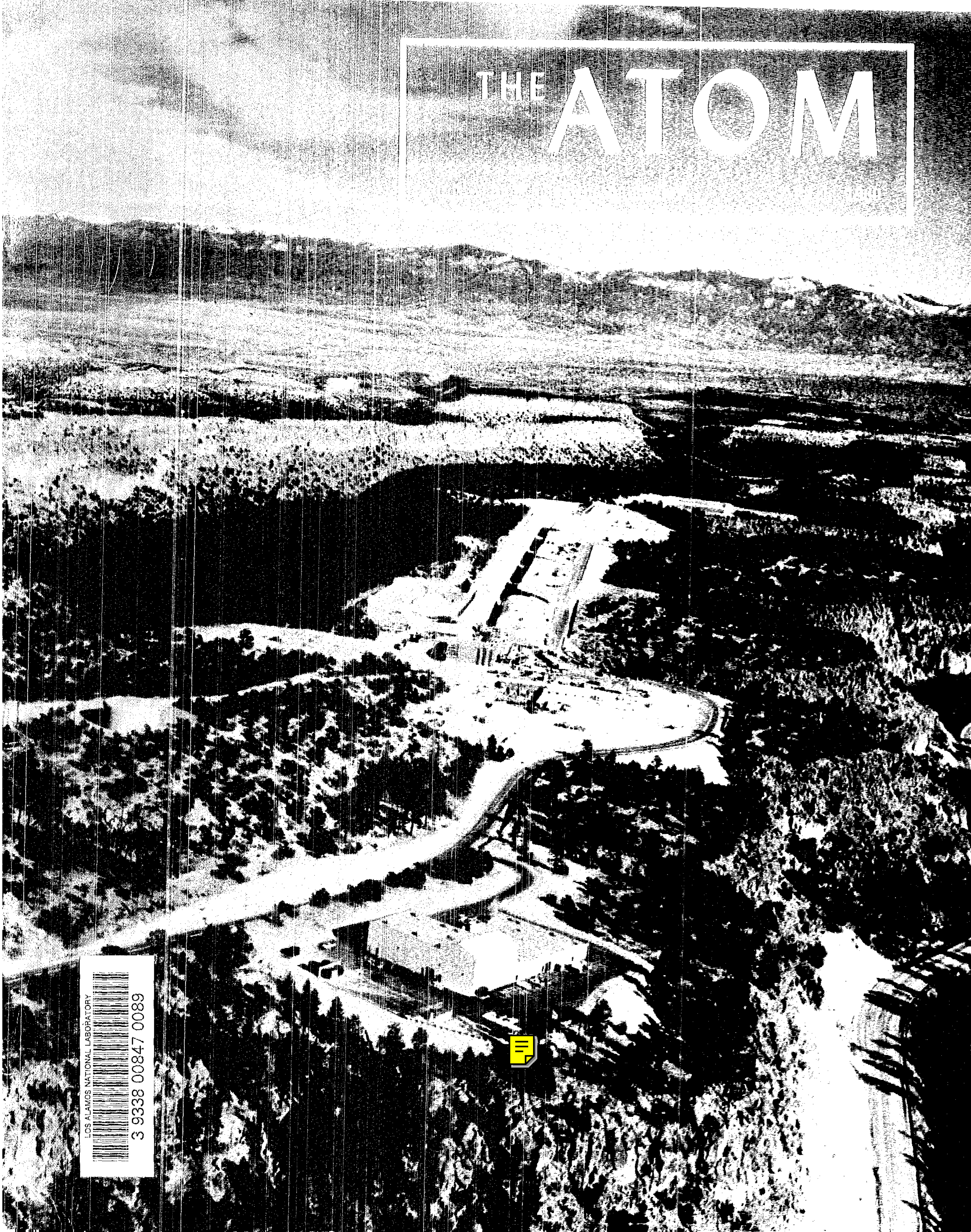
THE ATOM



Volume 6 Number 3
March, 1969

THE ATOM

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

CONTENTS:

Editor: Kenneth J. Johnson

Photography: Bill Jack Rodgers

Contributors: Members of the
Public Relations staff

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

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

COVER:

The Atom's cover-photograph of Mesita de Los Alamos, where construction of the Los Alamos Meson Physics Facility is well underway, was taken by Bill Jack Rodgers, PUB-1 photographer. For more detailed information on the facility, read "A Look at LAMPF" beginning on page one.

A Look at LAMPF

By Ken Johnson

The Los Alamos Meson Physics Facility is now under massive construction. With the exception of experimental area buildings, design work on all others is frozen and they are in various stages of construction. Many of the components that will make up the accelerator and associated instrumentation are being machined and fabricated, and others are on order.

Approximately 60 per cent of the funds requested have been received and are being committed toward making LAMPF operational by July of 1972. This date is predicated on the assumption that subsequent funding will be made available when it is needed. To maintain their construction time-schedule, Laboratory officials feel $15.3 million will be needed in the next fiscal year, although the President's budget now includes only $5 million for the facility. They are hopeful, however, that Congress can be convinced of the necessity for additional funds. Assuming that the $15.3 million will be authorized and released, a balance of less than $6 million would be needed to complete the project.

The facility, or meson factory as it is sometimes called, is to be a basic research tool that will also have practical applications. It is national in character in that its operation time will be shared by scientists of the Los Alamos Scientific Laboratory and others from throughout the United States, but primarily from the Rocky Mountain region.

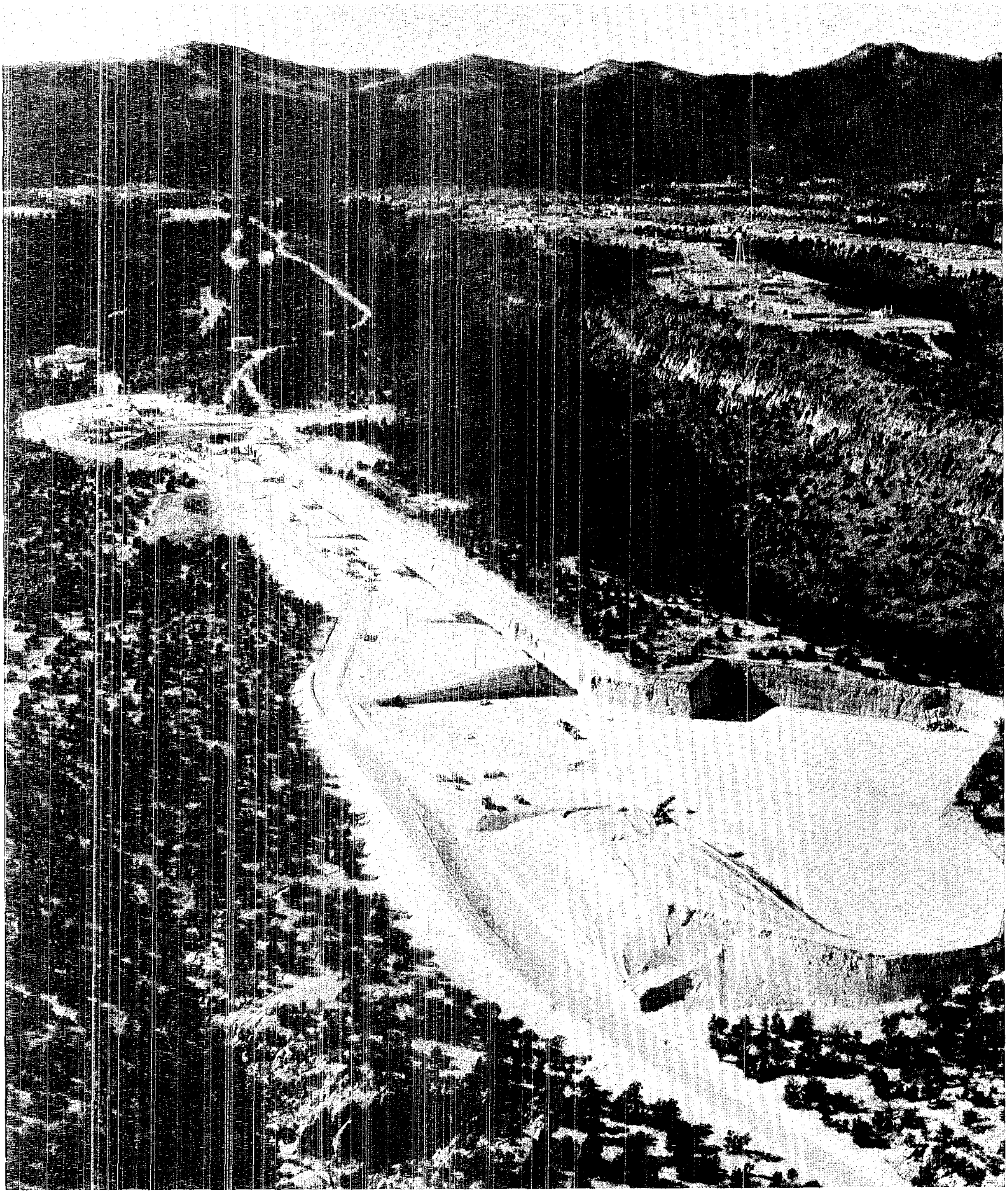
The heart of the meson factory is a three-unit linear accelerator more than one-half mile in length. It will produce a variety of particles with which nuclear physicists will probe the atom's nucleus to find out how it is made up and what forces govern it.

Nuclear physicists are concerned with probes that have energy and intensity. Energy determines the size of the probe and is measured in electron volts. Intensity is the number of particles that makes up the probe and is measured in amperes.

Physicists have been walking down divergent paths in studying nuclear structure. One group is concerned with the structure of the nucleons that comprise the nucleus and the forces that govern them. The accelerators they use to carry out their work are in a high energy range, exceeding 1,000 MeV (million electron volts). The other group has been probing the nucleus with accelerators in a low energy range, under 100 MeV.

The nucleus has been the domain of the low

continued on page 3



Approximately two-thirds of a million yards of dirt were excavated from Mesita de Los Alamos, site of the Meson Physics Facility. The dirt will be used to backfill areas over the accelerator. Conceptual design work is underway on buildings for the experimental area, foreground, and Laboratory officials are hopeful that funds for their construction will be made available in the fall. To the rear of the site is the Laboratory and Los Alamos. In the background are the Jemez Mountains.

. . . LAMPF

continued from page 1

energy physicist. His main concern, however, has been the overall properties of the nucleus in its low and high energy states and with interactions of the nucleons and nuclei, with themselves and with each other. But the tools he has had to work with have, so far, only rattled the framework of the nucleus without exposing in detail its makeup at any instant of time.

The meson factory then, is expected to bridge the gap between low and high energy physics by introducing the first large-scale studies of nuclear structure in a medium-energy range. But, LAMPF's capability to produce particle probes at medium energies is not spectacular. Its claim to fame is an intensity thousands of times greater than any other accelerator being planned or built will be capable of producing. It will produce particle probes at energies ranging from 200 to 800 MeV at intensities up to one milliampere or $6x10^{15}$ (6,000,000,000,000,000) particles per second.

Why is intensity important? It allows a more accurate evalution of the nucleus than with less intense beams of particles. By analogy, if an insurance company were making a study of mortality rates, it could obtain rough statistics from a study of 10 people. But, its statistics would be more accurate from a study of 1,000 or more.

Two of the accelerator's units, a nearly conventional Cockroft-Walton generator and a four-section, modified Alvarez drift tube accelerator, make up about 300 feet of its total length. The rest of it is made up by a waveguide unit.

Why a three-unit accelerator? No one has yet been able to come up with a single device that will accelerate particles from zero energy to high energy levels. For this reason it is necessary to use more than one type of accelerator structure.

The Cockroft-Walton injects a beam of protons into the accelerator system. Before entering the Alvarez unit, the protons are bunched so they progress through the accelerator like bursts of bullets from a machine gun.

The Alvarez unit is made up of four tanks connected in series. When electrical power is introduced to the unit, an electro-magnetic field is set up in each tank. The field causes electrons in the copper lining of each one to oscillate from one end to the other.

A bunch of protons is injected into the first tank when the electrons are at the far end. Since opposite charges attract each other, the positively-charged protons move toward the negatively-charged electrons at increasing speed. At various times, however, the oscillating negative charges are alongside and behind, as well as ahead of the protons. How then is the forward motion of the protons maintained? Scientists have had to fool them into thinking the electrons are always ahead of them. When the electrons start back toward the near end of the tank, the protons suddenly find themselves entering a tunnel (drift tube). When they emerge from the drift tube, they again feel the pull of the electrons, which have returned to the far end of the tank. This procedure continues until the protons have been fooled through the Alvarez unit at increasing speed and enter the waveguide unit.

The waveguide portion is made up of a chain of cylindrical copper cavities, or cells, which are brazed together. Other cavities are coupled to the side of this chain, out of the beam line, and serve to transfer the electrical power between cavities, to assure that electrons in the cell walls of each one are excited and begin to oscillate.

When the protons enter a cavity in the chain, they are attracted by electrons at the other end and the chase continues. But, as they move toward the negative charges, they find themselves in a passage which extends into the next cavity where a new group of electrons awaits them. The protons are attracted again and again until they reach the desired energy level.

Why is the beam made up of protons? In order to probe the nucleus, scientists need a beam of particles that, in general, feels at home within it. This makes protons and neutrons likely candidates. But a neutron has no charge and therefore cannot be accelerated.

The protons for the LAMPF system originate from hydrogen. Each hydrogen atom has a nucleus of one proton which is orbited by a single electron. The protons are stripped of their electrons and accelerated to 750 keV, or about four per cent the speed of light, by the time they are injected into the Alvarez unit. Here their energy reaches 100 MeV before being passed on to the waveguide which can take them up to to 800 MeV, or approximately 84 per cent the speed of light.

As they are accelerated, the protons, in their beam configuration, have a tendency to spread, just as the beam from a flashlight spreads as the distance from its source increases. To keep this condition from occurring, the beam is kept in a

continued on next page

. . . LAMPF

continued from page 3

condensed state by a series of focusing magnets throughout the system.

While the accelerator is in operation the beam is on for six per cent of the time and off for 94 per cent of the time. It is switched on 120 times per second. An accelerator beam that can be turned on for six per cent of the time is said to have a high duty factor, although scientists are hopeful it can be increased to as high as 12 per cent. The beam can't be on all of the time because the electrical system can't be operated continuously.

When the beam leaves the accelerator, it traverses a switchyard where it can be divided and channeled by magnets toward target areas. The targets will be made up of materials that are consistent with the requirements of the experiments being conducted. They are placed in the beam channel so that the protons collide with them. From these collisions a variety of particles is thrown out. These include protons and neutrons from the target's nuclei; mesons (pions) which are thought to be the glue that holds a nucleus together and for which the facility is named; and photons (gamma rays).

These particles can be separated and formed into individual beams. These secondary beams then, strike secondary targets in the experimental areas at prescribed energies, with one possible exception. The pion beam can strike a secondary target, but its decay products, muons and neutrinos, also offer possibilities for experimentation. Pions decay into muons. These are the only two particles in the meson family. Neither of them has been used to a great extent in basic research because there has been no way of producing them with great enough intensity to conduct profitable experiments.

The muon is a mysterious particle. A nucleus will capture a muon in much the same way it does an electron to form a kind of pseudo-atom, called a muonic atom. The muon, however, is much heavier than an electron and orbits closer to the nucleus. To date physicists cannot find any differences in the properties of the muon and electron with the exception of weight. Is it then, just a heavy electron?

