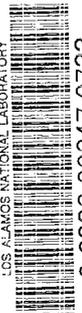


THE ATOM

Los Alamos Scientific Laboratory

June, 1970

LOS ALAMOS NATIONAL LABORATORY



3 9338 00847 0733



Volume 7 Number 6
June, 1970

THE ATOM

Published monthly by the University of California, Los Alamos Scientific Laboratory, Office of Public Relations, P. O. Box 1663, Los Alamos, New Mexico, 87544. Second class postage paid at Los Alamos.

CONTENTS:

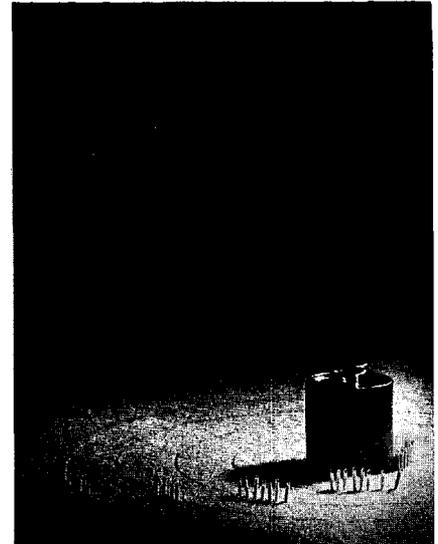
- 1 Polywater?
- 5 Short Subjects
- 6 MP Division at LAMPF Site
- 9 Nuclear Power for an Artificial Heart
- 12 239 Receive Service Pins
- 14 To Move an Office Building
- 16 MONAL's Inaugural Journey
- 20 LASL Photographers Dominate Competition
- 21 Health Division Leader Named/New Groups Formed
- 22 The Technical Side
- 24 20 Years Ago/What's Doing

Editor: Kenneth J. Johnson

Photography: Bill Jack Rodgers
and Bill Regan

Office: D-413 Administration Building. Telephone: 7-6102. Printed by The University of New Mexico Printing Plant, Albuquerque.

Los Alamos Scientific Laboratory, an equal opportunity employer, is operated by the University of California for the United States Atomic Energy Commission.

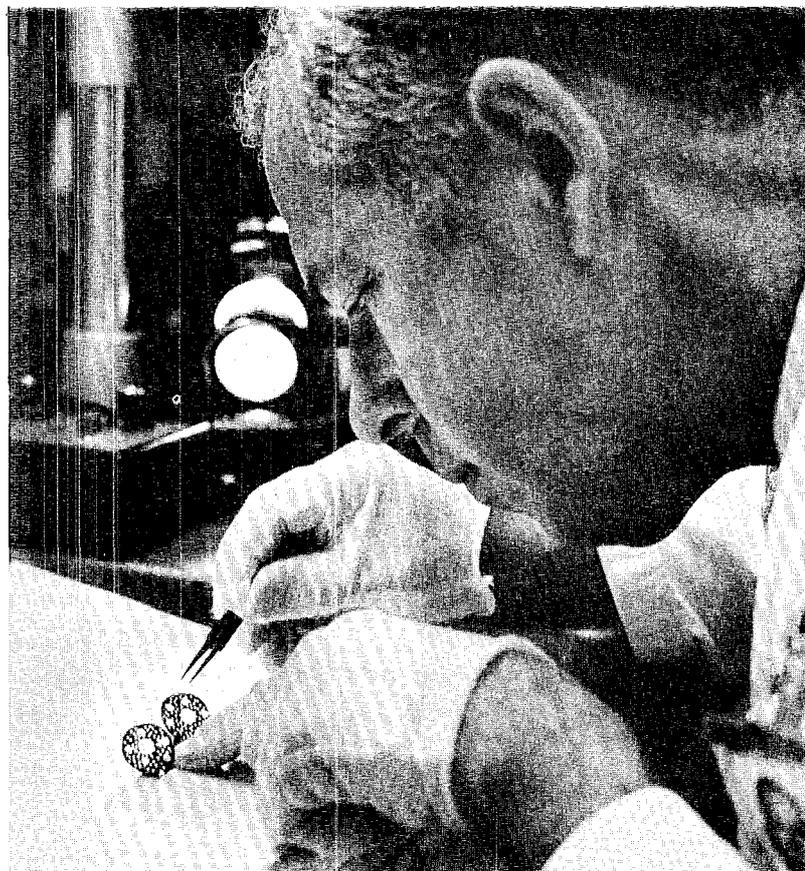


COVER:

A plutonium-238 heat source developed by the CMB-11 Research and Development section for the Atomic Energy Commission's program to develop an artificial heart is positioned on a target for dosimetry measurements. Thermoluminescent detectors are placed at various orientations on the target's gradients to detect and determine the radiation dose as a function of distance. A chill block keeps the polyethylene target from melting. The story "Nuclear Power for an Artificial Heart" begins on page 9.

Polywater?

By Charles Mitchell



Sherman Rabideau loads the capillary holder prior to placing it in the pyrex apparatus.

Water is water, right? Wrong! Chemists the world over recognize the existence of water in gaseous, liquid and solid forms, and, in addition, variations of each of these forms. For example, among the liquids is deuterium oxide, also known as heavy water, which has been used in nuclear reactors. In 1962 two Russian scientists, B. V. Deryagin and N. N. Fedyakin, announced they had discovered a new liquid type which they called "modified or anomalous water." Another name, "polywater," has been suggested by Ellis Lippincott of the University of Maryland and co-workers at the National Bureau of Standards because of the belief that it is a true new form—that is, a new arrangement of water molecules which gives rise to unusual properties.

This water may display a unique form of chemical bonding, but its physical properties and potential uses have been the focal points of newspaper and science magazine

editors. "Polywater" forms a glass at -50 degrees centigrade, is said to have a density 1.4 times that of ordinary water, a viscosity like motor oil, a very low vapor pressure and an extremely high boiling point. Researchers have suggested it might have many uses ranging from the boiler fluid for a proposed steam automobile to applications in nuclear power reactors.

At the Los Alamos Scientific Laboratory, Sherman Rabideau and Al Florin, both of CMF-2, have been studying the formation of this water and its chemical composition for more than a year. One of the problems associated with the study, is that the water, which they prefer to call "anomalous," has only been made in very small amounts—in the one-millionth of a gram range.

In conducting their investigations, Rabideau and Florin attempted to duplicate exactly the Russian process for obtaining sam-

continued on next page

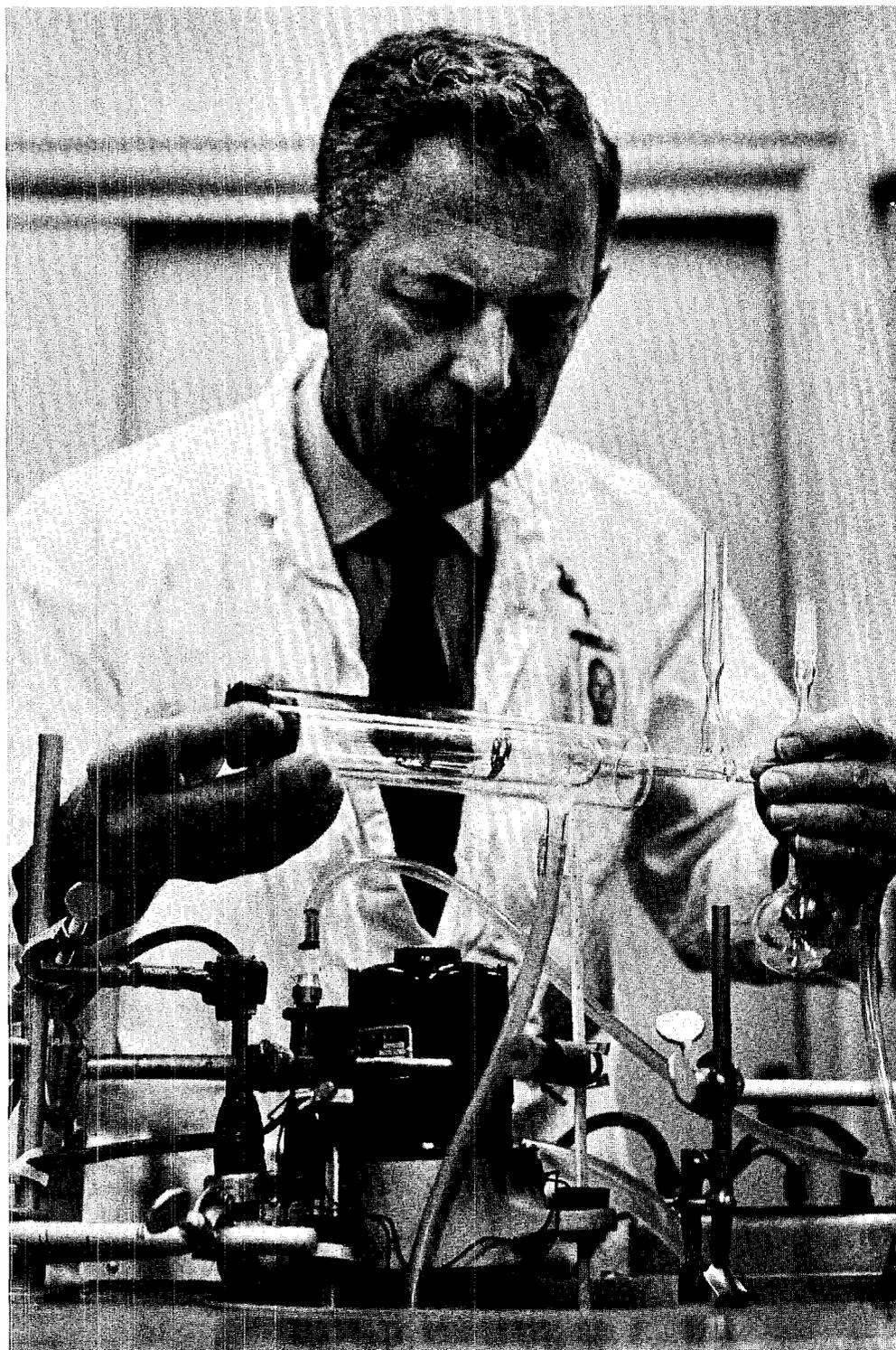
ples of the water. If the Russian process could be duplicated exactly and sufficient material could be obtained for analysis, they thought it would then be possible to settle the question of whether or not a new form of water had been prepared.

Nearly everyone knows the formula for water is H_2O . It has been theorized that the formula for the purported Russian water could be $(H_2O)_n$. This means a number of H_2O molecules are bonded together in a polymer form in a way never before achieved. If this new bonding actually takes place, not only would the physical characteristics of the water be different, but a new form of hydrogen bonding would exist. When these characteristics were reported, it was even suggested that it might act as a "seed" which could transform all of the water on earth into the new form. It was at this point that some of the news media became interested, although the "seed" idea received little support from theorists.

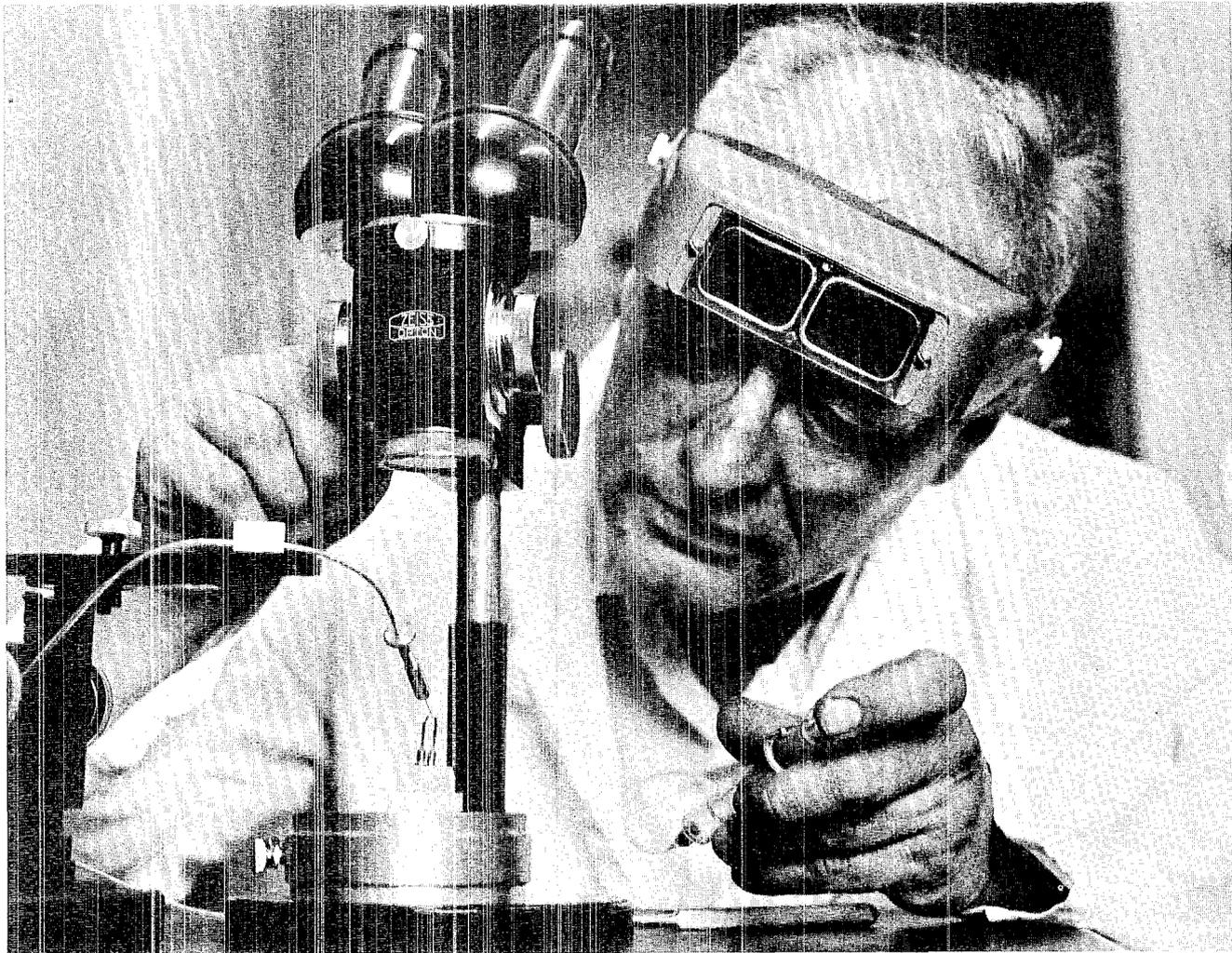
In duplicating the Russian process for obtaining samples of the water, Rabideau and Florin placed triply-distilled water in an evacuated bulb and positioned capillaries in a holder adjacent to the bulb. The two sections were separated by a thin glass diaphragm. By breaking the diaphragm, the vapor from the distilled water is free to pass into the capillary chamber. The temperature in the chamber is regulated so the relative humidity is held at 98 per cent.

