

LIQUID SCINTILLATION COUNTING—Recent Applications and Development. Vol. 1. Physical Aspects. Chin-Tzu Peng, Donald L. Horrocks, Edward L. Alpen, Eds. New York, Academic Press, 1980, 414 pp, \$27.50

LIQUID SCINTILLATION COUNTING—Vol. 2. Sample Preparations and Applications. Chin-Tzu Peng, Donald L. Horrocks, Edward L. Alpen, Eds. New York, Academic Press, 1980, 538 pp, \$32.00

The widespread use of iodine-125 and solid crystal scintillation detectors in radioimmunoassay diminishes the usefulness of proceedings of a liquid scintillation symposium for most nuclear medicine physicians. The presence of liquid scintillation counters in many laboratories, the continued use of some tritium-labeled ligands, and the potential for wider applications suggest, however, that perusal of these volumes may be more interesting than it might initially seem.

This work contains the proceedings of the International Conference on Liquid Scintillation Counting, Recent Applications and Development, held in August 1979 at the University of California, San Francisco, and attended by scientists from various disciplines. It consists of 76 papers organized into fourteen sections in two volumes. With few exceptions each paper is preceded by an abstract or introduction and is well referenced. Each volume contains a brief, but generally helpful, index. For an undertaking of this magnitude, published so rapidly, the papers are remarkable for their readability and consistently good quality. These volumes are not primers nor are they intended to provide reviews of basic principles for the uninitiated. Rather, the intent is to examine the present status of liquid scintillation physics, instrumentation, sample preparation, and applications in a variety of scientific disciplines. Typically, most sections contain a summary paper followed by papers directed to specific problems, developments, or applications. These summary papers contain current information of interest to the widest group of potential readers. Those interested in specific problems will turn to more detailed literature, since the largest portion of this presentation will appeal to those with a general interest in and some knowledge of liquid scintillation counting (LSC).

Volume 1 contains eight sections beginning with historical notes and ending with a disappointingly brief discussion of waste disposal problems, which, unfortunately, offer few solutions. The section entitled "Scintillation Physics and Scintillators" contains only two papers of general interest to nuclear medicine physicians—"Liquid Scintillation Counting from Gross Counts to Spectral Analysis" and "The Application of Spectral Analysis in Liquid Scintillation Counting." Except for the intrusion of annoying commercialism, these papers, written by scientists from industry, describe beta spectral analysis and will be of interest to readers with counting instruments equipped to correct quench effects using "spectral indices." The section entitled "Quenching" begins with an excellent discussion defining the problems and reviewing possible approaches for quench detection and/or its correction. "Radioactivity Standards" reminds the reader that reliable standards are essential for calibration, efficiency measurements and quench correction, and instrument quality control. The approach to standardization taken by the National Bureau of Standards, the American National Standards Institute, and various commercial concerns are reviewed. The section, "Advances in Instrumentation," is notable in that although the major advances in basic liquid scintillation instrumentation during the past decade involve the development of microprocessor control and applications, most casual users remain ignorant of basic principles of liquid scintillation instrumentation. This problem is well summarized by Phillip E. Standley (Volume 1, p. 258) who writes:

"LSC is a commonly used analytical tool yet its complexity is generally not appreciated. It comes as no surprise, therefore, that users encounter disproportionate difficulties which are aggravated by their having little or no knowledge of the physical processes

involved. The matter is further complicated by the increasing tendency for manufacturers to make spectrometers that are easier and easier to use. The worker loads his samples, presses a few buttons and only has to return later to remove the printed output. With the neatly formatted results, he finds it difficult to believe that they may not be valid and it is only when he finds a totally unexpected result that his attention is turned to the use of the LSC technique and the problems therein. This situation has not changed since 1964."

Presumably, physicians will need little knowledge of techniques useful for alpha detection. The introductory paper in the section "Alpha Counting" may, however, be useful to groups associated with nuclear power facilities. "Cerenkov Counting" is a particularly interesting section and contains four well-written papers. The reader is reminded that higher energy beta particles can be quantitated using inexpensive scintillation media of suitable refractive index (e.g., phosphorus-32 in water) in a commercial liquid scintillation counter.

Because radioimmunoassay involves counting aqueous, solid, or inhomogeneous samples, considerations relevant to achieving an intimate association between the sample-containing radionuclide and the liquid scintillation solvent are of critical importance if this technique is to be successfully applied. Volume 2 devotes three sections to papers that address these problems. Those of greatest interest to physicians include the two introductory papers in the "Sample Preparation" section, and the majority of the papers in the "Emulsion (Solgel) Counting" section.

That chemiluminescence, considered an unwanted source of error by most of us, may be usefully applied is demonstrated in the section "Applications—Chemiluminescence and Bioluminescence." The fact that some immunoassays presently done by radioimmunoassay have been described using a luminescent label may make the excellently written introductory paper in this section of more than passing interest.

The section "Application—Environmental Monitoring" contains some interesting papers, e.g., "Determination of Natural Product Purity by Radiocarbon Measurement" and "Determination of the Origin and Age of Alcoholic Beverages by Liquid Scintillation Counting," but is really not relevant to nuclear medicine.

