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MALLINCKRODT TEAM DEVELOPS TRANSAXIAL EMISSION TOMOGRAPHY

MIR'S - Unique Approach
"COMPUTERIZED TOMOGRAPHY"
Mallinckrodt Team's Unique Approach

A team of bio-medical scientists from MIR'S Division of Radiation Sciences, under the direction of Dr. Michel Ter-Pogossian, has developed a Positron Emission Transverse Tomograph (PETT) — a unique device which produces cross-section imaging of the body subsequent to the administration, through intravenous injection or inhalation of radio-active gases, of radio-pharmaceuticals labeled with nuclides emitting positrons. The team responsible for the one-year research and development program has been (in alphabetical order): Carol Coble, Edward Hoffman, Ph.D., John Hood, Nizar Mullani, Michael E. Phelps, Ph.D., and Michel M. Ter-Pogossian, Ph.D., in conjunction with Drs. Jerome Cox, Henry Huang, and Donald Snyder of the Biomedical Computer Laboratory.

The Positron Emission Transverse Tomograph, a unique concept in tomography developed at Mallinckrodt Institute, is demonstrated by Michel M. Ter-Pogossian, Ph.D., Professor of Radiation Sciences.

Position emission transaxial tomography represents an advance over current nuclear imaging systems which obtain a two dimensional image representing the summation of all radioactivity throughout the depth of the object being scanned — thus degrading the images by their superimposition. With the PETT there is no super-imposing of the data and the actual location of the radioactivity in the "slice" or layer can be determined in four to six minutes. Results are available within the same length of time.

Although the PETT requires the use of positron emitting radio-nuclides, the radiation absorbed dose delivered to the patient is frequently less than that incurred with conventional nuclear medicine procedures. This results from the very short physical half-lives of the positron emitters employed, e.g., $^{11}$C — 20 minutes; $^{15}$O — 2 minutes; $^{13}$N — 10 minutes; $^{68}$Ga — 68 minutes.

This system, which has been made possible by the teamwork funding of NIH, MIR, and the Advertising Women of St. Louis, offers many exciting possibilities in the demonstration of important data of the brain, heart, liver, and pancreas, in the detection of cancer and metastatic cancer in many organs and in providing information on tumors hitherto undetectable by other methods. Observations with phantoms and animals as well as preliminary measurements in humans show that this approach will provide true regional, quantitative information.

Radio-pharmaceuticals used are either labeled with cyclotron produced radio-nuclides or generator produced Gallium '68. Dr. Michael Welch is responsible for the synthesis of the radiopharmaceuticals employed by the group. This imaging system is especially suitable to MIR since the cyclotron of Washington University Medical School is located in Mallinckrodt Institute and Barnard Hospital where John Hood supervises the engineering of the cyclotron. But the PETT is not limited to institutions with a cyclotron. The Gallium '68 is an available commercial source of the positron — emitter which means that the various radio-pharmaceuticals can be made at any hospital.
John Hood supervises the engineering of the cyclotron.

Two Interdate processors are included in the Radiation Sciences' computer system. Nizar Mullani, left, demonstrates the tape drive and Carol Coble is seated at the terminal.

By combining the speed and accuracy of the digital computer with advanced gamma-ray technology, the PETT enables a tomographic reconstruction of the image to be carried out by the computer. 23,040 individual readings are taken for each slice with a 60° rotation. These readings are sorted and corrected by the computer and a mathematical reconstruction is done to produce an image of the distribution of the radio-pharmaceuticals in the patient.

The patient lies on his back with his body partially inside the detector. The test can be done without hospitalization, inconvenience, or discomfort.

Though similar to the computerized technique of the EMI Scanner, the PETT differs in that it works by emission (patient is given radio-pharmaceuticals which are then emitted by patient and detected by tomograph) whereas EMI works by transmission (EMI has own source of radiation which shoots through patient, is absorbed, and then is detected by the scanner). The EMI system images structural morphology (study of shapes) based on differences in the attenuation of X-rays whereas the PETT system images organ functions based on the distribution of radio-nuclides.

Clinical studies will be directed by Drs. Barry Siegel and Edward Coleman and according to Dr. Coleman, the PETT system offers many exciting possibilities in nuclear medicine imaging and the investigation of a wide range of conditions in many cases revealing information never before gained by other means. For example, not only will brain tumors be identified, but the metabolism of these tumors and the effect of these tumors on normal brain metabolism can be studied.

Another interesting area in which the PETT will be used is in the evaluation of heart disease. Although there are presently methods to detect patients with lack of blood flow to the heart muscle, a good method for quantitating the amount of heart muscle with inadequate oxygen supply is not available. By using various positron emitting radio-pharmaceuticals, the areas of ischemia can perhaps be identified and differentiated from areas of infarcted heart muscle. With the use of labeled metabolic substrates and the PETT, the metabolic function of the heart at rest and under stress could also be studied. These parameters that can be measured with tomography are extremely important since many treatments are presently being evaluated in patients with myocardial infarction to decrease the amount of heart muscle that dies. With this system it will be possible to evaluate the effects of these treatments on the normal and ischemic myocardium.
EMISSION TOMOGRAPHY

The liver is an organ in which it is difficult to detect small lesions by radionuclide scanning since abnormalities are usually surrounded by normal liver tissue hiding the small lesions. Since the PETT is taking a "slice" through the organ, small lesions can be identified with this system. It is also hoped that the PETT will make possible the evaluation of the pancreas. Presently this is a difficult organ to study by any examination but preliminary studies have suggested this may be feasible.

Physicians from Washington University Medical School are expecting to find the tomograph instrument useful in various medical disciplines such as cardiology, neurology, neurosurgery, and neuroradiology.