The Russians had found that if this apparatus was left to sit under these conditions, water would appear inside the capillaries. The LASL researchers also found this to be true.

When the Russians examined the water they had prepared, they made only physical measurements. No chemical determinations of the composition of their material were made. Lippincott and his co-workers reported they had detected only trace amounts of impurities by their chemical measurements. To be classified as a real form of water, however, it must contain only hyd-



Rabideau holds the pyrex apparatus containing the capillary holder.



Al Florin prepares a sample for spectrographic analysis.

rogen and oxygen, the LASL researchers said.

Rabideau and Florin planned as complete an examination as possible of the very small samples they had prepared. They enlisted the help of Dick Tisinger of W-7 to analyze the water with a mass spectrometer. Ed Journey and John Yarnell, both of P-2, helped seek the presence of boron in the water with neutron activation studies. Arnold Haktila of CMB-1 conducted electron microprobe investigations. Studies of the proton nuclear magnetic resonance of the samples were made in CMF-2.

Under high magnification, Rabideau and Florin found that the index of refraction (how much light is "bent" as it passes through a substance) was, indeed, very near that of quartz which is approx-

imately 1.4. The match was so close in fact that even under a microscope it could not be seen where the quartz wall of the capillaries stopped and the water started.

The vapor pressure of the liquid obtained at Los Alamos was much lower than that of normal water and its freezing point was much lower. So, indeed, a substance had been prepared which had properties very similar to the Russian material. But when the results came in from the mass spectrometric, neutron activation and electron microprobe studies, it was found that almost half the weight of the sample of anomalous water could be accounted for by impurities. Silicon, boron and sodium were all found to be present in significant amounts in the sample.

continued on next page



Florin looks at printout while seated at the console of a nuclear magnetic resonance device.

Reasoning that the water film on the pyrex wall of the apparatus used in preparing the water samples was leaching impurities, Rabideau and Florin changed their experimental setup so the water would have to "creep" in a more devious way to get into the capillaries. They found, however, that these variations in the experimental arrangement resulted in the failure of the capillaries to fill with liquid.

Rabideau and Florin are excited about the potential of polywater if it can be prepared solely from hydrogen and oxygen. Detailed anal-

yses of samples have shown, however, that a high percentage of other substances are present which could contribute in a significant way to the properties observed. In fact, many of the physical properties of "polywater" can be duplicated with borax solutions in capillaries.

The LASL researchers hope workers in this field of study will soon exchange their anomalous water preparations with laboratories which have the analytical facilities. In this way, they feel it can be established for once and for all whether a polymeric form of liquid water can exist. 

short subjects

A decreased budget and mounting costs for printing of "The Atom" will make it necessary to consolidate some issues during the 1971 Fiscal Year beginning July 1.

Tentative plans are to publish one magazine during July and August and one during January and February. The July-August issue will be distributed in mid-July and the January-February issue in mid-January.

Any deviations from these plans will be announced prior to the time they are put into effect.

Denton T. Doll, a staff member at the Los Alamos Scientific Laboratory for nearly 18 years, died May 2 in an Albuquerque hospital following an illness.

Doll was employed by the Laboratory in 1949. He was promoted to alternate group leader of CMB-6 in 1957, a position he held until he retired in 1966. Doll had been an Albuquerque resident since his retirement.



Jack L. Jones, a resident of Los Alamos for 13 years, and a LASL employee for nine, will be ordained a Roman Catholic priest June 12.

Jones will be ordained by Archbishop James Peter Davis of Albuquerque in Immaculate Heart of Mary Church in Los Alamos and will celebrate his first mass there June 13.

Jones was assistant business manager in the Los Alamos Schools from Nov. 1953 until Feb. 1957, and then was employed in the Accounting office at the Laboratory. In July, 1966, he terminated his position at the Laboratory to begin studies at Pope John XXIII National Seminary, Weston, Mass.

Since March he has been psychological counselor at the New Mexico Boy's School at Springer. After ordination he will be a chaplain at the school.



Complete indexes for the 1969 issues of "The Atom" are available at the Laboratory's Public Relations Office. There is no charge.

Jose Pete Herrera, Nambe, a Shop department trainee, died May 16 of injuries received in an automobile accident. He is survived by his wife, Connie, and one daughter, Karen.



Leonard Crogstad, SD-1 developmental machinist, has retired. He was employed by the Shop department for 20 years. He and his wife, Ruth, will continue to reside in Los Alamos.



Gretchen Schuch, D-2, is a member of the Executive Board of the Regional Advisory Council of the South Central Regional Medical Libraries Program. She was appointed to represent the Los Alamos Scientific Laboratory by Director Norris E. Bradbury.



The South Central Regional Library Program is a communications network linking 11 participating medical libraries in the five states of Arkansas, Louisiana, New Mexico, Oklahoma and Texas. Through rapid teletype transmission, re-

searchers can forward requests for needed technical data to the regional headquarters at the University of Texas (Southwestern) Medical School in Dallas where the request will be forwarded to the proper member library.

The regional system is one component of a federally-funded, nationwide, biomedical communications network at the National Library of Medicine in Bethesda, Md.



For Reporting Change of Address

If your address has changed please inform **THE ATOM** by clipping and filling out this coupon. Print or type your name and both your old and new addresses.
Mail to: The Atom
Los Alamos Scientific Laboratory
Box 1663
Los Alamos, N.M. 87544

Previous Address

name _____

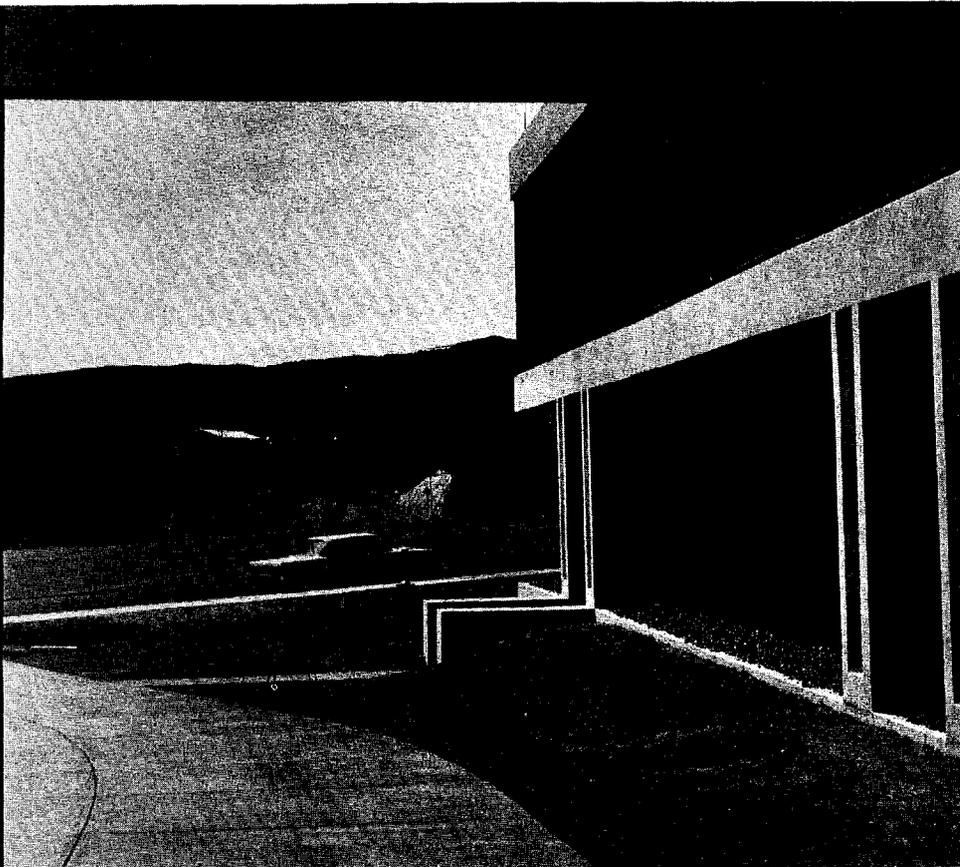
address _____

city _____ state _____ zip code _____

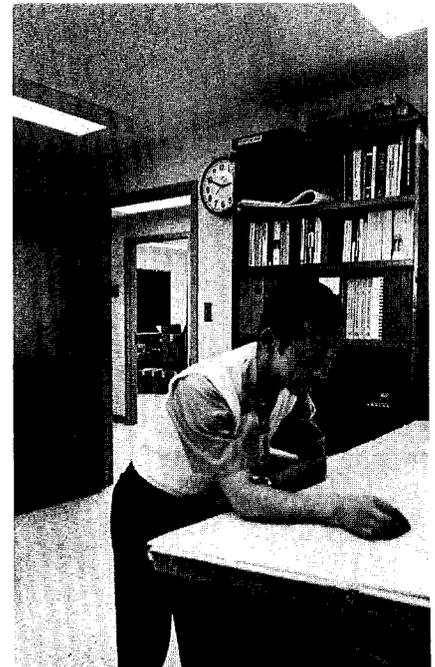
New Address

address _____

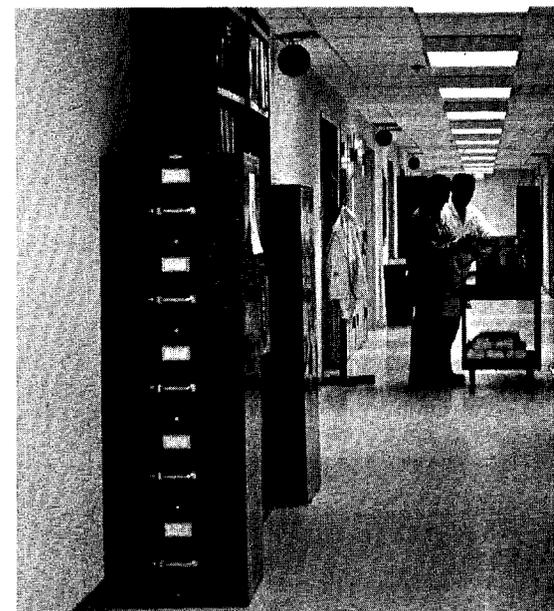
city _____ state _____ zip code _____



At left is a view from the front of LAMPF's Laboratory-Office building. Below, Nobuyuki Tanaka, MP-4, works in his new office. Across the hall, boxes of furnishings and supplies await the arrival of Herbert Vogel and Nancy Weinbrecht, both of MP-6, who will occupy that office. Right, MP Division Leader Louis Rosen, right, talks with MP-2 Group Leader Don Hagerman in Rosen's office. About 80 per cent of the division had moved to the LAMPF site as of mid-May when these photographs were taken.