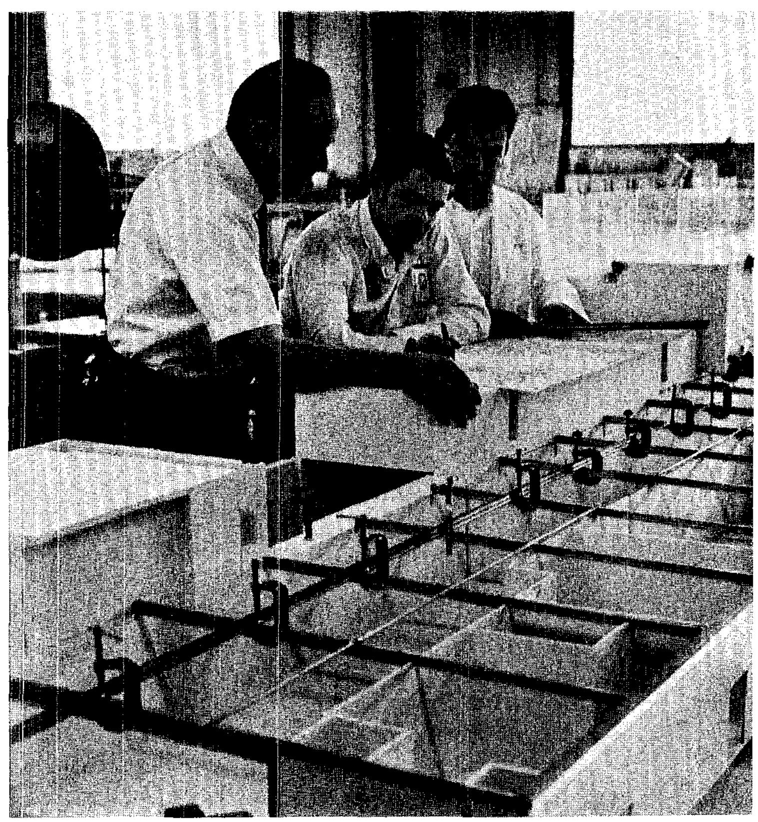
Some neutrinos are the decay products of muons. They are produced in many nuclear reactions. They react very weakly with matter, are hard to detect, and have high penetrating power. Neutrinos from the sun, for example, usually pass right through the earth. This particle, however, is not a meson; it has no electrical charge and its mass is negligible.

Each kind of particle has different properties and permits the investigation of different characteristics that will help in mapping the nucleus. The neutron, proton and pion, for example, are all strong interaction particles, but the pion has different mass, spin, momentum for a given energy, and obeys different laws.

Electrical power for the facility will be provided by a 115-kv substation at the site through large radio-frequency tubes which will amplify the power to the accelerator system. There will be 44 of these tubes for the waveguide and three for the Alvarez unit. They will be situated in clusters at various points along the accelerator. The tubes operate at about 50 per cent efficiency, making half of the power supplied to the tube available to the accelerator system. This is considered to be a good efficiency factor.

Control of the accelerator will be centralized

In the ENG-2 Model shop, Donald Sterner, Bruce Martinez and Mariano Vigil work on a scale model of the meson factory.



in the Operations building. A digital computer will turn the accelerator on, monitor its operation and turn it off. It will also help in locating equipment malfunctions and reduce some of the data from experiments while they are in progress. There will be light service support facilities and personnel in this building to perform necessary modifications on experimental equipment. Included are machining and electrical support facilities.

In the Equipment Test Laboratory building much of the accelerator will be constructed; its cavities will be tuned and brazed. The radio-frequency tubes, as well as vacuum pumps which will be used to evacuate the accelerator, will be tested before being installed in the system. When LAMPF is operational the building will be a source of replacement components and can also be used as a staging area for assembling equipment before taking it to the experimental areas.

A Laboratory-Office building will be the administrative center for the facility. It will consist of laboratories, offices, and an auditorium. Many of its offices will be occupied by personnel from MP division which is charged with the responsibility for the meson facility.

Planning for LAMPF began in 1962 and was carried on, to a large extent, in P division where considerable effort was being applied in studies of nuclear structure.

Even in the early stages of planning it was conceived as a national facility. Nuclear physics facilities in this country are largely concentrated on the east and west coasts at colleges, universities and other laboratories. It was realized that the Los Alamos accelerator would strengthen science, education and technology in the Rocky Mountains by bringing together the scientists from this region. Rocky Mountain scientists, in general, gave full support to the venture.

LASL's invitation to scientists from other parts of the country to participate in experiments at the facility was met with widespread interest. Plans were made to form a Users group made up of scientists who were interested in taking part in experiments. The first meeting of this group was held in Los Alamos in June of 1968. Twenty-one scientists representing universities, laboratories and medical institutions were present. In December of 1968, a regional meeting of 20 members from the Associated Western Universities was held on the University of Wyoming campus. It was not until February of this year, however, that the Users held their organizational meeting. Approximately 40 institutions were represented at the meeting where an executive committee was elected and a charter adopted.

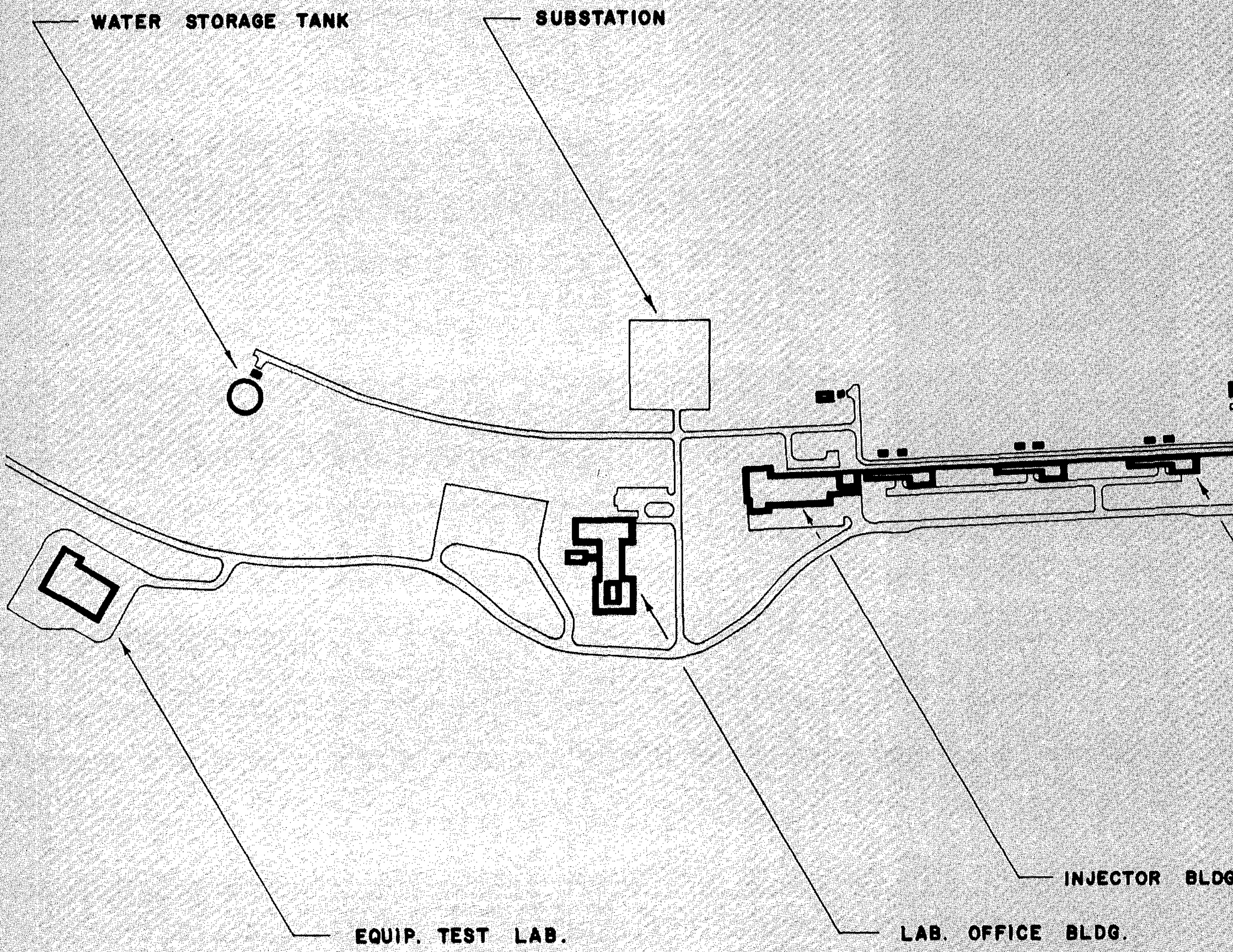
It is the User's job to provide a channel of communication between LASL and various research scientists from all parts of the country who will be conducting experiments at the meson factory.

Why was Los Alamos selected as the site for the facility? The idea for it was conceived by Los Alamos scientists. A large effort had been applied in nuclear structure studies at Los Alamos and there was interest and participation on the part of a competent and experienced body of scientists, knowledgeable in the problems and the experimental techniques required for such studies. Laboratory personnel are experienced in remote handling and processing of highly radioactive materials and have a sizable program for personnel protection from radioactive hazards, ranging from routine monitoring to basic research in biological effects. LASL has quality computing and data-processing facilities, extensively used in nuclear structure problems. It also has engineering, contractual, supervisory and administrative personnel, as well as machinists, instrument makers and their required facilities, which will be relied upon heavily to provide services when LAMPF is operational.

Why a linear accelerator? After studying the possible geometries of an accelerator, Los Alamos scientists decided on a linear configuration because a higher percentage of the beam could be extracted and radiation problems are fewer than with a circular geometry. The energy of the beam can be varied by inactivating cavities of the waveguide and additional cavities can be added to it to increase its energy capabilities in the future, above 800 MeV. A "linac" is also capable of producing polarized particles, which are not practical in a circular accelerator. Most nuclear particles spin on their axes like the earth rotates on its axis. Particles are said to be polarized when they are all spinning in the same direction.

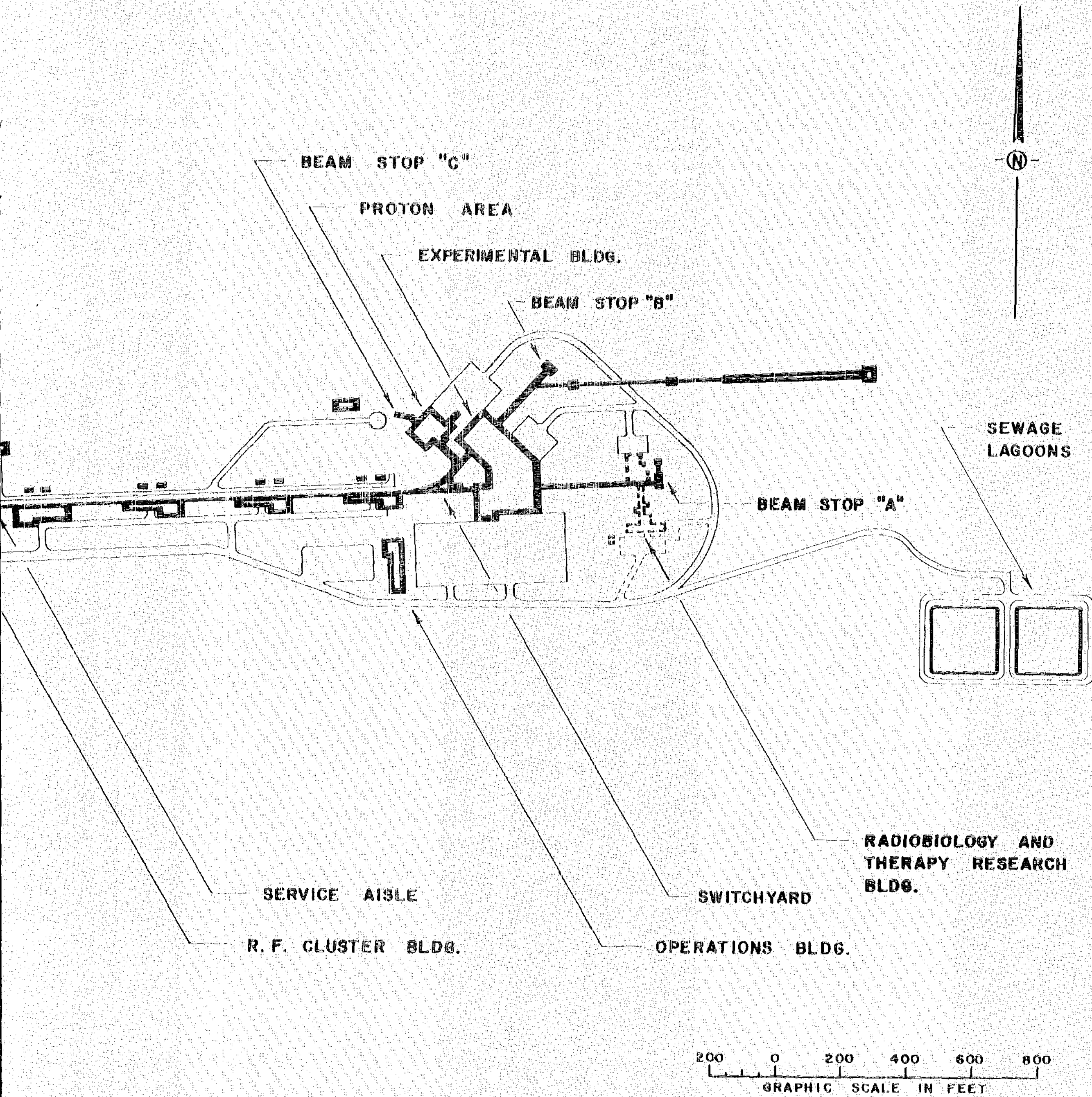
Why now? There are two major reasons for building a meson factory now. Low energy physicists have reached a point where profitable experiments with existing accelerators are more difficult to perform. They need one that has higher energy and greater intensity to probe deeper into the nucleus. In 1962 technology had advanced to where such a facility was more feasible economically. One of the big drawbacks prior to that time

continued on page 8



PRELIMINARY SITE PLAN

LOS ALAMOS MESON PHYSICS


BEAM STOP "C"
PROTON AREA
EXPERIMENTAL BLDG.
BEAM STOP "B"
N
SEWAGE LAGOONS
BEAM STOP "A"
RADIOBIOLOGY AND THERAPY RESEARCH BLDG.
SERVICE AISLE
SWITCHYARD
R. F. CLUSTER BLDG.
OPERATIONS BLDG.
200 0 200 400 600 800
GRAPHIC SCALE IN FEET

FACILITY

. . . LAMPF

continued from page 5

was that large radio-frequency tubes were not available and, to use smaller ones, would have resulted in astronomical electrical costs. The large tubes have only come about as a result of more powerful radar stations required by the military.

By mid-1963 planning had progressed to where some experimental hardware was being built and additional personnel were hired. In April of 1964 the Atomic Energy Commission provided $500,000 for the preparation of a formal proposal. It was completed in September of that year and put into the political arena for consideration in October.

Early in 1965 the possibility of the meson factory project being approved by Congress looked favorable and, in July of that year, MP division was formed to pursue research and development of the proposed facility under the leadership of Louis Rosen. In its beginning, the division had a staff of about a dozen people. Rosen has since divided it into six groups, appointed leaders for each one and assigned each of them task areas in which their groups are to function.

