

World's Largest

Melt Facility Aids Reactor Safety Studies

It's like baking bread in an oven — except that the "bread" is cooked at temperatures that would boil steel. That's one way to describe the new Large-Scale Melt Facility (LMF) designed by T.Y. Chu of the Thermal Test and Analysis Division 7537. The LMF produces melts of reactor fuel similar to those that might occur in a severe nuclear power reactor accident.

The "bread" used in the LMF is depleted uranium dioxide. It reacts to high temperatures just as does the enriched uranium dioxide used as fuel in nuclear reactors.

The LMF, which is the world's largest facility of its kind, is capable of melting and superheating up to half a ton of uranium dioxide to temperatures far greater than the melting point of steel. This facility was developed as part of the NRC-funded reac-

(Continued on Page Two)

Groundbreaking Tomorrow

All Labs employees are invited to a groundbreaking ceremony for the \$40 million Simulation Technology Laboratory (STL) tomorrow (Sept. 17) at 11 a.m. The facility, designed for testing nuclear weapon systems for vulnerability and survivability within intense radiation environments, is scheduled for completion during the summer of 1985.

The 30-minute ceremony will be at the eastern edge of Tech Area IV, the construction site. President Dacey will be master-of-ceremonies. Former U.S. Senator Harrison Schmitt and Herman Roser, DOE Assistant Secretary for Defense Programs, are among those scheduled to participate.

The Laminar Air Flow Clean Room

Willis's 'Invisible Broom'

"It was truly a fun project," says Willis Whitfield (6453) in what must be one of the most diffident statements of the last quarter century. Without his development of the laminar flow clean room, the electronic age as we know it would probably have been impossible, or at least much more difficult.

"Sandia had never been involved in anything that went national and international so quickly," he says. "It was almost overwhelming."

Willis is nearing the end of a distinguished 30-year career with Sandia — he's planning to retire next year. As he talked with LAB NEWS in his compact Area V office, Willis flipped through his neatly ordered newspaper and magazine clippings and other assorted memorabilia that go back 25 years.

"The laminar clean room is perhaps the most successful example of technology transfer at Sandia or any other lab," says Willis. "The invention came along at a time



CLAMBERING on top of the furnace at the Large-scale Melt Facility are T.Y. Chu and John Bentz (both 7537). The IMF, the world's largest facility of its kind, permits researchers to investigate, on a scale and at temperatures never before possible, the safety-related phenomena that would occur if a reactor core-cooling system were to fail.



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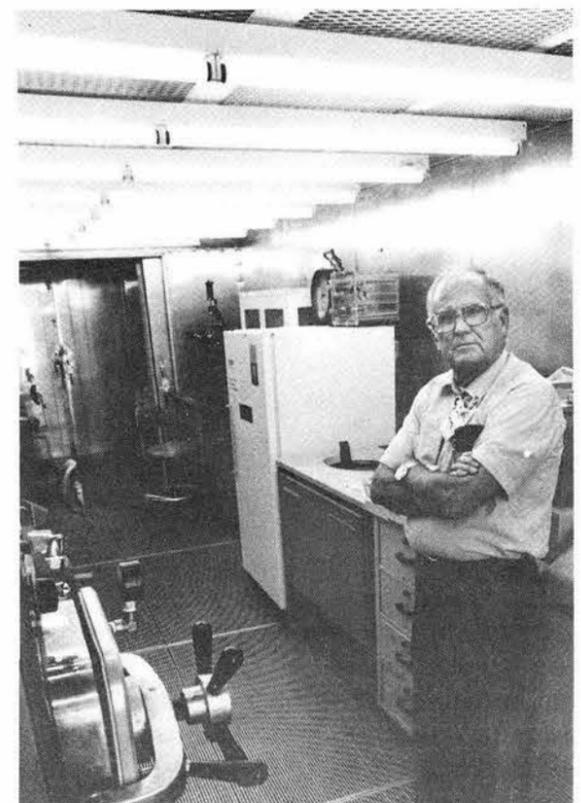
when there was a desperate need for it. Since then I've gotten requests for information from all over the world — Europe, Asia, Latin America, and Africa."

Willis's epochal work began innocuously enough in 1959 when he was asked to investigate the inadequacy of clean rooms to maintain cleanliness levels for Sandia's weapon components, particularly in the production phases.

"The clean rooms of 1959 were essentially the same as the ones developed during World War II to assemble gyroscopes and bombsights," he says. "They had high-efficiency filters but were used in conventional ventilating systems which required constant cleaning of the room to remove contamination. People working in them had to wear special clothing.

"But none of these measures were working. The best that could be achieved was 100,000 particles of contaminants per cubic

(Continued on Page Four)



ORIGINAL CLEAN ROOM is still in operation just east of Bldg. 892. It's now being used as a biology lab for the sludge program. Willis Whitfield, the clean room's inventor, demonstrates its essential features: a large uniform flow of filtered air sweeps down from the ceiling removing particles via the floor grating.

Large-Scale Melt Facility

tor safety research studies carried out by Reactor Containment Safety Studies Division 6422. Before the LMF's completion, the largest facility for tests of this kind was also at Sandia; however, it could produce only about 60 pounds of molten fuel.

A scenario for a light water reactor accident has the fuel, its zirconium cladding, and other metallic or steel parts in the reactor's core melting in a highly oxidizing steam environment if the reactor cooling system malfunctions.

"The LMF will permit us to investigate, on a scale and at temperatures never before possible, the safety-related phenomena that would occur if a reactor core cooling system failed," says Chu. "LMF tests are on a scale closer to what can be expected in an actual core meltdown, so surface-to-volume ratios will not influence the results as significantly as they would in smaller-scale tests."

