# the Atom

Los Alamos Scientific Laboratory

May 1977

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## In this Issue



## Regular Features



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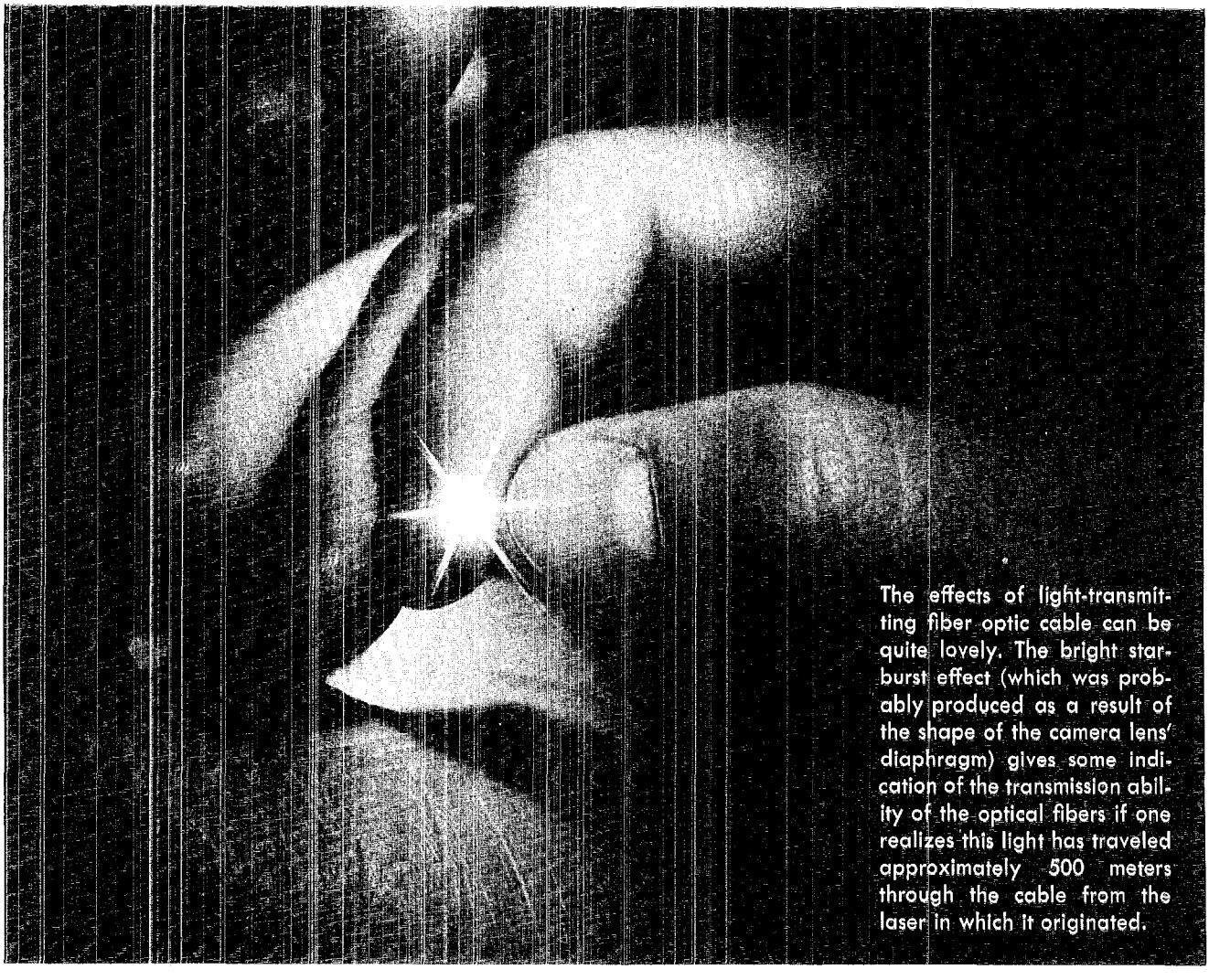
### FRONT AND BACK COVERS

Johnnie Martinez, on a recent trip to the Nevada Test Site, took the cover photo of workers walking alongside thousands of feet of cable used to transmit data from underground explosions at NTS. Johnnie's fiber optics story, page 1, describes LASL's research into a way to simplify this data gathering and transmission.

The back cover photo, also taken by Martinez, illustrates some of the work underway at the Weapons Neutron Research (WNR) Facility near LAMPF.

# Fiber Optics: Simplifying The Task Of Data Gathering



The effects of light-transmitting fiber optic cable can be quite lovely. The bright starburst effect (which was probably produced as a result of the shape of the camera lens' diaphragm) gives some indication of the transmission ability of the optical fibers if one realizes this light has traveled approximately 500 meters through the cable from the laser in which it originated.

By JOHNNIE MARTINEZ

In a barren, moon-like valley in Nevada, a curious landscape has been created that may be as puzzling to archeologists of the future as the mysterious lines on the South American plains of Nazca are to contemporary researchers.

From the air, this Nevada valley appears to be a carefully transplanted crater-scarred section of the moon. Alternately baking under the Nevada desert's intense summer heat and freezing in the biting winter cold are scores of subsidence craters that fill a 600-square-mile area like monstrous pock marks.

This is the Nevada Test Site (NTS), and the craters are no puzzle to the hundreds of scientists and technicians who work here. Each subsidence crater marks the spot where a nuclear device designed and built by the Los Alamos Scientific Laboratory (or its west coast counterpart, the Lawrence Livermore Laboratory) has been detonated far underground and the earth above the resulting cavity has collapsed at the surface.

As anyone associated with the Laboratory's weapons testing program could quickly point out, the underground testing of a nuclear device involves much more than digging a deep hole in which to place it. The many complicated experiments required to test the performance of a nuclear device call for tremendous effort and the ability to record as much data as possible under extremely difficult conditions.

At present, these data-gathering techniques call for the use of thousands of feet of heavy and expensive copper coaxial cable. Every bit of data obtained from these experiments must follow a lengthy electrical path from underground to be recorded on oscilloscopes and other devices above ground. It's a far from ideal system for a variety of reasons that range from its cost to the quality and amount of information these heavy cables can carry.

Members of the Laboratory's reaction history, J-14, and electronics engineering, E-3, groups appear to have gotten off to a successful start in solving these problems. The team is headed by Pete Lyons, J-14, and John Golob, E-3, and the solution they think will simplify many NTS data-gathering activities is fiber optics, that is, the use of optical fibers to transmit data.

Optical fibers are specially made filaments or threads along which light signals can travel considerable distances. The technology is relatively new, and most people's exposure to fiber optics has probably been in department stores where the fibers have been arranged as decorations or on television commercials where the "light pipes" have been demonstrated as the telephone transmission lines of the future.

With little thought to decoration and much thought about the transmitting capabilities of optical fibers, the group started work they believe will prove the advantages of fiber optics over coaxial cable in areas of cost, handling ease, higher range of transmission frequencies, security, and multiplexing—the transmission of more than one signal on a single fiber.

Two "off-the-shelf" commercially available types of optical fibers were selected for the experiment. The first was a pure silica-clad fiber with a germanium-doped core manufactured by Corning Glass Works. The second was a borosilicated-clad fiber with a pure silica core made by Fiber Communications, Inc.

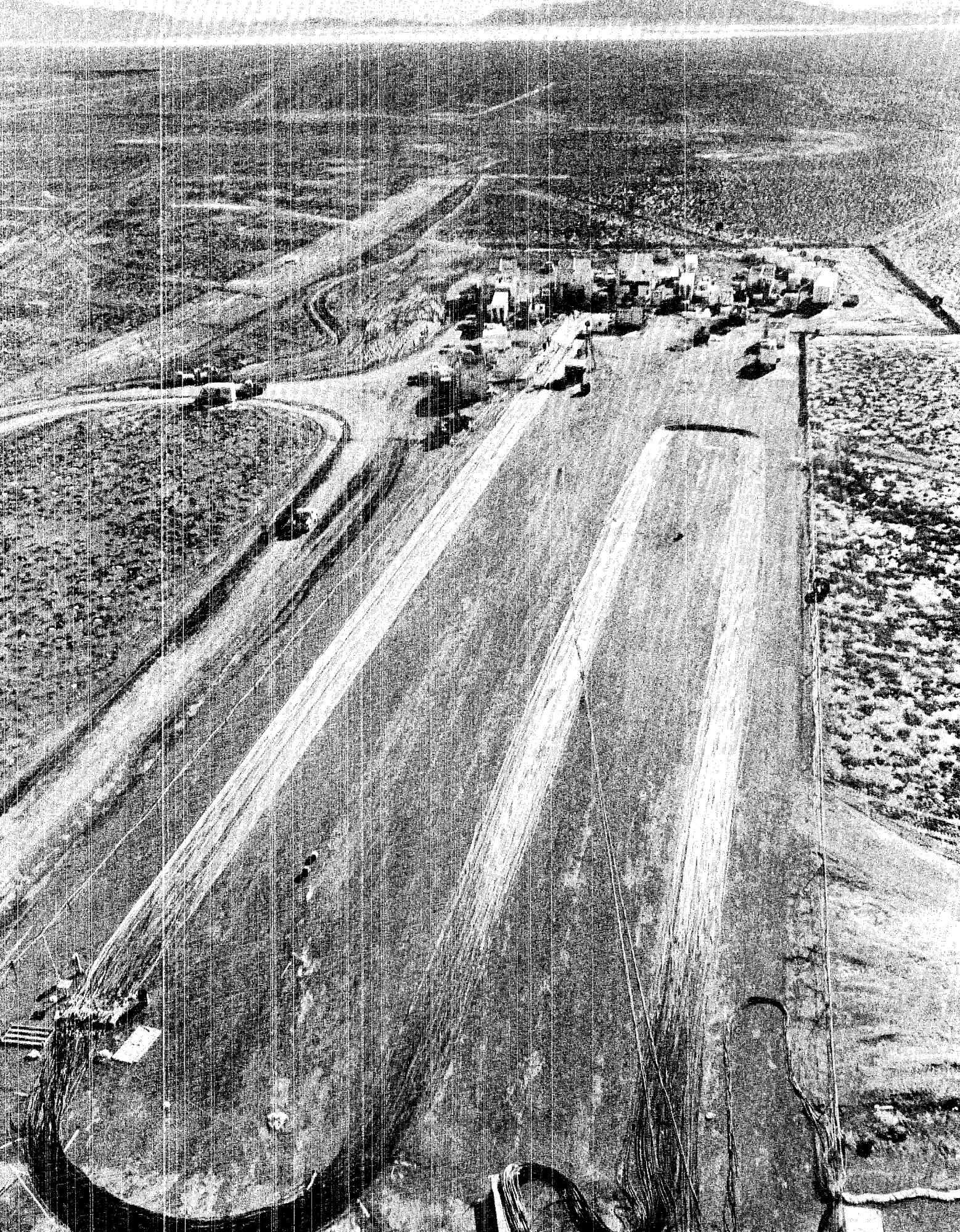
Before the fibers could be placed "downhole" on an actual underground test, an extensive testing and research program was launched that called for a good deal of effort not only from the J-14 and E-3 team members, but also from personnel at EG&G's Los Alamos, Las Vegas, and Santa Barbara facilities.