MP-1 is headed by Thomas Putnam and is concerned with the design and development of the computer control system and other associated instrumentation. Donald Hagerman's Group MP-2 is assigned the task of developing reliable and economic radio-frequency power sources for the accelerator. Hagerman and Edward Knapp, MP-3 group leader, are assistant division leaders. MP-3 is engaged in the design, fabrication and testing of the accelerator's cavities and side cavities. MP-4, headed by Darragh Nagle, who is also alternate division leader, is concerned with the configuration of the accelerator, and the injector facility. MP-5, led by Paul Edwards, performs liaison functions between groups, and between divisions and other agencies, concerned with the project. It is also responsible for scheduling construction. Working with the group is an Atomic Energy Commission official and staff. A contingent from the Laboratory's Engineering department is also assigned to assist in design work. MP-6, under Donald Cochran, is charged with the design of the experimental areas, including targets, shielding, remote handling equipment and some of the major items of experimental equipment.

Rosen also appointed a construction steering committee to keep watch over expenditures and to see that construction progresses on time and within the budget. Members of this committee are Hagerman, Knapp and Edwards.

Division personnel now number about 150. Its staff will swell to about 225 by the time LAMPF becomes operational. The additional staff members will be concerned with the support or performance of experiments. The division will continue to occupy some of its present offices and others at the facility site.

The fruits of political activity were known in December of 1965 when Congress authorized expenditure of $1.2 million for architect-engineering design.

In September of the following year, the Laboratory received another $3 million. Design work on the site was completed in February of 1967 and initial site construction began late that month. Water, gas and sewer lines were taken to the site; the accelerator beam channel was excavated; an access road was constructed; the experimental area was excavated and compacted.

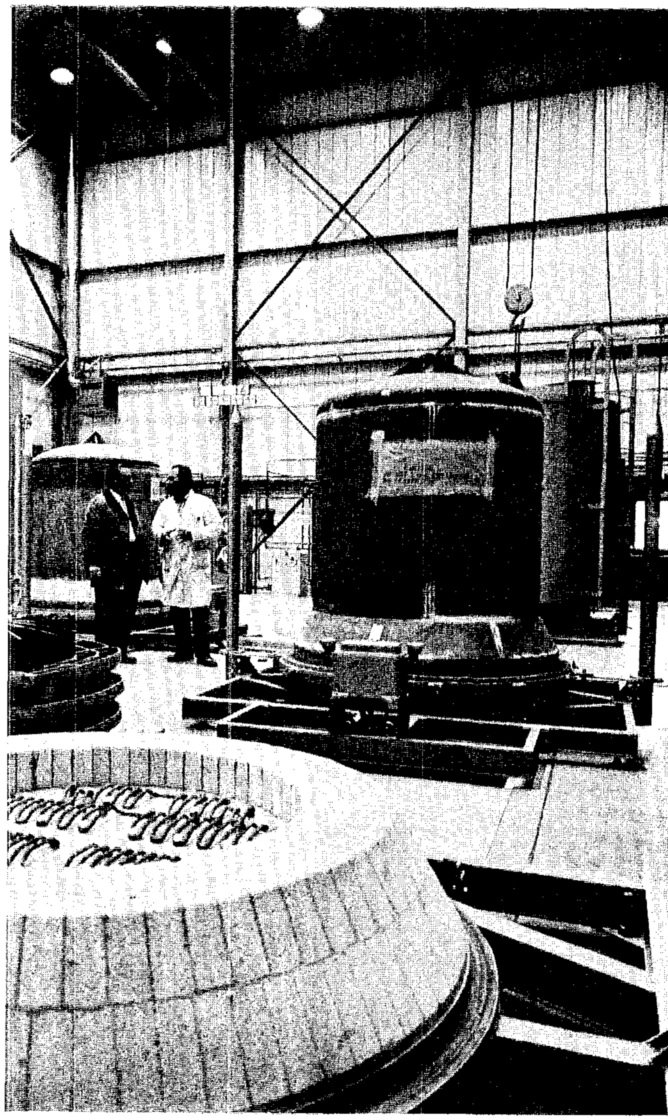
These were steps that saved money in subsequent construction. The site on Mesita de Los Alamos was remote. There was no road to provide contractors with easy access and no utilities for equipment operation and men. The beam channel was the deepest required excavation and would reveal whether the tuff had any pumice pockets in it that would be detrimental to a firm foundation on which to build. There were no surprises. The tuff proved to be solid.

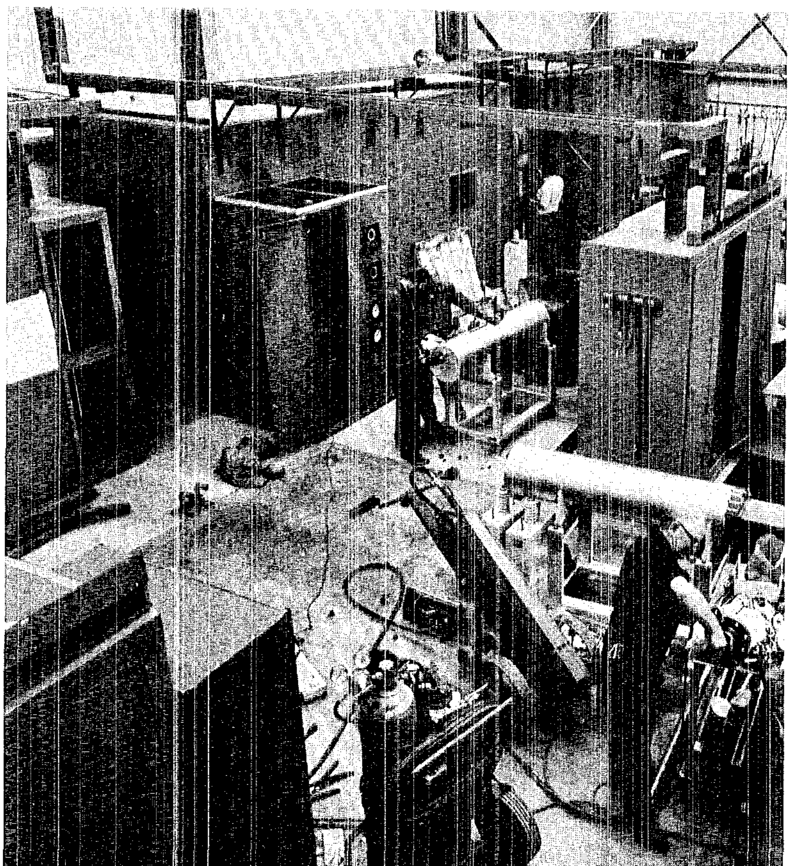
When Congress authorized $10.4 million for LAMPF in October of 1967, bids were opened on the Laboratory-Office building and 115-kv substation. The Bureau of the Budget, however, released only $1 million and both contracts had to be canceled. Instead, a contractor was secured to build the facility's $750,000 Equipment Test Laboratory building at the west end of the site. It was completed, including installation of the brazing furnaces, last month.

The Bureau released another $2.7 million in February of 1968 and bids were let on the 100-MeV building which will house the injector and Alvarez units of the accelerator; a one-million-gallon water storage tank; sewage lagoons and additional work on the water and sewage systems. The injector portion of the 100-MeV building is expected to be completed in June and the rest of it in October. The water storage tank, sewage lagoons and other additions to the systems in this

continued on page 10

Inside the Equipment Test Laboratory building (ETL), completed last month, is a machine shop, above. Working in it are Jesse Lee and Wendell Smith, both SD-5. The open area in the foreground will be used for shipping and receiving. In the furnace room, right, where the waveguide accelerator's cavities will be brazed, are Bob Burdette, MP-5, and Jerry Sherwood, MP-3. Below, MP-2 and Zia personnel work on the installation of test stands for the large radio-frequency tubes that will amplify power to the accelerator system.





. . . LAMPF

continued from page 8

construction package have been completed and accepted for beneficial use.

The Laboratory had some funds left over, from this and previous allocations, which totaled about $700,000. Construction of the 115-kv substation, canceled because adequate funds were not available, was to cost about $750,000. But when it was learned a new substation would be built for the Eastern Technical area, LASL officials found that requirements for the LAMPF substation could be reduced. Some redesign work was done and a contract for its construction was negotiated for $662,000. Construction started in July of 1968 and is expected to be completed in December of this year.

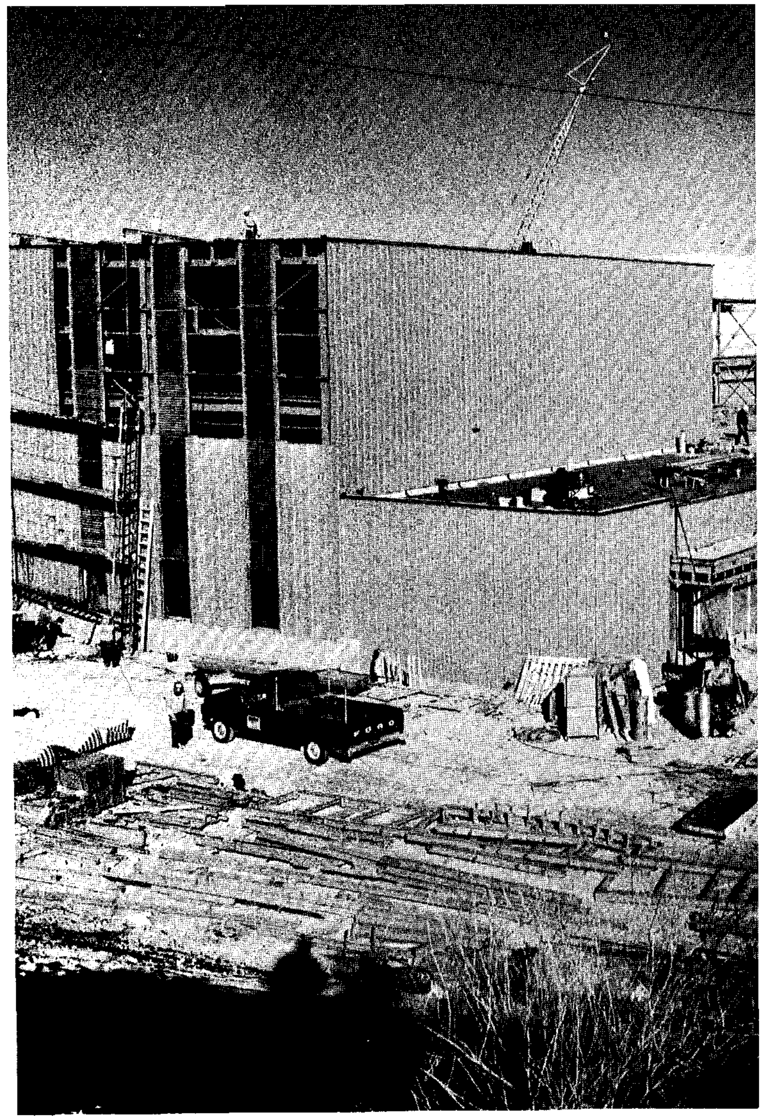
The Bureau of the Budget was still holding $7.5 million when Congress authorized an additional $18.7 million. The total, $26.2 million, was released in October of 1968. Of that, $9.5 million was tentatively planned for additional buildings and site work and $16.7 million for accelerator construction.

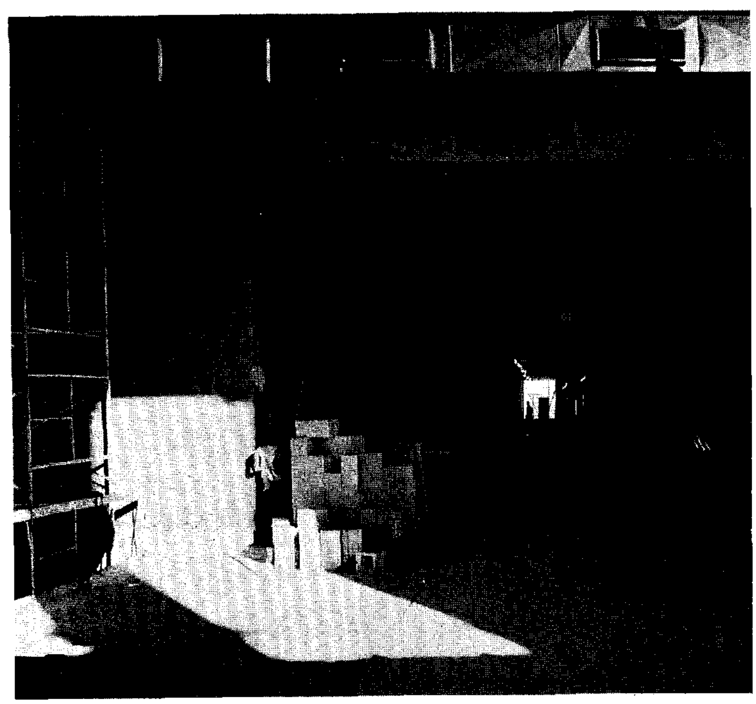
A contract was let for the construction of the Laboratory-Office building, which had been canceled a year earlier. Through their experience with this building and the 115-kv substation, LASL officials realized that construction costs were increasing at the rate of about eight per cent a year. The site has been excavated, footings have been poured and steel work is in progress.

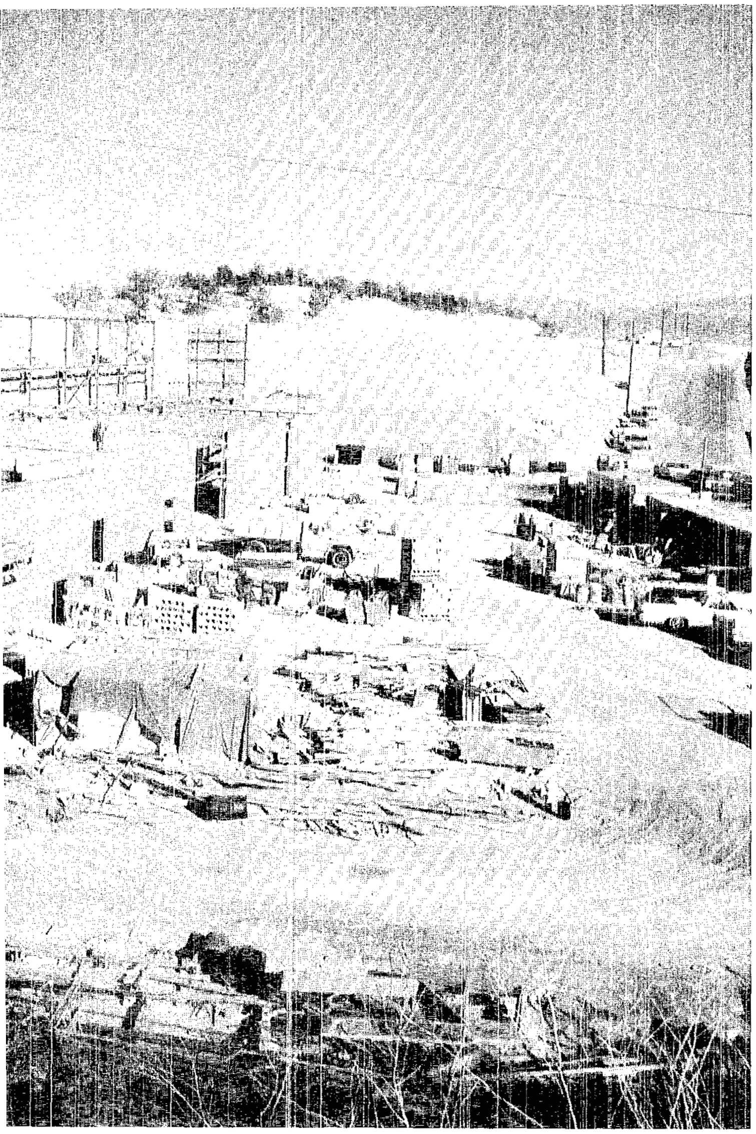
The Waveguide building and Cluster buildings for the radio-frequency tubes were contracted for construction, and a contract was negotiated for the Operations building. Final excavation for the Accelerator and Cluster buildings began in January. A conceptual design of the Operations building has been completed and final design work has been authorized and should be completed in April.