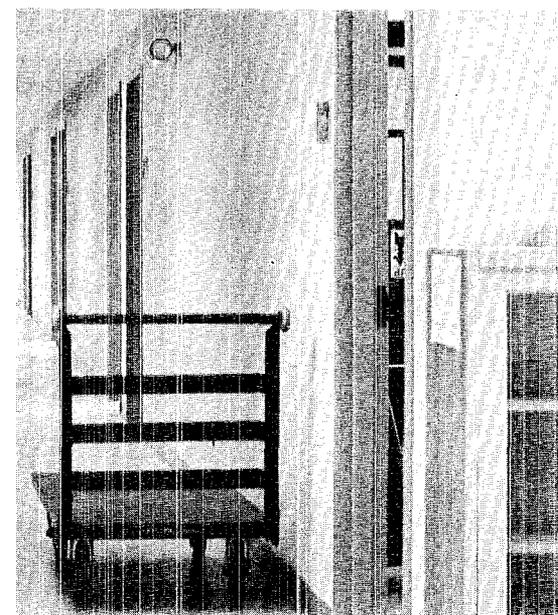


MP Division at LAMPF Site





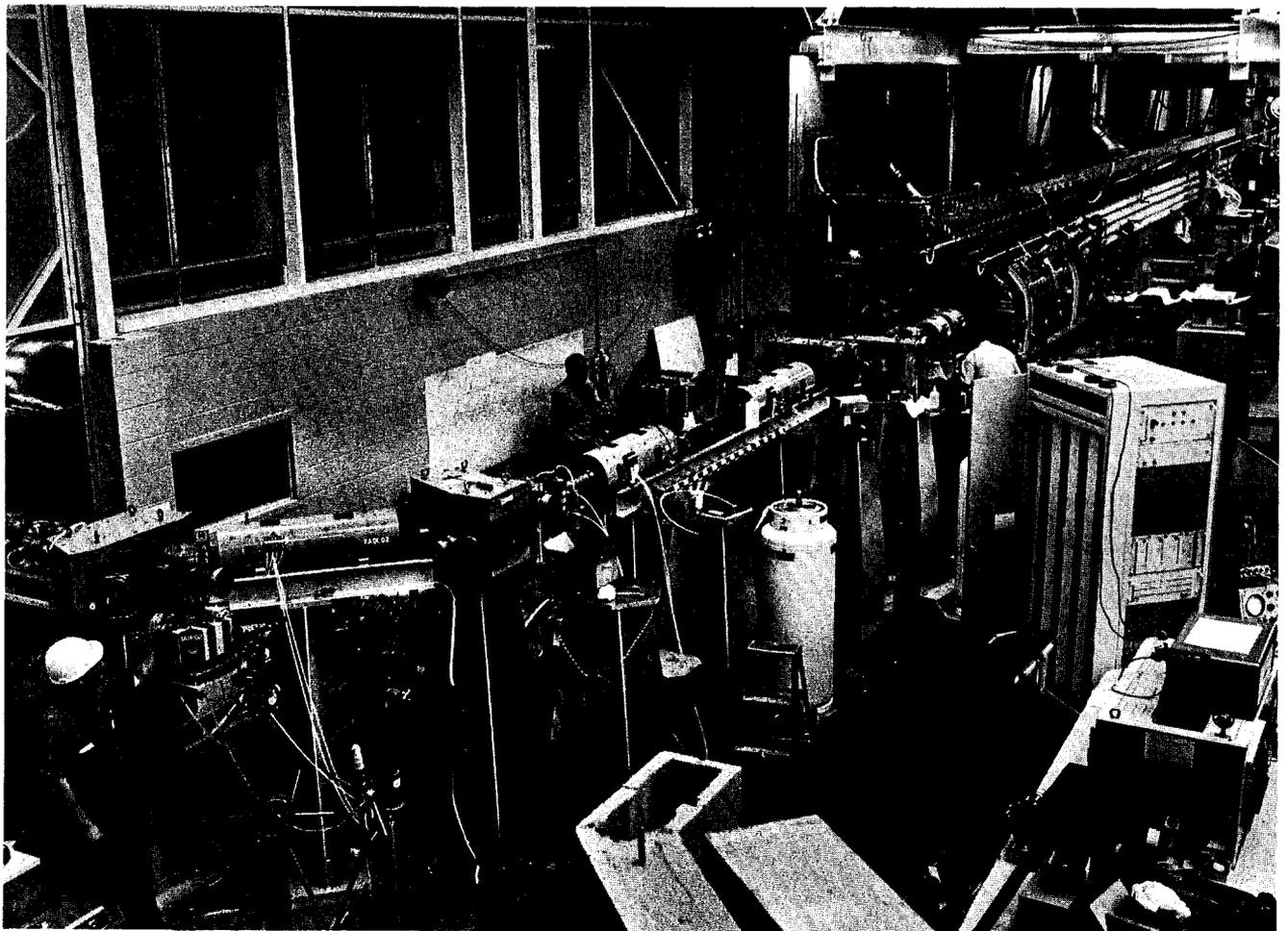
Below, Emilio Ortiz and Bennie Gomez, both of MP-1, unload cart in corridor of the Laboratory-Office building. Right, contractors Don Haywood, Albuquerque, and Carmen Espinoza, Chimayo, assemble seats in the building's auditorium.





Left, work continues on beam switchyard and experimental areas at the east end of the beam channel.

Below, preparations are being made for the five MeV test utilizing the injector system a part of which can be seen at left, and the first drift-tube tank, at upper right. The beam transport system is at center.





Bobby Dye and Arthur Beaumont, both of CMB-11, remove a plutonium-238 heat source from a "target" after conducting dosimetry tests. The source is ready for shipping and for use in testing heat conversion systems.

Nuclear Power for an Artificial Heart

LASL scientists are working on it

By Ken Johnson

Mike Harbor turned out the lights and locked the door of his service station. As he drove toward home, he thought about the next day when he would enter the hospital to have his second artificial heart implanted. The first one replaced his own diseased heart nearly five years ago.

Is this true? No, an artificial heart has not yet been built and successfully implanted in a human body, but scientists are working on it.

Physicians have estimated that 10,000 artificial hearts could be used each year in the United States alone if they were available. To meet this need the Atomic Energy Commission's Division of Isotopes Development began a program to develop a compact, completely self-contained, artificial heart powered by a nuclear source.

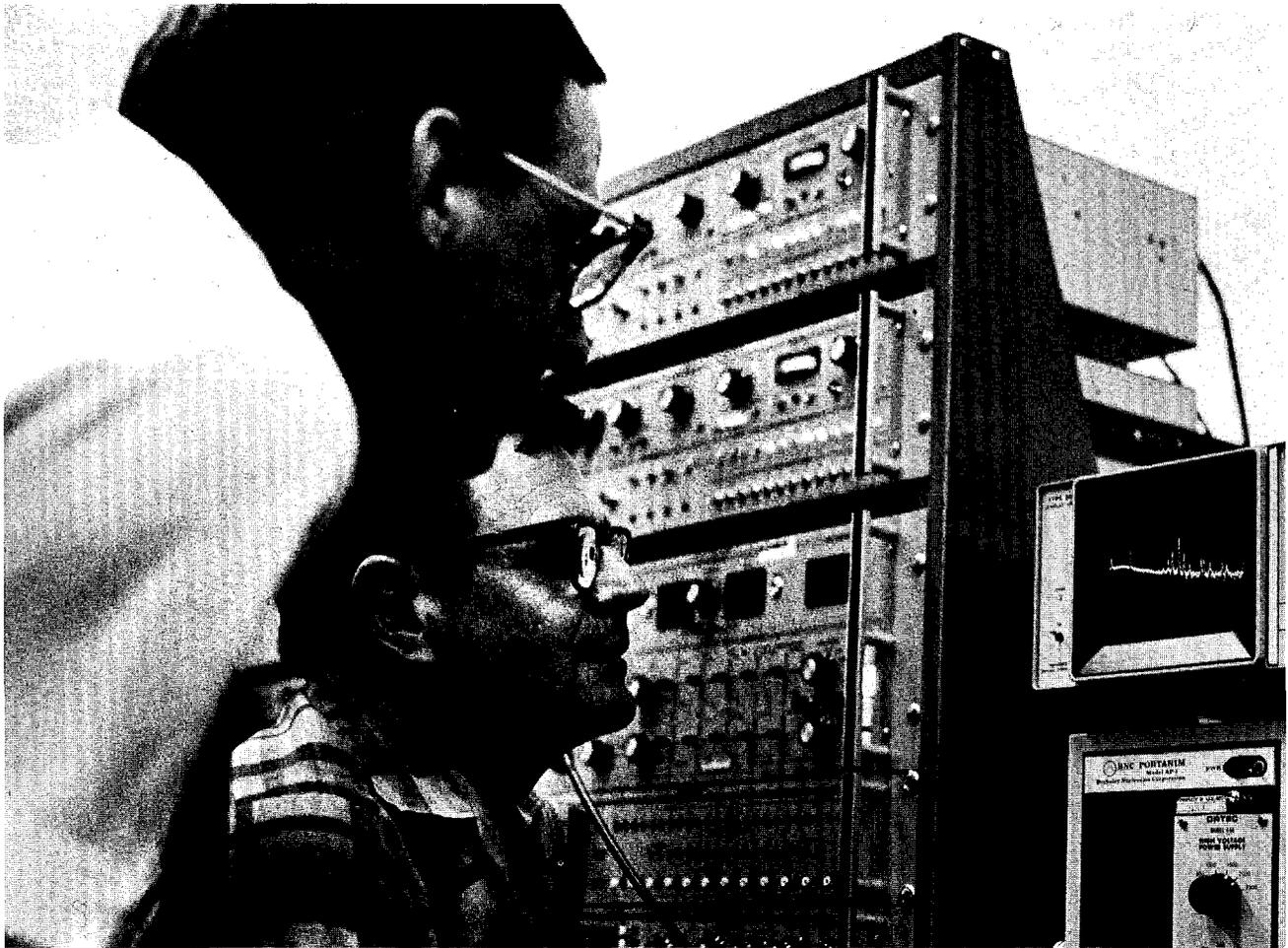
Development of this source has been underway at the Los Alamos Scientific Laboratory for the past four years, under the direction of Joseph A. Leary, CMB-11 alternate group leader, and Charles Metz, CMB-1 group leader. Research and development work on the source is being done by CMB-11. Chemical purity and radiation characteristics measurements and other required analytical work is being provided by CMB-1.

Under a self-imposed deadline, development of a source that will meet AEC requirements will be completed by September of this year, Leary said. "We're about finished with the research and evaluation of candidate materials. We're now preparing prototypes and small capsules of the source materials for final evaluation."

From the beginning of the project, LASL's objective has been an economical and compact heat source that will produce up to 50 watts of power to drive an artificial heart pump for a period of approximately five years.

To meet these criteria, a material was needed that gives off alpha particles at a high rate during nor-

continued on next page



George Matlack and Joe Bubernak, both of CMB-1, observe the gamma spectrum of a plutonium-238 heat source prepared by CMB-11.

mal decay because the power that can be derived from a radioisotopic heat source is dependent on the rate of alpha disintegration. The material had to have a fairly long half life if it was to provide life-sustaining power for a period of five years, and external gamma and neutron radiations originating from the source had to be at a level that was biologically safe.

After an extensive study, the AEC decided on plutonium-238 as one of the best possible source materials. The isotope has a high alpha decay-rate and a half life of approximately 87 years. Gamma ray and neutron emissions, however, provided a stumbling block. No one had ever successfully measured the gamma and neutron emission rates of plutonium-238. The reason was

that the isotope had never been available in states pure enough that its radioactive emissions could be segregated from those of impurities.

LASL acquired material prepared in a nuclear reactor at the AEC's Savannah River plutonium processing plant. The plutonium in this material was 80 per cent plutonium-238. From it, neutrons and gamma rays were being emitted at a rate that was biologically hazardous.

Neutrons, for example, were being emitted at rates ranging from 15,000 to 200,000 per second per gram. "Without reduction of these emission rates, one would only be rescuing a man from heart failure to kill him with radiation," Leary said.

By modifying an electrorefining process that was developed at Los Alamos for purifying plutonium-239, CMB-11 used the Savannah River material to produce ultra-pure plutonium-238 and CMB-1 could measure its radiations precisely. It was found that the dose-rates of both neutrons and gamma rays were about the same. Neutron emissions were about 2,500 per second per gram, an irreducible number since it is associated with the normal decay rate of the isotope, but biologically acceptable.

Using the electrorefining process, CMB-11 scientists drastically reduced emission rates of the Savannah River material by eliminating oxygen-18 and oxygen-17 from it and substituting amounts of enriched oxygen-16 which is pro-

duced by CMF-4. Plutonium-238 materials have been prepared, for example, whose neutron rates are below 2,800 per second per gram. Leary noted that a further reduction, down to about 2,600, is anticipated.

In addition to the problem of reducing harmful radiations, the source had to be of a composition that would withstand the temperatures expected of it. Plutonium-238 metal was rejected because its melting point was below the temperatures expected of the source and liquid plutonium is very corrosive. Nitrates using nitrogen-14 resulted in the increased emission of gamma rays. Several excellent compounds could be made with nitrogen-15, but they were more expensive than the ceramic oxides which were eventually accepted for the program.

