The ATOM

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COVER:

The photograph on the cover, taken by ISD-7's Bill Jack Rodgers, is of a series of pictographs made by early Pueblo Indians. These pictographs, and one of a serpent, can be seen on the rock faces of a mesa about a mile from White Rock on Pajarito Road. The photograph was taken in connection with the article, "Historic Ruins Have Priority," which begins on page one.

Historic Ruins Have Priority

Supplementing the general terms of federal acts to protect historic ruins at the Los Alamos Scientific Laboratory are signs which clearly state the penalties for unauthorized disturbance of historic sites. In background are Wayne Hanson of Group H-8 and Charlie Steen who has been contracted by the Laboratory to inventory ruins in all of Los Alamos County.

Old and new construction has a peculiar way of coming about in the same places. At the Los Alamos Scientific Laboratory, for example, the ruins of early Indian civilizations are often found where new construction is planned.

Ancient ruins have been given certain priorities by four federal acts. These are the Federal Antiquities Act, the Historic Sites Act, the Historic Preservation Act and the National Environmental Protection Act. What they boil down to is that before any new construction can begin, the building site must be searched for ruins. If any are found they must be excavated, and artifacts must be salvaged and passed on to public museums for present and future generations to enjoy.

Many artifacts have been salvaged from excavated ruins at the Laboratory. Some 30 cardboard boxes, filled with ancient hunting, farming and cooking tools, are presently awaiting inspection by repre-

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Steen and Hanson inspect a kiva at Tshirege Ruin, west of White Rock. Mounds of rock in background are the remains of early Indian pueblos.

sentatives from various New Mexico museums.

Archeological searches, and the excavation and salvage operations that follow the discovery of any historical sites, have traditionally come just one jump ahead of new construction, but the Laboratory is now taking an inventory of all historic sites in Los Alamos County so that they can be considered in the earliest planning stages for new construction.

Conducting the inventory is Charles Steen, a noted archeologist who recently retired from the National Park Service. Steen, for 16 years, was the NPS archeologist for the southwestern states, and for two years prior to his retirement, he was the historic preservation officer for all of the United States west of the Mississippi River. In addition to his work at the Laboratory, Steen is teaching classes in archeology at the College of Santa Fe.

According to Wayne Hanson of Group H-8, Steen has been contracted by the Laboratory until the end of Fiscal Year 1974 to supervise the excavation of ruins on land areas currently included in construction plans and to locate and record all ruins in Los Alamos County on a base map. Hanson noted that extending the inventory of ruins beyond the boundaries of the Los Alamos Scientific Labora-

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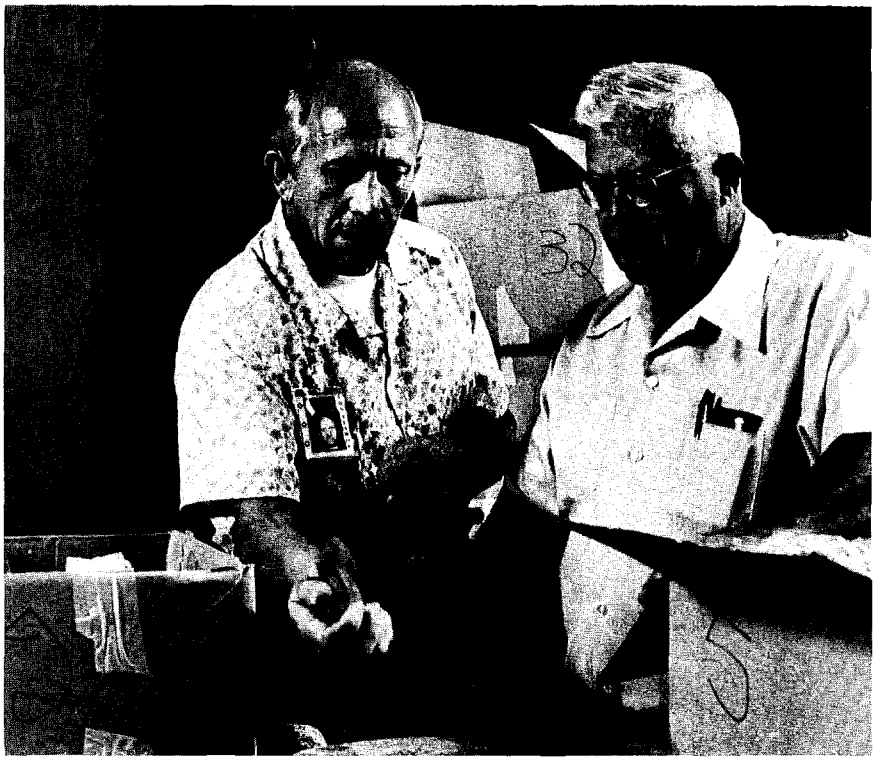
Steen examines a pictograph of a serpent on the face of a rock that can be seen from Pajarito Road. There is also a pictograph of a serpent on a facing rock not shown.

Steen and Hanson measure the dimensions of a room in a ruin on Mesita Del Buey. The ruin, Steen estimates, consists of as many as 50 rooms.

Hanson and Steen examine chips of pottery found at one of many ruins on the LASL reservation.



Hanson and Steen examine the artifacts contained in some 30 boxes which are awaiting inspection by representatives of several New Mexico museums. The artifacts were collected by the late Fred Worman who was official archeologist at LASL and the Nevada Test Site from 1950 until 1971.

tory will be useful in the future if the LASL reservation expands. It will put the Laboratory in perspective with the surrounding area, and it may also be of use in cases where Laboratory experiments might be undertaken on non-LASL lands through agreements with individuals or other government agencies. One example of such a case is the drilling operations currently underway on U.S. Forest Service land in the Jemez Mountains, west of Los Alamos, in connection with LASL's Geothermal Energy Research Program.

The base map, Hanson said, is being prepared for the Laboratory's Engineering Department for use in construction planning and for inclusion in a local environmental survey being conducted by members of Group H-8. "How early man lived with the plants and animals of various elevations will be an important result of the environmental inventory."

"The map," Steen said, "will be made up in the form of overlays that will show the location of ruins on a given land area. It will include information on the cultural affiliations and ages of the various sites.

"Most sites are mound appearing and range from one room to as many as 1,000 rooms. Most were built with stone masonry, laid with adobe mortar, but some adobe walls were made.

Most of the smaller sites were occupied between the 13th and 15th centuries. The larger sites were occupied between the 13th and 16th centuries or early in the 17th century. The sites can include shrines built of rock, used for praying, which are usually found on the rims of canyons; deer traps which are holes eight to 12 feet long, three to five feet wide, and six feet deep, usually found in the saddles of ridges; and rock art. There is a great wealth of pictographic art here on LASL lands. These are figures that were pecked, scratched, or gouged in rock.

"The Antiquities Act states that things of historical interest salvaged from ruins are to go to public museums. In this way they go somewhere where the public can see them. We're now in the process of disposing of things found by Fred Worman." Worman, a biologist at the Laboratory, was also official archeologist at LASL and the Nevada Test Site on a part-time basis until his death in 1971. Although educated in biology, practical experience in archeological work since childhood led to his appointment as head of the Department of Anthropology at Adams State College at Alamosa, Colo., prior to his employment at LASL.

In addition to distributing artifacts found by Worman, Steen has proposed three sites for the National Register of Historic Places, a register which protects historically significant sites from disturbance by government activities. These sites are the Otowi and Little Otowi Ruins, east of Los Alamos, Tshirege Ruin, between White Rock and the Laboratory; and several "fragile" ruins, located east of the Laboratory's main technical area.

"When I took on this work," Steen said, "I thought I would begin at the north end of the county and work south. So far though, my work has been directed at small areas where construction will shortly occur in the central part. I have some of this central area inventoried now and I feel that I might as well finish it up before planning a methodical way of completing the survey."

United Fund Seeks $125,000 for 18 Agencies

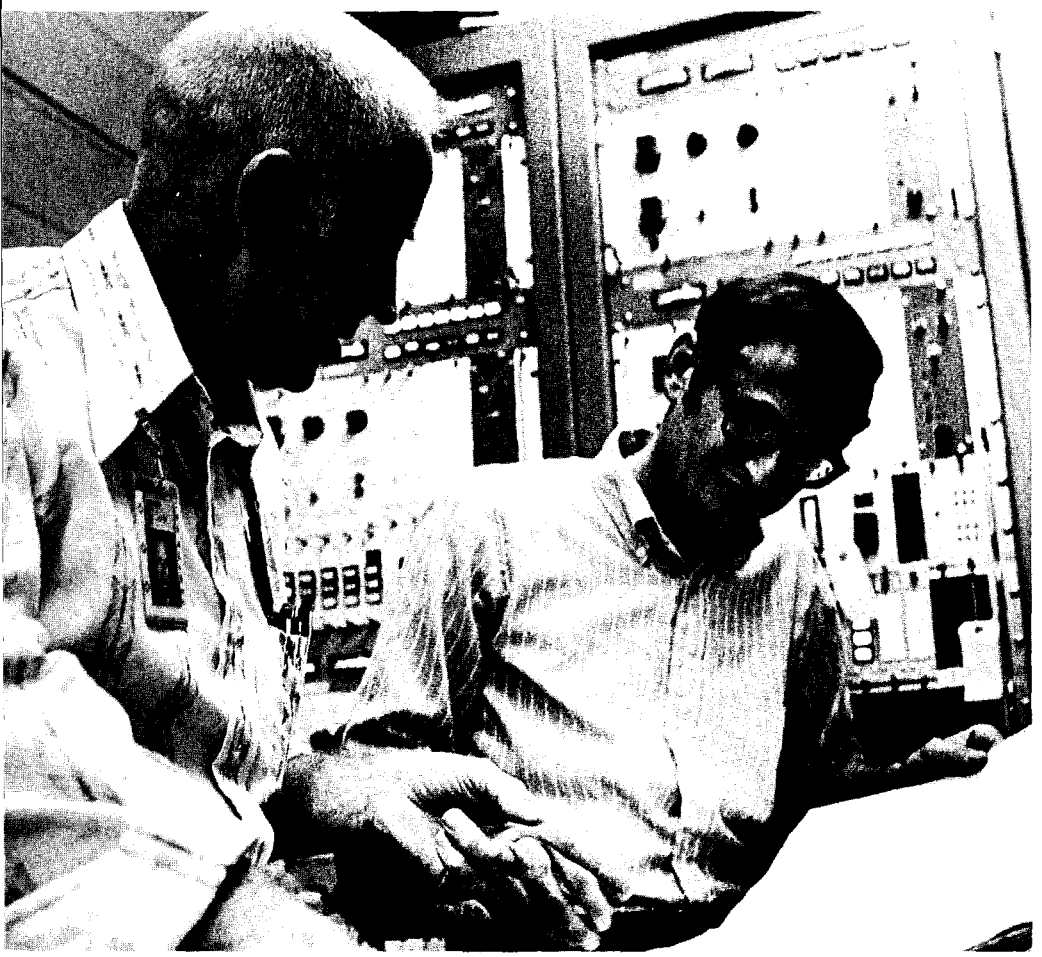
The Annual United Fund Campaign has begun in Los Alamos to raise a total of $125,000 for 18 participating agencies.

