

on radiation and subradical surgery in the head and neck, breast, and soft tissue sarcomas. This volume contains 54 papers presented at the Second International Meeting on Progress in Radio-Oncology held in Baden near Vienna, Austria, in 1981. By limiting the conference to these four specific areas, the resulting publication does indeed give a comprehensive analysis of the theories, complications and early results of these areas by a number of groups currently active in them.

The series of papers on particle beams contains neutron beam reports from the USA (Seattle and Houston), Japan (Chiba-shi), The Netherlands (Leeuwenhoek), Scotland (Edinburg), England (Hammersmith), and Germany (Hamburg, Heidelberg and Essen), representing a significant portion of current patient experience. Even these groups, each with several years of experience, recognize the limitations of current equipment for adequately demonstrating any superiority of neutrons for radiation therapy of hypoxic tumors. Neutron therapy machines currently being installed at a variety of centers will improve the depth dose, gamma contamination, field size and direction limitations, and penumbra problems of present facilities. In short, the impact of fast neutron beams on cancer cure is not likely to be astounding or universal, but may provide an added measure of control for certain tumors when more careful investigations can be completed. As with the rest of this volume, the discussions are generally clinical in nature, with minimal physics. There are three papers on radiobiology, however, that deal with hyperfractionation, abscopal effects, and the effects of slow neutrons. Finally, in this section there are two primarily clinical papers on preliminary pion trials and one on heavy-charged particle beams.

The section on radiation sensitizers and radiation protectors contains 14 papers dealing with some very basic studies designed to assess the differential uptake and effect of oxygen mimicking sensitizers and sulfhydryl containing radioprotectors. Much of this work has been done *in vitro*, but there are extensive discussions of toxic effects in humans, scheduling and fractionated radiation, and combinations with chemotherapy and hyperthermia. Several papers support the use of Misonidazole, under proper conditions, in a variety of tumors, though most are careful to refrain from drawing any firm conclusions from the Phase I and Phase II trials presently underway. This section contains considerably more theoretical discussion than the previous section, due one suspects to the youthfulness of this area. In the middle of these papers there is one dealing with the potential for using micronucleus appearance in the cytoplasm of tumors to predict their response to therapy.

The opening paper in the dose fractionation section states very succinctly the rationale for hyperfractionation and the crucial question of late or acute effects as preparation for the 13 more specific papers that follow. Again, this work is in its infancy and therefore the papers cover a wide variety of fractionation regimens and trials, complete with extensive discussion of the rationale for each. Also included in this section are two papers on the use of low-dose-rate continuous irradiation of malignant brain tumors with implanted photon sources Au-198, I-121, and Ir-192. Initial studies show significant palliation in patients with recurrent malignancies.

The final section, on hyperthermia, follows in much the same, though shorter, vein. There are nine papers dealing with very basic

problems in clinical hyperthermia such as thermotolerance alteration; fractionation; phase I trials; whole body compared with localized heat; physical problems of heat penetration; distribution and measurement; toxicity; and heat-drug combinations. There are some good discussions of rationale in this section as well, and a similar lack of conclusions. Anecdotes and enthusiasm abound, as is customary for such complex areas of clinical investigation.

This is a "meaty" book, with substantial background and current insights into the four areas under consideration. It is far better than most diverse symposia publications and is generally readable by persons not directly involved in these specific areas. It should serve well as a review of progress to date (1981) in these not yet standard areas of radiation therapy.

J. L. BEACH

University of Kentucky Medical Center
Lexington, Kentucky

INTRODUCTORY PHYSICS OF NUCLEAR MEDICINE (2nd Ed).
R. Chandra. Philadelphia, Lea & Febiger, 1982, 237 pp, \$17.50

Introductory Physics of Nuclear Medicine is the second edition of the book first published in 1976. In a discipline that is changing as rapidly as nuclear medicine, texts become dated rather quickly, particularly those describing imaging instrumentation. This edition is a welcome addition to the literature in a field that suffers from a paucity of current works. The book is primarily directed toward the nuclear medicine technology student or the clinician who does not specialize in nuclear medicine or is unacquainted with it, but wishes to acquire some knowledge of the framework, current techniques, and recent developments in the field.

The first two chapters outline the elements of atomic and nuclear structure. Mass-energy equivalence, energy levels, binding energy, radioactive processes, and conservation laws are among the subjects discussed. Since the material is presented as a review, the reader should refer to an introductory physics text for a more thorough treatment of these subjects. Succeeding chapters are devoted to the mathematics of radioactive decay, radiopharmaceuticals, production of radionuclides, interaction of radiation with matter, radiation detection and nuclear medicine imaging, among other subjects. The book features an excellent chapter on radiation absorbed dose with a very clear and rather detailed discussion of dose calculations.

Revisions in the text are noteworthy. A chapter on radiopharmaceuticals has been expanded and includes an outline on the development and testing of labeled compounds. The application of computers to image digitization and quantitation is described. The discussion of the scintillation camera is detailed and includes the microprocessor-based uniformity correction. Although SI units are introduced, they are not used throughout the text. Topical but brief descriptions of longitudinal, axial, and seven pinhole emission tomography, positron scanning, x-ray fluorescent scanning, and multifilmatters are included.

Overall, this is an excellent introductory text, and we hope it will encourage the reader to pursue his study of nuclear medicine.

HEINZ WAHNER

Mayo Clinic
Rochester, Minnesota