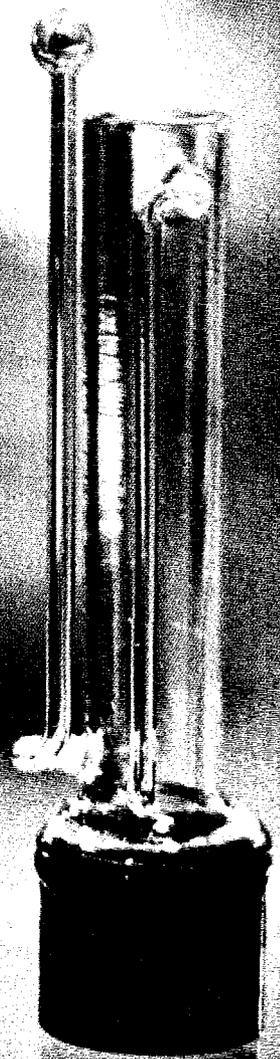
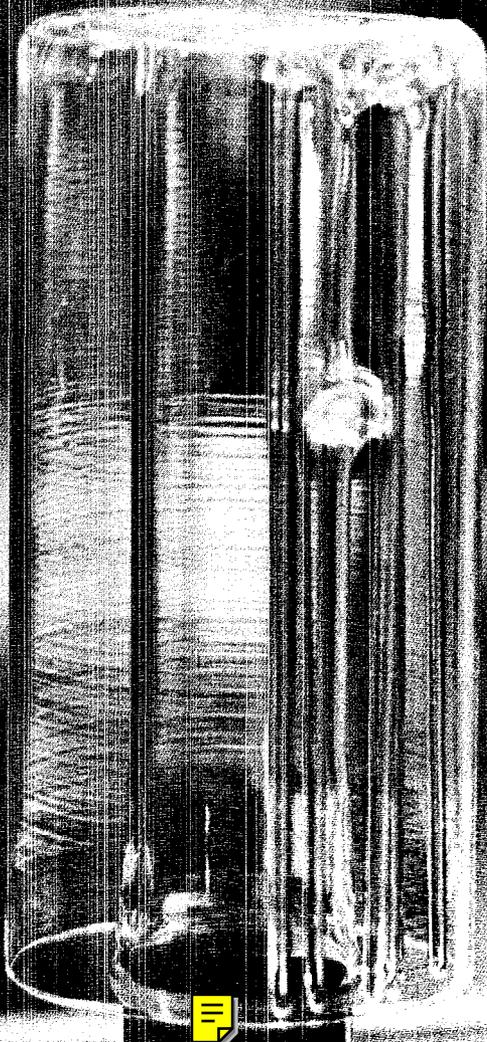


THE ATOM

Los Alamos Scientific Laboratory

February 1967



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CONTENTS:

- 1 Short Subjects
- 2 A Decade in the Outside World
- 4 Legislators Visit Laboratory
- 6 A Housecleaning Binge
- 8 Controversy Over Co-ops
- 11 Debate On Denver Steels
- 14 The World of Supercold
- 21 Hill Residents Remodel
- 24 The Technical Side
- 25 New Hires
- 26 Service Awards/Retirements
- 28 20 Years Ago/What's Doing

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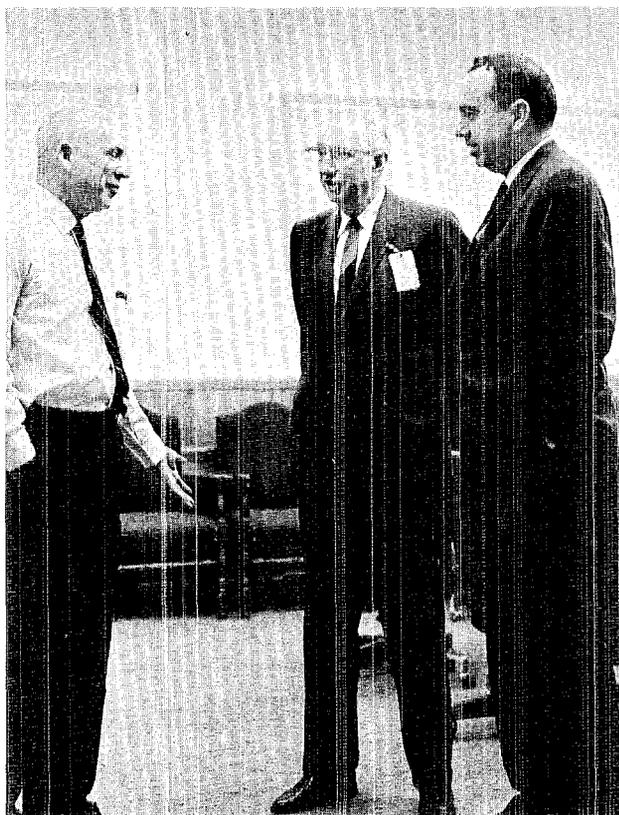
New technique for investigating processes affecting superfluid film flow was developed by LASL cryogenists Ed Hammel and Bill Keller. Story on CMF-9 begins on page 14.

short subjects

Science Youth Days at the Los Alamos Scientific Laboratory have been scheduled for April 13 and 14 this year.

Patrick G. Smith, PUB-2, coordinator of the event, said Science Youth Days were changed from the usual mid-February dates because of the greater possibility of inclement weather and adverse road conditions early in the year.

This will be LASL's 11th annual observance of Science Youth Days, which initially began in honor of the American inventor Thomas A. Edison who was born in the month of February. High school seniors from New Mexico, Texas, Colorado, Arizona and California will visit Laboratory sites during the event.



Earl C. Bolton, right, University of California vice president for governmental relations, and John Canaday, center, chairman of the regents committee on special research, conferred with Laboratory Director Norris Bradbury during a visit to LASL last month.

Carroll W. Zabel, alternate leader of K division from 1961 to 1964, has been elected vice chairman of the Atomic Energy Commission's Committee on Reactor Safeguards for calendar year 1967. Now associate dean of arts and sciences at the University of Houston, Zabel was with the Los Alamos Scientific Laboratory from 1949 to 1964. He was responsible for the operation of the Clementine reactor and supervised the design and construction of the Omega West reactor.



Ludgard Emelity, engineering section leader in H-7, left last month for Vienna, Austria, where he will work for the next two years in the health, safety and waste disposal division of the International Atomic Energy Authority as a senior engineer. Emelity will be on leave of absence during this time. With Los Alamos Scientific Laboratory since February, 1959, Emelity received his B.S. and M.S. degrees from the University of Wisconsin. Emelity's wife, Virginia, a substitute teacher in the Los Alamos schools, and their two children accompanied him to Vienna.

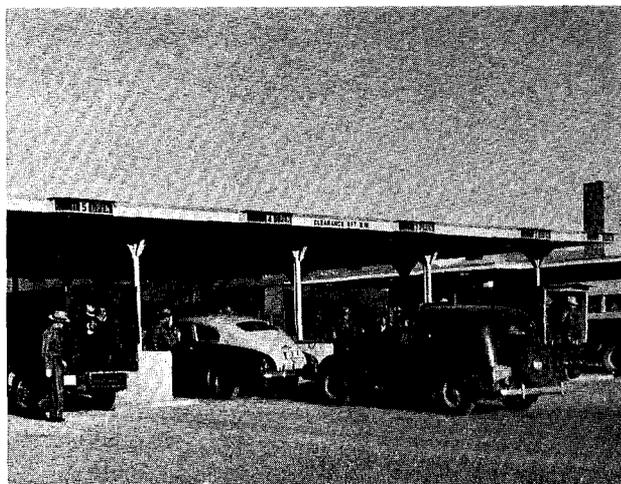
C. G. Chezem, N-2, will teach a graduate course in nuclear rocket propulsion during the spring term at Texas A & M University. Chezem, on leave of absence from LASL, is serving this year as visiting professor of nuclear engineering at the university.

Articles by W-7 staff members have appeared in two recent scientific journals. "Reaction Kinetics of Powdered Uranium and Deuterioammonia" by **R. M. Aire** and **J. H. McCrary** was published in the Journal of Chemical Physics, Vol. 45, December, 1966. The Jan. 10 issue of Physical Review published a paper by **McCrary**, **Elizabeth H. Plassman**, **J. M. Puckett**, **A. L. Conner** and **G. W. Zimmerman** titled "X-Ray Attenuation Coefficient Measurements."

(Editor's note: Articles by or about LASL personnel appearing in magazines and technical journals will be listed from time to time in The Atom. To have an article or published paper included in this listing, notify The Atom editor in D-413 administration building; telephone 7-6101.)



In the early days, Los Alamos residents had to go through two guard stations to get in or out of town.



Later, a modern stone and concrete structure replaced the frame shacks, but access to town was still tightly controlled.

Gate photos courtesy AEC

A Decade in the 'Outside World'

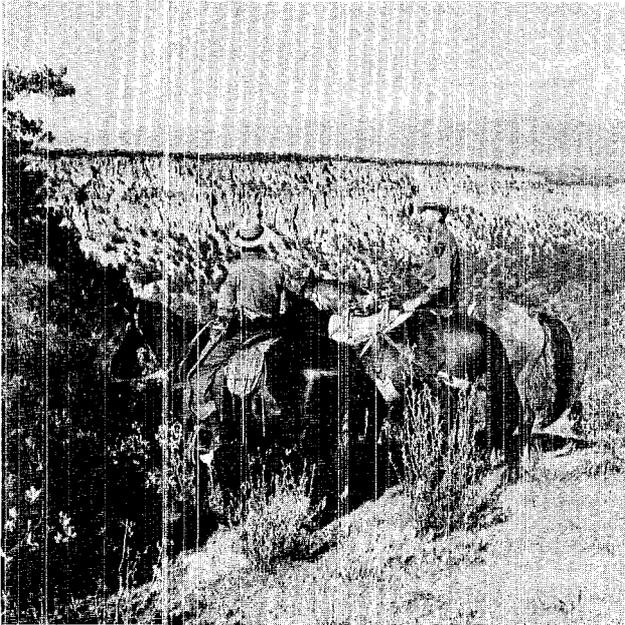
“Welcome to the outside world,” read an editorial in the Santa Fe New Mexican Feb. 17, 1957.

The next day, the security guards at the entrances to town were officially withdrawn, and Los Alamos became an “open city.”

Although the technical areas remained fenced and closely guarded, as they are today, the discontinuation of pass inspection at the gates to the city meant that residents could leave and enter town without stopping at the guard gate, that relatives could visit Hill families without special advance permission—and that the general public could see the “secret city.”

Although the decision to “open” the town came as quite a surprise to most Hill residents in February, 1957, the issue had been a highly controversial one for several years. From its beginning as Project Y in 1943, Los Alamos had been a closed community with tight security regulations on the town itself as well as the technical areas—and many residents liked it that way.

Oak Ridge, Tenn., became an open city in 1949, but in Los Alamos the technical and residential areas were almost as one, so the gates to the town remained. However, in 1948, a master building program had been outlined which would separate the tech area from the community townsite. Until this time, almost all housing and Laboratory buildings were in the area of Ashley Pond and the Community



Mounted guards patrolled the rugged boundaries of Los Alamos until the Hill became an "open city."

Center. But, gradually, new laboratories were built on South Mesa, and residential areas were developed in other sections of town. In 1953, the Atomic Energy Commission area manager appointed a long-range planning committee "to study security and private ownership of property from the viewpoint of residents as well as the AEC and the Laboratory."

The committee invited public discussion on various phases of long-range planning—and in particular the removal of the gates. And this is when the controversy began.

In the spring of 1954, the town council held a public meeting which drew a large crowd of residents voicing strong disapproval of removing the gates. According to *The New Mexican*, "The town was sharply divided into the groups which thought Los Alamos would become a mecca for curiosity seekers and tourists and that the gates gave additional protection from crime, traffic hazards and litter. Another group had no strong feelings one way or the other. A third group, very much a minority, thought the gates were a nuisance and undesirable in that they gave residents a false sense of security and an unrealistic view of life such as experienced in a normal, non-government town."

Later in 1954, the AEC polled the residents of Los Alamos and found that 81 per cent had strong objections to removing the gates. Residents waited for the AEC decision. Finally, in April, 1955, the AEC



Los Alamos AEC Area Manager Paul Wilson, right, escorted Gov. Edwin L. Mechem through the main gate without a pass on Feb. 18, 1957, signifying the removal of access restrictions on the townsite.

announced that the gates would remain closed, but that "if a substantially different situation develops in the future, the commission would reconsider its position."

Said *The Denver Post*, "Los Alamos will remain the only closed city in the United States with the exception of some military communities and all penal colonies." And, according to *The New York Times*, ". . . most of the residents are glad of it."

Then, nearly two years later, the AEC announced, on Friday, Feb. 15, 1957, that the town would open three days later—on Monday, Feb. 18. The announcement made it clear that although the gates would open, security of the Laboratory would remain tightly guarded, as would air space over Los Alamos. Coming as it did after the controversy had died down, the decision took residents by surprise. But on Monday noon a ceremony was held at the main gate, and Gov. Edwin L. Mechem became the first person to enter Los Alamos without a pass.

According to *Newsweek* magazine, "He was greeted by City Manager Paul Wilson, who expressed the hope that Los Alamos would now become 'a more normal community.' But the people of Los Alamos, as they looked around at their snug houses of pink, blue, green and white, weren't so sure they would like being more normal. Until now, they had not had to worry about burglars, hawkers, tourists—or even unexpected visits from in-laws."



Ed Little, P-15, illustrated the "pinch effect" in Sherwood for State Sen. Ozzie Davis of Bernalillo County as Rep. Ed Grilly of Los Alamos (right background) looked on.



P-14 tour guide Nick Salazar, left, and Lt. Gov. E. Lee Francis demonstrated the power of a magnetic field with a heavy, levitating wrench at the entropy trapping machine.

Scylla IV operation is explained by Warren Quinn, right, P-15, for State Senator Jerry Apodaca, center, from Dona Ana County.



New Mexico Legislators Visit LASL

Radiation safety, pollution safeguards and research into new sources of nuclear energy for home and industrial uses occupied members of New Mexico State Legislature during a day-long visit to Los Alamos in January.

Interrupting their heavy work schedules the day after they formally convened in Santa Fe, 42 legislators and their wives made the trip. They were guests of Los Alamos Chamber of Commerce for lunch at the new Los Alamos Inn, and then visited Los Alamos Scientific Laboratory's health and thermonuclear fusion research areas.

LASL Director Norris Bradbury addressed the group—more than 200 Chamber members and guests—during lunch. Afterward the legislators were given their choice of health research, occupational health or waste treatment laboratories for an hour-long visit. They all met at the Sherwood laboratory for a tour and talks on fusion research, and finally visited LASL Science Hall where they were served coffee and cookies and given a brief look at exhibits depicting other research programs of the laboratory.

Wright Langham, Harry Schulte and C. W. Christenson worked with Dr. Thomas L. Shipman in showing the visitors through the various health labs. Legislators learned a little of LASL research on the reaction of the body to radiation, the new fields of cellular and molecular biology and methods of treating and clarifying both air and water of radioactive materials and other toxic substances.

At Sherwood, Jim Phillips lectured the legislators briefly on efforts to control thermonuclear fusion and the benefits which can come from being able to use the tremendous source of nuclear energy. They were then escorted through the Sherwood laboratories to view devices aiding scientists in their work.

At lunch, Dr. Bradbury reviewed the history of the Laboratory, started, he said, for the "sole task of producing an extraordinary instrument of war," the



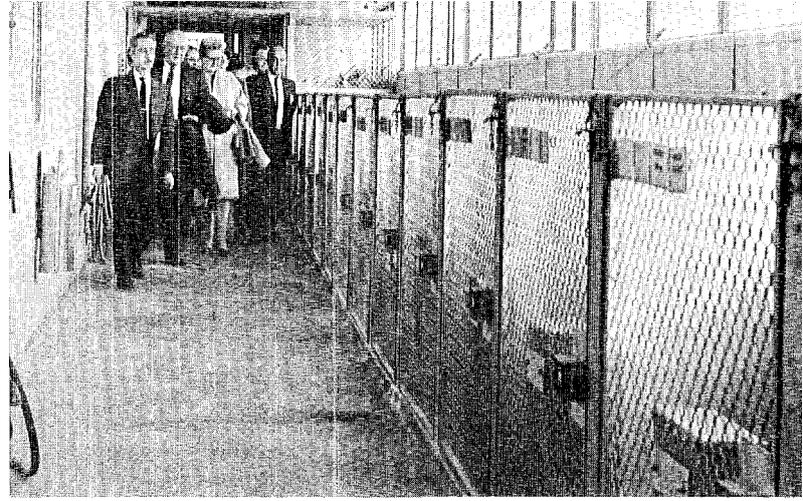
Sue Wooten, PUB-2, operates a LASL museum model of a Kiwi reactor for three Navajo legislators, Rep. Jake C. Chee and Sen. Tom Lee, McKinley county, and Rep. Wilbert C. Begay, San Juan county.

atom bomb. The remarkable achievement—putting fission energy to work—was brought to pass in a little over two years. Scientists had to choose the quickest and simplest way to achieve their objective, he explained. In doing so, they by-passed other methods of accomplishing the same thing. “Exploring these other paths led to the continuing operation of LASL in the interests of national defense and national prosperity,” Bradbury said.

