THE ATOM

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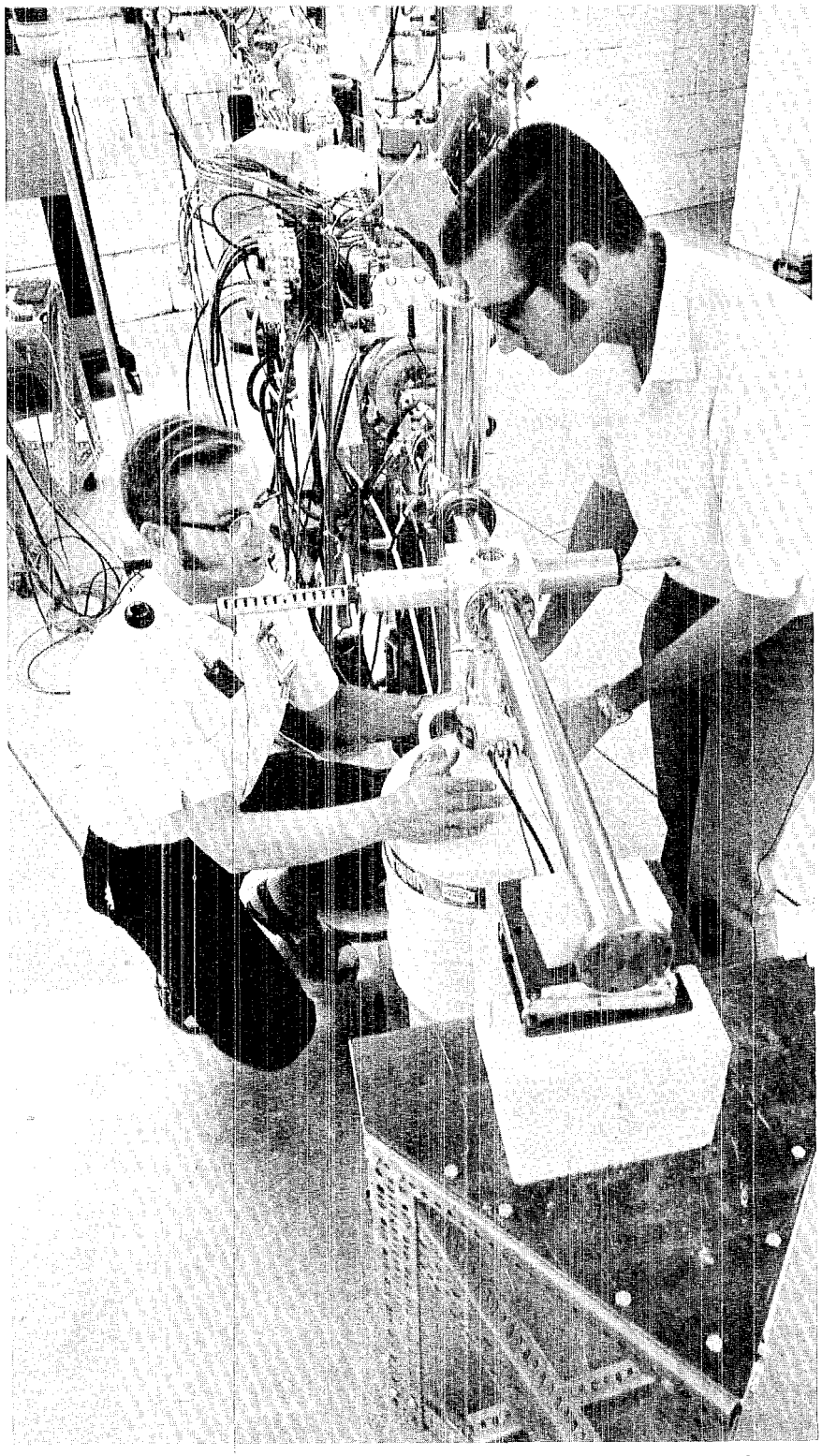
COVER:

The two screwworm flies on the cover of this edition of "The Atom" were photographed by ISD-7 photographer Victor Stevenson. The flies were obtained by John Umbarger and John Malanify, both of Group A-1, from the U.S. Department of Agriculture's screwworm eradication project laboratories in Mission, Texas. The Texas laboratories provided the two scientists with both native and laboratory-grown screwworm flies. Umbarger and Malanify have demonstrated that x-ray fluorescence techniques can be used to differentiate between the two types, a factor of statistical importance to the USDA. For more detailed information, read the story which begins on page one.



John Umbarger and John Malanify link a lithium-drifted silicon detector beneath a target chamber in the Group A-1 Van de Graaff accelerator experimental area. Screwworm flies are placed within the chamber and irradiated with protons from the accelerator. The energies and intensities of x rays emitted are characteristic of the elements present in the flies and are measured by the detector.

New Applications for an Old Technique

An old technique shows promise of making new contributions to both science and society. The principles of this tool, x-ray fluorescence, have been known for at least 50 years and are used in routine materials analyses by the metallurgical and mining industries. Now, with the advent of more sensitive x-ray detection systems, scientists feel x-ray fluorescence may have many new practical applications.

Some of these applications, being investigated by scientists at the Los Alamos Scientific Laboratory, are in the fields of biology, biomedicine and ecology. The principle investigators are John Malanify and John Umbarger who are members of LASL's Nuclear Safeguards Group, A-1, headed by Robert Keepin. Although the primary function of A-1 is the development of nondestructive techniques and instrumentation for assaying nuclear materials in unknown mixtures, Keepin noted that nuclear safeguards technology could be used for other purposes.

Malanify and Umbarger have so far used x-ray fluorescence techniques to detect and determine the amounts of elements contained in laboratory-grown and native screwworm flies, blood, urine, tissue, and pollutants in water samples and air-sampling filters.

The scientists had demonstrated the capability of x-ray fluorescence

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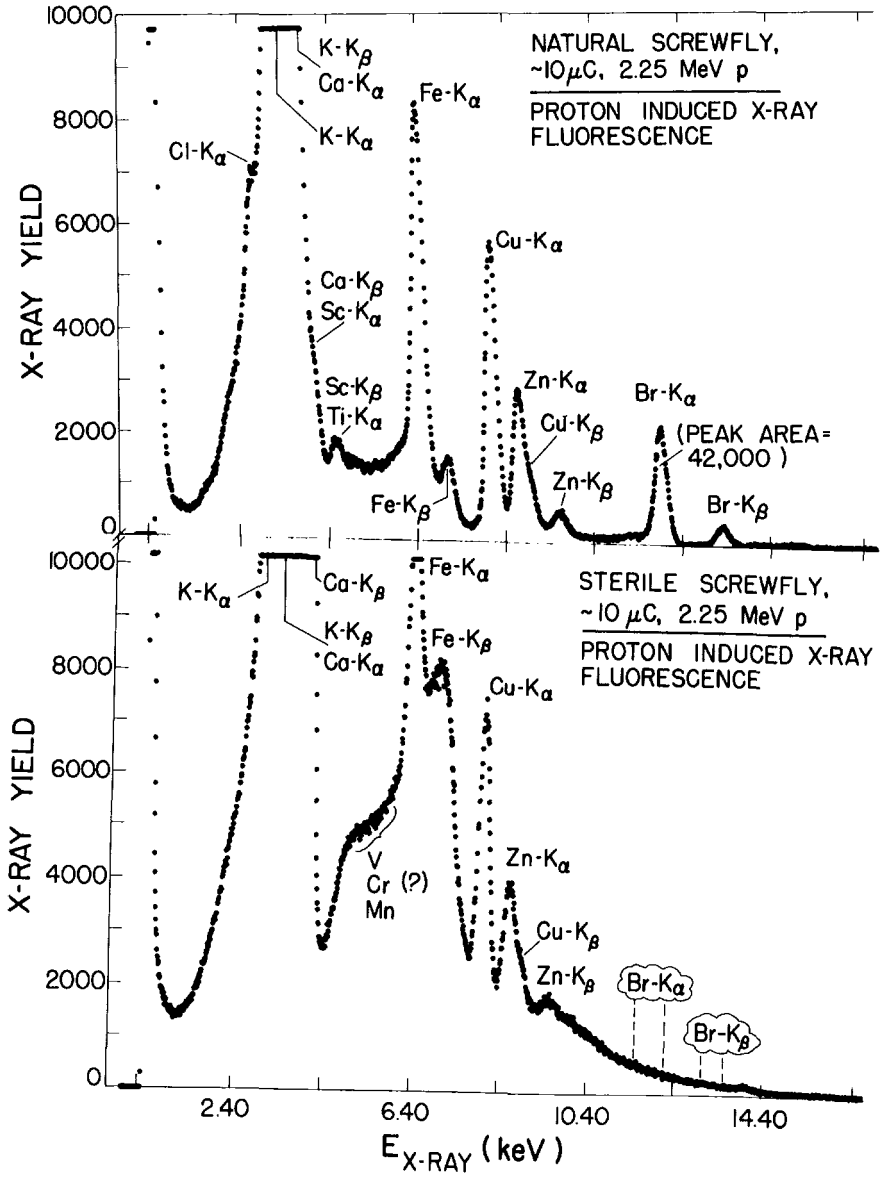
Umbarger displays screwworm flies obtained from the USDA.

X-ray fluorescence techniques employed by Umbarger and Malanify confirmed the results of neutron activation work done by John Balagna of CNC-11. The native screwworm fly contains significant amounts of bromine while the laboratory-grown fly contains none.

techniques to assay uranium in water as a part of nuclear safeguards activities. This seemed a good indication that the technique could also be used to identify and quantify elements in other materials.

They subsequently demonstrated that x-ray fluorescence could be used to show differences between laboratory-grown screwworm flies and their native counterparts. The results of this study were identical to those obtained by the neutron activation work of John Balagna. Balagna, CNC-11, determined with neutron activation methods that the native screwworm fly has more bromine in its system than the laboratory-grown fly. His work was a test to determine the feasibility of using neutron activation to help the United States Department of Agriculture obtain some statistics on the dynamics of its screwworm fly eradication project.

Screwworn infestation of livestock in some southwestern states has reached epidemic proportions. In an effort to control this problem, the USDA grows and sterilizes screwworm flies and then air-drops them in infested areas. The idea is that the sterile fly will not repro-



duce and that if enough of them are dropped, the screwworm population will eventually die off. Flies are trapped in air-drop areas to determine population statistics for program evaluation.

Malanify and Umbarger obtained both native and laboratory-grown screwworm flies for their investigations from the USDA's eradication project laboratories in Mission, Texas, where 200 million flies are grown and sterilized each day for international distribution. They irradiated these flies with both protons from the A-1 Van de Graaff accelerator and x rays from a radioactive source. Either technique utilizes the principle that each element has its own characteristic electron cloud surrounding the nucleus of its atom. When an electron in the cloud is ejected from its orbit, or shell, by collisions with protons from the accelerator or x rays from the radioactive source, the vacancy in the orbit is soon filled by an electron falling from a higher orbit. In order to match the lower energy of its new shell, the falling electron radiates electromagnetic energy in the form of x rays. These x rays are characteristic of the elements to which the atom belongs. By measuring the energies and intensities of these x rays, the elements present in the sample and their quantities can be determined.

It has been suggested that the high bromine concentration found in natural flies is due to additives in gasoline that when burned become a pollutant in the fly's environment. In order to determine where the bromine was located, Malanify and Umbarger analyzed the wings, head and thorax regions of native flies separately. The results showed that the amount of bromine present in the fly is proportional to weight and not surface area. This means that the bromine is ingested and not just "dusted" on the fly's surface.

The scientists said bromine may not be the best element to use in "tagging" the native fly since the laboratory fly would also be likely to ingest amounts of bromine once introduced in a screwworm-infested area. Malanify and Umbarger noted that a solution to this problem may be to give laboratory flies a nonradioactive tracer element in their diet which the native fly is known not to contain.

X-ray fluorescence studies by Group A-1 are included in a Laboratory proposal to the USDA to determine some of the dynamics of the screwworm eradication project. The proposal, which also suggests work to be done by groups H-4, CNC-4 and GMX-2, is aimed at determining attractants, or "bait," that could be used effectively in trapping screwworm flies, and tagging methods that coud be used to differentiate between native and laboratory screwworm flies and in separating these flies from other members of the fly species.

