

Six Local Agencies, One National Added to ECP



THE OLD—The Christina Kent Day Nursery is a longterm United Way agency that provides day care for children 2 to 6 years old—children of women and men who work but whose incomes aren't adequate to pay private nursery fees.

October 6-13 is campaign week for ECP—the Employee Contribution Plan through which Sandians help support 36 member services of the United Way and 9 national health agencies.

This year, the theme is: *The Need Grows!*

“Six new agencies have been accepted into the United Way,” Calla Ann Pepmueller (3140), ECP Committee Chairman told us, “and the ECP Committee has accepted one new national agency—the Lung Association.

“In addition to more agencies to support, inflation and a growing population have really increased the need for funds. The United Way goal is 2.9 million, up 11.3 percent from last year. As a leading employer in Albuquerque, Sandia will play a crucial role in reaching this goal.”

In dollar terms, Sandia (through individual, corporate and Credit Union pledges) hopes to reach \$575,000. “But just as important,” says Calla Ann, “we hope to increase individual participation in ECP to at least 85 percent. Our second goal is to

[Continued on Page Three]

LAB NEWS

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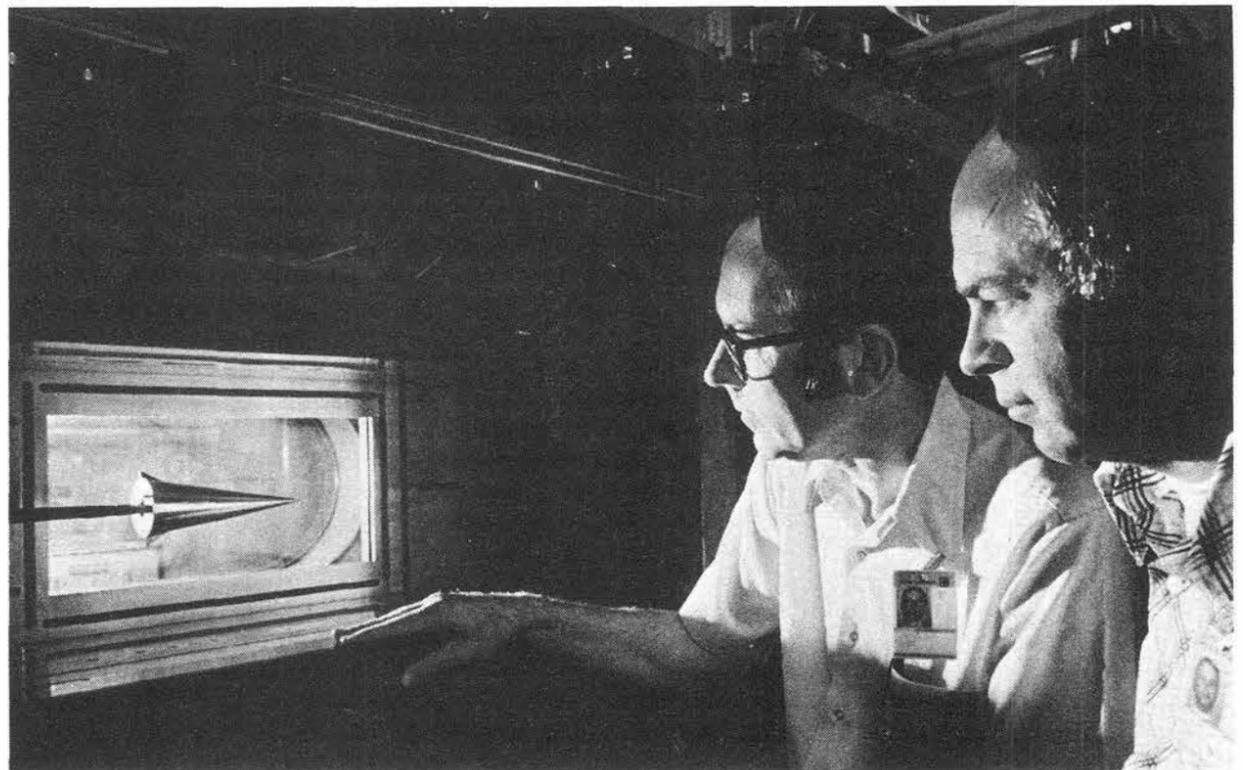
SEPTEMBER 29, 1978

SANDIA LABORATORIES • ALBUQUERQUE NEW MEXICO • LIVERMORE CALIFORNIA • TONOPAH NEVADA

Labs Wind Tunnel Does 20K

In a modern research lab, how many items of equipment do their thing 20 thousand times? Probably not many, yet that's the record compiled this month by the Sandia Trisonic Wind Tunnel. On Sept. 7 run number 20,000 was completed; first run of this tunnel was made by now-retired Alan Pope on April 10, 1956. Longest continued association with the tunnel is that of Cecil Tolbert (5634) who assisted with the fabrication and assembly of the tunnel and was its principal operator for several years.

With a 12 x 12-inch test section, the TWT operates at Mach numbers 0.6 to 2.6, a range that is specially suited to Sandia needs. Some 200 test programs have been conducted in the tunnel, and its list of completed projects reflects the wide-ranging pursuits of Sandia Labs in the last two decades: bombs—B28, B41, B57, B61, ERB and Tiger II; sounding rockets—Tomahawk, Sandhawk, Strypi and Malemute; artillery projectiles—M106, M483, M549 and M753; reentry vehicles—MTV and RVRTV; parachute test vehicles; air-dropped intrusion detectors; and Systems for Nuclear Auxiliary



20,000 TESTS—Ed Clark and Don MacKenzie (both 5634) inspect model of RVRTV-3 in Trisonic Wind Tunnel. The tunnel, more than 20 years old, recently completed its 20 thousandth run, is still blowing strong.

Power (SNAP).

While many of Sandia's aerodynamic tests must be performed in outside facilities, the advantage of the TWT is that tests can be conducted with short lead times and at minimum expense. Over the

many years of usage, the facility has been continually upgraded by improving both the tunnel and its associated data acquisition system. Current tunnel supervisor is Don McBride, head of Experimental Aerodynamics Divison 5634.

Authors

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Supervisory Appointment

RUTH WHAN to manager of Chemistry and Materials Characterization Department 5820, effective Oct. 1. After joining the Labs in June 1962, Ruth worked on radiation effects in semiconductors, materials characterizations, and ion implantation. She was promoted to supervisor of a materials analysis division in February 1972. This group performed materials analyses using instrumental techniques—electron optics and x-ray analysis. For the past few months, Ruth has been supervisor of the Explosive Materials Division 2516.

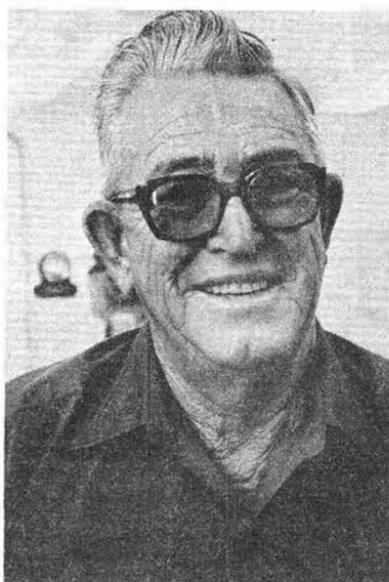
Ruth earned a BS in chemistry from Allegheny College and an MS and PhD in physical chemistry from Carnegie Institute of Technology and UNM, respectively.

Raising a family and business travel have curtailed Ruth's interest in skiing and tennis; however, she's currently coaching a young soccer team, and says that even if she was "drafted," she's enjoying it. Ruth, her husband Glenn, who is associate dean of engineering at UNM, and their three children live in NE Albuquerque.



RUTH WHAN (5820)

Retiring



Allen Williams (3613)



Wilbert Jones (1132)



Helen Anderson (2431)



Gloria Starzynski (3321)



Walter Norris (3651)



George Ray (2323)

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so does Russell Smith

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Continued from Page One

ECP Drive

substantially increase the number of Fair Share givers at Sandia—individuals who give at least one hour's pay per month."

About 84 percent of all funds contributed by Sandians goes to the United Way. The other 16 percent goes to national health agencies with local chapters.

Union Presidents Endorse ECP

The agencies supported through the Sandia Employee Contribution Plan provide valuable health and social services in our community. Union members at Sandia have participated in ECP for many years; we are pleased to add our endorsements as a way of contributing to the success of the 1978 campaign.

Conrado A. Otero, President

Atomic Projects & Production
Workers
Metal Trades Council
AFL-CIO

Maxine M. Stephenson, President

Office and Professional Employees
International Union
Local 251, AFL-CIO

Robert L. Stewart, President

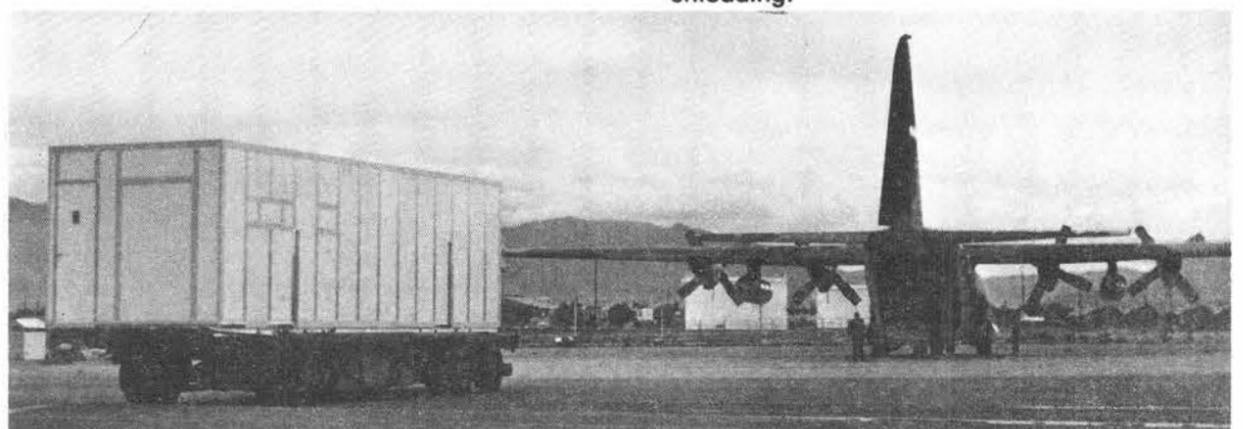
International Guards Union of
America
Local 27

THE NEW—Executive Director Billie Poteet of Share Your Care, an agency new this year to United Way, talks with two (of 40) individuals who participate in a day care program for the frail elderly and dependent adults.



International Flavors and Fragrances is a company dedicated to the proposition that all things are not created equal (but can be made to smell or taste as though they were).

Among their scents is one that makes old VW's smell like new Rolls Royces. They have a skunk smell to repel vandals—and another to camouflage hunters by making them smell like apples. This last, we presume, is an advantage. Unless, of course, an angry tiger puts his emphasis on content rather than form.



ATIS Takes To the Air

Sandia field test operations can take place in any part of the world. For men of Gordo Miller's Mobile and Remote Ranges Division 1127, being in Alaskan snow or Brazilian jungle is just another day's work. Key part of any operation, however, is the instrumentation trailer.

Housing telemetry equipment and racks of electronics, these trailers are 40-ft. long commercial items adapted to Sandia's special needs. They are usually pulled by truck to the site.

Some sites, you can't get there from here.

A new kind of instrumentation trailer has now become operational at Sandia that ameliorates these problems and offers additional advantages as well. Called ATIS (Air Transport Instrumentation Shelter), the new unit is designed to fit inside a C-130 aircraft, workhorse of the Military Air Command.

Designed by Leo Dunn (4541), ATIS is 28 ft. long, 9 ft. wide, and 8½ ft. high. Loaded with electronics, it weighs 12,600 lbs.

The frame is constructed to be compatible with the USAF-44 cargo handling system. The remaining structure is primarily aluminum skin foamed panels supported by extensions containing a thermal block feature. The roof is covered with one continuous piece of a material called "Flexseal."

The unit is compatible with the special cargo fittings of the C-130 aircraft and the Air Force K-loader system for ground handling and loading. In addition, four accessory hydraulic jacks with wheels permit the unit to be rolled onto a flatbed truck if no K-loaders are available.

ATIS has a separate generator, heating and air conditioning service unit which fits snugly inside the same aircraft with ATIS.

"The operational flexibility, speed and safety of air transport, compared to over-the-road hauling of a 40-ft. trailer makes ATIS cost effective," says Ray Brin, manager of Test Operations and Analysis Department 1120.

Al Young (1127) is responsible for the electronics in ATIS. Dean Kuehl (1127) is project leader. The unit was fabricated in the Bldg. 892 Branch Shop. Phil Meekings and Ernie Lovato (both 1482-1) were project leaders.

ATIS (Air Transportable Instrumentation Trailer) fits snugly into a C-130, saves over-the-road trucking to remote sites. Below, a military K-loader with ATIS on board approaches cargo doors. At left, a flat bed truck is used for unloading.



SYSTEM TEST of the Sandia developed Perimeter Surveillance System, Closed Circuit Television, is performed by Paul Stickler and Hovey Corbin (both 1733). They are at the Security Police operator's position in the control cab. In operational use, cab is positioned on a tower 30 to 50 ft. above the ground.



ORVILLE HOWARD (1733) adjusts aim of TV camera over a security fence. Special camera support standard was also developed by Sandia for the Air Force as part of new CCTV security system.

TV Surveillance

Labs Program Enhances AF Base Security

Air Force bases around the world are the focus of an extensive Labs program to enhance base security through use of a sophisticated closed circuit television system. Called the Perimeter Surveillance System, Closed Circuit Television, the system has been developed over the past year in Tom Hoban's Project Engineering Division 1733. First operational use is anticipated this winter, with installation now underway at Pease AFB in New Hampshire.

Additional installations are planned at some 60 Air Force sites worldwide; Sandia has accepted responsibility for the installation of the CCTV hardware at these sites. This work is being done for the Air Force Base and Installation Security Systems Program Office headed by Col. Roger Kozuma.