Because of the performance and physical differences between optical fibers and electronic coaxial cable, it was necessary to come up with an almost entirely new set of operating and handling procedures, tools, and signal-generating equipment.

One of the first tasks facing the group was determining the effects of intense radiation on optical fibers. Work on this problem got under way with J-14's Febetron—a machine capable of producing radiation levels near those the fibers would experience during a Nevada test. It was important the researchers have as accurate a picture as possible of the transmission performance of optical fibers.

## New Procedures, Tools, And Equipment Were Developed

**This view (photo on opposite page) from atop the tower that houses the experiment racks at the Nevada Test Site shows the great lengths of expensive coaxial cable required for an underground test. The heavy cable must be carefully lowered underground for a test and presents a variety of handling problems that may someday be eliminated to a great extent by the use of lightweight fiber optic cable.**



Since the Febetron could simulate only pulsed gamma irradiation, more information was needed on pulsed neutron-induced effects that could only be gathered during an NTS test.

"Two things happen to irradiated glass," Lyons says of the initial testing. "It lights up (luminesces) and it turns black (absorbs)—and this absorption persists for long times."

A blackened fiber cannot transmit data. More importantly, a fiber that is turning black during a period of nanoseconds is transmitting information during that time that is not of the same quality as the signals that were transmitted before the radiation damage.

"Once fibers start to absorb, the data become nonlinear," Lyons explains. "We were, in both our Febetron tests and the NTS test, trying to make a statement on radiation levels and how they would affect the data the fibers were transmitting."

The damage and loss of transmitting ability the fiber would suffer from the neutron and gamma radiation emitted by a nuclear explosion would occur within millionths of a second, but it is very important that the researchers be able to take these aberrations into precise consideration in order to devise a suitable means for collecting accurate data on subsequent optical fiber tests. Since these effects depend on details of the fiber composition, 2 fiber types were exposed to radiation.

The fibers were placed so as to measure either radiation-induced absorption or luminescence at 2

J-14 Alternate Group Leader Peter Lyons and his team found installing the fiber optic cables on the test rack to be one of the most difficult phases of their experiment. Lyons is shown here placing a lead wire down a section of the rack through which the breakable optical fiber will be very carefully drawn.

radiation levels. Optical absorption of the fibers was measured using a flashlamp light source.

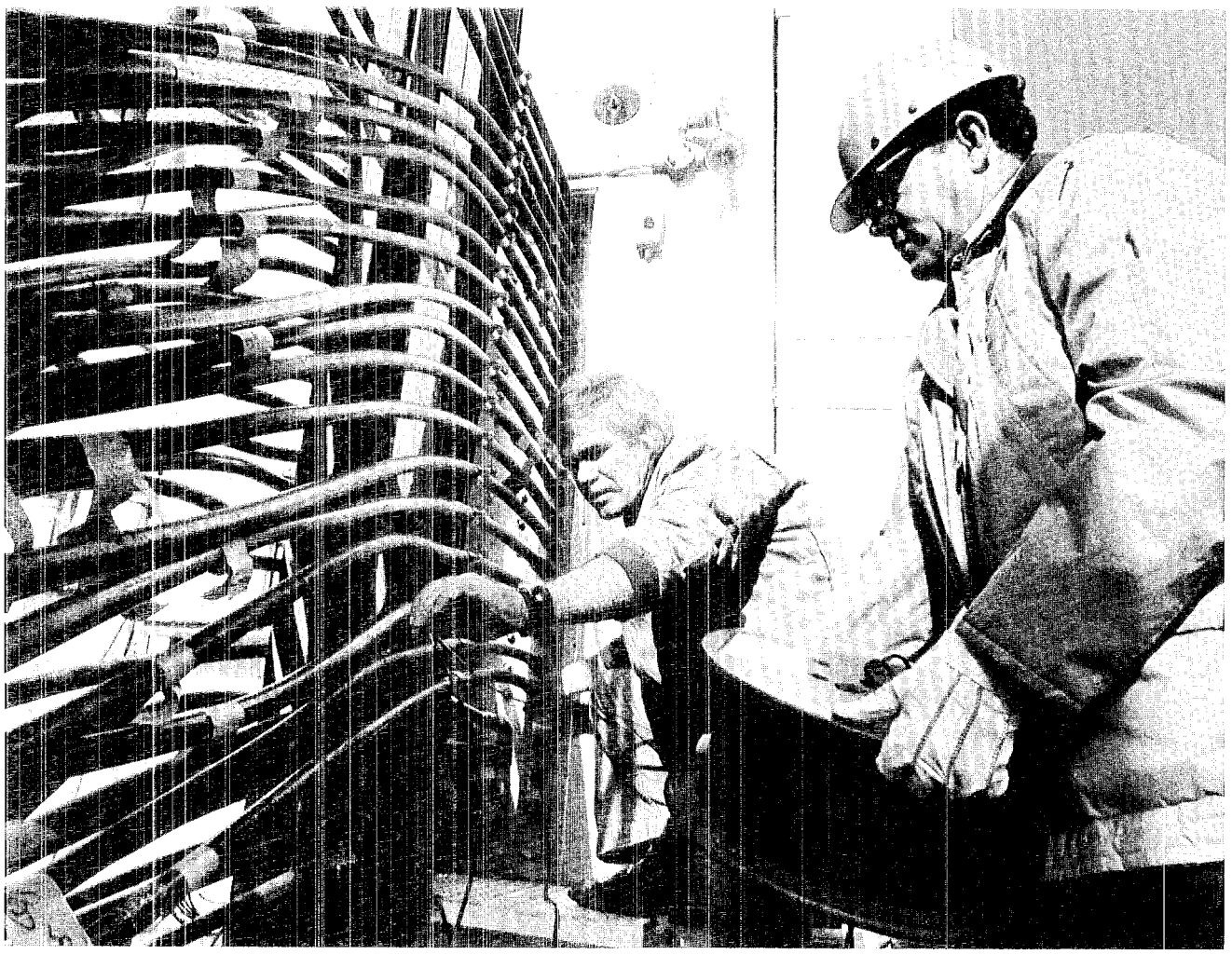
A system of background fibers was also installed at both radiation levels for the experiments. All the fibers (a total of 13) were attached to photomultiplier detectors above ground by 2 fiber-optic cables—both of which were of a standard type (Coreguide) manufactured by Corning. Short coaxial cables connected the photomultiplier outputs to standard oscilloscope recorders.

Finally, the team made use of the opportunity to evaluate the optical cables as a gamma-radiation detector by observing and recording the Cerenkov effect—the type of radiation that occurs when a charged particle, in this case an electron, passes through a medium, such as glass, faster than the speed of light in that medium.

Two of the major hurdles the LASL team had to contend with in its effort to demonstrate the handling characteristics of optical fibers at the test site were gas-blocking and splicing.

A primary concern when testing nuclear devices underground is radiation confinement, and all underground cables used at the Nevada Test Site must meet very rigid gas leakage specifications to preclude totally any radiation leakage. The fiber optic cable was successfully gas-blocked and approved by the test-site Containment Evaluation Panel (CEP), but only after the LASL and EG&G teams had gone to extreme lengths to prove the safety and durability of the cable.

Installation of optical fibers at the Nevada Test Site presented some interesting contrasts between the tiny "light pipes" and the heavy coaxial cable presently used to transmit underground test data. The 2 fiber optic cables that Robert Hooker (left) and Larry Looney are leading to a photomultiplier shack carry enough information to require the use of the 40 coaxial cables at left for recording on electronic oscilloscopes.



In addition to experimentation by J-14 at LASL with various techniques for sealing the cables, 3 preliminary tests were conducted in connection with underground detonations at the test site. The first was a cable abrasion and durability test in which a 100-foot-long section of cable was buried during regular backfill of a test rack and pulled back out before scheduled detonation for a check of its structural integrity and optical transmission quality.

The second test, conducted by Barbara Killian, J-9, for radiation confinement, called for downhole placement of sections of fiber-optic cable. The cables did not extend to the surface, and an extensive underground radiation monitoring system, developed by Richard Smale, H-1, was used to document the absence of radiation leakage.

The gas-blocking techniques developed by Larry Looney, J-14, to meet the requirements of the CEP were successfully used for the confinement test.

Yet a third test addressed possible degradation of the cable from the use of 10-foot-thick epoxy seals that are routinely placed in the shaft to aid in containment. As the epoxy cures, these seals subject the downhole cables to extremes of temperature and pressure. The test consisted of filling a 12-inch-diameter, 6-foot-long sewer pipe containing 10 feet of cable with the epoxy mix at NTS. The entire pipe was returned to Los Alamos, where tests confirmed that the cable was not affected.

Another area in which the LASL researchers were forced to develop their own tools and handling procedures was in the cutting and splicing of single optical-fiber strands. Lyons and Golob's experimental package called for a total of 25 splices that had to be made in the field to mate the cable to the various fibers being exposed to radiation.

The EG&G Los Alamos team, led by Roger Robichaud, was able to solve the problem. A special fiber-breaking tool that consistently delivered the optically flat cuts required for efficient splices was fabricated, and several splice techniques were investigated.

Another major requirement called for creation of a time-domain-reflectometry (TDR) or "laser rangefinder" system for locating faults along the fiber optic system. EG&G Santa Barbara developed this system, and, finally, the time came for placement of the experimental package on an actual underground test in Nevada.

The fiber-optic experimental package and cables shared space on the experiment rack with a number of other Laboratory tests. "We were in for a few surprises," Lyons commented later.

Among those surprises was the difficulty Lyons, Golob, Looney, and Don Bartram, J-14, encountered in installing the experiment in the test rack and splicing the fibers under field conditions. The work, which included field gas-blocking and 25 splices, was completed, however. The design, construction, and installation of recording equipment was carried out as in conventional experiments using coaxial cable and was also completed in time for the scheduled detonation.

Because of the relative fragility of fiber-optic cable, one of Lyons and Golob's main concerns was how

Much of the work required to prove the radiation containment abilities of the fiber optic cable took place in the laboratory at Los Alamos. Carlos Martinez (left), an electronics technician and electro-optical technician Looney experimented with a variety of gas block techniques designed to prevent the leakage of radiation from an underground test to the surface through the optical fibers.

Success! It's difficult to appreciate the excitement a few wiggly lines on a piece of film can produce unless one has spent several months of work on an experiment like John Golob (left) and Lyons have. The film contains information that is still being evaluated but which has already revealed the potential importance of optical fibers in future tests.