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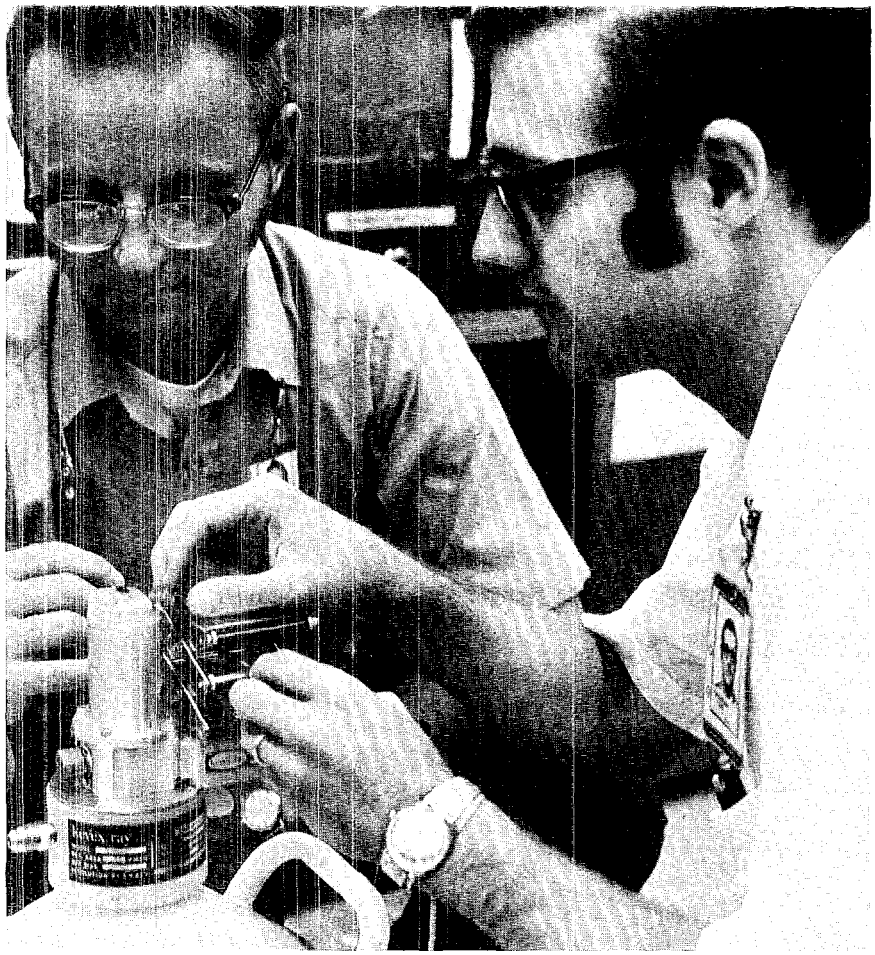
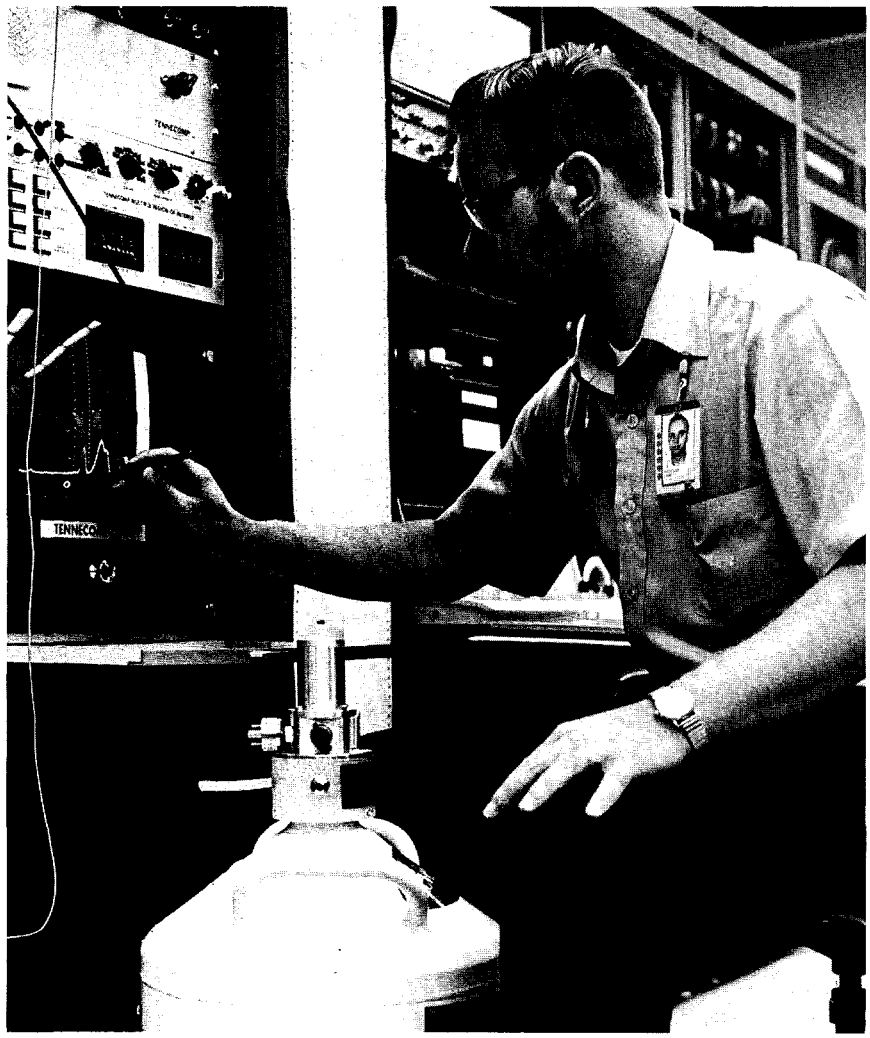


Malanify and Umbarger mount a directional plutonium-238 x-ray source on the lithium-drifted silicon detector. The source is pointed at a screwworm fly which is supported by a film of Mylar above the detector.



The detector transmits signals to a computer which stores the spectrum of elements present in the fly and displays it on an oscilloscope screen. Here, Malanify moves screen markers to the bromine region of the spectrum. The computer then determines bromine content.

Malanify and Umbarger have expanded their x-ray fluorescence studies to determine other possible practical applications. Their previous investigations of uranium in water indicated that x-ray fluorescence could probably be used to identify and quantify pollutants in other materials. The scientists have since determined the elemental spectrum of pollutants in air-sampling filters provided by Group H-8. They have also been working with Group H-5 industrial hygienists to develop methods to measure toxic metal concentrations in body fluids and tissues. To date, the scientists have successfully determined the elementary spectrum from human blood, tissue and urine samples. Another application being considered is the determination of elementary composition of artifacts collected by the Museum of New Mexico to better pinpoint the origin and migration of an artifact.

Although most of the x-ray fluorescence work done by Malanify and Umbarger has been concentrated on elemental composition of materials, the scientists are widening their investigations to include other techniques for isotopic measurements.

In collaboration with Al Evans, A-1, they have used the Van de Graaff accelerator to assay carbon-12 and carbon-13 in various materials and are interested in determining whether the technique can be applied to nitrogen isotopic analysis as well. The establishment of carbon and nitrogen isotopic analytical techniques is aimed toward applications in support of the Laboratory's ICONS program. ICONS is the acronym for Isotopes of Carbon, Oxygen, Nitrogen and Sulfur. Stable isotopes of these elements are in increasing demand for medical, biological and environmental research and development projects. The advantage of stable isotopes used as tracers is that sophisticated studies can be made without the hazard of radiation exposure.

This month, Malanify and Umbarger are beginning a series of experiments using muonic x rays from the accelerator at NASA's Space Radiation Effects Laboratory at Newport News, Va., to do isotopic studies of heavy elements such as plutonium, uranium, and of fissionable isotopes in general. The Virginia experiments will be followed by similar studies at the Los Alamos Meson Physics Facility soon after it becomes operational. Malanify and Umbarger are being assisted in the muon studies by Ron Augustson and Roddy Walton, both of A-1, and LASL consultant Lon Morgan from the University of Texas at Austin.

Malanify and Umbarger said the revival of interest in x-ray fluorescence techniques is world-wide. Many scientists at other laboratories are studying a seemingly endless number of applications that will have significant and beneficial impact on both science and society. Some of the attractive features of x-ray fluorescence are that it is nondestructive, rapid, direct and extremely sensitive to elements of interest. Analyses can be performed on small samples with little preparation and the necessary instrumentation is compact and easily adapted to mobile field units.

The Oppenheimer Memorial —What will it be?

J. Robert Oppenheimer

By Barbara Storms

"If we are to have a future in which all people are to live together and to work together in the same world, at peace, men must be able to understand one another. They must be able to communicate with each other without barriers, without coercion, and without fear. We must have an open world and we must have men with open minds."

When J. Robert Oppenheimer made this statement to a "Life" writer he articulated once again his life-long concern for communication and understanding in all aspects of life. In so doing, he set the theme for his own memorial, soon to be established in Los Alamos.

The J. Robert Oppenheimer Memorial Committee, an assorted group of dedicated Los Alamos citizens, has devoted the last year to finding ways to achieve a lasting and appropriate memorial that will serve as a reminder of Oppenheimer's efforts to find common paths of understanding between the communities of the arts and sciences and between them and the world at large.

The first part of the memorial, a series of annual lectures by eminent speakers in a wide range of fields, began last month with a discussion, by former Ambassador George Kennan, of the environmental predicament facing the United States. The second part is still in the planning stages.

By means of an international competition, the committee will acquire a sculpture to be placed in a memorial park, probably at the site of the old Central School, west of Fuller Lodge.

The desired purpose is to dedicate an object of high cultural merit to the memory of J. Robert Oppenheimer and to place it in a location that had great personal significance to him. It is hoped that the sculpture and the continuing lectures will together provide a rallying point for an improved understanding of the factors that sometimes trouble the relationship between the scientist and the non-scientist.

Just how this goal will take shape is still to be worked out by the committee before the competition can be launched. Opinions about what kind of sculpture will best express the aims of the memorial are as varied as the committee membership, ranging from the traditional—a bust or representative statue—to abstract interpretations of Oppenheimer's wide-ranging interests and vision.

The job of compiling these ideas and establishing a consensus will fall to members of the competition jury, three of whom have already been selected. One, Architect Wallace Harrison, is an Oppenheimer family friend and designer of the United Nations building in New York. The others are two of New Mexico's most renowned artists:

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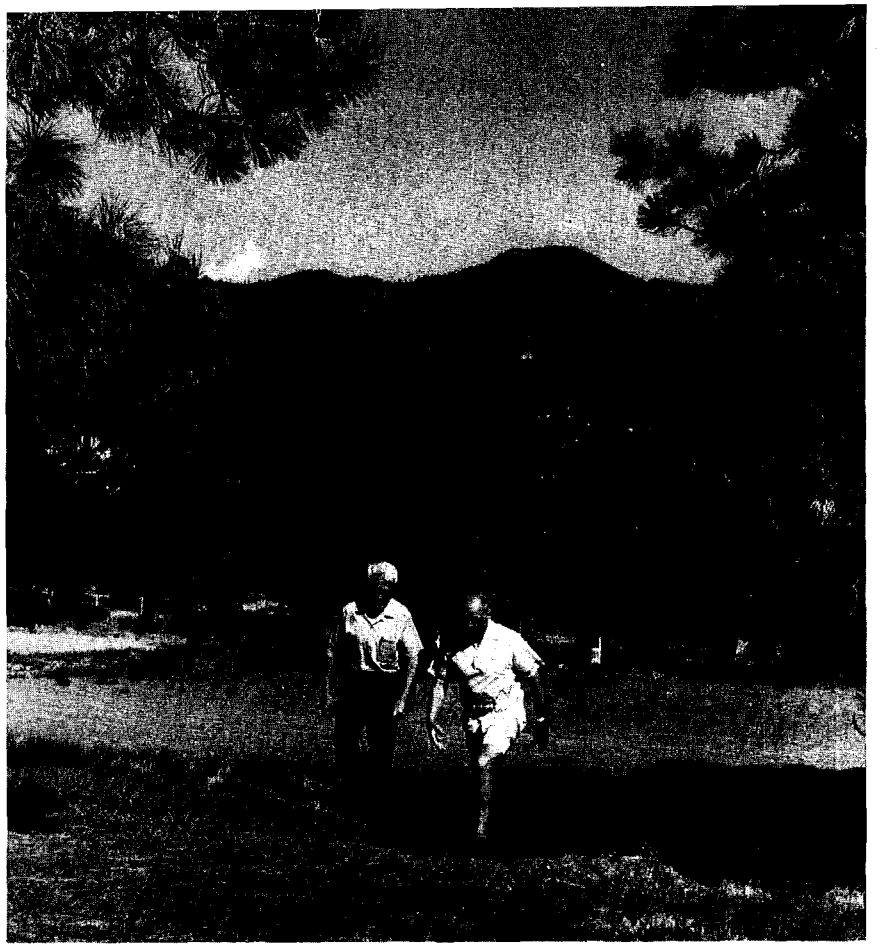


Harold Argo, chairman of the Oppenheimer Memorial Committee, and John Brolley, who originated the idea of a memorial, look over the site of the old Central School.

