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Computerized diagnostic system a reality

Scientists at Donner Laboratory have announced development of a diagnostic system that will give physicians a much more complete understanding of common disorders of the heart, brain and other vital organs.

Reporting to the Society of Nuclear Medicine meeting in Boston on July 14, LBL research physician Thomas F. Budinger said that the computer-controlled nuclear medicine system can provide important and in some cases previously unobtainable information on the dynamics of virtually all the important organs of the body.

With little or no discomfort to the patient, the system—developed over the past three years—can reveal in detail such vital physiological characteristics as rate of blood flow through the heart and brain, the location of dying regions of heart muscle (myocardial infarctions) and lung abnormalities such as blood clots, cystic fibrosis and airway obstructions. It can also detect congenital heart defects in children, inadequacy of kidney, liver and thyroid function, and changes in the size of bone tumors. Accurate data on such characteristics rarely have been available to the doctor, but would be invaluable in diagnosis and selection of treatment.

Evolution of the system was made possible by several technological advances in the field of nuclear medicine, the most important of which was development of a computer fast enough to handle all the data the diagnostic system produced.

The team that created the system included Budinger, engineers at Hewlett-Packard, and members of LBL Computation and LLL Theoretical Physics. Drs. James McRae, Howard Parker, Don Van Dyke, and Hal Anger, and Yukio Yano of the Donner Laboratory make up the team of researchers exploring clinical application.

This is how it works. Nuclear imaging cameras - a scintillation camera and a whole body scanner - record the minute radiations from isotopes introduced into the patient with polaroid photographs and simultaneous transmission of data into a computer.

In the past the data handling capability of imaging cameras has often been much too slow to "stop" the action of a dynamic organ for accurate diagnosis. Consequently

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AEC renews contracts with LBL, LLL, LASL for 5 years

Five year contracts for operation of Lawrence Berkeley Laboratory, Lawrence Livermore Laboratory and Los Alamos Scientific Laboratory to September 30, 1977 were signed June 16 by the University of California and the Atomic Energy Commission.

Two contracts were negotiated, one for the two Lawrence Laboratories and one for LASL. The University employs about 12,000 scientists, engineers, technicians, and support personnel at the three locations.

The agreements continue a relationship with the University begun more than 30 years ago when the first contract was signed by the U.S. Army Corps of Engineers Manhattan Engineer District, predecessor of the Atomic

Peacetime radiation incident training course held at Lab

"You are local authorities (policemen, firemen, etc.) who have received an emergency telephone call from the highway patrol. An officer has come upon a truck on a main highway. The driver is lying alongside his vehicle with a broken spine and injured leg. The truck has radiation placards and part of the shipment appears to be open and loosely tied down."

Fortunately, this event is fictitious. It's an exercise in a one-week Peacetime Radiation Incident Training program conducted by the California Office of Emergency Services for local police, fire, health, and highway patrol training officers and others who need to know how to respond to such emergencies.

The first course was hosted by Lawrence Berkeley Laboratory for 22 Bay Area "students" the week of June 20-26. The course will now travel around the state to teach key

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Two students at the Peacetime Radiation Incident Training course try to detect source and

Neighborhood Youth Corps' 3rd summer

For low income teenagers from minority racial groups, information about and access to challenging career opportunities is often worlds away. The Neighborhood Youth Corps is a U.S. Department of Labor program which aims to change this situation.

Lawrence Berkeley Laboratory is in its third summer of participation with NYC. This year 56 Bay Area high school juniors, seniors, or June graduates are working for ten weeks at the Lab, receiving job training in such assignments as clerical, technical shops, lab routines, and computer work.

The Neighborhood Youth Corps is one of several programs promoted and supervised by the Laboratory's Affirmative Action Program under Harold Wilson. Each year one of the Lab's interested employees is named to coordinate the summer NYC; this year Antonio Delacruz, a chemical technician with Dr. I. Perlman and Frank Asaro's group was asked by Wilson to take on the full-time summer job.

Students joining the program are first screened by their local NYC agency for motivation and academic aptitudes, then referred for a second interview process by the employing institution. LBL's students come from the City of Berkeley and Oakland Public Schools' NYC programs.

Tony Delacruz starts his part of the job well before summer begins, requesting placements from Lab supervisors. Then when the students arrive, Delacruz and the three NYC counselors, Rodney Noel, Candy Phillips, and Albert Taylor, try to fit student to job, with each supervisor interviewing his prospective employee. The Lab particularly likes to see students return for a second summer; many supervisors request the same student so they may have the satisfaction of witnessing his personal growth.