Dr. M. E. Raichle, Assistant Professor of Radiation Sciences in Radiology and Neurological Sciences (Neurology), in a paper, "Cerebral Blood Flow and Metabolism", presented in London at the 1974 Ciba Foundation Symposium on the outcome for severe brain injury, stated the following: "The development of a variety of physiologically important radiopharmaceuticals which emit positrons, accompanied by the parallel development of practical algorithms for the analysis of their behaviour, has resulted in the recent availability of several important measurements of regional brain metabolism and blood flow in vivo. Coupled with recent advances in detector systems, these developments promise to provide, safely and easily, significant in vivo information in patients with acute brain injuries. Such information is clearly necessary for the rational understanding of the pathophysiology of acute brain injury."

The full impact of transaxial tomography is not yet known and only time will realize its potential. Dr. Ter-Pogossian has already demonstrated the effectiveness of the scanner through numerous pre-clinical trials and after extensive use in a series of experimental studies, indications are very strong that the new facility will be ready for clinical use in the near future.

"Magazines, Please"

In order to make the patient waiting rooms more enjoyable and comfortable for our many patients and their families, we would appreciate donations of any recent magazines. This is a continuous problem so immediate and future contributions to the reading tables will be greatly appreciated. Magazines may be left in the Public Relations Office on the second floor.

MIR Provides Educational Approach For Pharmaceutical Sales Trainees

Mallinckrodt Institute of Radiology is presently engaged in a pilot program designed to supplement the contemporary methods used for training pharmaceutical salesmen. Collaborating with the Mallinckrodt Chemical Company in this new educational approach for sales trainees, M.I.R. has agreed to provide a series of lectures covering the fundamental principles of radiological science, along with certain other topics that will give the trainees insights into the administrative operations and functions of an x-ray department.

On March 4, Dr. Ronald G. Evens, Director of the Institute, spoke to the Mallinckrodt trainees on organizational structure of the department, contrast media used, and the protocol for sales trainees within the x-ray department. Mr. Armand Diaz, Technical Administrator, spoke on the principles of radiography, equipment, and factors affecting radiographic quality.

The trainees participated in an organized tour of M.I.R. and observed for one day under the direction of each floor supervisor, the daily operations of the clinical sections.

Barbara Bridgeforth, secretary to Dr. F. Lee and Dr. J. Marks in Radiation Oncology, is a native St. Louisian. She is a certified medical secretary graduate from Northeast Missouri State University, lives in Normandy, and enjoys golf.
PROCEEDS OF 1975 GRIDIRON EARMARKED FOR ADVANCED MAMMOGRAPHY EQUIPMENT

The Advertising Women of St. Louis will donate proceeds of this year's Gridiron dinner-show to improve breast cancer detection equipment at Mallinckrodt Institute, especially the purchase and installation of advanced instruments using X-ray film in vacuum containers.

Funding of the improvements to the breast cancer diagnostic equipment was spearheaded by AWSL member Betty Zemitsch, “Devil’s Advocate” Chairman for the Gridiron (which includes St. Louis and St. Louis County business and professional men who pay $100 for the privilege of NOT attending the March 19th Gridiron event). They are the “devilish” stay at home counterparts of the “Angels” (women who pay $100 to attend).

In making the announcement March 3, at Barnard Hospital, the Gridiron General Chairman Jane Sprague said “Breast cancer is the single most common type of cancer in woman.” It is believed that this gift of a second mammography unit will make the facility the most modern in the area for this type of breast cancer diagnosis, and will allow not only seeing more patients per day, but a wider range of patients than is now possible.

YOU MET...

PROFILE OF ERIK SELIAK

Erik Seliak, 27, was born in Genoa, Italy, and at age three, moved with his family to Australia. Eric received a B.Sc. degree in Physics and Computer Science from Melbourne University. Coming to St. Louis in 1973, Eric traveled extensively in Europe before joining the Radiation Oncology Computer Section as a Programmer.

The announcement meeting included a televised interview of Lucy England, President of the Advertising Women of St. Louis, Inc., and Dr. Ronald G. Evens, Director of Mallinckrodt Institute of Radiology. Dr. Evens stressed that while the self-test for breast lumps or nodules remains the single most important test for breast cancer, the special imaging technique of mammography determines whether these breast lumps are cancerous or benign, whether a surgical examination is necessary, whether infection is present, and can detect nodules too small or deep to be felt manually.

Since 1945, $339,000 raised through the annual Gridiron events has been donated to cancer research. In 1967 a special cancer research floor at Barnard Hospital was dedicated to the Women’s Advertising Club of St. Louis.

The 1948 Gridiron enabled Barnard to introduce and make available in the St. Louis area, the now famous Papanicolau method (“Pap test”), a simple means of early detection of cervical cancer.

Included in the 1975 donation to Barnard Hospital are tributes in memory of AWSL members Beulah Schacht Skinner and Myra Stroud.
MALLINCKRODT’S “NEW

Third Floor

Third Floor’s Cardio-Vascular Suite, which includes bi-plane radiography, fluoroscopy, and cine radiography, is powered by a new 2000 M.A. constant potential generator enabling greater flexibility in the filming methods. Barbara Pearson, R.T., prepares patient for Cardiac Catheterization.

Fourth Floor

Fourth Floor’s New Siemens Radiography-Fluoroscopy Unit for spot filming offers the option of front or rear cassette loading on 100 mm spot filming where the exposure time is reduced considerably thereby eliminating the problem of patient motion. Phyllis Isbell, R.T., explains the barium enema procedure to patient, Stanley Jenkins.

Loading the spot film device on a second new Radiography-Fluoroscopy Unit, also on Fourth Floor, is Connie Huesgen, Student Technologist. Patient, Charles Williamson, will receive an Upper G.I.

Queeny Tower

Bob Ronecker, R.T., Technical Supervisor, Queeny Tower, positions patient, Beverly Schroeder for an ankle examination in the new Radiography Room which features a 1250 M.A. three-phase generator.

The now Polytome Room on Third Floor features a pleuri-directional body section radiography unit used primarily to demonstrate minute bone anatomy within the skull. Mike Albertina, R.T., Assistant Technical Supervisor, demonstrates procedure with Carla Vogel, acting as patient, assisted by Louise Elinsson, R.T.

