TOMOGRAPHIC IMAGING IN NUCLEAR MEDICINE. Ed. by Gerald S. Freedman, Society of Nuclear Medicine, Inc., New York, 1973, 271 pp. $12.

The Proceedings of the Symposium on Tomographic Imaging in Nuclear Medicine published in this book are recommended reading for nuclear medicine researchers and practitioners alike. These collected works present, in one volume, the state of the art of recent instrumentation and analytical developments as well as clinical evaluations of some devices for portraying three-dimensional radionuclide information. This reviewer notes that the instrumentation or measurement techniques are clearly distinguishable in terms of the kind of data which are collected for analysis and display.

One class of instruments collect and display data in manners analogous to conventional radiographic tomography. In essence the images from these instruments differ from conventional two-dimensional scintigraphic images in that data originating above and below selected plane of interest are blurred. Thus, depth specificity is provided through degradation of image sharpness at defocused planes. H. O. Anger sets a theme for his and a number of succeeding papers by examining tomographic characteristics of the blur pattern (disk) produced by his instrument as compared with other common radiographic blur patterns. His work is also distinguishable by resolution characteristics which are not particularly limited by detector inherent resolution. The circular blur pattern produced with rotating collimator tomographic camera systems may lead to image artifacts in clinical situations. Diffuse pattern tomography is also obtained with a linear detector tomographic system reported by F. Miraldi. This system has inherent detector resolution limitations which are similar to those of camera systems. In the particularly interesting method of Fresnel zone plate imaging reported by H. H. Barrett, the coded holographic data is inherently tomographic. The depth at which the image is to be focused is selected after the data are collected and before its optical unscrambling.

Transverse section imaging is deservedly well represented. In this method data are separately collected from one or more selected anatomical planes which are usually normal to the body longitudinal axis. These methods differ from the more conventional tomographic techniques in that the portrayed data derive solely from the selected planes of interest and blurred images from surrounding planes do not confuse interpretation. However, transverse section imaging inherently yields gross degradation of the spatial resolution characteristics. Retrieval of good resolution characteristics through data analysis in the spatial or frequency domain appears possible, provided that the statistical accuracy of the data is adequate. Such reconstruction appears to be of paramount importance.

In addition to tomographic and sectional imaging, multiview imaging techniques and direct three-dimensional imaging techniques are also reported. One method of imaging in three dimension was reported by P. B. Hoffer. This method measures fluorescence radiation from naturally occurring elements which derive from external excitation by a radiation source. The method presently appears to be limited to thyroid imaging. Another method presented by W. G. Monahan detects the coincidence of cascading gamma rays with two orthogonally directed scintillation cameras. The method is severely limited by low coincidence counting efficiency.

D. E. Kuhl reports that he is able to detect by transverse section scanning (without data processing) 6 brain tumors in every 100 which had been missed by conventional scanning. Hopefully, higher counting statistics along with resolution retrieval techniques such as those reported by D. A. Chesler, J. S. Robertson, and J. A. Patton, in addition to Dr. Kuhl, may extend the capabilities of sectional imaging. Other authors are guarded in their evaluation of the clinical efficacy of other tomographic devices. It appears that it is much too early to assess their tumor detection ability at this stage of development although most agree on their usefulness in characterizing lesions.

The investigators do not lack unanswered fundamental problems. A major disadvantage of tomography is degradation either through superposition of blurred images from surrounding planes or through degradation of resolution characteristics in sectional imaging. Miraldi points out that the conditions under which structures of interest are distinguishable from their blurred surroundings remain unknown and de-

serve our attention. Chesler offers a highly promising estimate of the time required to perform a section scan such that subsequent image regeneration would be comparable to a hypothetical direct scan of the excised layer.

In short, this book presents a concise collection of material (most of which is reported elsewhere) which well describes a field in a high state of flux. Clearly, much analytical work must be done before we are secure in a clinical approach to the third dimension.

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THE SOCIETY OF NUCLEAR MEDICINE
21st ANNUAL MEETING

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FOURTH CALL FOR ABSTRACTS FOR SCIENTIFIC PROGRAM AND FOR WORKS-IN-PROGRESS PAPERS

The Scientific Program Committee welcomes the submission of abstracts of original contributions in nuclear medicine from members and nonmembers of the Society of Nuclear Medicine for the 21st Annual Meeting. Abstracts for both the regular scientific program and for works-in-progress papers will be published in the June issue of the *Journal of Nuclear Medicine*, necessitating earlier deadlines for abstracts than in previous years.

This year the Committee plans to divide the program into four major categories: Basic Science, Clinical Practice, Clinical Research, and Special Topics. Papers on the following subjects will be considered in these sessions:

Bone/joint
Cardiovascular
Competitive binding assays
Computer/data analysis
Dosimetry
Gastroenterology
Hematology
Instrumentation (and ultrasound)
Metabolism
Neurology
Oncology
Pediatrics
Pulmonary
Radiopharmaceuticals
Renal/electrolytes

GUIDELINES FOR SUBMITTING ABSTRACTS

This year abstracts will be printed from camera-ready copy provided by the authors. Therefore only abstracts prepared on the official abstract form will be considered. These abstract forms are available from The Society of Nuclear Medicine, 305 East 45th Street, New York, N.Y. 10017. *The abstracts will not be sent to the entire membership* as in former years, but must be requested from the Society office in New York. Be sure to request enough forms since only original forms can be used for each submission. The original and six copies must be submitted.

The deadlines for submitting abstracts for the regular scientific program and for works-in-progress papers are:

DEADLINE FOR WORKS IN PROGRESS: February 15th, 1974

Send the original abstract form, supporting data, and six copies to:

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