An Air Force security requirement that all alarm signals indicating intrusion at Air Force bases be checked out visually was a major factor leading to the development of the CCTV system. At many bases, sections of the base perimeter are obscured by buildings or by the terrain itself. This means that in addition to the central surveillance tower, auxiliary guardposts are necessary, continuously manned by Air Force personnel. With CCTV covering these obscured areas, only one central tower is needed, manned by one operator, and the resultant savings in manpower are considerable.

In operation at a base, CCTV is an adjunct to the Small Permanent Communications and Display Segment (SPCDS), also developed for the Air Force by Sandia. SPCDS collects and transmits intrusion sensor alarm data and displays

these alarms on an illuminated map display at the security operations center. When an alarm comes from a blind zone, the television cameras in that zone are automatically activated, enabling the operator to visually check out the zone.

By agreement with the Air Force, the CCTV program is based on use of commercial closed circuit television equipment, modified where necessary and feasible to provide enhanced reliability, performance, and maintainability. A number of additional hardware items have been developed at the Labs. Central to the system is the Control Indicator Assembly, designed and developed by Chuck Kinsey (1733). The assembly employs a micro-processor to decode alarm data, to activate hardware, and to perform monitoring and self-testing functions. In addition to its random access memory, the micro-processor utilizes a programmable read-only memory to store data that is peculiar to the site at which it is installed. Lee Maschoff (1736) assisted in the development of the software.

Other Sandia-developed hardware includes a control monitor unit, television camera support (see photo), mounting and installation equipment as well as test equipment. All of these items were designed and developed in Division 1733. Project leader Paul Stickler coordinated design activities. Team members include Jack Armbrust, Harry Chaney, Tim Malone, Sherry Smith, and Win Watson. System reliability analysis was performed by Division 1222, human factors engineering by Division 1223 and quality assurance support by Division 1417.

Site survey teams, headed by Carl Curtis

and Billy Johnson, have been conducting preinstallation activities at the various Air Force locations. This work has been underway since May 1977 and is about two thirds complete. A target date of October 1980 has been set for full operational capability of CCTV systems at the Air Force bases.

Fun & Games

Skiing—Next Sunday, Oct. 8, the C-Club Ski Club has its annual walk-down on Sandia Peak. In this event, you ride the chair lift up, then walk down a run heaving rocks and other debris into the woods (or at that guy you don't like.) Refreshments and hamburgers await at the bottom. Things start at 10:30 a.m.

Ski Patrol Ski Swap is coming up—Oct. 20, 21 and 22—at the Agriculture Bldg., State Fair Grounds. More on this next issue of LAB NEWS.

* * *

Running—Roadrunners meet at Wilson Stadium on Sunday, Oct. 8, starting at 1:30 p.m. There's a 1-miler, a 5000-metre race, and a 2-person 10-mile relay. You don't have to be a member to participate.

* * *

Golf—Sixty Sandians took part in the September Sandia Golf Assn. SGA Cup Tournament, played at Los Altos and Arroyo del Oso golf courses. Low net winner was Jim Langenhorst (1253), while Leon Chapman (4724) took low gross. Two more tournaments remain before the annual year-end banquet on Oct. 27.

New Tech Control Center Operational

Next Monday, a new Tech Control Center that centralizes all monitoring and diagnostic functions on the communication lines between remote terminals and the computing center in Bldg. 880 goes into operation.

The new Tech Control Center becomes the focal point for dispatching all computer service organizations, for terminal repair, for telephone service on lines used in computer communications, for signal cable repair, for customer engineers for the main computers and for relocations or installation of computer terminals.

More than 18 months in research, development, fabrication and installation, the new center is the work of Dan Puetz (2633), Bob Trudo (2648) and Joe Sena (Syntonic Technology). The center was completed at a cost of \$65,000.

"This is particularly gratifying," says Bob Trudo, "since outside bids for only a portion of the system were considerably higher."

One of the reasons for the cost savings was the unique approach the team used to monitor communications lines. Most diagnostic systems are placed on the digital side of the links between terminals and computers. This requires patching up to 25 wires to monitor a single terminal. Sandia's center is placed on the analog side of the line and the digital diagnostic information is generated within the center. This requires patching only two wires to



NEW TECH CONTROL CENTER in Bldg. 880 monitors and diagnoses all links between remote terminals and Sandia's main computers. Center is the work of, from left, Bob Trudo (2648), Dan Puetz (2633) and Joe Sena (Syntonic Technology).

monitor a single terminal. (All computer data travel through telephone lines, are converted from digital data at the terminal to analog signals for transmission, then back to digital form for computer processing.) The new system is less complex and more compact than digital diagnostic systems but actually provides more information.

"We can diagnose trouble on all the Sandia computer links," Bob says, including the link to the LASL Cray machine and the computers at Sandia Livermore.

This is groundwork for networking all of the terminals.

"If garbling occurs on any link, we are in constant contact with the user—he can help us with tests on the line—and we can usually provide a remedy within minutes or, at the outside, a couple of hours. Previously, it would require up to four hours just to diagnose a problem before initiating repairs."

To report computer communication problems to the new control center, call 4-8017.

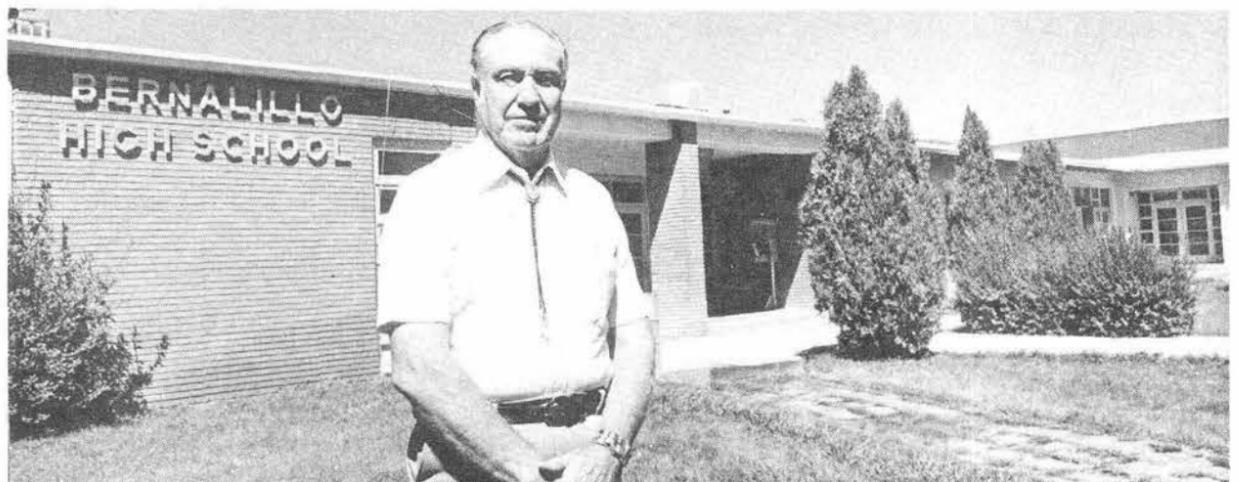
Lt. Reuben Montoya—Guarding the Quality of Education

Worrying about the quality of our own children's education is traumatic enough for most of us. But consider the magnitude of Reuben Montoya's concern: as President of the Bernalillo Board of Education, he's responsible for the education of 3600 young people—from Bernalillo, Sandia Pueblo, Placitas, Algodones, Santa Domingo Pueblo, San Felipe Pueblo, Pena Blanca, Cochiti Lake, Cochiti Pueblo and the town of Sile. At the Labs, Reuben is a Lieutenant in Security Division 3432.

Reuben is no stranger to Sandoval County—or its needs. Born, raised and educated in Pena Blanca, he served as Chief Deputy County Clerk after high school. Following four years in the Air Force, he ran his own general merchandise store in Bernalillo. He joined Sandia in 1951, was promoted to lieutenant in 1967.

With four children of his own, it seemed natural to Reuben to be involved with education. "My first experience was on the County School Budget Committee," he explains. "Then, in the late 60's, Cuba, Jemez Springs and Bernalillo all voted to dissolve the county school system, to go municipal. In 1969, I ran for the Bernalillo School Board and was elected for a six year term."

He was reelected in 1975. During his tenure he has served two years as Secretary



AS PRESIDENT of the Bernalillo Board of Education, Security Lt. Reuben Montoya (3432) is concerned with the quality of education of some 3600 young people. Voters recently approved a bond issue and levy, and the Board is now selecting a new school site and planning remodeling of existing facilities.

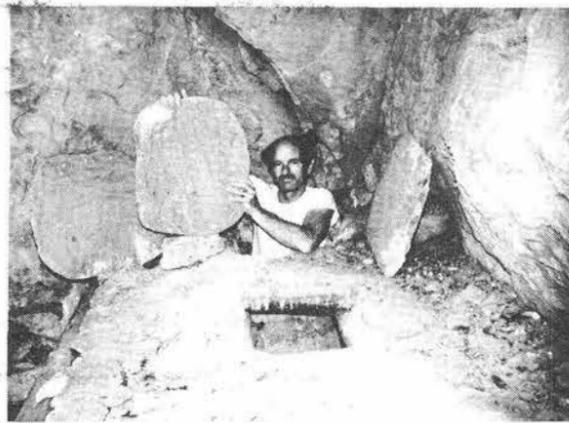
of the Board, three as Vice President, the last four as President.

"Part of our job," Reuben says, "is planning for the future and finding the money to meet our needs. Our big job right now is to find the right site for a new school—and to remodel the facilities we have. We took our needs to the people last April. Our school bond election passed overwhelmingly and will provide \$650,000. The voters also approved a two mil levy which will provide about \$250,000 a year for three years. Based on our success, we got an \$800,000 capital outlay grant

from the State—which was gratifying, since we were in competition with all 88 school districts in the state."

Will he continue on the school board now that all his children are out of the public school system? "Maybe," Reuben says. "The job doesn't pay anything, but there's a lot of satisfaction in it. I enjoy serving the people, especially the young ones."

In addition to his work with Sandia Security and his school board job, Reuben runs the 30-acre family farm in Pena Blanca in his spare time.



HIGH in a remote canyon off the Gallina Creek in northern New Mexico, Don Mattox and Hugh Pierson (both 5834) found this granary which dates back, probably, some 800 years to the Gallina Indians. Don is shown making the climb to the corn bin, while Hugh stands in bin holding rock slabs which covered roof openings.

Vista New Mexico

Sandians Discover Indian Ruin

One of the abiding charms of New Mexico lies in the remoteness of much of its countryside. Canyons and hilltops still abound that experience the impress of human passage only once a decade. But you have to leave the beaten path to find these pristine places. At the Labs there are two Sandians—Hugh Pierson and Don Mattox of Div. 5834—who have travelled to many of the world's remote places and who continue to search out these special places here in New Mexico. A recent backpack into the countryside northeast of Cuba was rewarded by discovery of an Indian ruin that appeared to be undisturbed, a most unusual circumstance. Hugh has written this account of their discovery.

* * *

Snow was on the mesa and a cold February wind moved through the junipers. A thin flow of water trickled between the frozen bank of the Gallina Creek just above its junction with the Chama on the wild and beautiful northern edge of the Jemez Mountains. The old rancher had spread some alfalfa for a few head of Black Angus cattle. I stopped and told him of my interest in Indian culture. "You know, amigo," he told me, "way up there in one of the side canyons, there is an old ruin. The canyon is very steep, very rough. I've never been there myself. Buena suerte!"

When I returned three months later, the snow had disappeared under the warm spring sun. After a three-hour hike, my son Doug and my friend Don Mattox and I had found our way up the canyon to the ruin. There it was, probably 25 feet up the canyon wall. We climbed the nearly vertical face to the ruin, not without difficulty.

We were sitting on a small, sturdy structure some eight feet long, four feet wide and five feet high, built with flat rocks and adobe. Carefully laid pine poles with a cover of clay formed the roof. There were no doors, no windows. Three holes in the roof were closed with well-fitted stone slabs. I lifted one and peered inside. The room was bare and clean, showing only a fine layer of dust. Walls, roof, and floor

all were in excellent condition, apparently untouched for many hundreds of years. The narrowness of the canyon, here less than 20 feet across, as well as a deep overhang had protected the little structure from sun, rain, wind and snow. And its inaccessibility gave it protection from man. The rooms were certainly too small for living quarters; this had to be a food storage bin and certainly the best-preserved "ruin" I had seen in all my years of wandering the Southwest.

Now our job was done. We had mapped the site, photographed it, and were on our way down the steep canyon to Gallina Creek. I could not shake from my mind the lonely image of the small fortress-like corn crib, so remote, so intriguing. Who built it and why?

The Gallina Indians lived in the area some 800 years ago, and ruins of their small villages can still be seen on the surrounding mesas. They were a peaceful people, yet were constantly threatened, both by hunger and by marauding bands of Navajos. A hidden, secure food storage was essential; their very life depended on it.

But why so high up the canyon? Why not closer to the river? Simply because their fields (and their villages) were on top of the mesa and not by the river. And this is indeed a characteristic of prehistoric pueblos in the Jemez. Why not by the river where water always runs and things grow? I believe the answer is found in these peoples' ancient religion. A chief of the Hopis once explained the belief to New Mexico writer Frank Waters, "Our villages do not lie in the path of the running water. Everyone sees that there are no ditches in our fields. It is only by our faith that our fields are watered. But those who live along the running water will be the first to lose their faith because they do not have to depend on prayer."

That night at camp with the new moon over the pines, it was easy to see the long lines of short, sturdy men and women dancing to the drum in a communal prayer to the rain god who lived among the thunderheads. The rain would come, the corn would grow and the old corn bin would be filled for another season.

John Gardner Adapts Bard For '12th Night'

The upcoming Classics Theatre production of Shakespeare's "Twelfth Night" will not be your standard classic Shakespeare. Director John Gardner (3144) has adapted the comedy about English noblemen and women into a comedy about out-of-work vaudevillians and silent screen stars in Hollywood in the classic time of American cinema—the mid 1920's.