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LOOK" IN X-RAY EQUIPMENT

Fourth Floor West Wing

Pictured in the new office and conference room facilities on Fourth Floor West Wing are secretaries, Sue Day, left, and Ann Brock.

Becky Lueng, secretary, and Dr. Mokhtar Gado prepare for his lecture series in Bermuda involving computer cranial tomography.

Fifth Floor

The Multi-Planograph allows pleuri-directional body section radiography. The X-ray tube can be programmed to move in linear, elliptical, or circular motions. Phil Sotir, R.T., Technical Supervisor, positions 7 year old patient, Carl Hermann, for laminography of the 4th lumbar vertebrae.

A new Pediatric Radiograph Room features the same installation as in Queeny Tower. Johnnie Moore, R.T., Assistant Technical Supervisor, adjusts patient, 10 year old Patrick Howard, for an X-ray of the forearm.

Pediatric Radiology's newest installation, the Thoracomat, permits chest radiographic exposures to be synchronized with the precise phase of respiration by means of a heat-sensor placed at the patient's mouth.
DR. GIL JOST NAMED JAMES PICKER FELLOW

The James Picker Foundation has selected Dr. Gilbert Jost as a 1975 Scholar — an honor based on the young staff member's unusual potential to contribute to diagnostic radiology and the basic sciences related to medical imaging. The Foundation will set aside $40,000 to be used by Washington University School of Medicine over a four year period to provide enhanced opportunities for Dr. Jost in research, self-development, and advancement as a member of the faculty. In addition to his residency workload, Dr. Jost has distinguished himself at Mallinckrodt through his knowledge and contributions to MIR's computer system installed on the twelfth floor.

Dr. Jost, Mr. Rex Hill and Mrs. Pamela Studer are responsible for the design of programs which will initially be used to capture information on all patients entering the department. A data base on any patient seen in the preceding thirty days will provide information on the patient's films and previous visits without the reentry of data. The system will also generate input information for the billing and accounting program on the main campus. Numerous new ways to use the computer will be introduced in the future in support of improved efficiency in the radiology department and expanded data retrieval on all patients.

Dr. Jost's keen interest in problems in the biomedical computer field dates back to Harvard University where he was an undergraduate student. Graduating magna cum laude with highest honors from Harvard in 1964, Dr. Jost received his M.D. degree from Yale Medical School in 1969 where he was the recipient of a fellowship to investigate medical computer applications at Yale.

Dr. Jost, 32, who has served as Co-Chief Resident of MIR, was nominated for the Picker Scholarship by the Washington University School of Medicine, Department of Radiology, and his preceptor will be Dr. Ronald Evens, Director of MIR and a former James Picker Advanced Academic Fellow in Radiology. Dr. Jost will complete his diagnostic radiology residency at the Institute on June 30, 1975, and will continue on the staff as an Instructor in Radiology. He has applied for certification by the American Board of Radiology. Dr. Jost is primarily interested in the teaching of medical students and as a Picker Scholar he will devote at least one-third of his time to the development and expansion of the MIR computer system in support of his goals in radiology.

PERSONNEL ASSISTANT

Mary Lou Bernhoft assumed the position of Personnel Assistant on March 11, 1975. Questions related to payroll, employee benefits, parking, and personnel guidelines should be referred to her at phone extension 2851. Mary Lou will be responsible for the personnel activities formerly handled by Connie di Christina, who is moving to California.

Mary Lou is a graduate of the North Dakota State University at Fargo, N.D. with a B.S. in Textiles and Design. Her husband, Rolin, is a third year student at Washington University Medical School. Mary Lou's hobbies include tennis, ballet, and fashion designing.
NEW MIR APPOINTMENTS, 1975

Dr. Michael A. Mikhael will complete his residency in diagnostic radiology at the Institute and remain on the staff as an Instructor and Fellow in Radiology for an additional year of experience in neuroradiology, effective July 1, 1975.

Dr. R. Gilbert Jost will complete a diagnostic radiology residency at the Institute on June 30, 1975, and will continue on the staff as an Instructor in Radiology and James Picker Fellow in Academic Radiology.

Dr. Carlos V. Rosenbom will join the staff in Radiation Oncology as an Instructor in Radiology on July 1, 1975. He is currently a clinical fellow in therapeutic Radiology at the New England Medical Center Hospital in Boston.

Dr. William A. Murphy, Jr. will complete his residency in diagnostic radiology and remain on the staff as an Instructor in Radiology in the bone and joint section of the Institute, effective July 1, 1975.

Dr. Isidro L. Huete will complete a one-year fellowship in neuroradiology on July 1, 1975 and remain on the staff as an Instructor and Fellow in Neuroradiology for an additional year of experience.

Dr. Fred Zivnuska has been awarded a second-year Junior Faculty Clinical Fellowship from the American Cancer Society for the period July 1, 1975—June 30, 1976. Dr. Zivnuska is currently in his first year of this fellowship and is an Instructor in Radiology in the division of radiation oncology.

Dr. Gary D. Shackelford will return to active status at the Institute and assume an administrative post as co-chief of the section on pediatric radiology in addition to his clinical and research activities as Assistant Professor of Radiology. He is currently on leave-of-absence serving a tour of duty with the United States Air Force at Lackland AFB in Texas.

Dr. Arthur A. Porporis joined the staff of the Mallinckrodt Institute as an Assistant Professor of Clinical Radiology, effective 1/1/75.

Dr. Federico Reiter returned from Chile to join our staff as an Instructor in Radiology in the abdominal roentgenology section, effective 2/15/75.

Dr. Karen L. Brandt joined the staff in the Radiation Oncology Division as a Research Associate in Cancer Biology, effective 2/1/75.

Dr. Gerardus Freeriks joined the Radiation Oncology staff as a Research Associate in Cancer Biology, effective 1/1/75.

Dr. Paul P. Busse will join the staff as an Instructor in Radiology on July 1, 1975, following a residency in radiology at St. Louis University.

Dr. Javad Jamshidnejad will complete his residency in radiology at Albany Medical Center and join the staff at the Institute as an Instructor in Radiology on July 1, 1975.