Participating agencies and funds requested by them are: Amateur Baseball Congress, $1,250; Boy Scouts, $10,000; Cancer Clinic, $7,500; Chaparral Home and Adoption Service of Albuquerque, $1,400; Cystic Fibrosis Foundation, $3,800; Family Council, $20,000; Girl Scouts, $10,000; Heart Association, $5,000; Jemez House Boy's Ranch, $23,000; Little League, $1,250; New Mexico Council on Crime and Delinquency, $750; Red Cross, $6,500; Los Alamos Association for Retarded Children, $5,200; Salvation Army, $7,600; Sheltered Workshop, $5,200; United Services Organization, $900; and Los Alamos Family YMCA, $8,000. Lassie League, although a participating agency, has requested no funds. Of the $125,000 goal, $7,650 will be used to offset campaign expenses and to establish a reserve fund to help participating agencies meet any unforeseen expenses incurred during the coming year.

Los Alamos residents will be contacted at their places of employment for contributions which may be paid directly, by payroll deduction or on the installment plan.

Heading the United Fund Campaign in Los Alamos is Sara Balcomb. Assisting her will be several persons responsible for various segments of the community. Otis Farmer, T-3, is in charge of conducting the campaign at the Los Alamos Scientific Laboratory. Persons in charge of other segments of the community are Billy Brown, the Zia Company; Robert McClenahan, federal employees; Don Anderson, Mike Astle, Dorwin Justice, John Leavitt, Joe Meacham, Eileen Moore and Chuck Wood, business places; C. Eugene Pollard, Los Alamos County; Carolyn Worthington and Dr. Ann Wadstrom, Los Alamos Medical Center; Jean Elder, Los Alamos Schools; and Al Dyhre, retired people and clergy.

Lore Watt who is handling public relations activities for the campaign, noted that a "speakers bureau" has been added to United Fund information activities this year. "People qualified to talk about the United Fund as a whole and about all agencies are available to talk to groups of people on request," she said. Persons interested in acquiring a United Fund speaker can contact Martha Anne Cole by calling 662-3264 or June Gauge, after 5 p.m., at 662-5485.



Principal experimenters Mark Jakobson, University of Montana, Missoula, who is chairman of the LAMPF Users Group, and Bob Burman, Group MP-7, review pion measurements made during the Aug. 27 experiment.

Pion Production Begins at LAMPF

Pions, one of a family of particles for which the Clinton P. Anderson Los Alamos Meson Physics Facility is named, have been produced at the facility for the first time. They were observed about 3 a.m. Aug. 27 in a brief experiment that began five hours earlier.

Principal experimenters were Bob Burman of Group MP-7, and Mark Jakobson, University of Montana, Missoula, who is chairman of the LAMPF Users Group, a 1,000-member organization of scientists from throughout the United States and some foreign countries who will share the Meson Facility with Los Alamos researchers.

In addition to being the principal experimenters for the event, Burman and Jakobson, were instrumental in the optical design of the magnetic channel used in pion or pi-meson detection. Bob Fulton of MP-7 was responsible for the channel's mechanical design. According to Burman, design work for the channel began late in 1968. "Several members of the Users Group that were here this summer spent a great deal of time working on the pion channel," he said. "They were here in the interest of their own experiments, but they devoted much of their time to getting the channel ready for testing. There were two phases to the test, and members of both the Users Group and the MP-Division groups were heavily involved in them."

In the first phase, pion trajectories were simulated by alpha particles emitted from americium-241 and curium-244 sources. It was essentially a debugging operation prior to committing valuable beam time from the huge LAMPF accelerator to the pion-channel system.

In the second phase, a low-power beam of protons from the linear accelerator was focused on the rim of a 12-inch-diameter, graphite-wheel target less than a half-inch thick. From this interaction of protons with target nuclei, a cloud of many kinds of particles—including protons, neutrons, electrons and pions—is produced. Some of the charged particles—protons, electrons, pions, and muons resulting from pion de-

cay—enter an aperture leading from the target chamber into the pion channel. Within the channel, the particles are fanned out into an energy spectrum by a magnetic field. Particles of desired energies are selected from the spectrum by a pair of slits. The channel transports these particles—electrons, pions and muons—into the experimental area where they are intercepted by a series of plastic scintillation counters. Light, emitted as each particle interacts with the scintillators, is detected by photomultiplier tubes which convert light into electrical signals or pulses. Signals representing pions are distinguished from those of muons and electrons with the use of a pulse-height analyzer, an instrument capable of sorting and counting electrical pulses according to their sizes.

About 500 pions per second were

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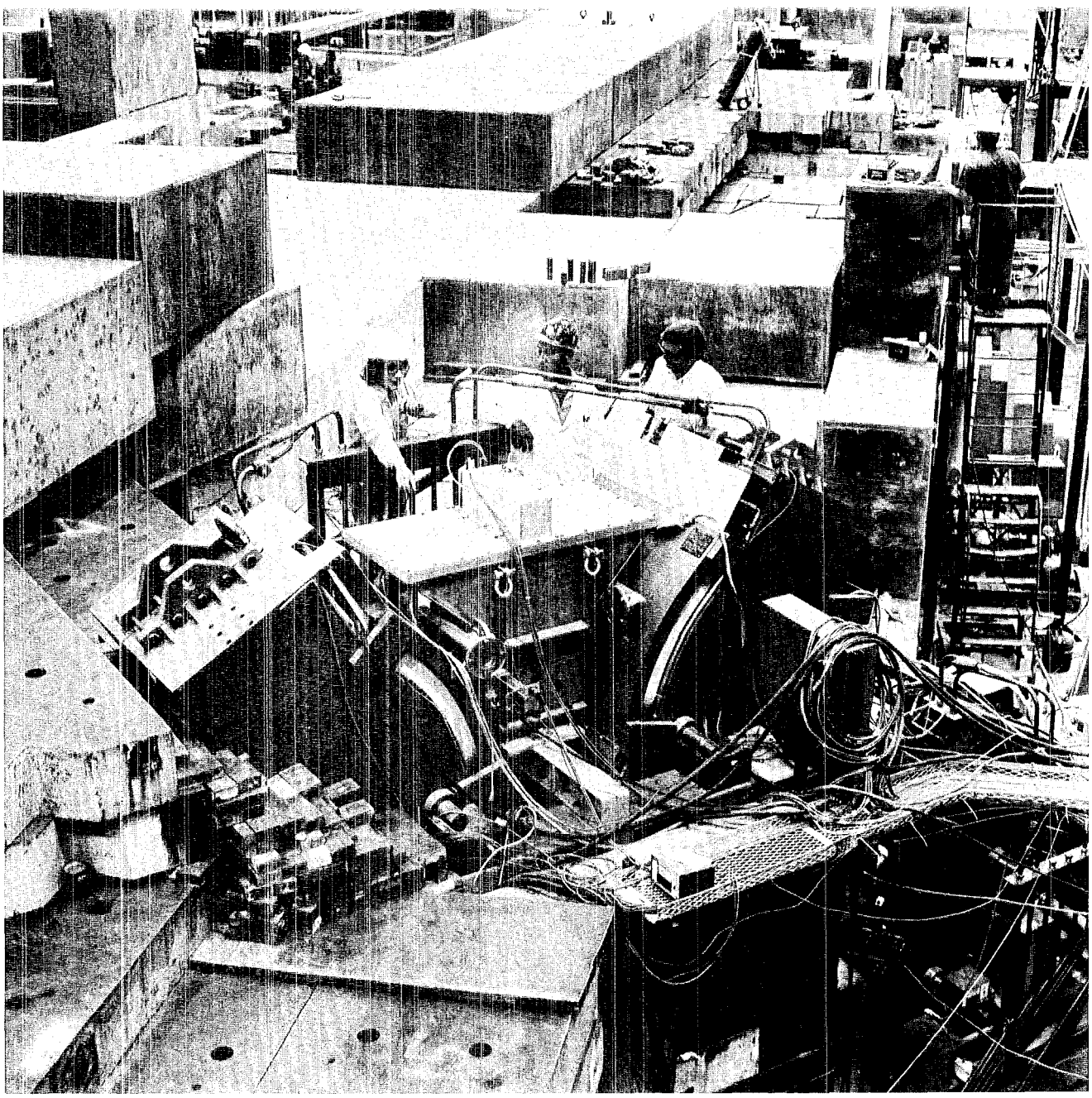
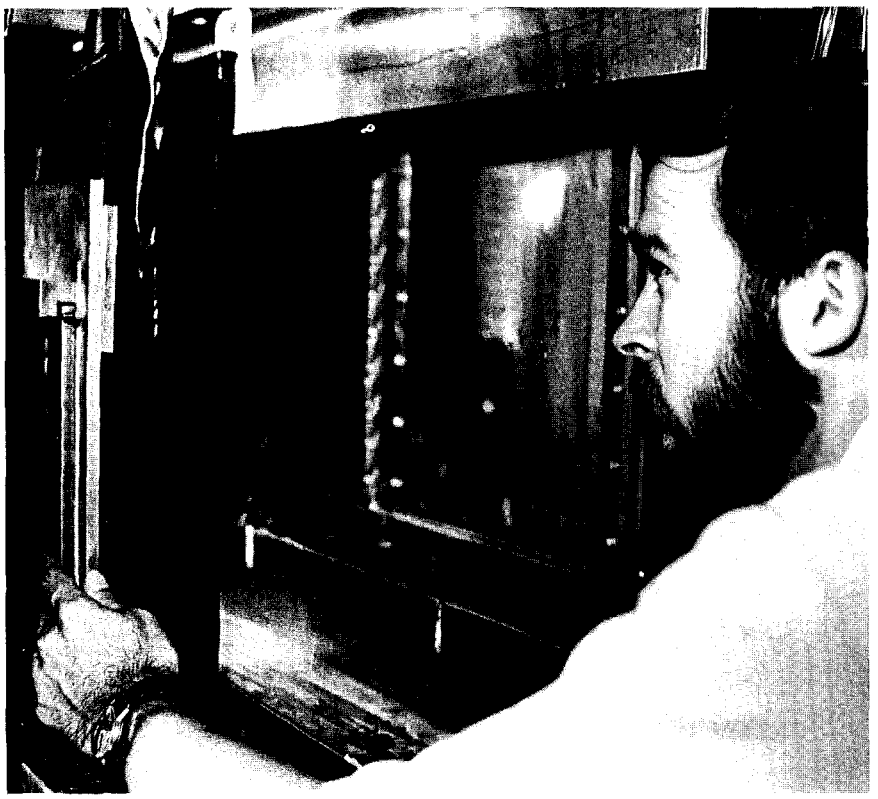


Bob Fulton, right, who is responsible for mechanical design of the pion channel, consults with Jerry Sherwood, MP-7, and Jean-Pierre Perraud, visiting scientist in MP-7 from Switzerland, about a bending magnet for the pion channel.



Bob Redvine, MP-7, works on scintillation counter system in counting room at the end of the pion channel.

measured with the fractional accelerator beam used during the experiment. When the accelerator is operated at full power, intensity or the number of pions produced is expected to increase by a factor of 20,000.

"The identification of pions at LAMPF represents the facility's real beginning as a meson 'factory'," said Burman. "In the next few months we will be measuring the performance of the pion beam."