John has also added some touches of that era's popular entertainment—ragtime music, silent movies, screen titles, slapstick humor, burlesque routines, flappers and sheiks.

"It works," John says enthusiastically. "Shakespeare's plot remains intact. Virtually all of the dialogue is original Shakespeare, and the characters are basically the same—just new professions. Most of our audiences are high school and college students, so this adaptation is a ploy to make a classic play more exciting to a modern audience. The cast is having a ball in rehearsals and, frankly, I'm enjoying it more than any show I've worked on."

(John, Phil Mead, 3151, and Bill Carstens, retired, chartered the Classics Theatre Company 10 years ago. "Twelfth Night" is the 15th production John has directed for the company.)

The show will run at Popejoy Hall at UNM Oct. 12 through 14. Curtain time is 8:15 p.m. A matinee at 2:15 p.m. will also be presented Oct. 14. Tickets are \$3, \$4.50 and \$5.50 with a \$1 discount for students and senior citizens. Call 277-3121 for reservations.



DIRECTOR JOHN GARDNER (3144) enjoys telling how he's adapted Shakespeare's "Twelfth Night" from a setting in medieval England to the Hollywood of the 1920's. The Classic Theatre Company production is scheduled Oct. 12-14 at UNM's Popejoy Hall.



As though we didn't have enough to worry about on our freeways, psychiatrists are reporting a new mental aberration—the "freeway freakout." As an L.A. psychiatrist puts it, "People explode. Their car becomes a weapon and they strike out with it." He cited the case of the overstressed driver of a pickup who went on a 20-mile rampage. After sideswiping 32 cars, he crashed his truck, commandeered an auto from a terrified motorist and crashed that, too. He was finally subdued by police.

Take Note

Bernalillo County Planned Parenthood is holding a fund-raising Walk-A-Thon this Sunday, Oct. 1, at 8:30 a.m. The Walk underlines Planned Parenthood's over 8000 patients' need for family planning services. Everyone is welcomed to walk the 10-mile course from the Planned Parenthood Clinic at 7704 2nd St. NW, south to the Civic Plaza, then east on Central to Morningside Park. Information and registration forms (available in LAB NEWS office) explain sponsorship arrangements and list of prizes.

* * *

The annual tour to Trinity, site of the first nuclear explosion, takes place next Saturday, Oct. 7. Once a year the military opens the northern end of the White Sands Missile Range for this purpose. If you're interested, drive on the Interstate past Socorro a few miles to San Antonio and State Road 380. Go east on 380 about 12 miles to Stallion Range, then south five miles to the gate where you will be met by MP's. A caravan is formed for the trip to the Trinity site. Our information is incomplete at this writing, but we understand you should be at the Stallion Range gate around 10:30. Bring a lunch—the trip takes several hours.

* * *

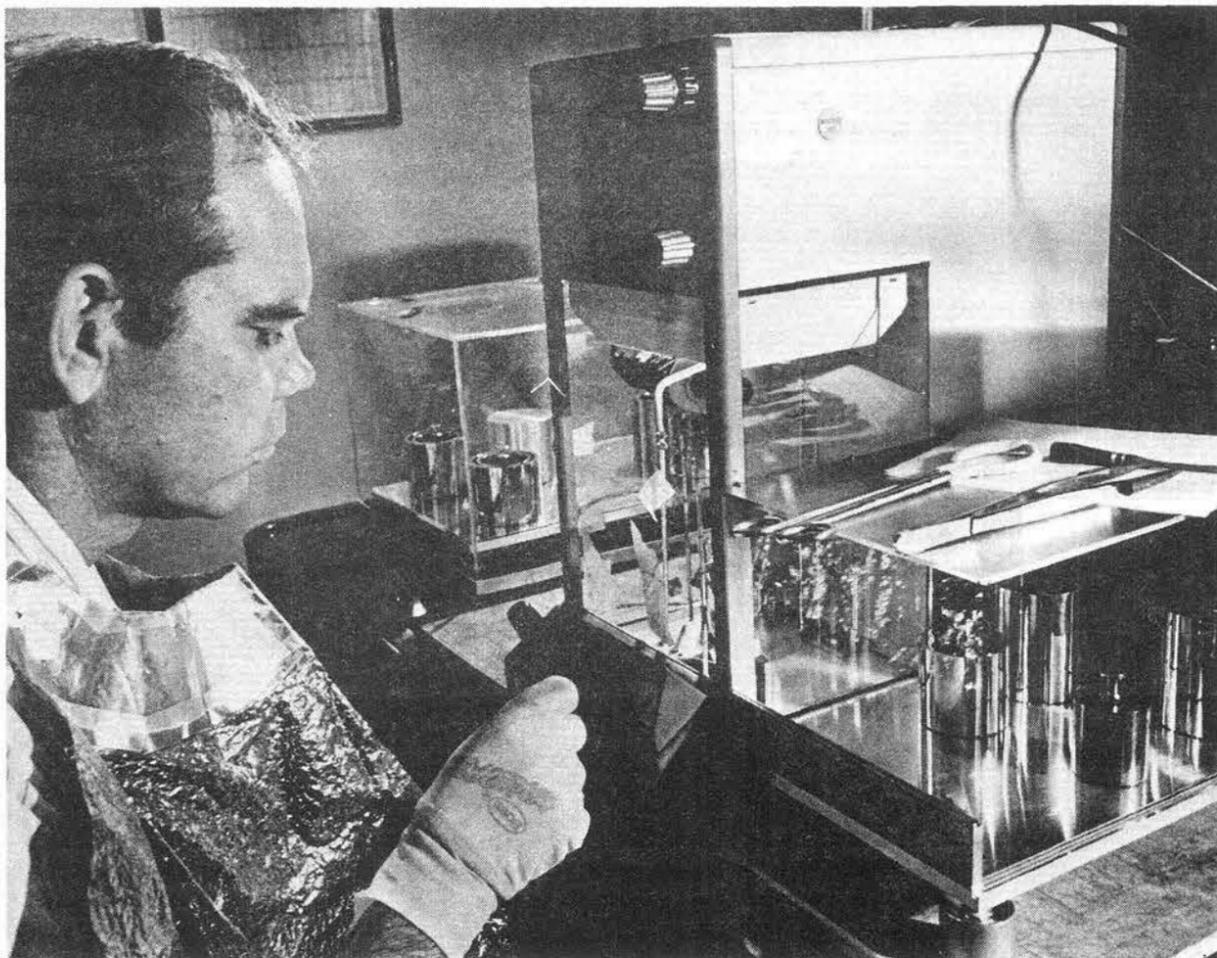
For its subscribers, Mastercare is offering something called "Activated Patient Class," a program of six classes about maintaining good health and coping with illness. It begins Oct. 12 and meets on consecutive Thursdays from 7-9 p.m. at the Presbyterian Professional Bldg. A fee of \$10 is charged to cover materials. Call Priscilla Sands, Health Education Coordinator, at 247-0361 if you're interested.

* * *

Don Stone (3543) reports that the 10th Annual Search & Rescue Conference is being held in Albuquerque at the Convention Center Oct. 5 to 8. Don is active with the Sandia Search & Rescue Team, as are many other Sandians. The conference consists of workshops, panels and rescue-related exhibits.

Events Calendar

- Oct. 2—Bella Lewitzki Dance, UNM Cultural Entertainment Series, Popejoy, 8:15 p.m.
Oct. 5—"Gifts of an Eagle," Audubon Wildlife Film, Popejoy, 8:15 p.m.
Oct. 6-8—Grecian Festival '78, pastry, food, dancing, artifacts, St. George Hall, 308 High St. SE, 11 a.m.-10 p.m.
Oct. 6-9—"Brother to Dragons, Companion to Owls," UofA Stage I, 8 p.m., 831-1111.
Oct. 6-15—International Hot Air Balloon Fiesta.
Oct. 9—"Egypt," travel film, Popejoy, 277-3121.
Oct. 12—Open House at Career Enrichment Center, 807 Mountain Rd. NE, 7-8:30 p.m.
Oct. 12-14—"Twelfth Night," UNM Classics Theater, Popejoy, 8:15 p.m.



READING THE BEAM. Randy Schoonover, one of the four-man National Bureau of Standards team recently at Sandia to run experiments related to the standard mass, weighs one of several accurately known kilograms to determine variation in apparent weight caused by gravity, temperature, humidity and air density at this altitude.

Is A Kilogram A Kilogram?

NBS Measures Air Density Effects

A kilogram weighs the same in Moscow as it does in Washington, D.C. or Albuquerque. Right? Wrong!

The differences (caused by gravity and air buoyancy) aren't likely to cause any consumer consternation since they're too minute to show up on the scales at the corner meat market. But scientifically speaking, they're significant. Just how significant is a matter of concern to the National Bureau of Standards—and thus to Sandia since we provide physical standards for the entire ALO weapon production complex.

All last week, three physicists and a chemist from NBS's Center for Absolute Physical Quantities ran experiments in Sandia's Primary Physical Standards Lab (2551) on a number of accurately known kilograms of varying densities. Their objective was to determine the variation in apparent weight caused by gravity, temperature, humidity and air density at this altitude. Their data will be used to verify equations of buoyancy.

To put this in perspective, we talked with Vince Bower, the chemist with the four-man NBS team. He explained that the international standard for mass, Kilogram #1, is stored in a temperature-and-humidity controlled vault at the *Bureau International des Poids et Mesures* in Sevres, France, just outside Paris.

Clones of Kilogram #1 have been sent all over the world (the U.S. has #4 and #20). These are primary standards, the ones against which all secondary and working standards throughout the U.S. are calibrated to make sure a kilogram is a kilogram. But weight isn't the sole factor.

The primary standards (#4 and #20) are made of an extremely dense (and therefore heavy) alloy of platinum and iridium. Their overall volume is considerably smaller than, say, the secondary standards, which are made of stainless steel, a less dense material.

In the lab, there's no easy way to make a direct comparison of the mass of two objects. So the objects are weighed, using an extremely sensitive balance. And this is the crux of the matter. The balance used to weigh the objects doesn't compare mass, it compares force. And both gravity and the density of air act on the object in the balance pan.

"Recent experiments at the National Bureau of Standards suggested that the equations used to calculate the buoyant force of air were in error," Vince explained, "and that's why we came to Sandia. We're running experiments to establish whether our initial conclusions are true or false. In a scientific sense, it's imperative that the mass standards of the U.S. be identical to those of other nations."

The objective of the experiment is to test a mass algorithm which is believed to give results with an uncertainty of less than one part per million. "We picked Sandia," Vince said, "because NBS has a close working relationship with your Primary Standards Lab—and because Sandia has the right equipment at the right altitude."

Other members of the NBS team were physicists Randy Schoonover, Richard Davis and Gregory Driver. They were assisted at Sandia by Arnold Draper, Frank Anderson, Sandy Anderson and Bill Schuessler (all of 2551).

Retirees Gather

SLL RETIREES gathered at the Pleasanton Hotel this year for their annual get-together. The



Hostess Carolyn Townes (8212) helps Burnie and Ruth Biggs with name tags.



Russ Hutchison, Ray Faltings and Hellmuth Woidtke listen as Les Rowe makes a point.

turnout was the largest since the event began 13 years ago.



Former co-workers (from left) Tom Holmes, Frank Moore and Jeanne Powell Honsal.



Ray Raty with wife Mildred.

Livermore Speakers

Wil Bolton (8115), "Hybrid Trajectory Simulation of a Parachute System," and Bob Marmon (8412), "Graphics for the Hybrid Stores Separation Simulation of the B-77 System," Hybrid Computer User's Group Conference, Apr. 11-13, Idaho Falls, Idaho.

Hal Short (8327) and Mike Sharp (1223), "COM Applications at Sandia," Computer Micrographics Technology annual meeting, Mar. 1, San Francisco.

Bob Schneider (8342), "Pressure Dependence of Gas Breakdown by Combined Laser and Microwave Radiation," American Physical Society meeting, Apr. 24-27, Washington, D.C.

Reggie Mitchell (8351), "Nitric Oxide and Hydrogen Cyanide Formation in Laminar Methane/Air Diffusion Flame," and Bob Cattolica (8353), "OH Rotational Temperature from Laser Induced Fluorescence," Combustion Institute, Western States Section Spring Meeting, Apr. 17-18, Boulder, Colo.

Carl Melius (8341), invited presentations: "Hydrogen in Metals and Metal Hydrides: Electronic Structure and Mobility," Princeton University Solid-State Physics Department, Apr. 17, Princeton, N.J., and Brookhaven National Laboratory Chemistry Division, Apr. 20, Upton, N.Y.; and "A Quantum Chemical Cluster Approach to Hydrogen in Metals and Metal Hydrides," IBM Thomas J. Watson Research Center, Apr. 21, Yorktown Heights, N.Y.

John Brooks (8316) and Anton West (8314), "Hydrogen Induced Ductility Losses in Austenitic Stainless Steel Welds," and Anton West, Ben Odegard (8314) and Ron Stoltz (8316), "The Effect of Carbide Sensitization on Hydrogen Induced Ductility Losses in Stainless Steels," 19th AIAA Structures, Dynamics and Materials Conference, Apr. 3, Bethesda, Md.

Jack Dini and Rudy Johnson (both 8312), "Influence of Nickel Sulfamate Operating Parameters on Impurity Content of Deposits," International Conference on Metallurgy Coatings, Apr. 3-7, San Francisco.

John Brooks (8316), "Thin Section Welding of HP9-4-20"; John Brooks, Jack Dini (8312) and Rudy Johnson (8312), "Effect of Impurities of Weldability of Electroformed Nickel"; and Ken Hicken (8423), "Weldability of a High Strength Martensitic Steel," American Welding Society 59th annual meeting, Apr. 3-7, New Orleans.

Lutz Dahlke (8444), "Radioactive Gas Penetrant

Inspection of Platings," and Chuck Oien (8444), "Epithelial Neutron Radiography of Fast Reactor Fuel Assemblies," American Society of Nondestructive Testing Conference, Apr. 3-6, New Orleans.