The years since the war have been devoted to keeping this country ahead in the nuclear weapons business and to making certain no other nation would make technical advances which could “surprise or embarrass our nation.” LASL, then, continued improving fission weapons and created the H-bomb which operates on the fusion principal. “No one works on these weapons with any great relish. They hope they are only gaining time in which other ways of settling differences between nations can be worked out,” he said.

Turning to peaceful uses of nuclear energy, Bradbury briefly outlined LASL efforts to produce power through fusion energy with its accompanying advantage of a practically limitless source of materials in water, and no pollution of air or water because there is no radioactive debris. At this time, he said, an eight- to ten-million dollar device called “Scyllac” has been proposed to give LASL an additional research “tool.”

Returning to fission energy, Bradbury said much work is being done on uses of plutonium and uranium 238—ordinary uranium—for energy production. The advancement of rockets brought a need for reaching out into space, and the nuclear rocket came into its own. LASL developed a nuclear fission reactor to power space vehicles, and “this research will continue for several years,” Bradbury said. Those reactors—called the Kiwi reactors—have also brought on new ideas for high temperature research into new



Wright H. Langham, H-4 group leader, explained some of the research with animals at HRL for the visiting legislators

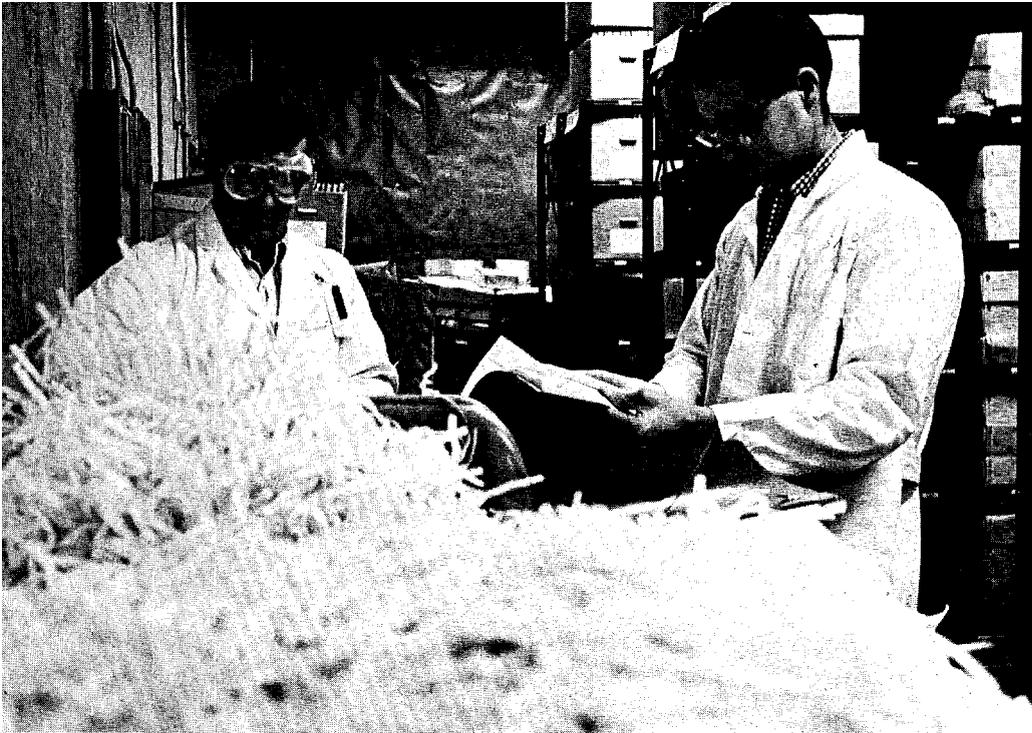
fuel elements and generation of useful energy. The result has been the building of the reactor known as UHTREX—ultra high temperature reactor experiment. “We also have a deep stake in biology,” he continued, “both to keep our people safe now and afterward, and to provide basic knowledge.” Programmatic objectives also include basic research into almost every field of physics, chemistry, metallurgy and others and “how we can use our abilities,” he said.

One new program is meson physics research and the proposed linear accelerator which will be national in character. A facility will be created here for use not only by LASL, but by people of the academic world throughout the Rocky Mountain area. “Keeping in touch with the young people of the academic world keeps us alive and aware of new ideas. At the same time we can enlighten and inspire them through our research,” he said. “This large, unique accelerator will aid in probing deeper into the nucleus of the atom. Why? Because that’s where all the energy in the universe comes from. Man has the right and the necessity to learn as much as he can about this energy,” he said.

“We must keep looking under every stone because we never know when we will find a useful scientific bug. We have to turn them all over.”

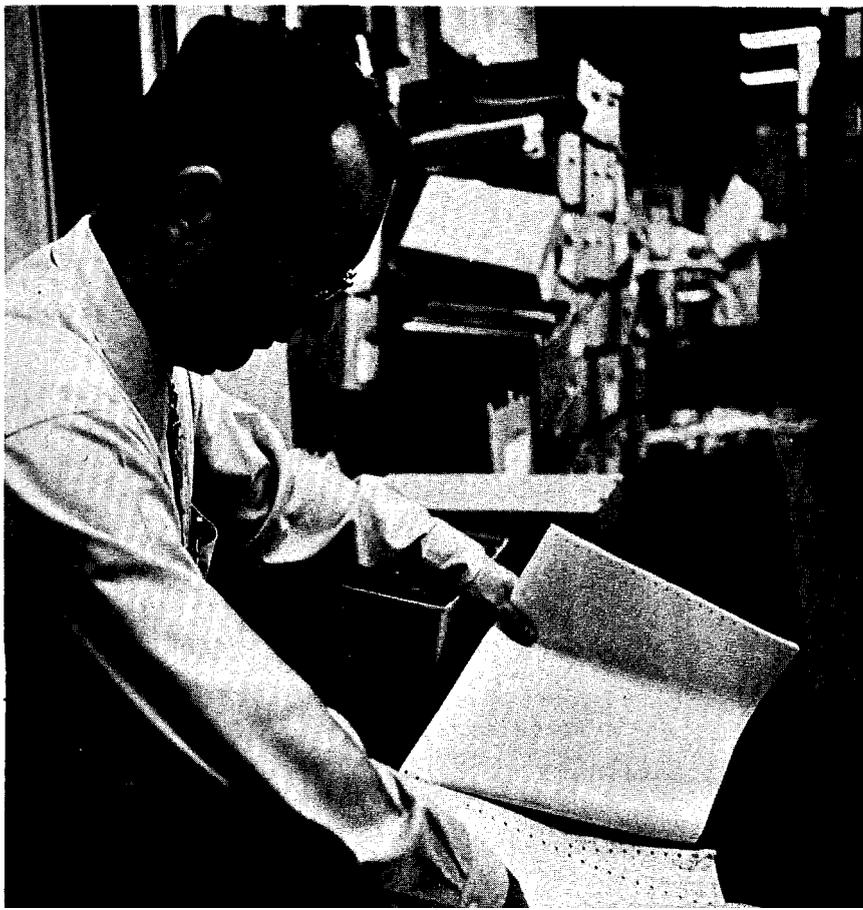
Expressing confidence that LASL programs will go “forward in the future,” and acknowledging that LASL operates on tax dollars, Bradbury said: “We are proud of our state. We are proud of Los Alamos. We are working for you, and we hope you feel we are good workers.”

State Sen. Sterling Black and Rep. Edward Grilly of Los Alamos issued the invitation to the legislators. Former legislators from Los Alamos, Harold Agnew, Foster Evans, Boyd West and Tom Roberts, were special guests at lunch. Lt. Gov. Lee Francis headed the legislative contingent.



Edward Roybal, left, and Oliver C de Baca have shredded literally tons of paper since the LASL clean-out campaign began. All classified material and payroll and personnel records are shredded before being turned over to the AEC protective force for disposal.

David Heimbach sorts through IBM listings to be destroyed.



LASL

Like many a homeowner who discovers his attic or garage is overflowing with things that once seemed worth saving, the federal government, too, finds it is necessary to do some housecleaning.

In an effort to cut down on the amount of federal money spent on filing equipment and other office furniture, President Johnson has requested all government agencies and their prime contractors to clean out the files and destroy all material that is no longer useful.

January and February were designated "clean-out month" for Atomic Energy Commission and its contractors; however, LASL plans to continue its housecleaning efforts through the end of the fiscal year.

David Heimbach, LASL records management officer, is in charge of the Laboratory's clean-out efforts. During the first four weeks, he supervised the disposal of more than 50 tons of no-longer-useful material—some 2,000 cubic feet if it. About half of this material came from the

Housecleaning Yields Tons Of Useless Records

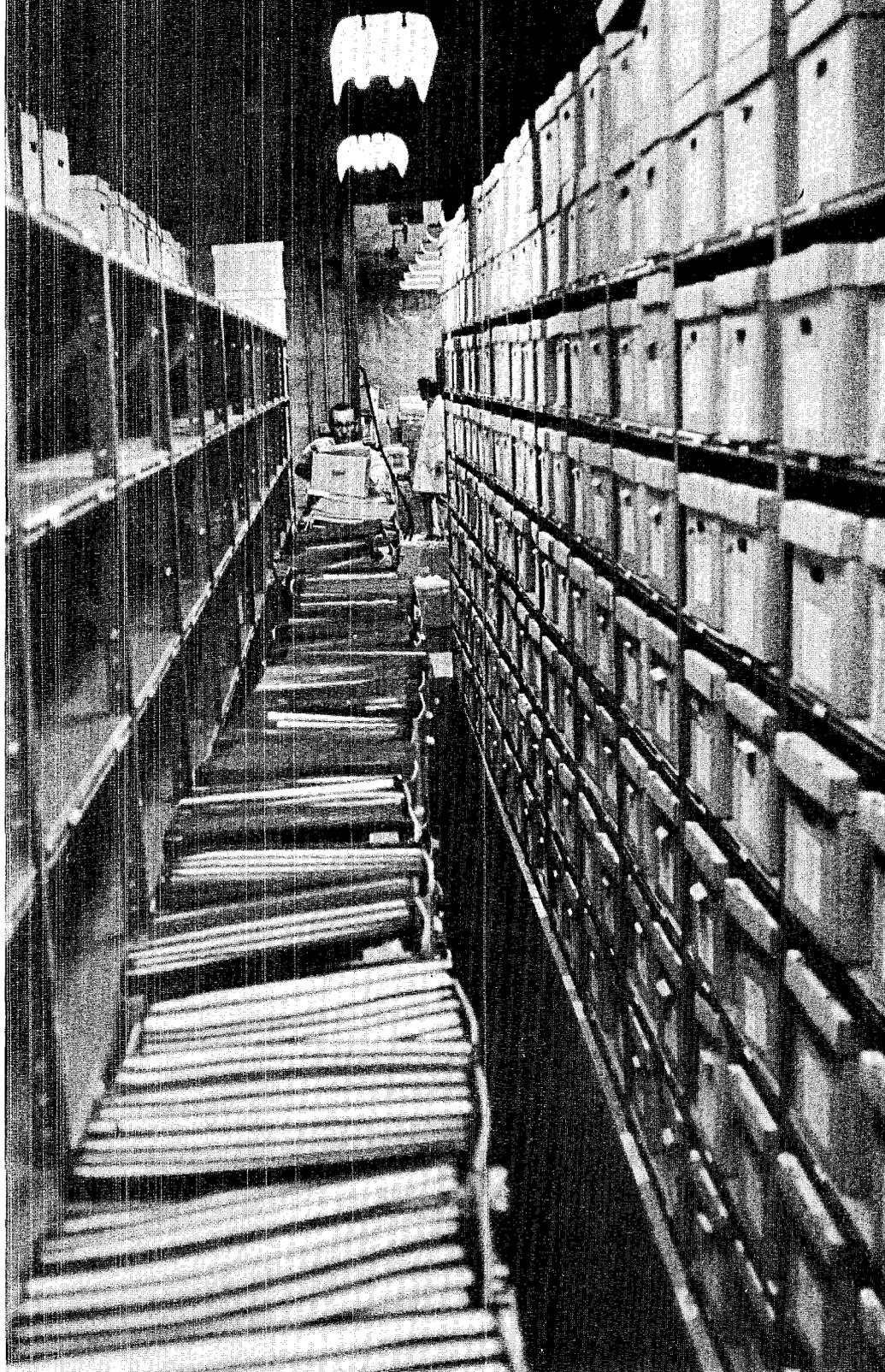
records management office, which stores material no longer needed in individual offices.

"Nothing of value has been destroyed," Heimbach explained. Nearly all Laboratory material is "scheduled"—that is, it has value for a certain length of time. Such things as purchase orders and payroll records are kept for several years and destroyed when they are no longer useful.

After only a month of the housecleaning effort, some 200 pieces of filing equipment were turned back to the supply and property department to be reissued. In addition, many offices got rid of enough material that they now have room for new records without adding more file cabinets.

Heimbach said that at the end of last fiscal year, the Laboratory had 42,000 cubic feet of records.

"LASL records have been increasing on the average of 10 per cent a year," Heimbach said, "so we really need to reduce the files by 30 per cent instead of 20."



Heimbach is nearly hidden by the tons of material to be destroyed during the clean-out campaign.

Controversy Snags Multiple Housing Sales

'Really a complicated
mess,' ad hoc
committee finds

By BARBARA STORMS

“This is *really* a complicated mess,” sighed Chairman Franklin N. Parks midway through last month’s hearing of the ad hoc committee on multiple family housing. And it was no less complicated by the end of the day.

The committee was appointed by the Atomic Energy Commission late last year after increasing protest forced postponement of the sale of apartment buildings. It met Jan. 12 to hear complaints from interested citizens and recommendations and suggestions for improvement in the sales procedure.

First offering of the buildings was to have been made on Oct. 21 to legally organized cooperatives in accordance with the provisions established in Section 58 amending the Atomic Energy Community Act of 1955. First priority for the purchase of the buildings, to be sold singly or in blocs, would have gone to cooperatives composed of a majority of the bona fide occupants of the building in question. Second priority would go to cooperatives made up of fewer than a majority of the occupants.

Before either priority could be exercised, however, the purchasing cooperatives would have to acquire 100 per cent of the occupants or potential occupants as members.

Opposition to the cooperative system prompted a last-minute postponement of the sale until further study could be made.

Prime objection to the sale, most of it from residents of quads, appears to be based on the technicalities of cooperative ownership: that quads must be purchased in blocs of at least two, that all occupants must join or move out, and that each owner must occupy his unit, thus virtually eliminating rentals in Los Alamos.

The committee itself offered for public consideration some possible changes in rules that would broaden the base of the sale as much as possible without requiring changes in the law.

According to the proposal, the present method of sale to eligible cooperatives meeting existing AEC and FHA requirements would be continued except

that the second priority would be deleted. In other words, unless the cooperatives were welcomed by a majority of the occupants, it could go into the open market.

The second possibility would be that project-connected occupants of a single quad would be eligible for the AEC priority and the price discount privileges, but only on the basis of a cash sale since such a small co-op presumably would not meet FHA standards.

The committee also suggested that all occupants of a quad or apartment, without forming a co-op, would be given priority to purchase the house at the appraised value, foregoing the discount. Such a group presumably would be eligible for FHA financing provided they would individually obligate themselves to underwrite the purchase.

The committee indicated that for the sake of expediency it hoped to be able to remedy the problem without resorting to legislative changes but did not rule out that possibility if it appeared necessary.

Most of the witnesses declined to comment on the committee’s proposal until it could be more thoroughly studied.

In his opening statement to the committee, Charles Caldwell, GMX-6, a 14B resident and prime mover in the protest movement, based his objections on three main points: First that cooperatives must be made up of at least two buildings in the case of quads, and not less than five occupants of the two buildings. He objected to the competition between small and large co-ops, pointing out that priority would go to the co-op having the largest number of members in each building and that if an occupant had chosen the wrong co-op he would not have an opportunity to change his membership and would be evicted. He objected strenuously to professional management required for co-ops to become eligible for FHA financing.