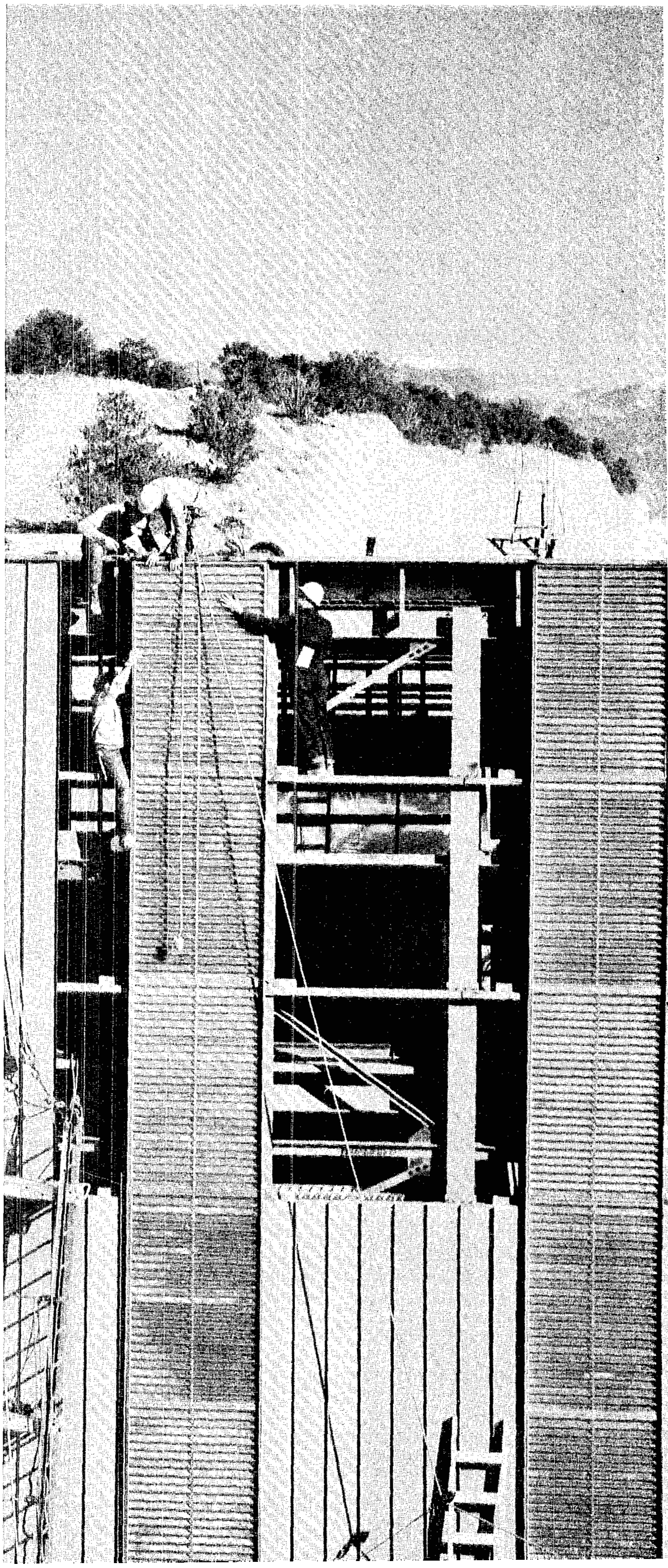
Design work on the experimental areas has been held off until the latest possible date because its makeup is predicated on essentially two variables. First of all, it was not known how much money would be available for the areas, a condition caused by rising construction costs as opposed to a fixed $55-million budget. The second is that the state-of-the-art changes rapidly and officials want to be sure, when design work is frozen and construction underway, they are sampling the most advanced technology available.

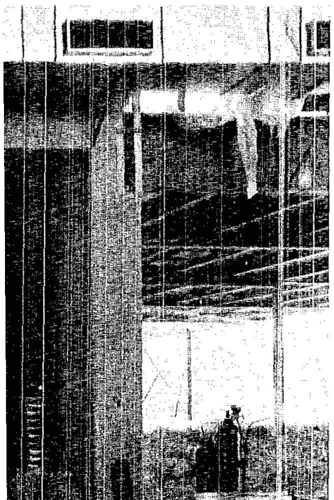
continued on page 12











Above is the 100 MeV building which will contain the Cockroft-Walton generator and Alvarez portion of the LAMPF accelerator. At right, workmen install air vents on the west side of the inector building; below is a view from inside, looking down the beam channel.

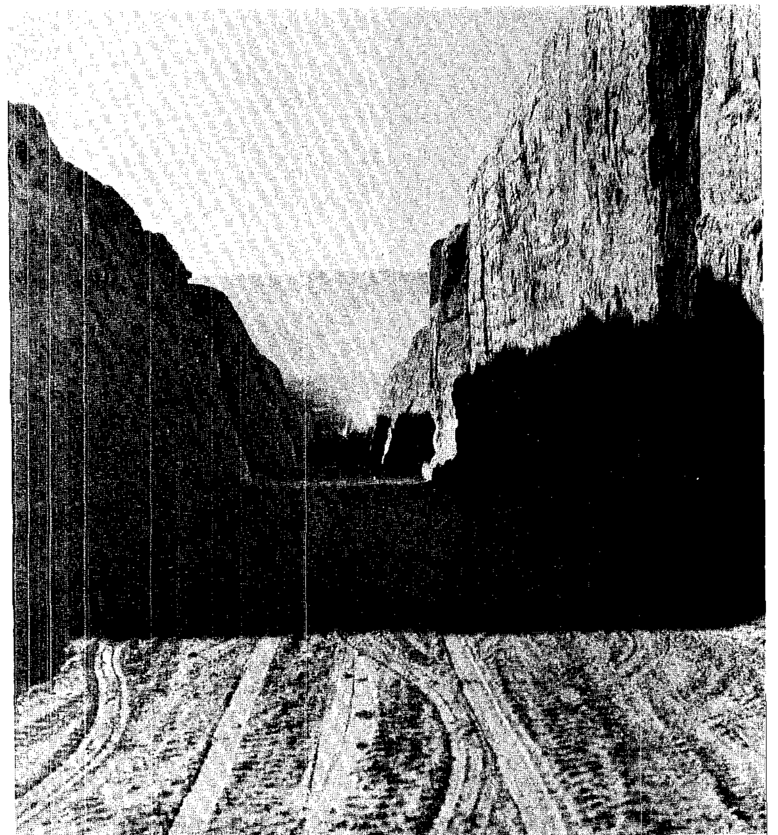
. . . LAMPF

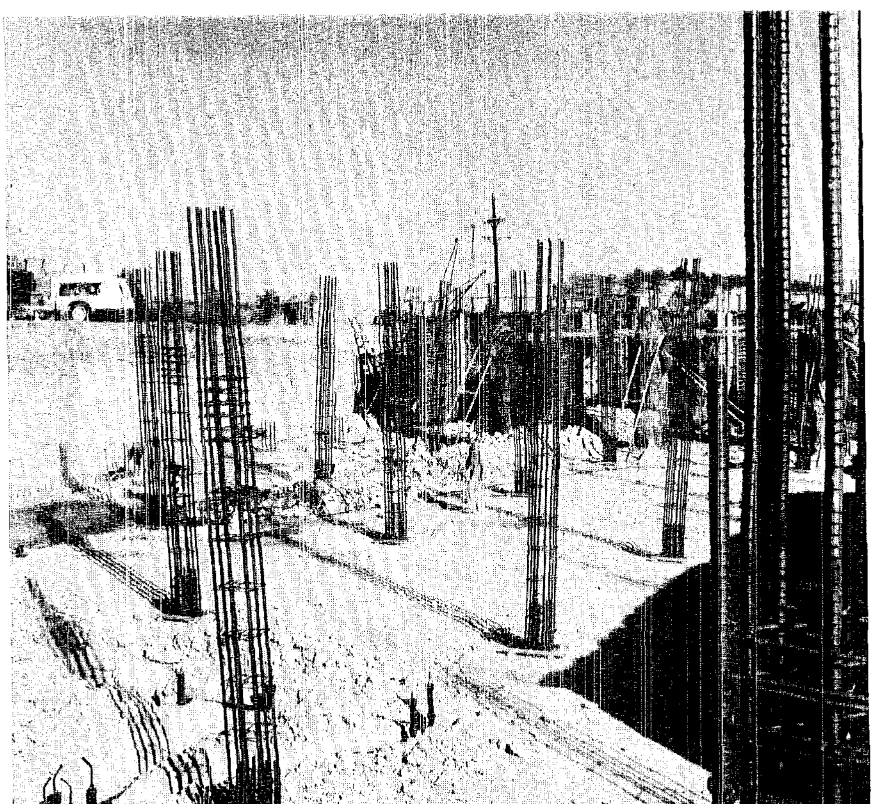
continued from page 10

Conceptual design work has begun on the experimental areas and it is hoped that funds will be made available for construction in September or October.

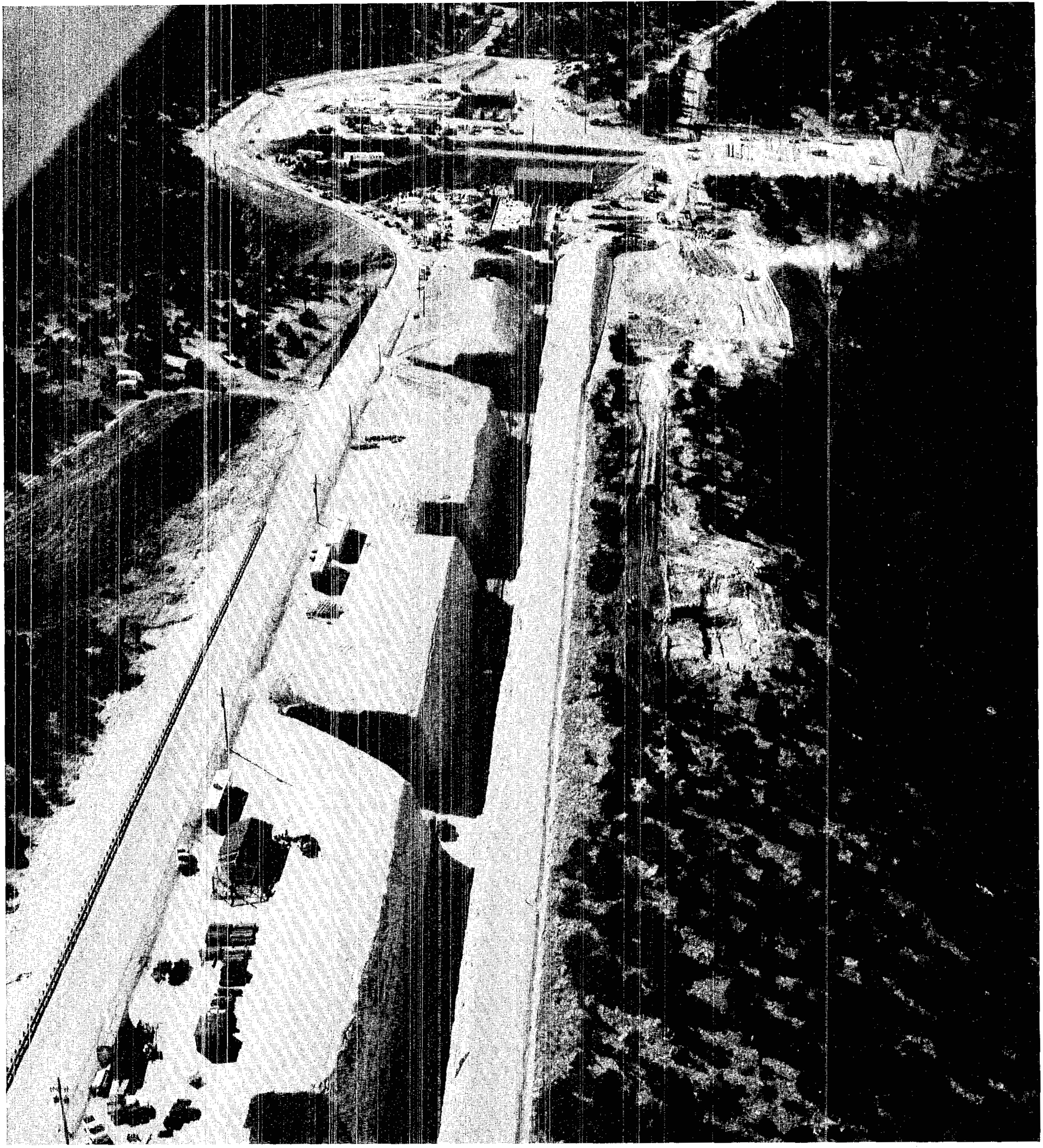
The best that can be expected, initially, is three experimental areas. Area A would be for experiments involving the mesons and, to a lesser extent, neutrinos and gamma rays. Area B would be a backup for A, but would be devoted, for the most part, to experiments with neutrons. Area C would be for proton experiments.

The power supply for the injector unit of the accelerator has passed its acceptance tests. A contract has been awarded for the construction of the Alvarez tanks and the drift tubes, and components representing modifications of the system are being fabricated at Los Alamos. Its power supplies are on order, as well as all copper forgings for the waveguide accelerator from which its cavities will be formed. A contract is being negotiated for machining 20 per cent of the cavities and a contract for machining the rest of them is expected to be signed by July.





Construction of the Laboratory-Office building, administrative center of the meson factory, has commenced, left. Final excavation of the waveguide-accelerator beam-channel is underway, above, as well as for cluster buildings that will house radio-frequency tubes. Cluster-building excavations appear as notches in the beam channel, right.



Also by July it is hoped that a contract will have been negotiated for the purchase of most of the heavy electronics equipment.

Construction of the control system has commenced, and officials hope the computer can be purchased soon.