Right, what the "object of high cultural merit" to be dedicated to Oppenheimer will be is debated at a meeting of the Memorial Committee. Members shown in the photograph are Edmund Storms, Perc King, Nicholas Metropolis, Charles Critchfield, Nerses Krikorian, Argo and Norris Bradbury.

Painter Georgia O'Keeffe of Abiquiu and Architect Alexander Girard of Santa Fe.

Meanwhile, the committee's plea for funds has brought encouraging response from individuals, but the largest portion of the money probably will have to come from some type of grant. The original goal of $100,000 is still tentative and subject to change once the specific desires of the committee have been firmed up. Robert Davis of New York, former editor of "Physics Today" and one-time member of the Los Alamos project, is working with the committee as fund drive chairman.

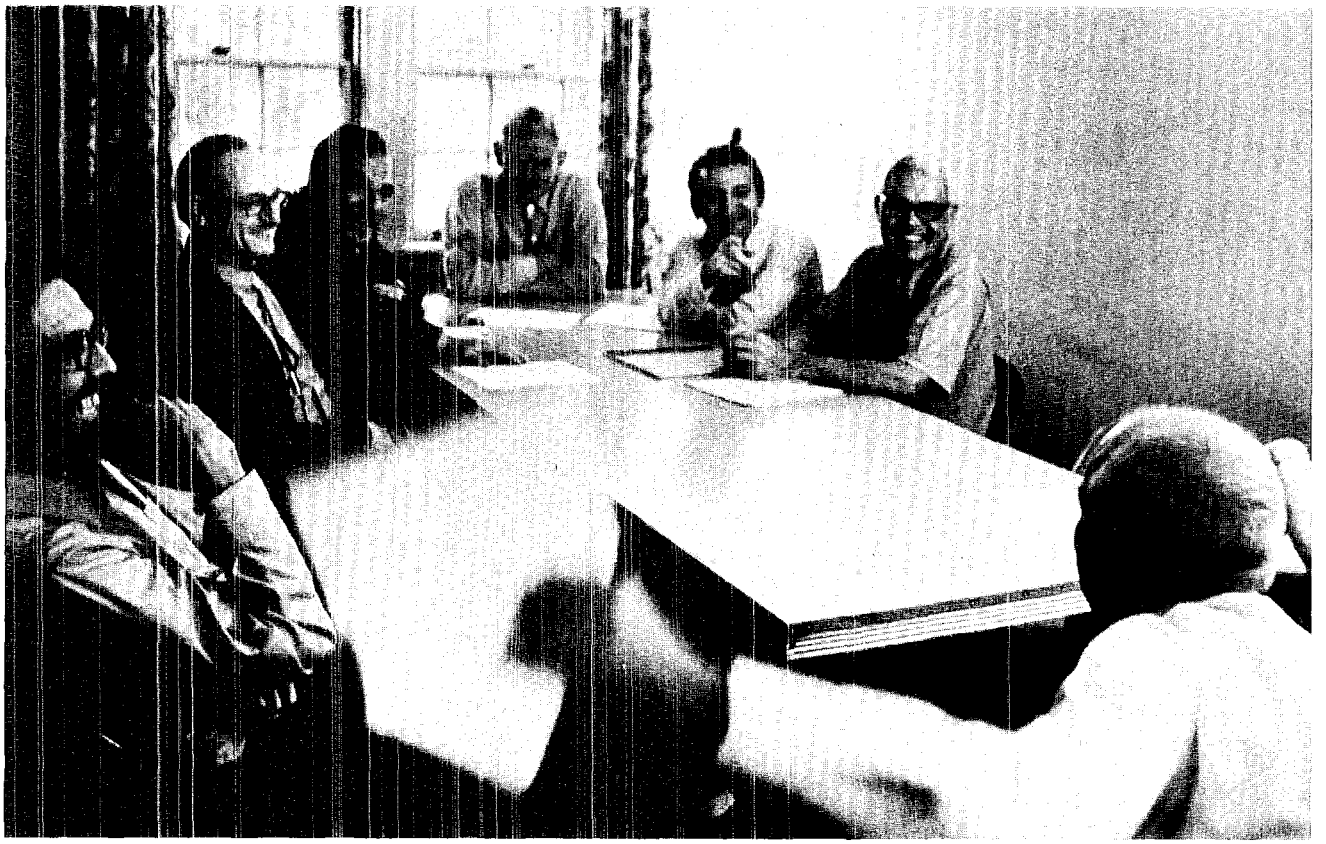
Acquisition of a park site seems a reasonably sure thing, according to Harold Argo, P-4, chairman of the committee. The county has been negotiating with the Los Alamos school system for a land trade in which the county would acquire the Central School site in exchange for land of equal value elsewhere. The land would continue to be owned by the county but dedicated as a memorial park.

The idea for the memorial originated with John Brolley, P-DOR. He attended an anniversary celebration of Enrico Fermi's first chain reaction at the University of Chicago at which a Henry Moore sculpture to nuclear energy was dedicated. Brolley originally envisioned a memorial to all the great scientists who had worked at Los Alamos and he took his proposal to the Los Alamos Arts Council.

Enthusiastic about the idea, the Arts Council delegated Brolley to investigate various means for establishing the memorial, the scope of which was eventually limited to honoring Oppenheimer.

Brolley inquired around the world about casting costs and made preliminary cost estimates for the project. Help from the artistic viewpoint came from Robert Ewing and Carlos Nagel of the Museum of New Mexico who volunteered museum facilities for judging and display of the entries.

Former Oppenheimer associates John Manley and Perc King, both research advisors at LASL, compiled a list of possible sponsors, all of whom agreed to endorse the memorial when they were contacted by Darol Froman, former LASL associate director. The sponsors, most of them scientists and all of them former associates of Oppenheimer's in science and government, include Harold Agnew, LASL director; Robert Bacher, provost, California Institute of Technology; Hans Bethe, Nobel Laureate of Cornell; Austin Betts, former director of the AEC's Division of Military Application; Norris Bradbury, former LASL director; Edward Creutz, assistant director of research, Na-



tional Science Foundation; Lee DuBridge, former science advisor to the President and former director at the California Institute of Technology; Robert Duffield, director, Argonne National Laboratory; Froman; George Kennan, Institute for Advanced Study; Donald Kerst, University of Wisconsin; George Kistiakowsky, former presidential science advisor and currently professor at Harvard; David Lilienthal, former chairman, AEC; Edwin McMillan, Nobel Laureate and director, Lawrence Berkeley Laboratory, University of California; Sir Rudolf Peierls, Oxford University; Lord William Penney, former chairman, United Kingdom Atomic Energy Authority; I. I. Rabi, Nobel Laureate of Columbia University; Norman Ramsey, Harvard; Glenn Seaborg, Nobel Laureate and former chairman, AEC; Ralph Carlisle Smith, academic vice president, Highlands University; Henry Smyth, Princeton, former member of AEC; Sir Ernest Titterton, director, Research School of Physical Sciences, the Australian National University; Stanislaw Ulam, University of Colorado; Victor Weisskopf, Massachusetts Institute of Technology; Robert Wilson, director, National Accelerator Laboratory.

No longer associated with the Arts Council, the committee has been organized independently as a non-profit corporation with Argo as chairman. Members, in addition to Brolley, Froman and King, include Mrs. Beverly Agnew; Bradbury; Charles Critchfield, T-9 group leader; Donald Harris, T-2 group leader; Mrs. Gloria Hausner, First National Bank of Santa Fe; Nerses Krikorian, CMB-3; Nicholas Metropolis, C-division advisor; Chaim Richman, H-9 group leader; George Shepherd, H-4; Edmund Storms, CMB-3; Gerold Tenney, LASL consultant; and Mrs. Judy Young. Ewing and Nagel represent the Museum of New Mexico on the committee.

When Oppenheimer died in February of 1967, Bradbury, who was then LASL director, commented: "His stamp upon the character of Los Alamos was profound and permanent; his impression upon those who knew him was no less so."

With generous financial support, with a successful communication of ideas between the arts, the sciences and the community, the memorial committee hopes to achieve a memorial that will leave the same kind of impression on all who see it—a memorial offering a profound and permanent reminder of a remarkable man.

The Inspectors

Bernie Gilbert and Eugene Harkleroad use an optical comparator to determine the location of the intersection of two angles. The angles appear as a shadow on the circular screen.

This page is 4.8-thousandths-of-an-inch thick. It was measured by Hannibal Fraga, SD-4 group leader, with a simple, but precise, hand-held micrometer.

The micrometer is only one of many instruments—although not the most exacting—used by Fraga and his 20-member group for making fine measurements. Group SD-4 is the Shop department's Inspection group at the Los Alamos Scientific Laboratory. Equipped with latest precision tools and measuring instruments, group members can inspect apparatus and tools to 10-millionths of an inch and calibrate gauges to within one-millionth of an inch.

"We provide a service to the Laboratory," Fraga said. "We assist with gauging problems, we do dynamic balancing, we measure straightness and hardness, we check materials for fine cracks and flaws, we do leak testing, and we make many different types of dimensional measurements for such things as roundness and concentricity.

"Our personnel are selected from experienced machinists in the Shop department. The mechanical aptitude and manual dexterity they develop through years of working with machinery makes them best suited for the job of an inspector. Some of our tools are only refinements of the tools they used as machinists, but others, such as optical flats, comparators and microscopes, they've never used before, and they have to be trained to use them properly."

Of the 20 members of SD-4, 17 are permanent employees and three are apprentice machinists temporarily assigned. Apprentice machinists are assigned to the Inspection group and other groups of the Shop department for short periods of time. "It gives them an appreciation for the geometry of parts and for good work," Fraga said.

"Ninety per cent of the work we do," the group leader noted, "requires inspection to within thousandths of an inch. The remainder is in the millionth-of-an-inch range and generally not closer than 10 millionths."

Accurate measurements to within millionths of an inch are affected by too many variables for it to be done in normal laboratory facilities. Serious errors can be caused by slight contraction or expansion of both instruments and the parts to be inspected due to fluctuating room temperatures. Measurements can also be influenced by a man's body heat, his breath or by dust particles only a few millionths of an inch in diameter. Because of these variables, such fine measurements are made in the "Modulab," a custom-built room where the atmosphere is carefully controlled.

"The Modulab," Fraga said, "is maintained at 68 degrees Fahrenheit, plus or minus a quarter of a degree, and the air is changed 20 times an hour. Dust particles down to 10-millionths of an inch are filtered out of the incoming air."

To avoid any errors, due to contraction, parts are allowed to reach ambient temperature in the Modulab before they are inspected.

Most parts reach ambient temperature within 24 hours, although more massive components take longer. Fraga noted that a coordinate measuring machine, moved into the room more than a month ago, is still one degree above room temperature.