The source being developed to power the artificial heart is highly purified plutonium-238 oxide, cast in a ceramic capsule eight-tenths of

an inch in height and the same in diameter.

"We have made three 30-watt heat sources for other laboratories who are testing heat conversion systems and conducting dosimetry studies on a 'phantom' man (a plastic man, complete with organs, used in laboratory studies)," Leary said.

When used in the artificial heart, the fuel capsule will be encased in a cylinder whose double walls are sealed at both ends. This cylinder was designed and developed for the program by CMB-11. So that helium emitted from the source is not released into the human body, there is a void between the capsule and the inside wall of the cylinder to contain it. This wall is made of a tantalum alloy which is compatible with the plutonium source material at high temperatures. Tantalum, however, succumbs to oxidation when exposed to air. For this reason the outer wall, separated from the tantalum alloy by another void filled with helium and argon to facilitate heat transfer, is made of a nickel alloy which serves as an oxidation barrier. As a secondary container of the plutonium-238 heat source, the nickel outer-wall meets another requirement. It is standard practice to doubly-contain radioactive materials. Shaped pieces of tantalum felt pads between the heat source and inner-wall, and between walls, at the top of the cylinder, hold components of the assembly in place.

Even after the initial research and development program is completed, the Laboratory will continue to play a role in the program, Leary said. "We'll still supply various radioisotopic heat sources to the AEC on an interim basis to meet their requirements in this program; we'll continue to evaluate the aging affects of capsules; there will be some research and development to produce more advanced materials for heat sources; and we'll assist the AEC in establishing a commercial capability for the production of heat sources for which we have developed the technology." 

Joe Leary, CMB-11 alternate group leader, and Larry Mullins, also of CMB-11, discuss new equipment to be used in research and development of heat sources for the artificial heart program.



A group of 239 employees last month received pins for a combined total of 3,670 years service at the Los Alamos Scientific Laboratory. Among those honored at the brief ceremony were 24 persons who were marketing their 25th year at LASL. Sixty-three persons received pins honoring them for 20 years service; 68 received 15-year service pins; and 79 were honored for 10 years service.

239

Receive Service Pins

25 Years

Robert J. Adams, SD-1
Melvin L. Brooks, GMX-3
Laurence J. Brown, P-1
Arthur W. Campbell, GMX-8
Robert S. Dike, P-16
Hannibal Fraga, SD-4
Edward F. Hammel, Jr., CMF-9
George E. Hansen, SD-1
Rufina V. Ladabour, GMX-7
Charles F. Metz, CMB-1
Polly L. Montoya, H-1
Donald W. Mueller, MP-4
Norris G. Nereson, P-2
William E. Ogle, J-DO
Maria A. Pacheco, GMX-7
Louis Rosen, MP-DO
Antonia M. R. Salazar, GMX-7
Arthur R. Sayer, W-DO
Allan G. Spooner, SD-4
James M. Taub, CMB-6
Hugh B. Tucker, SD-DO
Dwayne T. Vier, CMB-3
Donald J. Watts, SP-4

Frank Barylski, SD-5
Morris E. Battat, K-1
Howard T. Belfry, SD-4
William Bernard, N-2
George H. Best, K-1
Joseph B. Bourne, Jr., GMX-3
Eduardo Catanach, GMX-3
Walter R. Ciddio, SD-1
Leonard Crogstad, SD-1
Francis V. Dare, GMX-3
Roderick S. Day, CMB-11
Donald C. Dodder, T-9
Fred E. Doremire, W-3
Floyd L. Evans, SD-5
Alfredo Fernandez, H-1
George P. Ford, J-11
Margaret E. Gibson, P-9
Edward G. Gould, GMX-3
Donald E. Grimm, J-9/NTS
Lester S. Hackenberry, J-8
Pauline E. Heimbach, SP-2
Clarence F. Henderson, H-DO
Richard L. Henkel, P-9
Richard D. Hiebert, P-1
William G. Hudgins, C-1
Nelson Hunter, GMX-3
Edwin C. Hyatt, H-5
Arthur J. Justus, GMX-3
William J. Kelley, SD-5
Bernice S. Kelly, T-DO
William Kirkpatrick, N-7
Ellen La Plant, J-DO
Donald A. Larson, J-8
Wallace T. Leland, P-10
Luis A. Lucero, GMX-3
Mariano J. Lucero, GMX-3
Robert G. McQueen, GMX-6
Carl T. Maes, GMX-3
Antonio F. Maestas, GMX-3
Robert D. Marlett, SD-1
Benjamin O. Martinez, GMX-3

Joe R. Nichols, CMB-11
Edward I. Onstott, CMB-8
Robert C. Peck, W-3
James D. Perrings, H-4
James A. Phillips, P-14
Celeste I. Porto, H-5
Norman H. Riechman, SP-2
Edgar B. Rynd, W-1
Charles S. Saunders, N-7
Aldred E. Schofield, P-14
Adam F. Schuch, CMF-9
Robert R. Sharp, SD-5
William E. Stein, P-DOR
Wendell R. Williams, GMX-3
Thomas B. Williamson, GMX-3
Vernon L. Zeigner, N-3

20 Years

William P. Aiello, P-1
Robert Apodaca, GMX-3
Felix B. Archuleta, GMX-3
Larned B. Asprey, CMF-4
Milton G. Bailey, GMX-1
Paul E. Barbo, W-3

15 Years

Donna M. Arnold, SP-12
Herman P. Baker, FNG-2
John F. Barnes, T-5
George O. Bjarke, P-1
Leonard Buettner, GMX-4
Merle W. Carter, SD-1
Donald R. F. Cochran, MP-6
Don O. Coffin, W-3
Bernardita A. Cordova, GMX-7
Richard L. Cubitt, K-1
William C. Davis, GMX-8
Dana L. Douglass, CMF-5
Bonnie F. Drake, W-4
Harry Dreicer, P-13
Lillian M. Fox, P-1
William A. Fox, CMB-7
John L. Gammel, T-9
Verna L. Gardiner, C-7
Ralph H. Greenwood, P-4
Fay C. Harris, D-8
Nancy Hillhouse, SP-DO
Lena M. Hobbs, PER-4
Evelyn G. Hughes, H-1
Vernon N. Kerr, H-4
Kathryn M. Killoran, D-8
Edward A. Knapp, MP-3
Ivan K. Kressin, CMF-4
Herald W. Kruse, J-14
Norman A. Kuehn, SD-5
Clarence E. Lee, T-1
Jules S. Levin, P-9
David Liberman, T-4
Glen H. Livermore, P-7
Susie C. Lujan, M&R
John L. Lundgren, K-4
Alvin R. Lyle, P-2
Charles L. Mader, T-5
Maurice E. Manes, W-1
David A. Martinez, SD-1
Edward Martinez, D-8
Venancio Martinez, J-16
Opal D. Milligan, P-10
Ernestino Mirabal, GMX-3
Clayton E. Olsen, CMF-13
Willie V. Ortiz, D-4
Eugene A. Plassmann, N-2
Glyde H. Reed, N-2
Prince E. Rouse, Jr., GMX-2
Herta A. Schmidt, C-1
Ruby N. Smith, GMX-7
Leland B. Sprouse, J-16
Ted Starnes, PER-4
W. Amos Stone, CMB-7
Elizabeth M. Sullivan, H-4

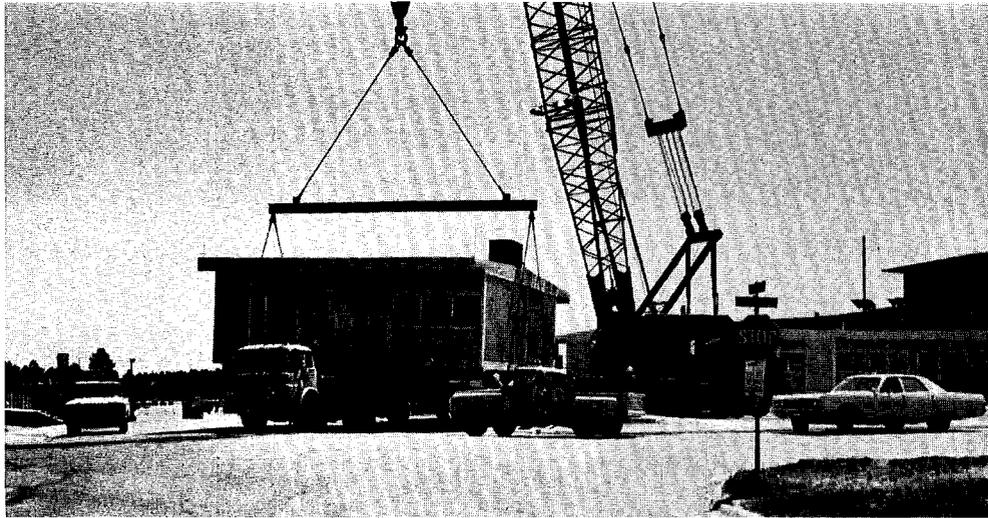
Edgar A. Thomas, P-1
Luciano Torres, GMX-7
Elizabeth N. Tynan, C-1
Arthur A. Usner, N-2
Alvin A. Van Dyke, CMB-7
Robert W. Walker, CMB-11
Donald R. Westervelt, J-14
Robert G. Whittemore, CMB-6
Orville G. Winslow, GMX-8
Frederick E. Wittman, P-13
Walter P. Wolff, J-8
W. Jack Worlton, C-DO
William H. Yeamans, SD-1

10 Years

Richard M. Alire, W-7
Jack L. Bacastow, K-3
J. Douglas Balcomb, N-4
Clarence U. Benton, J-16
Otis W. Boise, ENG-4
Jerald D. Bower, SD-1
George Breisch, J-18
Edward A. Brown, N-4
Bruce E. Burkheimer, P-17
Harold F. Claus, Jr., J-5
R. Dallas Clayton, MP-3
Jimmy W. Collier, SD-1
Harvey Colyer, GMX-11
Kenneth C. Cooper, N-3
W. Clarence Courtright, H-3
Harry W. Craig, H-1
Kenneth R. Crandall, MP-4
Charles W. Dagggett, ENG-4
Bert R. Dennis, ENG-6
Richard D. Dick, GMX-4
Thomas N. Elder, GMX-7
Jerome J. Erpenbeck, GMX-10
Edward Foley, J-7

Joseph N. Fritz, GMX-6
Jack C. Fuller, W-7
Andres A. Gallegos, GMX-8
Julio J. Garcia, GMX-3
Donald A. Garrett, GMX-1
Terry R. Gibbs, GMX-7
Robert J. Gill, SD-1
Richard A. Glass, N-7
Margaret A. Gore, T-DO
Edward I. Hall, J-8
David L. Harris, J-5
John C. Hopkins, P-DOR
Harold M. Ide, H-4
Opal D. Jasinski, GMX-4
George F. Kieren, SD-5
Charles R. King, N-6
Gary W. Lind, SD-2
Barbara J. Lujan, M&R
John L. Lunsford, CMF-5
Jesse J. Lytten, SD-1
John McLeod, P-13
Jimmy McTeigue, GMX-3
Mary L. Mariner, SP-3
Jack R. Markham, N-5
Charles F. Mynaugh, MP-3
Lee E. Naranjo, GMX-3
Ramon S. Preciado, SD-1
Walter H. Reichelt, N-5
James H. Reid, SP-3
Oliver M. Rivera, MP-3
George H. Robinson, N-2
M. Jane Robyn, J-12
Richard H. Rochester, GMX-7
Grace C. Roybal, ENG-1
Katherine E. Royer, PER-1
Edward J. Schneider, MP-3
Virgil W. Scott, SD-5
Boyd A. Sherwood, P-12
J. Edward Simmons, H-7
Frances M. Smith, K-1
Darrel M. Spring, D-8
Gertrude M. Stout, T-DO
Bobby G. Strait, C-8
Douglas R. Thayer, J-14
Rodney S. Thurston, W-4
Donald E. Tolmie, C-7
David Trujillo, SD-5
David G. Valdez, GMX-11
Glenn E. Waggoner, SD-1
Beverly W. Washburn, J-18
Neil W. Weeks, H-7
Lloyd D. Wheat, CMB-7
Herbert T. Williams, P-2
Kurt Wolfsburg, J-11
David Yandell, Jr., SD-5