Jim Bartel (8313), "Heat Storage and Transmission by Reversible Chemical Reactions," American Chemical Society meeting, Apr. 5-7, Baltimore.

Bill Alzheimer (8120), "Issues and Methodology for the Selection of a Conceptual Design for a Solar Central Receiver Pilot Plant," International Symposium on Solar Thermal Power Stations, Apr. 12-13, Cologne, Germany.

Clayton Mavix (8451), "Heliostat Glass Mirror Module and Low Iron Float Glass Evaluation," Reflective Materials Technology Workshop, Solar Energy Research Institute, Mar. 28-30, Golden, Colo.

Marty Abrams (8124), "Solar Energy in Your Future," Swedish-American Chamber of Commerce, Mar. 30, Los Angeles.

Walt Bauer (8347), Ken Wilson (8347) and George Thomas (8341), "Fundamental Surface Processes in Plasma Wall Interactions"; Ken Wilson and Mike Baskes (8341), "Deuterium Trapping in 316 Stainless Steel"; Walt Bauer, Ken Wilson, Charles Bisson (8322) and Leroy Haggmark (8341), "Surface Exfoliation in Tokamak Devices"; Ken Wilson and George Thomas, "Microstructure of Low Energy Deuterium Implanted Stainless Steel"; Bob Bastasz (8347) and George Thomas, "Surface Analysis of Sputtered Stainless Steel"; and Leroy Haggmark and Bill Wilson (8341), "Monte Carlo Studies of Sputtering." Third International Conference on Plasma Surface Interactions and Controlled Fusion Devices, Apr. 3-7, Culham Laboratory, United Kingdom.

Carl Melius (8341), "Hydrogen and Helium Migration in Titanium Hydrides"; Chuck Hartwig (8342), "Raman Spectroscopy of Pollucite"; John Holbrook and Bill Wilson (both 8341), "Binding of Helium to Dislocations"; John Holbrook, "The Pressure Dependence of the Solubility and Diffusivity of H and He in Fe, Ni and Cu"; Carl Melius and Bill Wilson (8341), "A Hybrid Quantum Chemical Cluster and Lattice Defect Approach to Hydrogen Migration in Nickel"; and John Vitko and Corey Coll (both 8342), "Calculation of the Matrix Shift and Center of Mass Frequency of H₂ and D₂ Dissolved in Solid Argon, Krypton and Xenon," American Physical Society meeting, Mar. 27-30, Washington, D.C.

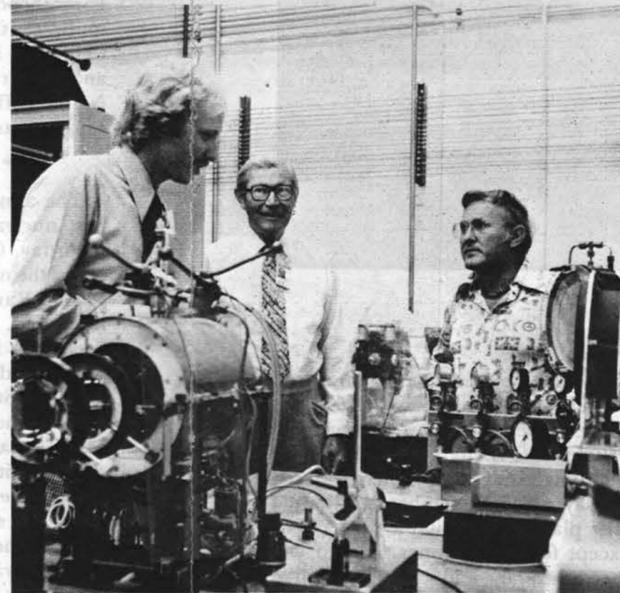
LIVERMORE NEWS

VOL. 30, NO. 20

LIVERMORE LABORATORIES

SEPTEMBER 29, 1978

GIL CORDOVA, new manager of Sandia Area Office, visited SLL last month. Here he listens to Mike Dyer (8352, left) describe a combustion experiment as Byron Murphy (8300, center) looks on.



Livermore Authors

Bob Carling (8313), "Calorimetric Investigation of Orientational Disorder in Ionic Crystals Containing Linear Anions," 175th annual American Chemical Society Meeting, Mar. 15, Anaheim, Calif.

Mote Nichols (8313), "Interim Report of the American Crystal Subcommittee for Establishing Standards for the Publication of Powder Patterns," ACA meeting, University of Oklahoma, Mar. 19-24, Norman, Okla., and "Plan for Improvement of Published Powder Pattern Quality," ACA Joint Committee for Powder Diffraction Standards annual meeting, Mar. 28-30, Philadelphia.

Louis Talerico (8452), "Advanced Central Receiver Studies"; Bill Wilson (8451), "Key Analyzers and Trade-offs for the Prototype Heliostat Program"; Ernie Eason (8122), "Generic Heliostat Studies"; Joe Hankins (8326), "Plant and Module Size Optimization"; Joan Brune (8326), "Hybrid and Repowered Solar Electric Plants"; and Jim Woodard (8326), "The Role of Storage in Determining the Value of a Solar Plant in an Electric Power Grid," 1978 DOE Workshop on Systems Studies for Central Solar Thermal Electric, University of Houston Solar Energy Laboratory, Mar. 27-30, Houston.

John Vitko, Chuck Hartwig and Pete Mattern (all 8342), "Interaction of Dissolved Molecular Hydrogen with a Vitreous Silica Host," American Physical Society International Conference on the Physics of SiO₂, Mar. 24-27, Tarreytown, N.Y.

Bill Ashurst (8354) and Bill Hoover (8314), "Hard Sphere and L-J Shear Viscosity at the Triple Point Via Equilibrium and Nonequilibrium Molecular Dynamics—Do They Agree?"; and Bill Ashurst, "Vortex Dynamics Simulation of Turbulent Fluid Flow," Third West Coast Statistical Mechanics Conference, IMB Research, June 14, San Jose, Calif.

Bob Cattolica (8351), Bob Gallagher (8321), J. B. Anderson (Pennsylvania State University) and L. Talbot (UC/Berkeley), "Velocity Slip and Translational Non-Equilibrium of Ternary Gas Mixtures in Free Jet Expansions," 10th AIAA Fluid and Plasma Dynamics Conference, June 27-29, Albuquerque, N.M.

Bob Carling (8313) and Jim Bartel (8131), "Heat Capacities of Zinc Ferrite and Zinc Doped Magnetite from 350 to 1000K," 32nd Annual Calorimetry Conference, Universite de Sherbrooke, July 6-9, Quebec, Canada.

LEAP '78—People Helping People

This year's LEAP (Livermore Employees' Assistance Plan) fund raising campaign begins Monday morning with a briefing of solicitors from SLL organizations through the Lab.

"People Helping People," the campaign theme, is what LEAP is all about," says Chairman Frank Murar (8345). "Sandians have always been generous in their support. LEAP provides a convenient means for helping people with real needs through payroll deduction. And I feel that when we support agencies that help make our community a better, healthier, less threatening place to live, we all benefit."

The LEAP '78 campaign goal is \$60,000 (\$5000 more than last year), to be allocated among the United Way of the Bay Area, Combined Health Agencies Drive (CHAD) and local agencies. Of the eight local agencies supported last year, Buena Vidas Youth Ranch, Hotline, Valley Emergency Fund Center and the Nurse's Welfare Fund will continue to receive LEAP funding. Three others have been added:

•Parental Stress Service—a service to help parents with the objective of preventing child abuse and neglect.

•Tri-Valley Haven for Women—provides a safe shelter for women and their children who are victims of domestic violence.

•Connection—a 24-hour Valley listening service for people who find themselves in a crisis situation.

Although the United Way (supporting 196 Bay Area agencies) and CHAD (supporting 13 national health agencies) are the principal recipients, 17 percent of allocated funds go to the selected local organizations. Services furnished by these Valley agencies focus on people experiencing problems varying from crisis situations—fire, accidents, family upheaval—to drug and alcohol abuse.

"Many dedicated volunteers work with the LEAP agencies," comments Frank. "This can only indicate the worthiness of the work. If we could each have similar compassion through doing or giving, wouldn't we all be enriched?"

Sandians Visit LEAP Agencies



Glenda Day (8256) learns first hand how children's learning disabilities can be helped through therapy at the rehabilitation center.



Dr. Adeline Hackett, who directs a staff of scientists at the Peralta Cancer Research Institute, explains to Debbie Nordell (8168) some of the equipment used in the study of human cells.



Joan Brune and Jim Woodard (both 8326), married in Livermore, Sept. 9.

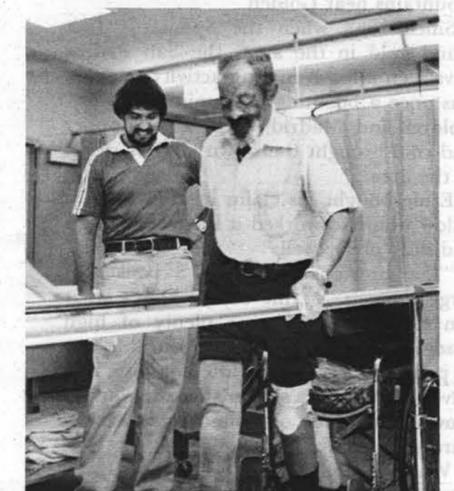
Congratulations

Sympathy

To Arnie Andrade (8424) on the death of his mother-in-law in San Leandro, Sept. 5.

To Clarence Loveless (8463) on the death of his father in Amarillo, Aug. 28.

Work at the Livermore Garnet Austin Center for mentally retarded is done under subcontract to local business firms. Tony Souza (8257) looks on.



Joe Barbera (8423) encourages an elderly amputee patient undergoing therapy at the Easter Seal Society's rehabilitation center.

Sandians Get High



CESSNAS of the Flying 8 Club.

Flying planes is not cheap. Even small planes. But seven Sandians cope with the cost of vacation and fun flying in an organization called the Flying 8 Club—a “flexibly organized” group that owns two aircraft, a Cessna 150 and a 182. Started by eight people, the club now has 14 members. It’s been going for 18 years but has few of the original members.

Fred Schkade (1281), VP for the Flying 8, reports one membership is open at this time. “Sometimes there’s a waiting list for membership and sometimes there are memberships waiting to be sold like now.” Each member buys into the club with an initial fee; monthly dues and an hourly charge for flying time are part of the package. The buy-in fees usually go up as the airplanes appreciate and currently stand at \$2350. This fee can be recouped

by selling membership, sometimes at a profit. Twenty dollars a month is collected for tie-down and insurance costs.

Savings come with the hourly rates. Commercially rented Cessna 150’s go for \$19 per hour. The Club’s rate is \$14. The cost for the Club’s 182 is \$23/hr. vs. \$38 commercially.

“We have a really good safety record,” says Mike Ford (1282), Club past president. “There’s never been an accident resulting in an injury. The few accidents we’ve had have all been minor—blown tires and the like.”

Brandon (5622) and Janet Ahrens (1763), who joined the club to learn to fly, have both now earned their licenses.

“The rate system makes it great to take the plane on vacation,” Brandon says. “In commercial planes there’s a minimum daily fee even if the plane just sits on the

ground. But club members are guaranteed 16 consecutive days each year. This gives them three weekends in a row, and only the actual flight time is charged for.”

“Scheduling isn’t a problem,” Fred Schkade says. “With membership limited to 14, the planes are available most of the time except for mid-summer. And if you really need the plane and someone else had it scheduled for, say, just some local fun flying, they’ll usually give it up.”

“We used to be able to take the planes on Sandia business trips, but a change in policies has pretty much cut that out,” Fred mentions regretfully. “People in the club do get together socially sometimes and for flying competition. Mostly, though, it’s just a way to cut costs while giving you most of the advantages of owning your own plane.”

Retiree Ernie Hall is Gold Digger

Ernie Hall doesn’t mind being called a gold digger at all. Since he retired last February, he has dug up a handful of the pretty stuff at his claim in the San Pedro Mountains near Golden.

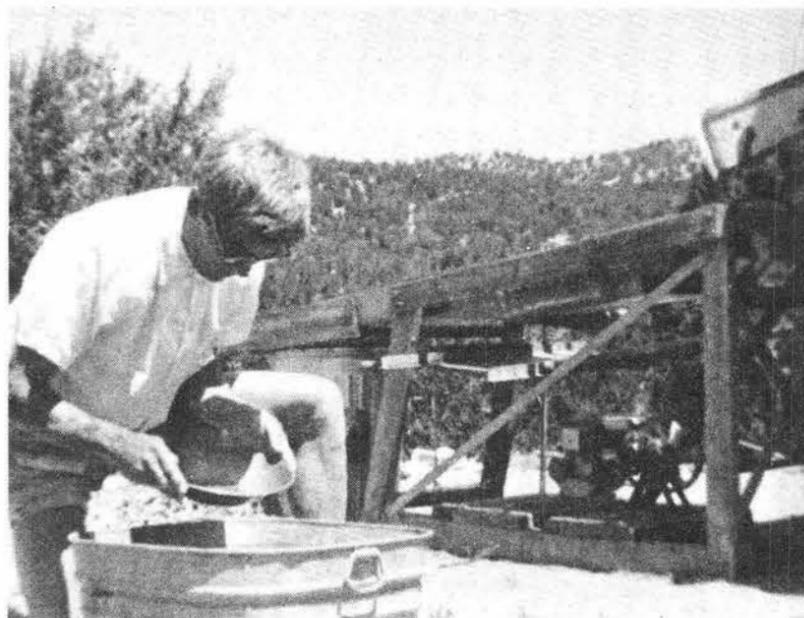
Since 1832 when the Spaniards first found gold in the area, the San Pedros have seen a lot of mining activity. Golden was once a booming gold mining town—Dolores and Madrid were, also. Copper and coal brought their own kind of riches to the area.

Ernie bought his claim in 1972 from a fellow who had worked it for several years and did “pretty well.”