The Modulab became operational about a year ago. Although used regularly, a major portion of the Inspection group's work is done in normal laboratory facilities.

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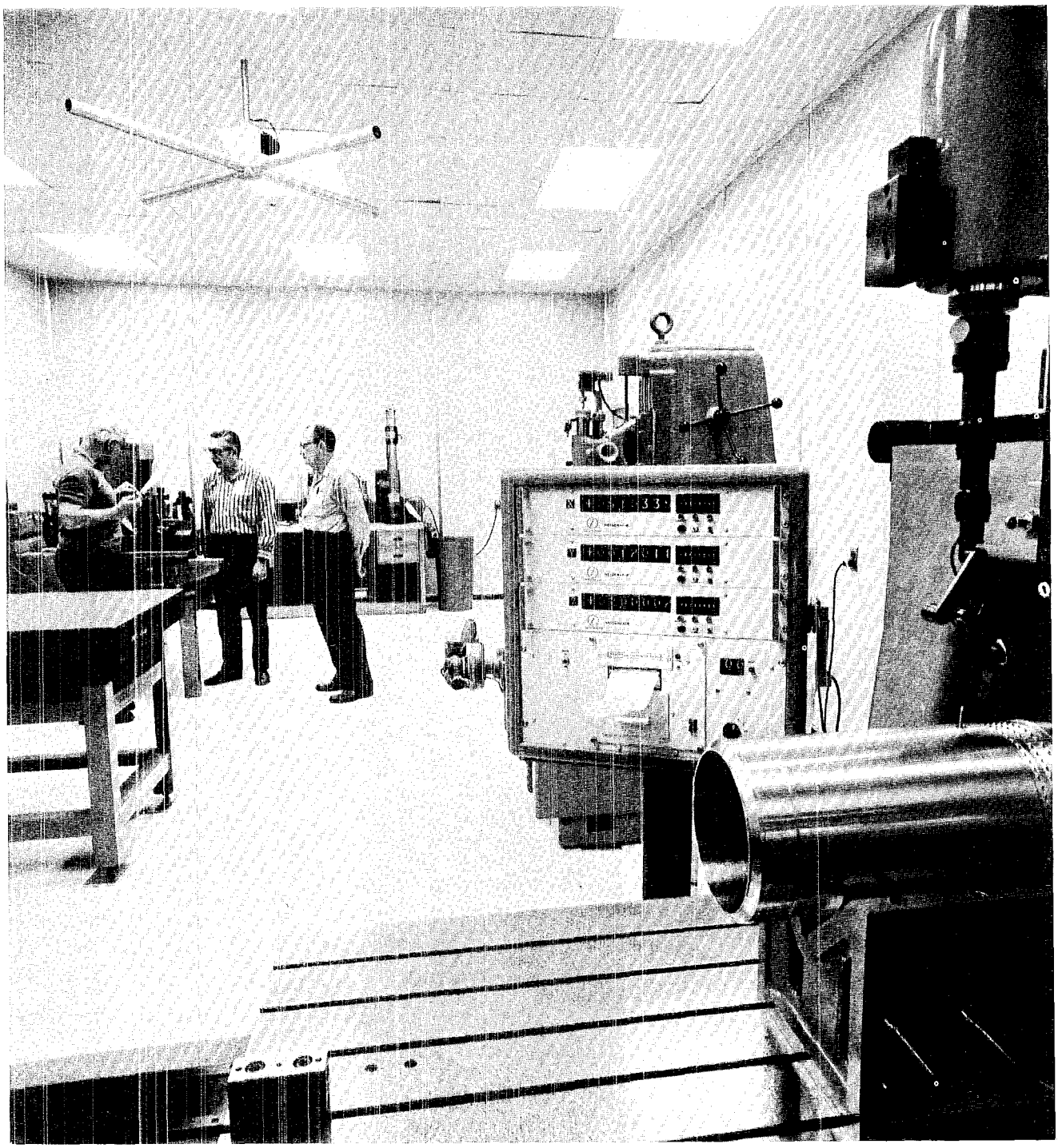
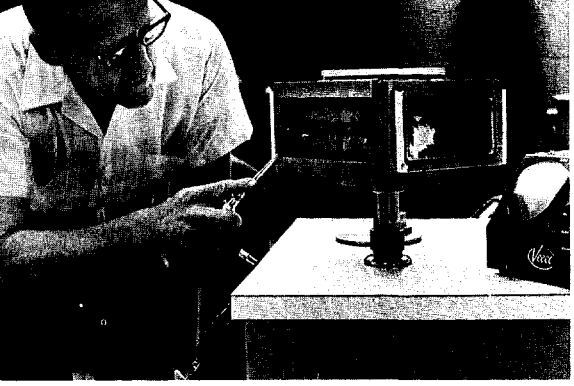
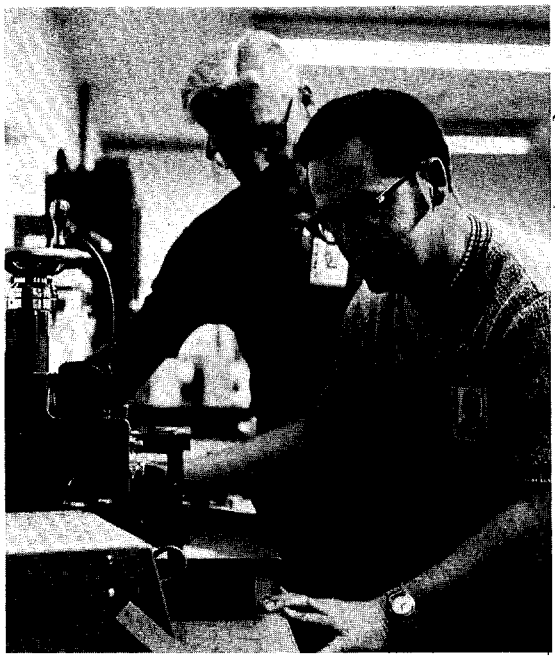


Inside the Modulab, SD-4 Group Leader Hannibal Fraga discusses a work order with inspectors Albert Tilby and Lee Bridges. In right foreground is a coordinate measuring machine, moved into the Modulab more than a month ago, whose parts are still one degree above room temperature.



Left, Allan Spooner traces welded joints on a component with a jet of helium gas to determine whether the welds are airtight. Gauge at right indicates whether any of the helium gas enters the component through the welded joints.



Above, Fraga observes Paul Valdez measure the smoothness of the sealing surface with a horizontal profilometer.

After the component was leak tested, hole locations were measured on a coordinate measuring machine by Harkleroad.

A recent and typical job done by group members is the inspection of a square component consisting of several welded parts. On each of two sides of the component is a large hole, rimmed by a smooth sealing surface. This surface is surrounded by a series of 12 smaller holes and, in addition, there are similar-sized holes at each of the component's corners.

Inspection requirements were that the welds be airtight, that hole locations be accurate to within five-thousandths of an inch, and that the rims of the two large holes in the component allow a good sealing surface.

The inspectors plugged the holes in the component and mounted it on a leak detector, a machine equipped with a vacuum pump and helium-sensitive detector. In a leak test, a vacuum is created within a component and an inspector traces the welded joints with a jet of helium gas while watching the detector gauge which indicates how much, if any, gas is sucked into the vacuum through the welded joints.

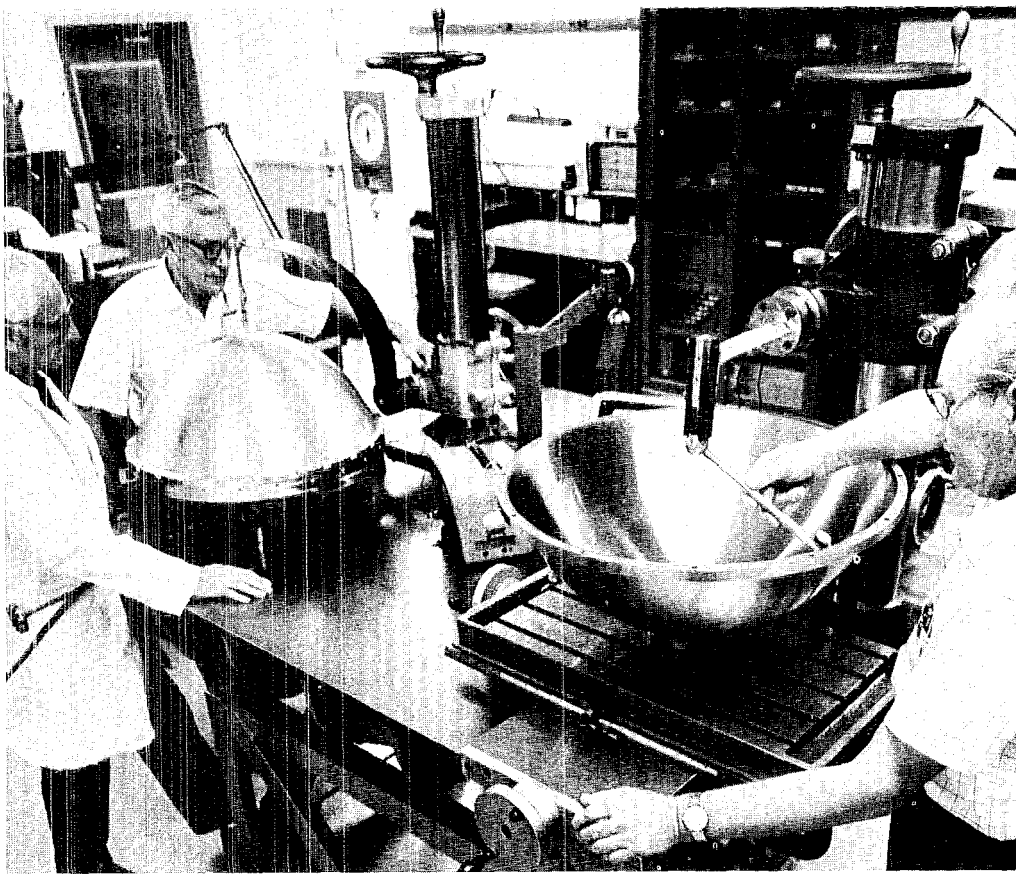
After the component was leak tested, hole locations on two of its surfaces were measured with a coordinate measuring machine. This is an instrument capable of measuring the location of points on a surface in relation to a reference point to .5 thousandths of an inch. After establishing the reference point (in this case, the center of the large hole in either of the two surfaces) the machine's vertical pointer is moved from point to point (hole to hole) and its coordinates with relation to the reference point are indicated on a digital printer.

To measure the smoothness of the sealing surface a horizontal profilometer was used. This machine measures the roughness of a surface in millionths of an inch. Surface variations are recorded on a gauge electronically linked to a sensitive diamond-tipped needle detector which moves across the contours of the machined surface.

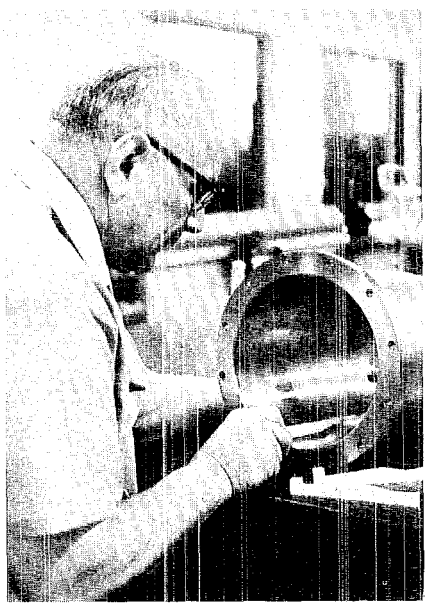
Another recent job completed by

Ralph McFarland and Clayton measure the wall thickness of a hemisphere. The component is positioned over a steel ball which rolls against the inside wall. The dial indicator on the outside wall indicates deviations from specified thickness.

Inside and outside radii of some hemispheres were measured with sweep gauges. Making the measurements are Jim Clayton, Eugene Roach and Jim Snyder.