An important milestone in research and development work for the meson factory has been the Electron Prototype Accelerator, which is essentially a waveguide, built to test the accelerator hardware and the many other associated parts of LAMPF. These include shielding, targets, accelerator cavities and side-coupled cavities, power

continued on page 14

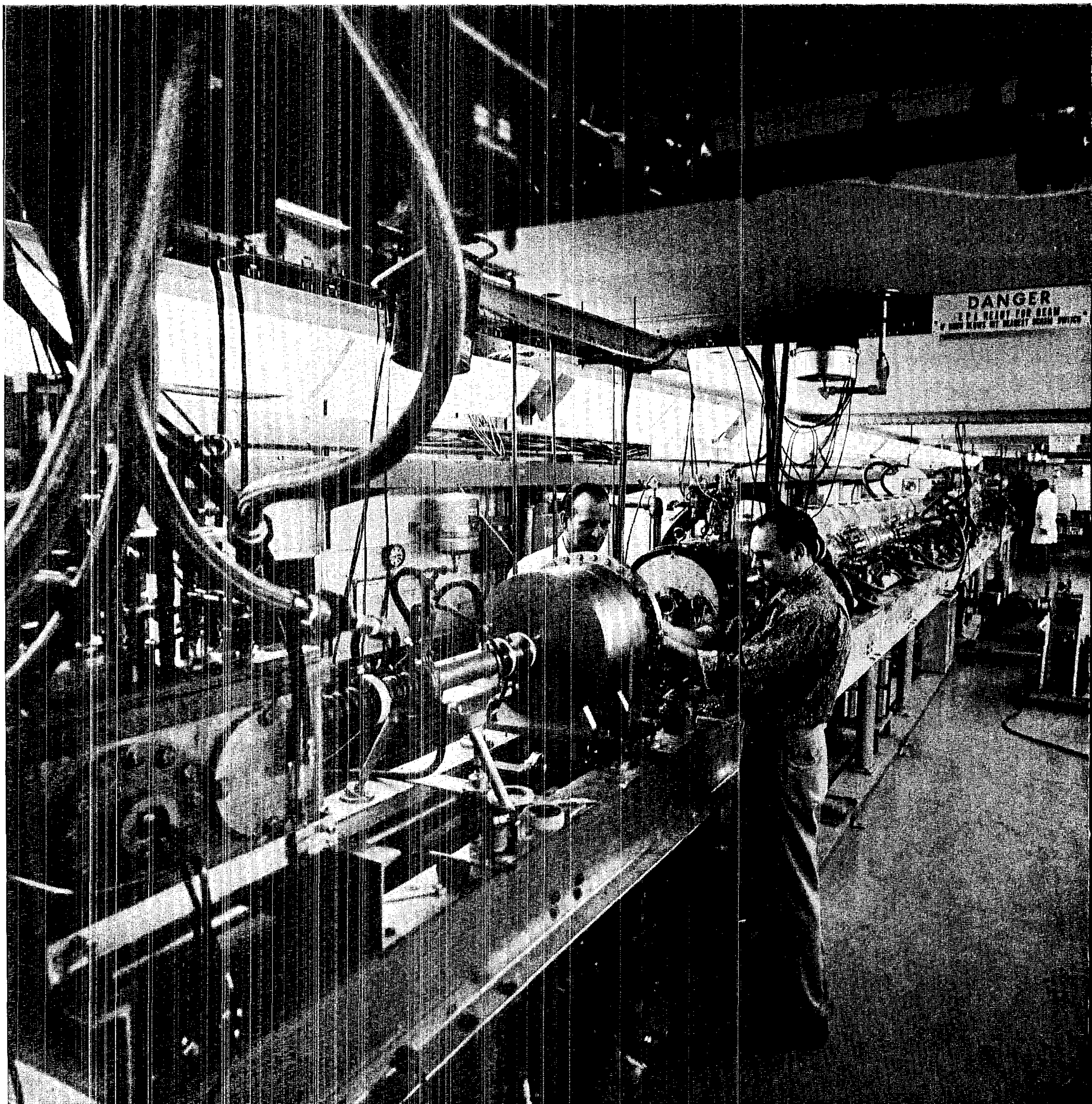
... LAMPF

continued from page 13

units and control system. Instead of a proton beam, however, the prototype's is made up of electrons of the same beam intensity the LAMPF accelerator will have. Electrons have less mass than protons; thus, they are more easily diverted. Scientists knew, if they could accelerate electrons through the machine, there would be no problem with protons.

The stability of the waveguide accelerator, a measure of its insensitivity to changes in environmental conditions, was so remarkable, it was thought the cavity and side-coupled principal might be used to increase the stability of the Alvarez unit. Temperature variations were enough to disturb the resonance of its tanks. Scientists installed a series of posts from the walls of the tanks toward their centers. These, in effect, divide the tanks into cavities and serve the same purpose as the side-coupled cavities in the waveguide. As a result, the stability of the Alvarez unit was increased by a factor of 100.

Through tests it has been determined that the waveguide accelerator is three times more efficient



in using electrical power than any other accelerator known.

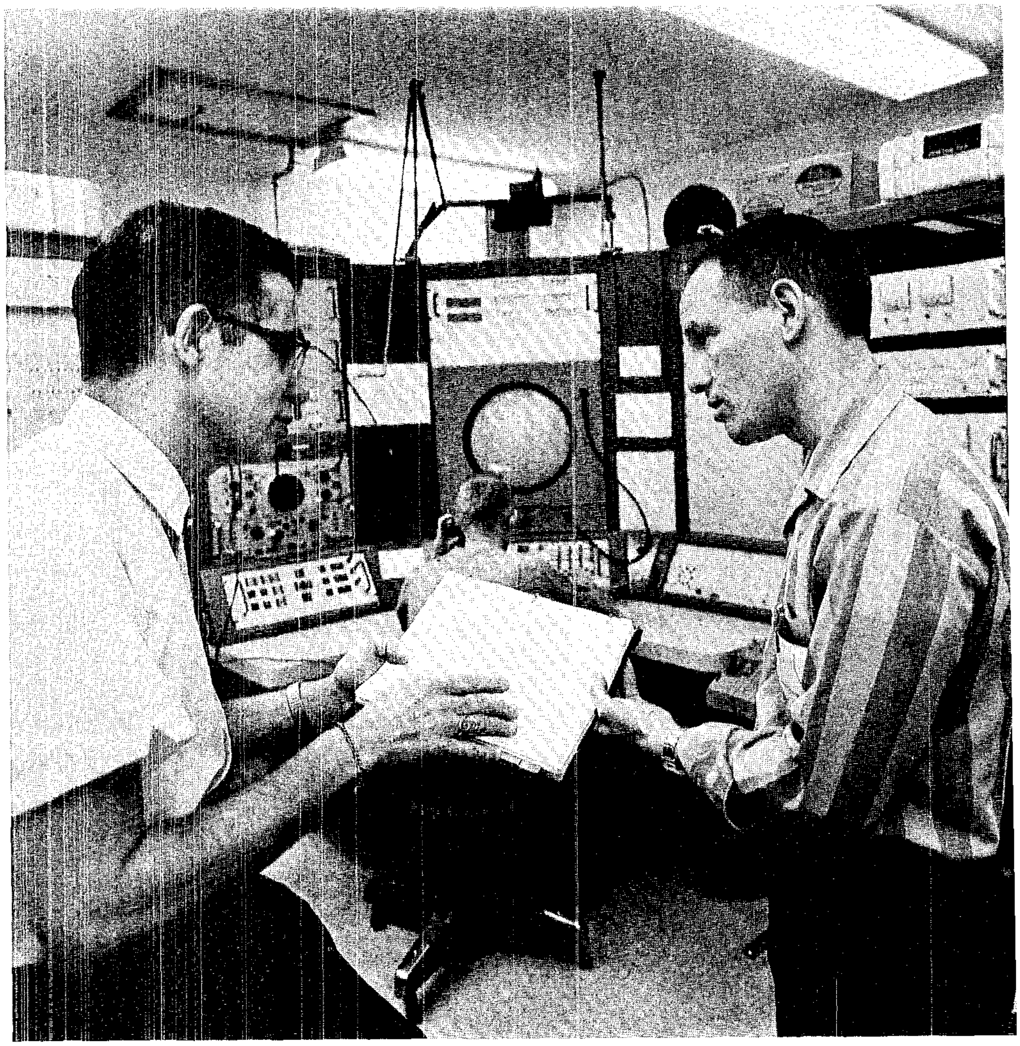
The importance of basic research cannot be over-estimated. From experience it is known that it is the stepping stone to advanced technology. The meson facility will help to assure a continuing effort in basic nuclear research.

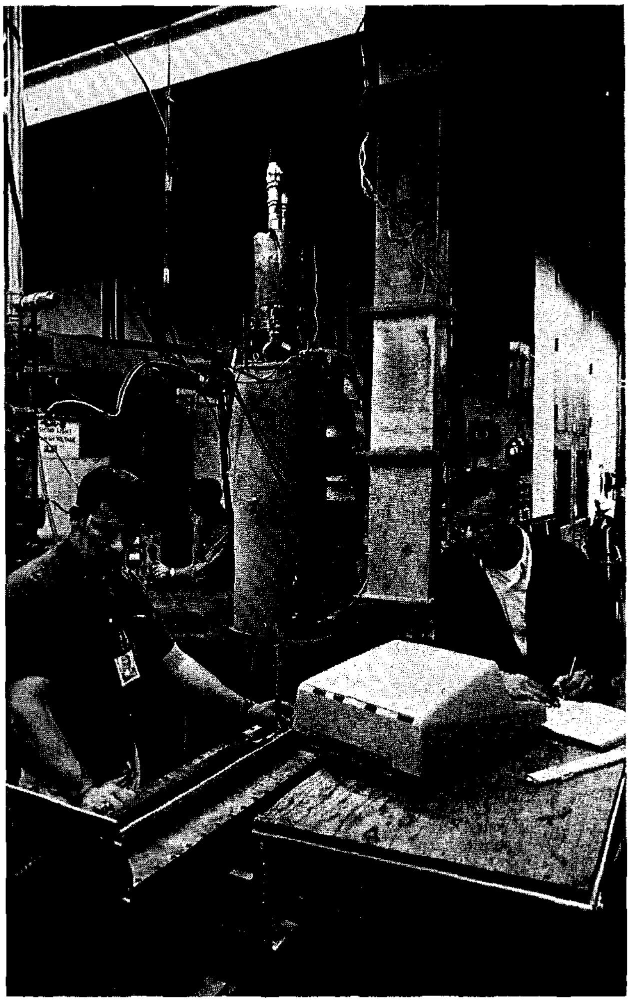
Although scientists have anticipated some practical applications, many others are expected to be revealed as experimentation progresses. The accelerator is an intense source of radiation, which will be used in the development of new processes and materials. The high levels of radiation possible from LAMPF can also be used in studies of radiation effects as they apply to our manned space program. Much of the radiation found in outer space can be produced in the meson factory which will permit on-the-ground investigations.

A practical application receiving considerable attention is the possible treatment of cancer with

continued on page 16

Jack Busick, MP-5, and Jim Ruhe, MP-3, work with the Electron Prototype Accelerator, left, which is essentially a waveguide unit built to test hardware and many other associated parts for LAMPF. Responsible for the design and development of a computer control-system for the meson facility is Group MP-1, headed by Thomas Putnam. Putnam, in photo at right, talks with one of his associates, Hal Butler, right. At the control panel is Cliff Plopper, also of MP-1.





Electrical power from a substation will be amplified *through huge tubes like the one shown at center. This tube* is being used to provide power for the Electron Prototype Accelerator and is undergoing a test by Group MP-2 members Duard Morris, Celestino (Rob) Quintana and Bob Jameson.

. . . LAMPF

continued from page 15

mesons. Deep-seated, inoperative malignancies are often treated with x rays and cobalt gamma rays which care not whether they destroy healthy or malignant tissue. Their energy is greatest before they reach the tumor, so the healthy tissue surrounding a tumor suffers greater damage than the malignant area itself. There has been a considerable amount of evidence that negatively-charged pions can be used in radiation therapy more effectively, but a meson-producing accelerator with an intense enough beam has not been available. LAMPF will be the first to have a beam with adequate intensity. Negative pions, used in radiation therapy, would work somewhat differently than x rays and cobalt gamma rays. Most of the negative pion's energy would be released inside the tumor. By determining the stopping power of the body in front of the tumor, the beam's energy can be controlled to bring the mesons to rest within it. The beam can also be shaped like the tumor so there would be minimum damage to healthy tissue surrounding it.

As the negative pions come to rest inside the malignant tissue, they are captured by heavy atoms such as oxygen, carbon and nitrogen, or, in the case of bone, calcium. They begin to orbit the nucleus of the atom so close that their activities overlap, resulting in a violent disruption of the nucleus. Charged particles and neutrons fly off in all directions for short distances and have a devastating effect on the cells they encounter.

A Radiobiology and Therapy Research building has been proposed and if authorized would be built near the experimental areas. It is not, however, included in the $55 million budgeted for LAMPF.

It has been estimated that operational expenses of the meson facility will be in excess of $10 million per year, not including research activities. Under operations is included maintenance, electrical power, and equipment and materials used to provide appropriate beams for experiments. The funding is dependent on Congressional appropriations, which in turn, determines the level of research activity.

The names of the 725 applicants were placed in a rotating drum, above, by Joe E. Maestas, PER-DO; Robert Albertson, PER-1 group leader; and Marianna Howenstine, PER-1. Witnessing the drawing, below, were Delbert Sundberg, Public Relations department head; Edward Laymen, alternate Personnel department director; Charles Canfield, Personnel department director; Henry Hoyt, assistant Laboratory director for administration; and S. E. Russo, ENG-3 group leader.

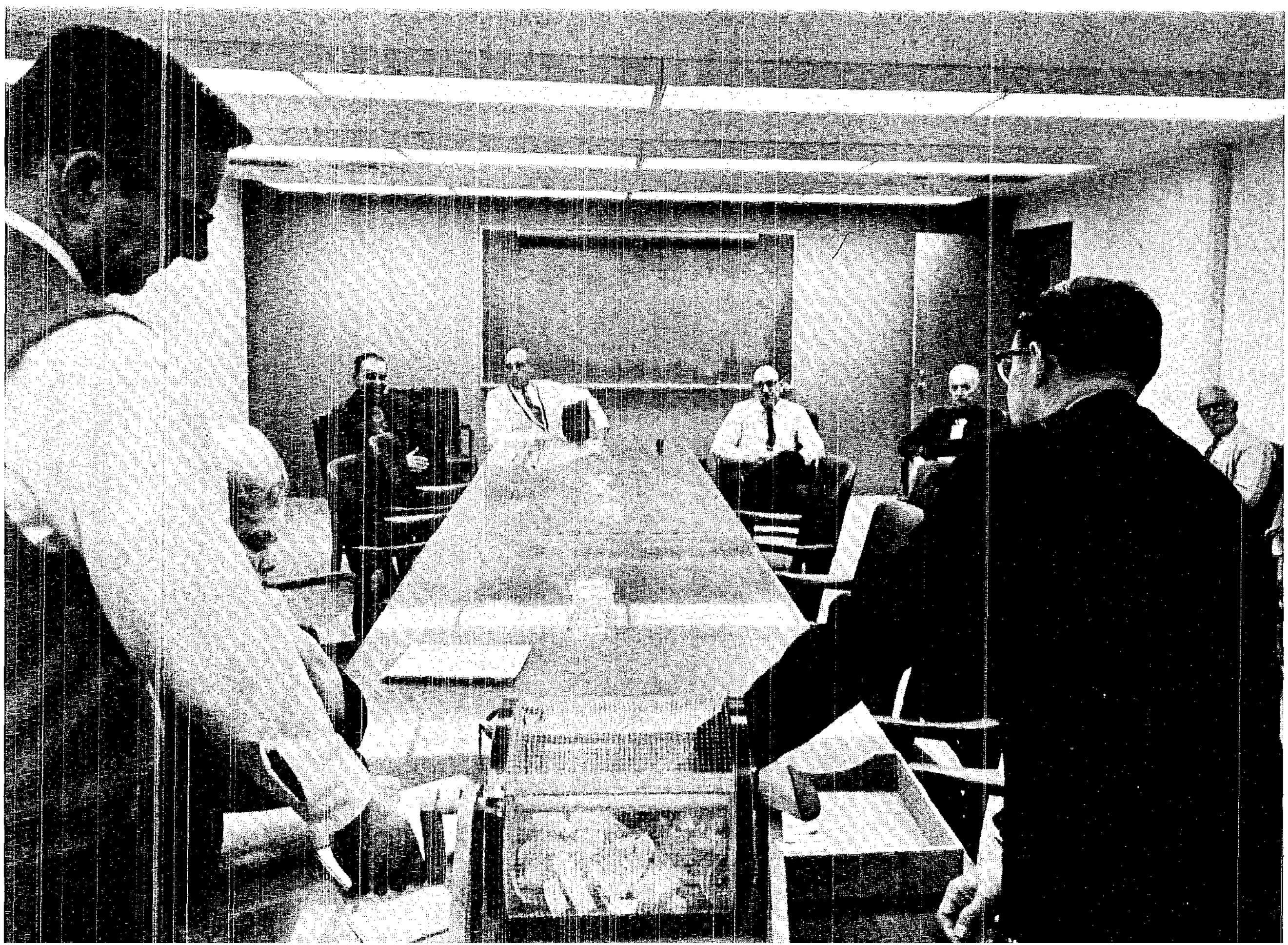
Summer Jobs by Lottery

There were 725 applications for jobs under the Los Alamos Scientific Laboratory's 1969 Summer Replacement Program, but only 87 openings.