“The previous owner hit a pocket of large nuggets,” Ernie says. “That’s what I’m looking for. There’s plenty of high grade, almost pure, flakes of gold that can be panned out of the ore after washing it. I have a sluice and a shaker, but the work in moving hundreds of pounds of gravel is hardly worth what’s recovered.”

Water is a problem in the area—Ernie has a nearby supply but he has to haul it in 55-gal. drums and recover as much as he can for re-use.

Ernie also has a small mobile home at



ERNIE HALL displays a handful of gold earned the hard way.

the claim where he spends a couple of days a week during summer months.

“It has all the comforts of home,” Ernie says, “plus the excitement of a couple of mountain lions wandering around at night. I have to keep my dogs inside.”

Ernie works the mine more as a hobby than as a scheme to get rich. “At the rate I’m going, I’ll hardly break even,” he says.

“Still, I’ll be able to gather enough gold to make a few pieces of jewelry.”

Ernie is an accomplished jewelry maker—rings, bracelets, watchbands in cast and worked silver with turquoise and other stone inlays and settings.

“Anyway,” Ernie says, “moving all that dirt with a pick and shovel keeps me in shape.”

Sandia Locksmith Collects Locks

What kind of a hobby would interest a locksmith? Sandia's locksmith Ken Ludwick (3614) collects old locks and keys—he maintains a display in the locksmith shop in Bldg. 887.

"Most of them have been given to me," Ken says, "by people who found them in their garages or storage sheds—old rusty relics. I clean them up, oil them, build a key and get them working again. It's a challenge."

Locks—or perhaps the need for security—have been part of civilized life ever since men began to accumulate property. Ken has a photograph of an intricate lock used by Egyptians about 2000 B.C.

"If you have a lock," Ken says, "then you need a key. Keys are easily lost. That explains my job at Sandia."

Making new keys is actually only part of Ken's job. He also repairs, modifies, installs, adjusts, rebuilds and cleans the many kinds of security devices at Sandia. He notes that just about every desk and workbench has a lock—more than 10,000. Cabinets, storage files and safes have locks. Some 1500 combinations are on file. Doors to buildings, storage rooms, labs and lockers have locks. Vehicles and other equipment have locks.

If something happens to the locks on any of this equipment, Ken is the man to call through Telecon—4-4571.

Ken usually makes a new key by checking reference codes engraved on the



KEN LUDWICK (3614) displays part of his collection of old locks and keys. Locks are in working order, some date back to the early 1800's.

lock—manufacturers and distributors usually provide these. With the number on the lock, Ken can check his codes and quickly make a new key. He has spent much time putting together an extensive library of the codes to locks used at Sandia.

Occasionally there's a hitch. Once Ken received a panic call when material locked in a vertical file cabinet was needed within two hours for an important briefing. The combination padlock wouldn't work.

"I tried everything," Ken says. "I'm usually pretty good with a combination padlock but this one wouldn't budge. Then I started to saw at the padlock. Time was running out and I wasn't making much progress. Finally, one of the guys in the lab brought some liquid nitrogen up. We

poured that on the lock and shattered it with a hammer. We made it with only minutes to spare.

"I was just new at the job then. I've learned more and we now have some specialized tools. I've demonstrated to the Safeguards people that a determined man with proper tools can open most conventional locks and safes in just a few minutes.

"Nowadays, the theory is to rely on the safes and vaults as devices to delay an intruder. Other measures must assure security."

In the meantime, locks are formidable barriers to most of us. If you need help, call Ken.

Henry Street Helps Handicapped Kids

"About six years ago," says Henry Street (5844), "when my son Kevin enrolled in public school, I became aware of the lack of facilities for physically impaired school-age children. Kevin has cerebral palsy and must use braces and a walker."

Henry thus became a charter member of the APS East Area Special Education Advisory Council and has since served as chairman/advisor for the physically handicapped. For five years, he has also been a member of the Mark Twain Elementary School Parent Advisory Council. In this capacity, he counsels parents of children and infants afflicted with cerebral palsy.

Henry, along with a number of other Sandians, is a member of the Albuquerque Breakfast Civitan Club, presently serving as club secretary and chairman of the New Projects Committee. This club has been involved for two years with projects for the special education program for the physically impaired at Mark Twain school.

Their help has taken many forms—a woodworking area was constructed and stocked with wood and tools to fit small hands; another area was outfitted as a kitchen for home economics training; a puppet theater with two levels—for ground- or wheelchair-level operation—was constructed; a play area, complete with special swing sets, maze, sand box, and riding toys was built. Not all of the Club's activities are concerned with construction: a bowling program was initiated



MEMBERS OF THE BREAKFAST CIVITAN CLUB built this puppet theatre for physically impaired students in the Special Education Program at Mark Twain School. It's one of several facilities supplied by the club for the "hands on" concept of improving dexterity.

last year, and 39 physically handicapped children now enjoy this form of recreation; and funding was provided to transport children wishing to play wheelchair basketball. The Club also hosts an annual picnic/swim party at the Coronado Club for members of the Albuquerque Association of Retarded Citizens, as well as a Christmas party.

"Naturally, I have a personal interest in these activities," Henry says. "But there's also great satisfaction when you witness a child's delight, when, perhaps for the first time ever, he or she is able to play and compete as normal children do. Now that's a bonus!"

Other Sandia members of the Albuquerque Breakfast Civitan include: Dave Begeal (2353), Ray Berg (2354), Tom Cabe (4216), Arnold Draper (2551), Dick Elrick (4422), Nancy Hall (5844), Bob Hughes (5155), Nick Magnani (5831), Glen Miller (4216), Jon Munford (5832), Bob Sallach (5843), Harry Saxton (5840), Fred Yost (5832) and Dave Zagar (4244).

Three retired Sandians—Loyt Lathrop, John Gustafson, and Byrd McKay—also help out at Mark Twain school. Skilled cabinetmakers, the men design, build, or modify furniture and equipment to meet the special needs of the children.

Speakers

L. D. Hostetler (1313), "Optimal Terrain-Aided Navigation Systems"; L. R. Rollstin (1335) and A. E. Hodapp, Jr. (1331), "Experimental Evaluation of Artillery Projectile Impact Errors Induced by Principal Axis Misalignment"; W. E. Williamson, Jr., and W. R. Barton (both 1335), "Minimum and Maximum Endurance Trajectories for Returning Flight of a Gliding Vehicle in a Horizontal Plane"; Williamson and Barton, "Optimal Drag Coefficient Histories Which Extremize Dynamic Pressure for a Ballistic Reentry Vehicle," Atmospheric Flight Mechanics Conference, Aug. 7-8, Palo Alto, Calif.

F. C. Perry (5242), "Electron Beam Driven Shocks and Implosions of Model Fusion Targets," Gordon Conference, Aug. 7-11, Meridith, NH.

D. S. Ginley and M. A. Butler (both 5154), "Flatband Properties of Photoelectrochemical Cells for Solar Energy Conversion," 2nd International Conference on the Photochemical Conversion and Storage of Solar Energy, Aug. 10-12, Cambridge, England.

L. S. Nelson (5333), "Steam Explosions Involving Molten Oxides," Gordon Conference on High Temperature Chemistry, Aug. 16, Wolfeboro, NH.

J. E. Schirber (5150), "Fermi Surface of α -U"; G. A. Samara (5130), "Pressure and Temperature Dependence of the Ionic Conductivities of Cubic and Orthorhombic Lead Fluoride (PbF_2)," Gordon Conference on Physics and Chemistry at High Pressure, Aug. 7-11, Meriden, NH.

R. L. Iman (1223), invited paper, "The Rank Transformation as a Method of Discrimination with Some Examples"; R. R. Prairie and I. J. Hall (both 1223), "Generation of Standard Meteorological Year"; R. G. Easterling (1223), "Discussion of: Confidence Interval Estimation for the Weibull and Extreme Value Distributions," and "Statistical Problems in Nuclear Regulation: Introduction and Overview," Annual meeting of the American Statistical Association, Aug. 13-17, San Diego.

M. K. Matzen (5211), "Experiments and Numerical Simulations Using Long Pulse Lasers at Sandia Laboratories, invited presentation, KMS Fusion, Aug. 10-11, Ann Arbor, Mich.

P. J. Fiebelman (5151), "Prospects for Many-Body Research in Surface Theory," DOE Evaluation Panel, Aug. 14, Hyannis, MA.

E. A. Salazar, K. T. Gillen (both 5813), and R. L. Clough (5811), "Evidence of Synergistic Effects During Aging in Combined Radiation and Temperature Environments," IEEE/ICC/WG12-37 meeting, Aug. 16, SLA.

J. A. Leonard (5721), "Operating Experience at The DOE/Sandia Midtemperature Solar Systems Test Facility"; D. A. Northrop and L. C. Bartel (both 5732), "Instrumentation Development for In Situ Coal Gasification"; H. M. Stoller (5730) and E. W. Reece (1327), "The Development of Multifunctional Seafloor Instrumentation Systems"; R. C. Reuter (1284) and M. H. Worstell (5715), "Torque Ripple in a Vertical Axis Wind Turbine," Intersociety Energy Conversion Engineering Conference, Aug. 20-25, San Diego.

W. B. Benedick (5131), "High Explosive Initiation of Methane-Air Detonations," International Symposium on Combustion, Aug. 20-25, University of Leeds, England.

P. M. Richards (5132) and D. Follstaedt (5111), "Effect of Paramagnetic Impurities on NMR in Superionic Conductors," 20th Congress Ampere, Aug. 21-26, Tallinn, USSR.

R. F. Puk (2644), "GCS - The Graphics Compatibility System," SIGGRAPH '78 Conference, Aug. 23-25, Atlanta.

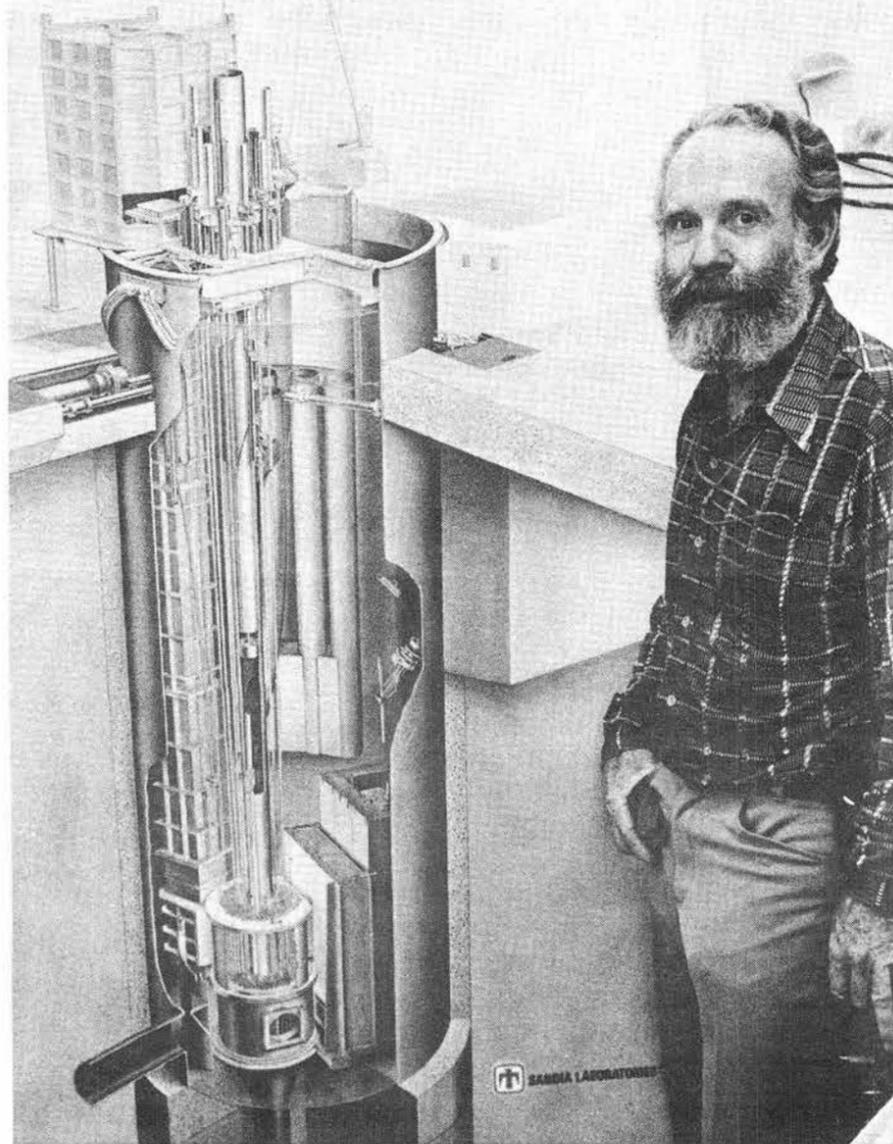
J. E. Schirber (5150) and A. C. Switendick (5151), "Volume Dependence of the Electronic Structure of Cu_2Mg ," 25th International Conference on Low Temperature Physics, Aug. 23-29, Grenoble, France. J. E. Schirber (5150), "Fermi Surface and Band Structure of Actinide Metals and Compounds," 3rd International Conference on Electronic Structure of the Actinides, Aug. 30-Sept. 1, Grenoble, France.

G. B. Krefft (5112), "Radiation Annealing in Al_2O_3 and MgO ," Oak Ridge National Laboratory, Aug. 24.

D. G. Schueler and G. I. Jones (both 5719), "Energy Storage Considerations in Photovoltaic Central Station Utility Applications"; C. N. Vittitoe and F. Biggs (both 5231), "Terrestrial Propagation Loss"; E. Hoover (5716), "Design and Computer Simulation of Solar-Heat Pump Systems"; R. R. Prairie, I. J. Hall, H. E. Anderson (all 1223), and E. C. Boes (5719), "Generation of a Typical Meteorological Year (TMY)"; R. B. Pettit (5842), C. N. Vittitoe and F. Biggs (both 5231), "Sunshape Broadening



Annular Core Pulse Reactor Facility



ANNULAR CORE RESEARCH REACTOR, formerly the Annular Core Pulse Reactor, was ceremoniously placed into operation on Sept. 14 following extensive modifications to enhance reactor capabilities. President Sparks, ALO Deputy Manager Tom Clark, and NRC's Charles Kelber jointly pushed button to initiate pulse of radioactivity. Group is observing glow from reactor core deep in pool of water. Inside of the ACRR, which is to be used for advanced reactor safety studies and weapons effects simulation, is depicted in painting by tech artist Buzz Babcock (3155) who stands at right. The work will be used by Advanced Reactor Research Dept. 4420 to orient visitors and as an illustration in a brochure.