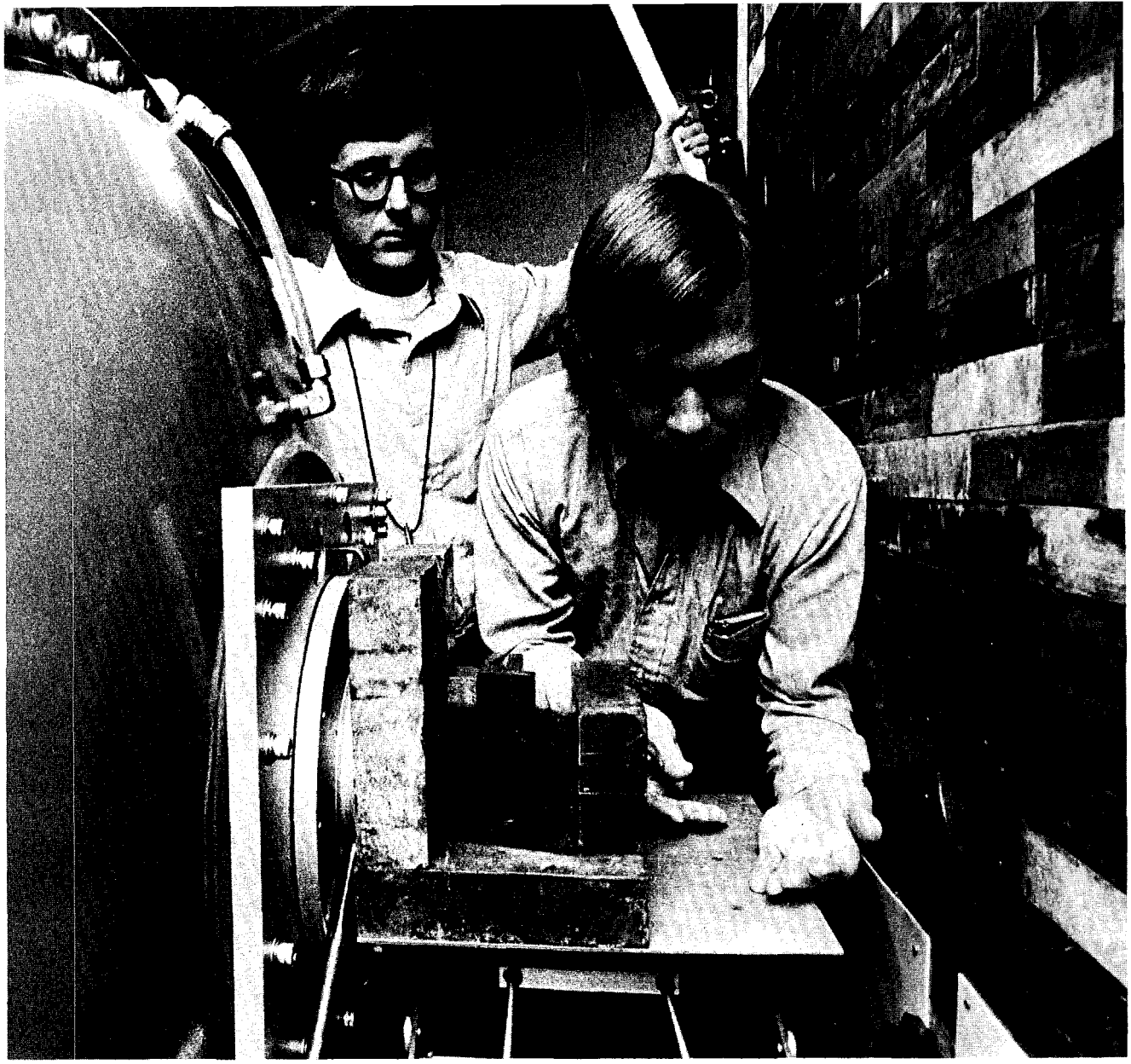
well the cable would stand up under the backfill operations when tons of earth are funneled into the test hole after the nuclear device and its test rack had been lowered. The cables held up under the stress, and, like expectant fathers, the LASL team members awaited the final step of the experiment.

That step came with the detonation of the underground device. With a quick, hiccough-like heave of the earth, the nuclear device, its rack, and the earth around it was evaporated in the intense heat generated by the underground explosion. Myriads of electrical signals launched by the destroyed experimental packages raced out of the underground holocaust to register their brief lives on oscilloscopes in ground-level trailers and in skids that pitched for a moment and then were still.

The retrieval of the film on which the brief signals had etched themselves was carried out quickly, and, shortly, the giant underground cavern formed by the explosion collapsed and one more subsidence crater was added to the stark landscape of the Nevada Test Site.

Not until the film bearing the precious information had been developed did Lyons, Golob, or any of the other LASL experimenters know if their work had been successful.

A tense 2 hours later the developed film was delivered. As welcome a sight, perhaps, as gold and precious jewels, were the tiny lines that



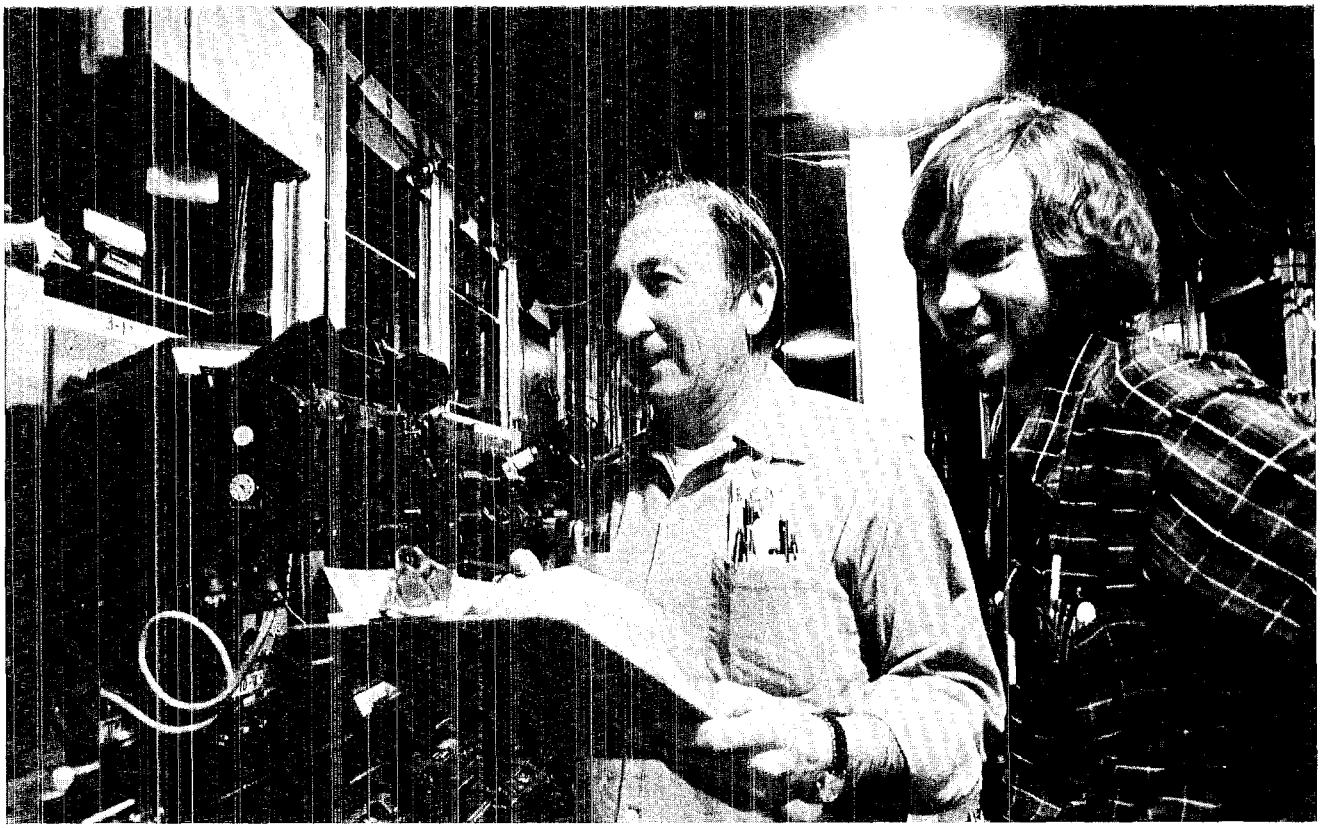
Some of the first radiation-induced tests of optical fiber luminescence and absorption took place at Los Alamos with the use of J-14's Febetron. The machine is designed to simulate pulsed gamma irradiation comparable to that the fiber optic cables used by Lyons and Golob would experience during a Nevada Test Site experiment.

demonstrated the performance of the fiber-optic cables.

The experiment was successful, and, although the LASL researchers will be some time in reading and interpreting all the bits of information their test generated, enough is already apparent to indicate a genuine leap forward in the use of optical fibers, not only in connection with underground nuclear tests but also in other areas of nuclear research as well.

In addition to the work being conducted by J-14, a consortium of other J-Division researchers is looking at a similar approach for the application of optical fibers at the Nevada Test Site.

Ralph Partridge, J-8, Jim Walker, J-16, and Marvin Hoffman, J-DOT, are focusing their attention on the use of optical fibers as an optical transmission line for electrical signals generated underground by conventional detection systems. This approach would function much like



Ninety oscilloscopes were used at the Nevada Test Site to record the data generated in the optical fiber test. Electronics technician Jerry Allen (left), electrical engineer Golob, and other members of the team spent considerable time in the recording station checking the performance of the recording devices.