In the interest of impartiality, an eligibility list was established by a lottery, the first in the Laboratory's history. The list contains 109 names, or 125 per cent of the jobs available, to allow for possible rejection or withdrawal of employment offers.

The 87 vacancies will be filled from among those applicants whose names appear on the eligibility list. They will be selected this month.

A summer vacation replacement must be a graduating high school senior, or an undergraduate student in good academic standing at a college, university, business college, or technical institute, and must be 18 years of age on or before June 15, 1969.



Howard H. Cady

George M. Campbell

Robert H. Dinegar

Donald E. Hoard

W. Burton Lewis

Charles L. Mader

George M. Matlack

A. Edward Norris

Seventeen from LASL Named AIC Fellows


Charles J. Orth


John Ramsay

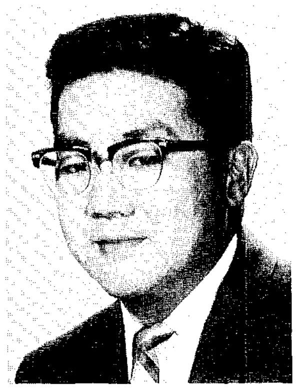

Gordon M. Smith


Roderick W. Spence


Edmund K. Storms


Burton J. Thamer


James M. Williams


Stanley K. Yasuda

Seventeen more Los Alamos Scientific Laboratory staff members have been elected Fellows of the American Institute of Chemists. The new Fellows brings to 38 the number of Laboratory staff members named for the honor.

Those recently elected are Howard H. Cady, GMX-2; George M. Campbell, CMB-11; Robert H. Dinegar, GMX-7; Robert M. Douglass, CMB-1 (not pictured); Donald E. Hoard, H-4; W. Burton Lewis, CMF-2; Charles L. Mader, T-5; George M. Matlack, CMB-1; A. Edward Norris, J-11; Charles J. Orth, J-11; John Ramsay, GMX-8; Gordon M. Smith, J-12; Roderick W. Spence, N-DO; Edmund K. Storms, CMB-3; Burton J. Thamer, K-2; James M. Williams, K-5; and Stanley K. Yasuda, GMX-2.

The AIC confers this honor on "chemists or chemical engineers who have achieved full maturity in the professions as evidenced by record of outstanding scientific accomplishments or by having attained positions of distinction or responsibility."

The organization was founded in 1923 to elevate the professional status of chemists and chemical engineers. One of its committees proposed the establishment of the National Science Foundation in 1941 and was an active supporter of the bill creating it in 1946.

A Gold Medal award is conferred annually for "noteworthy and outstanding service to the science of chemistry or chemical engineering or the profession of chemist or chemical engineer in the U.S."

The AIC also grants "Honorary" memberships for distinctive achievements in the chemical field. Glenn T. Seaborg, chairman of the Atomic Energy Commission, was granted such a membership in 1949. Seaborg was a member of the committee that nominated the Laboratory's most recent AIC fellows.

Interesting and useful courses are offered in the

Los Alamos Night School Program

Instructor Forrest Strong supervises Mrs. Rita Bieri's ceramics project, above. In the same class, at left, are Art Murray and Bill Hassenzahl. Below, Duane Wagner, instructor for the Mineral and Rock Identification class gives some pointers to students Mrs. Toshiko Bradley, Mrs. Ann Dingus and Mrs. Barbara Larson.

By Sonia Strong

"You learn to appreciate something more when you understand it."

This statement, made by a housewife taking a ceramics class, largely summarizes the feelings of those who enroll in the Los Alamos Night School program.

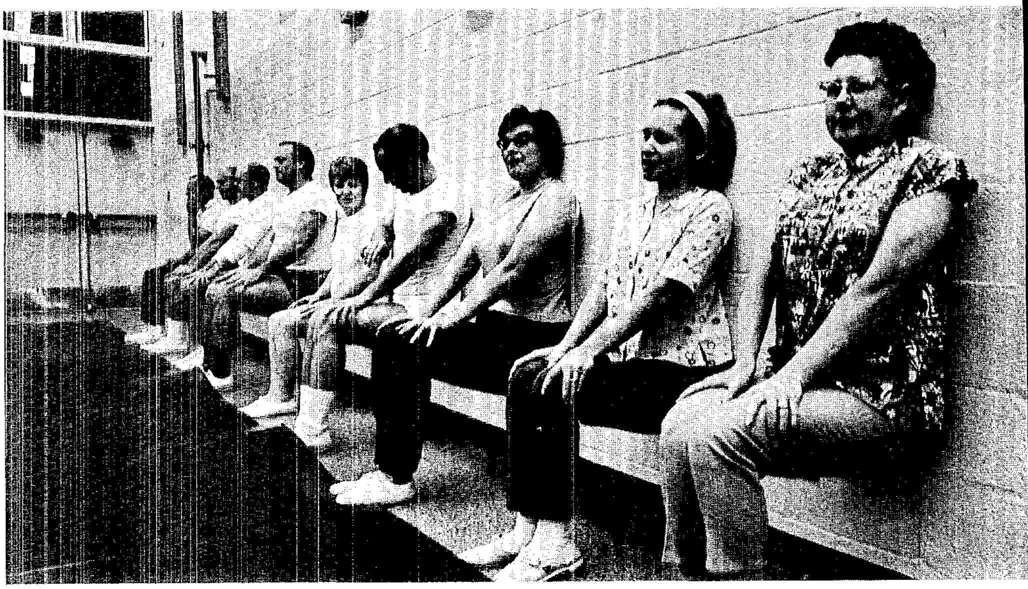
A variety of courses is offered during the fall and spring of each year under the sponsorship of the Los Alamos schools. Almost any course can be offered provided a minimum number of 10 persons register and a qualified instructor is available.

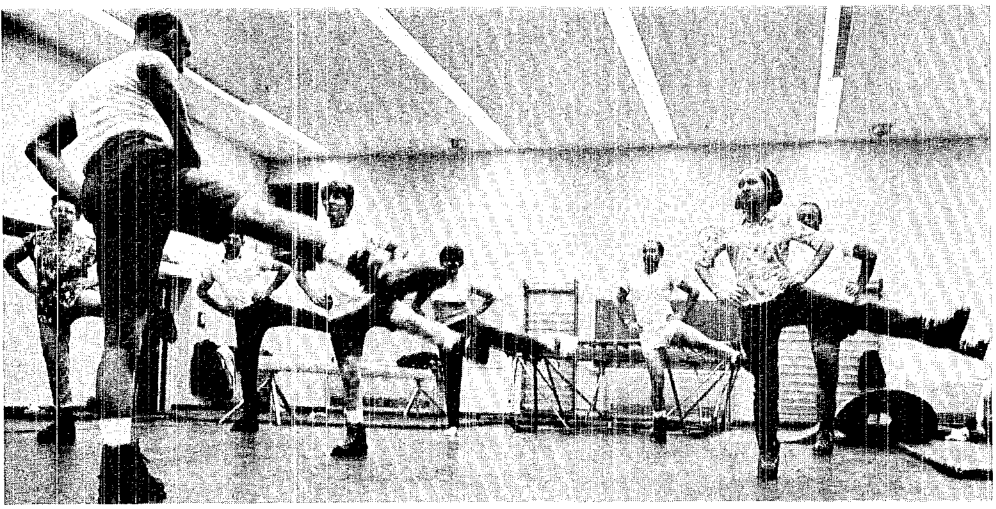
The night school has grown steadily since its first program in 1952 when 208 students enrolled in 17 classes. Last fall, more than 400 persons were enrolled in 21 non-credit courses and more than 50 in college extension courses. Enrollment exceeds 400 in the spring series of classes, now in progress, excluding 110 persons in a competitive swimming class. Seventeen are non-credit courses while four others are at college level. In addition, approximately 30 General Education Development tests are given each year for the High School Certificate of Equivalency.

Except for the director's salary, the Adult Night School program is self-supporting. Director Duane W. Smith schedules the classes, arranges for the instructors and coordinates the purchase of text books and other materials. The books and materials necessary for class parti-

continued on page 22

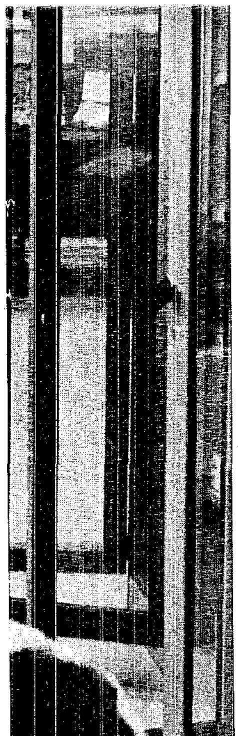
While the wall-sit, taught in the Pre-Season Ski Conditioning class by Bill Hudson, may appear easy, it really isn't. Until the proper conditioning is achieved, this exercise results in sore leg muscles.

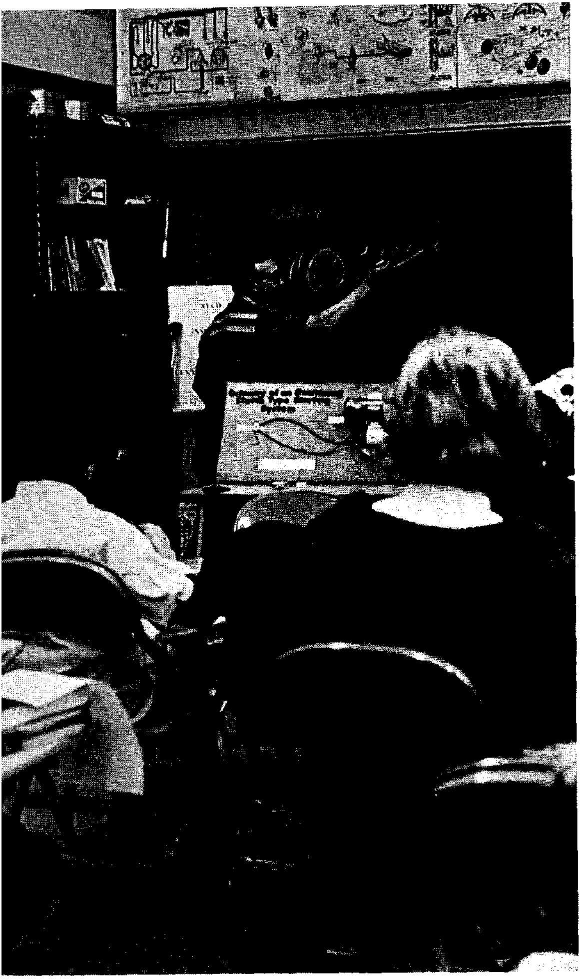


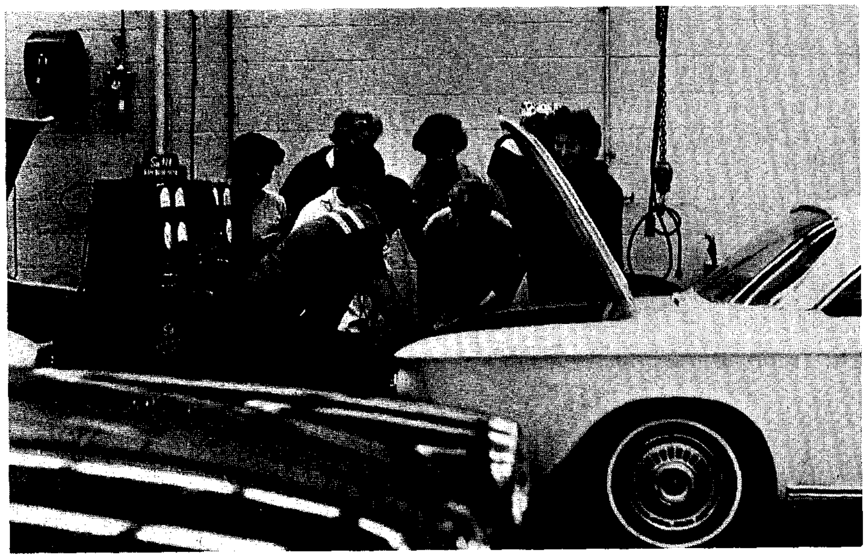


Dancing class? No, its just another exercise taught in the Ski Conditioning class. Hudson, foreground, leads the exercises.

Indoor recreation classes taught in the night school program include knitting under Mrs. Catherine Apprill, standing at the far end of the table.







"What's Cooking Under Your Hood," a class in auto mechanics for women, is taught by Frank Sacco. The course includes classroom lectures, right, and practical applications, left.

. . . *School Program*

continued from page 20

cipation are a student expense and, when possible, are sold to the student at the school's cost.

Housewives, scientists, clerical workers, engineers and persons with a host of other occupations have enrolled in the program and are representative of educational backgrounds ranging from eighth grade through postdoctorate.

Most participants find the courses offered both interesting and useful. "When we are on a camping trip or hike, my kids are always asking me what this or that rock is. I'm taking this course so I can tell them," said one mother taking the Mineral and Rock Identification class. Others in the class said their interests were mainly in rock identification but, the majority was anxious to learn all they could about nature.

Love of nature can often develop into an interest in outdoor sports such as skiing. To get in shape for the season, many enthusiasts took the Pre-Season Ski Conditioning class. Persons at all levels of physical fitness, as well as beginning and veteran skiers, enrolled. The exercises were designed to allow each individual to advance at his own speed. The skiers experienced many sore muscles while the class was in session, but suffered less discomfort when the season arrived.

Classes in sewing, knitting, and art were offered for those who prefer indoor activities. Not all were beginners. Many knitters, for example, had a knowledge of basic stitches, but wanted help with more advanced work. Many had taken the art classes previously, but wanted additional instruction to develop their techniques or simply to use the equipment available.

An auto mechanics class entitled "What's Cooking Under Your Hood," is for women only. Here they learn the how's and why's of their automobiles. While several were taking the course so they could talk intelligibly to a repair man, many mothers said they often take their children for rides and don't want to be stranded on a little-traveled road if car-trouble develops. One housewife said, "Now I know it's worth it to pay the garage."

Other general courses offered during the year include shorthand, typing, electronics, auto mechanics for men, child behavior in teen years, foreign languages, sculpturing, art, metal work, graphic arts, office machines, meteorology and creative writing. At college level, classes in sociology, anthropology, and two undergraduate courses in history are currently in progress.