Jakobson noted that the day before the pion experiment began, members of Group MP-6, headed by Don Cochran, moved more than 1,000 tons of concrete and steel shielding into position in the experimental area. In addition he called attention to the performance of the pion channel and the LAMPF accelerator: "The pion channel is more complex than any other in existence and it operates with more precision in terms of energy resolution—small spot focus and uniform energy of particles. I was particularly impressed with the stability of the accelerator. It was extremely stable for a new machine. By this, I mean the intensity of the beam was very constant. When you have constant intensity, all you have to do is measure time and the problem of counting particles becomes much simpler."

The intense beams of pi-mesons that will be produced at the Los Alamos Scientific Laboratory's Meson Facility are expected to play a major role in both basic and applied research. First of all they are an especially powerful probe that will be used to explore the nucleus of the atom in greater detail than has ever before been possible. The ease with which the pion is captured by and destroys other atoms makes it a most promising candidate for applications in clinical medicine, particularly in the treatment of some forms of inoperable tumors.

The existence of mesons was postulated as early as 1935 by Hideki Yukawa, a Japanese scientist who held that these particles account for the forces that hold the nucleus of the atom together. In 1936 and 1937, United States scientists C. D. Anderson and S. H. Neddermeyer and J. C. Street and E. C. Stevenson identified charged particles in cosmic rays which were called muons or mu-mesons. Yukawa's theoretical particles, however, resemble more closely pi-mesons which were observed in cosmic rays in 1947 by C. M. G. Lattes, G. P. S. Occhialini, and C. F. Powell in England. Pions were artificially produced for the first time in 1948 at Lawrence Livermore Laboratory by Lattes and E. Gardner.

Since that time it has become evident that mesons can be used effectively to explore the structure of the nucleus and to study certain fundamental interactions with high precision. Even with this awareness, however, mesons have not been used extensively in scientific research because there has been no way of producing them with great enough intensity to conduct meaningful experiments.

The requirement for intensity has given rise to a new class of particle accelerators, commonly known as meson "factories" because of their capability to artificially produce intense beams of mesons. Among these is the Los Alamos Scientific Laboratory's Meson Physics Facility whose beam intensity will be thousands of times greater than that of any other existing accelerator.

LASL's First 25-Year Safety Award Earned by Critical Assemblies Group

By Barbara Storms

Twenty-five accident-free years in a potentially risky business were honored recently when the Los Alamos Scientific Laboratory awarded its first 25-year safety citation to the Critical Assemblies group, P-5.

Working in one of the best-equipped critical assembly laboratories in the world, the group is concerned with assembling fissionable materials in critical masses to create controlled chain reactions for experimental purposes. About 10 different critical assembly devices are used to bring fissionable materials together in configurations that achieve the shape or magnitude necessary to sustain chain reactions, producing neutrons and gamma rays for criticality experiments, nuclear safety measurements and radiation effects studies. It can be tricky work.

"But this group's safety record demonstrates how well fissionable material can be managed," commented Roy Reider, Laboratory safety director. "Like any other group, P-5 has to worry most about avoiding the standard industrial accidents. The technology of criticality is thoroughly understood today."

It was not always so. The first two of four criticality fatalities of the atomic age occurred as a result of critical assembly work at Los Alamos. In those first daring and adventurous days, all the work was done manually because it was the firm conviction of the foremost scientific minds in the country that in order to best understand his work, the scientist must have intimate contact with his experiments.

In August, 1945, Harry Daghlian was stacking tungsten carbide bricks as a reflector around a plutonium core when a nearby reactor counter indicated that the next brick would make the pile supercritical. As he withdrew his hand, the brick dropped into the center. An excursion resulted and Daghlian died 25 days later. Then, in May of 1946, Louis Slotin, group leader of what was then M-2, was demonstrating to members of his group the techniques involved in creating a metal critical assembly using a plutonium core and beryllium reflector in a two-hemisphere configuration.

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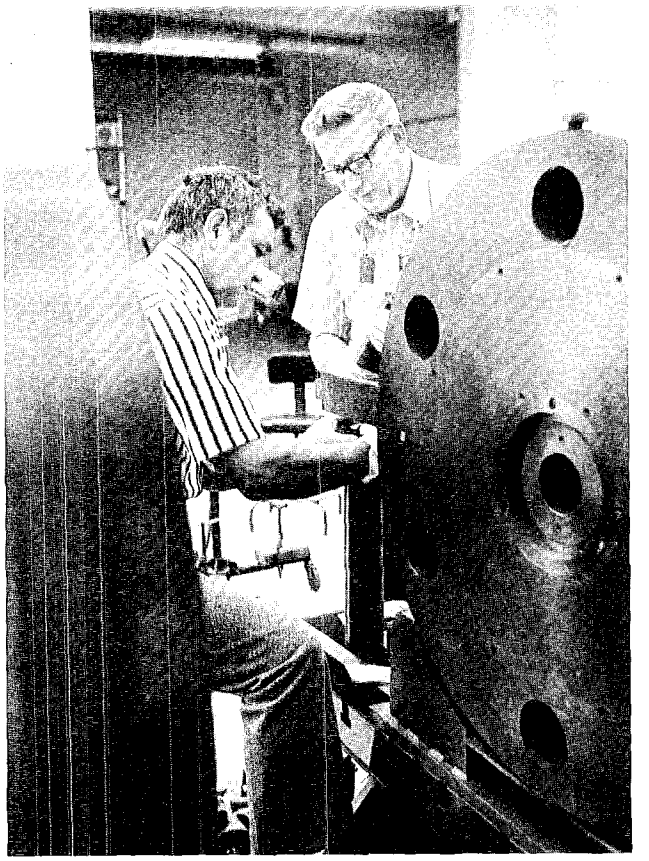


Bennie Pena and Bert Helmick install a neutron detector in P-5's new Big Ten low-enrichment critical assembly in preparation for the machine's second measurement of neutron spectra, an experiment being performed by Ghislaine and Seraphin DeLeuw of the Belgian Atomic Energy Center. In operation about one year, Big Ten has a 10 per cent enriched-uranium core which produces a unique neutron spectrum of particular interest to people making reactor calculations. Helmick is chairman of the group's Nuclear Safety Committee.

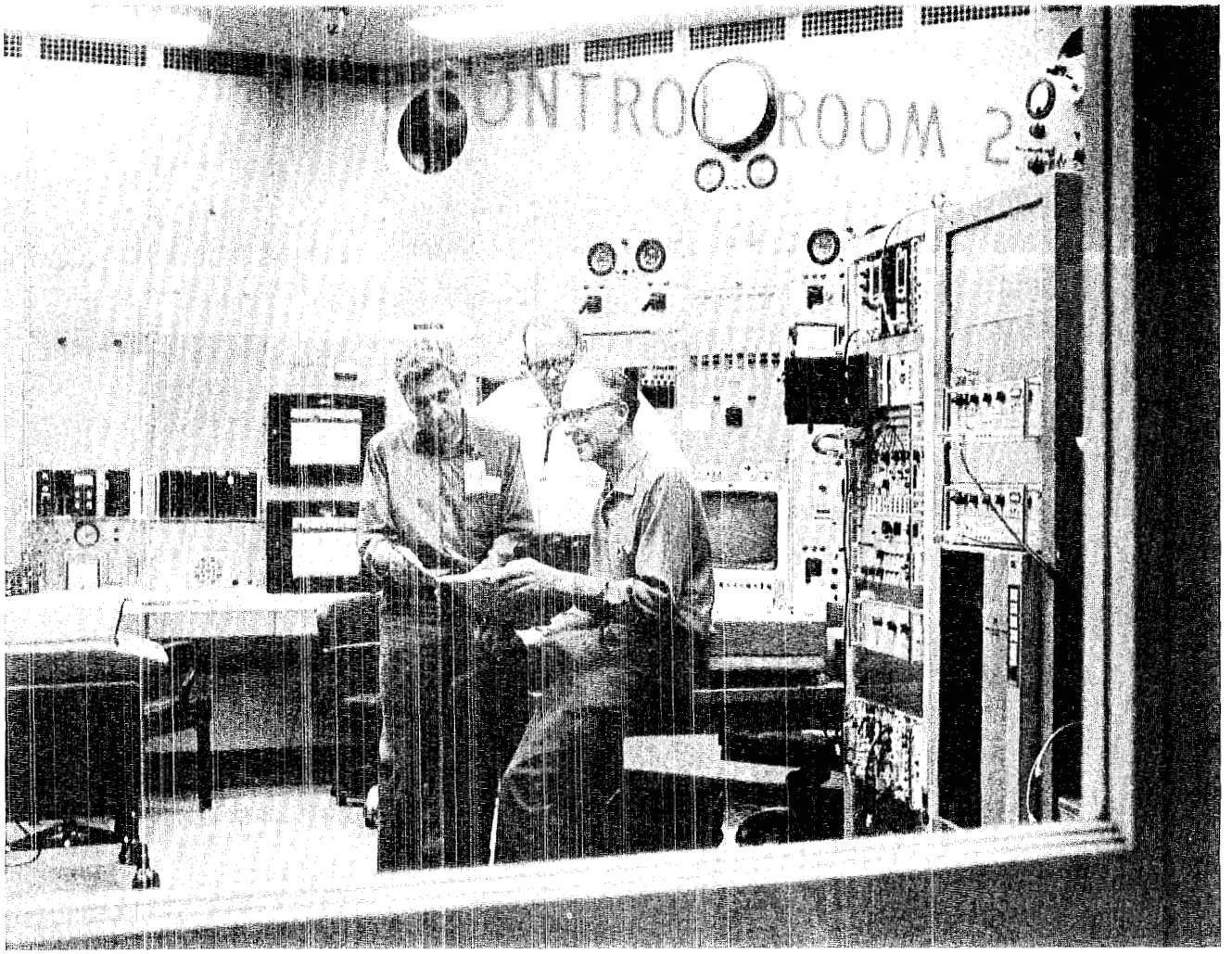
Taking the long road from Kiva II back to the control building, Hugh Paxton, P-5 group leader, and Eugene Plassmann have plenty of time to discuss experiments and enjoy the autumn beauty at Pajarito Site. Each kiva is located about one-quarter mile from the main laboratory building.

Holding the top hemisphere in one hand, Slotin began slowly to pull out a screwdriver that separated the two halves. Suddenly his hand slipped, the hemispheres came together and supercriticality resulted. Slotin died nine days later and others in the room received significant radiation exposure.

By then it was clear that criticality experiments could only be conducted by remote control. By early 1947 a new laboratory was in operation in canyon-shielded Pajarito Site which incorporated special remote control equipment, television and telephone facilities, and an instrument and assembly building (Kiva I), located about 1,000 feet from the control room. Today there are three kivas, all located about a quarter-mile from the control building.

"The distance has turned out to be a distinct advantage," reported Hugh Paxton, who has been group leader since 1948. "The typical critical assembly is protected only by heavy shielding with controls just outside. We are able to work at such distances that we can do things that would be pretty scary otherwise."