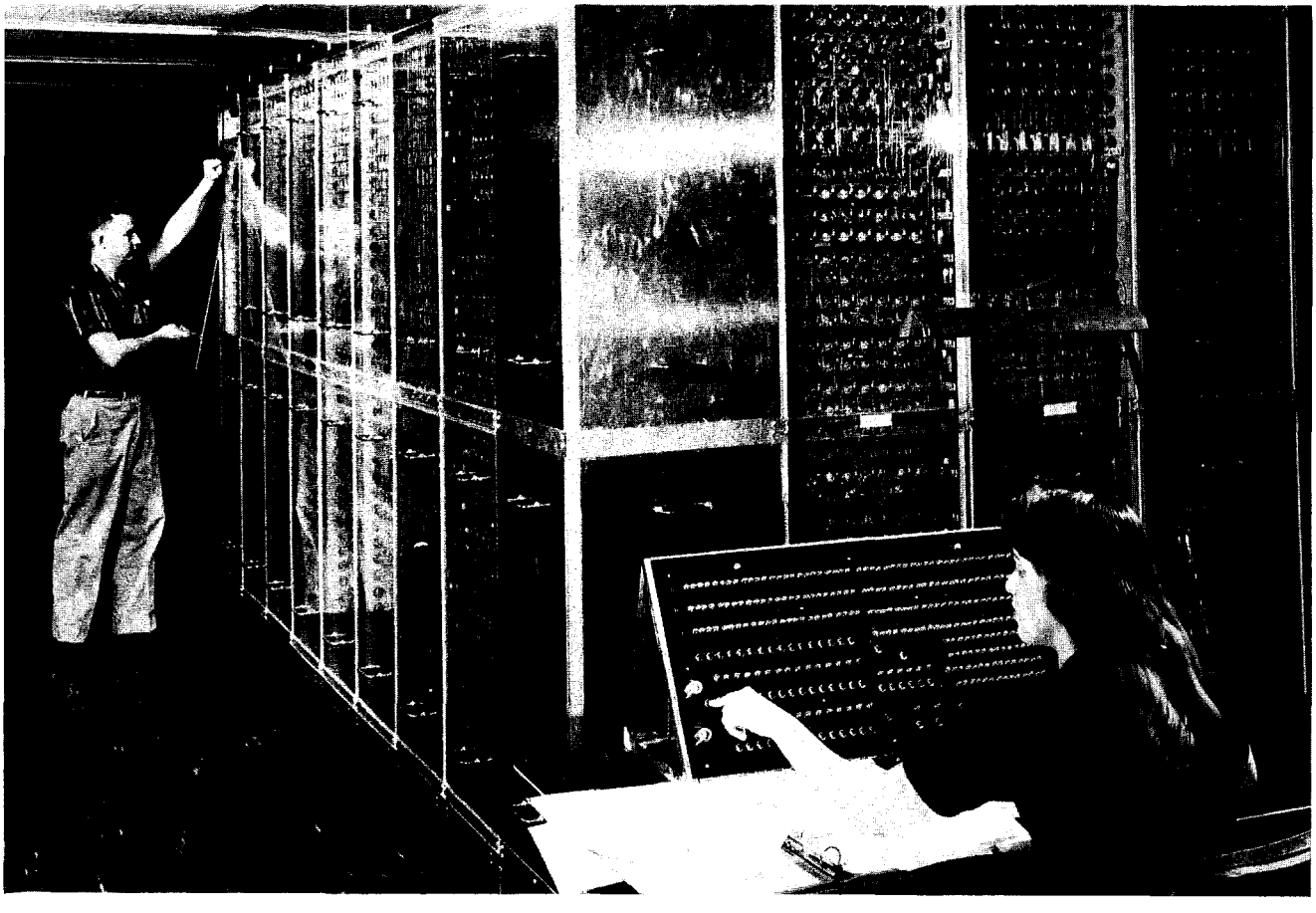
the present coaxial cable system except that an electrical signal generated by an underground test would first be converted to an optical signal for transmission through the fiber-optic cable. Upon the optical signals' arrival above ground, it would be converted back to an electrical signal to be recorded on conventional electronic recorders.

Much more work remains to be done before some of the special abilities that fiber-optics systems possess can be put to use—work that will undoubtedly be accompanied by the creation of a few more craters in Nevada, the production of much perspiration, and the application of a considerable amount of "elbow grease."

We can only guess about the origins of the mysterious lines on the Peruvian plain of Nazca, but it would be interesting if they, like the craters of Nevada, were incidental monuments to man's research and quest for knowledge.

# Photo Shorts


The old and new look in computers are accentuated in these 2 photographs. At left, Phil Salazar, C-1, lead operator of the new Cray-1 computer, is assisted by Bernadette Lujan, C-1. The photo below was taken in 1958 of Maniac II, a computer designed and built by LASL engineers.



Photographs and Indian rugs adorn the walls of the gallery of LASL's new National Security and Resources Study Center adjacent to the Administration Building. The tranquil gallery scene changes, however, as visitors pour into the Center for technical meetings. (See story and photos, page 19)

# Short Subjects

Two motion pictures produced by ISD-9 were shown in New York in April during the annual meeting of the Institute of Electrical and Electronics Engineers (IEEE).

**Charles Barnett,** ISD-9 group leader, produced "Subterrene" with the technical advice of **Robert Hanold** of Geosciences Division, and "Electronic Tagging of Livestock" with the technical aid of **Dale Holm** of Health Division. The 2 films were selected from among nationwide entries sent to the IEEE Electro-77 Film Theater Committee.

LASL, in cooperation with the U.S. Department of the Treasury, offers a plan for the purchase of United States Savings Bonds through automatic payroll deductions.

The bonds are secured by the federal government, are protected against loss, and are easily converted to cash. They now earn 6 per cent interest (4.5 per cent the first year) when held to maturity. And, the interest earned is exempted from state and local income taxes. The federal income tax can be deferred until the bond is redeemed or reaches maturity.

LASL employees who want more information on Savings Bonds or who want to sign up for the payroll deduction savings plan should call or write Payroll (AO-2), 4595, MS-238.

**J. Douglas Balcomb,** assistant division leader for solar programs in Q-Division, has been elected to a 3-year term as a director of the International Solar Energy Society (ISES). Balcomb is a board member of the American section of ISES and is chairman of the passive systems division. He also is chairman of the New Mexico Solar Energy Association, a regional chapter of ISES.

**G. Robert Keepin,** associate Q-Division leader for nuclear safeguards and director of nuclear safeguards programs, was the principal speaker at the banquet of the 19th Air Force Academy Assembly recently at the Air Force Academy in Colorado Springs, Colorado. Theme of the 5-day assembly was "Nuclear Energy: Do The Benefits Outweigh The Risks?"

**Douglas Venable,** deputy assistant director for weapon planning and coordination, has been nominated for Fellowship in the American Physical Society. Fellowship in the American Physical Society is possible, according to the Society's laws, to "such persons as have contributed to the advancement of physics by independent, original research or have rendered some other special service to the cause of the science which is considered equivalent to such investigations." Venable has held several positions at LASL including alternate leader of M-Division and leader of the PHERMEX group, M-2.

**John W. Dean,** Q-26, has won the 1977 Russell B. Scott Award for Applications of Cryogenic Engineering. The award, consisting of $200 and a certificate, was presented to Dean by the Cryogenic Engineering and Conference Board of the National Bureau of Standards for a paper he coauthored with Jack E. Jensen of Brookhaven National Laboratory on "Supercritical Helium Refrigerator for Superconducting Power Transmission Cable Studies."

Retirements: **Harold J. Lang,** P-9, staff member; **Margaret A. Lang**, T-DO, secretary; **Voyle A. McClurg,** SP-3, storesman; **Robin R. Edwards,** E-1, instrument technician: **Roman Martinez,** H-4, animal technician; **William J. Ruthven,** SP-3, assistant warehouse supervisor; **Landis L. Marriott,** CMB-11, special process technician.

Deaths: **Phillip A. Dodd,** L-4, mechanical technician; **James T. Hume,** E-2, electronics technician; **Lonnie W. Dexter,** MP-1, electronics technician; and former employee **Don L. Bunker,** LASL chemist from 1957 to 1965.

# . . . more short subjects

**Richard T. Meyer,** acting director of the Western Governors Regional Energy Policy Office, spoke on "Energy and State Rights" recently at the Laboratory. Meyer was with Sandia Laboratories from 1960 to 1975 when he joined the Western Governors Regional Energy Policy Office in Denver.

**Alfred O. C. Nier,** Regents' Professor of Physics at the University of Minnesota, spoke on "Martian Atmosphere" during a recent visit to LASL. Nier was involved in development of mass spectrometers for the 1976 unmanned Viking spacecraft landing on Mars.

**David Edwards,** P-2, spoke on "Everyday Moscow and Laser Fusion" at a colloquium on March 8. Edwards was in Moscow from January, 1976, through June, 1976, as part of an exchange agreement between the U.S. and U.S.S.R. National Academy of Sciences. Working as a visiting scientist in the P. N. Lebedev Physics Institute in Moscow in the field of laser fusion, Edwards was in the laboratory of A. M. Prochorov, one of the recipients of the 1964 Nobel Prize in physics for the discovery of the laser.

**R. J. Van Gemert,** SP-Department head, has been named a member of the Committee on Socio-Economic Policies of the American Bar Association's Model Procurement Code Project.

The Bradbury Science Hall and Museum in April welcomed its 750,000th visitor. The museum moved to its present location in 1965 from one of the original laboratory buildings near Ashley Pond.

According to **Bob Porton,** leader of group ISD-2, which manages the museum, the museum bridges a gap between the scientist and the layman. It tells the Los Alamos story.

An important function of the museum, says Porton, is to tell young people about LASL, and create interest in them to learn more about science.

It also tells the American people how their research dollars are being spent.

Porton explicity says the success of the museum depends on the tour guides, not gadgetry. "Our people courteously and efficiently take individuals and groups through the museum, carefully explaining, demonstrating, and answering questions to make sure the people understand what they see. If our guides can't answer a question, they tell the visitor so and offer to get the information later and pass it on to the visitor."

The museum is open from 8 a.m. until noon and 1 to 5 p.m. weekdays, and from 1 to 5 p.m. weekends.

## PATENTS

**Eugene H. Farnum** and **R. Jay Fries,** both L-4, Jerry W. Havenhill, Independence, Missouri, Maurice Lee Smith, Kansas City, Missouri, and Daniel L. Scoltz, Blue Springs, Missouri, all with the Bendix Corp., were awarded U.S. Patent 3,997,435 on December 14, 1976, for a method for selecting hollow microspheres useful as containers for the high pressure gaseous deuterium and tritium fuel in laser fusion targets.

**Dwight L. Stephenson,** E-5, was awarded U.S. Patent 4,001,557 on January 4, 1977, for invention of a stored program digital process controller. With the invention any arbitrary function may be stored in a programmable read only memory (PROM), and read out at any predetermined rate.