DR. WILLIAM POWERS INTERVIEWED
ON THYROID CANCER

From the 1920's to the 1940's, a popular and widely accepted treatment was the use of X-rays to destroy diseased tonsils and adenoids, shrink swollen lymph glands in the neck and the thymus gland in the chest, and to cure facial acne.

The X-ray treatment involving the head, neck, and upper chest was given mostly to children and in some instances part of the radiation inadvertently passed through the thyroid gland which lies under the Adam's apple at the base of the neck.

Over the years, medical findings have reported that thyroid cancers were frequently occurring in adults who had received this type of treatment as children.

In the context of these publicized reports on the high incidence of thyroid tumors, Dr. William Powers, Director of the Radiation Oncology Division and Professor of Radiology at Mallinckrodt Institute was interviewed on KMOX-TV on March 7, 1975.

Dr. Powers pointed out that very little of this type of radiation had been given in the St. Louis area and that when thyroid cancer does occur, it is a highly treatable and curable cancer.

Dr. Powers stressed the following follow-up care for anyone who thinks he or his children might have been irradiated:

1. Thyroid Scan to detect nodules.
2. Physician's examination of the thyroid gland which involves palpating the gland to discover location of nodules.
3. Quick action — the earlier thyroid cancer is diagnosed the better chance for cure.

MIR SINGERS IN REHEARSAL

Pictured left to right, front row, seated: Marge Perry, Nadine Getz, and Virginia Trent, Director and Pianist. Standing, left to right: Delores Pelletier, Becky Leung, Bettye Thomas, Nancy Medley, Sheila Doerhoff, Susan Ratliff, Dr. John Forrest, and Chaplain Bob Davis. Second row: Norm Hente and Lou Hoger. Not pictured: Irene Mulac, Ron Craig, and Terry Karch.
Faculty for the 1975 MIR Alumni Meeting, March 5-9 at Camelback Inn, Scottsdale, Arizona included: Drs. Ronald G. Evens (MIR Today, Radiology Business Procedures), John V. Forrest (Chest Radiology), and Gary D. Shackelford (Pediatric Radiology).

Dr. Marcus E. Raichle has been appointed to the editorial board of Stroke.

James Purdy, Ph.D. presented an invited talk on "Dose Distributions in Moving Strip Radiation Therapy" by Arnold Feldman, James Purdy, and Al Hrejsa at the Fifth Varian Clinac Users Meeting in Pebble Beach, California, January 15-17, 1975.

Michael E. Phelps, Ph.D., presented the following invited papers at the Society of Nuclear Medicine meeting, The Past, Present and Future of Non-Invasive Brain Imaging, in Salt Lake City, Utah on January 19, 1975:
- "Computerized Transaxial Reconstruction Tomography" by Michael E. Phelps, Edward J. Hoffman, Mokhtar Gado and Michel M. Ter-Pogossian.

Dr. Robert Stanley was guest lecturer at a Seminar sponsored by the Medical Society of Caracas, and enjoyed a 5 day visit to Caracas, Venezuela with his wife, Sally. Included on the program of lecturers was Dr. Denton Cooley and Dr. Henry Kaplan, Stanford University, California. Dr. Stanley found the quality of medical practice in Caracas to be excellent, surpassed only by the friendliness and hospitality of their hosts.

Dr. Thomas Fuller has been appointed Chief Resident for 1975-76 and Dr. Gene Davis Co-Chief Resident. Drs. Fuller and Davis will be working closely with Dr. Jack Forrest in the continued development of MIR's residency program.

Dr. Carlos Perez, Chief of the Clinical Section in the Division of Radiation Oncology, recently attended the XI Congress of the Interamerican College of Radiology in Bogota, Columbia, South America. Dr. Perez participated in a round table discussion on "Radiation Therapy of Soft Tissue Sarcomas." Immediately following the meeting, Dr. Perez vacationed in Colombia, his home.

Dr. Mokhtar H. Gado presented a series of five lectures at the International Symposium and Course on Computed Cranial Tomography in Hamilton, Bermuda, March 9-14. The meeting was sponsored by Paul F. J. New, M.D. and Juan M. Taveras, M.D.

Dr. G. Leland Melson attended the 18th Annual University of California Diagnostic Radiology Post Graduate Course in San Francisco, California, February 17-21. En route home, Dr. Melson and his wife, Brenda, had an enjoyable visit with Dr. and Mrs. Charles L. Robertson of Boise, Idaho. Dr. Robertson was a member of the MIR staff prior to entering private practice in Boise some 2½ years ago. Dr. Melson reports, "A highlight of our visit with the Robertsons was an invigorating day of cross country skiing."

"Arthrography of the knee after meniscectomy" by Drs. James Debnam and Tom Staple, published in the October issue of Radiology, has been selected by the Year Book of Orthopedics and Traumatic Surgery for an abstract in a forthcoming issue.

Dr. Mokhtar H. Gado delivered a lecture, "Mechanism and Implications of Contrast Enhancement in Cranial Computed Tomography," Mokhtar H. Gado, M.D., and Michael E. Phelps, Ph.D., at the Workshop on Reconstruction Tomography in Diagnostic Radiology and Nuclear Medicine which was held in San Juan, Puerto Rico, April 17-19. The Edward Mallinckrodt Institute of Radiology and Biomedical Computer Laboratory, Washington University School of Medicine co-sponsored the workshop.

Dr. Tom W. Staple was installed as an associate member of the American Academy of Orthopedic Surgeons at the March meeting in San Francisco.
Dr. Ronald G. Evens has been elected to the board of directors of City Bank.

An exhibit by Drs. Edda de Sevilla, James Debnam, and Tom Staple entitled “Preoperative Localization of Nonpalpable Breast Lesions” was shown at the 14th Annual Conference on Detection and Treatment of Early Breast Cancer given by the American Cancer Society and the American College of Radiology in Puerto Rico March 10-14, 1975. Attending the conference from Mallinckrodt was Dr. Edda de Sevilla.