Resulting from Concentrator Effects"; R. S. Berg (5842), "Dust Exposure Simulation Experiments on Optical Surfaces"; F. Biggs and C. N. Vittitoe (both 5231), "Concentrator-Quality Evaluation"; R. B. Pettit (5842), "Solar Averaged Transmittance Properties of Various Glazings"; E. E. Rush (9742), "High Pressure Steam Generation at 5mw Solar Thermal Test Facility," International Solar Energy Society Conference, Aug. 28-31, Denver.

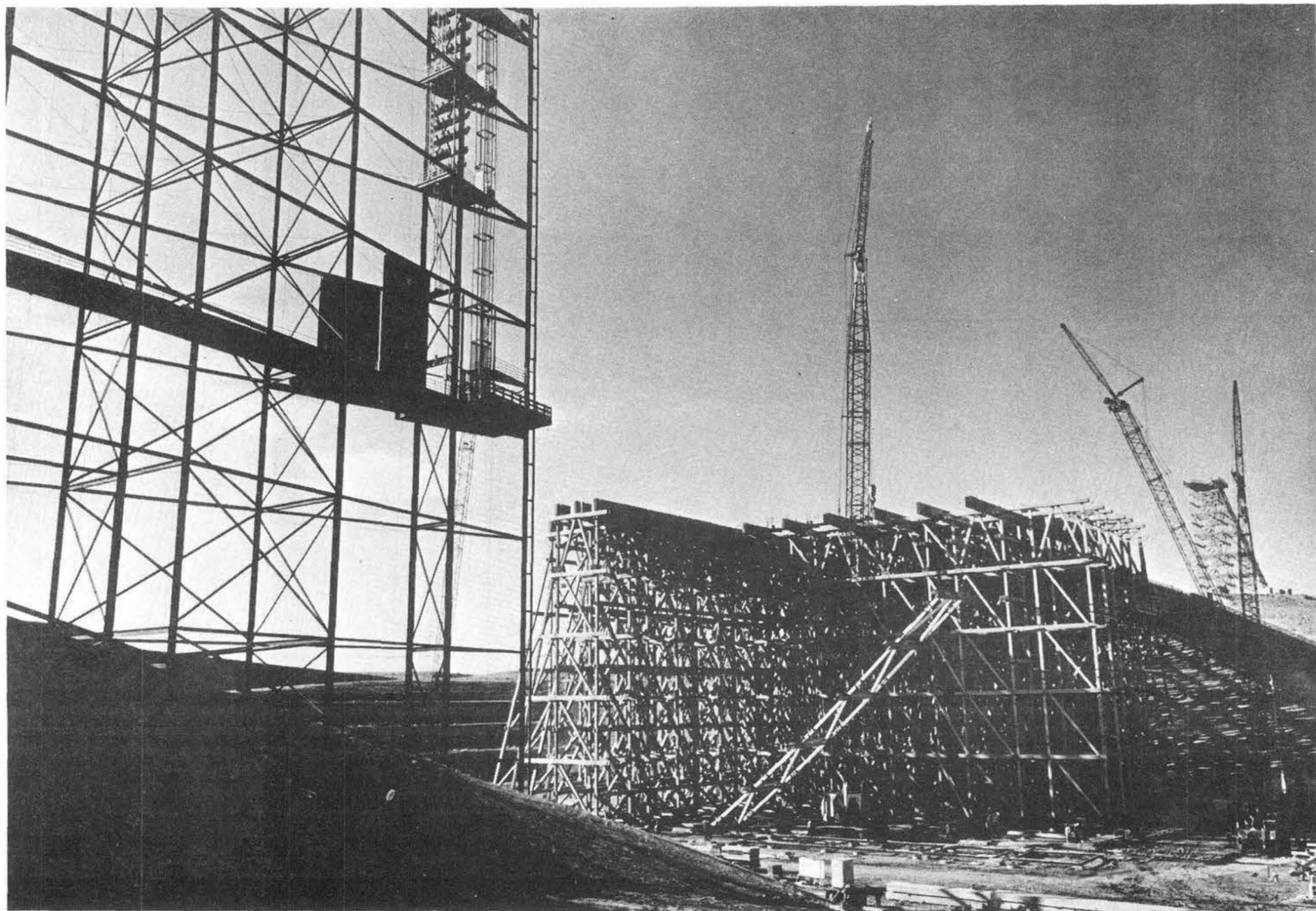
M. A. Palmer (5214) and R. E. Palmer (5215), "Characterization of the Nonlinear Response at 1.3 μ m of Electro-Optical Camera Systems Incorporating S-1 Photocathodes," SPIE's 22nd International Symposium and Instrument Display, High-Speed Photography for Data Acquisition and Measurements, Aug. 29-31, San Diego.

R. L. Ward (5335), "Inactivation of Enteric Viruses in Dewatered Wastewater Sludge"; J. R. Brandon and K. S. Neuhauser (both 5335), "Moisture Effects on Inactivation

and Growth of Bacteria and Fungi in Sludges," National Conference on Design of Municipal Sludge Compost Facilities, Aug. 29-31, Chicago.

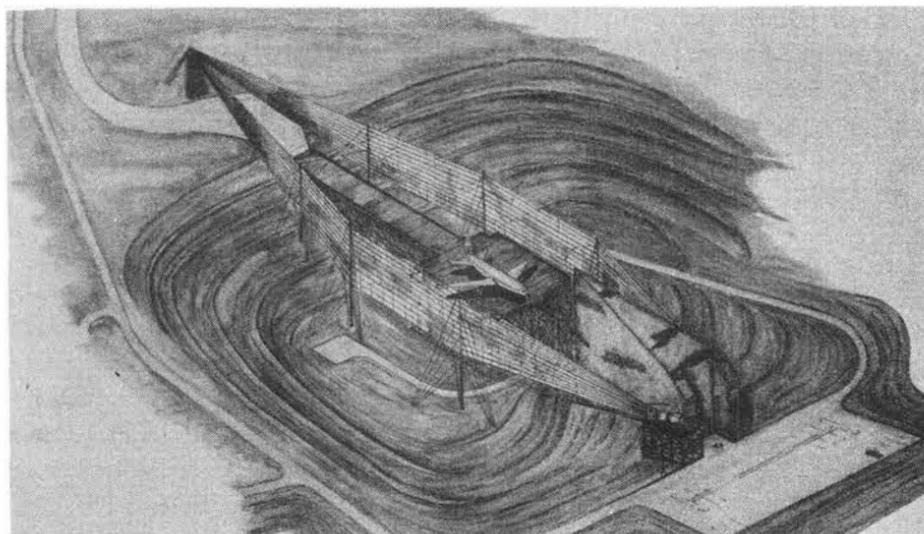
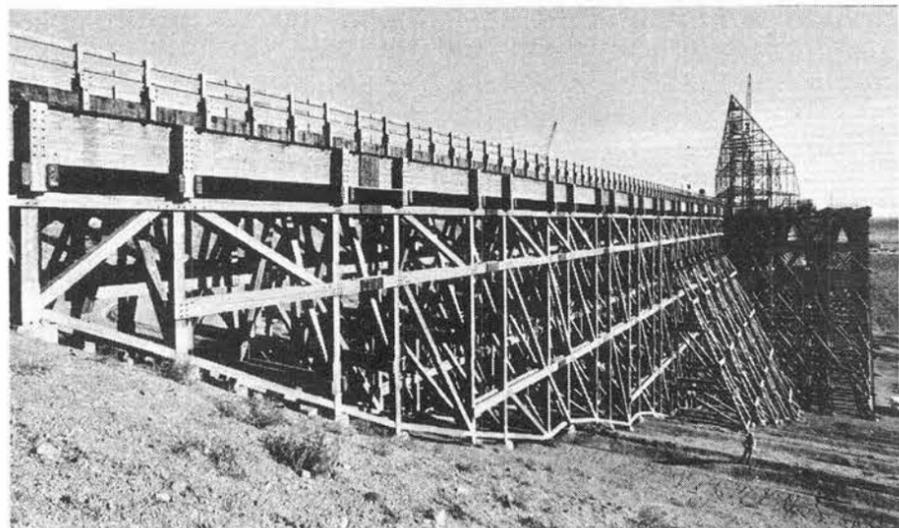
J. W. Nunziato (5131), E. K. Walsh (Univ. of Fla.), and J. E. Kennedy (2513), "A Continuum Model for Hot Spot Initiation of Granular Explosives," to be presented by Prof. Walsh; D. B. Hayes and D. E. Mitchell (both 2513), "A Constitutive Equation for the Shock Response of Porous Hexanitrostilbene (HNS) Explosive," International Symposium on High Dynamic Pressures, Aug. 28-Sept. 1, Paris, France.

H. M. Stoller (5730), "A Review of the Drilling R&D Program at Sandia"; R. C. Reineke and S. G. Varnado (both 5735), "A Portable High Temperature, High Pressure Mud Viscometer"; C. F. Huff and S. G. Varnado (both 5735), "Development of a Diffusion Bonding Technique for Attaching Stratapax^R Cutters to Drill Bits"; A. L. McFall (5735), "An Improved Pressure Coring System for Fluid Content Measurements"; D. R.



TRESTLE—If you walk down through this Air Force facility, you'll probably conclude there was one crackerjack lumber salesman on the scene earlier: it's all wood, even to fastenings. Located a few miles south of Tech Area I, Trestle is designed to test the effects of electromagnetic radiation on aircraft electronics, just as though the aircraft were actually airborne (thus, the wooden construction). It's reputed to be the largest all-wood structure ever

and should be complete by early next year. Cost: about 50 megabucks. Above, assemblage of Trestle by erector set technique. It's over 100 feet high. Steel structure at left is framework for antenna. Below, left, aircraft platform is extension of Kirtland runway. Drawing shows how full-scale aircraft will be tested.



Johnson (5737) and N. J. Magnani (5831), "Materials Studies for Thermal, Enhanced Oil Recovery Processes"; D. A. Northrop, N. R. Warpinski, R. A. Schmidt (all 5732), and C. W. Smith (1111), "Stimulation and Mineback Experiment Project - The Direct Observation of Hydraulic and Explosive Fracturing Tests"; R. L. Fox (5731), "Development of Downhole Steam Generation Systems and Injection String Modifications for Deep Steam Injection"; C. L. Schuster (5733), "Massive Hydraulic Fracture Mapping and Characterization Program"; E. W. Reece (5733), "The Status of the Offshore Technology Program" 4th Annual DOE Symposium on Enhanced Oil and Gas Recovery and Improved Drilling Methods, Aug. 29-31, Tulsa, Okla.

G. Yonas (5240), "Developments in Sandia's Particle Beam Fusion Program"; M. K. Matzen (5211), M. A. Gusinow (5215) and J. P. Anthes (5214), "Ablative Target Studies at Sandia Laboratories"; J. A. Borders (5825), S. T. Picraux (5111), K. L. Wilson (8347), M. I. Baskes (8341), W. Bauer (8347), et al., "Hydrogen Isotope Retention in Tokamak Walls," to be presented by F. Dylla (Princeton Plasma Physics Lab), 7th International Conference on Plasma Physics and Controlled Nuclear Fusion Research, Aug. 23-30, Innsbruck, Austria.

G. W. Arnold (5112), "Ion Implantation in Glass: A Versatile Tool for Material Modification and Silicate Research," invited presentation; G. B. Krefft (5112), "Radiation Annealing in MgO," Naval Research Laboratory, Aug. 24, Washington, D.C.

A. J. Toepfer (5242), "Particle Beam Fusion," ANL-AUA Institute, June 5-9, Argonne, Ill.

L. J. Azevedo (5151), "Exchange Coupled Pairs: A Model for the Random Exchange One-Dimensional Heisenberg Antiferromagnet," Gordon Conference on Quantum Solids & Fluids, July 10-14, Plymouth, NH.

J. M. Hueter (3521), "Creativity - Choice or Chance?" American Society for Training and Development, Aug. 17, Albuquerque.

J. L. Gooding, K. Keil (both UNM) and J. T. Healey (5822), "Physical Properties of Individual Chondrules from Ordinary Chondrites," annual meeting of the Meteoritical Society, Aug. 14-17, Sudbury, Ontario, Canada.

A. Owyong (5214), "Vibrational Spectroscopy by Stimulated Raman Effects," invited presentation at Gordon Research Conference, Aug. 21-25, Wolfboro, NH.

G. B. Krefft (5112), "Radiation Induced Defect Annealing in Al₂O₃ and MgO Single Crystals," Max

Planck Institute for Solid State Research, Aug. 29, Stuttgart, Germany; "Radiation Effects in Insulators: Damage Induced Volume Changes and Optical Absorption," Institute for Solid State Technology of the Fraunhofer Gesellschaft, Sept. 11, Munich, Germany.

G. W. Arnold (5112), "Radiation Effects in Insulators: CTR Materials and Bedded Salt Deposits for Waste Isolation," SCK/CEN (Studiecentrum Voor Kernenergie), Aug. 30, Mol, Belgium; "Ion Beam Interactions in Fused Silica," Heraeus Quarzschmelze GmbH, Sept. 1, Hanau, Germany.

D. K. Gartling (1261), "Spectral Decomposition in Advection-Diffusion Analysis by Finite Element Methods," and "Observations on Contemporary Numerical Fluid Dynamics by Finite Element Methods," FENOMACH 78—International Conference on Finite Elements in Non-Linear Mechanics, Aug. 30-Sept. 1, Stuttgart, Germany.