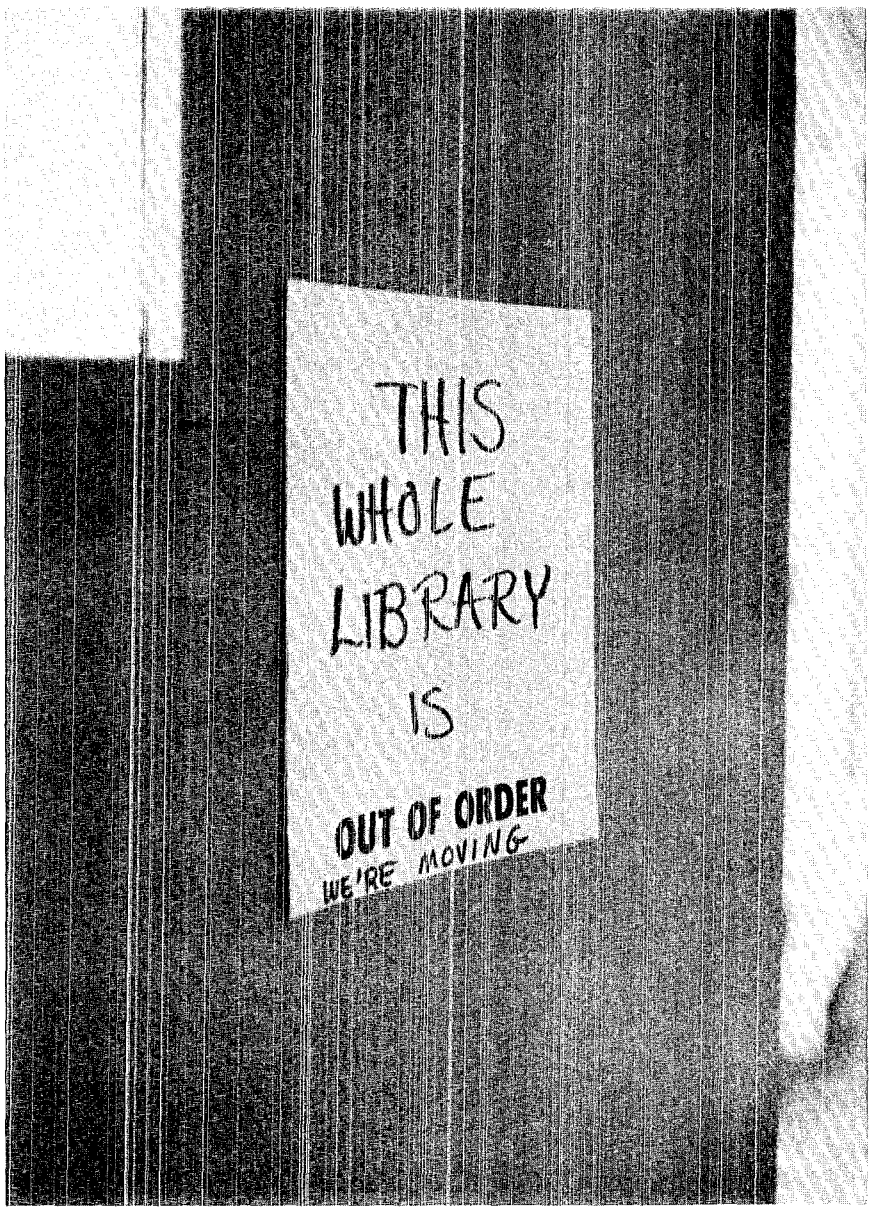
**Lawrence R. Newkirk** and **Flavio A. Valencia,** both CMB-3, were awarded U.S. Patent 4,005,990 on February 1, 1977, for an invention that relates to superconductors, and more particularly to bulk coatings of niobium germanide ($Nb_3Ge$) superconducting compositions having transition temperatures of about 20 K and higher.

# Moving, Moving, Moving....

Most people probably don't realize how much "stuff" they have accumulated until they pack and box everything and move it.

Art Freed, group leader, and his library staff in ISD-4, however, were aware of how many books, reports, journals, and shelves and how much miscellaneous equipment they had accumulated, and they were prepared for the move. But it didn't make the move any less dramatic.

The LASL library moved all of its collections and operations from the basement of the Administration Building to new spaces in the National Security Resources and Study Center (NSRSC) building the last of March and the first of April.




This sign tells the whole story.

Zia people, working mostly at night, have done the actual moving of more than 9,000 shelves of all types of printed matter, classified and unclassified. The 9,000 old shelves, combined with 5,000 new shelves purchased for the new library, give 14,000 shelves to contain the ever-expanding library.

"We can't say enough about the hard work of the Zia people in getting everything moved," said Freed. "E. A. Thompson and Napoleon Garcia were able to supervise their work forces in a most efficient manner."

Freed explained that the move from the old library to the new library was different from a move that might be experienced by other libraries. "Not only did we have to move all the books, journals, and other printed matter, we had to move the shelves and set up and arrange the stacks, also. Most libraries probably would have moved only the books, placing them on new shelves already set up."

"Some shelves could be moved as a unit, intact, but most of the books and journals had to be taken from the shelves and moved separately."

Zia built special carts to haul shelves of books and boxes. The carts held up to 1,000 pounds of books. The number of carts moved per day varied, with one of the busiest days on Saturday, April 9, when about 100 heavily-loaded carts were moved.

The work continued day and night, with at least 4 library personnel present for each night shift, and all day Saturday.

The old library occupied about 25,000 square feet in the Administration Building, and occupies twice

that amount in the NSRSC. "We have room to expand in our new space," said Freed.

Lois Godfrey, assistant group leader of ISD-4, added that about 200,000 volumes of books and journals, and 480,000 technical reports (many thousands on microfiche) have been moved into the new library. The library has subscriptions to more than 3,750 different journal titles.

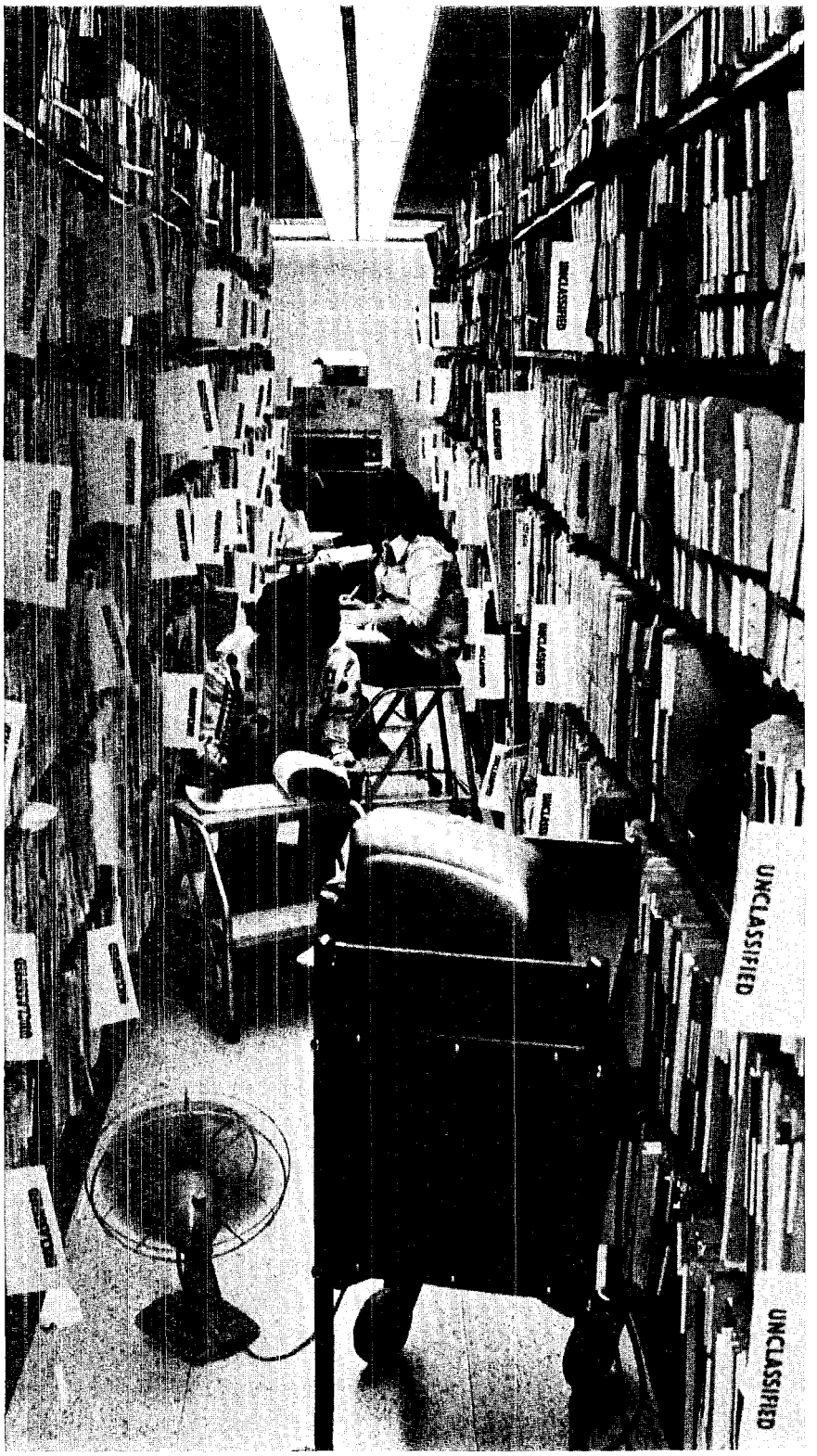
The unclassified areas of the library, which will be open to the public, include study carrels and tables with chairs for 100 readers, some lounge seating, a current journal reading area, card catalogs, reference collections, circulation area, and open stacks for books, journals and unclassified reports.

The classified report library is separate from the general-use portion of the library. "Sorting out classified from unclassified reports and moving them was an enormous, time-consuming task," said Godfrey. "We had to look at every report twice, and do the same thing with the 1 million cards interfiled in the report card catalog."

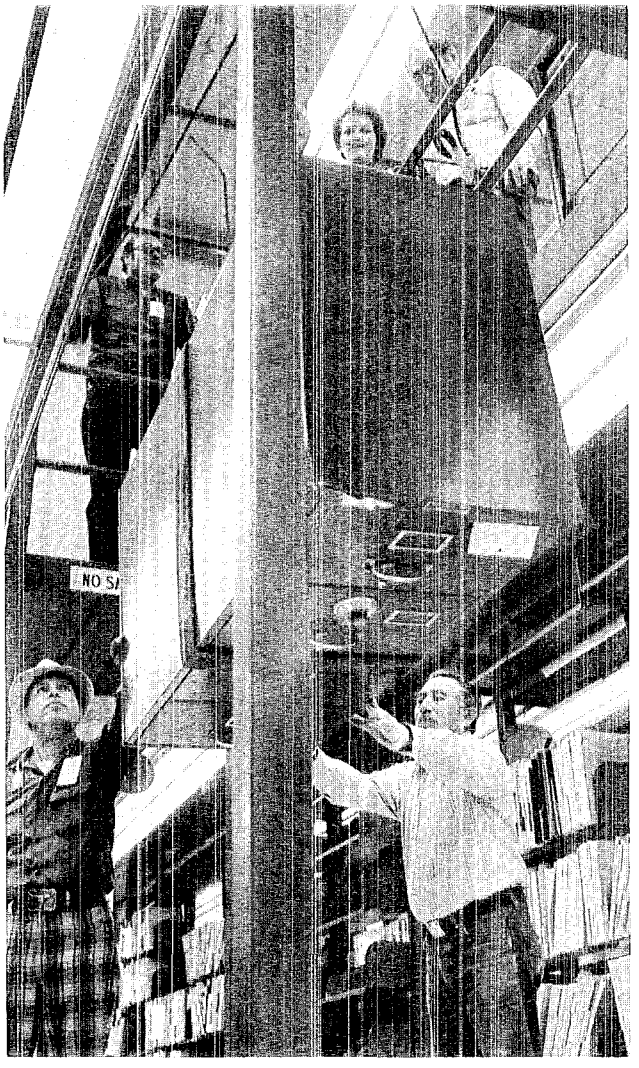
The increased space will allow more reader space and use of the library. In the old library, says Freed, reader space had to be sacrificed to keep the collection of books and journals up to date. "Once a book is out of print, it can be very hard to get. We therefore decided to limit reader space in the old library so we could maintain the best possible collections. But now we have more space, and we encourage people to come to the library and study."