Dr. Mokhtar H. Gado will attend the 13th Annual Meeting of the American Society of Neuroradiology June 3-7 in Vancouver, British Columbia.

Dr. William H. McAlister, Professor of Radiology, and Dr. William E. Allen, Associate Professor Emeritus of Clinical Radiology, were guests on the KSD-TV program, “The Black Experience”, December 15, 1974. “X-ray, Economics, and Pediatrics — A Three Fold Problem” was the topic discussed by the radiologists and Host, Howard Wood, and Robin Smith, Co-Host.

MIR Alumni

70’s
Dr. John D. Armstrong, Salt Lake City, is assistant Professor of radiology at the Utah Medical Center and Chief of Radiology at the V.A. Hospital. He is researching membrane oxygenation in adult respiratory diseases.

Dr. Robert S. Francis, Rockville, Maryland, is on the staff of the diagnostic radiology department of the National Institute of Health.

PROMOTIONS, Effective July 1, 1975

Dr. Robert Stanley to the rank of Associate Professor of Radiology.
Dr. Mark Eagleton to the rank of Associate Professor of Clinical Radiology.
Dr. Sumner Holtz to the rank of Associate Professor of Clinical Radiology.
Dr. Marcus E. Raichle to the rank of Associate Professor of Radiation Sciences in Radiology.
Dr. Louis A. Gilula to the rank of Assistant Professor of Radiology.
Dr. Emily L. Smith to the rank of Assistant Professor of Radiology.

Two “Firsts”

Dr. and Mrs. King Tak Lee (Joseph) announce the arrival of their new son, Alexander S. Y. Lee, born January 9, 1975.

Dr. and Mrs. Bharath Kumar (Jayanti) announce the birth of their daughter, Asha, on February 25, 1975.

South American Radiotherapist Visits Mallinckrodt

Dr. Felix Leborgne, radiotherapist from the Hospital Pereira Rossell in Montevideo, Uruguay, visited MIR’s Division of Radiation Oncology from March 5-7, 1975. Dr. Leborgne has special interest in pediatric tumors and recently participated in a round table discussion on this subject at the Interamerican Congress of Radiology meeting in Bogota, Colombia, South America. While at Mallinckrodt, Dr. Leborgne presented a talk in Scarpellino Auditorium on “Management of Wilms’ Tumors.”

... You know that old trees just grow stronger and old rivers grow wilder every day, but old people just grow lonesome waiting for someone to say hello in there, hello... So, if you see an old person just say... hello... and watch them smile...
from Bette Midler
MIR SINGERS IN PERFORMANCE AT CHRISTMAS PARTY

Christmas Photos by Tom Murry
Ladies and Gentlemen:

I am pleased to inform you of a most exciting and significant development for the Mallinckrodt Institute of Radiology. A major (and very likely revolutionary) development in diagnostic radiological equipment has been announced by the EMI Corporation of England, and the Mallinckrodt Institute of Radiology has been selected to be one of the first three worldwide Institutions to perform scientific and clinical investigations.

The major reason for this selection is our outstanding faculty and research performed by our Division of Radiation Sciences and its Director, Dr. Michel Ter-Pogossian, Professor of Radiology. Dr. Ter-Pogossian and his colleagues are at the forefront of knowledge and investigations related to the use of computers for diagnostic examinations with x-rays or radioisotopes. Indeed, the Division of Radiation Sciences has independently developed a related technique for the detection of special radioisotopes which are important in the diagnosis of diseases in humans.

We anticipate beginning our studies with the EMI Whole Body Computerized X-Ray Tomograph in July 1975. Due to the developmental nature of this technique, a certain amount of confidentiality is required and initially the equipment will only be used with carefully selected patients for clinical protocols. It is our firm belief that the technique will demonstrate its diagnostic importance rapidly and will become a key diagnostic test for many diseases.

The announcement of this technique and the news of our selection has already been mentioned in several national newspapers and magazines. My desire was to notify our MIR friends first; however, this has not been possible.

Rest regards.

Sincerely,

Ronald G. Evens, M. D.
Elizabeth Mallinckrodt Professor and Head, Department of Radiology, Washington University School of Medicine Director, Mallinckrodt Institute of Radiology
Anyone wishing to remember a deceased relative or friend now has the opportunity to do so in a permanent and valuable way through the Edward Mallinckrodt Institute of Radiology LIBRARY MEMORIAL. Your gift will be used to purchase a library volume which will contain a book plate acknowledging the name of the deceased and the donor. The relatives of the deceased will receive a Library Memorial card (with an enclosed book plate) explaining the nature of this memorial and expressing the gratitude of the Institute. Gifts may be sent to:

Library Memorial Fund
Edward Mallinckrodt Institute of Radiology
510 South Kingshighway
St. Louis, Missouri 63111

Dr. Ronald Evens informed the Editor that the impetus for this project came from Mrs. William H. McAllister who also designed the Library Memorial card and book plate.
The Section of Cancer Biology began as a very small laboratory designated as Radiation Therapy Research on the 7th floor of MIR. Dr. Powers, desiring a strong interface between the clinical and biological research activities within the Division of Radiation Oncology recruited Dr. Fred Valeriote in 1969 to proceed in that direction. As the facilities available in MIR at that time were inadequate and about to be renovated, Dr. Teresa Vietti in the Department of Pediatrics provided laboratory space to begin the studies on tumor biology, cancer chemotherapy and radiobiology. The staff consisted of Dr. Valeriote, Jim Patterson, Sandra Tolen, Barbara Wagner, Cliff Lucas and Phil Phillips who have remained at MIR plus two other technicians. Mr. Patterson has become both the administrator and technical supervisor of the Section. Under his direction, the job of purchasing and grant administration is removed from scientists to allow for more productive research with efficient operation of labs.