As an example, he said, his group was able to develop the Godiva assemblies for super-prompt-critical fission bursts, the kind of fast reaction pro-



Bill Stratton, Dave Smith and Roger White discuss the schedule for experimental work at Kiva II in the kiva's control room. Each kiva at Pajarito Site has its own control room in the main building.

duced in a bomb and usually avoided in ordinary critical assemblies.

As a rare source of neutrons delivered in split seconds, Godiva was in great demand for radiation effects studies. "Our fast burst capabilities really put us on the map," said Roger White, one of the group's long-time staff members.

Radiation effects studies have been one of P-5's major fields of endeavor from the beginning. "People have come to us from all over the country," White said. "We've had everything in here from beans to missile guidance systems to test their reactions to heavy radiation doses. We've even had a group of burros."

Some years ago, the group was asked to bombard peanuts with Godiva neutrons, and as a result, shared the credit for developing a new disease- and wilt-resisting type of peanut from mutations that would otherwise have taken centuries to produce.

The critical assemblies are also used in weapon design and weapon safety work, reactor design and for such advanced studies as measurements of neutron and gamma spectra, neutron distribution, time behavior and determination of cross sections. The group played a major role in development of the Rover reactors.

Criticality safety is one of the group's prime concerns. P-5 provides criticality safety guidance, not only for the group, but for all LASL operations with fissile materials, including their handling, transportation and storage.

"We believe our good record is due to the group's long-time interest in nuclear safety which has grown right along with our program," Paxton said. "We have established our own ground rules

The first Safety Achievement Award at the Los Alamos Scientific Laboratory to recognize a quarter century of work without a disabling injury was presented recently to members of the Critical Assemblies Group, P-5. Accepting the award from LASL's deputy director, Raemer Schreiber, who was leader of the group in 1946 when its designation was M-2, is Hugh Paxton, left, group leader since 1948. From 1948 to the present, members of the group have worked 1,500,000 man hours without a disabling injury.

and constantly surveyed our operations with the group's own safety committee."

As LASL Nuclear Criticality Safety Officer, P-5's David Smith reviews all procedures involving fissile material, arranges for and helps prepare safety analysis reports for storage facilities. He also serves as consultant to the Naval Research Laboratory, the AEC's Richland Operations Office, the Division of Space Nuclear Systems and Division of Applied Technology on various criticality safety problems. Tom Wimett serves as consultant to a number of installations on the safety of pulsed nuclear reactors and Gordon Hansen is involved with a standard for criticality safety calculations. Bill Stratton is vice chairman of the AEC's Advisory Committee on Reactor Safeguards.

Paxton has been chairman of the LASL Criticality Safety Committee since 1958 and has assisted the American Nuclear Society in establishing its Nuclear Safety Division and in formulating its safety standards. He is a member of the AEC's Atomic Safety and Licensing Panel.

Paxton and his group are the ultimate authorities on the subject, according to Reider, and this fact caused a problem when the AEC recently established regulations requiring that all crew chiefs and crew members be certified as qualified to handle critical material. When the AEC objected because Paxton was certified by his own staff and vice versa, there seemed to be no solution. "There just isn't anybody else better qualified to do the job," Reider said.

The Critical Assemblies group has long been noted for its imaginative nomenclature. The carefully guarded kivas, where critical assemblies actually function, were named for the Pueblo Indians' underground meeting places where secret ceremonials are conducted. Topsy, the first remote assembly device which stacked uranium cubes until criticality was achieved, was named for the character in "Uncle Tom's Cabin" who said "I just growed." Lady Godiva was a bare, or unshielded, assembly. Jezebel, also bare and used for reactor physics investigations, was expected to be extremely unpredictable. "Actually, it has performed quite predictably all these years," says Roger White. Flattop, named at a time when the Dick Tracy character was in his heyday, operates on a large flat table. Comet, a hydraulic lift machine, was named for its designer, Jano Haley. The only acronym in the bunch is PARKA (Pajarito Research Kiwi Assembly), built from parts of defunct Kiwi reactors from the Rover Program.

Cost-Improvement Program Saves LASL $2 Million a Year

A cost improvement program saving the Laboratory about $2 million a year will undergo its semi-annual review this month after LASL division leaders report the money-saving efforts of their divisions for the past six months and project estimated savings through 1975, according to Flora McCracken of the Financial Management Office.

The program was instituted by the AEC in 1964 and aimed, not only at cutting costs, but at gathering innovative money-saving ideas that can be used at other installations. These are published semi-annually in the AEC's "Management Improvement Abstracts."

LASL's biggest saving innovation, described in the Summer 1973 edition of the publication, was conceived in the Shop Department to save $2,700 the first year, $7,500 the next year and to realize a total saving of $17,700 by the end of 1975. This is a method, devised in Branch Shop 26 of SD-5 by Ed Sass, for using one lathe to machine inside and outside surfaces of hemispheres and a mill to machine the groves. The new operation saves both time and errors.

Group E-2 has realized considerable savings in man-hours and improvement in quality by using a commercially available wave-soldering device to perform final soldering of printed circuit boards. The new device cuts time ordinarily required for hand soldering by one third, and it will provide an estimated saving of $13,500 by the end of 1975.

Group CMB-1 is using a computer to control sample positioning, beam deflection and the x-ray spectrometer in electron microprobe work to save about $4,000 annually. The computerized system, initiated by Eero Hakkila, also can collect data, do limited data reduction, and produce printouts or punched paper tape for additional data analysis. The group finds that computer control makes sample analysis simpler, faster and less subject to operator error.

Savings are grouped according to five classifications which include reduction in the costs of operating and maintenance; in the costs of outputs from production, manufacturing and other AEC programs; in upgrading the monetary value of waste and scrap or of salvageable equipment; of new facilities and new special purpose machines; and of management, administrative and other general functions.

During the last half of 1972, the Laboratory's biggest economies came in the use of salvageable material estimated to bring a total saving by the end of 1975 to $673,000. During the first half of 1972, reductions in the cost of management and administrative functions brought the biggest savings, estimated at $568,000 by the end of 1975. This included the big record clean-out in the spring of 1972 which put a total of 1,969 pieces of filing equipment back into stock and allowed cancellation of large procurement orders. The total saving through 1974 was estimated at $170,000.

Nitrogen Fertilizers --on Trial

Large distillation column being constructed at TA-46 will increase nitrogen-14 and nitrogen-15 production by a factor of 10. Working on the column are Warren Sickles, Ramon Romero and Mike Garcia.

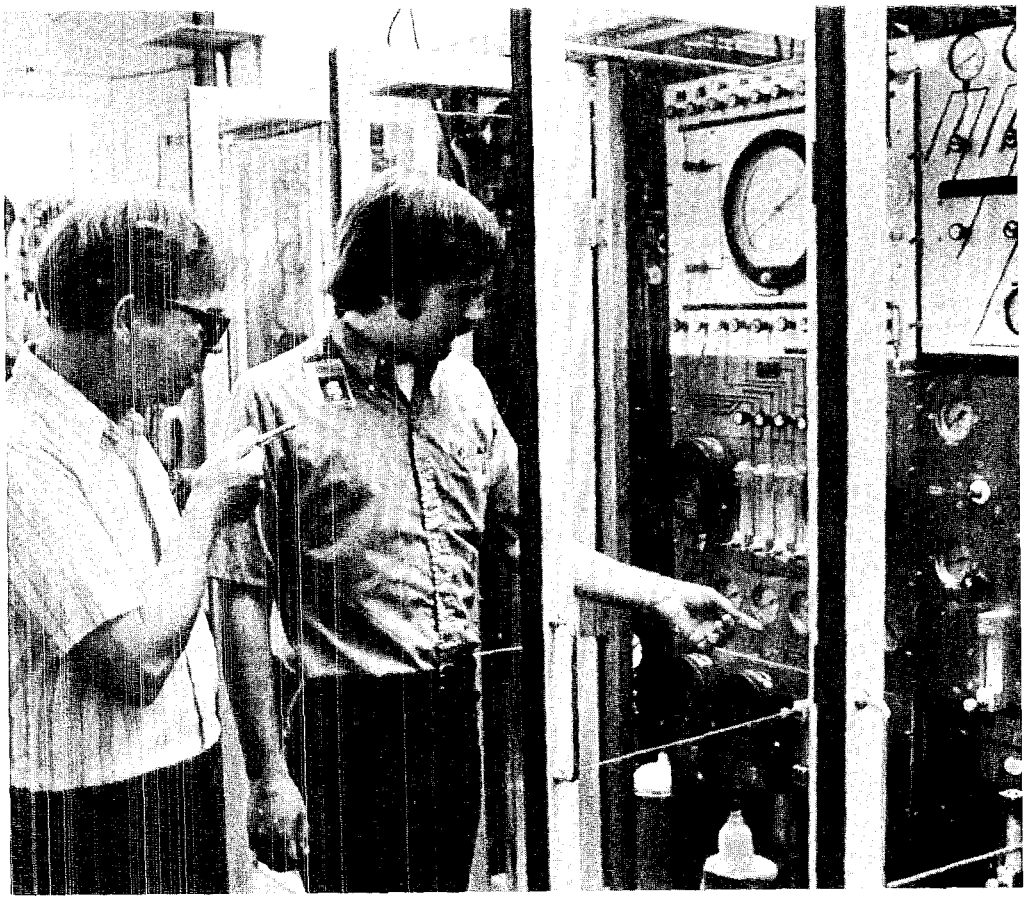
Inorganic nitrogen fertilizers are responsible for greatly multiplying crop yields in the United States, but there is some concern that they may also be at least partly responsible for high nitrate concentrations in some rural and city water supplies.

This concern stems largely from a study recently made of runoff from farmlands near Decatur, Ill., by a group of scientists from Washington University, St. Louis, Mo., headed by Barry Commoner, director of the University's Center for Biology of Natural Systems.

In a chapter of Commoner's book, "The Closing Circle," concerning the Illinois study, the scientist reported that nitrate levels in Decatur's water supply, which is obtained from Lake Decatur, had exceeded limits recommended by local health officials. One of the dangers of exceeding this limit, Commoner stated, is the possibility of some cases of methemoglobinemia, an illness that can result in asphyxiation. Nitrate can be converted to nitrite by intestinal bacteria, which are often more active in infants than in adults. Nitrite combines with hemoglobin in the blood to form methemoglobin which prevents blood from carrying oxygen to life-supporting systems in the body.

According to Nick Matwiyoff, CNC-4 alternate group leader at the Los Alamos Scientific Laboratory, the interpretation of the results of the Illinois study is a controversial issue, mainly because the investigation concerned a very localized part of the country, and there is some question about the validity of the experimental data. However, he noted, it is nonetheless significant because nitrogen fertilizers are used heavily in America's farmbelt states.

For these reasons, nitrogen fertilizers are now on trial by way of a field study being conducted by a group of University of California scientists and another more massive field investigation is being planned jointly by the U.S. Department of Agriculture and the Tennessee Valley Authority.



B. B. McInteer, associate CNC-4 group leader, and Tom Mills observe gauges of purifier-pumping station while contemplating time-frame for feeding NOCO-2 rich broth to HINO.

"LASL is involved in these studies from the standpoint that group CNC-4 is producing materials for them," said Matwiyoff. "The investigations will address two questions. One is, how much, if any, of the nitrate problem is due to fertilizer? The other is, under what conditions can nitrate in runoff be minimized? Both questions will take into account best times of the year to fertilize, interactions between plants, fertilizer and soil, different soils and other environmental and geographic variables."