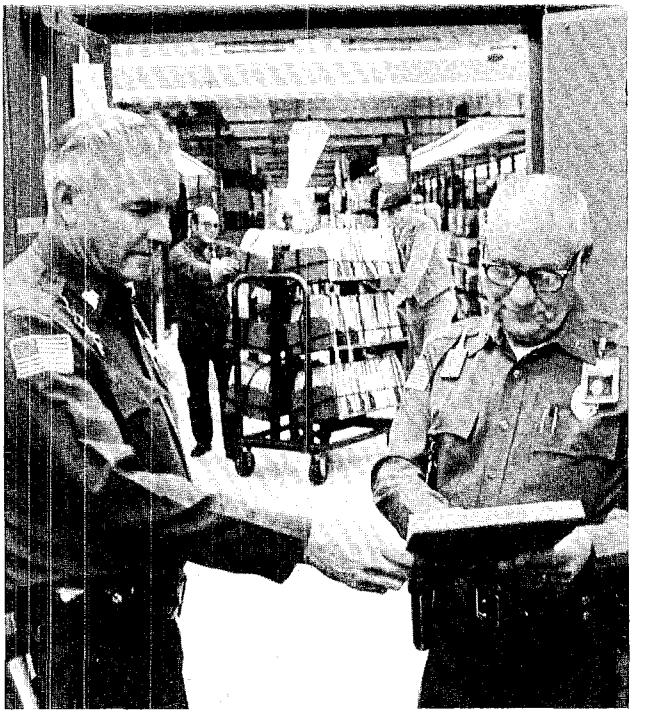
In addition to use by the public and LASL employees, the library will support the activities of the NSRSC such as the many seminars expected to be conducted in the Center.

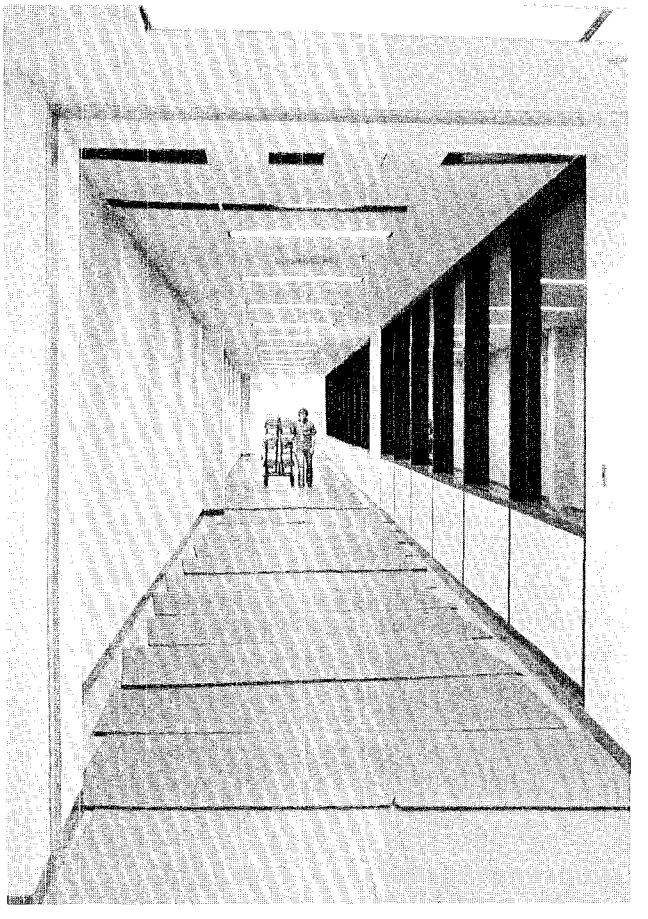
"It will be good to get unpacked, organized, and settled," adds Freed. "The task will take a while."



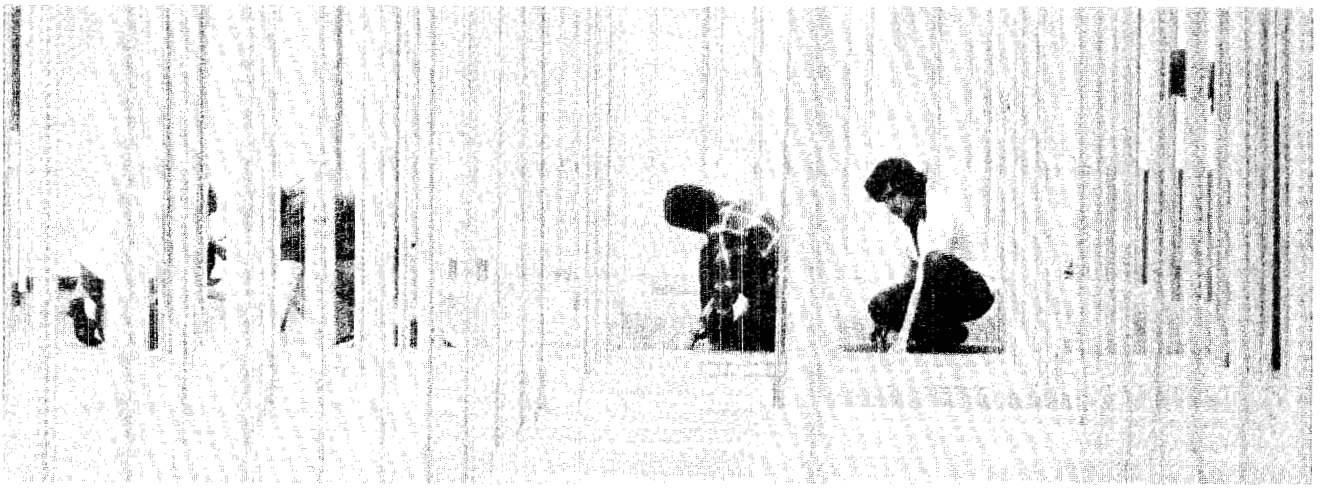

Unclassified reports and documents are checked against a catalog of titles before being moved.



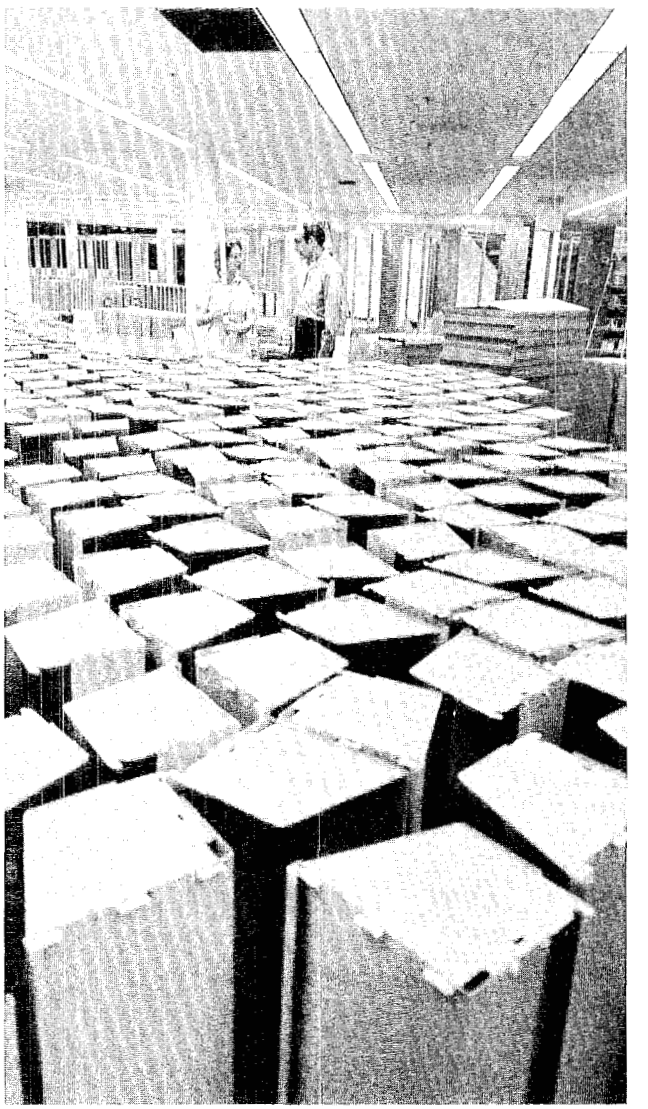


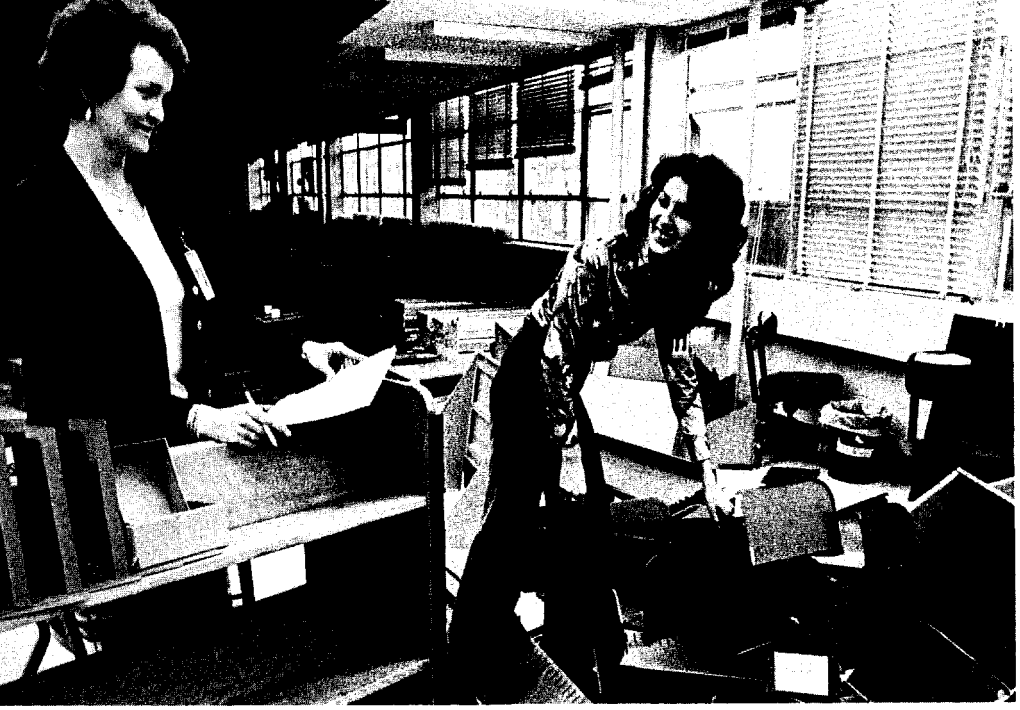


In the photo above, Zia workers move a heavy safe file from the basement of the Report Library with the aid of an overhead hoist as library personnel and fellow workers observe. In the top right photo, security inspectors Bill Sowell, left, and Ad Willer, check orders before moving documents from a classified report section of the library. Jerry Sandoval, in the photo at right, pulls a cart of books along the concourse leading to the National Security Resources and Study Center, which houses the new library.