W. B. Gauster (5111), "Positron Annihilation Studies of Quenched Al," Max Planck Institute fur Metallforschung, Aug. 31, Stuttgart, Germany; Hochschule der bundeswehr, Sept. 8, Munchen, Neubiberg, Germany; and Bell Laboratories, Aug. 14, Murray Hill, NJ.

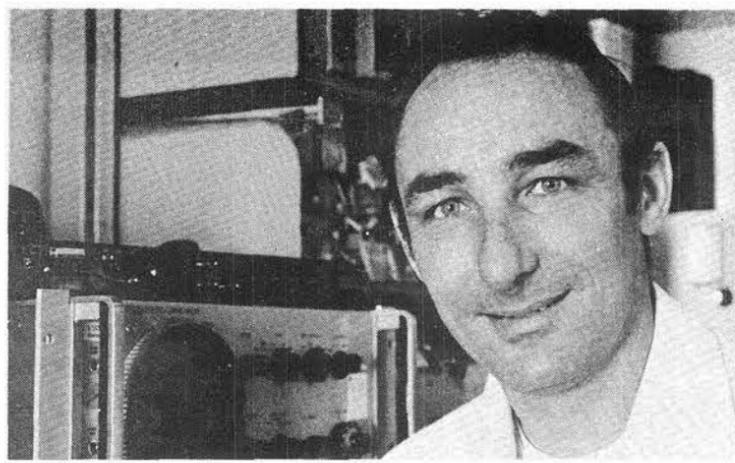
MILEPOSTS

LAB NEWS

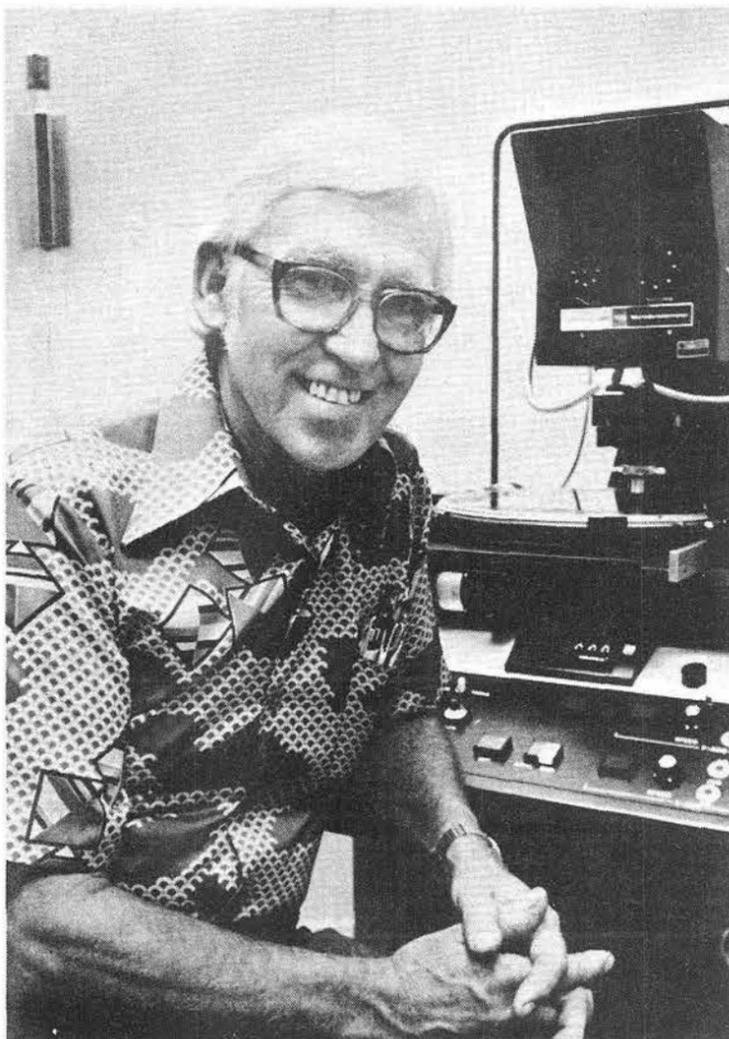
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Mike Rex - 3522 10



Bill Jacoby - 5624 20



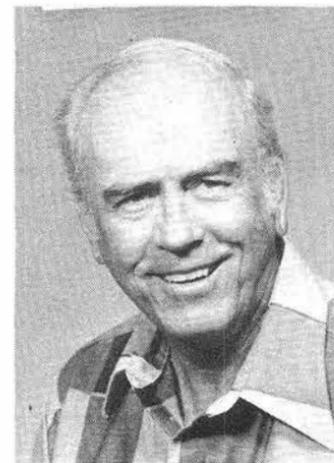
Dale Fastle - 1556 30



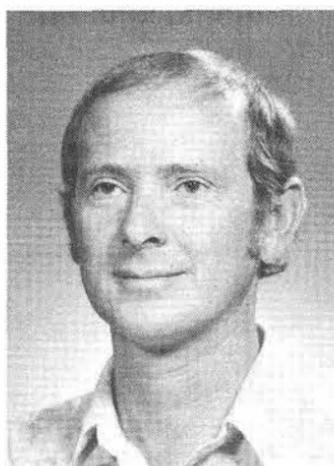
John Aragon - 1754 10



Dorene Allen - 8300 10



Paul House - 3155 30



Edwin Moss - 2632 15



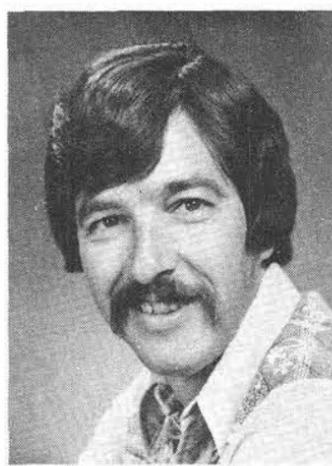
Tom Green - 4231 15



Randall Cole - 4411 10



George Staller - 4243 15



Joseph Brazil - 8323 10



Jan Kowalski - 3001 10



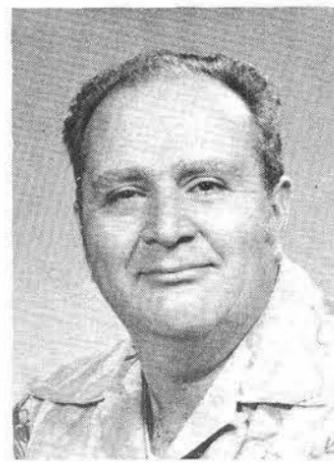
James Winter - 3613 30



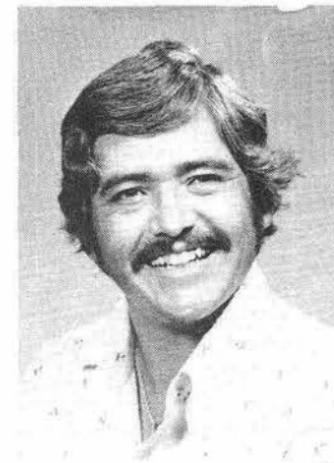
Kay Montoya - 3618 15



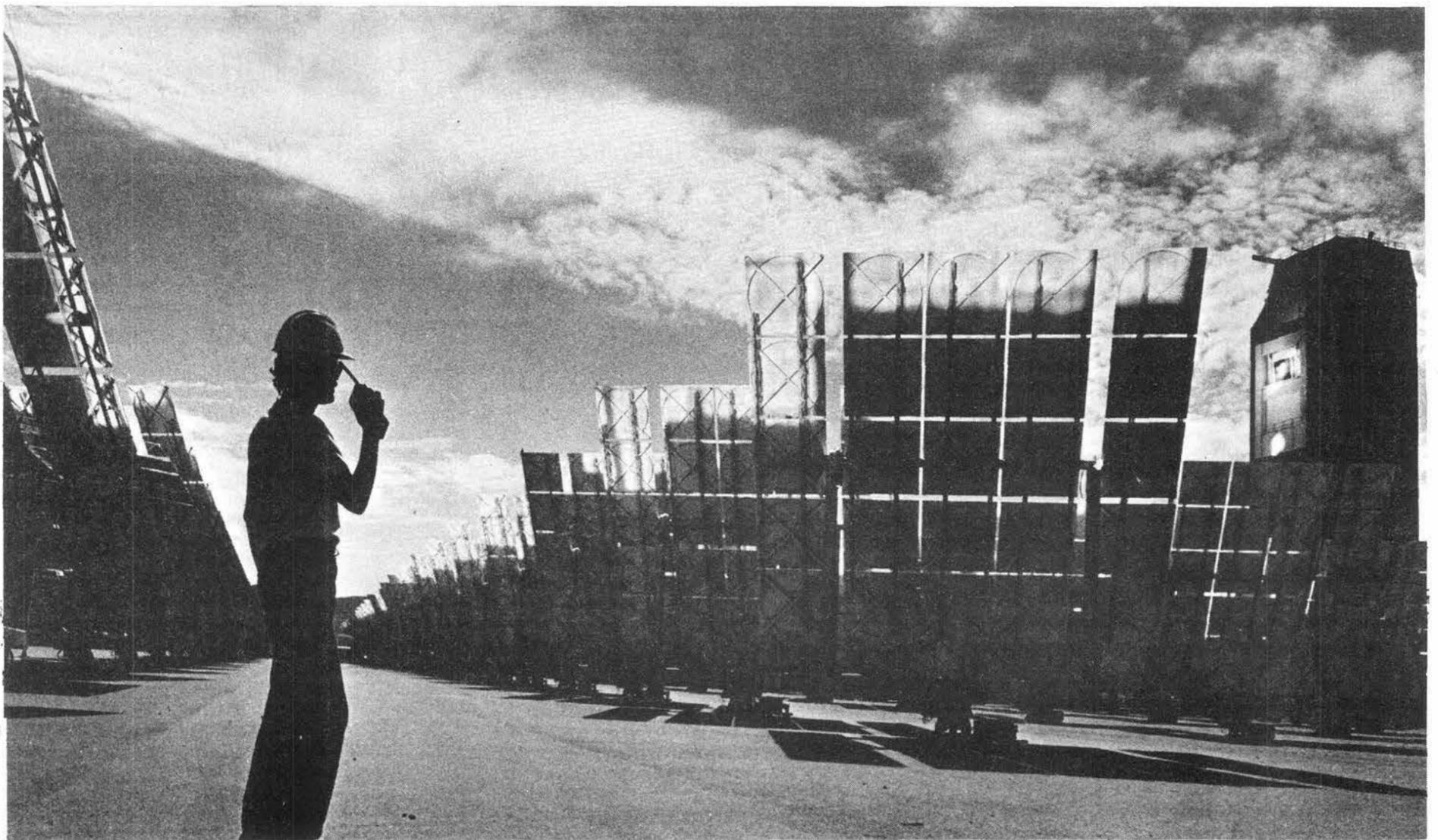
James Kelsey - 5613 10



Wendell Grimsley - 3653 15



Fidel Perez - 1483 10



SHADOWS & SUNLIGHT—Sandia's Solar Thermal Test Facility with its array of heliostats and 20-story tower offers many camera possibilities. LAB NEWS

photographer Bill Laskar composed this picture on a day when clouds created dramatic areas of sunlight and shadow.

JUNK • GOODIES • TRASH • ANTIQUES • KLUNKERS • CREAM PUFFS • HOUSES • HOVELS • LOST • FOUND • WANTED • & THINGS

CLASSIFIED ADVERTISING

Deadline: Friday noon prior to week of publication unless changed by holiday. Mail to: Div. 3162 (814/8).

RULES

1. Limit 20 words.
2. One ad per issue per category.
3. Submit in writing. No phone-ins.
4. Use home telephone numbers.
5. For active and retired Sandians and DOE employees.
6. No commercial ads, please.
7. Include name and organization.
8. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

TRASH BAGS, city approved, \$4/box, \$20/case of 6, South Hwy. 14 Project. LAB NEWS office, Bldg. 814.

BUNK BEDS, springs & mattresses, \$50. Garcia, 255-5944.

FOLDING WALKER for elderly person, adjustable height; Sears reel type gasoline power lawnmower. Stoever, 296-3717.

ELEC. GUITAR, white Fender Mustang, hard case; children's toys: NFL elec. football, Stargazer, tinker toys, motorized erector set. Amos, 298-1095.

CULLIGAN water softener; Sears scroll saw w/PTO; alum. storm door. Patrick, 255-5944.

PHILCO refrig., 10 cu. ft., as is, \$50. Korak, 296-1165 after 5.

DUCKS, rare breed chickens, bantam & top knot chickens, will trade for hay or grain; need incubator. Lackey, 898-6638.

CHILD'S guitar & case, \$35. Detry, 821-9437.

GERMAN violin, full size w/case. Krause, 293-8507.

NIKON F camera body, \$100; Nikkor Q lens f2.8 135 mm, \$100. Henry, 266-6467.

MG Midget tonneau cover, used twice, \$35; service manual, '58-77 Midget/Sprite, \$5. Barnard, 831-4114 after 5.

CATALINA AM/FM, 8-track, turntable system w/2 speakers & stand; Panasonic AM/FM, 8-track w/2 speakers & stand. Sanchez, 836-4134 after 6.

NEW OLIN Mark IV 190's, \$150; 1 ea. male/female white rabbits w/cages, \$25 ea.; console AM-FM radio w/ turntable, \$50. Mason, 281-3052.

LOVE SEAT, \$45. Rizkalla, 293-3734.

SMALL 1-wheel utility trailer, w/metal

top cover, \$125. Cover, 881-3860.

1/4 SIZE VIOLIN, bow & case. Schnetzer, 292-0733.

SAILBOAT, 10' Glen-10, car toppable, \$150. Watterberg, 294-6759.

3-YR.-OLD silver miniature poodle, male, housebroken. Zimmerman, 242-1439.

DRESS BOOTS, ladies, black leather, size 6B, knee high, never worn, orig. cost, \$40, sell for \$20. Kohut, 296-8537.