Both investigations are dependent upon the use of "labeled" nitrogen fertilizer that will enable the scientists to trace the material's course in soil. The labeled nitrogen is produced at LASL by unique refinery techniques developed by members of CNC-4. The material is being provided to UC scientists through an interagency agreement

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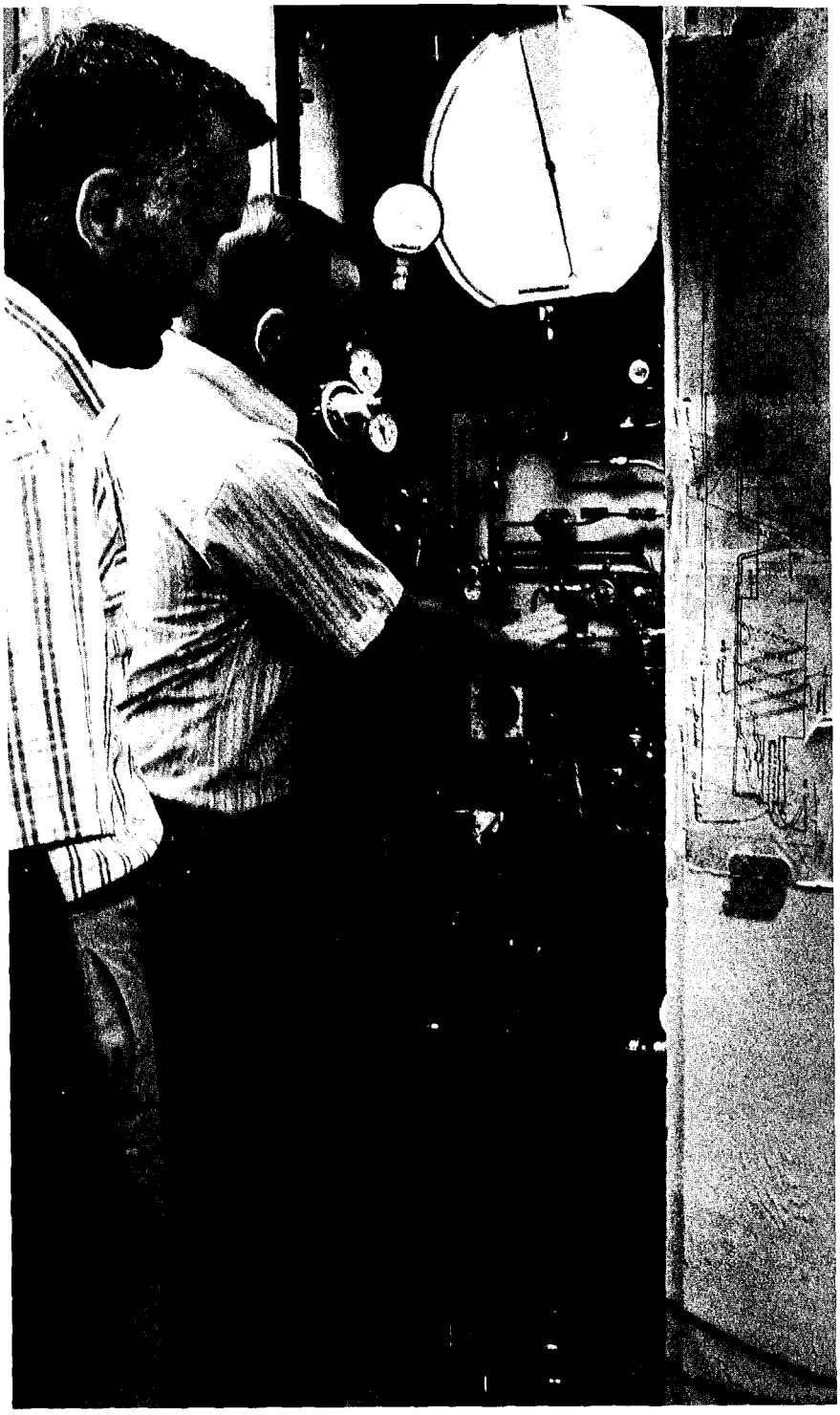
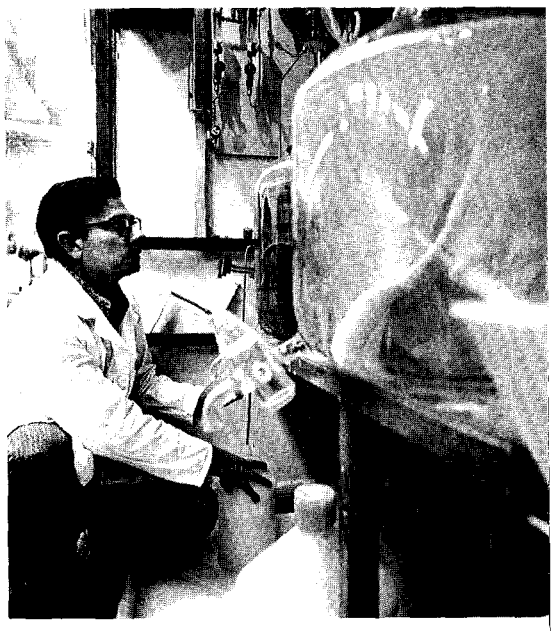


Nick Matwiyoff, CNC-4 assistant group leader observes while Ray Vandervoort adjusts flow of feed material for NOCO.

with the Atomic Energy Commission and will be provided for the USDA-TVA studies through a similar arrangement.

By nitrogen "labeling," it is meant that one, or the other, of the two isotopes of nitrogen is produced in a concentration that is abnormally high with respect to the other. In nature, nitrogen exists in two forms. One is nitrogen-14, which makes up 99.6 per cent of all natural nitrogen. The other form, nitrogen-15, makes up the remaining .4 per cent. For the UC study, members of Group CNC-4 are producing two types of nitrogen-labeled ammonium sulfate. In one the concentration of nitrogen-15 is about 99 per cent. In the other, the concentration of nitrogen-14 is better than 99.99 per cent. These differences in ratios set the labeled isotopes far enough apart from other nitrogen in the environment that they can easily be traced with the sensitive detection equipment available to scientists.

Concentrated, or enriched, nitrogen isotopes have been produced at the Los Alamos Scientific Laboratory since 1960. Nitrogen-15 was used primarily at the Laboratory for small-scale experiments until about a year ago when Perry Stout



Bob Pruner drains off water during chemical process to isolate nitrogen-14 enriched ammonium sulfate for agriculture studies.

and Parker Pratt began the UC field study of nitrogen fertilizers at the University's Riverside campus.

"Until the California study began, enriched nitrogen-14 was a wasted product," said B. B. McInteer, associate CNC-4 group leader. "It's so abundant in nature, there was more interest in nitrogen-15.

"Now the University of California group is using most of both isotopes that we can produce. Their program is being funded by the National Science Foundation. Nitrogen-14 is being used for field studies and nitrogen-15 is being used in associated laboratory experiments.

"We have one column now, NOCO (Nitric Oxide COlumn), which is producing about half a metric ton of nitrogen-14 a year, and HINO (HIgh concentration Nitric Oxide), a column which produces about two kilograms of nitrogen-15 a year. From the top of the NOCO column, we get nitrogen-14 and oxygen-16. We convert this mixture, by a chemical process, to nitrogen-14 enriched ammonium sulfate for the agriculture studies, water with some ammonia in it, and excess hydrogen which is released into the atmosphere. We're doing this in an experimental setup now. It's not a good way to handle acids, but it's the way it grew up as we were learning how to do the chemical processing. We're building a standard, engineered system now that will replace the present setup.

"From the bottom of NOCO we get what we call a 'rich broth.' This is a mixture of the heavier isotopes nitrogen-15, oxygen-17, and oxygen-18, along with some of the lighter isotopes of nitrogen-14 and oxygen-16 that didn't separate out at the top of the column. This broth has to be reworked in another distillation column, which is HINO. It's a complex operation, not so much from the standpoint of design and construction of the column as maintaining the chemical purity of the isotopes.

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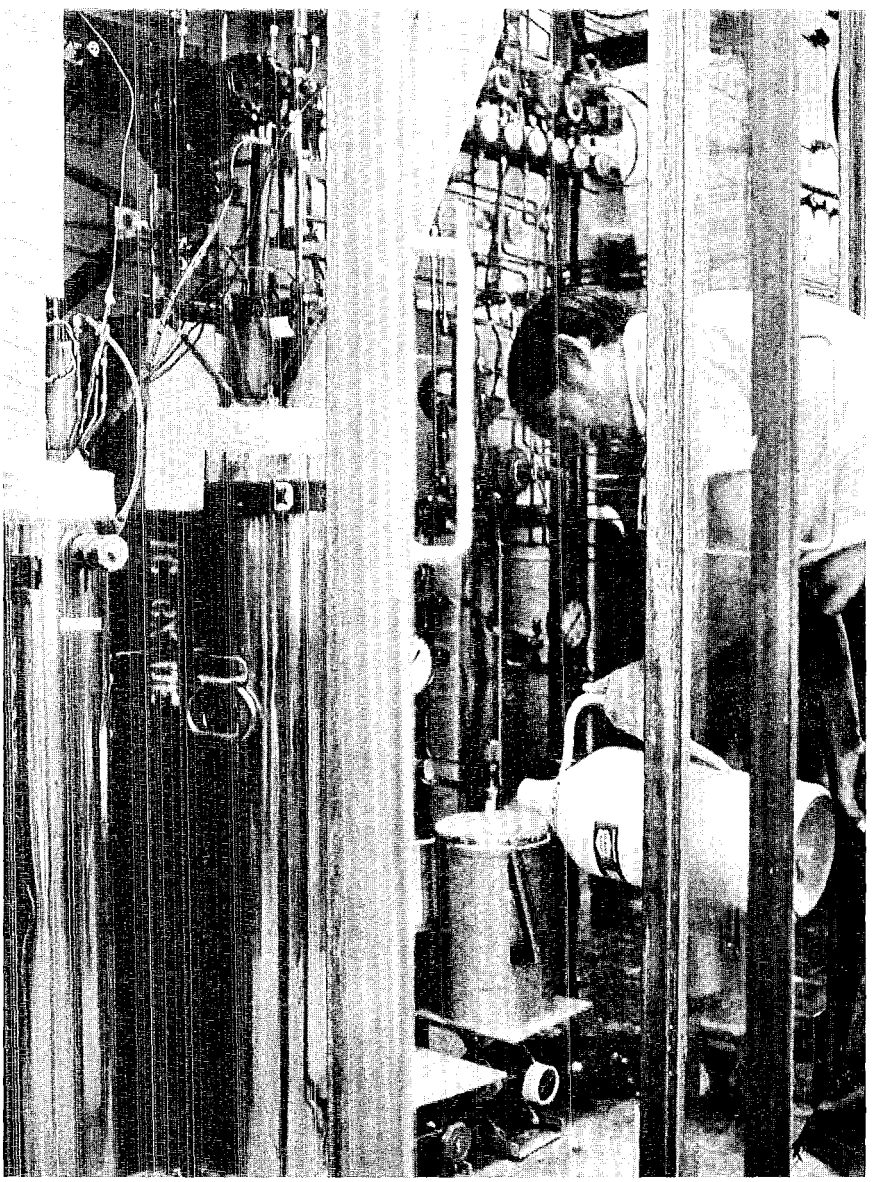
Larry Gomez fills dewar with liquid nitrogen which cools cryogenic pump used in processing enriched nitrogen-15 and oxygen-18.