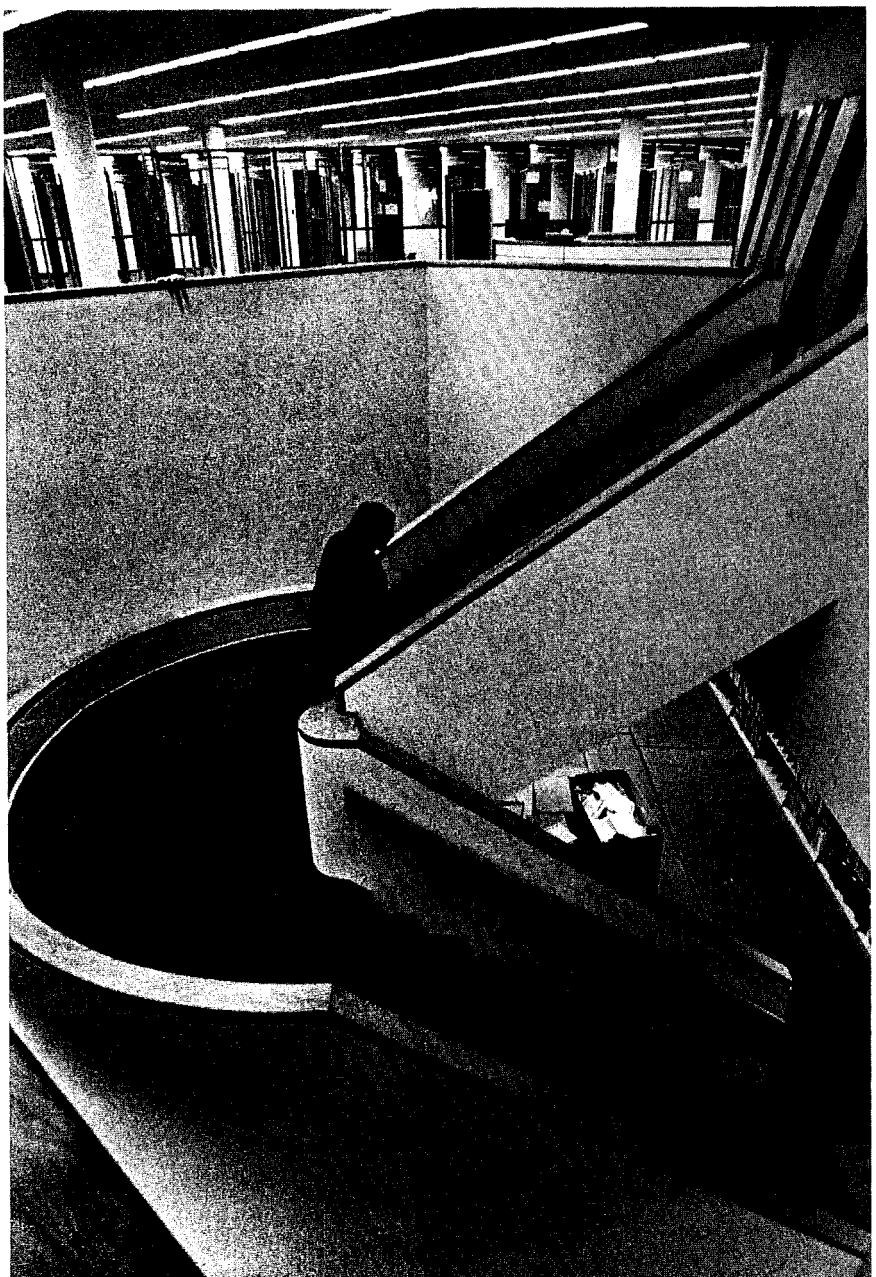


Above, workers erect shelf supports on the main floor of the new library, as Lois Godfrey and Art Freed, in the photo at right, are dwarfed by hundreds of shelves yet to be put in place. In the photo below, Gilbert Garcia and Fidencio Trujillo place shelves of books and documents in designated places by the new shelf supports.





Edwina Shelton, left, and Barbara Ortiz survey what remains of some shelves and equipment in the old library.

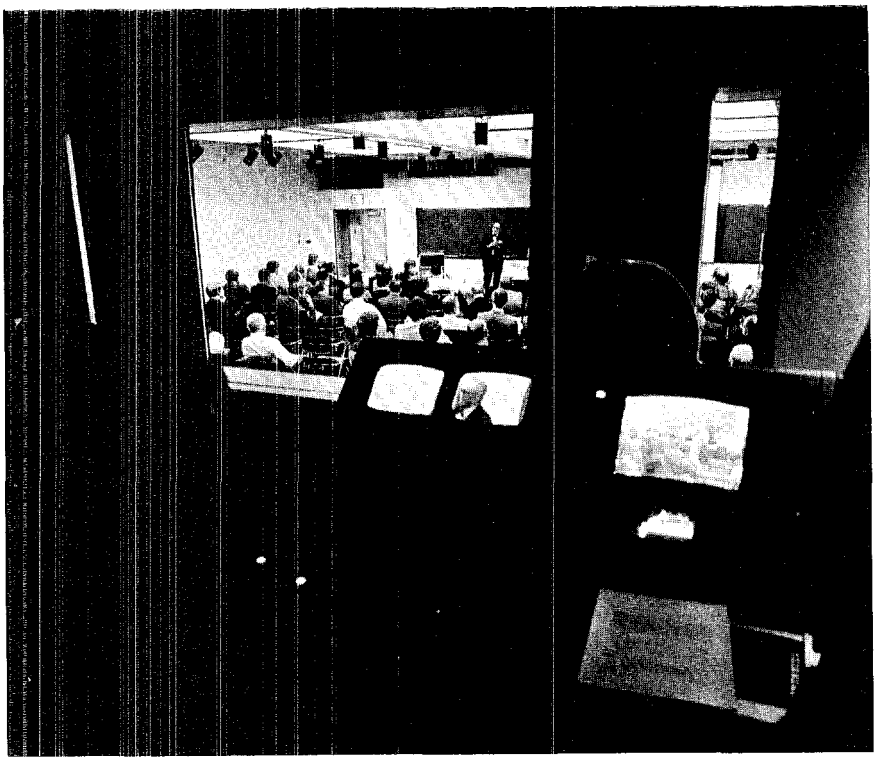


A view of the stairwell between two levels of the library.

# The NSRSC Has Its First Meeting . . .

The 5th meeting of the LASL Tactical Nuclear Panel was conducted in the National Security and Resources Study Center April 5-6, marking the first time the new Center has been used for any type of meeting. More than 15 speakers participated in solo presentations and in panel discussions. The Center is the only facility in the United States where people can convene for long periods of time to conduct classified meetings and have at their fingertips all the research materials of LASL's excellent technical library, computers and other facilities.

Panels, as well as individual speakers, were part of the first technical meeting in the new National Security and Resources Study Center, in the photo above. In the photo below, guests relax in the gallery of the Center during a mid-morning break in sessions.



Robert Shreffler, a consultant to LASL and a host for the 2-day technical meeting, is seen through a window in the videotaping control room and on monitors in the room, in the photo at right. Below, Virginia Emelity, WPC-2, assists guests with travel arrangements.

*Science Youth Days:*

# Pojoaque Students Visit LASL

About a dozen Pojoaque High School students were among hundreds of students from New Mexico and surrounding states who participated in the 20th annual Science Youth Days at LASL April 13-15.

The Pojoaque group, composed of Dennis Martinez, Jennifer Hass, Rachel Goldstine, Lori Austin, Whitney Buchanan, Kathleen Valencia, Jill Bradley, Carol Laughlin, Tays Ballman, Catherine Vigil, Anita Romero, David Herrera and Terri Benavidez, toured the Laboratory, heard lectures, and took part in discussions on April 14.

The morning was filled with welcome and orientation speeches from LASL administrators, and with lectures on LAMPF, geothermal energy, and lasers. During the lunch break the students saw movies on solar energy and cancer research with pions.

In the afternoon, the Pojoaque students toured the Omega West reactor, Cryogenics, and the Health Division facilities.

The students were asked to comment on their visit to LASL, and

James Hoffer, Q-26, explains some of the functions of the LASL cryogenics laboratory to the Pojoaque students.

all of them agreed the visit was interesting, well-planned, educational, and enjoyable. They also agreed that the lectures they heard and the sites they toured presented information relevant to their daily living in Pojoaque.

Carol Laughlin commented ". . . the man who gave the one (lecture) on geothermal energy did an excellent job. He spoke with words everyone could understand."

Whitney Buchanan said "The entire visit was highly enlightening, and the coordinators of the tour were all very courteous and helpful."

Jennifer Hass agreed, saying "The people in Los Alamos made great provisions for the visiting students, and the entire day was abundant with learning and laughs."

Tays Ballman "especially liked the speech on the meson facility and on geothermal energy. The Omega Reactor was the most fascinating thing in the whole town for me."

Terri Benavidez said "I didn't really know what kind of work was done in Los Alamos. But after the tours I realized how many tests and experiments were being done there, besides just working on weapons."

Kathleen Valencia added that it "was an exciting and educational experience," and David Herrera said "I've been looking through many different fields and this kind of helped me to know more about what is going around in the field of science."

Anita Romero found the lectures "supportive of each other, and this made the whole trip very educational." Jill Bradley added that the visit "gave me a real feel for what goes on at the Laboratory."

Rachel Goldstine commented that "the students were exposed to many different fields, which helped to give a clear picture of what LASL does and what its goals are."

Lori Austin concludes that "I never realized the Laboratory was such an interesting place, or I would have visited it in the past. . . . I think it is a special privilege for the students of the southwestern states to have the opportunity to visit this laboratory without having to travel half way across the United States to see it. Some of us don't

**The students toured the Omega West reactor and received an explanation of the reactor's operations from Tex Williams, P-2.**

realize how lucky we are to have such an interesting facility so near us."