OAK CABINET, front & top openings, \$40; bean bag chair, \$10; stereo, \$10; catalytic heater; motorcycle carrier. Shepherd, 299-9066.

SUBMERSIBLE PUMP, 1/2 hp motor, head pressures 5-25' at 140 to 4 gpm, \$100 cash; three 1/2 hp motors, \$25 ea. Gardner, 344-2547.

MAPLE PEDESTAL TABLE, 48" round, make offer. Kraft, 299-2157.

GE 7700 BTU air conditioner window unit, adj. width, \$125. Bolwahn, 821-6278.

CHAIN SAW, Homelite XL12, manual oiler, 20" bar, extra chain, bar, accessories, spark arrestor, \$105. Liguori, 256-3613.

FIREPLACE screen w/pull chains, polished brass frame, fits fps up to 36" w x 30" h, \$10. Perdreauxville, 296-2870.

180 YARDS multigreen sculptured shag carpet, \$2/yd.; blue floor to ceiling drapes 160" wide, \$100; woven woods, \$25. Sheives, 296-9780.

TWO 17" split rims for pickup truck. Hymer, 298-2232.

RIMS, 14x6, 5-stud, \$20/pr.; 14" wire spoked wheel covers, set of 4, \$50; 165R15 radial tires (VW), set of 4, \$100; 560.15 new recap, \$12; VW seats, \$5. Hart, 255-2133.

DEN SET: five pieces, matching couch & chair, glass top coffee table & 2 end tables, \$250. Bartberger, 821-9079.

KONI adjustable shock absorbers, fit '70-78 Firebird & Camaro, \$80/4 or offer. Webster, 298-8102.

ELEC. GUITAR, Gibson SG special. Fisher, 881-8072.

COUCH, yellow, makes into bed, \$50; typewriter, port., \$20. Rotkosky, 881-4705.

TRUCK camper window, fits '67-72 Ford, \$35; free English Setter, female, 2 yrs. old. McNeill, 293-1897.

ASSORTED puppies to loving homes: all colors & sexes, fathers are pure-bred Dalmation, Shepherd, Doberman. MacCallum, 268-1184.

ETAGERE, 5-shelf, new, unassembled, \$7; 4 tray tables, \$8; 2 Cosco folding chairs, \$8 ea. Young, 292-

1266.

CABINET, metal, avocado, dbl. cabinet w/white formica top, \$75. Damrau, 881-4576.

LONG HAIR female Dachshund, red, 11-mos.-old, champion blood lines; 2 duplicating office machines; time clock; Underwood adding machine. Browne, 881-3772.

MOVING SALE: Sat., Sept. 30, 10 a.m.-5 p.m., 6501 Northland Ave. NE: washer/dryer, single bed, dinette, household & children's items. Muir, 296-2252.

CORNET, Reynolds, w/stand, \$125. Stirbis, 299-5363.

CLOTHES DRYER, GE, elec., white, \$65; toys for very young children. McGuckin, 299-1342.

SEARS 20" girls' bicycle, \$35; dog shipping crate, medium size, \$40. Griego, 299-0426.

MARANTZ-Superscope 8-track tape player for home stereo system, head demagnetizer included, \$35. Peters, 293-6356.

DESK, 60"x36", \$125; Simmons high-rise fold-away bed, queen, \$90. Shaeffer, 255-9473.

NURSERY ITEMS: crib, mattress, rocking chair, chest of drawers, lamp, stroller, any or all. Hatch, 296-2773.

SINGLE BED BOX SPRING & mattress, bookcase headboard, \$35; kitchen table, 4 chairs, \$20; patio sliding door, \$50. Lowe, 299-7725.

TRUCK TIRE CHAINS, 7.50x16 w/V-bars, \$20. Davis, 881-7068.

CALIFIA BAGS & crash guard assy., fits GL1000, black, \$125; two 14x7 chrome reverse rims, fit Ford, \$15. Sturgeon, 299-1984.

TRANSPORTATION

'74 NOVA, 6-cyl., disc brakes, AT, 35,000 miles, \$2300. Patrick, 255-5944.

BOY'S bike, 24" wheels, \$17. Gerwin, 881-0028.

'69 RIVERSIDE 260, needs battery, \$150; '69 Mustang, 80,000 miles, needs paint & interior, \$1200. Rizkalla, 293-3734.

'72 250 YAMAHA Enduro, needs body work, \$300-offer. Garcia, 255-3201.

'71 VW 411 stn. wgn., AT, radio, new steel belted radials, \$1295. Mogford, 898-1416.

'71 FORD 1/2-ton pickup, newly rebuilt 360 engine, AT, PS, \$1300; '72 Chevy 1/2 ton 350 engine, AT, \$1400. Minor, 865-5117.

'75 NOVA SS, metallic green w/gold stripes, steel belted radials, with

or without CB. Jarvis, 255-7652 or 266-1687.

'75 AMC Matador wagon, AC, PS, PB, AT, luggage rack, 8-seater, 2-way rear door, elec. rear window, 25,000 miles, \$2275. Burrows, 293-5047.

'75 MARK IV, full power, low mileage, \$7500. Perryman, 294-6113.

'75 HONDA 550-F, 9000 miles, \$650 firm. Downie, 293-1039.

HANG GLIDER, Model C-3, no harness. Lyons, 296-8866.

UNICYCLE, Schwinn 20", \$32. Lenz, 298-9121.

'48 PLYMOUTH Special Deluxe 4-dr. sedan, orig. paint & upholstery, recently overhauled engine is flat head 6-cyl., approx. 221 cu. in. Noel, 298-2142.

'76 DATSUN B-210, 2-dr., nearly new Michelin radials, \$2500. Barnes, 299-4114.

'73 INTERNATIONAL Travelall, 392 V8, 4-wd, AT, AC, PS, PB, 6-ply radials, trailer pkg. Fifer, 299-3501.

'66 1/2-ton DODGE pickup; '60 Ford 1/2-ton pickup; '63 Triumph motorcycle. Sanchez, 864-8494.

'78 YAMAHA motorcycle, dirt bike, YZ 125E, never raced. McDaniel, 296-8073.

'76 CHEVETTE, 4-spd., AC, radio, low mileage, interior trim, \$200 under list. Rotkosky, 881-4705.

'70 124 FIAT Spider convert. Perea, 883-1433.

'77 DODGE Ramcharger S.E., 4-wd, roll bar, removable hardtop, AC, PS, PB, extended warranties, low mileage. Villarreal, 268-8045.

GO KART, racing type w/2 McCulloch engines, includes Bell helmet, elec. starter, spare parts, \$395. Haushalter, 881-7721.

'75 RABBIT, 4-dr., reg. gas, good mileage, AM/FM stereo tape, auto., extras, maintenance free battery, \$300 under book. Atkins, 298-5762.

DIRT BIKES: 100cc Kawasaki Enduro, \$250; 175cc Yamaha Enduro, \$295; both are street legal. Lassiter, 298-2461.

'74 BMW R90/6, Windjammer II, Craven bags/box, backrest, Mulholland shocks, HD springs, wired for CB/stereo, \$2200. Warren, 294-5250.

'73 MUSTANG, PS, PB, VT, AT, 2-dr. HT, \$2000. Disch, 299-0756.

REAL ESTATE

YEAR-ROUND HOME on 2.2 acres in Sandias, 1576 sq. ft., 3-bdr., fp, util., LPG heat, stream, \$59,000. Kennedy, 298-0704.

3-BDR MOBILE HOME, 1969 Kit, 12X65, refrig. AC, \$6300 cash, extras. Seymour, 299-2644.

1 ACRE, more or less, at Deer Lake Estates, has electricity & well water. Hill, 299-7813.

3-BDR., SE corner lot, walled/landscaped yards, RV access, low 40's, 1036 Dakota SE. Chavez, 294-7933.

FOR RENT

14'x65' MOBILE HOME on fenced 1 acre lot, \$200/mo. & utilities, no pets, no kids, 4 mi. s. of Rio Bravo on Coors. Abe, 883-5778.

3-BDR. HOUSE, unfurnished, 1 1/2 baths, near KAFB & Lenkurt, available Oct. 1, \$300/mo. + DD. Humberstone, 264-2564.

CABIN on Vallecito Lake near Durango, modern, 3-bdr., fp, available day/week. Croll, 881-7235.

3-BDR., 2-bath, near everything, 4308 Boone NE, built-ins, oversized garage & patio, \$425/mo., unfurnished. Haushalter, 881-7721.

WANTED

FEMALE ROOMMATE to share 3-bdr. apt. Langkopf, 266-6098.

NEED to borrow for a weekend, a color bar & dot generator for TV alignment, will pay deposit. Barnard, 831-4114.

ONE 5-GAL. (20-lb.) propane/butane tank, used. Sherwood, 299-2169.

JOIN or form carpool from Rio Rancho (Corrales Heights). Dolan, 898-4782.

INFORMATION about local skydiving clubs & lessons. Barber, 296-0462 or Lassiter, 298-2461.

'67-69 CAMARO, prefer V-8, mech. condition not important but must have good body & interior. Preverder 299-5253.

HEAVY work bench w/drawers; 12" lathe; milling machine; welding outfit, gas or arc; band saw; machinist's tools. Watterberg, 294-6759.

PICKUP SHELL for '78 GMC short wide bed. Houghton, 299-3386 or after 5 1-471-0188.

HEARTS players, Bldg. 880, Rm. X5, 12-12:30. Long, 296-2590.

LOST AND FOUND

LOST—Timex watch w/red band & removable face, lost cash.

FOUND—Silver De Grazia earring, gold twisted net earring for pierced ear. LOST AND FOUND, Bldg. 832, 264-1657.

New Board Faces Serious Challenges

MAX NEWSOM (5620), reelected to the board and presidency of the C-Club last week, says the new board of directors faces serious challenges in the coming year.

"Of most concern," says Max, "is the rising cost of utilities and maintenance. The additional revenues required to pay these bills have forced a dues increase which will be effective January 1st. While we anticipate some loss in membership, we feel that the new food coupon, redeemable monthly for the purchase of food at any club function, will both minimize this impact and stimulate attendance on Friday and Saturday nights."

Max reports that the new Club management under Pat Corcoran is doing an outstanding job on food service—quality is up and the special Saturday functions are getting maximum attendance.

"The attendance at Friday night happy hour buffet was disappointing over the summer, but now seems to be on the rise," Max says. "We're working on improving entertainment. The idea of a mid-week phone call to make buffet reservations is slowly catching on—it's necessary for food planning—and we're hopeful attendance will increase now that vacation season is over."

Max says the relations between Sandia Labs and the Club are "excellent." The Labs recreation program, now the responsibility of the Club, has widespread support and participation.

"Membership is at an all-time high of 3358," Max says, "and activities of the varied interest groups are increasing. The board's job is to continue to make the facilities and activities attractive to the membership. We're open to suggestion at



NEW C-CLUB BOARD of directors are (clockwise around the table from center left) Nancy Sanchez (3725), Bill Fay (DOE), Bob Monson (DOE), Howard Romme (3243), Pro Padilla (3735), Preston Herrington (1758), Bob Dougherty (2351) and Max Newsom (5620), president. Standing are Marv Plugge (1712), Lew Sisneros (3731), Frank Loomis (ret.), and Luke Stravasnik (1713). Not shown is travel director Ed Neidel (2166) who was traveling when photo was taken.

any time. Coronado Club membership is still the best private club buy in the city."

TONIGHT, HAPPY HOUR features a barbeque ribs and beef buffet, Jeanne Rich and Friends on the bandstand. Next Friday, Oct. 6, Happy Hour will feature a lobster tail buffet and Smoothie on the bandstand. Call 265-6791 during the week for buffet reservations. The lobster and accompanying goodies are only \$6.25.

SINGLES MINGLE Friday, Oct. 6, starting at 4:30 in the El Dorado Room. Guitarist/singer/entertainer Denny Gallegos performs. Door prizes will be awarded. Another singles party is set Saturday, Oct. 21, at 8 p.m. with munching goodies, dancing and entertainment by Faye Joy, belly dancer.

SINGLES TRAVEL to Las Vegas Nov. 10-12 for three days, two nights at the Castaways, dinner and cocktails there, a choice of shows at the Frontier, Silver Slipper or Tropicana and other goodies. The package costs \$164 (dbl.) or \$192 (single). Call Hazlet Edmonds, 4-9481, Dave Powers, 4-6150, JoAnne Pigg, 4-7339, or Jeanne Ayers, 294-3488, for more info. Trip costs must be paid by Oct. 17.

VARIETY NIGHT Oct. 7 features a show by the Goodday Singers and the movie, "Son of Flubber." Bring the kids, admission is free. Super sandwiches are available at 6 p.m.

C-CLUB TENNIS group's annual meeting is set Wednesday, Oct. 11, at 7:30 p.m. in the El Dorado Room. New officers will be elected, refreshments served.

SQUAREDANCE LESSONS for beginners start Oct. 2 at 7 p.m. The 20-week course, taught by Cal Campbell, costs \$40 per couple. Call Mel Olman, 4-7701, for more info.

DISCO LESSONS are offered by Renee Velasquez beginning Oct. 4. The 5-week course costs \$15 for members, \$20 for guests. To enroll, call the Club office, 265-6791.

UPCOMING EVENTS — Oktoberfest Oct. 28; Kids Halloween party Oct. 31.

Death



Ed Summons, an Engineering and Science Assistant in Systems Research Division 1252, died Sept. 12 after a short illness.

Ed joined Sandia as a Staff Assistant in 1961 after graduating with an A.S. degree from Penn State University. He has worked in Systems Research since 1966.



It's just possible the Japanese are giving us our first look at the wave of the future. According to the *N.Y. Times*, Japan is being hard hit as foreign nations become increasingly proprietary about their off-shore fishing grounds—waters where Japan has traditionally sought its food supplies. The Japanese solution once more demonstrates their well-established ability to turn technology to their own ends. Using computers to control everything from feeding to harvest, the Japanese will take up the slack by producing a half million tons of fish a year on fish farms.

