (^{131}I , ^{51}Cr and others) and therapeutic (^{60}Co , ^{137}Cs) radioisotopes from their tight AEC security and made them available to licensed physicians.

Despite being progressively handicapped with multiple sclerosis (he did better in the Tucson climate), Brucer managed to write well over 200 papers and 103 historical vignettes (published by Mallinckrodt Corp.). He was a recognized expert in the history of nuclear medicine. This book, representing over 20 yr of work and over 500 references, is the expression of a lifetime of dedication to the field and intimate knowledge of its development where he knew most of the principal players on a first-name basis.

Brucer's salty, no-nonsense, iconoclastic style strips away the romantic veneer often given to discoverers and inventors by their biographers. He does not ignore false starts and wrong trails. Brucer tells his story with wit, and is often acerbic and head-biting; in battling the promoters of radiation hysteria—especially bureaucrats—he takes no prisoners. The book is a mixture of history, satire, humor, hyperbole and an occasional touch of sarcasm. One never knows what Brucer is going to say next. His style alone makes it entertaining reading.

Exceptionally organized, the book alternates between two styles: a chronology, or tabular year-by-year summary of developments (1600–1989), and groups of vignettes or brief anecdotal narratives. The chronologies list over 3,500 names and are organized into six headings: Scientific and Technical Background; Organizations and Internal Politics; Instruments, Units of Measurement and Drugs; Radioiodine, P-32 and Radioactive Therapy; Scans and Other Tests of Function in Various Organs and Radiation Hysteria and Health Physics. These headings are further subdivided into 30 subheadings. The reader interested in a specific subject, such as cardiac studies, can easily follow the thread of this subject through the tabular sections which have marginal black bars to make them easy to find.

Interspersed among the chronologies are the vignettes. Some derive from the original Mallinckrodt series; many are brand new material, taking us up to Chernobyl. Many are based on first-hand accounts. The vignettes are shorter than those in the Mallinckrodt series. They are in turn factual, fanciful, gossipy, scathing, tongue-in-cheek, very often humorous and always entertaining. One especially enjoyable aspect of his style is that the reader has

the option of biting off a small chunk for some short, light reading, or settling down for an evening of serious study. Another is that Brucer, a gifted artist and cartoonist, did all his own illustrations.

There are several appendices of tabular historical material, including one entitled "Nuclear Accidents and Newsmedia Exaggerated Incidents." The table of contents and the index are abundantly stocked.

Whether you are looking for entertainment, historical information, a better understanding of how nuclear medicine developed or just a little relaxation, Brucer's *Chronology* will generously supply it. It is a thoroughly captivating and yet factual account of our heritage and an insider's look at how it all came about—our intellectual ancestry. I highly recommend it as a book you will read again and again.

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Nuclear Medicine Annual 1994. L. M. Freeman, editor; Raven Press, New York, 304 pages, \$112.00, 1994.

This newest addition to the "Annual" family has all the distinctive features of the clan; most attractive, a few less so. As in previous editions, the majority of topics are of general interest, the illustrations are clear and the format pleasing. However, as in previous volumes, the quality and timeliness of the articles remains variable.

A fine up-to-date clinical review of Brain SPECT by Mountz et al. will hearten anyone who has been confused by the fragmentary and often contradictory presentations of this topic in the literature. Datz et al. provide an excellent introduction to the use of artificial intelligence in nuclear medicine that is readable, salient and possibly worth the cost of the volume itself, if you think you might have an interest in this topic.

Useful clinical reviews of muculoskeletal infection (particularly white cell imaging) and pharmacologically-assisted myocardial scans will be of value to most practitioners.

An inclusive review of the uses of thallium and sestamibi in tumor imaging was interesting but would have benefited from proofreading. Even so, most of the typos and syntactical problems could be deciphered from context.

A chapter on hepatic mass lesions from the editor's institution is inclusively referenced but seemed somewhat out of place in a 1994 Annual. For everything there is a season, but for this topic, it may not be 1994.

More research-oriented articles on monoclonal antibody therapy and the biological fates of administered radiopharmaceuticals will be of interest to the hard-core nuclear practitioner whose desire for knowledge reaches beyond the immediately practical. Most readers of this review will probably fit that description.

A final observation concerns review articles that compulsively index every paper ever published on a topic. It seems that a form of hypnosis in which closing the book may be the posthypnotic command, is effected through the reading of endless strings of conflicting sensitivities, specificities and accuracies. As these figures obfuscate more than they educate, I can only hope that future

writers will turn away from such orthodoxy and actually explain how things like population-dependence and experimental design can account for apparent variances between studies. This would provide a true service to the reader.

In summary, the 1994 Annual, despite its faults, provides a sufficient number of well-written and useful articles to warrant its purchase by all nuclear medicine practitioners and most nuclear medicine fellows.

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Internal Radiation Dosimetry. Otto G. Raabe, editor. Medical Physics Publisher, Madison, Wisconsin, 667 pages.

The thirty chapters in this timely book contain interesting and important material presented at the annual HPS summer school by a faculty of distinguished dosimetry experts. The material runs the gamut from basic physics as taught to nuclear medicine and radiology residents, and to first courses for health physicists.

The chapter on the biological basis for radiation dosimetry provides an introduction to biology and nomenclature. The section on physical and chemical interactions of radiation with matter is excellent and well-illustrated. Several chapters present current methods used in dose calculations and their verification starting with a clear discussion of the mapping between micro- and macro-dosimetry. Other chapters deal with in vivo and in vitro measurement methods, the MIRD and ICRP methodology including a discussion of Monte Carlo methods and the definition of "standard man". There are many practical examples on how to make measurements and to calculate dose. In depth, well-presented discussions deal with mathematical models and their use in fitting data. Unfortunately, notations vary between different application areas discussed in different chapters. However, problems with model notations and style are not unique to this publication.

There are a number of specific dosimetry problem areas that are covered in depth including four chapters dealing with lung

dose which include the new ICRP lung model, radon, thoron and characterization and biokinetics of inhaled particles. Dose estimates from transuranics, including plutonium, and from bioassay measurements are presented along with the influence of chelation therapy. The practical applications of internal dose calculations for assessing accidental exposures and the management of internal contamination accidents are covered. Human cancer risks from radiation are presented extending the discussion in preceding chapters. Detailed consideration is given to the risk from radon, as well as radium, and transuranics.

The book begins with an excellent introduction to the physics necessary to understand dosimetry issues and ends with a chapter by the author and editor, dealing with the complex three-dimensional linear- and non-linear interactions between radiation risk and time, dose and dose rate.

This book brings together a wealth of information that will be of interest to both serious students and teachers of health physics and radiological sciences. The illustrations are excellent and the material is presented in sufficient detail to be an important reference as well as a readable text dealing with dosimetry, and, to a lesser extent, health effects of internal emitters. There were some notable omissions, for example, EGS4, one of the most commonly used Monte Carlo programs for dose calculations, was not mentioned anywhere in the text. The logic underlying the choice of chapter sequence is not clear, but may represent the order of presentations at the school. The references are well chosen and cite the earliest pertinent work, and the most recent important references. There is an index, although somewhat abridged.

This is an excellent book which should be on the shelves of all academic nuclear medicine, radiology and health physics programs. If one were to buy a single book on this topic, I would recommend that it be this volume.

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