The concluding section "Application—Biomedical and Radioimmunoassays" possibly could have been in another volume but contains only four papers. The introductory paper, "Applications of Liquid Scintillation Counting to Radioimmunoassays," by Grafton Chase, is intended as an introduction to radioimmunoassay for the uninitiated. The other papers describe the adaptation of crystal detectors for use in a liquid scintillation counter, liquid techniques for quantitating iron-59 and chromium-51, and speculations regarding the future of liquid scintillation counting.

These volumes will find their way to the bookshelves of relatively few nuclear medicine practitioners but do contain information of interest and importance to any practitioner employing liquid scintillation techniques. Although this information is probably of greater importance for the occasional liquid scintillation user, those individuals would be better served by a straightforward primer on liquid scintillation techniques.

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RADIOGRAPHIC EVALUATION OF THE SPINE—Current Advances With Emphasis on Computed Tomography. M. Judith Donovan Post, Ed. New York, Masson Publishing USA, Inc., 1980, 738 pp, illustrated, \$135.00

There are few textbooks on radiology of the spine. Those

available do not deal with the two most significant recent advances: computed tomography and metrizamide myelography. This book provides a comprehensive discussion of the latter two procedures and provides as well material on other invasive special procedures relating to the spine, noninvasive conventional radiographic examinations, gas myelography, and an informative section on clinical evaluations. The book is well written and organized and contains numerous high-quality illustrations.

The first section on computed tomography (CT) covers noninvasive and invasive evaluation. There are excellent discussions with illustrations of the normal and pathologic anatomy, and the gross material is correlated with the CT appearance. Adult and pediatric material is covered. Low-resolution and high-resolution scanner material are presented, discussed, and compared. This material serves as a useful guide for individuals contemplating the purchase of a whole body scanner or the upgrading of a current scanner. The section devoted to physics is adequate to help the reader understand this area, and the material is well written—one does not get bogged down in esoteric physics discussions. The CT material appears up-to-date, presenting the current state of the art in CT scanning of the spine.

The second section deals with noninvasive conventional radiographic examinations. It includes material on plain film examination, transverse axial tomography, and nuclear scattering radiography, all clearly presented with good illustrations.

Both conventional myelography and CT imaging are discussed in depth in the third section—metrizamide myelography. A very

good chapter on gas myelography is included.

In the fourth section other invasive special procedures, with an update on several of them, are discussed. Chapters on percutaneous spinal cord cyst punctures, epidural venography, and spinal cord arteriography are included.

The fifth section covers clinical evaluation of patients with spinal problems and includes discussions of low-back pain, lumbar and cervical spinal stenosis, acute spinal injury, and fracture treatment.

The book is practical and presents the precise technique for performing the procedures and includes the pathology demonstrated by the various radiologic examinations with a review of the normal anatomy. The indications and contraindications as well as the limitations and value of the various procedures are presented in a concise, understandable manner. Dr. Post states in the preface: "After reading the book, it is our desire that the physician will be greatly assisted in the care of his patient with spinal pathology. He will know what radiographic procedure to order, when under what circumstances, and with what diagnostic results. He will also know where and in what order to proceed with further radiographic examinations." The book succeeds in matching its goal, and it should be a valuable addition to the library of those physicians dealing with spinal disease and its diagnosis.

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BOOKS RECEIVED

Thallium-201 and Technetium-99m-Pyrophosphate Myocardial Imaging in the Coronary Unit. Developments in Cardiovascular Medicine. Vol. 9. F.J. Th. Wackers, Ed. The Hague/Boston/London, Martinus Nijhoff Publishers, 1980, 255 pp, illustrated, \$42.00

Clinical Nuclear Medicine. Medical Outline Series. P. Martin, Ed. Garden City, Medical Examination Publishing Co., Inc., 1981, 346 pp, illustrated, \$29.50; paperback \$21.50

Clinical Ultrasound. Review. Vol. 1. F. Winsberg, Ed. New York, John Wiley & Sons, 1981, 348 pp, illustrated, \$43.50

Progress in Radiopharmacology. Vol. 2. P. H. Cox, Ed. (Proceedings of the Second European Symposium on Radiopharmacology held at Noordwijkerhout, The Netherlands, Nov. 6-8, 1980.) New York, Elsevier/North-Holland, Biomedical Press, 1981, 399 pp, illustrated, \$68.75

Craniofacial and Upper Cervical Arteries. Functional, Clinical, and Angiographic Aspects. P. L. Lasjaunias. Baltimore, William & Wilkins, Inc., 1981, 199 pp, illustrated, \$57.00

Nuclear Medicine Technology Examination Review. D.L. Gryniewicz, S.M. Spies, D.R. Martin. New York, Arco Publishing, Inc., 1981, 155 pp, \$12.00

Gamma Images in Benign and Metabolic Bone Diseases. Vol. I. W. Sy, Ed. Boca Raton, CRC Press, Inc., 1981, 280 pp, illustrated, \$69.95 U.S., \$79.95 Foreign

Gamma Images in Benign and Metabolic Bone Diseases. Vol II. W. Sy, Ed. Boca Raton, CRC Press, Inc., 1981, 282 pp, illustrated, \$79.95 U.S., \$84.95 Foreign

Manual of Nuclear Medicine Procedures. D.B. Sodee, P.J. Early. 3rd ed. St. Louis, C.V. Mosby Co., 1981, 601 pp, illustrated, \$35.95