Caldwell said his first choice would be that units, specifically quads, be sold individually, “even if this means additional expenditure for separate metering, etc.” His second choice is a sale to the occupants on

a condominium concept but confined to one building "and without the insulting and demoralizing requirements of professional management."

He asked the committee to consider five suggestions to remedy the situation:

1--Amend the present laws to provide for the sale of individual units to each occupant who wishes to buy wherever such possibility exists.

2--Amend laws to permit sale to condominiums confined to one building.

3--Provide rental units in sufficient quantity to meet the requirements of those who do not wish to buy.

4--Make specific provisions for accommodating the needs of those who have retired.

5--After all occupants of a building have turned down an offer to buy their units, "then and only then" offer the building to the senior tenant.

In later testimony another quad occupant objected to the "senior tenant" idea because of the inequities that occur. He pointed out, as an example, that in his building the senior tenant had been an occupant for 17 years and the junior tenants for 16 and 6 years, whereas in a neighboring quad the senior tenant has occupied the building for less than a year.

The sale of individual quad units was proposed frequently throughout the hearing, and the question

was continually posed as to why the quads were deemed inseparable.

Herman Roser, deputy AEC area manager, said the possibility had been considered at length during early disposal talks and that the decision to sell the buildings as whole units was the result of extensive engineering surveys made in 1962 which indicated that splitting was not practical. The complete survey was made available to the committee, and a summary of the findings appears elsewhere in this article.

Echoing Caldwell's sentiments, Hermann Ruess, K-1, another 14B resident, proposed the same three alternatives to cooperative ownership. His objections to cooperatives included the "considerable" down payment, three-year lease and professional management required and the fact that cooperatives do not provide for rental housing. Ruess also objected to what he referred to as "threats" to non-joining occupants made by the Los Alamos Community Homes cooperative by correspondence and phone calls.

A number of witnesses said they accepted the cooperative idea but would like to limit their purchase to one building rather than a bloc. Along this same line, State Representative E. R. Grilly told the committee he intended to introduce a bill to the state

Continued on next page

Roser Explains Decisions on Quads

One of the most frequent questions brought up at the hearing on multiple family housing last month was why the quadruplex units could not be sold individually.

In his statement to the committee, Herman Roser, AEC area manager, provided background for the decision to sell the quads as multi-family units.

"Prior to final classification of properties, an intensive study was made of all buildings containing more than one dwelling unit to determine which could be offered for sale as 'single family units' in a multi-family building.

"This study was directed to all aspects of the problem, including structural characteristics, utility arrangements, siting and engineering considerations and cost

estimates of construction which might be required to overcome any problem or deficiencies. Upon completion of the study, a determination was made as to which units would be classified for sale as single family units in a multi-family unit."

The following summary of the findings, as they applied to quads, was submitted to the AEC in Washington on Feb. 11, 1963. In each case the recommendation was to "sell the building as a unit."

"Type 4U 12: Overlapping closets on second floor and breezeway easement problems make it impractical to attempt separation. Common pipe chases and vent stacks add to the problem.

"Type 2-4 12: Common pipe chases and vent piping in common walls, foundation access and

heater locations make separation impractical.

"Type 14A: Common heating system and offset first floor common walls differing from second floor common walls make separation impossible.

"Type 14B: Common vent areas, pipe chases and air space with separate wells make separation impractical.

"Type 15: Common heating system and single floor unit construction makes it impossible to separate.

"No other units are separable either, due to construction characteristics and central heating systems."

Roser said that in consideration of possible future sales, the AEC felt all units should meet FHA requirements for financing. "We felt it would be a disservice to do otherwise."

Multi-Family Housing . . .

continued from preceding page

legislature early in the session reducing the required number of units in a condominium from five to two.

Fred R. Selarge, a security inspector living on Kiva Street, told the committee he was concerned with the rights of tenants in multiple units other than quads. He said he felt occupants need some protection because of the imbalance of housing supply and demand.

"The key to cooperatives is permanency," he said. In large communities where cooperatives are successful, those who join have stable family status, go into stable buildings in a stable city. In Los Alamos, he continued, the size of the community, the size and type of apartments are against co-ops. "I don't believe this type of housing is desirable enough to entice people to join cooperatives."

Selarge said apartment occupants who don't want eviction should have some rights. On the other hand, he said, if the buildings are not sold to cooperatives, the occupants probably would be charged excessive rents.

"Provisions should be included in the sales contracts to provide protection from both these problems," he concluded.

The need for rental housing was mentioned time and again as a major objection to limiting apartment sales to cooperatives. Post doctoral appointees and other temporary employees, new hires, teachers, retirees and other people who do not choose to buy were singled out as likely to suffer most if all the buildings are sold to co-ops.

George A. Browne, assistant director for cooperative housing for FHA in Washington, surprised the assemblage by stating that cooperatives are not barred from renting under certain conditions, subject to FHA approval. He said a cooperative may acquire up to 20 per cent of its income from rentals and still retain its non-profit tax advantage provided it has permission from the local insuring office. Rented units must ultimately be sold, however, once they are vacated by the renter, Browne said.

The most urgent plea for rental housing at reasonable rates came from Robert Shreffler, president of the Los Alamos Board of Educational Trustees.

Shreffler said the school board believes quality education is attained through recruitment and retention of a highly qualified professional staff for schools, but pointed out that for Los Alamos this will become increasingly difficult unless it is possible to promise a prospective teacher adequate housing at reasonable rates and of insuring the housing of people already hired. He expressed concern that adequate housing for teachers may not be available at any rental rate if all apartments are sold.

To insure adequate housing for new and non-tenure teachers who wish to rent, the school board proposed that rental be continued under auspices of the AEC, to be handled the same way as the 64 units being retained for summer students and other temporary employes. As an alternative, the board asked that units be given to the school board which would rent and maintain the units. Shreffler emphasized that the board considered this a poor second choice.

The current proposal by the board is mainly a reiteration of previous requests made, first in April, 1962, before the hearing of the Subcommittee on Communities of the Joint Committee on Atomic Energy. Again in May, 1964, School Superintendent C. W. Richards officially requested the AEC to retain housing for teachers and "if such an arrangement is impossible," the AEC was requested to "turn over to the school housing that would be adequate until normalcy is reached."

In April, 1966, in a letter to AEC Area Manager Charles Campbell, Richards again stressed that housing of new teachers would be an acute problem in securing quality people after transfer and urged AEC to "make every possible effort to secure apartment housing which may be used by teachers for a limited time or until they have been able to procure more permanent housing. In both cases the schools were advised that AEC had attempted to reserve rental housing from the sale without success.

Finally, in October, 1966, Richards again listed the schools' needs and cited a number of specific incidents where inadequate housing had resulted in the loss of newly-hired teachers. At this time Richards asked that if all else failed whether the school system itself might be allowed to join cooperatives and sublet the units to teachers.

FHA's Browne replied at the hearing that arrangements can be made with co-ops, and have been made elsewhere, to provide for teachers and students.

Proponents of the original cooperative sale method, most of them members of the Los Alamos Community Homes, Inc., known familiarly as "the big co-op", gave statements pointing to economy, efficiency and convenience as the primary advantages of cooperative ownership.

Philip Thompson, representing LACH, gave the committee a run-down on the state of "the big co-op" as of Oct. 21 when the sale was postponed. He said the group had acquired about 300 members and had first priority on about 176 buildings. He said they had made no sales and had accepted 20 cancellations since Oct. 22, but added that none of the cancellations was attributed to delay of the sale.

Thompson estimated that LACH would pay management fees on a 600-unit coop of about five per cent of the gross annual income. He said this would be about one per cent more than is charged elsewhere because there would be more units and conse-

quently more work but emphasized that rents here would be lower. He said the legal-organizational-marketing fee charged by his company, the FCH Company, would amount to about three and three quarters per cent of the total mortgage.

Thompson recommended that legislation be changed to permit a co-op an occupant membership of 70 per cent instead of 100 per cent. He also suggested that regulations be changed to permit all occupants who had joined "losing" co-ops to join the "winning" co-op after either first or second priority had been awarded.

Another co-op organizer, Don Kincaid, ENG-4, protested the AEC change of heart, explaining that while they would have preferred to buy their own units, he and seven other occupants of two quads had organized a cooperative as instructed by the AEC and were prepared to pay cash for their buildings. He felt the AEC was not holding up its end of the bargain.

The board of county commissioners, in a statement read by Commissioner Martin Gursky, justified the AEC's providing for re-examining the various methods of multiple housing ownership "because of the difference between the expectations once held for the construction of private housing and the actual conditions which now exist."

"The addition of the present 'tight money' market to the inherent difficulties of isolation and non-availability of a pool of local skilled construction labor

has resulted in the construction of new housing being far behind need and little prospect for immediate relief," he said.

"If Los Alamos is truly to function as a self-governing community, the people of Los Alamos must feel a sense of belonging and participation in that community," the statement continued. "This sense cannot exist when so many people are insecure in so basic a human need as shelter for themselves and their families. We feel that the addition of these elements of insecurity is adding a burden to the community which is complicating the already difficult job of transfer."

Just how or when the multi-faceted problem will be solved is a matter of conjecture. The ad hoc committee expected to take at least two weeks sifting through volumes of information to arrive at its conclusions and write its recommendations. The committee's report will go to the AEC in Washington which will make the final decision on the action to be taken.

Members of the committee are I.ASL's Raemer Schreiber, technical associate director, and John H. Manley, research advisor; Chairman Parks, assistant general counsel for military application, AEC; John C. Ryan, director, Office of Economic Impact and Conversion, AEC; William O. Sanford, deputy assistant commissioner for property disposition, FHA; and Richard T. Curtis, assistant director, Rental Housing Division, FHA.

The Denver Steels:

Occupants Want to Buy

By BARBARA STORMS

While the problem of how to dispose of multi-family houses in Los Alamos is fraught with complications, the question of the Denver Steel houses—to sell or not to sell—seems incredibly simple and the arguments remarkably one-sided.

During a hearing of a special review committee last month, the testimony so overwhelmingly favored sale of Denver Steels to their occupants that Chairman Chalmers King, in a determined effort to hear

both sides of the question, repeatedly urged opponents, if any, to speak up. None did.

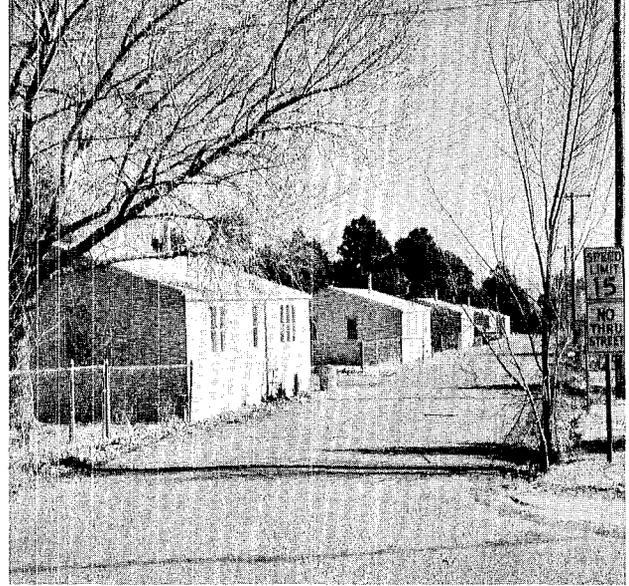
The 243 units in question are prefabricated metal houses which were trucked to Los Alamos from Denver in 1947 to provide, along with the Western Area, the first permanent housing on the Hill. All are two-bedroom units containing 718 square feet and built with aluminum I-beam framing and aluminum siding, hardwood floors and gas-fired floor furnaces. Aver-

age lot size is about 6,000 square feet.

The fate of the houses was originally decided in 1961 when AEC announced plans to retain the units for rental, remove them when they were no longer needed and offer the land for new residential development. The announcement was not news. The plan had already been recommended in 1960 by the residential real estate task group of the Los Alamos Planning Com-

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*Not economically
practical
to maintain,
says AEC*



Denver Steels . . .

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mittee investigating all aspects of disposal.

The committee recommended removal of all substandard housing including the Sundts, Wingfoot trailers and Denver Steels. The recommendation was reiterated in 1962 by the Department of Housing and Urban Development which reported at the Congressional hearing on disposal in April that "the principal deficiencies in the Denver Steels are the materials used and the design of the buildings. These deficiencies cannot be corrected. We agree with the Los Alamos Planning Committee's conclusion that these properties should be removed from the inventory."

In 1964 the Leo A. Daly Co., in proposing a comprehensive plan for Los Alamos County, strongly recommended redevelopment of the Denver Steel areas "because of its potential as a slum area."

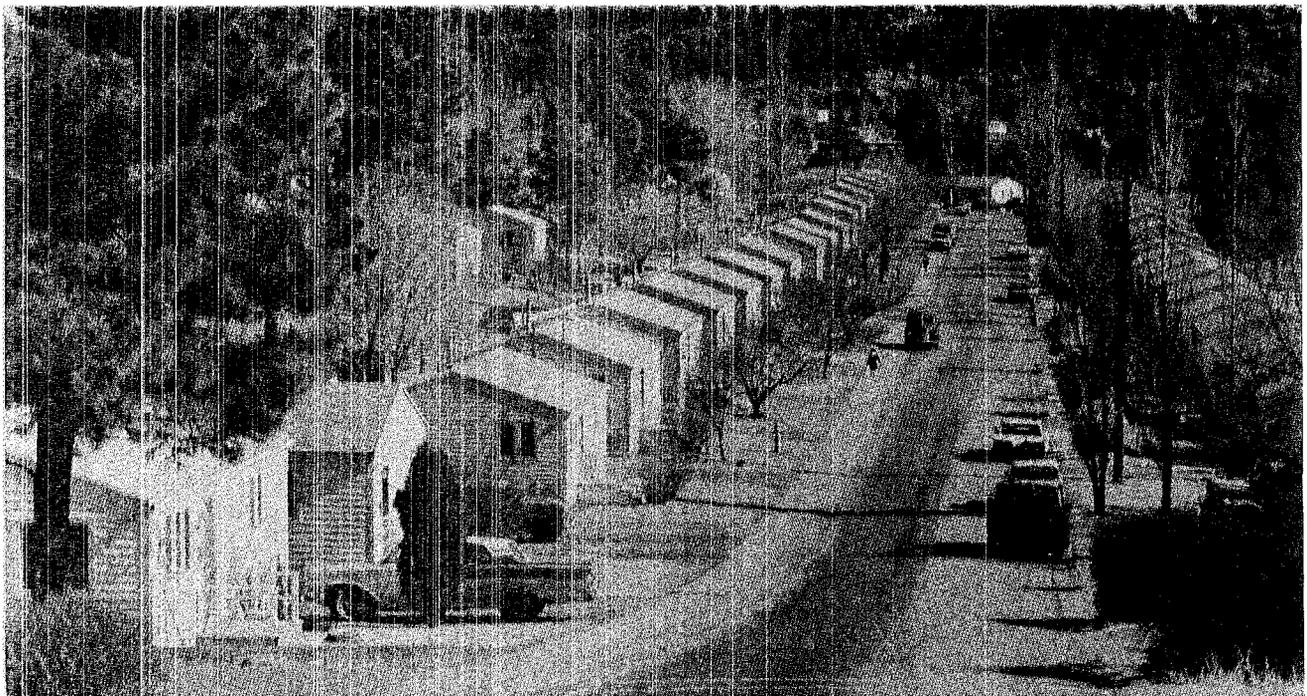
The Daly Co. maintained that annual maintenance costs are excessively high, that condensation and heating problems are common and that the floor area of 718 square feet falls below most minimum requirements for single family homes.

The AEC has long maintained that Denver Steel housing is not economically practical to maintain; that first owners would have difficulty selling, when the time came, since a second sale could not be financed through FHA; and that

density in the area is extremely high (8.5 units per acre).

From 1963 on, however, residents and interested citizens have voiced increasing displeasure with the AEC decision, and late last year, after preliminary meetings, AEC's Albuquerque Operations Office appointed the investigating committee to reconsider the problem. On the committee, in addition to King, chief counsel for ALO, were Ralph P. Johnson, ALO assistant manager for administration, and Don Johnstone, ALO manager for plans and budgets.

At the January hearing, Chairman King read a list of some two dozen people, both residents and non-residents of the Denver Steels,



Potential slum? 'Ridiculous,' says committee of occupants

and the entire New Mexico congressional delegation, all of whom had written the committee favoring reversal of the AEC decision.

Both Sen. Clinton P. Andersson and Rep. E. S. Johnny Walker were represented at the hearing by aides. Joe Martinez, speaking for Walker, said the congressman was opposed to moving the houses and strongly urged the committee to consider reversal of the decision so that the houses could be sold to the occupants.