Peter Kleczka matches a cast against the component part which served as a mold. From the cast, SD-4 inspectors could accurately measure the angle and length of angle of a surface deviation inside the cylinder.



members of SD-4 required the measurement of the inside and outside radii, and wall thickness of some hemispheres. The radii were measured with sweep gauges, instruments consisting of half-moon-shaped bars which swivel, or sweep, broadside over the rounded surface of a part undergoing inspection. On a stem mounted to the bars are dial indicators which measure deviations from true radius.

To measure wall thickness, each of the hemispheres was positioned over a steel ball. As the ball rolled against the inside radius of a hemisphere, a dial indicator on the outside radius measured deviations from specified thickness.

According to Fraga, not all measurements can be made directly from a part. Hole parameters, for example, must often be measured from impressions. "We had a job recently where we were required to measure some thread parameters on a part. The part weighed 9,000 pounds and was too big to bring in here, so we took our measurements from an impression we made with some investment casting material.

"We inspect items machined in the various SD shops and by outside vendors, and we provide a service for other LASL personnel. The group ordering a part must request an inspection and let us know the degree of inspection they want."

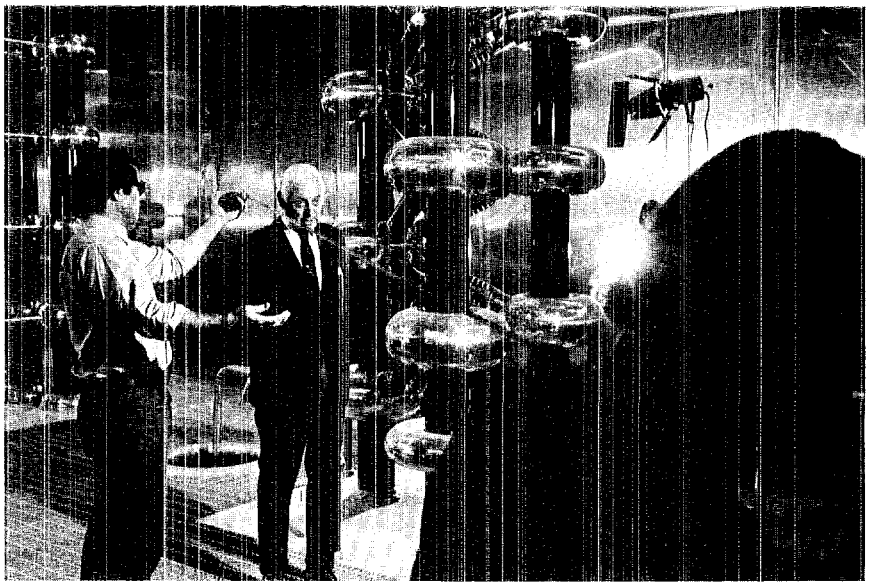
Photo Shorts

by Bill Jack Rodgers and Bill Regan

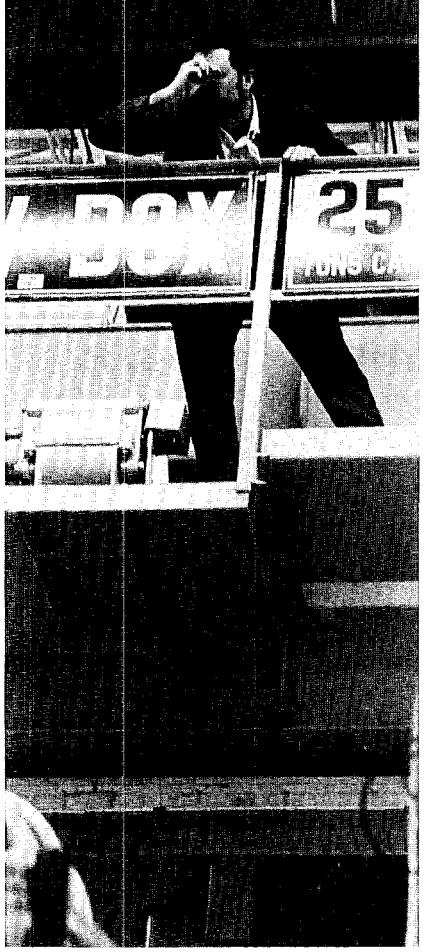
Unclassified paperwork discarded by LASL personnel during the recent Laboratory-wide clean-out campaign is loaded on a truck at the Records Management Center. The paper is being collected by the Albuquerque Paper Stock Company for recycling.

About two miles northeast of Fenton Lake, an oil-drilling rig is sinking a 3,000-foot hole. The hole, on Forest Service land two to three miles outside the Jemez Caldera, will be used by Los Alamos scientists for preliminary studies to support their proposal to investigate the feasibility of geothermal energy power plants. The scientists believe it may be possible to extract heat from dry, but hot regions of the earth, and convert it to electricity.

William Pickering, director of the Jet Propulsion Laboratory, California Institute of Technology, shows LASL's Raemer Schreiber, technical associate director, and Duncan MacDougall, assistant director for weapons, photographs taken of the planet Mars by Mariner spacecraft. Pickering talked at a LASL colloquium on "The Mariner Program." Below right, John Flaherty, assistant manager of the AEC's Energy Development Programs, observes a subterrene-bored hole. Kneeling is John Rowley, N-7 group leader, who heads the subterrene project at LASL.



British Broadcasting Company Narrator Alistair Cooke stands in front of one of LAMPF's Cockcroft-Walton injectors waiting for his cue. Members of the BBC spent three days filming in Los Alamos for a segment which will be used in one of a series of 13 hour-long programs on American history.



Right, Emory Kristof, staff photographer for "National Geographic" magazine, spent several days in Los Alamos photographing research areas. The photographs are for a special article on "The Energy Crisis," planned for November.

Bruce Stewart, J-10, climbs aboard a rubber raft in the Sandia Laboratories swimming pool. The exercise was a part of survival training taken by several LASL personnel who make up the NC-135 "flying laboratory" scientific crew during high altitude studies. To Stewart's right is Don Westervelt, J-14 group leader.

The Stanley Steamers

Singing Physicists

The Stanley Steamers—Stan Marsh, Joe Fritz, Max Fowler and Jerry Morgan.

Five years ago Jerry Morgan became the newest member of a car pool. He and its other members—Stan Marsh, Max Fowler and Joe Fritz—had a lot in common. All four lived in the northern part of Los Alamos; all were physicists, and all worked for Group GMX-6 at Ancho Canyon, one of the Los Alamos Scientific Laboratory's outlying sites. As it turned out, all four men also enjoyed music and it was often a topic of conversation.

About six months went by when one of the members suggested it might be fun to sing together. A canvass showed that the foursome was made up of a first tenor—Marsh; a second, or lead, tenor—Morgan; a baritone—Fritz; and a bass—Fowler. They bought some sheet music and borrowed the use of a piano. Fritz sat down at the keyboard and plinked out the voice parts for each of the men, and then they sang together.

They're still singing together. They formed a barbershop quartet known as the Stanley Steamers, a name suggested by Fowler. Since then the singing physicists have performed during GMX-6 group parties and other informal get-togethers, and they have made 24 formal appearances at such things as church socials, dance intermissions, parties, the Los Alamos Concert Association Festival, political dinners, service club banquets, and even a 50th wedding anniversary.

Their bookings could be more numerous, but to the members of the quartet, singing is a hobby. They accept invitations to sing when it's convenient for all of them and they limit their appearances so as not to interfere with their family lives or work.

The Stanley Steamers dress in striking red and white striped vests, white shirts with red garters, and flat-topped straw hats (skimmers or sailors). With one exception this attire is the same for each man. The exception is the band on Marsh's hat. Marsh has never gotten around to dyeing his hat's band black to match those worn by other members of the group. Because of this distinction, Morgan, Fritz and Fowler have affectionately named him "Chief."

The quartet holds its practice sessions on the way to and from work. "We found that it is pretty hard for the driver to concentrate on driving in the heavy traffic through town and on his singing part too," said Marsh, "so we don't start our practice sessions until we pass the Laboratory's Administration building."

The singing car pool has a novel way of deciding who drives on what day. The method, thought out by Fritz, is based on each man being assigned a day and a number. The number corresponds to the first, second, third or fourth day of each workweek. Fowler, for example, drives on Monday and since it is the first day of the workweek, his number is one. Fritz drives Tuesday; Morgan, Wednesday; and Marsh, Thursday. But who drives on Friday? This is decided by dividing the date of the month by four—the number of persons in the car pool. If the date isn't evenly divisible by four, the remainder will be one, two or three and the member with this number does the driving. If the date is divisible by four, Marsh drives.

"It's interesting to watch the reactions of people when we're singing on the way to and from work," Marsh said. "Some people roll down their car windows to find out where the music is coming from. Other people give us strange looks and roll their windows up. Most members of the Protective Force who know us don't think there is anything strange about us singing when we stop at the guard station for them to check our badges. We even do an occasional request for them. Once in a while though, there'll be a new guard and he'll give us some funny looks until he knows who we are and what we're doing."

The group sings unaccompanied and normally a pitch pipe is used to establish the starting pitch. They don't always have one with them during the practice sessions on the road to and from work, but then, they don't really need one. They have compared the pitch of their car horns with a pitch pipe and they know the note each one sounds. One horn may sound a "C" and another an "A," but from this they can reach the starting pitch for a number.

Aside from the 15- to 20-minute sessions on the 15-mile stretch to and from Ancho Canyon Site, the only other times the group practices is during noon hours when they are preparing for a performance. "When we have a noon-hour session," Morgan said, "we just find a room at the site that isn't being used, close the door and sing."

During their on-the-road practice sessions, the Stanley Steamers have worked up a repertoire of about 40 songs, 20 of which are used regularly at most events. Wages? "Cookies and punch," said Morgan, ". . . a meal or whatever refreshments are being served," said Marsh.

The singing physicists determine the pitch of Marsh's car horn by comparing its sound with that of a pitch pipe.

MT/ST, MT/SC, and MUX

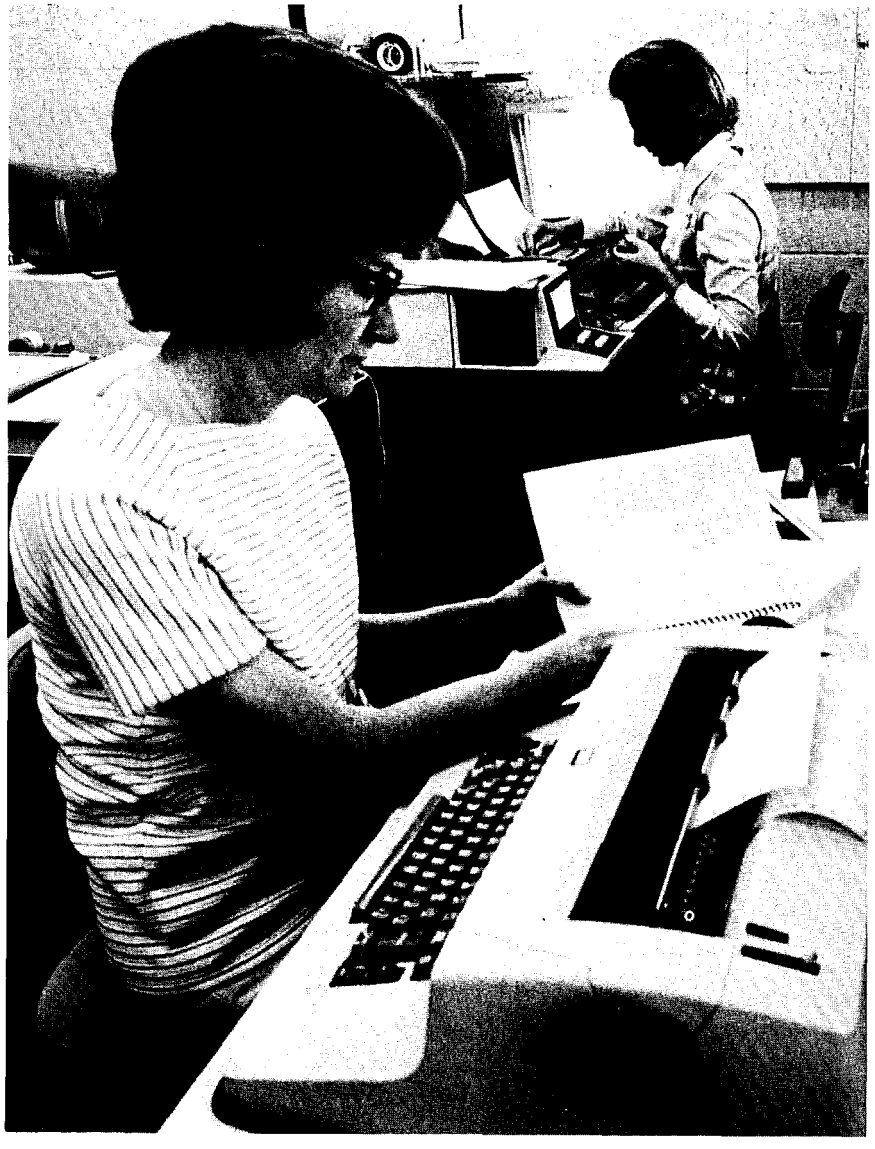
By Charles Mitchell

Because reporting results of research, making proposals to various agencies, and printing directories, manuals, and listings are so important to the Los Alamos Scientific Laboratory, the Reports section of Group ISD-6 has "gone modern." Modernization in ISD-6's case involves the use of two new systems to produce high-quality printed matter.