With the expansion of facilities on the 7th floor and the building of the 10th floor into which Cancer Biology moved in December 1970, a burst both of hiring and research activity took place. Chemotherapy research was expanded to include Dr. Hsiu-san Lin and Dr. Palmer Steward. Dr. Valeriote and Sandra Tolen are now studying the effects of drug combinations and immunochemotherapy regimens on experimental leukemia in an effort both to provide a scientific basis and provide experimental input into clinical treatment schedules. Similarly, Evelyn White is carrying forward projects on experimental plasma cell tumors in collaborative projects involving Medical Oncology and Pathology. One of
Dr. Lin’s activities concern chemotherapy of spontaneous lymphoma of AKR mice as a model for glucocorticosteroid-sensitive human tumors. Working with Scott Sauerbrunn, his goal is to elucidate the mechanisms by which the corticosteroid treatment enhances the cytocidal action of other anticancer agents. The thrust of Dr. Steward’s research involves computer modeling at the cellular level for both the description and therapy of tumors. Experimental data acquired in his laboratory by Richard Florman, by other members of Cancer Biology as well as by researchers elsewhere will be used in the design by computer of cancer treatment schedules. The growth and response of both tumor and normal cell populations is studied to determine how to eradicate the tumor while minimally damaging normal tissues. Dr. Mark Edelstein completed his Ph.D. with Cancer Biology last year and will be joining the staff in June after completing his M.D.

In order to include a promising new area of investigation in cancer research, Dr. Carleton Stewart began an immunology program. One of Dr. Stewart’s projects, under the direction of Barbara Hamill, deals with the immunoreactivity of cancer patients undergoing radiation therapy to determine whether the competence of a patient’s immune system correlates with prognosis. Barbara Wagner is studying the experimental correlate of this program by irradiating normal and tumor-bearing mice and examining the effect on the immune system. A second area of investigation deals with studies on macrophage function. Drs. Lin and Stewart found that colonies of macrophages can be obtained when certain conditions are met. Using these cloned cells, Cheryl Adles and Barbara Devaraj are studying the various functions of macrophages. These include the origin, proliferation and differentiation kinetics of macrophages and their...
role in both the control of cancer cells and the immune response.

It is important to understand the regulation of normal cells in any attempt to explain their conversion to malignant cells and to understand their response to drugs and radiation. Thus, a program in basic cell biology was initiated with Dr. Alex Nakeff, Dr. Ramanath Rao investigating two quite different normal cell populations and relating them in terms of response to chemotherapy and radiotherapy. Dr. Nakeff and David Floeh are studying the manner in which specific hormones control platelet production. Cell separation techniques and electronic analysis of purified platelet precursor populations are presenting new insights into how the complex interactions of cell proliferation and differentiation operate in this critical cell system. Also, a new cell colony technique is being developed by Dr. Susan Daniels-McQueen to assay for previously undetected platelet precursor cells.

Dr. Hill is interested in mechanisms by which cancer cells arise (carcinogenesis) and their subsequent history in the host. These problems are being approached from two directions. First, Cathie Miller is treating pregnant mice with chemicals known to cause cancer and the fetuses are removed and studied in tissue culture for the tumorigenic potential of their constituent cells. Second, the radiation response of a transplantable melanoma is being studied in mice and may give us some insight into how tumors persist once they have been initiated.

Dr. Rao has begun studies on hormone receptors and has developed techniques for their analysis. It is generally accepted that the hormonal dependent organs contain specific steroid binding proteins which
play a key role in hormone action and that cancer of these organs might be due to a perturbation in hormonal action. Based on the analysis of cancerous tissues for steroid binding proteins following removal from the patient, it is hoped that the classification of these cancers as hormonal dependent or independent will be of prognostic significance.

Three core groups are involved in the operation of the Cancer Biology section. First, secretaries, Jana Kesler, Donna Troeckler and Janet DiMaria provide communications, purchasing and the assurance that all of the data that finally finds its way into publication is professionally typed and formatted as required by the many different journals. The second core is animal facilities on the 7th floor where Cliff Lucas and Phil Phillips provide a high quality of animal husbandry. As might be expected, generated is a lot of dirty glassware which needs to be cleaned and often sterilized and hundreds of liters of tissue culture media are used each month. This third core facility is supervised by LeRoy Walker and includes Ken Kruse.

Ken Kruse. Two post-doctoral researchers are working with Dr. Steward: Dr. Gerry Freriks is developing a computer model for describing the response of bone marrow to various cancer therapy agents and Dr. Karen Brandt is embarking on experimental studies of a transplantable mouse tumor.

Richard Florman and Dr. Karen Brandt.

Finally, dozens of students carry on research projects yearly in the Cancer Biology laboratories and further augment their scientific knowledge via the Section's lecture series.

Barbara Hamill.

An annual report is available for those who would like to know more about Cancer Biology.
Sheila Doerhoff Reports:

Nancy Medley, medical transcriptionist, is attending Meramec Junior College, where she is working toward an Associates Degree in Liberal Arts. Nancy also plans to attend Meramec Junior College School of Nursing.

Susan Ratliff, 2nd floor medical transcriptionist, was awarded an honorary life-membership in the Missouri Branch of the National Parents Congress & Teachers Association on February 20, 1975. One of the youngest members to receive this distinction, Sue was honored for her volunteer activities and help with today's youth. She is also the new PTA President of the Sherman Elementary Schools. Congratulations, Sue, from all of us!!!!

Wedding Bells

Fred Curry, Radiation Oncology Computer Programmer, will be married on May 17, 1975 to Sarah Weinberg, Graduate Nurse at Jewish Hospital.

QUALIFIES FOR CHAMPIONSHIP SWIM MEET

Ann Stanley, 12 year old daughter of Dr. and Mrs. Robert Stanley, has qualified for the YMCA National Championship Swim Meet to be held in Fort Lauderdale, Florida in May. At the present time she has qualified for the 500 yard and 1 mile free style event. However, she hopes to qualify in several additional events between now and May by competing in further qualifying meets scheduled for March and April.

MIR'S ART EXHIBIT

The artistic endeavors of our MIR staff and families continue to meet with enthusiasm and appreciation, not to mention astonishment at the amount of unknown talent hidden among our co-workers. Please keep the Public Relations Dept. (Ext. 3718) informed of any "leads" or suggestions of talented, creative persons on our staff so that we may continue to have attractive and interesting exhibits.