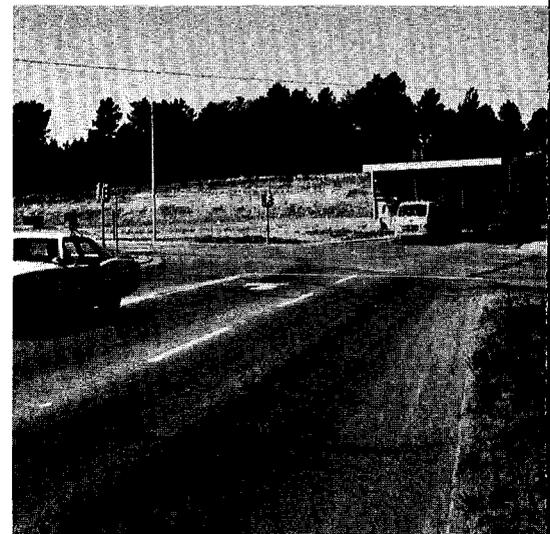
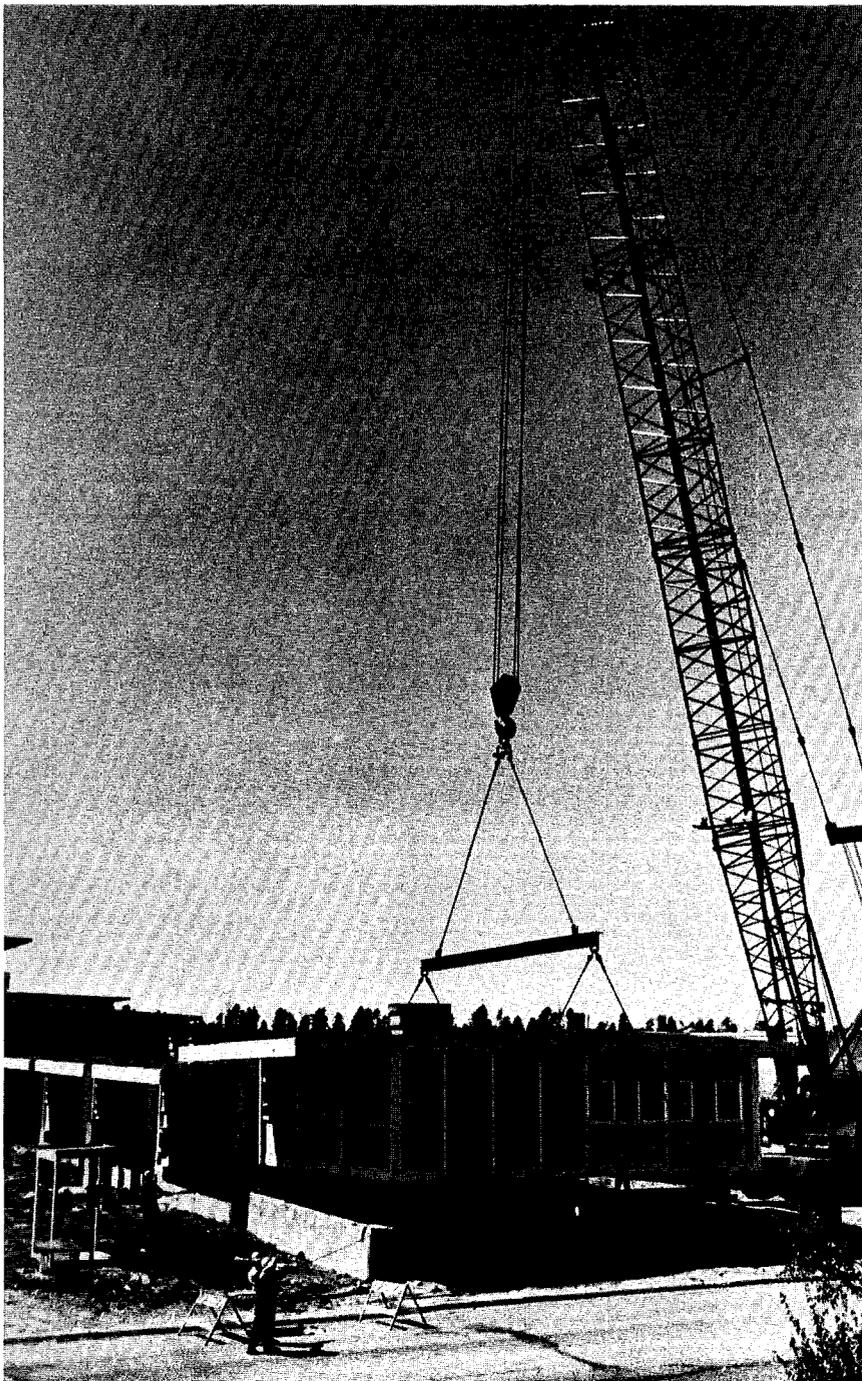
The first of four modular office buildings to be moved from near the Los Alamos Scientific Laboratory's main technical area is lifted off its foundation by a 140-ton crane. Los Alamos Constructors, Inc., moved the structures to the Laboratory's Meson Physics Facility (LAMPF) site where they will be used temporarily by summer employees and members of the LAMPF Users Group. They were formerly occupied by MP-2 before MP division moved into its new quarters at the site.



The building is lowered onto a special trailer for movement to the LAMPF site. At right, a Los Alamos patrol car stands ready to provide traffic control during the move.

To Move

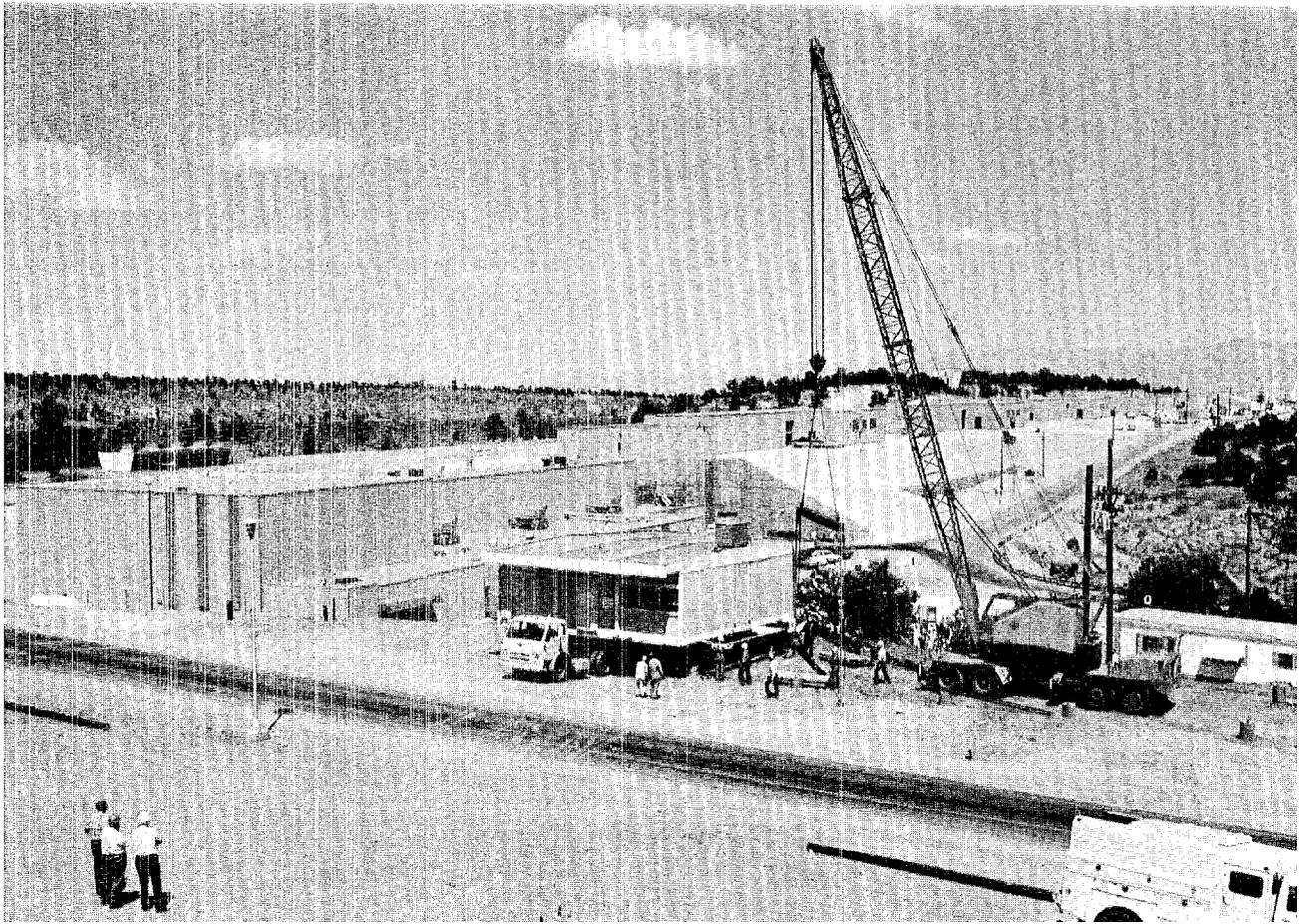
Below, the structure is taken across the busy Jemez Road-Diamond Drive intersection. Right, the building is positioned overlooking LAMPF's accelerator area.

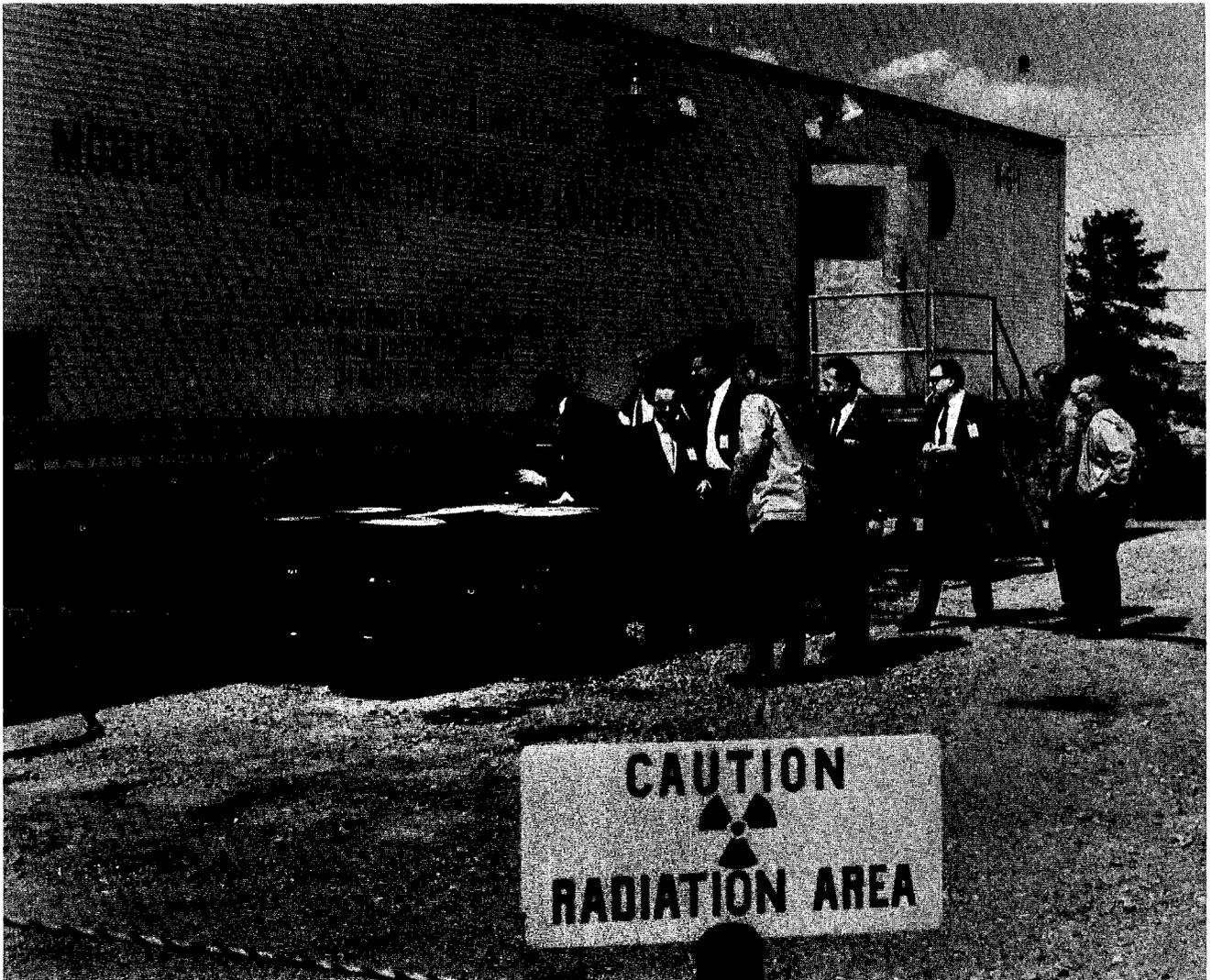




Near the end of its journey, the office building is taken up the road to the LAMPF site.

An Office Building





Among visiting dignitaries to be taken on a tour of MONAL by members of N-6 is this group representing the Atomic Energy Commission, Brookhaven National Laboratory, and United Nuclear Corporation. From left are Eugene Weinstock, Brookhaven; G. Robert Keepin, N-6

group leader; W. A. Higinbotham, Brookhaven; Martin S. Zucker, Brookhaven; Joerg Menzel, N-6; William C. Bartels, AEC; Robert Schomberger, United Nuclear; Munson Thorpe, N-6; and Roddy Walton, N-6 assistant group leader.