The counselors try to assure that each student is in an interesting and wholesome situation in his LBL assignment. Occasionally this means that placements are adjusted. Periodic conversations with every supervisor involved keep the NYC staff abreast of each student's experience.

Cafeteria luncheons held July 19, August 2, and August 16 for NYC participants and supervisors and interested guests will permit give and take on educational and recreational activities and program improvements. A weekly Tuesday Science in Action noon seminar in Building 50 auditorium has been organized, at which representatives from each of the Laboratory's departments present information on the various programs and occupations. In this way, NYC students are encouraged to view their relationship to the mission of the entire Lab.

NYC participants work Monday - Thursday at the Lab; Friday is reserved for special education or career days sponsored by their respective NYC agencies.

The primary goal of the program is to experience to strengthen his interest in education and to push him to aspire to goals he might never have dreamed were possible for him.

Of course, not all of the participants are interested in a career which requires college. For those who don't want further schooling, the NYC counselors try to place them in full time, permanent jobs, preferably but not necessarily at the Lab. Gladys Lewis, who for the third summer is teaching a well-attended key punch course also does part-time vocational counseling for students who want immediate employment.

If you have thought that you had no time for a NYC student, perhaps you can reconsider for next year's session. The kids are already motivated. All they need is good supervision in a rewarding training opportunity, and you might be the one to give it.

West assistant to director

Robert H. West has been named to the new post of assistant to the director for physical plant contracts and liaison, Laboratory Director Edwin M. McMillan announced July 5.

With the retirement of Associate Director Robert Thornton, many responsibilities have been reassigned. West, who was assistant to Thornton, will chair the General Plant Projects Committee and the Space Committee. He will continue his previous duties as liaison with the campus, University-wide offices and the AEC-SAN with respect to plant facilities, major utilities, construction and maintenance involving the physical plant, and his signature authorities as delegated by the director and the business manager.

Peacetime radiation training....

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local officials how to recognize a dangerous radiation situation, locate a radiation source, detect different kinds of radiation, rope off involved areas from the public and know when to wait for proper help.

While the course content was being designed several months ago, the Office of Emergency Services contacted LBL Fire Chief Elmer Silva, operations head Jim Haley, and chief monitor Joe Rainey, all of the Safety Services Department to help develop realistic field exercises for the trainees. Safety Services head Bob Lattimer agreed that it was a good idea, and they conceived of four challenging "incidents" using real, but mild, radioactive materials so that the students could learn to use detection equipment. These exercises will remain with the course to supplement the lectures and films.

The four exercises were the truck accident described above; a commercial radiation laboratory spill involving an unconscious victim; the crash of a cargo plane containing radioisotopes; and a hospital laboratory fire where students had to determine whether or

Lawrence papers donated to Bancroft Library

The papers of LBL founder Dr. Ernest O. Lawrence, maintained by the Laboratory since his death in 1958, were recently presented by Lab Director Dr. Edwin McMillan to the Bancroft Library on the University of California, Berkeley campus.

The sixty or so cartons of material will be of great value to scholars. Lawrence was the originator of group-type research on the grand scale, and played an important part in gaining government backing for science and having scientists advise the government on scientific policy matters.

The Bancroft Library, part of the Berkeley campus library, houses an outstanding collection of manuscripts, rare books, and illustrations concerning California, the American West, and Latin America. The Lawrence documents, except for several files kept closed for the present, will be made available to qualified scholars.

Computerized diagnostic system

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previous camera-computer systems lost as much as 40 percent of the available medical information in cardiovascular studies. Some imaging cameras can handle data fast enough but are too small to image an entire organ. This means that several images must be taken at different times, and it is difficult or impossible to compile them into a single, comprehensive picture. The coupling of a new, high-speed computer to the improved camera and scanner solves both the size and data-handling problems.

A related and essential factor in refining the system is the work, also done at Donner and LBL, in producing and selecting experimental radioisotopes. These studies are approached from two directions: Elements or compounds known to be taken up by specific organs of interest are tagged with radioisotopes; and isotopes giving low radiation doses are experimented with to see if they give desired information. Among the isotopes newly explored at Donner, cesium-129, potassium-43 and rubidium-82, along with nitrogen-13, have proved highly effective agents for obtaining heart muscle images.

Budinger considers the computer-controlled imaging system to be clinically available today, as components identical or comparable to those at Donner Laboratory can now be bought commercially. Operation of the instruments is simple enough that a single technician can be trained to use them.

"The system developed by the Donner team raises the diagnostic power of nuclear medicine to a new level, "said Dr. John H. Lawrence, pioneer in nuclear medicine and radiation therapy and founder of the Donner Laboratory. "It represents the advent of a new generation of instrumentation in this field, performing clinically a variety of studies