Marty Reisfeld, foreground, and Max Goldblatt, test new chemical processing and recording equipment that will be used in the production of nitrogen-14 enriched ammonium sulfate for agriculture studies.

Tom Mills operates mass spectrometer that will be used to determine concentrations of stable isotopes produced in the large distillation column being constructed at TA-46.

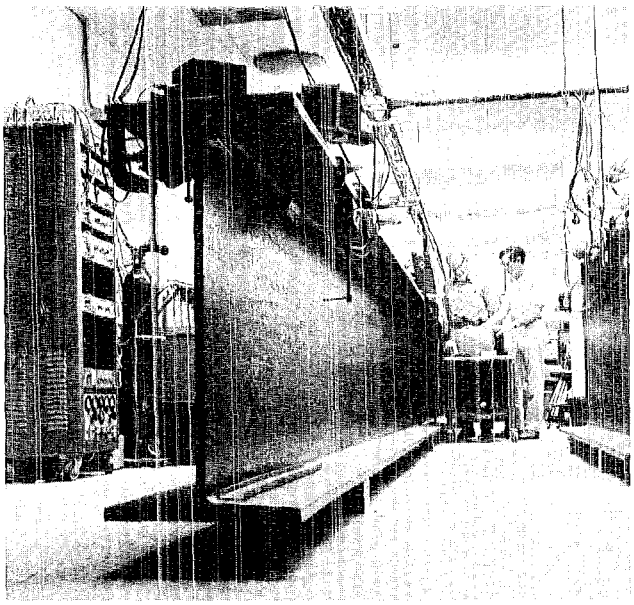
"The problem is that the broth is chemically impure. Impurities of chief concern are nitrous oxide and nitrogen dioxide. Both freeze out as solids at liquid nitric-oxide temperature (about -160 degrees centigrade) and if they're present in the material fed into the column they form an ice in the feed tube and plug it. If they get into the column they are concentrated at the lower end and, if they are abundant enough, they will plug up the column. Formation of these impurities is a chemical reaction that goes on constantly, so we have had to develop techniques to keep taking them out of the distillation process.

"While our only specific contract to produce nitrogen isotopes for an experimental program is with Stout and Pratt, we are also producing them for sale by Mound Laboratories to various researchers who are interested in them, and there is a great deal of interest expressed by the USDA and TVA. The isotopes have only been on sale by Mound for a few months, so there is some uncertainty about what the demand will be a year from now, and so, how much we will have to produce. But, we are stepping up production to meet potentially increased demands for nitrogen-14 and nitrogen-15 in the future."

Members of CNC-4 are putting into operation NOCO-2, a twin to NOCO, which will double production of both nitrogen-14 and nitrogen-15. HINO was designed to be large enough to handle broth from two NOCO columns. In addition, a larger column is being built that will multiply present production of both isotopes by a factor of 10.

While present production facilities for the nitrogen isotopes are at DP Site, the larger distillation column is being built at TA-46. The latter site is planned to eventually become the site for production of not only the nitrogen isotopes, but of all the so-called "stable" or non-radioactive isotopes which are rapidly coming into demand as tracers in medicine and for environmental control projects.

short subjects



Scientists in L-Division at the Los Alamos Scientific Laboratory are beating the high cost of optical benches for experimental laser systems by using huge I beams instead. Dan Bannerman, L-4, shown with John Kephart, also of L-4, was responsible for starting the I-beam bench system at LASL. Bannerman said a suitable optical bench would cost about $20,000. The cost of the beam, including machining on the top flange and shipping was about $3,000. It is 42 feet long, 36 inches high and 16½ inches wide, and it weighs 245 pounds per linear foot. I beams with these dimensions are normally used as support structures for the upper floors of skyscrapers. Bannerman noted that optical benches must be very rigid and heavy because laser systems are extremely sensitive to any physical movement.

Walter Siglock, Sr. former SD-1 employee, died recently. He retired from the Laboratory in 1962. Siglock is survived by his wife, Lucille, one son Walter, Jr., Los Alamos, and three daughters, Patricia Hinrichs and Marie Youngberg, both of Alton, Ill., and Jane Meyers, Los Alamos.

H. Eugene Gilbert, P-4, died recently in Palo Alto, Calif. He is survived by his wife, Maurine, and three children, Linda, Gary and Richard. He had been employed by the Laboratory since 1963.

Malcolm Ennis, P-3, died recently in Albuquerque. He is survived by his wife, Lee, and three children, Malcolm, Jr., Martha and Carol. He had been employed by the Laboratory since 1950.

James Singer, ENG-9, has been named a member of the Native American Advisory Committee which was formed recently as an advisory organization to the Atomic Energy Commission's Affirmative Action Advisory Committee.

Singer, who attended the first meeting of the Native American Advisory Committee in San Francisco, Calif., in July, was appointed by AEC General Manager **R. E. Hollingsworth.** The meeting was attended by Native American representatives from AEC installations and its contractors throughout the United States.

The committee's function is to advise the Affirmative Action Advisory Committee in the formulation of a program that will respond to and help alleviate some of the employment problems faced by the Native American.

Following this issue, "The Atom" will be published bi-monthly. The next issue will be distributed in December.

Edward Hammel, associate Q-Division leader for applied technology, received the highest award of the Cryogenic Engineering Conference, at the organization's meeting at the Georgia Institute of Technology, Atlanta, in August.

The honor was the Samuel C. Collins Award for Outstanding Contributions to Cryogenic Technology. It was presented to Hammel by K. D. Timmerhaus, associate dean of engineering at the University of Colorado, Boulder, and editor of the Conference's publication "Advances in Cryogenic Engineering."

Hammel is the third scientist to receive the Collins Award since it was established by the Conference.

Harold Agnew, director of the Los Alamos Scientific Laboratory is one of about 60 national and international figures appointed Woodrow Wilson Senior Fellows by the Woodrow Wilson National Fellowship Foundation.

The fellowship program, termed "a million-dollar effort" by the Foundation, will be started next year with funds from the Lilly Endowment of Indianapolis.

Fellows are drawn from various professions. They will serve as visiting professors at American college campuses for a week or more at a time. Purpose of the program is to bring academic and non-academic disciplines closer together.

the technical side

Taken from
LASL Technical Information Reports
submitted through ISD-6

Fifth International Conference on High Energy Physics and Nuclear Structure, Uppsala, Sweden, June 18-22:

"Pion Production from Nuclei" by M. M. Sternheim, visiting staff member in MP-DO, and R. R. Silbar, T-5

American Association for the Advancement of Science Inter-American Meeting on "Science and Man in the Americas," Mexico City, June 20-July 4:

"Unitary Symmetry and Null Spaces" by J. D. Louck, T-9 (invited

American Astronomical Society's 140th Meeting, Columbus, Ohio, June 24-28:

"Energy Spectra of Cosmic Gamma Ray Bursts" by T. L. Cline and U. D. Desai, both Goddard Space Flight Center, Greenbelt, Md., and R. W. Klebesadel and I. B. Strong, both P-4

Chemical Compatibility Meeting, Lawrence Livermore Laboratory, Calif., June 27-28:

"Summary of W69 Compatibility Program" by G. W. Taylor and R. M. Alire, both WX-2

"Small Scale W66 Compatibility Tests" by F. B. Baker, WX-2

Society of Professional Engineers Santa Fe and Los Alamos Chapter Meeting, Santa Fe, June 28:

"The Subterrene Concept and Related Applications" by R. J. Hanold, Q-23 (invited)

Ninth International Congress of Biochemistry, Stockholm, Sweden, July 1-7:

"Incorporation of Carbon-13 into Fetal and Maternal Protein and Nucleic Acid during Various Intervals of Pregnancy in Mice" by C. T. Gregg and D. G. Ott, both H-11, D. A. Smith, H-9, J. J. Malanify, A-1, B. B. McInteer and N. A. Matwiyoff, both CNC-4, and D. Neubert, Institute of Pharmacology, Free University of Berlin, Germany

Conference on the Numerical Solution of Differential Equations, University of Dundee, Scotland, July 3-6:

"The Comparative Efficiency of Certain Finite Element and Finite Difference Methods for a Hyperbolic Problem" by B. K. Swartz and B. Wendroff, both C-6 (invited)

International Quantum Chemistry Conference, Menton, France, July 4-10:

"Self Consistent Field Calculation of the Electronic Structure of the Uranyl Ion (UO_2^{++})" by A. M. Boring and J. H. Wood, both CMB-5, and J. Moskowitz, New York University, New York City

Fourth International Congress of Heterocyclic Chemistry, Salt Lake City, Utah, July 8-13:

"Nitro Derivatives of N-Picrylbenzotriazoles" by M. D. Coburn, WX-2

Conference on Physics of Quantum Electronics, Crystal Mountain, Wash., July 8-21:

"Survey of Laser-Initiated Fusion Research" by K. Boyer, L-DO

U.S.-Japanese Seminar on Thermodynamics and Phase Relations of Nuclear Materials, Ames Laboratory, Iowa, July 9-12:

"Thermodynamic Properties of Actinide Carbides" by C. E. Holley, Jr., CNC-2 (invited)

Gordon Conference on Molecular Pathology, Regulation of Mammalian Cell Proliferation, Plymouth, N.H., July 9-13:

"Control of Macromolecular Synthesis in Synchronized Cell Lines" by R. A. Tobey, H-9 (invited)

Fifth Conference of the European Group for Atomic Spectroscopy, Lund, Sweden, July 10-13:

"The Position of the $3s3p^5$ Configuration in the CL II Spectrum and the $3s3p^6\ ^2S1/2$ Level in the CL I Spectrum" by L. J. Radziemski, Jr., CMB-1

Fourth International Colloquium on Gasdynamics of Explosions and Reactive systems, La Jolla, Calif., July 10-13:

"Two Dimensional Flow of Detonations Proceedings Perpendicular

to Confined and Unconfined Surfaces" by C. L. Mader, T-4

Colloquium, Aerospace Corporation, El Segundo, Calif., July 11:

"The Outlook for Geothermal Energy" by M. C. Smith, Q-22 (invited)

Seminar, Scripps Institution of Oceanography, University of California, San Diego, July 13:

"Numerical Simulation of Tsunamis" by C. L. Mader, T-4 (invited)

Fourth International Powder Metallurgy Conference, Toronto, Canada, July 15-20:

"Strengthening of Liquid Sintered Tungsten Alloys" by R. E. Riley, J. M. Dickinson and J. M. Taub, all CMB-6

Seventh International Symposium on Fluorine Chemistry, Santa Cruz, Calif., July 15-20:

"Synthesis of Uranium Pentafluoride and Uranium Oxyfluorides" by L. B. Asprey and R. T. Paine, Jr., both CNC-4