Those who favor the sale of the Denver Steel houses, several of them members of the 1960 task group who have changed their minds, do so on the basis of the complete lack of other low-cost housing in Los Alamos.

Ed Stockly, a member of the task group, in a letter read at the hearing, said that the task group had made its recommendations in anticipation of construction of low cost housing and had insisted that no sales be conducted until the housing shortage was eliminated.

Martin Gursky, speaking for the Board of County Commissioners, said, "We feel that the AEC's decision not to sell the Denver Steels is justifiably reversible because of the difference between the expectations once held for the construction of private housing and the actual conditions which now exist . . ."

"There is no equivalent low cost housing in Los Alamos," he continued. "It (the Denver Steel housing) is superior to DHUD assisted housing in Santa Fe for income brackets of \$4,100 to \$7,600 and some in Albuquerque for income brackets up to \$8,200. The Denver Steel area houses a large percentage of unskilled, semi-skilled and skilled workers. These people desire to exercise the same right to purchase which has been offered to others in Los Alamos."

Gursky revealed that although municipal facilities and utilities in the area were not rehabilitated as they were elsewhere in the community, the county is prepared to act in cooperation with the AEC to alleviate any substandard condition which may exist.

John McLeod, chairman of the social responsibilities committee of the Unitarian Church, which has been actively promoting sale of the houses since 1965, also attributed the change in public opinion to the lack of housing construction.

"Six years ago . . . there was still hope that new low cost housing could be built privately. That hope has now disappeared."

In a letter submitted to the committee, McLeod's group said:

"The sale of Denver Steel houses to their occupants is the most attractive means available for providing dignified housing in Los Alamos for families with modest incomes. They are the only houses available or foreseeable which such families can afford to own individually. Since slums are not owned by occupants, the sale of these houses to their occupants is our best chance to avoid slums."

"Removal of these units," the statement continued, "represents an attempt to create an artificial community populated only by families with incomes substantially above the average. Persons who perform the less remunerative services required by such a community would be regarded as outsiders and not allowed to live in it. . . . Such a community is an unhealthy moral environment . . ."

The Denver Steel committee, organized among Denver Steel residents, presented the committee with a detailed argument largely based on results of a survey made of present occupants of the houses.

Of the 192 families interviewed, 178, or 93 per cent, wanted to buy; 14 did not. Thirty-five of the 243 houses are vacant and 16 occupants were not available.

The survey found that the majority of the Denver Steel occupants earn between \$5,000 and \$8,000 annually which, the committee said, shows "that the majority of residents are not capable of purchasing a house in White Rock or Barranca Mesa without undue hardship."

The idea of the area as a "potential slum" was termed "ridiculous" by the Denver Steel committee which pointed out that residents have taken great pride in their lawns, shrubbery and general appearance of their homes, winning more awards for best kept yards than any other housing area in Los Alamos.

"Even with the discouraging outlook of the residents at this time, the area has a well-kept and cared-for appearance," the report said.

The committee's survey found that 147 families of the 178 who wanted to buy planned to make additions and improvements on their homes, averaging \$2,650 per house. In addition, 171 families of the 178 said they would make immediate alterations on their houses if it were required to alleviate structural conditions which make the AEC and DHUD reluctant to sell.

Final decision on the houses will be made after the review committee has submitted its recommendations. Meanwhile, assignments to all vacant Denver Steel houses has been suspended since December, and assignments to houses located in the eastern area has been stopped since last spring. Fourteen of these houses have been transferred to the Bureau of Indian Affairs but have not been physically moved pending further developments.



Bill Steyert (left) describes the workings of the He^3 dilution refrigerator to Dr. Henry H. Kolm of the National Magnet Laboratory at M.I.T. During operation, the probe, which operates at temperatures as low as 0.04°K , is enclosed by a 3-inch-diameter glass vacuum chamber and a large dewar.

Milestones in the World of 'Supercold'

By Robert Masterson

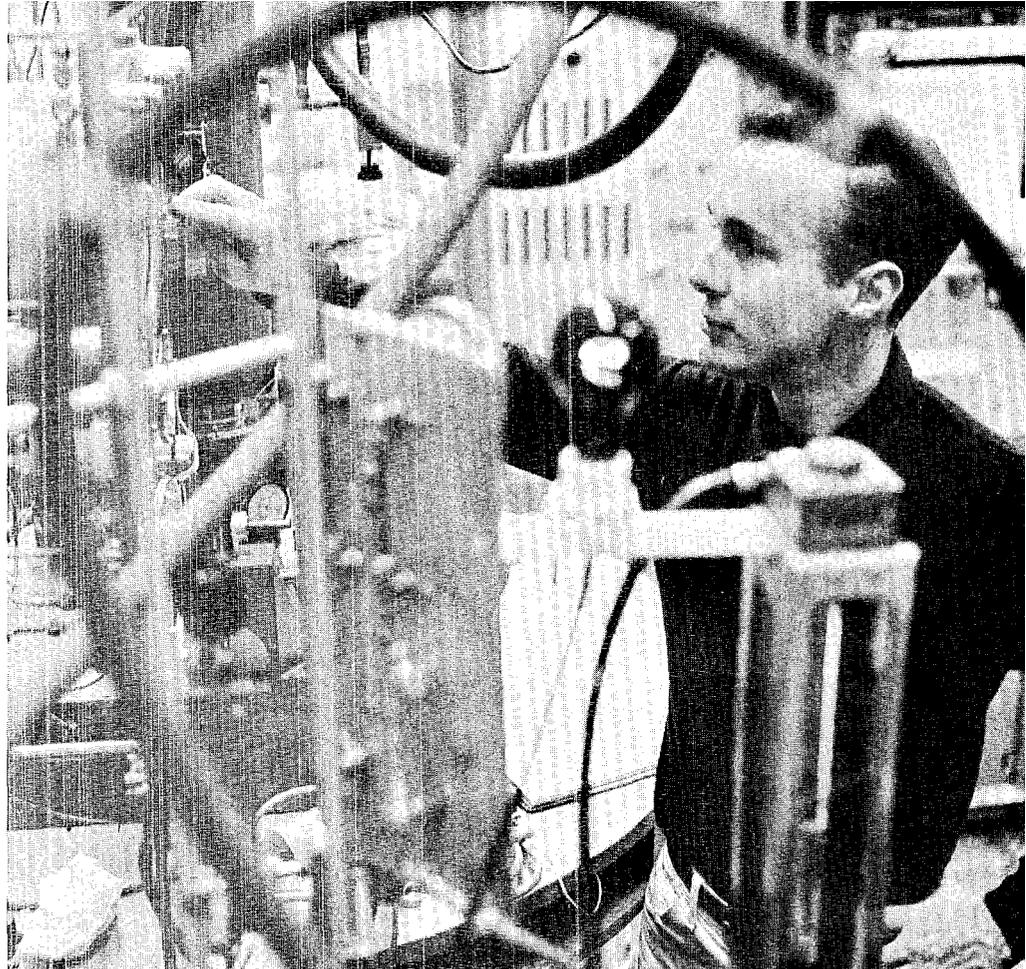
To most of us, ice, at 32°F , is considered cold; a temperature of 0°F feels very cold, and the -75° or -100°F of a Polar winter seems almost unbelievable.

But to one group of people at the Los Alamos Scientific Laboratory, a temperature of -100°F would be, at least as far as their work is concerned, unbearably hot. The work of CMF-9 is primarily concerned with low-temperature physics, or cryogenics—from the Greek *kryos* meaning icy cold.

These LASL scientists investigate the fascinating and frequently strange world of "supercold" where, for example, the gases that make up air become liquids or even solids, where certain metals lose all resistance to electrical flow and become superconducting, and where liquid helium becomes superfluid and flows up and over the walls of its container in apparent defiance of gravity.

These investigations are done at temperatures ranging from a few degrees to a few thousandths of a degree above absolute zero, a temperature that can be approached arbitrarily closely but can never be

Dave Depatie, a long-term visiting staff member from Amherst College, checks some of the x-ray diffraction equipment used to study the crystal structure of hydrogen and deuterium.



reached. On the Kelvin temperature scale used in low-temperature work, absolute zero is simply 0°K . On the Fahrenheit and Centigrade scales, this is -459.72°F and -273.16°C .

Since temperature is simply a measure of the thermal energy of matter, it was once thought that a substance at absolute zero would have zero energy. This is almost, but not quite, true. A small amount of energy, called the "zero-point" energy always remains, even at the absolute zero. What makes low temperature physics so interesting is that when the residual thermal energy becomes comparable with the zero-point energy, matter exhibits unexpected and seemingly bizarre behavior.

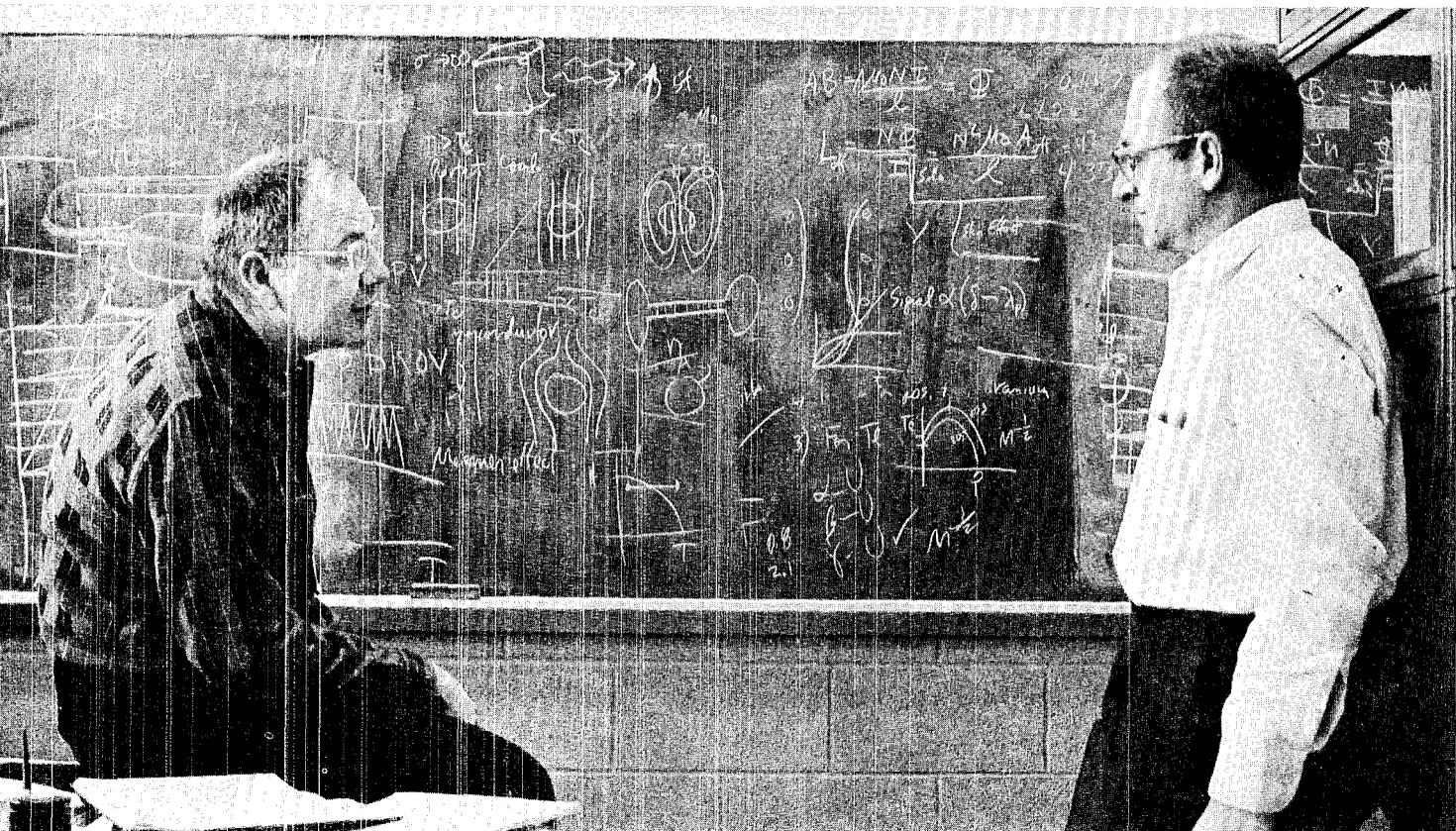
While water freezes at 32°F , 0°C or 273°K and carbon dioxide solidifies into "dry ice" at -108°F , much lower temperatures are needed to change various other gases into liquids. For example, oxygen liquifies at -297°F , air at -315°F , nitrogen at -317°F , hydrogen at -424°F and helium liquifies at -452°F or 4°K —only four degrees above absolute zero.

Cryogenics, one of the youngest branches of physics, had its real beginning with the liquefaction of helium in 1908. The somewhat involved history of cryogenics at LASL began in July, 1944, when Edward F. Hammel, Jr., now CMF-9 group leader, joined Eric Jette's uranium and plutonium metallurgy group. This group made the first measurements of the physical properties of the exotic new man-made metal, plutonium.

The CMF-9 group today consists of 35 people, divided almost evenly between those engaged in low-temperature physics research and the cryogenics engineering effort, which provides cryogenics support for the entire Laboratory and particularly for the Rover program.

CMF-9's research function was strongly influenced by a happy circumstance early in the group's history. When, by September of 1947 the group had dwindled down to one person—Ed Hammel—two of the men who joined the group in the next few months, Ed-

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Cryogenics . . .

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ward Grilly and Steve Sydoriak, belonged to the then-select group of those who had had experience with helium liquefaction.

After World War II, an almost violent controversy had developed among certain prominent theoretical physicists concerning the properties of helium 3 (He^3), including its capability of being liquefied. He^3 is a rare isotope present in nature in such small concentrations (one part of He^3 per one million parts of He^4) that pure samples of natural He^3 were impossible to obtain. But the Atomic Energy Commission had a supply—the world's only supply—of pure He^3 . It was produced by the radioactive decay of tritium (hydrogen 3) which, in turn, had been produced for the thermonuclear weapons program by the neutron irradiation of lithium 6 in nuclear reactors.

In 1948, some of this He^3 became available to the group, and in October of that year, Hammel, Grilly and Sydoriak liquefied He^3 for the first time. They subsequently measured liquid He^3 's vapor pressure, density and some of its thermal properties and helped to resolve the initial controversy.

This achievement propelled the group into a position of world-wide prominence in the field of low-temperature physics—a position that has since been maintained.

Subsequent research by the group was influenced by the demands of the then-growing thermonuclear weapons program which required research on liquid tritium (H^3) and deuterium (H^2). In addition, the group provided the cryogenic support for the first thermonuclear weapons tests in 1952.

LASL's cryogenists made the first measurements of the physical properties of three isotopes—plutonium 239 at one end of the list of the elements and helium 3 and hydrogen 3 at the other.

Many other CMF-9 achievements also are milestones in the field of low temperature physics. E. C. Kerr, P. C. Bendt and J. L. Yarnell (P division) made the first measurement by neutron scattering of the energy-momentum relationship in superfluid helium. H. S. Sommers made the initial measurements of vapor pressures and phase compositions of liquid He^3 - He^4 mixtures leading to the first prediction of separation of He^3 and He^4 into two liquid phases at low temperatures.

T. R. Roberts, S. G. Sydoriak, R. H. Sherman and W. E. Keller developed a temperature scale for the region from 0.25°K to 3.324°K based on the vapor pressure of liquid He^3 , and the Advisory Committee on Thermometry and the International Committee on Weights and Measures has recommended its adoption as part of the International Practical Temperature Scale.

CMF-9 Group Leader Ed Hammel (left) and William Keller discuss a problem in low-temperature physics research.



Initial gamma-ray resonant absorption (Mössbauer effect) work at very low temperatures and the discovery of several new isotopes exhibiting the effect were made by J. G. Dash, P. P. Craig, R. D. Taylor, W. A. Steyert and Keller, CMF-9; A. D. McGuire, D. Nagle and D. R. F. Cochran (all P division) and R. D. Reiswig (CMF-13). Adam Schuch, Grilly and R. J. Mills discovered that solid He^3 and He^4 have three crystalline phases rather than one.