MONAL's Inaugural Journey

The Los Alamos Scientific Laboratory's Mobile Nondestructive Assay Laboratory (MONAL) has made its inaugural journey. Early in May the 31-ton nondestructive assay "sample case," containing the most advanced instrumentation available for assaying nuclear materials, was deployed at its first field station—the Atomic Energy Commission's Rocky Flats Plant near Boulder, Colo. Here the capabili-

ties of MONAL's newly developed assay techniques are being demonstrated under practical industrial conditions.

The mobile laboratory will be at Rocky Flats for as long as two months. A team of N-6 scientists and technicians who were instrumental in the development of the new nondestructive assay techniques will demonstrate them by assaying nuclear material in scrap,

wastes and fire residues. Some standards (samples whose nuclear material contents are known) prepared by the Dow Chemical Company which operates the Rocky Flats facility for the AEC will also be assayed to cross-check techniques used by Dow for many years and those being demonstrated by N-6.

The mobile laboratory grew out of the Nuclear Safeguards Research and Development program being

conducted by N-6 at Los Alamos. The program is funded by the Office of Safeguards and Materials Management (OSMM) to develop new and more effective techniques for national and international control of nuclear materials. The techniques developed at LASL since the program's beginning in December of 1966 are also economically important to the nuclear industry in that they can be applied to a variety of materials management, quality control and accountability problems.

These techniques employ direct physical methods for detecting, identifying and analyzing nuclear materials in unknown mixtures; they are nondestructive, rapid, accurate and they can be carried out under a wide range of laboratory and field conditions.

A large number of people in industry have indicated their interest to explore the full potential of these new techniques in many practical in-plant and in-the-field problems; LASL and the OSMM agreed to demonstrate them to make as many other industrial concerns as possible aware of them. It was thought that the most effective way of communicating and demonstrating these techniques to industry was to field a mobile unit containing both in-place and portable assay instrumentation.

The portable instrumentation is for passive assay of nuclear materials and the in-place equipment is for active interrogation. Passive assay involves the use of a detector to obtain characteristic "signatures" of gamma rays and neutrons which are naturally emitted from fissionable material. Active interrogation involves the use of a neutron source to produce fissions in the material under study and a detector to record the resulting fission-produced neutrons and gamma rays. The signatures recorded by either method are related to the type and quantity of nuclear material contained in scrap, wastes, residues and other mixtures.

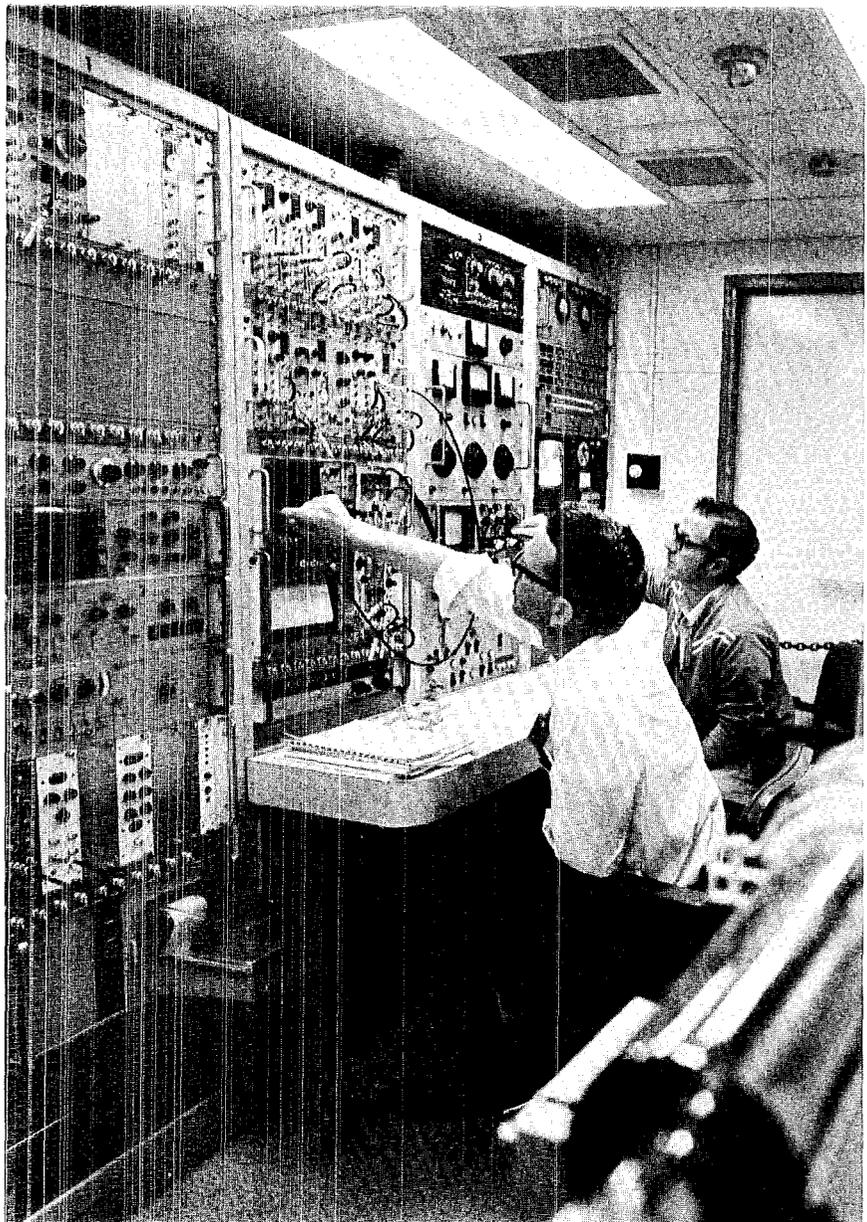
MONAL was designed by N-6 with the support of LASL's En-

gineering department. After it was constructed, it was instrumented and exhibited at the AEC Symposium on Safeguards Research and Development which was hosted by the Los Alamos Scientific Laboratory last October. It was then tested under practical conditions at the Laboratory's plutonium processing plant at DP site for approximately six weeks, before being fielded at Rocky Flats.

The mobile laboratory is contained in a 10' x 50' van that will support a maximum gross weight

continued on next page

At the mobile laboratory's control console are Menzel and Bert Dennis.



of 67,200 pounds. Its frame is designed to allow pickup by attaching slings to four top corner fittings, making it possible to load it, including contents, on board a seagoing vessel should it be demonstrated overseas.

Inside MONAL there are five compartments. The front compartment contains the unit's control console, data acquisition equipment and an area for data reduction and records storage. Adjacent to this compartment is the sample preparation room for receiving, weighing and storing samples submitted for nondestructive assay. Next is an electronic and instrumentation shop containing necessary tools, supplies and spare parts. A shielded rotating door separates the shop from the mobile unit's experimental cavity where samples are assayed using in-place instrumentation. At the rear of the van is the equipment room which contains the 14 MeV neutron generator used in active interrogation of samples, high voltage and power supplies, air conditioner and air compressor.

The experimental cavity is the heart of the active assay laboratory. Here samples are brought in by an automated handling system and interrogated using the neutron generator.

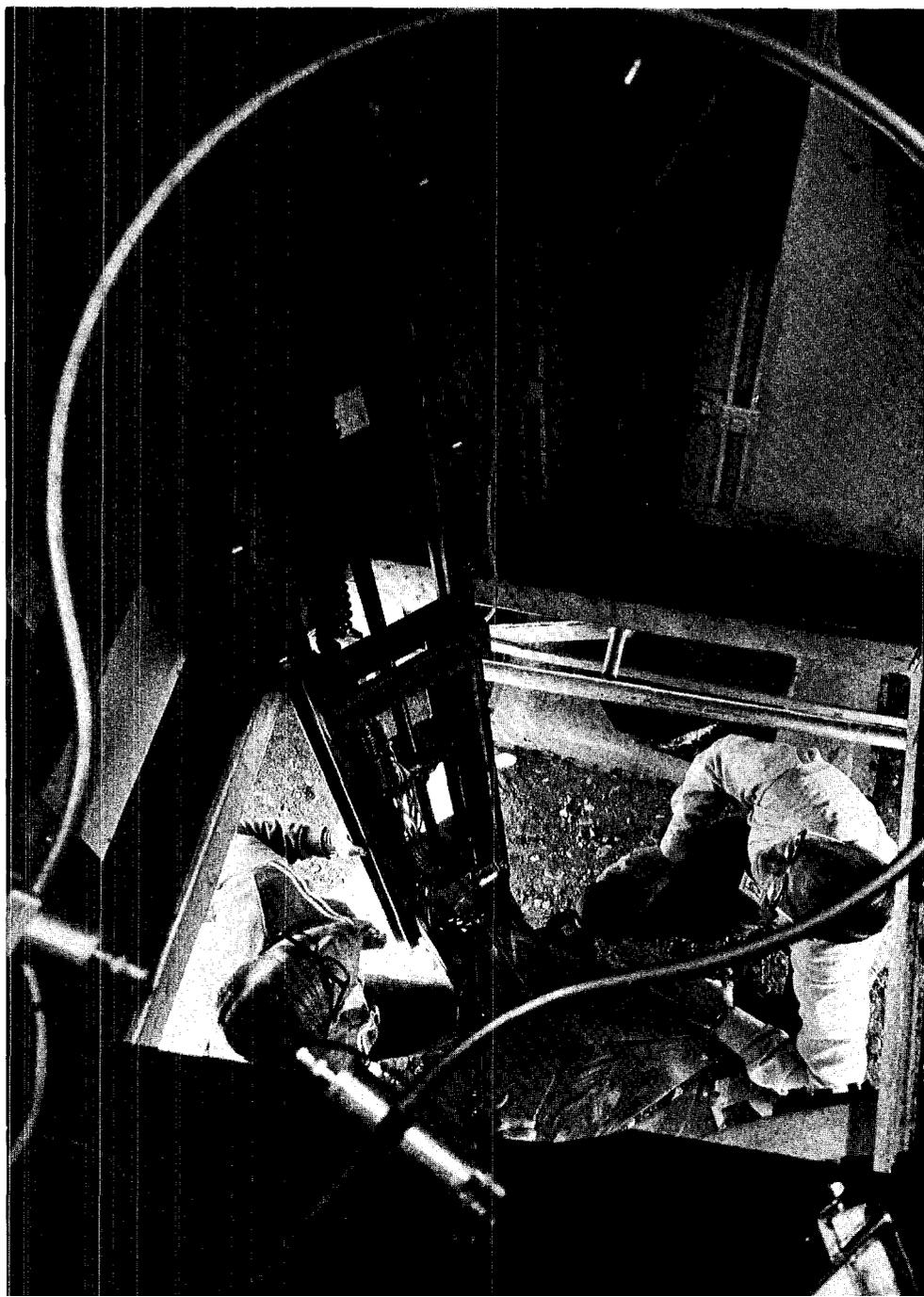
The shielding which surrounds the cavity, including the rotating door, is primarily water so that it does not have to be carried in transit. When full, the shielding tanks contain about 5,000 gallons of water. A layer of oil is used as shielding adjacent to the cavity because it is free of oxygen and eliminates delayed-neutron production from oxygen-17.

