

## BOOK REVIEWS

**PROGRESS IN RADIOPHARMACOLOGY—Volume 2.** P. H. Cox, Ed. Amsterdam, Elsevier/North Holland Biomedical Press, 1981, 339 pp, \$48.75

This book covers the proceedings of the Second European Symposium on Radiopharmacology held in the Netherlands, November 6–8, 1980, under the auspices of the Joint Committee on Radiopharmaceuticals of the Society of Nuclear Medicine (Europe) and the European Nuclear Medicine Society. "The objective was to review the state of the art with regard to the basic knowledge of the biological behavior of radiopharmaceuticals with special attention to European activities in the chosen fields." The topics were limited to cardiology, thrombosis, and lymphatics, and were organized accordingly: an initial discussion of the pathophysiology of the biological system involved, a presentation of the pharmacological behavior of related radiopharmaceuticals, and finally, a discussion of the clinical relevance.

The first chapter is a useful review of myocardial metabolism and pathophysiology. The next chapter addresses the question of the comparative radiopharmacology of Tl-201 and potassium. The author puts forward the controversial proposal, based on ion exchange and electrophoresis behavior, that the chemical state of Tl-201 as used clinically is the thallic +3 ion, which is bound as the anionic-tetrachloro complex. Since this point is important and contrary to the widely held general understanding of thallium chemistry, more discussion and supporting data would have been required to substantiate the contention. Personal communications with several who work with Tl-201 indicate that Tl-201 is supplied as the thallos +1 ion, at least in the United States. The remainder of the heart section included an exhaustive review of radiolabeled fatty acids, some clinical data on radioiodinated fatty acids, and a review of infarct agents. Unfortunately, only a few images of fatty acid myocardial studies are shown.

The next section, on thrombus localization, includes a review of the pathophysiology of thrombosis and papers on Tc-99m fibrinogen, Tc-99m plasmin, Tc-99m plasminogen, Tc-99m heparin, In-111 thrombocytes for thrombus localization, and In-111 and Tc-99m platelets for use in monitoring thrombotic depositions in transplanted kidneys. The final section deals with lymphoscintigraphy and contains useful reviews of the lymph system and the phagocytosis process of the reticuloendothelial system. Other papers cover the basic and clinical studies of lymphoscintigraphy, the use of Tc-99m-labeled neutral liposomes, the measurement of phagocytic and proteolytic lymph macromolecule transport kinetics, and Tc-99m gluconate in the staging of lymph node metastases.

The quality of the print and reproduced images in the book is good. Unfortunately, few of the images include arrows or other aids that would have been helpful in several cases in which the radioactivity localization patterns are not clearly obvious. Several comparative radiologic images include information not obvious to those unfamiliar with them, and aids to designate important features would have been helpful in these cases also.

I was somewhat troubled by the presentation of results contrary to general understanding, such as those dealing with thallium properties and oxidation level, without giving the necessary chemical detail. In addition, two papers on Tc-99m plasmin in which the biological behavior seems to be at significant variance

appear. In these cases the inclusion of questions and answers following the presentations might have been useful for clarification of certain points.

In general, the book contains a number of papers with useful review or recent research information, and the emphasis on myocardial- and thrombus-localizing radiopharmaceuticals is timely. The section on lymphoscintigraphy suggests that interest in this field may be greater in Europe than in the United States currently. This text is recommended as a useful addition to the field of radiopharmacology but with some reservations as indicated.

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**LIGAND ASSAY. ANALYSIS OF INTERNATIONAL DEVELOPMENTS ON ISOTOPIC AND NONISOTOPIC IMMUNOASSAY.** John Langan, Jeremy J. Clapp, Eds. New York, Masson Publishing USA, Inc., 1981, 286 pp, \$37.50

This book is loosely based on an international symposium on isotopic and nonisotopic ligand assays held in Toronto in May 1979. Eleven of the 21 topics covered at this symposium (plus one new one) have been expanded into 12 well-written chapters.

The main focus of the book is on nonisotopic immunoassays. In these days of political maneuvering over which hospital department should control radioimmunoassay, the nonisotopic assays are seldom performed in nuclear medicine departments. However, due to the emotive bias (and paperwork) surrounding the use of radioisotopes and the expense of radioactive waste disposal, nonisotopic immunoassays are becoming more and more widely used in clinical chemistry laboratories. Today, the bulk of therapeutic drug monitoring (TDM) is done by nonisotopic techniques (primarily enzyme immunoassays), and kits for other high volume, high concentration assays are being sought intensely by a number of manufacturers.

In addition to covering several of the basic nonisotopic assays, such as homogeneous and heterogeneous enzyme immunoassays (EIAs) and fluorescence immunoassays (FIAs), this book also discusses assays using other nonisotopic techniques. These include bioluminescence and chemiluminescence, nephelometry, and bacteriophage immunoassays. There are also chapters on the mathematics of ligand assays and the use of immunoassays for drugs. Additionally, the problems of standardization for the measurement of pituitary hormones are discussed, as is the use of polypeptide hormone receptors as binding agents.

The chapters do not go into the depth that would enable someone with no experience to develop assays using these different techniques. The introductory chapter is excellent and gives an overview of the various methods that are discussed later in the book, including a discussion of automation. Other chapters vary in quality, but all are written by leaders in the field and are informative and well referenced.

This book is not intended for the neophyte in immunoassay

techniques. However, for those who already understand radioimmunoassay and wish to develop familiarity with the increasingly popular nonisotopic immunoassays, it is enjoyable reading.