Dennis Martinez summed it up: "I consider the Science Youth Day to have been a complete success."

Many of the students have relatives who are employed by LASL, so they were familiar with some aspects of Laboratory activities. But all commented that this trip increased their understanding of the broad scope of LASL research.

Science Youth Days is cosponsored by the Thomas A. Edison Foundation and is designed to show and tell high school seniors of the scientific programs at LASL.

In the photo at right Anita Romero, Pojoaque High School senior, appears impressed with the Omega West reactor. Below, Jill Bradley, Pojoaque High School senior, left, gives her impressions of the trip to LASL as other students listen.

# Research Park To Be Dedicated

The Los Alamos National Environmental Research Park (NERP) will be dedicated later this summer.

Harold Agnew, LASL Director, will conduct the ceremony, and federal government officials, New Mexico legislators and members of Congress are expected to attend.

A NERP is an outdoor laboratory where research may be carried out to achieve national environmental goals, as articulated by the National Environmental Policy Act (NEPA), the Energy Reorganization Act, and the Nonnuclear Energy Research and Development Act.

The focus of every NERP is the impact of man's activities on his environment, that is, the interaction between man-altered systems and adjacent natural ecosystems.

The Los Alamos NERP (which was officially designated on November 15, 1976) comprises about 27,000 acres surrounding LASL's energy technology research facilities. It is one of several NERPs in the United States set aside to fulfill environmental studies goals.

A feature which makes the Los Alamos area a unique locale for environmental research is the relatively sharp elevational gradient within which falls several distinct continental life zones.

# 10 *years ago in los alamos*

Culled from the May, 1967 Files of the Atom and the Los Alamos Monitor by Robert Y. Porton

**STEELS TO BE SOLD:**

The AEC made an announcement today that the 193 Western Area Denver Steel housing units will be platted and offered for sale to their occupants on a basis similar to the sale of other single family housing in Los Alamos. Fifty Eastern Area Steels will not be sold. All of the Denver units had been slated to be removed from the community and to be turned over to other federal agencies.

**REGENTS, REAGAN VISIT:**

Governor Ronald Reagan of California arrived in Los Alamos last evening with 9 other Regents of the University of California to tour LASL facilities and sign a new 5-year contract. The University operates the Laboratory for the AEC. Reagan is president of the Regents. Among purposes of the visit is a meeting of the Regents' committee on special research projects with Laboratory officials.

**MOVING DAY:**

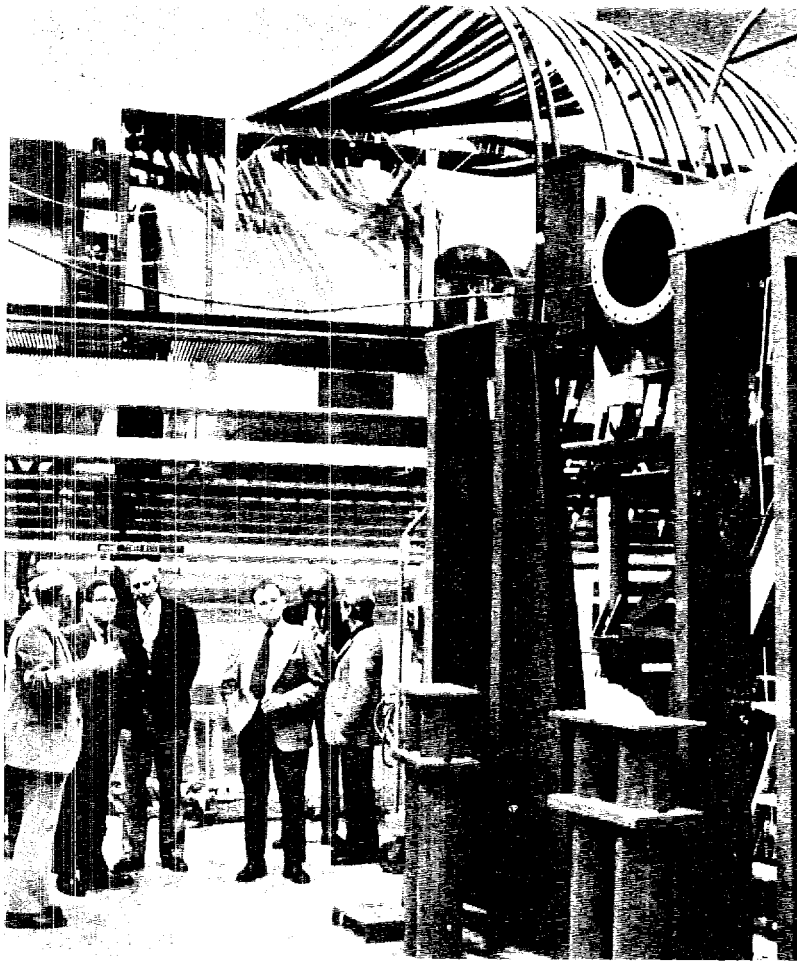
Los Alamos County offices will have a new address after this weekend. The move from the old county building to the shiny new structure facing Ashley Pond marks a major step forward for Los Alamos as the transfer procedure goes on. While things will be quite hectic for a time, county officials ask all residents to bear with them until the move is completed.

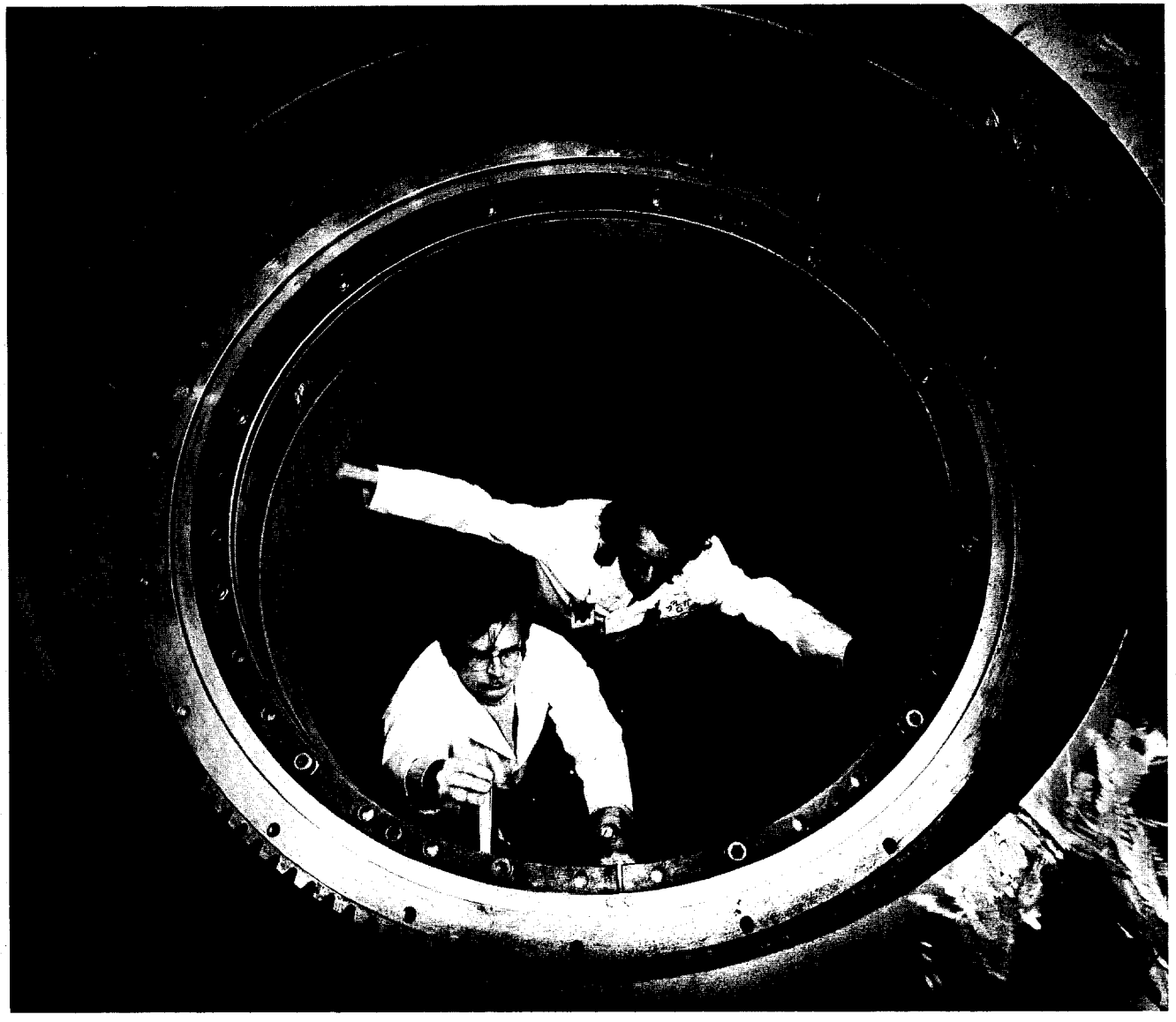
**PULLING THE WOOL:**

An employee at the Centre Theater was gazing across the Community Center Sunday evening and saw a "suspicious-looking man" enter the First National Bank. After he noted that the man covered the window with a blanket, the observant citizen called police. Two officers sped to the scene. They found the janitor working inside the bank building, where he had hung up a rug to clean it.

# Among Our Guests


In the top photo, Sid Singer, L-1 group leader, conducts a tour of the 8-beam laser system for U.S. Representatives Dan Daniel, second from left, Marjorie Holt, and Samuel Stratton, as LASL Director Harold Agnew assists. The Representatives are members of the Subcommittee on Intelligence and Military Application of Nuclear Energy of the House Armed Services Committee. Singer conducts another tour, photo at right, of the 8-beam laser system for U.S. Representative Robert W. Daniel, second from left, congressional staff members John J. Ford and Edward Bauser, and Commander Rudolf Bredderman of ERDA's Division of Military Application. Gene McCall, L-Division alternate leader, assisted with the tour. In the bottom right photo, Gen. Alfred D. Starbird, USA (Ret.), center, Assistant Administrator for National Security for ERDA, Vitalij Garber, left, technical director, Office of Assistant Administrator for Field Operations, ERDA, and George J. Bradley, right, special assistant to Starbird, were at LASL recently for a briefing on long-range projections for the Laboratory. Ed Hammel, LASL assistant director for energy, is shown with his back to the camera. In the bottom photo, U.S. Senator Pete Domenici of New Mexico discusses superconducting and energy storage with Fred Edeskuty, associate group leader of Q-26.





Ray Maestas, P-11 mechanical technician, right, and Harold Robinson, P-11 senior designer, make final adjustments in the high-current target at the Weapons Neutron Research (WNR) Facility. The WNR will be phased into operation beginning in mid-summer.

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