From Dianne Van Doren:

NEW ADDITION

The newest addition to the Billing and Accounting Department is Pat O'Neil. Before coming to Mallinckrodt, Pat took classes in special education and was a volunteer teacher for the deaf. She plans to be married May 3 to Paul Good, an automobile salesman, and after marriage, Pat hopes to return to night classes at UMSL for her degree in special education. Her hobbies include bowling and ceramics.

ELECTED TO YWCA BOARD

Miss Nancy Craig has been elected to her second term on the Metropolitan St. Louis YWCA Board of Directors. She is Chairman of the Special Projects Committee which is involved in developing innovative criminal justice programs for women offenders.

1975 STUDENT FELLOWSHIPS IN RADIATION ONCOLOGY

A ten week summer program in Radiation Oncology for students who have just finished their freshman year in medical school is again planned for 1975. The program, coordinated by James E. Marks, M.D. and Carlton C. Stewart, Ph.D., is supported by funds from the American Cancer Society and the National Cancer Institute and its purpose is to expose students to the clinical and basic science aspects of oncology. Some students will work primarily in clinical radiation therapy and others will do laboratory research in cancer biology. A series of didactic lectures integrating clinical oncology and cancer biology is planned.

Students will be instructed in pediatric malignancy by Dr. Teresa Vietti and solid tumor chemotherapy by Dr. Cary Presant. In addition, they will attend related multidisciplinary conferences and participate in an abbreviated research project which they will be required to present at the end of the summer.

Applications to the program have come from a number of schools including Washington University and must have been submitted before March 1, 1975.
A major area of Radiation Oncology's Patient Information System is the follow up data facility which was established for the purpose of unifying and promoting the gathering of accurate statistics on patients who have received a diagnosis or undergone treatments for cancer at Mallinckrodt Institute. A computer support system is effectively used to acquire and implement follow-up data.

Working in this area of Data Retrieval are Cecile Newberry, Phillis Reed, Terry Maher, Marguerite Boyd, and Ellyn Domke.

The National Tumor Registry Association promotes an interchange of ideas and information among the affiliates. The St. Louis area has eighteen registries which were hosted on March 17, 1975, by Mallinckrodt Institute. Included on the business agenda was a discussion of the By-laws for the newly organized local chapter.

Following the meeting, Cecile Newberry and Phillis Reed escorted the members on a tour of MIR facilities.

Mrs. Edna Quick Retires April 1

Mallinckrodt was a "small family" when Mrs. Quick joined it in 1959 as a receptionist on second floor. Dr. Hugh Wilson was then Director of the Institute and in the words of Mrs. Quick, "Many illustrious men in the field of radiology have served here during my tenure."

During the 12 years Mrs. Quick spent at the second floor desk, she became a friend of many — physicians, technologists, students, nurses, and patients — offering understanding, genuine interest and concern for all with whom she worked. Prior to her retirement, Mrs. Quick worked on second floor Wohl Clinic.

Mrs. Quick's family of whom she is extremely proud, consists of a daughter, Georgia Bennington, and her husband, Dr. Brad Bennington, a surgery resident at Washington University Medical School, and two grandchildren, Rebekah, 6, and Daniel, 4.

When asked about her future plans at a farewell party given in her honor by co-workers, Mrs. Quick said she planned to spend some time at her small cottage in Illinois, do a "spot" of gardening in her back yard, perhaps pursue a volunteer activity, and seek a "little peace and tranquility."

Wherever she goes, Mrs. Quick will bring happiness to others through her warmth of personality and good humor. Her many friends at MIR hope she will visit us often as we shall miss her.
At the January meeting of the Southeastern Conference of Radiologic Technologists in Columbia, South Carolina, Armand Diaz, R.N., R.T., F.A.S.R.T., presented two course lectures entitled: "Transverse Axial Tomography" and "Factors Affecting Radiographic Quality During Angiography." Mr. Diaz also presented a graduate course on "Special Procedures" as part of the Annual Seminar for Radiologic Technologists held in Santa Barbara, California in February.

Gary Brink, R.T., will deliver this lecture, "Gaining Perspective of the Socio-Economic Issues of Today," at the Spring Symposium of Radiologic Technologists in Amana, Iowa.

Student Essay Awards

Several M.I.R. X-ray technology students were among the winners chosen in the annual essay competition sponsored by the Fourth District X-ray Society in February. Michael Ward's paper, "The Single Contrast Barium Enema Examination" netted him second place, while "Pneumoencephalography of the Posterior-Fossa," written by Bob Mackin, gained the third place award. Jerome Campbell won fourth place with his paper entitled, "A Simple, Accurate Measurement for Dimensions of Focal Spots of X-ray Tubes: The Pinhole Camera." The winners were announced by Terry Karch, R.T., Chairman of the Essay Competition. The essays were judged on their originality, educational or technical value, organization of material and mechanics.

Dr. William Mill, Director of Radiation Oncology Technology Training Program, with students.

Back row, left to right, Donetta Dodwell, R.T., Mark Petry, R.T., Gary Steffen, R.T. Front, Jim Miller, R.T., Judy Rubach, R.T., Catherine Harmon, R.T.
New Faces

Mickey Palier, R.T. in X-ray Technology and Nuclear Medicine, joined the Nuclear Medicine technology staff in February. Mickey took her training through St. John's Mercy Medical Center and was previously employed at Missouri Baptist Hospital.

Bill Abbott, R.T., new to the Third Floor technology staff, received an A.S. degree from Belleville Junior College and took his technology training at Centreville Illinois Hospital.

NEW FACES ON SECOND FLOOR:

Gary Hecht, R.T., received his A.A. degree in x-ray technology from Belleville Junior College.

Richard Hoepfner, R.T., took his training in x-ray technology at Homer G. Phillips Hospital.

RANDOM GLIMPSES OF NEW PERSONNEL

Susan Whitworth Tait, 23, is the new Treatment Planning Technician in the Physics Section of Radiation Oncology. She graduated in 1972 from the University of Missouri, St. Louis, with a B.A. in Physics, and was twice elected to Who's Who among Students in American Colleges and Universities.