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**CRANIOFACIAL AND UPPER CERVICAL ARTERIES: FUNCTIONAL, CLINICAL AND ANGIOGRAPHIC ASPECTS.** P. L. Lasjaunias. Baltimore, Williams and Wilkins, 1981, 199 pp, \$57.00

The subspecialty of interventional neuroradiology has made astounding progress in the past decade with the development of superselective angiography, detachable and flow-guided coaxial balloon systems, and intravascular and embolization agents. The treatment of carotid-cavernous fistulae, vertebral jugular fistulae, deeply seated arteriovenous malformations, and juvenile angiofibromas are just a few of the many lesions of the head and neck that are amenable to treatment by interventional techniques. A detailed understanding of the vascular anatomy of the craniofacial region is an obvious prerequisite for anybody who desires to become involved in the use of these sophisticated and complex therapeutic systems. Dr. Lasjaunias' elegant text provides an ingenious new approach to the anatomy of this area by stressing flow relationships and regional blood supply rather than static anatomic and morphologic structure.

The book begins with an introduction to the basic concepts of hemodynamic balance, vascular pedicles, and regional blood supply. The next six chapters detail the arterial anatomy of the internal maxillary system, the pharyngo-occipital system, the upper cervical regional, the musculocutaneous elements of the head and mouth, and the transosseous peripheral nervous system. A dynamic approach to the vascular anatomy is consistently adhered to throughout the book. The author is to be commended on the excellent quality of the numerous line drawings, magnification-subtraction angiograms, and color photographs of anatomic preparations. All of the illustrations are of high quality and are clearly labeled. Since no more than two illustrations appear on a page, the figures are large and very legible. There are numerous tables included in the book that aid in defining some of the complex vascular relationships discussed. The subject index is quite complete and the up-to-date bibliography is extensive.

Perhaps the most important critical shortcoming of the book relates to Dr. Lasjaunias' somewhat convoluted use of the English language. For example, in the preface he writes, "Although theoretical arterial sources might appear too numerous, not every solution to a hemodynamic constraint is viable: only a certain number of them are encounterable. Therefore, anatomic variants are not unquantifiable, because they obey a phylogenetic and ontogenetic logic." With concentration and frequent reference to the excellent illustrations, the meaning usually becomes clear. In spite of this single shortcoming, this book should be valuable to the radiologist now engaged in or contemplating practice in the field of interventional neuroradiology. No doubt neurosurgeons, otolaryngologists, ophthalmologists, and others interested in the study of head and neck disease will benefit from Dr. Lasjaunias' unique approach to the vascular anatomy of this region.

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**FUNDAMENTALS OF RADIATION DOSIMETRY.** (Medical Physics Handbook 6.) J. R. Greening. Philadelphia/London/Rheine, Adam Hilger Ltd. (Heyden & Son, Inc.), 1981, 160 pp, \$27.00

*Fundamentals of Radiation Dosimetry* is one volume of an ongoing series of handbooks devoted to medical physics. The publisher, Adam Hilger Ltd., has begun a collaborative effort in the U.K. with the Hospital Physicists' Association, which has resulted in nine volumes, approximately 1500 pages of material, having appeared since 1979. John Greening's contribution, devoted entirely to ionizing radiation, is divided into 12 chapters with an appendix discussing physical quantities and units.

Physicists in radiation therapy will appreciate this volume. The author emphasizes the evolution of the dosimetric concepts described. Obviously he has had an extended and thorough association with these developments, generally from the point of view of the International Commission on Radiation Units and Measurements (ICRU). Such a historical approach is particularly useful during the present transition from the older systems to SI units.

Concise, well-written chapters are allocated to the concepts of fluence, radiation interactions, exposure, kerma, absorbed dose, cavity theory, and specific methods of dosimetry. The longest chapter (29 pages) is devoted to the physical description of the interaction of ionizing radiation with matter. Neutral particles, both photons and neutrons, as well as charged moieties are included in this discussion. A short section on neutron dosimetry is also available.

The most relevant chapter for nuclear medicine personnel is 13 pages long and entitled "The Dosimetry of Radionuclides." Much of this exposition is devoted to implantable therapy sources and includes Sievert's integral analysis and the Paterson-Parker strategies for tumor treatment. There are, unfortunately, only five pages allocated to calculations on "unsealed sources" of radionuclides. Although several MIRD publications are referenced, no sample computations of radiation doses associated with typical nuclear medical protocols are included. There is a tendency to be rather parochial about this as well. In lieu of such calculations or even a table of their results, the author cites "widely distributed" National Health Service Circulars.

The obvious omissions from Greening's work are in some contradiction to the information on the flyleaf, which explicitly states the intent of having "radiodiagnosticians" as part of the book's audience. Although dosimetry can mean different things to different people, it is unclear why diagnostic applications get so little coverage. There may be forthcoming companion volumes on nuclear medicine and diagnostic x-ray. If not planned, the editor should certainly add such titles to the series in the near future.

Other readers may be somewhat disappointed by the use of the word "handbook" in the complete title of this volume. Useful tabulations of expected entities such as gamma-exposure rate constant, roentgen-to-rad conversion factor  $f$ , or even typical depth-dose relationships are lacking. Numerous references are used instead, and the reader is left with the impression of receiving an enthusiastic literature survey. One limiting omission is a cognizance of other titles in the series. As an example, Greening spends several pages discussing thermoluminescent dosimetric (TLD) devices but gives no reference to the companion volume by A. F. McKinlay, *Thermoluminescence Dosimetry*. The paragraph on radiation therapy doses has no connection to R. F. Mould's *Radiotherapy Treatment Planning*, which is number 7 in the series. The lack of cross-references is disappointing. If one were to select a general medical physics topic, there presently appears to be no simple way to find it other than by going to each possible volume and checking the respective index.

In summary, this volume is useful in the training of physicists and radiation dosimetrists. It will probably not satisfy the typical diagnostic radiologist except as a source book for the concepts of