268 Service Pins Awarded

Pins, representing years of service at the Los Alamos Scientific Laboratory, were presented to 268 employees during ceremonies last month. Of these, 24 were presented to persons who have been employed by the Laboratory for 25 years; 55 for 20 years of service; 96 for 15 years; and 93 for 10 years.

25 Years

William H. Ashley, CMB-1; Richard D. Baker, CMB-DO; Berlyn Brixner, GMX-9; Clarence J. Brown, P-1; James H. Coon, P-4; Jean M. Davis, P-DO; Wray B. Garn, GMX-6; Jano W. Haley, J-9; W. Thurman Hargett, ENG-4; Howard E. Hathaway, CMF-13; Leslie G. Hawkins, Dir. Off.; J. Carlton Hoogterp, N-2; Wesley M. Jones, CMB-11; Stephen G. Kasunic, W-1; L. D. P. King, Dir. Off.; Robert D. Krohn, D-6; Gaza J. Nagy, SD-5; Frank Osvath, SD-1; Josephine E. Powers, C-4; William A. Raies, AO-1; Raemer E. Schreiber, Dir. Off.; William J. Van Buskirk, SD-1; Robert J. Van Gemert, SP-DO; Roger H. White, N-2.

20 Years

Robert W. Atkins, SP-3; Marion L. Clancy, GMX-2; George A. Cowan, J-11; Robert W. Drake, GMX-DO; Alfred C. Dumrose, CMB-8; Theodore A. Dunn, PER-5; Eugene H. Eyster, GMX-DO; Beatrice H. Johnson, D-8; W. Burton Lewis, CMF-2; Duncan P. MacDougall, GMX-DO; Ben G. Maestas, N-2; Silas E. Martinez, GMX-3; Roy G. Merryman, N-1; Rosana R. Minnick, ENG-3; Carpio R. Montoya, SP-4; John R. Mosley, W-7; Margaret M. Nelson, SP-8; Petrita Q. Oliver, J-11; Peter P. Osvath, CMB-7; Charles Pacheco, CMB-7; Joseph E. Perry, Jr., N-4; Peter M. Petersen, SP-10; I. Leslie Post, CMB-8; Esequiel Rael, GMX-3; Roy Reider, H-3; Edward J. Sass, SD-5; Domenic Scarafiotti, Jr., CMB-6; Manuel J. Schafer, GMX-7; Arthur D. Schelberg, J-16; Thomas L. Shipman, H-DO; James E. Stallings, GMX-3; Stephen G. Sydoriak, CMF-9; Joseph W. Taylor, CMB-6; Paulus P. Thomas, SD-3; Adela P. Tometich, SP-3; Harold M. Agnew, W-DO; Gordon L. Brown, SD-2; John J. Clifford, D-8; Tony H. Garcia, H-1; Dibbon C. Hagar, D-8; Antonio J. Herrera, GMX-3; Edward E. Holcomb, ADP-SF; Aurelia G. Madrid, GMX-DO; Ascension J. Martinez, GMX-3; Jesus M. Martinez, SP-4; Jose Z. Martinez, GMX-3; Eloy J. Montoya, J-14; Thomas W. Newton, CMF-2; Alfredo L. Ortiz, GMX-3; Hugh C. Paxton, N-2; Rolf E. Peterson, K-DO; Ludie A. Pulliam, CMB-1; Carolyn Tafoya, GMX-7; Louise R. Vigil, GMX-7; Alfred H. Zeltmann, CMF-2.

continued on next page

15 Years

Frank G. Alarid, SP-3; Bert H. Baca, CMB-1; Harry E. Balance, GMX-3; Barbara L. Bayhurst, J-11; Ruth E. Beckett, Dir. Off.; Clarence M. Berg, SP-10; Robert L. Bivins, C-7; William E. Braun, SD-5; John C. Bronson, CMF-9; James A. Brophy, SD-5; M. Lucille Brush, SP-DO; Charles C. Campbell, N-2; Donald E. Chamberlin, SD-DO; George E. Cole, SD-2; Thomas J. Cooper, SD-2; Blaine H. Cushing, SD-5; Avis R. Dade, SP-DO; Robert L. Dannewitz, CMB-7; Keith V. Davidson, CMB-6; James M. Dickinson, CMF-13; Esther P. Donathan, P-1; Jerome E. Dummer, Jr., H-8; Edward L. Duran, SD-5; Burton E. Farley, SD-5; Florence M. Farley, MR; Robert B. Ferrell, W-1; Jim B. Finley, GMX-1; Mary Ann Ford, D-DO; Buddy A. Gallegos, SP-2; Thomas E. Gould, GMX-4; Aloys C. Guenther, SP-2;

Wilma V. Haney, AO-1; Francis H. Harlow, Jr., T-3; Albert M. Harris, GMX-3; Troy B. Harris, GMX-3; Walter D. Hatch, ENG-6; John E. Hockett, CMF-13; Herman W. Hoerlin, J-10; Darleane C. Hoffman, J-11; Marianna V. Howenstine, PER-1; Harry C. Hoyt, W-DO; G. Roger Huckins, C-DO; Nelson Jarmie, P-DOR; Raymond J. Johnson, SD-1; Thomas L. Jordan, C-DO; Robert N. Kennedy, J-7; Jean W. King, GMX-8; Alethea E. Klein, C-1; Walter Krieger, SD-1; Robert M. Lang, N-4; Jose N. Lujan, GMX-3; Flora K. McCracken, PER-DO; John L. McHale, Jr., T-9; Juan A. Martinez, SD-1; Rubel F. Martinez, J-10; Robert C. Meier, PER-2; Barbara J. Melton, C-1; Carroll B. Mills, T-DOT; C. Donald Montgomery, CMB-14; Roger H. Moore, C-5; Mary S. Morris, D-2; Eldon L. Murley, J-5/NTS;

Joseph A. Ortiz, SP-3; William A. Ranken, N-5; Robert J. Reithel, GMX-7; Marvin Rich, T-9; Bruce B. Riebe, H-1; James C. Robinson, SD-6; Daniel Romero, SD-1; Robert E. Roush, W-1; Jerome T. Rowen, CMB-6; Tony Roybal, ENG-2; Clara G. Salazar, J-DO; Johnnie R. Salazar, W-3; B. Roy Saunders, Jr., J-15; Gretchen R. Schuch, D-2; Anthony A. Serna, SP-3; Eulogio J. Serrano, SD-3; James E. Simmons, P-DOR; John F. Spalding, H-4; Harold W. Staake, J-7; Eleanor B. Standring, D-2; Edgar B. Stein, W-1; Sue Thompson, P-1; Leona K. Thorpe, PER-1; Lavern A. Turner, SD-5; K. LaMoine Van Etten, AO-5; Noberta Vigil, SP-8; John F. Weinbrecht, N-3; Franklin P. Welch, AO-7; Ralph W. White, CMF-DOT; Grace W. Whitis, P-1; Lloyd C. Wilkerson, K-4; George L. Williams, GMX-6; Ralph E. Williamson, T-2; Donald L. Winchell, W-3.

10 Years

Warren H. Adams, H-7; Fidel Archuleta, H-4; Harold C. Archuleta, CMB-11; Charlie E. Arnold, CMB-11; Jose E. Atencio, H-4; Barbara A. Bacon, C-2; Charles A. Bankston, N-7; L. Dewight Bazzell, GMX-3; Helen B. Boone, SP-10; Allen L. Bowman, CMB-3; Robert E. Boyer, SD-1; Tom M. Buchanan, SD-4; Harold M. Burnett, CMB-1; Edgar D. Bush, Jr., MP-3; Lois M. Bustos, H-1; Don H. Byers, W-7; William F. Carlson, J-17/NTS; Carl M. Cartledge, GMX-3; Albert W. Charmatz, N-4; Don H. Collins, J-3/NTS; Rae R. Creed, GMX-3; Charles L. Critchfield, T-9; Joel W. Dahlby, CMB-1; Donald O. Dickman, C-4; Billy W. Deitrick, GMX-3; Rudolph J. Dietz, Jr., N-1; Roger S. Dildine, W-4;

Samuel T. Donaldson, J-15; Glessie A. Drake, H-4; Stanley V. Dubiel, Jr., GMX-3; Guy N. Earp, CMB-7; William A. Ebert, MR-1; LaVerne M. Eimer, K-2; Roy Feber, Jr., CMB-8;

Jack Fellers, K-2; Edward R. Flynn, P-DOR; Jake W. Foglesong, CMB-7; J. Arthur Freed, D-2; Jose D. Gonzales, H-1; Ludwig A. Gritzo, GMX-3; Robert H. Groff, W-1; Katherine H. Harper, MP-5; Raymond G. Harvey, SP-2; James C. Hedstrom, N-3; Edwina Herrera, SP-11; Martha S. Hoyt, C-4; Lawrence L. Hupke, N-7; Marie H. Hutchinson, ENG-4; Robert A. Jeffries, GMX-7; Lawrence E. Jones, CMB-7; Robert Kandarian, MP-2; Robert P. Kelley, GMX-3; William H. Lenz, CMB-6; Ivar E. Lindstrom, GMX-7; Paul H. McConnell, ENG-DO; John W. McDonald, D-6; Joe A. Mariner, CMB-1; Clara Belle Martinez, SP-3;

Julian Martinez, MR-1; Lonjino Martinez, CMB-7; Theresa I. Martinez, AO-4; Athel L. Merts, J-15; Antonio Miera, J-6/NTS; Lonnie B. Miller, SD-1; Warner E. Miller, GMX-8; James R. Morgan, CMF-5; Thomas A. Oliphant, Jr., P-18; Vincent J. Orlicky, GMX-3; Warren E. Orton, K-3; Ralph E. Partridge, Jr., J-DOT; Evelyn J. Peters, H-DO; Roy L. Petty, N-1; Dortha J. Pirtle, C-1; Anne F. Powell, AO-2; Barbara L. Price, SP-3; Walter F. Rich, T-5; John L. Richter, W-4; Mary V. Riggs, MP-5; Fabiola Romero, AO-4; Jim A. Romero, SP-4; Pablo O. Romero, H-6; Bernadette A. Rourke, N-3; Jose G. Salazar, SD-1; Peter G. Salgado, K-5; Dorothy E. Shore, CMF-5; James W. Shore, CMF-13; Myron G. Silbert, P-DOR; Thomas E. Springer, N-4; William W. Steger, P-1; Blair K. Swartz, C-6; Terry C. Wallace, CMB-3; John R. Wallis, SD-5; Robert G. Wenzel, P-2.

new hires

C division

Fred W. Dorr, Portland, Ore., C-6

CMB division

Anna L. Calkin, Santa Fe, CMB-1 (casual)
Virginia M. Day, Los Alamos, CMB-1 (part time)
Marilyn V. Phillips, Los Alamos, CMB-1
James M. Ledbetter, Espanola, CMB-8
Larry S. Romero, Taos, CMB-8
Bruno T. Ochsner, Los Alamos, CMB-11 (casual)

CMF division

Esequiel Salazar, Santa Fe, CMF-4 (casual)
Francis A. Schmahl, Los Alamos, CMF-4 (casual)

D division

J. LaDoris Whitney, Los Alamos, D-6 (casual-rehire)

Engineering department

Eleanor C. Roensch, Los Alamos, ENG-5 (casual-rehire)

GMX division

William L. Tyson, Los Alamos, GMX-3 (rehire)
Thomas A. Stephens, Cedar Rapids, Iowa, GMX-7

H division

William E. Goode, Shawnee, Okla., H-1

J division

Joseph H. Calligan, Boston, Mass., J-12
Thomas L. Elsberry, Ruskin, Fla., J-14

K division

Albert F. McGirt, Rowland, N.C., K-1
Robert E. Seamon, Worchester, Mass., K-1 (postdoctoral)
Robert D. Turner, Las Vegas, Nev., K-3
Miles O. Rickard, Temple, Texas, K-4
Sandra M. Sutherland, Los Alamos, K-4 (rehire)

MP division

Henry M. Andreatta, Coffeyville, Kans., MP-1
Alphonse L. Criscuolo, Milford, Conn., MP-1
Kenneth E. Chellis, Cambridge, Ohio, MP-3
Elbert W. Colston, St. Louis, Mo., MP-3

Mail and Records

Manuel J. Chavez, Santa Cruz

Personnel department

Johnny O. Atencio, Dixon, PER-3
Ivadell Burge, Los Alamos, PER-4

T division

Ralph S. Cooper, Newark, N.J., T-DOT (rehire)
Lonni C. Harrison, Arlington, Texas, T-2
George N. Brotbeck, Chattanooga, Tenn., T-5

W division

Fela B. Dupre, Alcalde, W-1
Daniel R. Koening, Berkeley, Calif., W-4

short subjects

The annual Laboratory-sponsored Science Youth Days will be held April 16-18. Approximately 700 students from 40 high schools have been invited to participate.

In the past, Science Youth Days have been observed over a two-day period. This year it will be for three, with the first day devoted to honoring Los Alamos High School science seniors.

Two other changes in the program will be expanded tours of the unclassified areas of the Laboratory and the use of students from the Los Alamos High School as honorary guides during the last two days of the event.

Director Norris E. Bradbury is to address the groups of students each day.

Co-chairmen of the event are **Kent Bulloch** and **Thomas Langhorst,** PUB-2.

Loyd Cox, PER-5 group leader, has been appointed chairman of the Governor's Committee on Employment of the Handicapped.

Cox has served as vice-chairman for the past two years.

Members of the Committee are volunteers who work with employers in the State of New Mexico in the interests of job placement of mentally restored, retarded and physically handicapped men and women.

Visitors to the LASL Science Museum and Exhibit Hall during 1968 totaled 64,053, an increase of more than 3,000 over the previous year.

Representatives from 72 foreign countries toured the facility during 1968. The highest number of visitations in any single month was 13,410 during August, followed by 11,492 in July.

Don H. Byers, W-DO, has been appointed to serve on the USAF Scientific Advisory Board (SAB).

SAB is a scientific counceling body that consists of a group of civilian professional and educational scientists who guide the long range research and development planning of the Air Force.

The Board is organized into a wide diversity of panels which function in such areas as aeromedical and biosciences, geophysics and psychology, and social sciences. Byers, whose appointment was by the Air Force chief of staff, will also serve on the Board's nuclear panel.

Lucille "Pat" McAndrew will retire from the Laboratory March 7. She first came to Los Alamos as a technical sergeant with the Special Engineer Detachment, Manhattan District Engineers. She was stationed here from January of 1945 until August of 1946.

Mrs. McAndrew returned to Los Alamos as a civilian in May of 1947 to work for LASL, was made group leader of Mail and Records on Aug. 1, 1949 and remained in that capacity until her retirement. Her husband, Edward, retired from the AEC several months ago.

Adam F. Schuch, CMF-9 alternate group leader, has been appointed an adjunct professor of the Chemical Engineering department at the University of New Mexico.

In this capacity, Schuch is teaching a course in cryogenic engineering at the University during the current semester.

Simon Shlaer, former LASL employee in H-1, died in Miami Beach, Fla. January 31.

Born in Russia in 1902, he came to this country in 1910 and was educated at Columbia University. Shlaer was employed in Health division from 1947 until his retirement in 1967. He is survived by his wife, Lee, and three sons, William J., Los Alamos; Robert M., Rochester, N.Y.; and Allen B., Albuquerque.