Pamela Alexander has joined the Film Librarians as a Floater. Formerly a Nurse's Aid at Parkside Tower Nursing Home, Pamela enjoys bowling, movies, and roller skating.

Phillis Reed has joined the Data Retrieval Group of Radiation Oncology. On a leave of absence from nurses' training at Lutheran Medical Center, Phillis lives in Belleville, Illinois with her two children, Billy, 8, and Dawn, 3. She enjoys ice skating, swimming, and water skiing.
MIR AND CONTINUING EDUCATION

Continuing education has long been recognized as an important developmental tool for employees. Upholding this idea, MIR has taken an active role in providing continuing education opportunities for its employees through regularly conducted postgraduate courses, seminars, and lectures designed to assist the personnel in keeping abreast with current developments and technological changes within their field. In-service educational programs have also been provided for job related procedures.

Although MIR has excellent educational programs, many employees have found a need to supplement their education from outside as well. Some pursue additional education to become more proficient and advanced in their own field, while others plan to completely change to another career area. Still others seek out mind-broadening educational courses merely because they satisfy certain psychological needs. Whatever the reason may be, those who seek continued education will be preparing themselves for positions of greater responsibility, and will inevitably benefit not only themselves, but others with whom they might come into contact through social or professional relationships.

MIR Technical Staff members who are continuing their educations are:

Washington University
- Michael Albertina, R.T., Assistant Technical Supervisor, Business Administration.
- Joseph Bradley, R.T., Radiologic Technologist, Business Administration.
- Gary Brink, R.T., Chief Technologist, Business Administration.
- Joseph DiCroce, R.T., Technical Supervisor, Business Administration.
- Louise Griffin, Film Librarian, Computer Programming.
- James Patterson, B.A., Research Technical Supervisor, Business Administration.
- Anthony Raia, R.T., Assistant Technical Supervisor, Business Administration.

UMSL
- Cathie Miller, Research Technician, Physics.
- Scott Sauerbrunn, B.A., Research Technician, Business Administration.

Sandy Tolen, A.A., Research Technician, Biology.
Evelyn White, Research Technician, Biology.

St. Louis University
- David Flach, B.A., Research Technician, Biology.

Meramec Community College
- Barbara Hamill, M.S., Research Technician, Data Processing.

Florissant Valley Community College
- Jackie Martin, R.T., R.N., Liberal Arts.
- Mickey Palier, R.T., Nuclear Medicine Technologist, Liberal Arts.

SIU
- Terry Karch, R.T., Nuclear Medicine Technologist, Business Administration.
- Barbara Wagner, B.A., Research Technician, Biology.

Forest Park Community College
- Patsy Bridges, L.P.N., Liberal Arts.

Belleville Area College
- Diane Simpson, Radiologic Technologist, Liberal Arts.

WE ARE PLEASED TO WELCOME

Mr. Adam Vorlage has joined the Section of Physics, Division of Radiation Oncology, as senior research technician. Following a stint with the Air Force, Mr. Vorlage's work in electronics and design engineering in industrial and academic laboratories has taken him throughout the world. This included rocket re-entry studies on Roi-Namur island in the Pacific and microwave control of power generators in Saudi Arabia.

His hobbies include sailing, fencing, amateur radio, photography, and show horses. He has four riding horses which are kept near his home in Illinois.
BEST WISHES, DR. STAPLE

After an association of sixteen years with Mallinckrodt Institute, Dr. Tom W. Staple, Professor of Radiology and Chief of Musculoskeletal and Peripheral Angiography, resigned, effective March 15, 1975, to move with his family to Long Beach, California where he has joined the staff of Memorial Hospital Medical Center and to accept a clinical appointment with the University of California at Irvine. Through the years, Dr. Staple has distinguished himself by his competence as a radiologist, with his significant contributions to arthrography, and by his desire to advance the field of radiology.

On February 26, 1975, MIR friends gathered in the Fourth Floor Conference Room for a surprise Farewell Reception honoring Dr. Staple.

RADIATION SCIENCES DIVISION REPORTS:

Dr. Edward Weiss will present the following paper at the "Federation of the American Societies of Experimental Biology" in Atlantic City in May: "External detection of altered metabolism of 14C-labeled substrates in ischemic myocardium" Edward J. Weiss, Edward J. Hoffman, Michael E. Phelps, Michael J. Welch, Michel M. Ter-Pogossian and Burton E. Sobel.

Dr. Michael E. Phelps will present a paper in the planary session of the 22nd annual meeting of the Society of Nuclear Medicine in Philadelphia (June 17-20). The title of the paper is "A computerized transaxial tomograph for nuclear medicine imaging," by Michael E. Phelps, Michel M. Ter-Pogossian, Edward J. Hoffman, Nizar Mullani and Carol S. Coble.

Dr. R. Edward Coleman will present the paper, "Application of computerized radionuclide transaxial tomography with positron emitting radioisotopes," by R. Edward Coleman, Edward J. Hoffman, Michael E. Phelps, Michael J. Welch and Michel M. Ter-Pogossian at the planary session of the 22nd annual meeting of the society of Nuclear Medicine. (June 17-20).

The following papers will be presented at the Seventh International Symposium in cerebral circulation and metabolism, June 17-20, Aviemore, Scotland:

The Effects of increased intracranial pressure upon cerebral blood volume, blood flow, and oxygen utilization by Robert L. Grubb, Jr., Marcus E. Raichle, Michael E. Phelps, Robert A. Ratchescn.


Brain barrier permeability of 14C-labeled alcohols and 18O-labeled water by M. E. Raichle, J. O. Eichling, M. G. Straatmann, M. J. Welch, M. M. Ter-Pogossian.


A positron emission transverse tomograph (PETT) for the three dimensional and non-invasive measure of cerebral hemodynamics and metabolism by M. M. Ter-Pogossian, M. E. Phelps, E. J. Hoffman, M. E. Raichle.