According to Charles Mitchell, who heads the Reports section, until a couple of years ago, all documents were typed on standard office typewriters. While work done this way was generally acceptable, it was decided that some new equipment by IBM, called the Magnetic Tape Selectric Typewriter (MT/ST) and the Magnetic Tape Selectric Composer (MT/SC) would offer four features not available with standard typewriters. This new equipment produces printed pages that look as good as the pages in books. Because of the way the machines arrange the type on the page, the copy produced is more "readable" and, in a long document, paper is saved. The fact that the MT/ST-MT/SC records everything on magnetic tape allows simple correction and updating of items that change regularly.

The MT/ST-MT/SC equipment is really quite simple in concept. In essence, the MT/ST creates magnetic tapes which, in turn, tell the MT/SC how to type the document, which it does essentially automatically. One of the four, half-time operators of this equipment types the document, and as she types, the document is recorded on a magnetic tape.

The format, or how the final report is to look, is also recorded on the tape so that the MT/SC, which is controlled by the tape, will type out the final report correctly. If an error, such as a mispelled word is found, the operator can search



In the ISD-6 composing room, LaVaughn Lundgaard, foreground, and Phyllis Holland operate the MT/ST and MT/SC equipment.

through the tape very easily and change that one word. Entire sentences and paragraphs do not have to be retyped as they would on a standard typewriter.

When a perfect tape has been created by the operator, the MT/SC takes over. This machine "reads" the tape the MT/ST produced and types the final document.

Instructions the operator has put on the tape tell the MT/SC when and how to do many special operations, such as stop to allow bold or italic letters to be inserted. The programming of the MT/SC even lets it "ask" the operator where words are to be hyphenated at the end of a printed line. These features allow ISD-6 to produce printed documents with all of the features, such as many type styles, found in "The Atom."

The Laboratory produces a number of "listings" that are updated periodically. A good example is the "Directory of Division Leaders, Group Leaders, and Secretaries." This directory has the building number, room number, and telephone number for all administrators and their secretaries. Naturally, with the formation of new divisions and groups, and with people and their telephone numbers constantly changing, this list must be redone, usually twice a year. Putting the whole listing on MT/ST magnetic tape makes this updating quite simple, since only those entries affected need to be changed. This means that a job that would take two days to do on an office typewriter, since the entire listing would have to be retyped, can be done in one day and be more attractive and easily used because of the flexibility in type styles and symmetry of layout.

Group ISD-6 is now looking into areas in which the MT/SC can be tied into a C-division computer. One of these areas is the production of legible computer printouts. The "normal" computer printout, generated by the high-speed printers in the Central Computing Facility (CCF), is not of high quality. The letters are, for printing purposes, fuzzy and of unequal quality. Because of this, when standard printout are printed in reports they are often very difficult to read.

Working with Stan Lyon of C-4, ISD-6 devised a method for producing such printouts on the MT/SC. Lyon developed a program which allows the mini-tapes in the CCF to be transcribed onto MT/SC tapes. The code Lyon developed allows certain control codes to be written on the tapes so that type styles and formats can be changed easily. Authors who have to use computer generated information in the form of printouts are now being advised of this service and are able to produce more readable reports.

While working on the computer printout problem with Lyon, ISD-6 started giving serious consideration to the idea of editing and composing reports using the CDC-6600

continued on next page

Charles Mitchell, composing section leader, operates the MUX terminal.

Carol Banks and Mitchell study layout sheets for report being prepared by the ISD-6 composing section.

computer in the CCF. MUX (Multiple User eXperiment) had been brought on line and its programming allowed text editing. Basically, MUX is a computer system that can be used simultaneously by a number of people from remote locations.

If ISD-6, with the help of C- and E-divisions, can work out the "bugs," a system can be created which will enable a number of users, at remote locations, to use MUX for the preparation of reports. While MUX is not perfect for ISD-6's intended use, this group now has the hardware and software to start investigating using computers for the editing and preparation of reports through the CDC-6600 computer.

When this system is perfected, an author will have his report typed on a "terminal" in his area. This terminal resembles a typewriter and is used to "talk" to the CDC-6600 computer. His report will be recorded by the CDC-6600 and given a "file" name. ISD-6 will be notified of this file name so that the author's report can be "called up" at the ISD-6 terminal, where it will be typed automatically. Since MUX has an editing capability, that is the system allows changes in the files, the ISD-6 editors can use their terminal to edit the report. ISD-6 will then give the author the new file name assigned so that he can "call up" the report to review the editing. After the author's approval, the report will be processed through a language conversion code, composer instruction will be added, and the computer will be asked to write the report onto MT/SC casettes on a tape writer in ISD-6. These tapes can then be run on the MT/SC to obtain a final typed copy.

In short, a report will have to be typed only once—the rough draft—and the physical difficulties in handling and transmitting various copies back and forth between ISD-6 and the author will be avoided. Information storage, retrieval, and record keeping will be much easier.

short subjects

Harry Schulte, H-5 group leader, was presented with the 1972 Cummings Memorial Award of the American Industrial Hygine Association at the Annual Industrial Health Conference last month in San Francisco.

Schulte, an employee at the Los Alamos Scientific Laboratory since 1948 and a past president of the American Industrial Hygiene Association, also gave the Cummings lecture at the conference. He talked on "The Industrial Hygienist as a Social Scientist."

The Cummings Memorial Award is the highest award given by the association. It was established by the association's board of directors in 1943 in memory of one of its founders and third president, Donald Cummings. It is presented ". . . for outstanding contributions to the knowledge and practice of the profession of industrial hygiene."

Louis Rosen, MP-division leader, has been appointed a member of the American Physical Society's Division of Nuclear Physics Committee on Contacts with the Press.

The three-member committee is chairmaned by D. A. Bromley of Yale University. The other member is H. Feshbach of the Massachusetts Institute of Technology.

The committee's function is to consider ways of informing the public on scientific activities and includes consulting with members of the American Institute of Physics with regard to the institute's annual press releases.

L. Frank Son, formerly employed in Group GMX-3, died recently in Graham, Texas. Son retired in 1968 after 18 years service at the Laboratory. He is survived by his wife, Hazel, a former employee in Group ISD-7.

Gerold Tenney, Laboratory consultant on nondestructive testing and evaluation, organized, chairmaned and gave the keynote address at the Symposium on Quality Assurance and Reliability in Buenos Aires, Agentina, last month. Tenney's address was on "The Economic and Industrial Role of Quality Assurance and Reliability."

The symposium was held in conjunction with the Exhibition of U.S. Made Quality and Reliabilty Equipment. It was the inaugural event of the First U.S. Regional Trade Development Center to be established in South America.

Eero Hakkila, CMB-1, has been elected president of the New Mexico Institute of Chemists, succeeding **Charles Holley,** CNC-2 group leader.

John Ward, CMB-5, was named president-elect; **David Bowersox,** CMB-11, secretary; and **Thomas Sandenaw,** CMB-13, treasurer.

Council members include **Darleane Hoffman,** CNC-11, **Karl Bergstresser** who recently retired from Group CMB-1, and Holley.

The New Mexico Institute of Chemists is composed of professional chemists and chemical engineers in New Mexico and West Texas. It is affiliated with the American Institute of Chemists.

The Atomic Energy Commission's Division of Research will provide funds to help scientists participate in experiments that have been approved for beam time at the Los Alamos Meson Physics Facility.

This financial support, to be administered by the Associated Western Universities is in the form of subsistence and travel while scientists are actively participating in an experiment or its preparation.

The announcement was made by G. Victor Beard, executive director of the AWU. Further information and application forms can be obtained from the Associated Western Universities offices, 136 East South Temple, Salt Lake City, Utah.

More than 11,000 persons from throughout the United States and from some foreign countries visited the Bradbury Science Hall during the first four months of this year. The record month during this period was March when more than 4,000 visitations were recorded.

Eight Scientists Die in Plane Crash

Eight Laboratory employees were killed May 19 when a Ross Aviation Queenaire crashed and burned shortly after takeoff at the Albuquerque International Airport. The pilot was also killed in the accident which is being investigated by the Federal Aviation Administration.

Dead are Wright Langham, associate division leader for biomedical research, H-DO; Eugene Teatum, TD-4; Richard Neithammer, W-1; Don Larson, J-8; Bruce Bean, J-8; William Frye, J-8; Johnnie Gallegos, J-14; John Gill, N-3; and Richard Zettel, pilot.

Langham, a LASL employee since 1944, was a pioneer in the field of the toxicology of plutonium. Starting as a chemist in the early days of the Manhattan District, he was with one of the many small groups working on the chemistry of plutonium when the world's supply of this nuclide consisted of only a few milligrams. He was a senior member of the team sent to Palomares, Spain, in 1966 to investigate that accident. Again, in 1968, he was sent to Greenland to assist with work in connection with that incident. He was also a member of several advisory committees connected with this country's space program. He was 60.

Gill, 43, had been employed at LASL since 1966. He was an electrical engineer.

Teatum was a staff member who was hired by the Laboratory in 1966. He was 37.

Larson, a technician in J-8, had been employed by the Laboratory since 1949. He was 46.

Bean, 28, had been a LASL employee since January 1 of this year. He was an engineer.

Gallegos, hired by LASL in 1956, was a senior electronics technician. He was 41.

Niethammer, 39, was an engineer in W-1. He had been a LASL staff member since 1968. He had also been a Laboratory employee from 1958 to 1967.

Frye, an electronics engineer, was 40 and had been a Laboratory employee since 1966.

Wright Langham

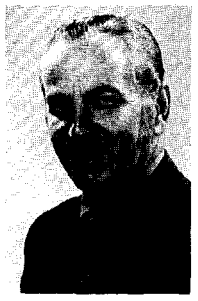
Johnnie Gallegos

Bruce Bean

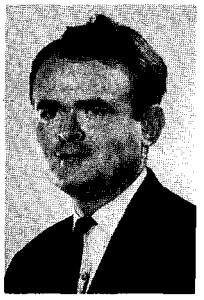
Richard Niethammer

William Frye

John Gill



Don Larson



Eugene Teatum

Eight Laboratory Employees to Retire

Eight LASL employees will retire at the end of the current fiscal year.

They include Glenn Champion, A-3 group leader and source and special nuclear materials accountability representative for the Laboratory, and Herman Hoerlin, J-DO.

Champion, who has been employed at the Laboratory since 1946, and his wife, Theresa, a longtime Los Alamos school teacher, who is also retiring, will continue to live in Pojoaque. Hoerlin, a LASL employee for 19 years, has served as J-10 group leader and during his tenure was responsible for developing an outstanding group for the study of high altitude weapons phenomenology. He was in charge of the LASL programs at the Johnston Island high altitude tests in 1958 and was LASL task unit commander for high altitude tests in 1962. He will serve the Laboratory as a consultant. He and his wife, Kate, live in Santa Fe.