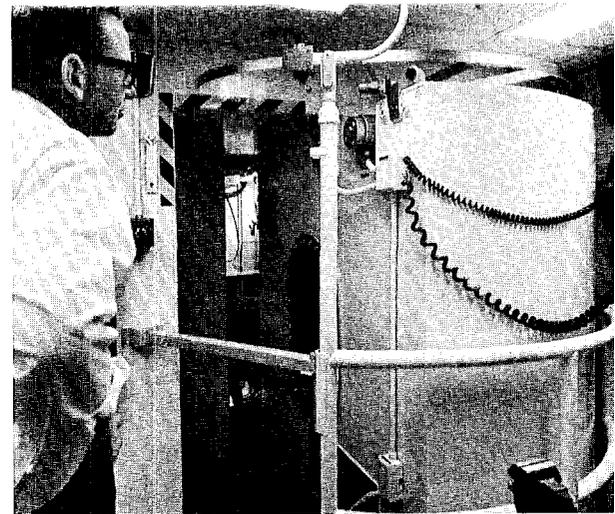
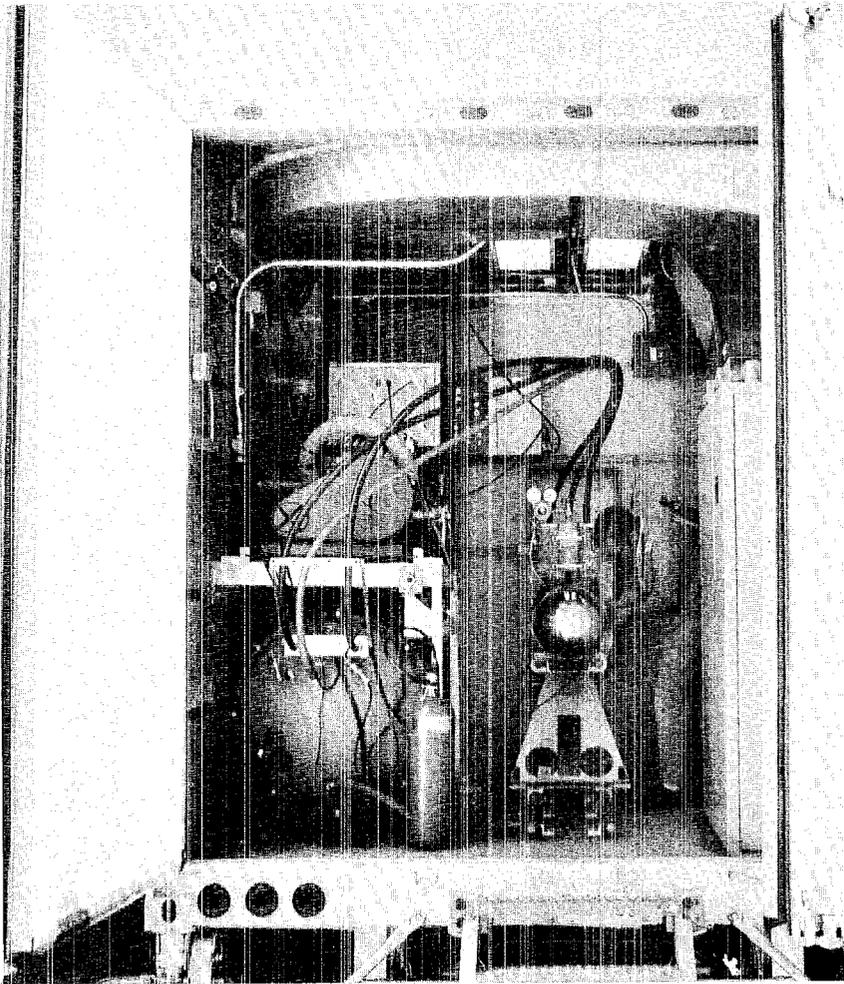
The automated handling system is for containers of fissionable material ranging in size up to 55-gallon barrels. A monorail conveyor with 16 sample-carriers has been mounted to the underside of the van. From the control room, one carrier at a time is properly positioned beneath the experimental cavity. A sample is lifted off its

continued on next page



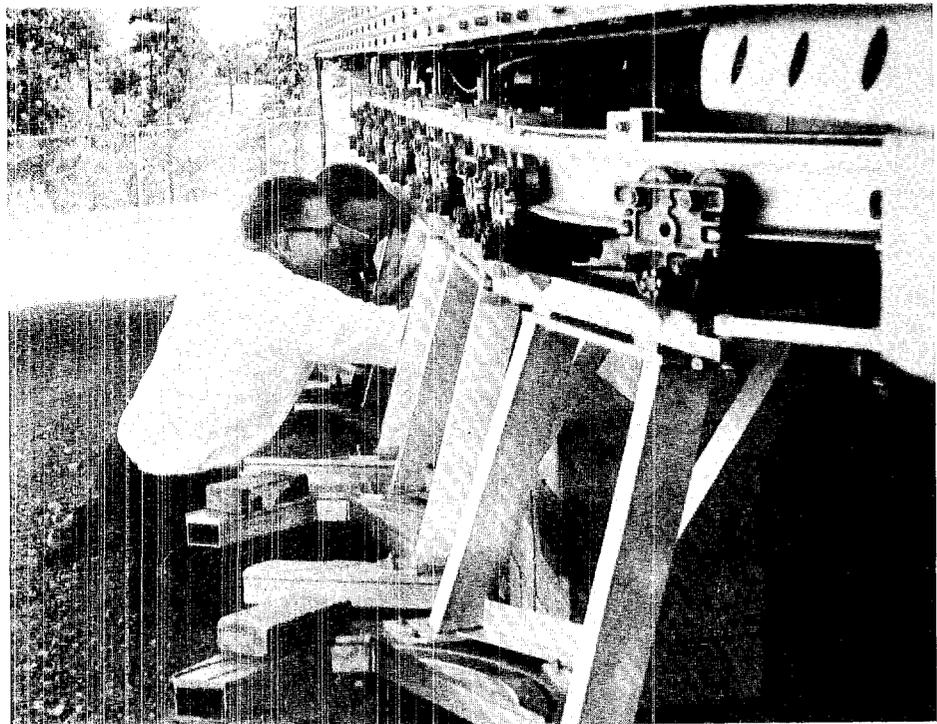
Left, John Kottman works in the sample preparation room. Below, Dennis and Dave Helfer work with the elevator device which lifts samples into the experimental cavity through the opening in the floor.





Menzel observes operation of the shielded rotating door which provides access to the experimental cavity.

Above, Dennis is shown with the neutron generator in the equipment room at the rear of the van. Right, Menzel and Helfer discuss MONAL's automated handling system. In foreground are the carriers which move on the monorail conveyer.



carrier by an elevator device and raised into the experimental cavity through an opening in the floor. The elevator device is capable of vertical and rotary motion so that the sample can be scanned both vertically and circumferentially. Typically, active interrogation of a sample takes about 15 minutes. Then it is lowered onto its carrier and the conveyor moves the next sample into position and the process is repeated.

At least two persons, a staff member and a technician, are necessary to operate the mobile unit. Depending on the job requirements, especially if many in-the-field assays are necessary in addition to in-place interrogations, the staff can be increased. MONAL's operation at Rocky Flats is being supervised by Joerg Menzel, of N-6. He is accompanied by Bert Dennis, a nuclear engineer assigned to the Nuclear Safeguards program from ENG-6. Technicians Dave Helfer and John Kottman are the laboratory's operators. Together with other N-6 personnel, they will conduct precision assay measurements on uranium-235, plutonium-239 and uranium-238 as MONAL is deployed at various types of nuclear installations around the United States and perhaps overseas.



Helfer studies the operation of the elevator device as a barrel is lifted into the experimental cavity.

LASL Photographers Dominate Competition; Billy Claybrook Wins "Best of Show" Award

LASL photographers dominated the winner's circle in competition at the 11th Annual Conference of the Industrial Photographers of the Southwest (IPSW).

The top honor, the "Best of Show" award was won by Billy Claybrook, D-8. Claybrook also took first place in the "On the Job Color" competition while Henry Ortega, also of D-8, was third.

Ivan Worthington, D-8, was first in "On the Job Black and White." Bill Jack Rodgers, PUB-1, was second and Vic Stevenson, D-8, was third.

In "Off the Job Color," the first award went to

Stevenson. Eugene Lamkin, D-8, was first in "Off the Job Black and White."

In "Scientific and Technical" competition, Robert Martin, D-8, took first and second places. Ortega's entry was third.

"The Wide Angle," the IPSW's publication, edited by Rob Gordon, D-8, received honorable mention in national competition it was announced.

Guest speakers for the seven-state gathering included Donald O. Dickman, C-4, Martin, and Robert Crook, D-8 group leader. 

Dr. George Voelz from Idaho Falls is Named Health Division Leader

Dr. George Voelz has been appointed Health division leader at the Los Alamos Scientific Laboratory, succeeding the late Dr. Thomas Shipman.

Voelz is currently director of the Atomic Energy Commission's Health Service Laboratory at Idaho Falls, Idaho. He has been employed by the AEC's Idaho Operations Office since 1957 when he was appointed chief of the Medical Branch. In 1963 he was named assistant director of the Health Services Laboratory. He was named director in 1967.

Voelz was a staff physician at the Los Alamos Scientific Laboratory from July of 1952 until he transferred to Idaho Falls.

He was graduated from high school in Wittenberg, Wisc. in 1943. He attended pre-medicine classes at the University of Wisconsin, Madison, from 1943 until he entered the U.S. Navy in 1945. In 1946 he returned to the University of Wisconsin where he received the B.S. degree in



1948 and the M.D. degree in 1950. He served his internship at Multnomah County Hospital, Portland, Ore., in 1950 and 1951. He was granted an Industrial Medical Fellowship by the AEC and studied at the University of Cincinnati Kettering Laboratory in 1951 and 1952 before coming to Los Alamos as a staff physician.

The new division leader is certified by the American Board of Preventive Medicine in occupational medicine. He is a fellow of the American College of Preventive Medicine, and currently, he is president of the Northwestern Association of Occupational Medicine. He is a member of the American Medical Association, the American Industrial Hygiene Association and the Health Physics Society.

Voelz was chairman of the Idaho Falls Medical Society in 1969; literature, abstractor and book reviewer for the "Journal of Occupational Medicine" 1961-69.

His work has been widely published in such publications as "Health Physics," "Journal of Occupational Medicine," and the "Archives of Environmental Health."

He and his wife, Emily, have four children: Valerie, 12; David, 11; Brian, 9; and Sharon, 5.

T and MP Divisions Form New Groups

New groups have been formed in both T and MP divisions at LASL.

A previous section of T-2, headed by Raymond Pollock, has been formed into a new group designated T-4. The group will consist of from 10 to 12 staff members who will concentrate on the physics of nuclear fuel ignition and burning in weapon design work. Alternate group leader of T-4 is Ralph Cooper, formerly of T-DO.

Lewis Agnew, formerly of MP-6, has been named to head newly-formed MP-7. H. A. Thiesen, formerly of MP-4 has been appointed alternate group leader. Initially the group will consist of approximately 15 members who will be responsible for all secondary beam lines at the Los Alamos Meson Physics Facility (LAMPF).



Raymond Pollock



Lewis Agnew

The Technical Side

Presentation at Meeting on Quantitative Magnetospheric Models, Environmental Science Service Administration, Boulder, Colo., March 18-20:

"Identifying Field Lines in the Magnetotail Through Substorm-Associated Variations of the Plasma Sheet" by E. W. Hones, Jr., P-4

Presentation at Physics Colloquium, Rice University, Houston, Texas, April 1:

"The Los Alamos Meson Physics Facility—A New Tool for Basic Research and Practical Applications" by L. Rosen, MP-DO

Presentation at the AEC Contractor's Health Protection Meeting, Cincinnati, Ohio, April 1-2:

"In Vivo Plutonium Measurements in the Lung" by P. N. Dean, H-4 (invited)

Presentation at Joint Working Group and Uranium Meeting, Lawrence Radiation Laboratory, Livermore, Calif., April 1-3:

"Uranium Alloy Development at Los Alamos" by D. J. Sandstrom and G. S. Hanks, both CMB-6

Presentation at Metallurgy Department, University of Utah, Salt Lake City, April 2:

"Thermodynamics and Structure of Liquid Alloys: Something Is Very Wrong with Our Usual Treatments of Experimental Data" by G. R. B. Elliott, CMF-2 (invited)

Presentation at the Gulf Southwest Meeting of the American Society for Engineering Education, New Mexico State University, Las Cruces, April 2-4:

"Orientation and Motivation of Engineering Freshmen at the University of Michigan" by E. R. Lady, CMF-9

"Los Alamos Scientific Laboratory Experience with Co-op Students in Chemical Engineering" by H. R. Baxman, E. I. Onstott and R. J. Bard, all CMB-8

Presentation at seminar, General Motors Laboratories, Detroit, Mich., April 6:

"Structure Studies of Mixed Valence Copper Cyanide Complexes" by R. J. Williams, CMF-5 (invited)

Presentation at Optical Society of America Meeting, Philadelphia, Pa., April 7-10:

Optical Study of the Hyperfine Structure of Uranium-233" by C. B. Ross, CMB-1

Presentation at the Second European Conference on the Thermophysical Properties of Solids at High Temperatures, Manchester, England, April 7-10:

"The Thermal Diffusivity and Conductivity of Zirconium Carbide and Niobium Carbide From 100° to 2,500°K" by B. H. Morrison and L. L. Sturgess, both N-1

Presentation at seminar at University of Illinois Section of the American Chemical Society, Urbana, April 9:

"Interatomic Forces in Molecules From Vibrational Spectra" by L. H. Jones, CMF-4 (invited)

Presentation at seminar, Oklahoma State University, Stillwater, April 10:

"Tracer Techniques with Carbon-13" by E. S. Robinson, CMF-4 and C. T. Gregg, H-4 (invited)

Presentation at Lederle Symposium, Bernalillo County Medical Association, Albuquerque, April 11:

"Medical Aspects of Meson Facility" by L. Rosen, MP-DO (invited)

Presentation at 1970 Annual Meeting of the Federation of American Societies for Experimental Biology, Atlantic City, N.J., April 12-17:

"Reversible Production of Stable G₁-Arrested Populations of Chinese

Hamster Cells in Suspension Culture" by K. D. Ley and R. A. Tobey, both H-4

Presentation at conference on Applications of Chemistry to Nuclear Effects, Air Force Cambridge Research Laboratory, Bedford, Mass., April 15-16:

"Air Fluorescence Induced by Nuclear Explosions" by K. B. Mitchell and R. F. Holland, both J-10

