

*The following abstracts of the Scientific Exhibits and the Annual Meeting Teaching Sessions did not appear in the Special Convention (May, 1966) issue because of limited space. They appear in this issue (June, 1966) as an added convenience for those who could not attend the annual meeting in Philadelphia as well as providing a reference for those who prepared Scientific Exhibits and participated as a faculty member for the popular Teaching Sessions.*

*Editor*

### Scientific Exhibit Abstracts

***"Salivary Gland Scanning with Technetium ( $^{99m}\text{Tc}$ ) Pertechnetate"*** GIOVANNI DI CHIRO, M.D. AND ARTHUR S. GROVE, JR., M.D. (Head, Section on Neuroradiology, National Institutes of Health Building 10, Room 2-D17, Bethesda, Maryland)

Technetium pertechnetate is concentrated by a variety of normal and abnormal tissues. This isotope rapidly accumulates in the salivary glands and permits their functional evaluation, delineation and localization by multiple view scanning.

This exhibit demonstrates the usefulness of technetium scanning in (a) evaluating salivary gland function, (b) determining the limits, location or infiltration of these glands and (c) differentiating among some of the tumors and masses which occur within or nearby the salivary glands.

***"Partners In Protection"*** JOHN VADEN AND JOHN G. BAILEY, (State Relations Branch U.S. Atomic Energy Commission, Washington, D. C. and U. S. Public Health Service, Radiological Health Lab. 1901 Chapman Avenue, Rockville, Maryland)

This is a joint exhibit of the Atomic Energy Commission and the Public Health Service and it is designed to demonstrate the cooperative capabilities of these federal agencies that are available to the States in the area of radiological health programs for the regulation of sources of radiation: X-ray, naturally occurring radioactive materials and radioisotopes produced in reactors and accelerators. A current status report of State programs is also presented. The exhibit is manned by a representative of each agency.

***"The Renal Scan: Its Contribution to Urologic Diagnosis"*** PERRY R. MANDEL, M.D., DAVID FAEGENBURG, M.D. AND HAROLD CHIAT, M.D. (Nassau Hospital, Nuclear Med. Dept., Mineola, New York)

The exhibit correlates renal scintiscanning and diagnostic urographic examinations in a variety of pathologic states. Unusual lesions such as medullary sponge kidney, giant adenoma, hemangioma, and trauma are included. The contributions of the renal scan in radiographically equivocal cases is stressed. Kodachrome enlargements of the gross pathology and odor scans are shown in many cases.

***"Radiocirculography and Cerebral Circulation"*** OTTO EICHHORN, M.D. (University of Graz, Psychiatric—Neurologic Clinic, Graz, Austria)

This exhibit is designed to illustrate the valuable role of radiocirculography in the documentation and localization of cerebral vascular disorders and the application of this method to the diagnosis and therapeutic management of such disorders.

A brief history and a detailed and concise description of the method, (the apparatus and the radioisotopes used) is offered, along with radiocirculograms of normal patients.

Finally, there are some examples of radiocirculograms on patients with cerebral vascular disturbances, demonstrating the use of this method in objectively evaluating the effect of a vasodilating drug on cerebral perfusion.

***“Combined Lung-Liver Radionuclide Scan in the Diagnosis of Subdiaphragmatic Abscess”*** DONALD W. BROWN, M.D. (Dept. of Radiology, University of Colorado Medical Center, Denver, Colorado)

Subdiaphragmatic abscess is a disease which is both difficult to diagnose and frequently fatal. By combining simultaneous lung and liver radioisotope scans, it is possible to delineate the space between the right lung and liver. A striking difference between the normal pattern and that in patients with right subdiaphragmatic abscesses is seen. Thirty-four of these combined lung-liver scans have been performed. Ten patients had subdiaphragmatic abscesses demonstrated clearly by their scans and subsequently proved at surgery or autopsy. There was one false positive scan and the other twenty three studies were interpreted correctly as negative. This technique has proved helpful in directly the surgical approach to these abscesses, as well as in their diagnosis.