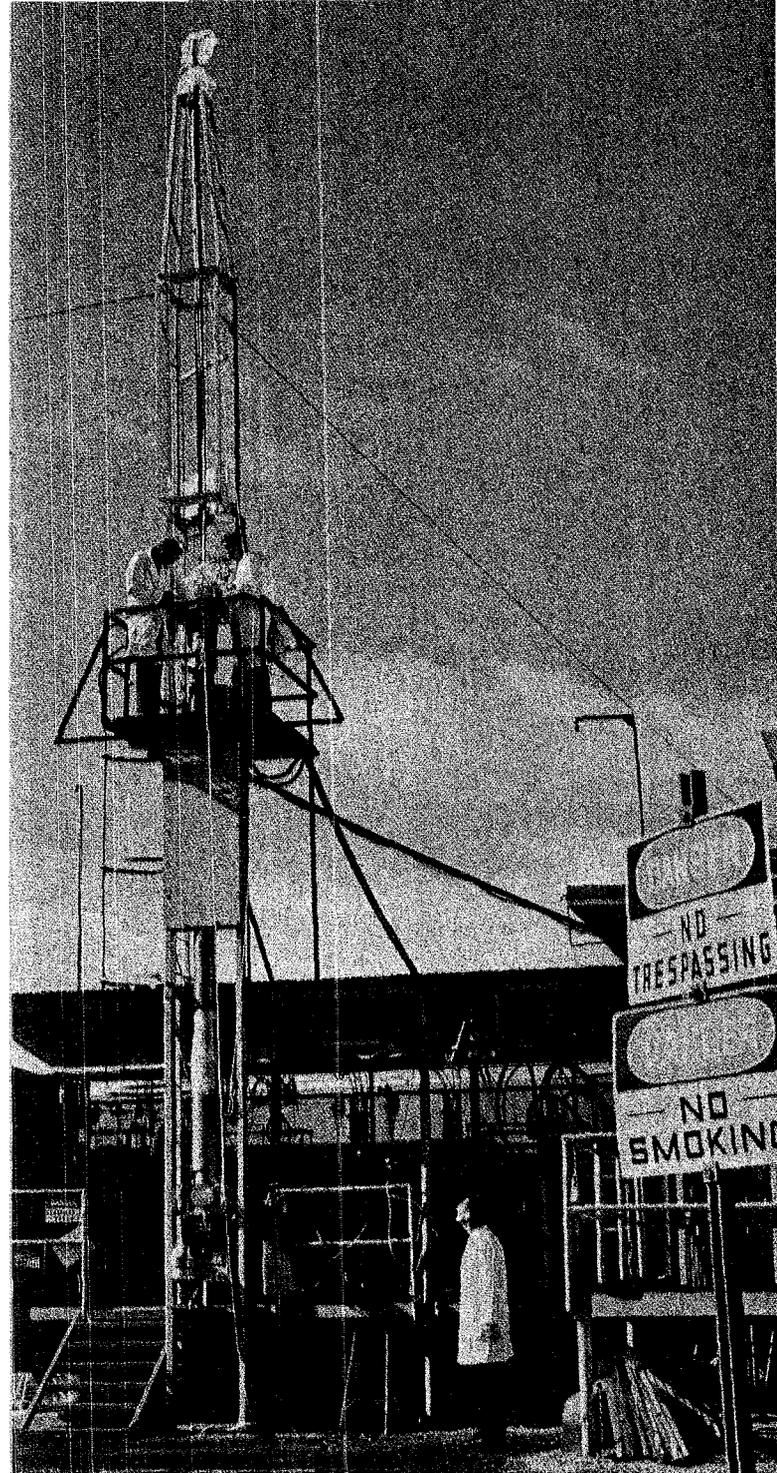
Some of the first work on large-field magnets immersed in liquid hydrogen was carried out by Henry Laquer and Hammel. In 1958 Schuch, Kerr and Taylor developed a He^3 refrigerator which provided constant temperatures below 0.45°K —twice as low as temperatures otherwise obtainable at the time—which was part of the United States exhibit at the 1958 Atoms For Peace Conference at Geneva.

How does one account for this enviable record of scientific achievement?

“Foremost,” said Hammel, “has been the quality of our staff. We have been extremely fortunate in obtaining and keeping people of the highest caliber.” Almost half of CMF-9’s permanent members have been in the group more than 15 years.

Another important influence on the group’s performance, Hammel believes, is the ratio of scientists to supporting staff, which is much higher than at

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Fred Edeskuty, CMF-9 associate group leader, watches from ground as Mahlon Wilson, left, and John Rogers, assistant CMF-9 group leader, right, inspect apparatus used to study heated hydrogen near its critical point—the combination of pressure and temperature at which gaseous and liquid properties are identical. Wilson, a graduate student on loan from CMF-14, is engaged in this study.

Cryogenics . . .

Continued from preceding page

other low-temperature labs. "This means," he explained, "that our scientists 'get their hands dirty' working in their labs, building equipment and taking data. This results in an informal atmosphere and increased communications and flexibility. We feel this is far preferable to a situation with a few senior people remaining secluded in their offices while assistants and technicians perform the experiments."

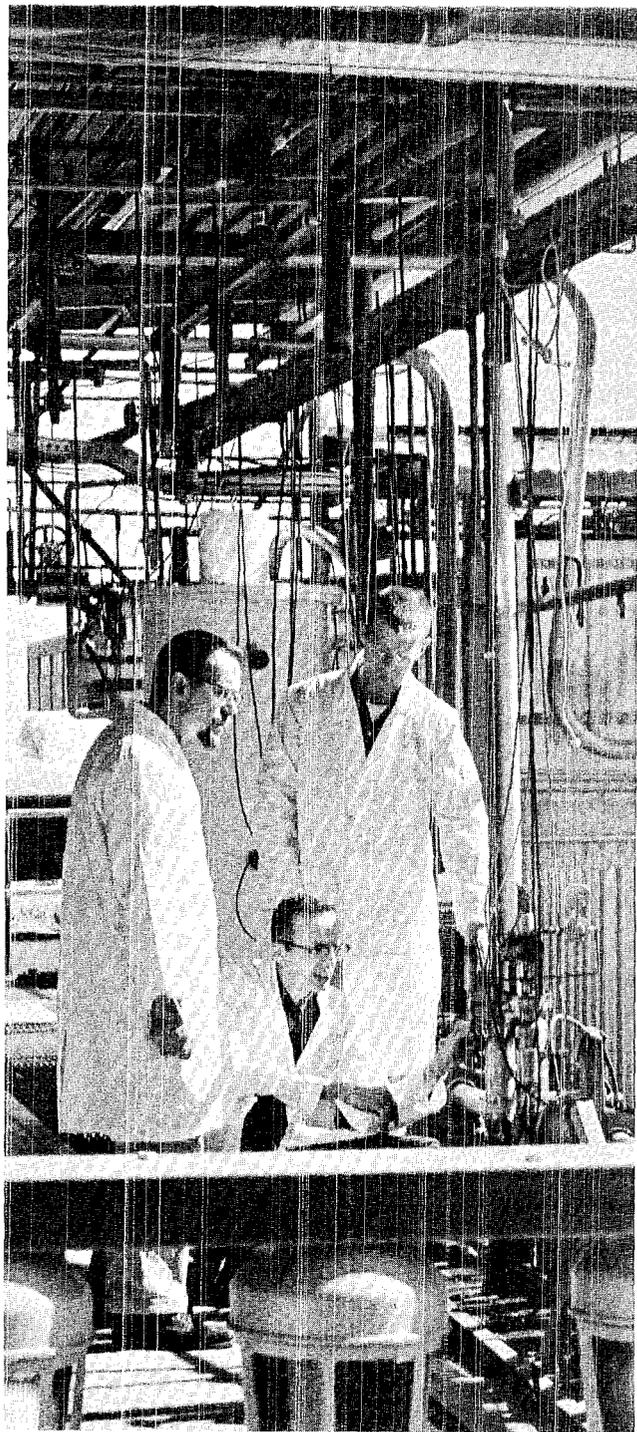
A few examples of recent CMF-9 projects illustrate the wide scope of the group's current work.

In studying condensed gases, Schuch and Mills are investigating the crystal structure of hydrogen and deuterium, using x ray diffraction techniques at temperatures as low as 0.95°K (-272.21°C). Grilly is studying the density and compressibility of liquid and solid He^4 and He^3 at temperatures down to 0.28°K (-272.86°C). Sherman and Kerr have been investigating phenomena in the neighborhood of the critical points of He^3 and He^4 . And, finally, a recently discovered new type of wave propagation in solids, called second sound, is being investigated in solid He^3 and He^4 by W. C. Overton.

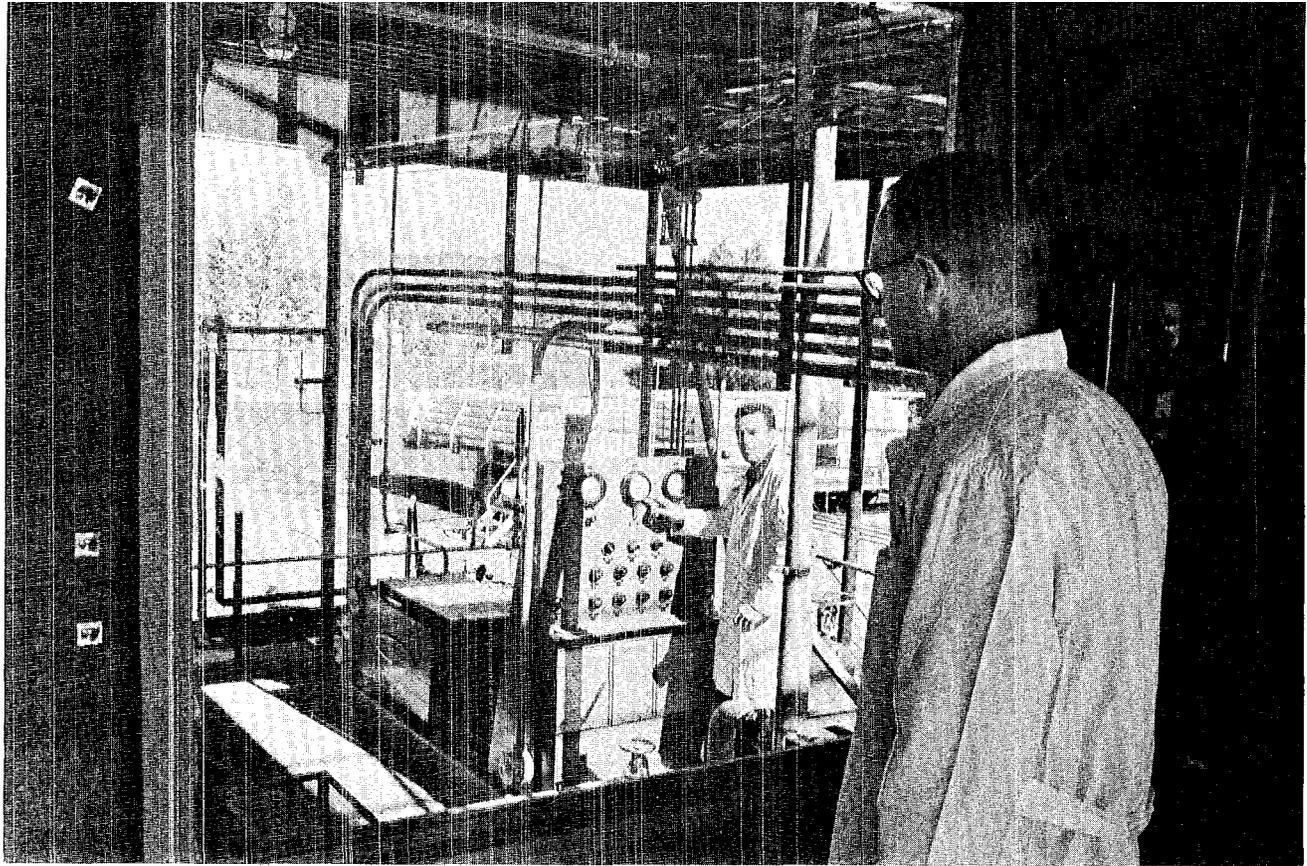
Another area of CMF-9 research involves studies of superfluid helium. Below 2.19°K (-270.97°C), helium loses essentially all viscosity, or resistance to flow, and a film of the liquid will flow up and over the lip of a vessel so that the vessel empties itself. Recently, in work which was described in *Physics Today*, Keller and Hammel devised a technique for investigating the processes affecting superfluid film flow by the use of relatively small diameter tubes inserted into the wall of a beaker containing superfluid helium. The liquid levels in side tubes inserted at various heights gives a measure of the driving force for the liquid transfer over the lip of the beaker. This powerful new technique promises to eliminate the many controversies which have arisen in the past over the measurements of helium film flow. (Cover photo.)

One of the most significant examples of current CMF-9 research involves the helium-3 dilution refrigerator, put into operation last June, which is capable of maintaining a temperature of low as 0.03°K (-273.13°C). This is almost 10 times colder than steadily maintained temperatures previously available and opens up a whole new area for research. There are only three more of these refrigerators presently in operation in the world—another in the United States, one in Great Britain and one in Russia.

Since its installation, Steyert and Mel Daybell, an Associated Rocky Mountain Universities researcher, have used this equipment for several experiments, including electrical resistivity and magnetic suscep-



Rod Thurston (left), Ken Williamson (center), and John Bartlit (right) discuss the liquid hydrogen transfer line from the 300-liter dewar (the tall white tank behind the group) to a liquid hydrogen-to-water heat transfer experiment. The guard rails and flashing lights keep unnecessary personnel out of the area during the experiment.



Robert Stokes (right) in the operator's shelter of the hydrogen pump-vaporizer system watches as Stretch Fretwell checks control panel. This system takes liquid hydrogen

at 30 lbs./sq. in. and -423°F and converts it to hydrogen gas at 2800 lbs./sq. in. and 70°F . It is sent through a three-mile pipeline to N division for Rover studies.

tibility measurements from 1°K to 0.05°K of copper containing small magnetic impurities. This work has disproved a theory which predicted that electrical resistivity would reach a peak about 1°K and then drop.

The success of this new device has led to plans for a second He^3 dilution refrigerator to be built by a team led by Sydiorak. Beyond that, members of the group are looking for rare earth salts which would be used in a paramagnetic refrigerator to reach steady-state temperatures of 0.0001°K .

Although the 17 members of the cryogenics engineering section, headed by Fred Edeskuty and John D. Rogers, often provide advice, designs, equipment and personnel assistance to many divisions or departments in the Laboratory, the heavy emphasis of the cryo-engineering work has been to assist the Rover program.

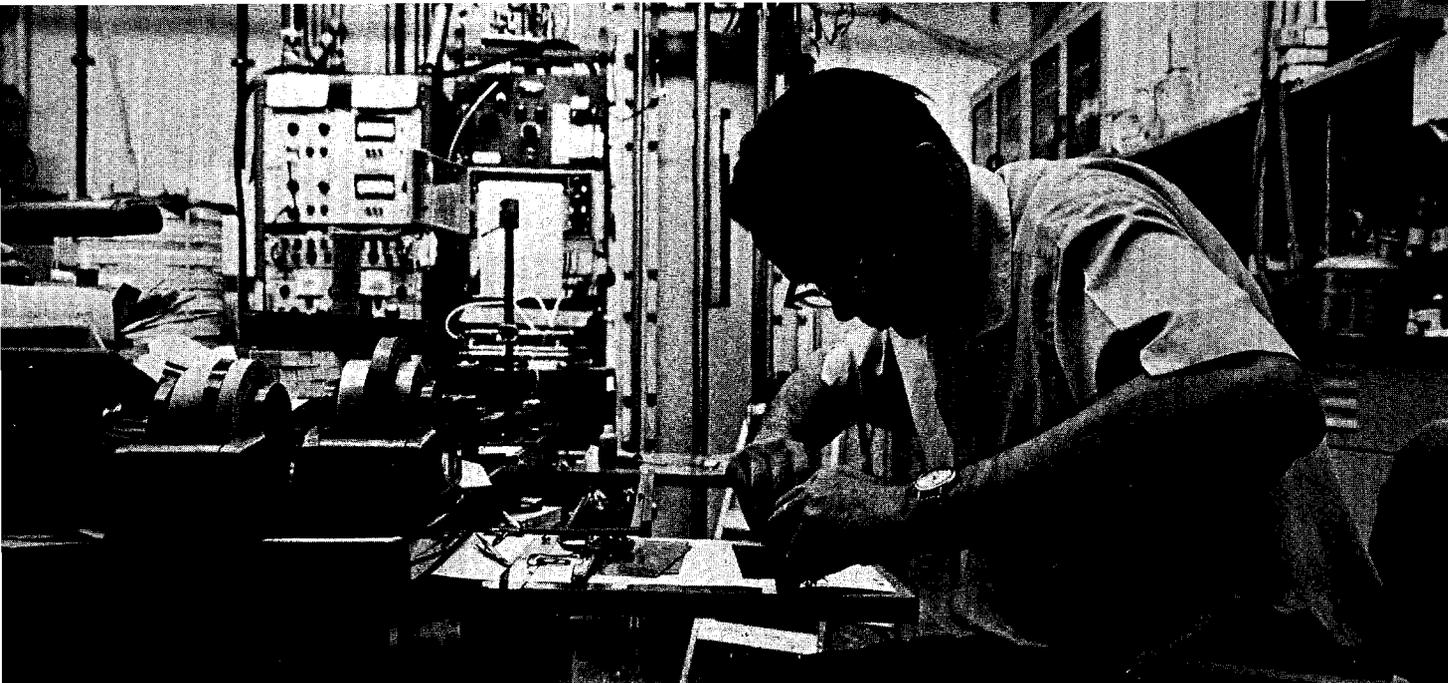
Recently Bob Stokes and Jim Fretwell, together with the engineering and supply and property departments, completed the installation of a liquid hydrogen pump-vaporizer system which serves effectively as a public utility, piping 2800 psi H_2 gas for three miles along Pajarito Road to N division.