Presentation at seminar, University of Illinois, Urbana, April 16:

"Complexes of the Transition Metals Through Z = 104" by R. A. Penneman, CMF-4 (invited)

Presentation at Department of Chemistry, University of New Mexico, Albuquerque, April 16:

"Graphite Binder Studies" by E. M. Werwerka, CMF-13 (invited)

Presentation at colloquium at Kent State University, Ohio, April 17:

"The Numerical Solution of Singular Perturbation Problems for Ordinary Differential Equations" by F. W. Dorr, C-6 (invited)

Presentation at seminar, Department of Biological Engineering, Rose Polytechnic Institute, Terre Haute, Indiana, April 17:

"Automated Cellular Analysis: Identification of Single Cells by Fluorescent and Darkfield Optical Techniques" by J. A. Steinkamp, H-4 (invited)

Presentation at the Eighth Rare Earth Research Conference, Reno, Nevada, April 19-22:

"The Relative Stabilities of the B and C Forms of Samarium Oxide, Europium Oxide, and Gadolinium Oxide" by G. C. Fitzgibbon, D. Pavone, and C. E. Holley, Jr., all CMF-2

"Magnetic Properties of Dysprosium Thallium-3" by C. E. Olsen, CMF-13, N. G. Nereson and G. P. Arnold, both P-2

"Mobilities of Rare Earth Cations by Bromine Redox Electrolysis with Porous Carbon Electrodes" by E. I. Onstott, CMB-8

"The Reaction of Selected Lanthanide Carbides with Platinum and

Iridium" by N. H. Krikorian, CMB-3

"High Pressure Synthesis of New Heavy Rare Earth Carbides" by M. C. Krupka and N. H. Krikorian, both CMB-3

Presentation at Safety Engineering Short Course, University of Oklahoma, Norman, April 20-24:

"Personal Protection—Respirators, Factors in Selection and Training, Use and Maintenance, Testing and Approval Procedures" by E. C. Hyatt, H-5 (invited)

Presentation at the 51st Annual Meeting of the American Geophysical Union, Washington, D. C., April 20-24:

"Conjugacy in the Gross Structure of Visual Aurora During Magnetic Disturbed Periods" by H. C. S. Nielsen and T. N. Davis, both University of Alaska and N. W. Glass, J-16

"The Kruskal-Shafranov Kink Instability for Field-Aligned Currents in the Magnetosphere" by D. W. Forslund, T-12

"Poleward Expansion of the Auroral Oval and Associated Phenomena in the Magnetotail During Auroral Substorms" by E. W. Hones, Jr., S. J. Bame, S. Singer, all of P-4, and S. I. Akasofu and P. Perreault, both of the University of Alaska

"Simultaneous Observations of Auroral Substorms by Ground-Based, Balloon-Borne, ATS and Vela Instruments" by R. H. Karas, University of California, Berkeley, E. W. Hones, Jr., P-4, L. J. Lanzerotti, Bell Telephone Laboratories, Murray Hill, N. J., and S. I. Akasofu, Geophysical Institute, University of Alaska

"Simultaneous Occurrence of Several Wave and Particle Phenomena During Two Relatively Isolated Substorms" by D. L. Carpenter, Radioscience Laboratory, Stanford University, Calif., R. S. Unwin, Physics and Engineering Laboratory, Auroral Station, Omakau, New Zealand, E. W. Hones, Jr., P-4, and R. R. Heacock, Geophysical Institute, University of Alaska

"Predawn 6,300 angstroms Enhancement Near Buenos Aires" by J. H. Wolcott, R. L. Wakefield, N. W. Glass, R. W. Peterson, all J-16

"Measurement of Long Period Water Waves From the Milrow Event" by K. H. Olsen and J. N. Stewart, both J-15; G. R. Miller and M. J. Vitousek, both ESSA/Hawaii Institute of Geophysics, Honolulu, and J. E. McNeil, Defense Research Laboratory, Goleta, Calif.

"Some Properties of Nonspherically-Asymmetric Flare-Associated Blast Waves" by D. S. DeYoung, National Radio Astronomy Observatory, Charlottesville, Va., and A. J. Hundhausen, T-12

"The Large Scale Characteristics of Flare-Associated Solar Wind Disturbances" by A. J. Hundhausen, T-12, and S. J. Bame and M. D. Montgomery, both P-4

Presentation at Mayo Clinic, Rochester, Minn., April 21:

"Isotopes from Spallation" by H. A. O'Brien, K-2 (invited)

Presentation at the Southwestern Institute of Electrical and Electronic Engineers Conference and Exhibition, Dallas, Texas, April 22-24:

"Analytic Method for Approximating Two-Dimensional Device Structures Using One-Dimensional Device Analysis Programs" by C. L. Wilson, C-7

Presentation at the Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science and the New Mexico Academy of Science, Las Vegas, N. M., April 22-25:

"Recent Volz Sunphotometer and Correlated Ground Level Particulate Measurements in Los Alamos, New Mexico" by D. H. Liebenberg, CMF-9 and H. F. Schulte, H-5

"Numerical Solution of Integro-Collision Problems" by Anne C. Niethammer, P-12 and J. E. Brolley, P-DOR

Presentation at the Annual Sherwood Theory Meeting, Princeton, N. J., April 23-24:

"Stability of a High Beta, Helically Symmetric Pinch" by J. P.

Freidberg and B. M. Marder, both P-18

"Numerical Simulation of CTR Related Plasma Phenomena" by R. L. Morse, C. W. Nielson, and T. A. Oliphant, all P-18

"Linearized Variational Analysis of One-Dimensional Vlasov Plasmas" by H. R. Lewis, P-18

Presentation at meeting at Naval Research Laboratory, Ultralow Temperature Symposium, Washington, D. C., April 23-24:

"Uses of Dilution Refrigerators" by W. A. Steyert, CMF-9 (invited)

Presentation at the American Mathematical Society Meeting, Davis, Calif., April 25:

"Lattice Structure of Some Linear Recurrence Pseudo-Random Points in Monte Carlo Calculations" by W. A. Beyer, T-8

Presentation at the Annual Meeting of the American Society for Microbiology, Boston, Mass., April 26-May 1:

"Specific Antibody Inhibition of Transformation in Haemophilus Influenzae" by D. P. Bingham and B. J. Barnhart, both H-4

Presentation at Symposium on Non-destructive Testing in AEC Programs, Richland, Wash., April 28-30:

"Flash X-ray During Electron Beam Welding" by L. E. Bryant, GMX-1

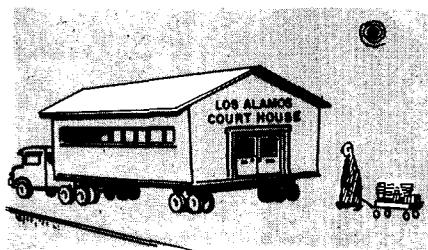
"Measurement of Hydrolysis in Rover Reactor Fuel" by D. A. Garrett, GMX-1

"The Application of Mass Spectrometry and High Resolution Eddy Current Measurement to Rover Fuel Porosity and Crack Measurement" by R. M. Ford, D. A. Garrett, R. R. Showalter and R. D. Strong, all GMX-1

Presentation at New Mexico Institute of Mining and Technology, Socorro, April 30:

"The Crystal Structure of ATP and Some Related Problems" by A. C. Larson, CMF-5 (invited)

20



years ago in los alamos

Culled from the June, 1950, files of the Los Alamos News by Robert Porton

Sheriff's Posse Gets Former Court House

The former Los Alamos Court House, located just outside the main gate, will be moved to North Mesa for use as a meeting house for the Sheriff's Posse. The one-room, white frame building is sixteen feet wide and thirty feet long. Now that Los Alamos has become a county, U.S. District Judge David Carmody has ruled that the court might be held in town. The Atomic Energy Commission will furnish a pass to any New Mexico citizen who has business in the court. A security guard accompanies the person from the main gate to the court and, when the session is over, back to the gate.

Bradbury Speaks to Museum Association

Norris E. Bradbury, director of the Los Alamos Scientific Laboratory, addressed the American Association of Museums in Colorado Springs. He was the principal speaker at the opening session of the Association's 45th annual meeting, and discussed "The Post-War Atom."

Auditorium Opens with "Gondoliers"

The new Community Auditorium was opened to the public for the first time when the Los Alamos Light Opera Company presented "The Gondoliers," a Gilbert and Sullivan favorite. Music director for the operetta was Mrs. John Manley. John W. Macy, Jr., was dramatics director and John Winks conducted the orchestra. Those taking parts in the production included Morris Milligan, Edward Spence, Katherine Anderson, Don McMillan, Florence Harlow, Neva Wheeler, Alvin Graves, Eric Jette, Robert Dike, Carol Duennermann, Elizabeth Graves, Bernice Kelly, Betty Lilienthal, Opal Milligan, Mary Jeanne Nilsson, Faith Schell, Helene Suydam, Lore Watt, Emma Lou Young, James Coon, Jerry Kellogg, Nerses Krikorian, Clifford Nilsson, Donald Schell, Raemer Schreiber, Jerry Suydam, Marvin Tinkle and Bob Watt.

Housing Policy Board Established

Announcement was made this week of the establishment of a Housing Policy Board to serve in an advisory capacity to C. L. Tyler, manager of the AEC's Santa Fe Operations Office in the development of policies governing the assignment and utilization of residential real estate, including non-family units, at Los Alamos. Appointed to the board were Max F. Roy, LASL, chairman; H. W. K. Hartmayer, AEC, executive secretary; Earle D. Sullivan, AEC; Richard G. Elliott, AEC; Wendell Miller, Zia Company; and Henry R. Hoyt, LASL.

what's doing

OUTDOOR ASSOCIATION: No charge, open to the public. Contact leaders for information regarding specific hikes.

June 1—meeting at 122 Beryl, Walter Green, 672-3203

June 7—Santa Fe Baldy, Ken Ewing, 662-7488

June 10—evening hike, Ken Ewing, 662-7488

June 17—evening hike, Walter Green, 672-3203

June 20-21—Pecos Falls, Walter Green, 672-3203

LOS ALAMOS FILM SOCIETY: June 24—"La Guerre est Finie (French-1966)" Civic auditorium, 7:30 p.m. Admission: members—\$.75; others, \$.2.

RIO GRANDE RIVER RUNNERS: Meetings scheduled for noon, second Tuesday of each month at South Mesa Cafeteria. For information call Cecil Carnes, 672-3239.

NEWCOMERS: June 24, 7:30 p.m., Los Alamos National Bank. Beautician from local shop will speak on "Hair Styles, Makeup, etc." For information call Judy Ware, 662-5743.

SIERRA CLUB: Luncheon meeting at noon, first Tuesday of each month, South Mesa Cafeteria. For information call Brant Calkin, 455-2468, Santa Fe.

MOUNTAIN MIXERS SQUARE DANCE CLUB: For information call Mrs. Joyce Headdy, 672-3783.

June 20—Harry "Bones" Craig, caller, 8 to 11 p.m., Pinon Park

PUBLIC SWIMMING: High School Pool—Monday through Friday, 1 to 6 p.m. and 7 to 10 p.m., Saturday and Sunday, 1 to 6 p.m.; Adult Swim Club, Sunday, 7 to 9 p.m. (Schedule same through Aug. 16.)

MESA PUBLIC LIBRARY: May 22 to June 18—children's book display
June 2 to June 30—paintings by Lanette Wilkinson

LOS ALAMOS ARTS COUNCIL: June 7—Bob Seamon organ recital, Bethlehem Lutheran Church, 8 p.m.
June 13 through June 20—Entries from early show exhibited for purchase.

AMERICAN FIELD SERVICE: June 7, 2 p.m. to 7 p.m., Graves Hall at the United Church, "Afternoon in Japan." For information call Lila Steyert, 662-4556.

LOS ALAMOS GEOLOGICAL SOCIETY: June 16 at 7:30 p.m. in the Little Theater—Earl Fullman, "Growing Crystals." Event is open to the public. For information, call Alice Wynne, 662-5964.



Wright Langham, left, assistant H division leader, discussed biomedical research activities at LASL with Dr. H. Marvin Pollard, right, national president-elect of the American Cancer Society, and Dr. H. J. Sannan, western area medical advisor for the ACS. In background is Dr. Michael W. Stewart, Los Alamos Medical Center pathologist. Dr. Pollard and a visiting group of medical men also toured the LAMPF site and were briefed by MP Division Leader Louis Rosen on the 800 MeV proton accelerator and the possible applications of its powerful pi-meson beam to cancer therapy.

TRESSA MINSHALL
1365 41ST ST.
LOS ALAMOS, NEW MEXICO 87544

Commemorative coins, honoring the 25th anniversary of the "atomic age" are being issued in Los Alamos by the Kiwanis Club. This photograph, a double exposure made by PUB-1 Group Leader Bill Regan, shows the two sides of the commemorative coin and its designer, Hal Olsen, D-3 alternate group leader.