"General Synthetic Pathways for the Preparation of Transition Metal Pentafluorides" by R. T. Paine, Jr., and L. B. Asprey, both CNC-4

Sixth Conference on Numerical Simulation of Plasmas, Lawrence Berkeley Laboratory, Calif., July 16-18:

"A Semi-Lagrangian Algorithm for Magnetohydrodynamics" by J. U. Brackbill, T-3

"MEMI, An Electromagnetic Plasma Simulation Code for General Use" by R. W. Mitchell, D. W. Forslund and R. L. Morse, all T-6, and E. L. Lindman, TD-8

"On Getting All the Waves out of the Box" by E. L. Lindman, J-10

"Numerical Cherenkov Instabilities in One-Dimensional Electromagnetic Particle Codes" by B. B. Godfrey, T-6

"An Implicit, Two-Dimensional, Electromagnetic Plasma Simulation Code" by C. W. Nielson, Q-6, and E. L. Lindman, J-10

"Comparisons of Some Plasma Simulation Models" by H. R. Lewis and C. W. Nielson, both Q-6, D. I. Brown and S. J. Gitomer, both University of Pennsylvania, Philadelphia

Eighth International Conference on the Physics of Electronic and Atomic Collisions, Beograd, Yugoslavia, July 16-20:

"Scattering and Radiative Processes in the Low Lying State of Ne_2 and Ne_2^+" by B. I. Schneider, T-6, and J. S. Cohen, TD-8

"Green's Function Theory of Photoionization" by B. I. Schneider, T-6, and J. S. Cohen, TD-8

Joint Technical Coordinating Group for Air-Launched Non-Nuclear Ordnance Symposium on High-Temperature Explosives, West Point Military Academy, N.Y., July 17-19:

"LASL Synthetic Program" by M. D. Coburn, WX-2

"Properties of Thermally-Stable Explosives" by L. C. Smith, WX-2

Twenty-first Refractory Composites Working Group Meeting, Los Alamos, July 18-19:

"Zirconium Carbide Insulators" by P. Wagner, CMB-8

"Subterrene Penetrator Materials" by P. E. Armstrong, CMB-8 (invited)

"Preparation of Solid Solution (U, Zr)C Powder" by D. H. Schell, CMB-6

1973 Hearings, Joint Committee on Atomic Energy, Washington, D.C., July 25:

"The Los Alamos Scyllac Program of High-Beta Controlled Fusion Research" by F. L. Ribe, Q-DO

Lebedev Institute, Moscow, USSR, July 26; Max Planck Institute, Garching, Germany, Aug. 9; Limeil Center of Studies, Paris, France, Aug. 6; Hull University, Culham Laboratory, Berkshire, U. K., Aug. 15:

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

Gordon Research Conference on Radiation Chemistry, The New Hampton School, New Hampton, N. H., July 26:

"Radical Effects on Thymidine 5-Phosphate that Result in Loss of Chromophore" by F. N. Hayes and D. E. Hoard, both H-9, and W. B. Goad, T-DOT (invited)

Seminar lecture, Oak Ridge National Laboratory, Tenn., July 30:

"The Los Alamos 'Dry Rock' Geothermal Energy Project" by M. C. Smith, Q-22

Lecture, Oak Ridge Associated Universities Summer Institute on "Energy Sources for the Future," Oak Ridge, Tenn., July 30:

"Clean Energy from the Earth" by M. C. Smith, Q-22

1973 Annual Meeting, American Association of Physicists in Medicine, San Diego, Calif., July 30-Aug. 2:

"Dose Distribution Due to Neutrons and Photons Resulting from Negative Pion Capture in Tissue" by M. E. Schillaci, MP-3

"CAMAC and Radiotherapy" by A. S. Lundy, MP-3, and S. Schlaer, MP-1

"Some Problems of Treatment Planning for Pion Beams" by R. L. Hutson, MP-3, and J. H. Jett, H-10

"Characteristics of Energy Deposition by Pions" by R. L. Hutson, MP-3, and T. W. Armstrong, Oak Ridge National Laboratory, Tenn.

"A Progress Report on Activities at the LAMPF Radiobiology and Radiotherapy Research Facility" by R. L. Hutson, MP-3, and E. D. Bush, MP-8

"Progress Toward Using Mu-Mesic X Rays as a Diagnostic Tool" by M. L. M. Boone and J. Faust, both University of Arizona, Tucson and R. L. Hutson and A. S. Lundy, both MP-3

Sixth European Conference on Plasma Physics and Controlled Nuclear Fusion Research, Moscow, USSR, July 30-Aug. 3:

"The Toroidal Z-Pinch Program at Los Alamos" by D. A. Baker and L. W. Mann, both Q-6, and L. C. Burkhardt, J. N. DiMarco, P. R. Forman, A. Haberstich, R. B. Howell, H. J. Karr and J. A. Phillips, all Q-2

"Review of Scyllac Theta-Pinch Experiments" by W. E. Quinn, W. R. Ellis, R. F. Gribble, C. R. Harder, R. Kristal, G. A. Sawyer and R. E. Eiemon, all Q-3, F. L. Ribe, Q-DO, and K. S. Thomas, Q-7

"Kink Instabilities in High β Toka-

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maks and Belt Pinches" by J. P. Freidberg, F. A. Haas and B. M. Marder, all Q-6

Laser Safety Short Course, University of Cincinnati, Ohio, Aug. 6-10:

"The Safety Program for Laser-Fusion Research at Los Alamos Scientific Laboratory" by D. C. Winburn, L-DO (invited)

Seminar, Pennsylvania State University, University Park, Aug. 8:

"Some Parameters of SV-40 Infection as Measured by Flow Microfluorometry" by P. K. Horan, H-10 (invited)

1973 Cryogenic Engineering Conference, Atlanta, Ga., Aug. 8-10:

"Prototype Tests on a 200-Watt Forced Convection Liquid Hydrogen/Deuterium Target" by K. D. Williamson, Jr., F. J. Edeskuty and J. H. Fretwell, all Q-26, J. E. Simmons, P-DOR, J. T. Martin, MP-7, and H. Ficht, formerly Q-26

"Compressive Load-Deflection Characteristics of Several Foam Materials at Room Temperature, 77 K and 4.2 K" by W. F. Stewart, Q-26, D. T. Eash, CMB-13, and W. A. May, WX-3

Atomic Energy Commission Reactor Safety Conference, Myrtle Beach, S. C., Aug. 8-10:

"The Application of Regulatory Guides to Technical Specifications for Research Reactors" by H. T. Williams, P-2

Fifth Hawaii Topical Conference in Particle Physics, Honolulu, Aug. 8-21:

"Search for the Weak Interaction Contribution to the Interaction between Hadrons" by R. E. Mischke, MP-4

Meeting on Molecular Biology of SV-40, Polyoma and Adeno Viruses, Cold Spring Harbor Laboratory, N. Y., Aug. 12-15:

"Polyploid Formation Resulting from SV-40 Infection" by P. K. Horan, H-10 (invited)

Third Workshop on Laser Interaction and Related Plasma Phenomena, Rensselaer Polytechnic Institute, Troy, N. Y., Aug. 13-17:

"Experiments with Laser-Produced Plasmas: Electrons, Ions, and Neutrons" by R. P. Godwin, L-4

"Electron Beam Controlled CO_2 Lasers" by K. Boyer and R. S. Cooper, both L-DO, and C. A. Fenstermacher, L-1

"Implosion Stability and Thermonuclear Burn of Laser Heated Pellets" by R. L. Morse, T-6

"Absorption of Laser Light in Plasma Targets and Subsequent Transport of Energy by Hot Electrons" by R. L. Morse, T-6

"Laser-Induced Instabilities and Anomalous Absorption in Dense Plasmas" by D. F. Dubois, T-6

Eighth Energy Conversion Engineering Conference, University of Pennsylvania, Philadelphia, Aug. 13-17:

"Compatibility of the MHW-RTG Heat Source Materials" by D. Pavone, CMB-5, P. E. Brown, General Electric Company, Philadelphia, Pa., and J. D. Watrous, McDonald Douglas Laboratories, Richland, Wash.

"Atmosphere-Entry Behavior of a Modular, Disk-Shaped Isotope Heat Source" by J. W. Vorreiter, W. C. Pitts and H. A. Stine, all NASA-Ames Research Center, Calif., and J. J. Burns, CMB-5

"A Combined Nuclear and Hydrogen Energy Economy—The Long Term Solution to the World's Energy Problem" by L. A. Booth and J. D. Balcomb, both Q-DOT, F. J. Edeskuty, Q-26

Joint Annual Meeting, Electron Microscopy Society of America and Electron Probe Analysis Society of America, New Orleans, La., Aug. 13-17:

"Prospects and Difficulties in High Spatial Resolution Surface Electron Probes" by T. W. Rusch and W. P. Ellis, both CMB-8

"Electron Microprobe Determination of U, Zr, and C in Mixed Carbide Fuel Elements" by E. A. Hakkila, CMB-1

"Microprobe Examinations of Irradiated Nuclear Fuels" by W. F. Zelezny, W. B. Hutchinson, R. E. Smith and E. A. Hakkila, all CMB-1

Integrated Coating Contractors Meeting, Dow Chemical Company, Rocky Flats, Colo., Aug. 13-17:

"Effect of Coating Technique on Microstructure of Deposits" by R. E. Riley, CMB-6

"Electroforming Thin Wall Seamless Parts" by A. Mayer, CMB-6

"Development of Microballoon Coatings" by B. W. Powell and J. J. Glass, both CMB-6

"Progress Report on Chemical Milling of Aluminum Circuitry" by J. J. Glass, CMB-6

International Atomic Energy Agency Symposium on Physics and Chemistry of Fission, Rochester, N. Y., Aug. 13-17:

"Experimental Fission Barriers for Actinide Nuclei" by B. B. Back and O. Hansen, both Neils Bohr Institute, Copenhagen, Denmark, H. C. Britt. P-DOR, J. D. Garrett, Brookhaven National Laboratory, N. Y., and B. Leroux, University of Bordeaux, France

"Fission Barriers for Odd-Even and Odd-Odd Pu, Am, Cm, and BK Isotopes" by B. B. Back and O. Hansen, both Neils Bohr Institute, Copenhagen, Denmark, B. Leroux, University of Bordeaux, France, H. C. Britt, P-DOR, and J. D. Garrett, Brookhaven National Laboratory, N. Y.

"Fission Barriers for Even-Even Actinide Nuclei" by B. B. Back and O. Hansen, both Neils Bohr Institute, Copenhagen, Denmark, H. C. Britt, P-DOR, and J. D. Garrett, Brookhaven National Laboratory, N. Y.

"Fission Barriers for Pa and Np Isotopes" by B. B. Back and O. Hansen, both Neils Bohr Institute, Copenhagen, Denmark, H. C. Britt, P-DOR, J. D. Garrett, Brookhaven National Laboratory, N. Y., and B. Leroux, University of Bordeaux, France

"Fission Barriers for Doubly Even Nuclei from (t, pf), (^{3}He, df), (p, p'f) and (t, αf) Studies by B. B. Back and O. Hansen, both Neils Bohr Institute, Copenhagen, Denmark, H. C. Britt, P-DOR, and J. D. Garrett, Brookhaven National Laboratory, N.Y.

