

## BOOK REVIEWS

**NUCLEAR MEDICINE ANNUAL 1982.** L. M. Freeman, H. S. Weissmann. New York, Raven Press, 1982, 420 pp, \$49.00

This third volume of "current status" reviews offers a wide variety of interesting topics ranging from such well-established procedures as blood-pool scintigraphy to ongoing investigations with radiolabeled leukocytes and to the past, present, and future role of the cyclotron. The chapters on bone scanning of trauma and benign conditions, radioiodine treatment of hyperthyroidism, and efficacy of bone and liver scanning in malignancies are exceptionally well-written and provide much useful information gleaned from the literature and the authors' personal experiences. Other chapters on liver scintigraphy for space-occupying disease, correlative radionuclide and ultrasound imaging in abdominal disorders, and radioimmunoassay and related methods are valuable reviews pertinent to daily practice. The chapters on radiolabeled platelets and radiolabeled leukocytes provide much information and excellent references for the reader who wishes to delve deeper into these areas. The section dealing with the role of the cyclotron and functional imaging of the brain with PET are comprehensive and extensively referenced, and it requires considerable concentration. Blood-pool scintigraphy of the heart details first-pass and equilibrium methodology, compares the two techniques, and contrasts them to two-dimensional echocardiography similar to other recently published reviews.

The illustrations are nicely reproduced, but in several instances the separation of many pages between the text reference and the illustration may prove disruptive to the reader. To the editors' credit, missing arrows, mistyping of tables, and the like are held to a minimum. This volume will be a valuable addition to the library of any practicing nuclear physician and should be required reading for residents and specialty examination candidates.

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**ADVANCES IN RADIATION BIOLOGY.** J. T. Lett, H. Adler, Eds. Academic Press, New York, 1981, Vol. 9, 473 pp, \$55.00

This volume covers a wide variety of subjects from radiation effects on molecules to those on tissues, and the authors and editors have maintained the level of excellence extant in the previous volumes. It is a valuable book not only for this reason but also because it is now the only publication dedicated to reviews on the action of ionizing radiation on biological systems.

The specific topics are revealed by the chapter titles: 1. "The role of radiation and chemicals in the induction of mutations and epigenetic changes during carcinogenesis;" 2. "Radiation-induced vascular injury and its reaction to late effects in normal tissues;" 3. "Evaluation of nitroheterocyclic radiosensitizers using spheroids;" 4. "Radiation-induced strand breaks in DNA: chemical and enzymatic analysis of end groups and mechanistic aspects;" 5. "Radiation-induced events and their time scale in mammalian cells;" 6. "Solid-state radiation chemistry of DNA: the bases;" 7. "Intrinsic radiosensitivity of proliferating mammalian cells;" 8. "Factors governing the use of microwave/radiofrequency energies in cancer therapy."

The vigor of the research in radiation biology exemplified by

these chapters puts them in sharp contrast to the final and unusual chapter by K. G. Zimmer, "That Was the Basic Radiobiology That Was: A Selected Bibliography and Some Comments," in which he gives a provocative and timely discussion of the decline in support for basic radiation biology on an international scale. This discussion will interest anyone concerned with radiation effects. To support its theme a list of "important textbooks, monographs, and review volumes with their tables of contents" published since World War II is included. Among other points, Zimmer notes that recent textbooks are directed primarily toward students of medical (applied) rather than toward those of basic science.

With the premise that sound basic research must precede practical applications, Zimmer offers a concise rationale for the current emphasis on "mission oriented" research. After reviewing the prominent conceptual and theoretical models of radiation action that have been proposed, beginning with the "point heat" theory Dessauer put forth 60 yr ago, he notes the failure of the models to yield a general law or rule for the biological action of radiation. One main reason for this is that a unique target has not been established in the nonhomogeneous molecular system that is the cell. Although DNA has been shown to be an important site of action, primary damage to other types of molecules cannot yet be unequivocally ruled out.

Zimmer proposes that the failure of basic research to provide information that would lead to an effective "drug" against injury from military and industrial radiation and to an effective regimen of radiation therapy for tumors has contributed to an accelerated pursuit of practical research for radiation protection and radiation therapy. This view seems simplistic, but it contains enough truth to prod us to persist in seeking fruitful research directed toward the fundamental problems. Zimmer is not pessimistic but rather points out questions that beg answers and takes the position, held by many, that the most promising approach is the molecular-biochemical study of the cell's response to radiation. Other chapters in Volume 9 of *Advances in Radiation Biology* report the significant progress that is being made with this approach.

A monograph that deserves attention and was not available when the volume went to press is *The Molecular Theory of Radiation Biology* by K. H. Chadwick and H. P. Leenhouts (Springer-Verlag, N.Y., 1981).

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**CRC HANDBOOK OF MEDICAL PHYSICS VOLUME I.** R. G. Waggener, J. G. Kerelakes, R. J. Shalek. Boca Raton, FL, CRC Press, Inc., 1982, 327 pp, U.S. \$64.00, outside U.S. \$74.00

The charge given the authors of this Handbook was that they should write about a topic as if to give a good friend a "quick knowledge of that particular subject." I contend that this approach leads to a set of chapters for the nonspecialist, which is not what a handbook should be. Be that as it may, I shall review the chapters for their breadth.

The *Handbook of Medical Physics*, Vol. I, contains twelve chapters, ten of which are oriented toward radiation therapy and may be helpful in that area. (The therapy-oriented chapters will