***“Isodensity Converter for Radioisotope Scanning Film”*** ROBERT ROBBINS, CHARLES HAAS AND K. C. TSIEN (Temple University Medical Center, Philadelphia, Pennsylvania)

This converter can show immediately on a monochrome or a color TV monitor several isodensity contours from film recorded by radioisotope scanning with data blending technique. The film is viewed by a Vidicon camera. With film obtained from a conventional scanner, the color TV monitor shows the equal density regions by groups of small dots with different colors. The photographic density represented by the contours or dots can be adjusted continuously within a pre-determined range. A polaroid camera is attached to this unit for taking pictures from the TV monitor.

***“The Crescent Pattern of Increased Activity in Brain Scanning”*** JAMES L. QUINN, M.D. (Dept. of Nuclear Medicine, Chicago Wesley Memorial Hospital, Chicago, Illinois)

The crescent pattern of increased radioisotope activity seen in either the anterior or posterior projection of brain scanning was thought to be specific for subdural hematoma. As experience in brain scanning has occurred, we have found this pattern to be quite non-specific.

The patient's history and neurologic examination along with other ancillary laboratory findings allow the interpreter to approach the differential of this pattern of increased radioactivity more intelligently but frequently one still has to rely upon cerebral arteriography or craniotomy for more definitive diagnosis.

Cases illustrating this scan pattern in patients with subdural hematoma, granulomatous pachymeningitis, scalp trauma, craniotomy defect, cerebral vascular accident, and metastatic carcinoma will be included in the exhibit.

***“Heavy Particles in Experimental Medicine and Therapy”*** JOHN H. LAWRENCE, M.D. (Donner Laboratory, University of California, Berkeley, California)

The history of biological and medical research with heavy particles is presented, starting with the first biological studies performed in Berkeley in 1935 using neutrons from the newly developed cyclotron and demonstrating that heavy-particle-induced tissue ionization is much

denser than that produced by x-rays or gamma rays and has a greater relative biologic effect. Later, when heavier, charged particles with very high energies became available, further therapeutic studies were undertaken which led to the successful treatment of several diseases.

***“Use of Radioactive Phosphorous ( $^{32}\text{P}$ ) in the Diagnosis of Ocular Tumors”***  
**BERNARD GOLDBERG, M.D., GERALD B. KARA, M.D. AND SAUL ZAVELL, M.D.**  
**(New York Eye and Ear Infirmary, New York, New York)**

The exhibit presented the rationale and technique for the use of the radioactive phosphorous ( $^{32}\text{P}$ ) test in the differentiation of malignant from benign ocular tumors. The external approach for anterior segment lesions is contrasted with the conjunctival approach for posterior segment lesions of the globe. Representative cases are illustrated by illuminated color transparencies and tabular data are presented detailing the experience of the New York Eye and Ear Infirmary with over 300 cases in the past five years.

***“ORINS Symposia in Medicine”*** by **STAFF** (Oak Ridge Institute of Nuclear Studies Oak Ridge, Tennessee)

The Medical Division of the Oak Ridge Institute of Nuclear Studies periodically presents symposia for investigators using radiation and radioisotopes in biomedical applications. The project is supported by the United States Atomic Energy Commission, and the proceedings are published by the Division of Technical Information of the AEC. Invited experts from the United States and abroad present new material and critiques of the current status of their topics. Information is given on the published proceedings of recent symposia: Progress in Medical Radioisotope Scanning, 1962, Dynamic Clinical Studies with Radioisotopes, 1963, and Radioactive Pharmaceuticals, 1965.