"Energy Dependence of Γ_n/Γ_f for the Nucleus ^{216}Rn" by H. Freieslebent and J. R. Huizenga, both University of Rochester, N. Y., and H. C. Britt, P-DOR

"Fission and Complete Fusion Measurements in ^{40}Ar Bombardments of ^{58}Ni and ^{109}Ag" by H. H. Gutbrod, Society for Heavy Ion Research, Darmstadt, Germany, F. Plasil, Oak Ridge National Laboratory, Tenn., H. C. Britt, P-DOR, B. H. Erkkila and R. H. Stokes, both P-12, and M. Blann, University of Rochester, N. Y.

"Prompt and Delayed Neutron Yields from Low Energy Photofission of ^{232}Th, ^{235}U, ^{238}U, and ^{239}Pu" by J. T. Caldwell, E. J. Dowdy and G. M. Worth, all A-2

"Calculations of Fission Barriers for Heavy Neutron-Rich Nuclei" by W. M. Howard, P-11, and J. R. Nix, T-9

"Prompt Neutrons from the Spontaneous Fission of Fermium-257" by J. P. Balagna, G. P. Ford, D. C. Hoffman and J. B. Wilhelmy, all CNC-11, J. A. Farrell, P-11, A. Hemmendinger and L. R. Veeser, both P-3

"Determination of Spins of Intermediate Structures Resonances in Subthreshold Fission" by G. A. Keyworth and F. T. Seibel, both P-3, J. R. Lemley, International Atomic Energy Agency, Vienna, Austria, C. E. Olsen, CMB-8, J. W. T. Dabbs and N. W. Hill, both Oak Ridge National Laboratory, Tenn.

Harvard Industrial Hygiene Institute, Cambridge, Mass., Aug. 14-17:

"Instrumental Methods for Field and Laboratory Analysis" by E. E. Campbell, H-5

"Laboratory Accreditation" by E. E. Campbell, H-5

Seminar, Salk Institute for Biological Studies, San Diego, Calif., Aug. 14:

"Flow Microfluorometry — Principles and Applications for Cell Biology" by H. A. Crissman, H-10 (invited)

Eleventh Student-Faculty Nuclear Engineering Conference, Argonne National Laboratory, Ill., Aug. 15:

"Status of Theta-Pinch Experiments" by F. L. Ribe, Q-DO

"Theta Pinch Theory" by J. P. Freidberg, Q-6

Seminar, Pennsylvania State University, University Park, Aug. 7; Seminar, Sloan-Kettering Cancer Hospital, New York City, Aug. 16; Atomic Energy Commission Headquarters, Washington, D.C., Aug. 27; and University of Virginia, Charlottesville, Aug. 29:

Techniques of Rapid, Single-Cell Analysis and Its Application to DNA Measurements, Quantitative Immunofluorescence, and Tumor Cell Identification" by P. K. Horan, H-10 (invited)

Colloquium, Department of Astronomy, University of Massachusetts, Amherst, Aug. 16:

"Buoyancy in Astrophysics" by E. M. Jones, J-10 (invited)

Thirteenth International Cosmic Ray Conference, University of Denver, Colo., Aug. 17-30:

"Variations in Solar Energetic Particles Associated with Interplanetary Shock Waves" by I. D. Palmer, P-4, and S. Singer, L-1 (invited)

Fall Meeting, American Society for Pharmacology and Experimental Therapeutics, East Lansing, Mich., Aug. 19-23:

"Differential Effects of Nitrosourea Analogues on Cell Cycle Progression" by R. A. Tobey, H-9, and H. A. Crissman, H-10

Fifteenth Annual Rocky Mountain Spectroscopy Conference, Denver, Colo., Aug. 20-21:

"The Use of a Small Computer in Spectrochemical Calculations" by C. T. Apel, C. J. Martell, J. V. Pena, and O. R. Simi, all CMB-1

Gordon Conference on Laser Interaction with Matter, Tilton School, N. H., Aug. 20-24:

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

Fourteenth National Radio and Electronics Engineering Convention, Melbourne, Australia, Aug. 20-24:

"A Microcomputer Data Acquisition System" by D. L. Stephenson, E-5

General Assembly of the International Astronomical Union, Sydney, Australia, Aug. 22:

"Astrophysical Opacity Library I. (Atomic)" by W. F. Huebner and A. L. Merts, both T-4

Conference on Applications of X-Ray Analysis, University of Denver, Colo., Aug. 22-24:

"The Effects of Self-Irradiation on the Lattice of 238(80%)PuO_2 (III)" by R. B. Roof, CMB-5

Seminar, Department of Physics, Dartmouth College, Hanover, N. H., Aug. 23:

"AC Electrical Resistivity of a Magnetized Plasma" by R. F. Ellis, Q-1

Fall Meeting, American Chemical Society, Chicago, Ill., Aug. 26-31:

" 'Calculated Chemistry' of Nearby Superheavy Elements: Comparison with Properties of Known Elements of the 7th Period" by R. A. Penneman, CNC-4, and J. B. Mann, T-4

"Electrochemical and Magnetic Studies of some Novel Iron-Sulfur Cluster Compounds" by G. J. Kubas, P. J. Vergamini and R. R. Ryan, all CNC-4, and M. Eastman, University of Texas, El Paso

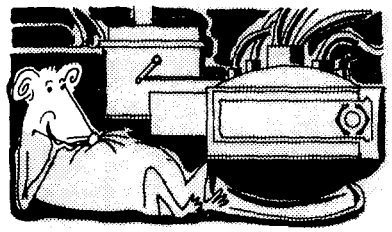
American Institute of Mining, Metallurgy and Engineers Symposium on Materials Performance in Operating Nuclear Systems, Ames Laboratory, Iowa, Aug. 28-30:

"A Materials Compatibility Problem in SNAP Fuel Capsules" by R. N. R. Mulford and S. E. Bronisz, both CMB-5

Colloquium, Sandia Laboratories, Albuquerque, N.M., Aug. 29:

"Ecological Consequences of the Trans-Alaska Pipeline" by W. C. Hanson, H-8 (invited)

10 years ago in los alamos



Culled from the October, 1963, files of the LASL News and the Los Alamos Monitor by Robert Porton

Space Sentries

The unblinking eyes in the nuclear-blast detection satellites now in orbit are products of the Los Alamos Scientific Laboratory. Devices sensitive to gamma rays, neutrons and x rays are the heart of the system. The current series of launches by the U.S. Air Force was from facilities in Florida and California.

Extra Funds Asked for LASL

A presidential request to Congress for supplementary funds to expand Laboratory facilities would mean $3,740,000 in additional construction at LASL. The money would be in addition to funds already allocated for fiscal 1964 construction. The new buildings will include: the Occupational Health Laboratory, costing $1,650,000; High Temperature Chemistry Facility, $1,435,000; and Plutonium Research Support Building, $655,000.

Engine Rodent Control?

Anyone know how to rat proof a car engine? If so, Mrs. Cecil Cottrell could use some advice. A rodent has been living by and underneath the carburetor of the Cottrell's 1960 Cadillac since Wednesday of last week. The rat has stripped some wires and taken insulation from underneath the hood to make a nest. The family has tried poison, a pellet gun, an ice pick and having the engine steam cleaned as methods of control. But none of them have worked so far. Mrs. Cottrell drove the car to Santa Fe the day after having the stripped wires repaired. About a half hour after she returned, the wires were stripped again and she could only conclude that the rodent had gone all the way to Santa Fe with her. It was a week later that the culprit was spotted and killed.

Safety Award

Los Alamos was honored for the ninth consecutive year for having a fatality-free pedestrian safety record. The "Pedestrian Safety Citation" was presented to the County Commissioners by Rod Doll, safety director of the New Mexico Division of the American Automobile Association.

what's doing

BIEN DICHO TOASTMASTERS CLUB: Luncheon meeting, noon, Mondays. Meeting place varies. For information call James Baran, 662-3977.

SIERRA CLUB: Meets second Monday of each month, 7:30 p.m., Graves Hall, United Church. For information call Betsy Barnett, 662-9581.

RIO GRANDE RIVER RUNNERS: Meetings at noon, second Friday of each month at South Mesa Cafeteria. For information call Jon Cross, 662-9462.

LOS ALAMOS SAILORS: Meetings at noon, South Mesa Cafeteria, first Friday of each month. For information call Dick Young, 983-9770.

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 Wayne Fullerton, 662-4171.

PUBLIC SWIMMING: High School Pool. Monday through Wednesday, 7:30 to 9 p.m.; Saturday and Sunday, 1 to 6 p.m.; Adult Swim Club, 7 to 9 p.m., Sunday.

WHITE ROCK KARATE CLUB: Workouts, 8 p.m., Monday and Wednesday, Pinon Elementary School gym. For information call Tom Cook, 672-9426.

LOS ALAMOS BADMINTON CLUB: Tuesday, 8 to 9:30 p.m., Girls' gym, High School. For information call Art or Jane Sherwood, 662-2966.

LOS ALAMOS VOLLEYBALL CLUB: Every Monday, Girls' gym, High School, Men—6-7:30 p.m., Women—8-9:30 p.m. For information call Gary Wall, 662-4601.

NEWCOMERS' CLUB: For information call Pat Astle, 662-4709.
Oct. 24—Fashion show and nomination of officers, White Rock Community Building, 8 p.m.

MOUNTAIN MIXERS SQUARE DANCING CLUB: Pinon School, 8 p.m. For information call Barry Lenhart, 672-9798.
Oct. 20—J. D. Wilbanks, Spearman, Texas.
Nov. 2-3—North East Festival, Las Vegas, New Mexico.

MESA PUBLIC LIBRARY:
Oct. 1-Oct. 29—Landscape paintings, Eddie Sandoval
Oct. 2-Oct. 23—Fire Prevention Time display
Oct. 16-Nov. 13—UNICEF display
Oct. 24-Nov. 12—Christmas crafts display, Los Alamos Garden Club

OUTDOOR ASSOCIATION: No charge, open to the public. Contact leaders for information.
Oct. 13-14—Rio Grande Cottonwood Cruise, Jon Cross, 662-9462
Oct. 19-23—The Maze, Canyonlands (limited to 25), Wally Green, 672-3203

Checks totaling $334.15 from an Albuquerque recycling firm were recently received by members of Los Alamos Explorer Post 104 for unclassified computer paper and cards collected at the Los Alamos Scientific Laboratory. Showing the checks to LASL Director Harold Agnew, right, is Greg McEwen, post advisor. Money earned by the Explorers from the recycling project is used to support some of the Post's activities. Standing are Post Advisor James Van Hecke, Jr., PER-1; Explorers Mary Guenther, Martha Churchman, Vicki Bankston and Linda Camp; and Supply and Property Department Head Robert Van Gemert who was instrumental in arranging for the recycling project.

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Peter MacDonald, chairman of the Navajo Tribal Council, right, recently discussed with officials at the Los Alamos Scientific Laboratory ways in which LASL's expertise might be used to assist the Navajo Nation. LASL personnel who talked with MacDonald included Phil Reinig, Engineering Department head, Harold Agnew, Laboratory director, and Robert Potter, a member of Group Q-22.