The Technical Side

Presentation at The International Symposium on Atomic, Molecular, and Solid-State Theory and Quantum Biology, Sanibel Island, Fla., Jan. 13-18:

"Spin-Polarized Herman-Skillman Calculations for Some First Transition Series Atoms and Ions" by J. H. Wood, CMF-5

Presentation at a Radiological Sciences Division Seminar of the Savannah River Laboratory, Aiken, S.C., Jan. 14:

"Reaction of the Lungs to High Specific Activity Particles" by W. H. Langham, H-4 (invited talk)

Presentation at Texas A&M AIAA Student Section Meeting, College Station, Texas, Jan. 14:

"Advanced Nuclear-Electric Propulsion" by D. B. Fradkin, N-7

Presentation at Highlands University Chemistry Seminar, Las Vegas, N.M., Jan. 16:

"Studies of Ice and Water Structure" by S. W. Rabideau, CMF-2

Presentation at Annual Meeting of the Rocky Mountain Academy of Industrial Medicine, Colorado Springs, Colo., Jan. 16:

"The Serious Radiation Accident and the Clinician" by T. L. Shipman, H-DO

Presentation during the technical program, Second LAMPF Users Group Meeting, Los Alamos, Jan. 16-17:

"Progress Report on LAMPF Construction" by L. Rosen, MP-DO

"Status of Accelerator Design" by D. Nagle MP-DO

"Experimental Area A (Pions and Muons) -- Targeting and Remote Handling" by D. R. F. Cochran, MP-6

"Experimental Area B (Neutrons)" by L. E. Agnew, MP-6

"Experimental Area C (Protons)" by R. L. Burman, MP-6

"Stopped Muon Channel" by V. W. Hughes, S. Ohnuma, and T. B. Tanabe, all Yale University, New Haven, Conn., and H. F. Vogel, MP-6

"A Proposal for a Transversely Polarized Muon Beam" by R. B. Perkins, P-DOR

"Instrumentation for Pionic X-Ray Studies" by D. Lind, University of Colorado, Boulder

"Progress on HRS Facility" by G. Igo, UCLA, Los Angeles, Calif.

Presentation at Trinity Section Meeting of the American Nuclear Society, Santa Fe, Jan. 17:

"Behavior of Trained Subhuman Primates During Protracted Gamma-Ray Exposure and the Genetics of Radioresistance" by J. F. Spalding, H-4 (invited talk)

Presentation at L. S. U. Analytical Symposium, Louisiana State University, Baton Rouge, La., Jan. 20-23:

"Applications of Time-Resolved Spectroscopy" by D. W. Steinhaus, CMB-1

Presentation at Meeting, Virginia Polytechnic Institute, Blacksburg, Jan. 20-23:

"An Alternate Direction, Discrete Ordinates Method" by B. G. Carlson, T-1

"Numerical Studies of the Initial-Value Problem for the One-Velocity Neutron Transport Equation with Delayed Neutrons in Slab Geometry" by W. L. Hendry and N. S. Lathrop, T-1

Presentation at Biology Division Seminar, Oak Ridge National Laboratory, Oak Ridge, Tenn., Jan. 22:

"The H-2 Locus and Resistance to Protracted Gamma-Ray Exposure" by J. F. Spalding, H-4 (invited talk)

Presentation at Department of Biology Seminar, University of Minnesota, Minneapolis, Jan. 23:

"Performance Testing of Monkeys During Continuous Gamma-Ray Exposure" by J. F. Spalding (invited talk)

"The H-2 Locus and Resistance to Protracted Gamma-Ray Exposure" by J. F. Spalding, H-4 (invited talk)

Presentation at AEC Contractors Health and Safety Meeting, Las Vegas, Nev., Jan. 23-24:

"Applied Aerosol Studies at LASL" by H. J. Ettinger and H. F. Schulte, both H-5

Presentation at National American Nuclear Society Topical Meeting, Albuquerque, Jan. 28-30:

"Disposable Core Fast Burst Reactors" by L. D. P. King, Dir. Off.

"Godiva IV" by T. F. Wimett, R. H. White and R. G. Wagner, all N-2

"Maximum Burst Yields from Coated Particle Reactors" by F. T. Adler, Dir. Off.

"Statistics of Burst Generation" by G. E. Hansen, N-2

Presentation at Health Physics Society Midyear Topical Symposium, Los Angeles, Jan. 29-31:

"Air Monitoring and its Evolution at the LASL Plutonium Facility" by A. M. Valentine, D. D. Meyer and W. F. Romero, all H-1

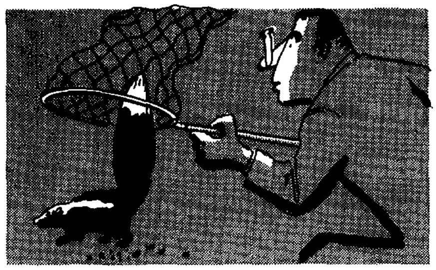
"Air Sampling in Operational Monitoring" by H. F. Schulte, H-5

"Health Physics at the Los Alamos 'Wing 9' Hot Cell Facility" by F. Fitzgibbon, CMB-14, A. M. Valentine and L. E. Martinez, both H-1

"High Intensity Electron Accelerator Radiation Hazards" by J. R.

continued on next page

20 years ago in los alamos



Culled from the March, 1949, files of the Los Alamos Skyliner by Robert Porton

Lost: One Skunk

If you should see a little black animal with a white stripe down its back, don't run, hold your nose, or cry for help. . . . It might be Flowers, the deodorized pet skunk of the Robert Armstead family. The skunk has been lost several days and the Armsteads have offered a reward for its return. Flowers won a first prize in the recent Fire Prevention Week pet parade, so he is a celebrity. If you see an animal answering the above description, please pick him up, take him home and claim your reward. If the little fellow doesn't turn out to be Flowers, you'll be a celebrity yourself!

Nineteen Juvenile Offenders During Month

Nineteen juveniles were picked up and dealt with by town police this past month. The youngsters varied in age from nine to fifteen years. In most cases, police have given custody of the youths to parents with each one required to report regularly to a town cop who volunteered to serve as a probation officer. "Of course, we will continue to give the young people every break possible," stated Lt. Jesse T. Rose. Rose has taken particular interest in problems of youngsters on the Hill. "Town police have made every effort to help juveniles in trouble, as a part of our community responsibility," he said.

Los Alamos Story in New York Times

Hanson W. Baldwin's feature on Los Alamos in the New York Times was read with interest this week. Mr. Baldwin had come to the Hill earlier to compile information for the story. Highlights included coverage of the Laboratory's "Clementine", a fast reactor, and a 12-million-volt electrostatic accelerator, now under construction. He called this project "the best-equipped physics laboratory in the world." Mr. Baldwin wrote of the coming transformation from a temporary boom town to a stabilized permanent community. He also covered the improvement in the release of technical information by the Atomic Energy Commission regarding the various areas of research. The story concluded with comments concerning the future when, in addition to advanced weapons development, the Scientific Laboratory would look to a thorough exploration of the peaceful uses of the atom.

. . . Technical Side

continued from preceding page

Parker, MP-1, and M. J. Engelke, H-1

"Some Uses of Thermoluminescent Dosimetry at Accelerators" by M. J. Engelke, H-1

"Surface Contamination Control at a Plutonium Research Facility" by J. W. Enders, H-1

Presentation at Fifth Mossbauer Methodology Symposium, New England Nuclear Corp., New York, Feb. 3:

"Use of Mossbauer Techniques to Determine Directly the Zero Point Velocity of Impurities: Calibration of the Second Order Doppler Shift" by R. D. Taylor, CMF-9, P. P. Craig and T. A. Kitchens, both Brookhaven National Laboratory, Upton, N.Y.

what's doing

MESA PUBLIC LIBRARY: March 1-21, 1968 Southwestern Fiesta-Biennial Exhibit by the New Mexico Museum of Arts. March 21-April 24, Oils by Virginia Brown, Los Alamos.

PUBLIC SWIMMING: High School Pool—Mondays, Tuesdays and Wednesdays from 7:30 to 9 p.m., and Saturdays and Sundays from 1 to 6 p.m.; Adult Swim Club, Sundays, 7 to 9 p.m.

CONCERT ASSOCIATION: James Dick, pianist, March 17, 8:15 p.m., Civic Auditorium. For information call Mrs. Henry Filip, 2-2135.

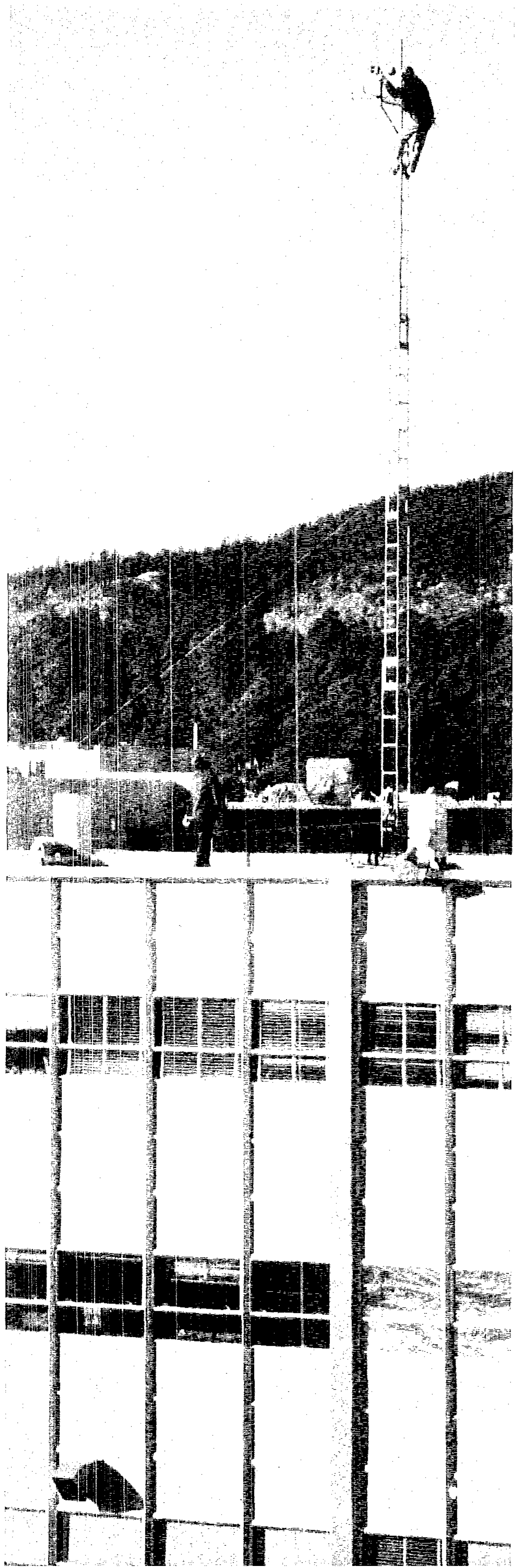
NEWCOMERS CLUB: Couples potluck dinner, March 28, 6:30 p.m., Recreation hall. Mrs. Phillip Koontz, speaker, "Early Days in Los Alamos." For information call Mrs. T. L. Talley, 2-4110.

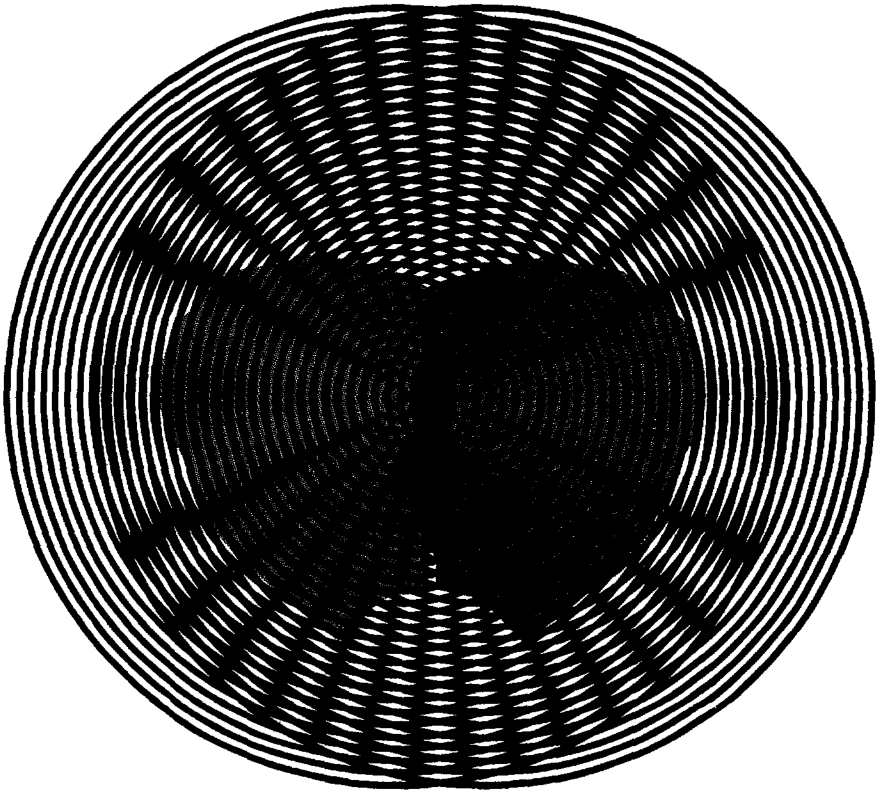
RIO GRANDE RIVER RUNNERS: Meetings scheduled for noon, second Tuesday of each month at South Mesa Cafeteria. For information call Cecil Carnes, 672-3593.

LOS ALAMOS SKI CLUB: Pajarito Mountain, tow runs from 9 a.m. to 4 p.m., weekends and holidays. Rental equipment available. Ski School schedule—group lesson, six to 12 students, one and a half hours, 10:30 a.m. and 1:30 p.m. Semi-private lesson, up to 3 students, one hour, 10:30 a.m., 12:15 p.m. and 1:30 p.m. Young children's class, kindergarten and up, six to 12 students, 12:15 p.m.

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

Precariously perched atop a tower on the west end of the Administration building is Ken Winn, SP-6, whose job it was to repair a transmitter in the anemometer used by the Meteorological section of H-6 to determine wind velocity and direction. Assisting Winn is Ralph Jennings, H-6, at the base of the tower.





profile

of LAMPF

The Los Alamos Meson Physics Facility project involves the development of a linear accelerator capable of producing a beam of 800 MeV protons with an average current of 1 milliampere. This unprecedented proton beam is essentially 10,000 times more intense than that from any existing machine in this energy range. Upon collision with appropriate targets, pi mesons, and subsequently mu mesons, will be produced in enormous quantities. They will be used for fundamental research in nuclear physics. The pion and muon beam intensities will permit important experiments in meson physics which are impractical with present day accelerators. Mesic atoms will be produced in abundance; neutron and neutrino research will be conducted.

In the current phase of the program the talents of the following types of personnel are utilized: Experimental and Theoretical Nuclear Physicists; High Energy Physicists; Mathematicians; Electronics Engineers (Controls, Microwaves, and Communications); Mechanical Engineers; and Technicians and Draftsmen.

A limited number of opportunities exist for highly qualified scientists and engineers in Los Alamos research programs. Interested individuals are invited to send resume to:

Director of Personnel
Division 69-3

los alamos
SCIENTIFIC LABORATORY
OF THE UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO

An Equal Opportunity Employer. U.S. Citizenship Required.

SHERMAN SWEET
AO-DO