At the same time, Don Liebenberg and Edeskuty have served as consultants and design experts to J division for construction criteria and operation of the Rover test facilities at the Nevada test site. Jan Novak has assumed the role of a stress analyst using the Laboratory computers to predict accurately the piping stresses for the large vacuum jacketed lines carrying liquid hydrogen to the Phoebus reactors at Test Cell C.

For the current Phoebus test a very large water to liquid hydrogen heat exchanger vaporizes liquid hydrogen. The high pressure gaseous hydrogen from this heat exchanger, designed by Ken Williamson and John Bartlit, is used to drive the turbine which pumps liquid hydrogen to the Phoebus reactors.

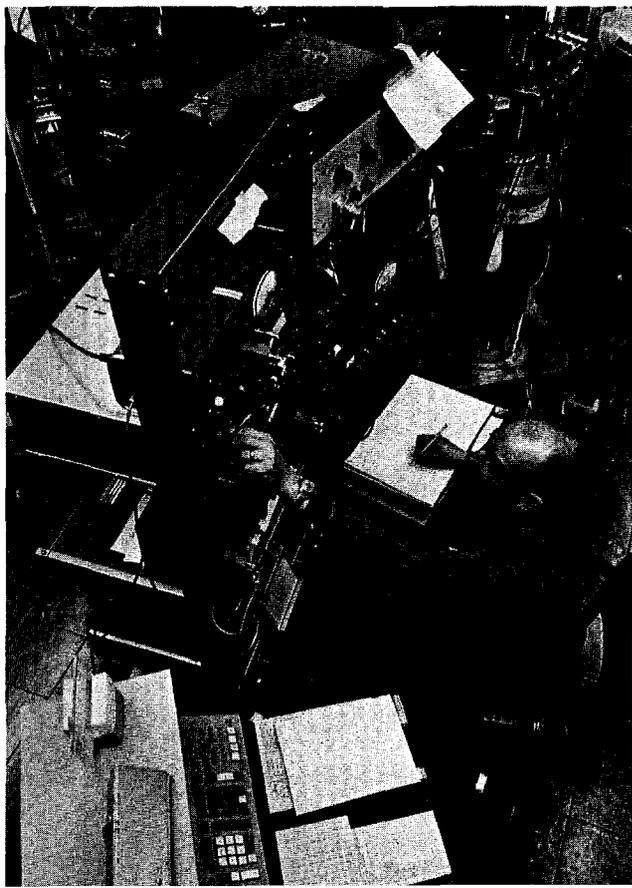
An equally important activity of this section is a concern for fires, explosions or failures of a nuclear rocket test which might result from leaks or ruptures of connectors and special joints. A remote test area manned by John Bronson, Jim Harlow, Barney Gulan and Robert Candler has been used to proof-test and develop almost every kind of fitting, from thermocouple seals to large reactor test cart gumble joints for the Rover program.

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Steve Sydoriak fabricates heat exchanger for the He³ dilution refrigerator he is building. He believes his newly designed heat exchanger will improve the performance of this type of refrigerator.

Bob Sherman records data in a measurement of the dielectric constant of He³ in the immediate vicinity of its critical point. The dielectric constant is obtained by comparing the ratio of the capacitance of a condenser filled with He³ to that of the condenser in a vacuum.



Cryogenics . . .

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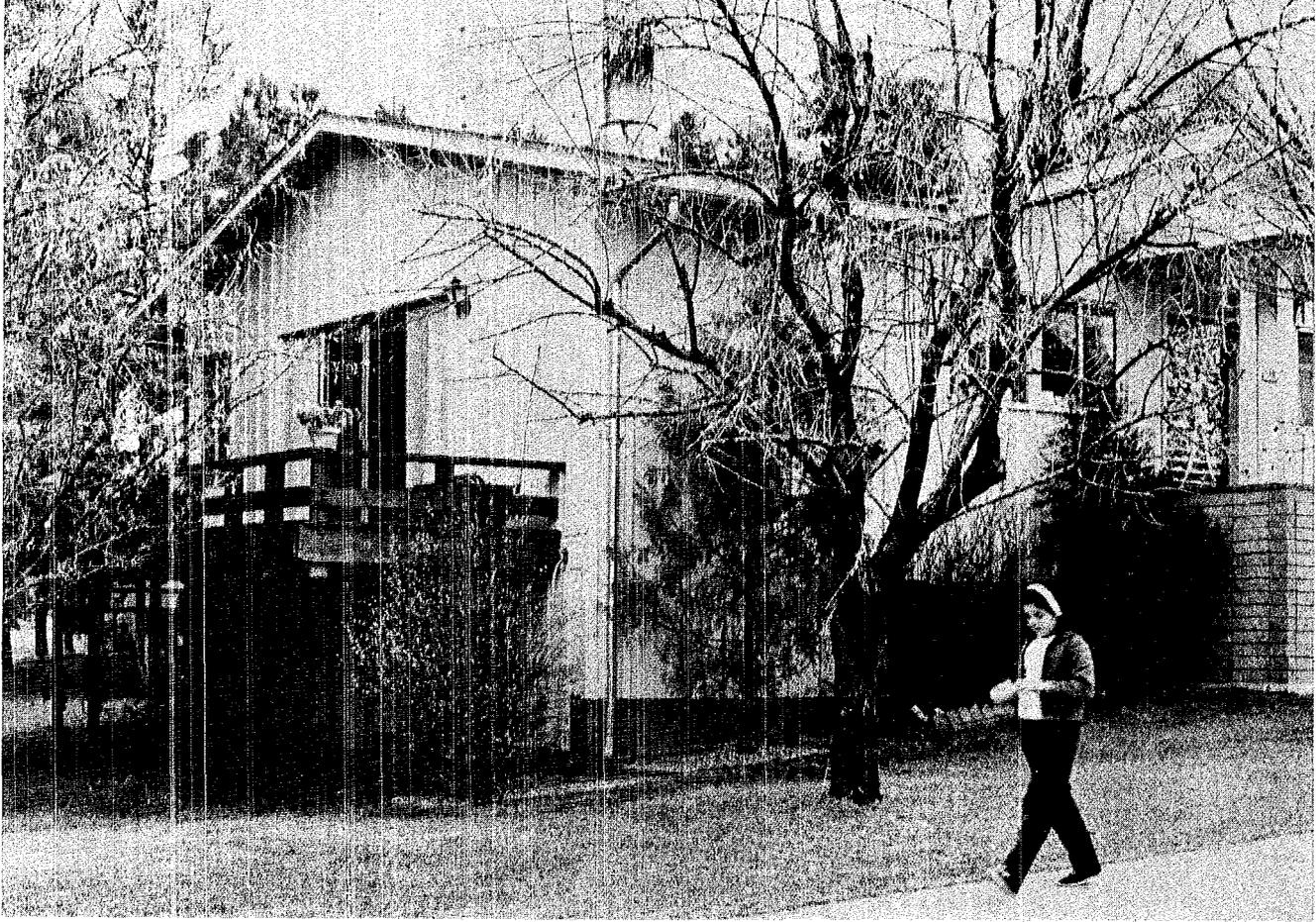
Associated with the engineering is a research-in-depth program investigating the fluid dynamics and heat transfer of hydrogen and nitrogen. Rod Thurston's doctoral dissertation classified and characterized the causes and behavior of certain oscillations observed in flowing hydrogen when it is heated. One of these is very similar to the acoustic resonance heard from an organ pipe.

The thermal conductivity and viscosity of liquid cryogenics—He³, He⁴, H₂, D₂, T₂—are two properties which determine how easily heat passes through these liquids and their resistance to flow. Such properties are important in understanding fluid dynamics and heat transfer. In a series of papers, Hammel and Rogers, Jerry Kerrisk (N-1) and F. G. Brickwedde, a consultant, have been able to predict these properties better than previously done.

Current experiments on heat transfer include work by graduate student Mahlon Wilson (CMB-14) on the flow and temperature structure of heated hydrogen near its critical point. In the region of the critical point, the liquid and gaseous properties of a substance are very similar.

Originally, CMF-9 liquefied nitrogen, hydrogen and helium, but the spectacular increases over the past 10 to 15 years in the nationwide demands for these gases encouraged the construction of large liquefaction plants, and LASL now obtains all three commercially at prices well below the cost to produce them locally.

The current Los Alamos consumption of liquid helium is about 350 gallons a month. Half of this is used by CMF-9, and the remainder is distributed to other LASL groups.



The Thomas Putnams (MP-1) added a hanging deck when they remodeled their Woodland Road home.

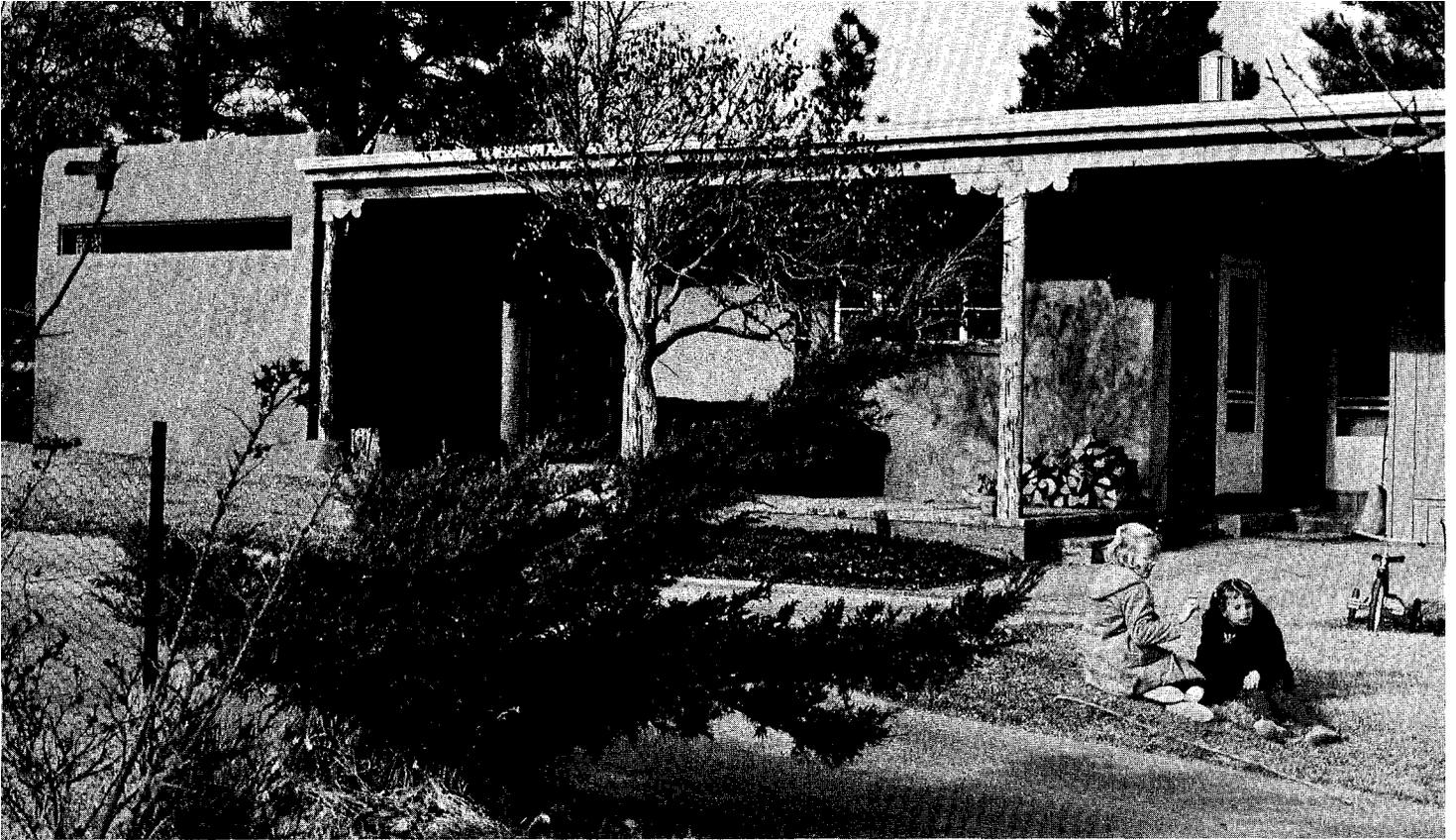
Government-Built Homes Gain A Personal Touch

Now that many Los Alamos residents are homeowners rather than tenants, they are remodeling their government-built homes to fit individual family needs.

Sale of government homes began a little more than a year ago, and the county's records of building permits reflect this fact. During 1965, there were 56 permits for additions, remodeling, fireplaces and similar changes, totaling \$114,060 in valuation.

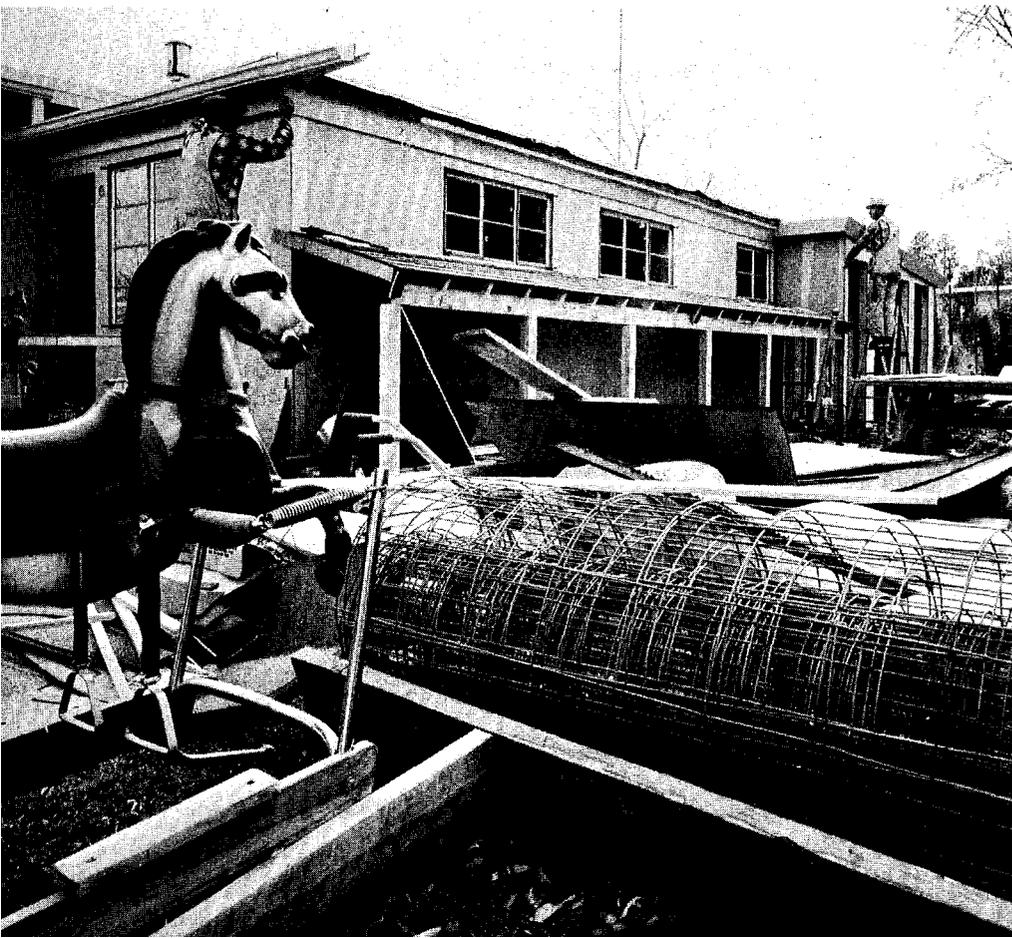
But during 1966, the first year of ownership for most residents, the county issued nearly 400 building permits, with a valuation of nearly a million and a half dollars.