***“High Speed Section Scanning of the brain”*** **P. H. CRANDALL, M.D., B. CASSEN, Ph.D. AND H. GASS** (University of California, Depts of Surgery/Neurosurgery and Biophysics-Nuclear Medicine, Los Angeles, California)

A scaled down, cutaway dynamic model of a high speed section scanner built at the Laboratory of Nuclear Medicine, UCLA, is presented. The instrument consists of a spherical cap wide solid angle detector with a 2,200 hole collimator which is operated hydraulically underneath the patient's head. The large solid angle detector has a shallow depth of focus and very high sensitivity enabling a sectional brain scan to be made in four minutes or less with an administered dose of 5 mC of  $^{99\text{m}}\text{Tc}$ . Selected brain section scans and cerebral angiograms of patients with tumors of different shapes and configuration are exhibited to illustrate the advantages of brain section scanning. <sup>1</sup>(See last page).

***“A Color Re-Scanner for Clinical Use”*** **Medical Nuclear Instrumentation Group Oak Ridge National Laboratory, Oak Ridge, Tennessee**

The ORNL color “re-scanner” is an analog computer for analysis of scan records; it produces a “computed” secondary scan record in color. In the simplest form, counts (or film opacities) are continuously integrated with a definite integration area; the “computed” out-put is an isocount contour map. Some simple data-analysis methods used with digital computers are also available.

We have developed this device—especially for clinical use—with emphasis on ease of use, speed, and lower cost than digital methods. It is helpful in reconstituting marginally useful or difficult-to-interpret scans; the quantitative nature of the final record is useful on all scan records.

<sup>1</sup>Research sponsored by the U.S. Atomic Energy Commission under contract with the Union Carbide Corporation.

***“Regional Blood Flow Studies with Radioalbumin Macroaggregates”*** JOHN C. KENNADY, M.D. AND GEORGE V. TAPLIN, M.D. (Laboratory of Nuclear Medicine and Radiation Biology, School of Medicine, University of California, Los Angeles, California)

The exhibit presents color transparencies of scan images and autoradiographs of transverse brain and lung sections following arterial injection of albumin  $^{125}\text{I}$  macroaggregates which demonstrate the regional variations of blood flow by the relative concentrations of radioactivity within these organs. Also displayed are segments from a color movie showing the physical mechanisms of arterial entrapment and release of arterially injected radioalbumin macroaggregates in the animal's cerebral cortex and exteriorized omentum. Finally schematic illustrations are presented to explain the minute ( $50\ \mu$  or  $75\ \mu$ ) lesions found after injection of a single 2 mg dose of 10-60  $\mu$  size RAMA.

***“Major Applications of Lung Scanning”*** GEORGE V. TAPLIN, M.D., EARL K. DORE, M.D., NORMAN D. POE, M.D., L. A. SWANSON, M.D. AND A. GREENBERG, M.D. (Lab of Nuclear Medicine and Radiation Biology, School of Medicine, University of California at Los Angeles and Los Angeles County Harbor General Hospital at Torrance and Olive View Hospital, Olive View, California)

This exhibit shows the equipment, test agents and techniques for performing lung perfusion and radioaerosol inhalation scans. Approximately 1500 patients with a wide variety of pulmonary disorders have been studied with one or both scanning procedures during the past 30 months. Scan findings are routinely correlated with conventional roentgenograms of the chest and when indicated with pulmonary angiograms and bronchograms. Results of such investigations are evaluated in large groups of patients with suspected pulmonary embolism; in following the course of pulmonary embolism; in patients with tuberculosis, chronic obstructive bronchopulmonary disease, and pulmonary emphysema. The clinical usefulness of the scanning procedures is illustrated in each disease category, by comparison of scan findings, chest films, angiograms and function test results.

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*In the listing of Scientific Exhibits on page 395 of the May 1966 issue of JNM, the name of Arthur S. Grove, Jr., M.D. was inadvertently omitted as the co-author with Dr. Giovanni Di Chiro of the scientific exhibit entitled, “Salivary Gland Scanning with Technetium ( $^{99m}\text{Tc}$ ) Pertechnetate”.*