Other retiring employees include veterans Jose Valdez, E-DO; Thelma Thomas, N-2; Mazie Anderson, H-2; and Edwin Knotts, ENG-2.

Valdez, who came to Los Alamos in 1944 as a member of the U.S. Corps of Engineers, and his wife, Stella, will continue to live in Los Alamos.

Mrs. Thomas, an employee for 22 years, will continue to live in Los Alamos.

Mrs. Anderson, a LASL employee for 20 years, and her husband, Carroll, will live in Santa Fe.

Knotts, and his wife, Virginia, will move to Denver. Knotts has been employed at LASL for 20 years.

Robert Swain, CNC-11, who has served at the Laboratory for seven years, and his wife, Marjory Ellen, will live in Jemez Springs.

Foy Gipson, a member of CMB-AS since 1966, and his wife, Mae, will move to Abilene, Texas.

the technical side

Taken from LASL Technical Information Reports submitted through ISD-6

Conference on Quantitative Flourescence Techniques as Applied in Cell Biology, Seattle, Wash., March 27-31:

"The Cell Sensing and Analysis Program at Los Alamos" by M. A. VanDilla, H-4 (invited)

Seminar, Columbia University, New York, N. Y., April 3:

"Anomalous Microwave Absorption Near the Plasma Frequency" by H. Dreicer, P-13

New York Academy of Sciences Conference on the Chemical and Physical Behavior of Porphyrin Compounds and Related Structures, New York, N. Y., April 3-6:

"Carbon-13 Nuclear Magnetic Resonance Spectroscopy of Tetrapyrroles" by N. A. Matwiyoff, CNC-4, and B. F. Burnham, Utah State University, Logan

American Crystallographic Association Meeting, Albuquerque, N. M., April 4-7:

"The Crystal Structure and Electron Distribution of 1, 1'-Azobiscarbamide and Acetylene Dicarboxylic Acid" by D. T. Cromer and A. C. Larson, both CMB-5

"The Crystal and Molecular Structure of di-μ-(Pyridine Oxide)-bis (Dichlorodimethyl - Sulfoxidecopper [II])" by R. J. Williams, Midwestern University, Wichita Falls, Texas, and A. C. Larson, CMB-5

Symposium on Plasma Waves, Instabilities and Interactions, Nord-Torpa, Norway, April 5-12:

"Parametric Instability and Observation of Anomalous Microwave Absorption Near the Plasma Frequency" by H. Dreicer, P-13 (invited)

Los Alamos—Santa Fe Subsection, Institute of Electrical and Electronic Engineers Meeting, Los Alamos, April 6:

"The High Energy Short Pulse CO_2 Laser Program at LASL" by C. A. Fenstermacher, L-1

"The High Energy Glass Laser Program at LASL" by D. H. Gill, L-2

"Laser Produced Plasma Research at Los Alamos" by G. H. McCall, L-4

Seminar, University of Pittsburgh Graduate School of Public Heatlh, Pittsburgh, Pa., April 6:

"Respiratory Protective Devices" by E. C. Hyatt, H-5 (invited)

Department of Chemistry, University of Texas at El Paso, Texas, April 7:

"Molecular Motion and Magnetic Resonance" by L. J. Burnett, CNC-2 (invited)

Florida Section, Optical Society of America, Winter Park, Fla., April 8:

"Analysis of the Energy Level Structure of Neutral Dysprosium" by R. D. Cowan, T-4, and D. C. Griffin and J. S. Ross, both Rollins College, Winter Park, Fla.

continued on next page

American Chemical Society's 163rd National Meeting, Boston, Mass., April 9-14:

"A New Synthetic Route to Highly Clustered Organometallic Sulfur Complexes and Characterization of their Structures and Bonding" by P. J. Vergamini, CNC-4, T. J. Burger and L. F. Dahl, both University of Wisconsin, Madison

"Chemical Aspects of New Superconducting Materials and Fabrication Techniques" by M. G. Bowman, CMB-DO

"^{15}N Spin-Lattice Relaxation in Liquid $^{15}NH_3$ and $^{15}ND_3$" by W. M. Litchman, University of New Mexico, Albuquerque, and M. Alei, Jr., CNC-2

"Studies of (α, xn) and (α, pxn) Reactions in Heavy Element Targets" by C. T. Roche and V. E. Viola, Jr., both University of Maryland, College Park, and M. M. Minor, P-2

"Raman Spectra of Single Crystals" by L. H. Jones, CNC-4

"A Compartmented Aquatic Model of the Relationship between Carbonate and Nitrate in a Great Plains Reservoir" by L. P. Varga, G. K. Rice, and D. W. Toetz, all Oklahoma State University, Stillwater, and E. D. Loughran, GMX-2

Controlled Thermonuclear Research Technology Committee Meeting, Federal Council on Science and Technology Energy Study Group, Argonne National Laboratory, Ill., April 10-11:

"Energy Balance, Circulating Power, and Plant Efficiency for a pulsed Theta-Pinch Reactor" by S. C. Burnett and W. R. Ellis, both P-15, and F. L. Ribe, P-DO

"Information for the Environment and Economics Subcommittee of the CTR Technology Committee of the FCST Energy Study Group" by S. C. Burnett, P-15

American Society of Biological Chemists 63rd Annual Meeting/ 1972 Federation of American Societies for Experimenal Biology Joint Meeting, Atlantic City, N. J., April 10-14:

"Synthesis of Mixed Polynucleotides Containing Ribo- and Deoxyribonucleotides by Terminal Deoxynucleotidyl Transferase" by R. L. Ratliff, H-4

"Turnover of Labeled Methyl and Acetyl Groups in Histone Fractions of Cultured Mammalian Cells" by P. Byvoet, University of Florida, Gainesville, and G. R. Shepherd, Julia M. Hardin and Billie J. Noland, all H-4

Colloquium, Astronomy Department, University of Wisconsin, Madison, April 11:

"Reduced-Proper-Motion Diagrams—A New Look at an old Way of Looking at Stellar Evolution or Hertzsprung Rides Again!" by E. M. Jones, J-10 (invited)

Computer Science Seminar, Courant Institute of Mathematical Sciences, New York University, New York, N. Y., April 11, and at Massachusetts Institute of Technology, Cambridge, April 17:

"The MADCAP VI Programming Language" by J. B. Morris, C-7

Optical Society of America, 1972 Spring Meeting, New York City, N. Y., April 11-14:

"The Electron Beam Controlled Discharge as a Method of Pumping Molecular Gas Lasers at High Pressure" by C. A. Fenstermacher, L-1 (invited)

"Laser Fusion Program at the Los Alamos Scientific Laboratory" by K. Boyer, L-DO

Defense Nuclear Agency Radiation Physics Division Long Range Planning Meeting, Washington, D.C., April 12:

"Cross Section Evaluation" by P. G. Young, T-2

Department of Chemistry, University of Arkansas, Fayetteville, April 12, and Symposium on Molecular Energy Transfer, University of Mississippi, Oxford, April 13-14:

"Energy-Transfer Mechanisms" by D. L. Thompson, CNC-4

Defense Nuclear Agency Thermal Effects Symposium, Nuclear Weapons Thermal Radiation Environment Seminar, Colorado Springs, Colo., April 12-13:

"The Temperatures of Fireballs" by H. G. Horak, J-10

"Total Thermal and Spectral Fraction vs Yield" by M. T. Sandford, J-10

"2D Radiating Fireballs" by E. M. Jones, J-10

"A Compilation of Air Opacities" by A. N. Cox, J-15

"Thermal Studies" by C. G. Davis, J-15

"Fireball Yields for Selected Events" by D. D. Eilers, J-15

"Sea Level Fireball Phenomenology" by J. Zinn and J. Kodis, both J-10

New Mexico Law Enforcement Academy, Santa Fe, N.M., April 13:

"Explosives, Some of Their Characteristics and Possible Illegal Uses" by T. E. Larson, GMX-2

United States National Committee/ Union of Radio Science International-Institute of Electrical and Electronic Engineers Spring Meeting, Washington, D. C., April 13-15:

"Some Results of Calculations of Radar Reflection Coefficients from Plasma Gradients with Collisions" by W. G. Chesnut, Stanford Research Institute, Palo Atlo, Calif., and M. S. Tierney, J-10

American Welding Society National Annual Meeting, Detroit, Mich., April 14:

"Some Practical Aspects of Tantalum Alloy Development" by D. J. Sandstrom, CMB-6 (invited)

Western Regional American Nuclear Society Student Conference, Pocatello, Idaho, April 14:

"Environmental Protection for Plutonium Facilities" by J. R. Lilienthal, CMB-DO

American Institute of Aeronautics and Astronautics Ninth Electric Propulsion Conference, Bethesda, Md., April 17-19:

"Experimental Performance of *Supersonic Nozzles Using Lithium* Vapor as a Propellant" by D. J. Roehling and T. F. Stratton, both N-5, and D. B. Fradkin, N-7

American Geophysical Union 53rd Annual Meeting, Washington, D.C., April 17-21:

"Positive Evidence for Closed

Magnetic Structures in the Solar Wind Associated with Interplanetary Shock Waves" by M. D. Montgomery, J. R. Asbridge, S. J. Bame, and W. C. Feldman, all P-4

"Association of Energetic Particle Streams with Large Scale Structure in the Solar Wind" by S. Singer, M. D. Montgomery, and S. J. Bame, all P-4

"Interpenetrating Ion Beams in the Solar Wind" by W. C. Feldman, J. R. Asbridge, S. J. Bame, and M. D. Montgomery, all P-4

"Auroral Intensities at Conjugate Points" by H. C. Stenback-Nielsen, E. M. Wescott, and T. N. Davis, all Geophysical Institute, University of Alaska, College, and R. W. Peterson, J-16

"Time History of Plasma Observations in the Geomagnetic Tail During a Substorm" by D. L. Reasoner and F. J. Rich, both Rice University, Houston, Texas, and E. W. Hones, Jr., P-4

National Aeronautics and Space Administration Langley Research Center, Hampton, Va., April 18:

"Development of Carbon-Base Space-Age Materials at LASL" by M. C. Smith, CMB-13 (invited)

New Mexico Section of the American Society of Heating, Refrigerating, and Air Conditioning Engineers, Los Alamos, April 18:

"Proposed New Plutonium Facility at LASL" by W. J. Maraman, CMB-11

National Science Foundation, Washington, D.C., April 18, and Rutger's University Physics Department Colloquium, New Brunswick, N.J., April 19:

"Conjectures on the Nature of Ball Lightning" by J. L. Tuck, P-DO

Institute for Defense Analysis Fifteenth Midcourse Measurements Meeting, Arlington, Va., April 19:

"High Altitude Iron Vapor Release" by J. S. Beardall, H. M. Peek, and R. A. Jeffries, all J-10

Cross Section Evaluation Working Group Shielding Subcommittee Meeting, San Diego, Calif., April 19:

"Calculation of Neutron-Induced Photon Cross Sections and Energy Spectra" by P. G. Young, T-2

Birmingham Aviation Association, Birmingham, Ala., April 20:

"Identification of Aerosols in the Southwestern United States Using Activation Analysis and Scanning Electron Microscopy" by W. A. Sedlacek, P. R. Guthals, and H. L. Smith, all CNC-11

Physics Research Conference, California Institute of Technology, Pasadena, April 20:

"Predictions for Superheavy Nuclei" by J. R. Nix, T-9

Thirty-second Annual Congress and Scientific Exhibition of the British Institute of Radiology, London, England, April 20-21:

"Possible Use of Negative Pions and Negative Muons in Therapeutic and Diagnostic Medicine" by L. Rosen, MP-DO (invited)

Colloquium, Carnegie-Mellon University, Pittsburgh, Pa., April 21:

"EPICS: A High Resolution Pion Nucleus Scattering Facility for LAMPF" by H. A. Thiessen, MP-7

Plasma Physics Seminar, University of Pennsylvania, Philadelphia, April 21:

"Stabilized Z-Pinch Program at Los Alamos" by J. A. Phillips, P-14

Seminar, Kellogg Radiation Laboratory, California Institute of Technology, Pasadena, April 21:

"Calculation of Fission Barriers for Heavy Nuclei" by J. R. Nix, T-9

Seventy-Second Annual Meeting of the American Society for Microbiology, Philadelphia, Pa., April 23-28:

"Replication and Sizing of Bacteriophage DNA: Membrane-Associated Functions in **Haemophilus Influenzae**" by B. J. Barnhart and S. H. Cox, both H-4

Symposium on Applications of Optical Electronics in Instrumentation, Albuquerque, N.M., April 24-25:

"Nanosecond Framing Cameras Using Proximity Focused Image Intensified" by H. D. Sutphin, E-4, and A. J. Lieber, W-11

"Holographic Interferometry of Plasma" by R. E. Siemon, P-15

American Physical Society Meeting, Washington, D.C., April 24-47:

"Elemental Analysis of Biological Samples" by J. J. Malanify and C. J. Umbarger, both A-1

"The Decay of 10^5-y 126-Tin" by H. A. Smith, Jr., M. E. Bunker, and J. W. Starner, all P-2, K. E. G. Löbner, Technical Institute, Munich, Germany, and C J. Orth, CNC-11

"Fission of 238-Uranium with 140-MeV 4-Helium Ions" by V. E. Viola, Jr. and C. T. Roche, both University of Maryland, College Park, and M. M. Minor, P-2

"Observation of the Decay of P-35" by K. E. Apt and J. D. Knight, both CNC-11

"Nucleon-Nucleon Bremsstrahlung" by L. Heller, T-5 (invited)

"Random Pulsations of Cygnus X-1" by N. J. Terrell, Jr., T-6

"Tongue-Palate Contact During Consonant Production" by J. G. Beery, formerly P-DOR, Joyce E. Beery and S. G. Fletcher, both University of New Mexico, Albuquerque

"Field Theoretic Description of (Pion-Proton) and (Proton-Pion) Reactions in Nuclei" by B. R. Wienke, T-5

"Fission Induced by (^{3}He, d), (^{3}He, α), (^{3}He, t) and (t, α) Reactions" by O. Hansen, B. Back, H. C. Britt, and J. Garrett, all P-DOR

"Resonance Structure in (t, pf) - and (d, pf) - Reactions on Actinide Nuclei" by B. Back, H. C. Britt, O. Hansen, and J. D. Garrett, all P-DOR

"Observation of Zeeman Effect in Optical Spectra of Fast Ion Beams" by J. O. Stoner, Jr., University of Arizona, Tucson, and L. J. Radziemski, Jr., CMB-1

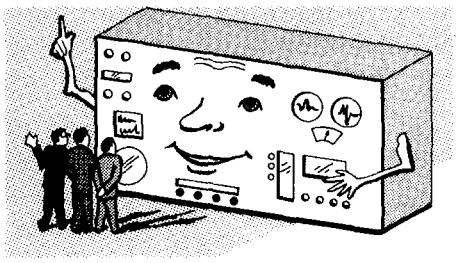
General Physics Colloquium, University of California, San Diego, April 26:

"Superheavy Elements" by J. R. Nix, T-9

Midregional Joint Statistical Meeting, Ames, Iowa, April 26-28:

"Three Kolmogorov-Smirnov-Type One-Sample Tests with Improved Power Properties" by R. K. Lohrding, C-5

20 years ago in los alamos



Culled from the June, 1952, files of the Santa Fe New Mexican by Robert Porton

Atomic Installations to be Expanded

Two atomic installations in New Mexico are due for expansion that will mean increased personnel and greater output if congress approves funds. Of the total amount, Los Alamos is scheduled for $9 million. Much of this sum will be used for the construction of an Administration building. Projects would also be undertaken at Sandia Base in Albuquerque.

Strange Sights and Sounds

Strange sights and sounds—the suspension of three khaki weather balloons and the firing of nine-inch aerial bombs—will be noted by local residents. These events will be part of defense planning here. The bombs, to be set off in a series of three at 9, 10 and 11 a.m. from the Main, North Community, East Road and South Mesa fire stations are to test their use as possible supplements to the present signal warning system. The balloons will represent possible bomb explosion points. If the blasts are clearly audible throughout the community, the Diaster and Defense Planning Committee will consider using them as a last minute warning to take cover in case of attack.

A MANIAC at Los Alamos

There is a cool calculating MANIAC in Los Alamos with a mathematical "brain" that figures 100,000 times faster than a trained computer operator sitting at a desk machine. It is the new electronic digital calculator, designed and constructed by staffers at LASL. Development of the machine has been handled by a small group, headed by Nicholas Metropolis with James Richardson as senior engineer.

Volunteer Water Conservation Asked

Unless volunteer action by residents corrects the use of too much water in Los Alamos, stringent controls may be imposed soon according to the Zia Company. Lack of rainfall in recent weeks coupled with increased consumption, resulting from population growth and care of newly seeded lawns, was the reason given for the dwindling water supply.

what's doing

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

RIO GRANDE RIVER RUNNERS: Meetings scheduled for noon, second Friday of each month at South Mesa Cafeteria. For information call Joan Chellis, 662-3836.

LOS ALAMOS SAILORS: Meetings at noon, South Mesa Cafeteria, first Friday of each month. For information call Dick Young, 662-3751.

SPORTS CAR CLUB DEL VALLE RIO GRANDE: Meetings, 7:30 p.m., Hospitality Room, Los Alamos National Bank, first Tuesday of each month. For information call Gerry Strickfadden, 672-3664 or Frank Clinard, 662-4951.

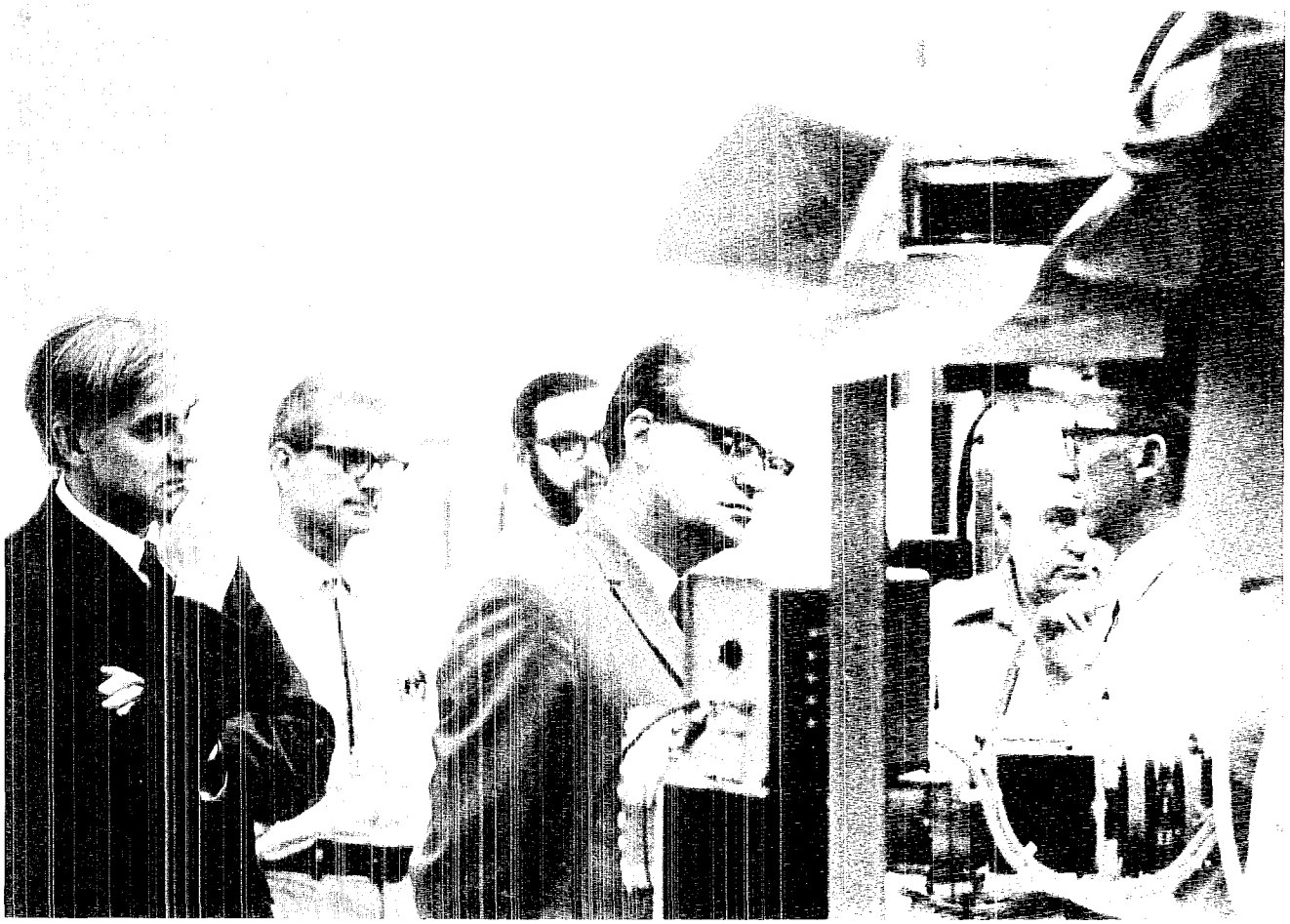
MOUNTAIN MIXERS SQUARE DANCING CLUB: Mesa School, 8 p.m. For information call Ruth Maier, 662-3843.
June 3—Bob Gregg, Albuquerque
June 17—Bones Craig, club caller
July 1—Fred Staben, Colorado Springs, Colo.
July 15—Pete Holly, Albuquerque

PUBLIC SWIMMING: High School Pool—Monday through Friday, 1:30 p.m. to 5 p.m. and 7:15 p.m. to 10 p.m.; Saturday and Sunday, 1 p.m. to 5 p.m.

MESA PUBLIC LIBRARY:
May 18-June 17—Marjorie Garn, watercolors and pen and ink sketches
June 8-28—Harriet Sanborn, oils
June 29-July 20—Sara Eyestone, batiks

OUTDOOR ASSOCIATION: No charge, open to the pubilc. Contact leaders for information.
June 3—Taos Junction Bridge to Pilar,* LaVerne Pollat, 672-3280
June 4—Heron Reservoir canoe sailing, Cecil Carnes, 672-3593
June 10-11—Horsethief Meadows, Bob Skaggs, 662-6597
June 10-11—Upper San Juan River Run,* Tom Springer, 662-7406
June 15—Meeting, South Mesa Cafeteria, noon, Reed Elliott, 662-4515
June 17-18—Conejos River, Colo.,* Dave Blevins, 662-7458
June 19-25—Goosenecks of the San Juan,* Watler Green, 672-3203
June 25—County line to Velarde,* John Sullivan, 662-6185
June 24-25—Culebra Peak, Colo., Reed Elliott, 662-4515
July 1-4—Conejos River trails, Marlene McKee, 662-4988
July 8-9—Conchas Reservoir, canoe trip, Cecil Carnes, 672-3593
July 15-16—Creede to South Fork, Colo.,* Dave Blevins, 662-7458
*River Trip

NEWCOMERS CLUB: June 28, 11:30 a.m., Pinon Park. Picnic for mothers and children. For information call Linda Hertrich, 662-9355.



Two Russian scientists—including a Nobel Laureate—visited LASL last month. Among the activities was a a tour of Scyllac. Shown are O. N. Krokhin, George Sawyer, P-15 group leader, Jeff Freidberg, P-18 alternate group leader, N. G. Basov (who shared the Nobel Prize in 1964 as a co-inventor of the laser principles), Keith Boyer, L-division leader, and Warren Quinn, alternate P-15 group leader.

Henry T. Motz
3187 Woodland
Los Alamos, New Mexico
87544

Wernher von Braun, associate administrator of the National Aeronautics and Space Administration, center, talks about the role of nuclear propulsion in space with Roderick Spence, N-division leader, and Frank Durham, alternate N-division leader. Von Braun reviewed the space program at a special colloquium at the Los Alamos Scientific Laboratory.