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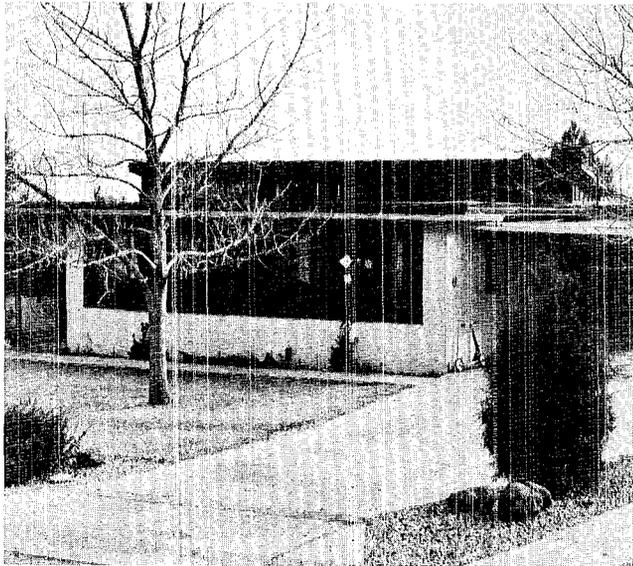
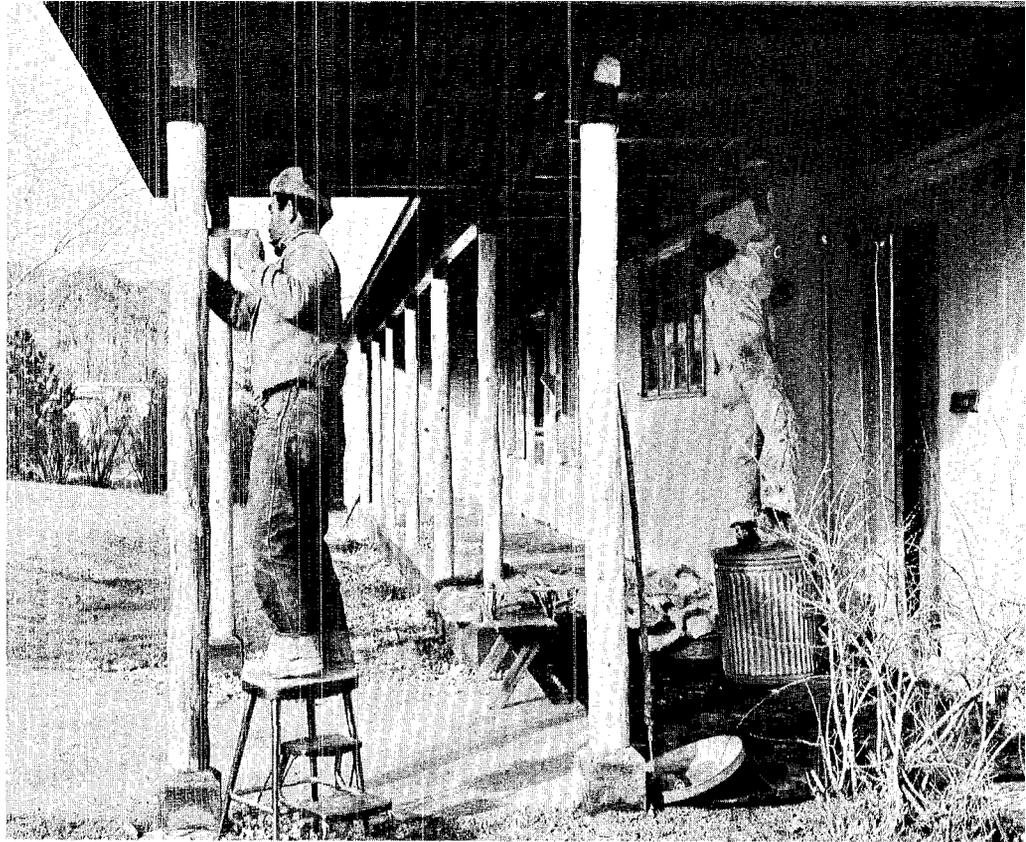
One of the outstandingly different homes is the one owned by Nicholas Metropolis on 44th Street. Once a standard Western Area house, it has been remodeled in the adobe

style so typical everywhere in New Mexico—except in Los Alamos. Heavy carved double doors provide an attractive front entrance.



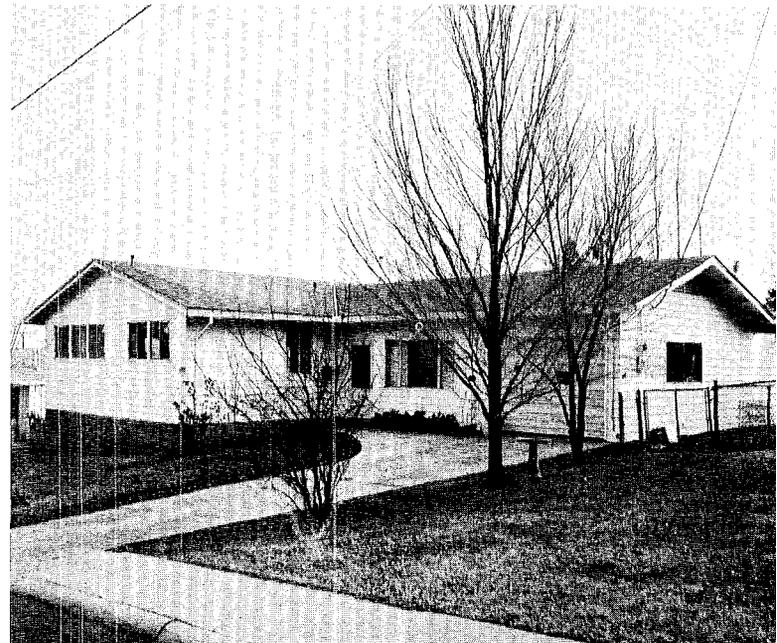
More storage space, along with more "living" room, were gained by remodeling for the Alvin VanVessems (GMX-7), at their 47th Street home.

Another Western Area house re-modeled to reflect the architectural traditions of New Mexico is the 42nd Street home of the Robert Shrefflers (W-DO).



Leroy Warren, AEC attorney, raised the roof on his Western Area home at 1220 46th Street.

The Charles Fenstermakers (J-18) built an L-shaped addition onto their rectangular bungalow at 3215 Arizona.



The Technical Side

Presentation at Bingham Memorial Banquet, Society of Rheology, Atlantic City, N. J., Nov. 1, 1966:

"An Idea for the Improvement of Theory of the Viscoelastic Properties of Polymer Solutions" by P. E. Rouse, Jr., GMX-2. (Invited Talk)

Colloquium, General Atomic, Torrey Pines, Calif., Dec. 9, 1966:

"International Cooperation and the Control of Nuclear Energy" by G. R. Keepin, N-6. (Invited Talk)

Presentation at Special Seminar, Department of Biology, Rice University, Houston, Texas, Dec. 12, 1966:

"Genetic and Epigenetic Forms of Malate Dehydrogenase in Neurospora" by K. D. Munkres, H-4. (Invited Talk)

International Meeting on Quiescent Plasmas, Frascati, Italy, Jan. 10-13:

"On the Theory of Velocity Distributions Associated with Bounded Quiescent Plasmas" by Harry Dreicer, P-14. (Invited Paper)

Presentation at Engineering Institutes on Computer-Aided Circuit Design, University of Wisconsin, University Extension, Madison, Wisc., Jan. 17:

"Nonlinear Analysis" by A. F. Malmberg, T-7.

American Nuclear Society, National Topical Meeting on "Coupled Reactor Kinetics," Texas Agricultural & Mechanical University, College Station, Texas, Jan. 23-24:

"Why Coupled Fast Breeder Reactors?" by W. H. Hannum, K-1. (Invited paper)

"Summary of Coupled Kiwi Experience" by H. H. Helmick and C. G. Chezem, both N-2. (Invited paper)

"Calculation of Interaction Parameters for Loosely Coupled Reactor Systems" by R. L. Seale, University of Arizona, and G. E. Hansen, N-2. (Invited paper)

"State-Variable Feedback Control of Coupled Nuclear Systems" by H. S. Murray, N-4, and J. L. Melsa, University of Arizona. (Invited paper)

"On High Frequency Transfer Function Measurements for Coupled Fast Reactors" by C. A. Anderson, Jr., K-3 (Invited paper)

American Crystallographic Association Meeting, Atlanta, Ga., Jan. 25-27:

"An Empirical Approach to the Problem of Anomalous Dispersion" by R. B. Roof, Jr., CMF-5.

"The Crystal Structure of N-Methyl-N, 2, 4, 6-Tetranitroaniline (Tetryl)" by H. H. Cady, GMX-2.

Presentation at Mossbauer Symposium, New York, N. Y., Jan. 29:

"Mossbauer Spectroscopy of the 29.4 keV Gamma Ray of ^{40}K from the Reaction $^{39}\text{K}(n,\gamma)^{40}\text{K}$ " by E. B. Shera, P-2, and D. W. Hafemeister, formerly LASL. (Invited paper)

American Physical Society-American Association of Physics Teachers, Joint Annual Meeting, New York, N. Y., Jan. 29-Feb. 2:

"p-p Bremsstrahlung" by J. E. Young, T-9.

Presentation at U. S. Naval Ordnance Laboratory, Chemical Division Seminar, White Oak, Silver Spring, Md., Jan. 30:

"Crystal Structures of Explosives" by H. H. Cady, GMX-2. (Invited paper)

Health Physics Mid-year Symposium on Personal Radiation Dosimetry, Chicago, Ill., Jan. 30:

"What Information is Possible from Personal Dosimetry" by G. J. Littlejohn, H-1. (Invited paper)
American Physical Society Meeting, New York, N. Y., Jan. 30-Feb. 2:

"Use of the Reactions $\text{H}^2(t, pt)n$, $\text{H}^3(d, pt)n$, and $\text{He}^3(d, pt)\text{H}^1$ to Search for Resonance in the Mass-4 System" by R. W. Newsome, Jr., formerly of LASL.

"Nuclear Glory Scattering" by Nelson Jarmie, P-DOR, and H. C. Bryant, University of New Mexico.

"Radio Frequency Transition Calculations for a Metastable Hydrogen Atom-Type Polarized Ion Source" by G. G. Ohlsen, P-12, and J. L. McKibben, P-9.

"Energy Dependence of N-P Polarization from 11 to 29 MeV" by G. S. Mutchler and J. E. Simmons, both P-DOR.

"Model for Classical Fluids" by M. S. Wertheim, T-DOT.

"Particle-Core Coupling in the Sb Isotopes and the Reactions: $^{121}\text{Sb}(t, p)^{123}\text{Sb}$ and $^{123}\text{Sb}(p, t)^{121}\text{Sb}$ " by P. D. Barnes, P-DOR; E. R. Flynn, P-10; G. J. Igo, P-DOR; and Richard Woods, P-9.

"Coulomb Excitation of ^{113}In and ^{115}In with Oxygen Ions" by E. M. Bernstein, T-DOT, G. G. Seaman and J. M. Palms, both formerly of LASL.

"Particle Identification Utilizing an On-Line Computer" by P. W. Keaton, Jr., P-DOR, and J. G. Beery, P-10.

"Phase Diagram of Argon" by M. G. Henderson, W-4.

"Optical Model Parameters from Simultaneous Fits to Polarization and Elastic Scattering of 14-MeV Protons" by J. G. Beery, P-10, and Louis Rosen, MP-DO.

"Study of the $\text{Cu}^{63}(n,\gamma)\text{Cu}^{64}$ and $\text{Cu}^{65}(n,\gamma)\text{Cu}^{66}$ Reactions" by E. B. Shera, P-2, H. H. Bolotin and H. J. Fishbeck, both of Argonne National Laboratory.

"One BeV Proton Total and Reaction Cross Section Measurements on H, He, ^6Li , C, O, and Pb Targets"

Continued on page 28



LASL Assistant Director Jane Hall congratulates Roser on appointment.

Roser Named AEC Area Manager

Herman E. Roser has been named manager of the Los Alamos Area Office of the Atomic Energy Commission.

Deputy manager since December, 1964, Roser succeeds Charles C. Campbell, who has been serving since May 15, 1966, in a dual capacity as Los Alamos Area manager and as deputy assistant manager for administration at the Albuquerque Operations Office. Campbell, now residing in Albuquerque, will devote his full time to the Albuquerque position.

In conjunction with the announcement ceremony Feb. 6, L. P. Gise, manager of the Albuquerque Operations complex, presented Roser with the AEC's "high quality performance award."

Roser came to Los Alamos in 1948 with the Zia Company. He joined the AEC in 1961 as assistant area manager for community affairs and assisted in developing the material which the AEC submitted to Congress in support of the 1962 legislative amendments providing for community disposal at Los Alamos.

new hires

CMB Division

Afton S. Kirby, Oak Ridge, Tenn.,
CMB-3 (Rehire)

D Division

Sylvester Newton, Los Alamos, D-2
(Casual)

Frederick H. Rick, La Crosse, Wis., D-8

Engineering Division

Wendell Ford, Culver City,, Calif.
ENG-6

GMX Division

Rae R. Creed, Los Alamos, GMX-3 (Re-
hire)

Paul F. Bird, Austin, Texas, GMX-7
(Rehire)

Frederick W. Van Haafden, Crane,
Ind., GMX-11

H Division

Beatrice A. Atkins, Los Alamos, H-2
(Casual)

Ronald W. Blankenship, Espanola,
N.M., H-5

William E. Stocum, Ann Arbor, Mich.,
H-8

MP Division

Donald Walker, Harlingen, Texas,
MP-1

Valerio Armijo, Valarde, N.M., MP-5

P Division

Stewart D. Orbesen, Las Vegas, Nev.,
P-DOR

Nancy L. Weinbrecht, Los Alamos, P-4
Doyall E. Allsman, Los Alamos, P-7
(Casual)

Shops Department

Floyd W. Hughes, Jr., San Diego,
Calif., SD-1

Amadeo Sanchez, Jr., Los Alamos,
SD-1

Darrel K. Farmer, Carlsbad, N.M.,
SD-5

James D. Noble, Espanola, N.M.,
SD-5

Roger R. Perraglio, Espanola, N.M.,
SD-5

T Division

William P. Dimas, Santa Fe, N.M., T-1
Gilbert T. Fuentes, Truchas, N.M., T-1

Jo Ann P. Martinez, Valarde, N.M.,
T-1

Anthony F. Montoya, Santa Fe., N.M.,
T-1

James E. Tabor, Arlington, Va., T-1

W Division

Ruth E. Peterson, Los Alamos, W-DO
(Part time-Rehire)

Jimmie L. Shields, Los Alamos, W-8
(Casual-Rehire)

LASL Men Make TV Film

High flying solar eclipse experimenters from the Los Alamos Scientific Laboratory will be featured on a National Educational Television (NET) color program, "The Living Sun," which will be released nationally during the week of March 6.

Premier showing will be on NET Block 1 stations, which includes most of the larger cities of the United States, such as New York, Chicago, Los Angeles, San Francisco and Denver. Los Alamos TV watchers will not be able to see the program until Wednesday, May 31, when Channel 5 will broadcast the half-hour show in black and white at 7:30 p.m.

Running narration on the show is by Arthur N. Cox, J-15, scientific

coordinator for the November, 1966, LASL eclipse expedition to South America. Also appearing in speaking roles are Robert Brownlee, J-15; Paul Rudnick, J-16; and Donald Liebenberg, CMF-9, all of whom participated in locally-filmed round-table discussions with Cox about preliminary analysis of data obtained on the expedition.

A spectacularly beautiful sequence of the eclipsed sun and its corona, location footage in Argentina, and in-flight action of scientific crew members at work aboard the NC-135 flying laboratory were all photographed by LASL's John McCloud, D-10, whose official documentary footage was made available to NET.

242 Earn Service Awards

The Los Alamos Scientific Laboratory's ever growing veteran employe roster received another boost last month when 242 more University of California service pins were awarded by Director Norris E. Bradbury at a ceremony in the administration building auditorium.

Fifty-nine 20-year pins were presented, making a total of 333 employes who have received this recognition since the first group of 12 became eligible in early 1963 for service exclusively at Los Alamos. Three other 20-year pins were presented at that time to Los Angeles purchasing office employes.

Recognition was also given last month to 86 new 15-year pin holders and a group of 97 who have served the laboratory for a decade.

The following people were invited to the pin award ceremony:

TWENTY-YEAR PINS

Benjamin B. Alarid, SD-1; Alfred C. Anderson, Jr., P-1; Theodore L. Bayhurst, ENG-4; Charles F. Beckett, P-1; James J. Bramble, W-1; James A. Bridge, K-3; John G. Carmichael, CMB-11; Louis T. Caveglia, ADP-SF; Temple W. Chronister, CMB-11; Esther A. Converse, CMB-1; Robert C. Crook, D-8.

Kenneth J. Dunahugh, SD-5; Montie G. Dunn, GMX-3; Virginia Ebelacker, GMX-7; Finley H. Ellinger, CMF-5; Cerda L. Evans, T-2; Roscoe A. Fausson, CMB-6; Henry Filip, N-1; Francis J. Fitzgibbon, CMB-14; Robert D. Fowler, CMF-DO; David M. Freeborn, SD-5.

Waldo E. Gamble, CMB-7; James S. Gilmore, J-11; Angelo L. Giorgi, CMB-3; Elisabeth F. Gittings, GMX-4; J. Paul Glore, P-1; Louis Goldstein, T-10; Edna F. Grantham, P-1; Conrado P. Gutierrez, CMB-3.

George E. Hansen, SD-1; Henry R. Hoyt, Dir. Off.; George A. Jarvis, N-2; John C. Kinker, GMX-3; Milton C. Krupka, CMB-3; William H. Lane, T-1; Marion S. Lew, CMB-1; George J. Littlejohn, H-1.

Theo E. McGurn, AO-1; Arthur N. Morgan, Jr., CMB-11; Leland K. Neher, J-14; Thelma F. Northrup, AO-2; John D. Orndoff, N-2; Ursulo V. Ortiz, SP-4; Eric L. Peterson, GMX-4; Robert M. Potter, CMF-4; William O. Rhodes, CMB-11; Luther D. Rickerson, SD-4; William C. Robbins, CMB-8.

Thomas K. Seaman, CMB-11; David S. Shaffer, CMB-14; J. T. Simmons, CMB-7; P. Harry Snowden, P-DO; Jose B. Suazo, CMB-AP; Alfred E. Tafoya, CMB-14; Jose E. Tafoya, H-2; Richard L. Thomas, CMB-11; Eugene E. Weiss, AO-1; Richard Wilhelm, K-2; Beltron J. Wilmoth, SD-5.

FIFTEEN-YEAR PINS

Mohammed Alei, Jr., CMF-2; James C. Anderson, GMX-7; Mazie P. Anderson, H-2; William Anderson, T-1; Silvio J. Balestrini, N-2; Philip J. Bendt, CMF-9; Emily H. Bergamo, AO-6; Louis R. Bergamo, K-2; Bernard L. Billings, SD-1; Laurence A. Blatz, CMF-2; Dolores B. Brown, WSD; Jack R. Brown, W-7; Cleo C. Byers, N-2.

Charles P. Cadenhead, W-4; Ross R. Calvin, Jr., GMX-3; James R. Case, ENG-1; Roy P. Casey, SD-1; Edmond D. Cashwell, T-8; Leo G. Chelius, Sr., H-1; Billy R. Claybrook, D-8; Ethel D. Cooper, K-DO; Helen D. Cowan, CMF-2.

James L. Desilets, ENG-2; Frederick W. Dubois, GMX-3; Reed O. Elliott, CMF-5; Leon B. Engle, N-2; Bernard C. Eutsler, H-5; Douglass F. Evans, GMX-3; Kenneth J. Ewing, GMX-3; Harry E.

Felthausen, P-4; Wildon Fickett, GMX-10; Anna L. Fojtik H-DO.

Alfredo Garcia, GMX-3; Ross D. Gardner, CMB-1; Raymond S. Gauler, GMX-3; Clifton B. Groff, SD-1; Jay E. Hammel, P-17; Clarence L. Harmer, SD-5; Earl L. Head, CMF-2; Walter B. Herin, N-3; Phyllis S. Heyman, T-1.

Betty S. Jackson, D-2; Richard E. Johnston, GMX-7; Llewellyn H. Jones, CMF-4; Leo M. Kelly, SD-1; Ernest E. Kimble, GMX-3; Herbert T. Knight, J-DO (NTS); John C. Konrad, ENG-4; Herbert C. Lauf, SD-5; James N. P. Lawrence, H-1; Robert B. Leachman, P-12; G. Norman Lindblom, D-8.

Jean J. Marrs, T-1; Gilbert J. Martinez, GMX-4; Frank J. Miller, CMB-7; Benito S. Montoya, SD-1; Shirley W. Moss, AO-1; Willard C. Moyer, CMB-7; Arnold T. Nereson, P-1; James B. Newville, SD-4; John A. Northrop, J-DO.

Leo A. Ortega, AO-6; J. Robert Penland, H-3; Carl E. Peterson, CMB-6; Robert T. Pickett, SD-5; Richard R. Renstrom, ENG-2; Bernard L. Ryan, K-DO.

Arsenio S. Salazar, SP-8; Albert W. Savage, Jr., CMB-8; Louis W. Schlatter, SD-3; John E. Schlosser, GMX-1; LeRoy C. Schmidt, SD-5; Albert Schoolcraft, SP-3; John D. Seagrave, P-DOR; Pauline F. Siverly, GMX-3; Hazel M. Son, D-8; Clinton H. Stephens, ENG-4; Fred A. Sterkel, SD-5; Patrick L. Stone, CMB-3.

Ermil E. Thrasher, CMB-3; Meliton Vigil, Jr., SD-1; Stanley L. Whetstone, Jr., P-9; George H. Whitehead, N-1; Edward J. Wiewandt, W-1; A. Hugh Williams, P-7.

TEN-YEAR PINS

Florence K. Adams, GMX-4; Jerry E. Allen, J-14; Gerson Arellano, GMX-3; Edgar A. Bacon, Jr., Dir. Off.; Lucien M. Black, J-16;

Normand C. Blais, CMF-4; Howard I. Bowers, K-3; John E. Boyer, Jr., CMB-6.

Robert S. Caird, GMX-6; Jacob Campos, MR; Johnny L. Casias, SP-3; Thomas E. Chandler, GMX-3; Melvin C. Chaney, N-5; Georgia A. Clark, P-1; Rodger S. Connellee, ENG-1; Louis W. Cutler, MP-5; Richard J. Daly, K-4; Flora C. Dimas, GMX-7.

Ivan K. Edgett, GMX-3; Billy B. Fisher, N-1; Clarence M. Fowler, GMX-6; Eric B. Fowler, H-7; Margaret F. Gifford, GMX-3; Ramona C. Gonzales, AO-4; Raymond A. Gore, N-4; Walter V. Green, CMF-13.

Vinson M. Hall, ENG-4; Robert S. Harper, Jr., D-8; Claude C. Herrick, CMF-13; Glen E. Horton, ENG-2; H. Jeanne Hudgins, T-7; Frederick C. Hutchinson, SP-3; Doris F. Jackson, P-9; Allan C. Juveland, W-3; Charles P. Kempter, N-1; Jane M. King, T-5; John

Knapp, Jr., CMB-7; Donald K. Kohl, MP-4.

Allen C. Larson, CMF-5; Thomas E. Larson, GMX-2; Jean E. Lindsey, H-5; Marvin D. Linke, ENG-2; J. Ronald London, GMX-1; Reymundo J. Lopez, ENG-2; Robert C. Lory, CMB-7; Virginia E. Lyon, PER-4.

Herman R. Maltrud, W-7; Nicolas Martinez, PER-4; Carl A. Mikkelson, Jr., GMX-3; Restus J. Miller, H-1; Mary J. Minor, T-1; Ignacio Moquino, PER-4; William H. Morton, Jr., GMX-8; Glenn H. Mottaz, CMB-14; Henry T. Motz, P-DO; Wilma I. Moxley, PER-5; Edward P. Moya, AO-5; Ruby I. Murry, AO-DO.

Matthew J. O'Keefe, D-8; William M. Olson, CMF-5; Enriques F. Ortega, D-8; Alton J. Patrick, N-5; Frederick W. Peters, Jr., N-4; Donald F. Petersen, H-4; Anthony L. Porto, GMX-3; Robert C. Prewitt, W-1.

Martin J. Reisfeld, CMF-4; Robert W. Richardson, ENG-2; Nathaniel K. Richerson, CMB-6; Richard H. Robertson, N-1; Arthur K. Robison, GMX-3; Donald G. Rose, N-1; Benigno Roybal, SD-2; Paul Rudnick, J-16.

Clark M. Sanders, SP-4; Horace Sanders, GMX-4; Robert L. Sandoval, H-1; Virginia G. Shadden, CMF-5; Wilmer L. Sibbitt, N-7; Betty J. Simes, T-DO; Joseph F. Stampfer, Jr., W-7; Justine L. Stehl, T-7; Dwight L. Stephenson, J-8; Sidney N. Stone, J-10; Orin W. Stopinski, H-6; Jose N. Tafoya, GMX-3.

William M. Visscher, T-9; Jerry D. Wackerle, GMX-7; William E. Wageman, CMF-4; Leo A. Waldschmidt, K-2; Robert Waldschmidt, SD-1; Peter D. Waldstein, CMF-2; Robert W. Wiesener, K-4; Mahlon T. Wilson, CMB-14; John K. Wooten, Jr., T-7; Herbert F. Yost, W-1; John Zinn, J-10.

Four Laboratory Employes Retire

Four long-time Los Alamos Scientific Laboratory employes have retired recently.

Robert L. (Bud) Shehan, assistant division leader in CMB and CMF divisions, retired Feb. 1 after more than 18 years with LASL. He started work in December, 1948, as an administrative aide in CMR division, and since that division's split in 1956 into CMB and CMF divisions, he has worked for both. A native of Lafayette, Ind., he received a B.S. degree in mechanical engineering from Purdue University. During World War II, he served with the Army Air Corps for four years, and now holds the rank of lieutenant colonel in the Air Force Retired Reserve. Prior to coming to Los Alamos, he was with Breese Burners, Inc., of Santa Fe, in engineering production work. Shehan and his wife, Irma, will make their future home in Sun City, Ariz. They have one

daughter, Mrs. Shirley Chumley, of Lemoore, Calif., and two grandsons.

John T. Mann, operations manager of T-1's computer room, retired Feb. 1. With LASL since April, 1952, when he hired on as a computer operator, Mann is a New Yorker by birth. He graduated from Cornell University with a B.A. degree in economics, and for 12 years following, he operated his own dairy and poultry farm. He then returned to the New York State Agricultural College, Cornell, to work in the animal husbandry department before coming to Los Alamos. His wife, Sarah, worked as a P division reactor operator for a number of years. He said they have no definite plans following his retirement.

Douglas Evans, staffer with GMX-3 since May 1, 1951, retired Feb. 1. He was born in Brooklyn, N.Y., and received a B.S. degree in chemical engineering from Colorado School of Mines, Golden. He

also lived in California and Louisiana for a time, then went to Carlsbad, N.M., to serve as chief chemist for the Potash Co. of America. Later he was plant manager of the Alox Co. in Niagara Falls, N.Y., immediately prior to coming to Los Alamos. He and his wife, Mae, will live in Tumecacori, Ariz., where Evans has already started building a home and planting an orchard. Mrs. Evans, a teacher at Canyon School in Los Alamos, will remain in Los Alamos for a time before joining her husband in Arizona.

Herbert L. Wheitsel, laboratory machinist in the shops department, retired Jan. 27 following almost 16 years' service with LASL. Originally from Pennsylvania, Wheitsel worked for the Gates Rubber Co. in Denver before coming here. He and his wife, Dorothy, who retired from H-1 last October, plan to travel extensively in their trailer, and "will have no permanent home" for some time.



Culled from the files of The Los Alamos Times by Robert Y. Porton

Executive Secretary Named

Dr. John H. Manley, a physicist here at Los Alamos since April, 1943, has been named executive secretary to the Civilian Advisory Board of the Atomic Energy Commission. Dr. Manley will make the Hill his headquarters while serving, and will continue in his post as associate leader in the Lab's physics division.

Survey of School Enrollment Made

A survey of the number of pupils likely to be enrolled in Hill schools next fall, based upon new housing soon to be made available, was undertaken at this week's regular meeting of the Board of Education. According to F. Robert Wegner, school superintendent, estimates of new facilities made for schools here to cope with the anticipated increase in enrollment for next term will be submitted to higher authorities. Present enrollment in Los Alamos school is 597.

Passage of Vote Bill Foreseen in State Senate

Voting franchise in Los Alamos was anticipated this week when Bill SB-200 was presented to the state senate. The bill concerns a simple amendment to New Mexico's election code to permit Los Alamos to vote. Many solons have been leading advocates of the bill. Politicos said passage of the bill by the senate appears likely.

Bubble, Bubble, Who's Got the Bubble

In a rush comparable only to a wartime lineup for nylons, 1,100 pieces of bubble gum were sold in half an hour Tuesday at the Hill's newsstand. Monday afternoon it came over the Hill school's grapevine that a shipment of the delicious, bubble-producing gum, scarce during the war and still hard to get, had arrived at the newsstand. To prevent tardiness of pupils Tuesday morning, Mathew Moore, manager, postponed sales until Tuesday noon. During the lunch hour the entire shipment of 1,100 pieces, at the rate of only one stick to a customer, was sold out.

the technical side . . .

Continued from Page 24
by G. J. Igo, P-DOR; J. L. Friedes, H. Palevsky, R. J. Sutter and G. Bennett, all Brookhaven National Laboratory; W. D. Simpson, Rice University; and D. F. Corley, University of Maryland.

"Phonon Dispersion Curves and Internal Displacement in Germa-

nium" by M. J. Katz and J. L. Yarnell, both P-2.

"Thermal Resistance and Phonon Scattering in Imperfect Crystals" by D. N. Payton, III, Marvin Rich and W. M. Visscher, all T-9.

"A New Isotope of Helium: ⁷He" by R. H. Stokes and P. G. Young, both P-12.

what's doing

FILM SOCIETY: Civic Auditorium. Admission by single ticket, 90 cents, or season ticket, \$4. Tickets available at door. Wednesday, March 15, 7 and 9 p.m., "The Red Inn," French comedy starring Fernandel.

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

Saturday, Feb. 25, snowshoe-ski hike. Mike Williams, leader.

Saturday, March 11, Pajarito Mountain to Sawyers Hill on skis. Bob Skaggs, leader.

Saturday, March 18, Pajarito Spring—Otowi Bridge. Virginia Winsor, leader.

PUBLIC SWIMMING, Los Alamos High School Pool, Adults 35 cents, children 15 cents. Saturday and Sunday 1 to 6 p.m.; Monday, Tuesday, and Wednesday 7:30 to 9:30 p.m.

LOS ALAMOS SKATING ASSOCIATION: Schedule for use of local ice rink, Los Alamos Canyon:

Mondays: After-school session, 3 to 5 p.m. (Small children encouraged to attend.) General skating, 7 to 9:30 p.m. (Family night—special family rate \$1.25.)

Tuesdays: "Mothers and Tots" session, 9:30 to 11:30 a.m.; After-school session, 3 to 5 p.m.; adults only, 7:30 to 10 p.m.

Wednesdays: After-school session, 3 to 5 p.m.; general skating, 7 to 9:30 p.m.; hockey team, 9:30 to 10:30 p.m.

Thursdays: "Mothers and Tots" session, 9:30 to 11:30 a.m.; After-school session, 3 to 5 p.m.; Figure Skating Club patch session, 6 to 7:30 p.m.; adults only, 7:30 to 10 p.m.

Fridays: After-school session, 3 to 5 p.m.; "Game Night" (primarily for teenagers), 7 to 9:30 p.m.

Saturdays: Hockey during the morning; general skating, 2 to 4:30 p.m.; "Date Night" (high school and young adults), 7 to 10 p.m.

Sundays: Professional lessons during the morning; general skating, 2 to 4:30 p.m.; Figure Skating Club patch session, 6 to 7:30 p.m.; adults only, 7:30 to 10 p.m.

Season tickets \$3 for students through high school; \$5 for adults. General admission students 25c, adults 50c. Rink telephone is 2-4500.



Rare sight at Nevada Test Site is Yucca Lake with water in it. Normally a dry lake bed, Yucca Lake lived up to its name for a few days last month when snow and rain

fell in the desert. Water was only an inch or two deep, but it was enough to reflect the clouds and cover the 11,000-foot landing strip that runs through the lake bed.

BACK COVER:

Los Alamos Scientific Laboratory, unofficially and unintentionally, joined the select few locations that fly the United States flag overnight when gusty, changing winds one day last month tangled the halyards and prevented the normal lowering of the colors at sundown. Zia rigger, Manuel Quintana, with some help from the crane, soared aloft in a bosun's chair and untangled the flag and halyards at the top of the 59-foot pole in front of the Administration building. Laboratory office windows facing the scene were jammed with interested onlookers.