The heart of the LMF is a unique furnace system that superheats refractory material to 2700°C without damaging itself. Uranium dioxide powder, consolidated by hot pressing, is heated to a molten state in the crucible, a pot-shaped container 13 inches in diameter and 21 inches high. This crucible is constructed in four layers: a quarter-inch-thick outer layer, an alloy of tantalum and tungsten; then a tenth-inch-thick layer of pure tungsten; next an eighth-inch-thick zone of tungsten powder; and finally a sixteenth-inch-thick inner tungsten liner.

A water-cooled copper coil serves as an induction coil that couples to a specially designed graphite holder, or susceptor. As the coil wound around the crucible generates a varying magnetic field, it causes current to flow in the susceptor, raising its temperature. The susceptor, in turn, heats the crucible by radiation and conduction.

"The key to the furnace's successful operation was extensive materials research and development," says Chu. "The material for the crucible has to survive the possible reaction with molten uranium dioxide on its inside surface as well as chemical attack on its outside surface where it contacts the graphite susceptor."



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Editorial Offices in Albuquerque, 87185
Phone 505/844-1053 FTS 844-1053
In Livermore 415/422-2447 FTS 532-2447

BRUCE HAWKINSON, Editor
DON GRAHAM, Assistant Editor
CARL MORA, NORMA TAYLOR, writers
LOUIS ERNE, photographer
GERSE MARTINEZ, assistant
BARRY SCHRADER, Livermore reporter

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Antojitos

New in California--The movement began, as all good movements do, in California. It's called "Getting Married," and five Livermore supervisors who serve as trendsetters for the rest of that lab are a part of the new movement.

Two of the couples, the movement's bona fide avant garde, had the ceremonies performed by fellow Sandians Don Adolphson (8445), a deacon in the Episcopal church, or Nick Wittmayer (8413). Trends in the western USA move eastward very slowly--but don't say you weren't warned, Albuquerque.

* * *

On Geo-sociological Trends--Except for adobe lipstick, much in favor with back-to-the-soil lovers, New Mexico starts few trends. That's because trends demand a few dozen folks who actually act in unison. But New Mexico is populated by a million or so determined individualists who decide how to behave, where to eat, and what to wear on the grounds that "Nobody's doing it--so I will."

* * *

What Was That Again?--From the Tribune: "We know who he (the suspect) is, but we don't know his identity." And from a TV commercial: "Now playing at Graham Central, the Divinyls, Australia's number one live band." ●BH

* * *

Adel sitzt im Gemüte nicht im Beblüte. (German) Nobility lies in the heart, not in birth.

After being heated in the crucible, the molten fuel is tapped by explosively driven projectiles into the experimental chamber below that contains materials the melt could encounter during a severe accident.

"In a nuclear reactor, the base of the containment building is made of concrete," explains Chu. "In a meltdown, molten material could contact, and interact with, the concrete and create radioactive steam, aerosol, and hydrogen. These could all vent into the environment if the containment failed.

"We tested a 'core catcher' concept in a recent LMF test. A core catcher is designed to contain the molten material and reduce the production of these dangerous gases and aerosols. One candidate material for the core catcher is magnesium oxide. Our test determined that it produces very little aerosol and gas when it comes in contact with molten material. In addition, magnesium oxide is available commercially in the form of bricks."

Measuring the high temperatures encountered in the furnace also required some innovative techniques. Thermocouples are effective only up to 2200°C. Temperatures in the furnace can reach 2800°C.

"We need unconventional instrumentation to measure such high temperatures," says Chu. "We settled on ultrasonic thermometry, which relies on the temperature dependence of sound velocities, and incorporated it into the LMF for controlling the furnace temperature and monitoring temperatures during experiments.

"The 'bread in the oven' analogy comes in handy in explaining what we do. If you turn the heat up too fast, the bread's outside surface will burn but the inside won't be cooked. The same is true of the uranium dioxide and other materials that we heat in the crucible."

Accurate temperature control is required during the entire process to ensure

that all the material is melted without damaging the crucible. A computer model was developed to aid in the planning of the heating schedule.

The first tests at the LMF began in the spring. Test schedules for the remainder of 1983 include investigation of how molten fuel reacts with concretes and with some other materials.

Division 6422 provided the overall coordination of the facility development with other reactor safety experimental programs. Divisions 1833 and 1834 carried out materials studies leading to the development of the crucible; Organization 6426 assisted in the adaptation of ultrasonic thermometry to the LMF.

Events Calendar

Sept. 16-18 — Classics Theatre Company presents "The Heiress," 8 p.m., 2 p.m. on Sun., KiMo.

Sept. 18 — Jensen Woodbury Classical Guitar Duo, 8 p.m., KiMo.

Sept. 18-19 — St. Joseph's Feast Day: eagle, buffalo, and corn dances; 2- and 5-mile runs, barbecue, rodeo. Old Laguna Village, Laguna Pueblo.

Sept. 20 — Best of Broadway Series: Lea Ballet Jazz de Montréal, 8:15 p.m., Popejoy.

Sept. 23 — The Feminist Theatre presents "Daddy's Girl," 7:30 p.m., KiMo.

Sept. 23-24 — NM Symphony Orchestra concert, 8:15 p.m., Popejoy.

Sept. 25 — Albuquerque Youth Symphony concert, 3 p.m., Popejoy.

Sept. 25 — St. Elizabeth Feast Day: harvest and social dances, Pagate Village, Laguna Village.



Murphey Steps Down

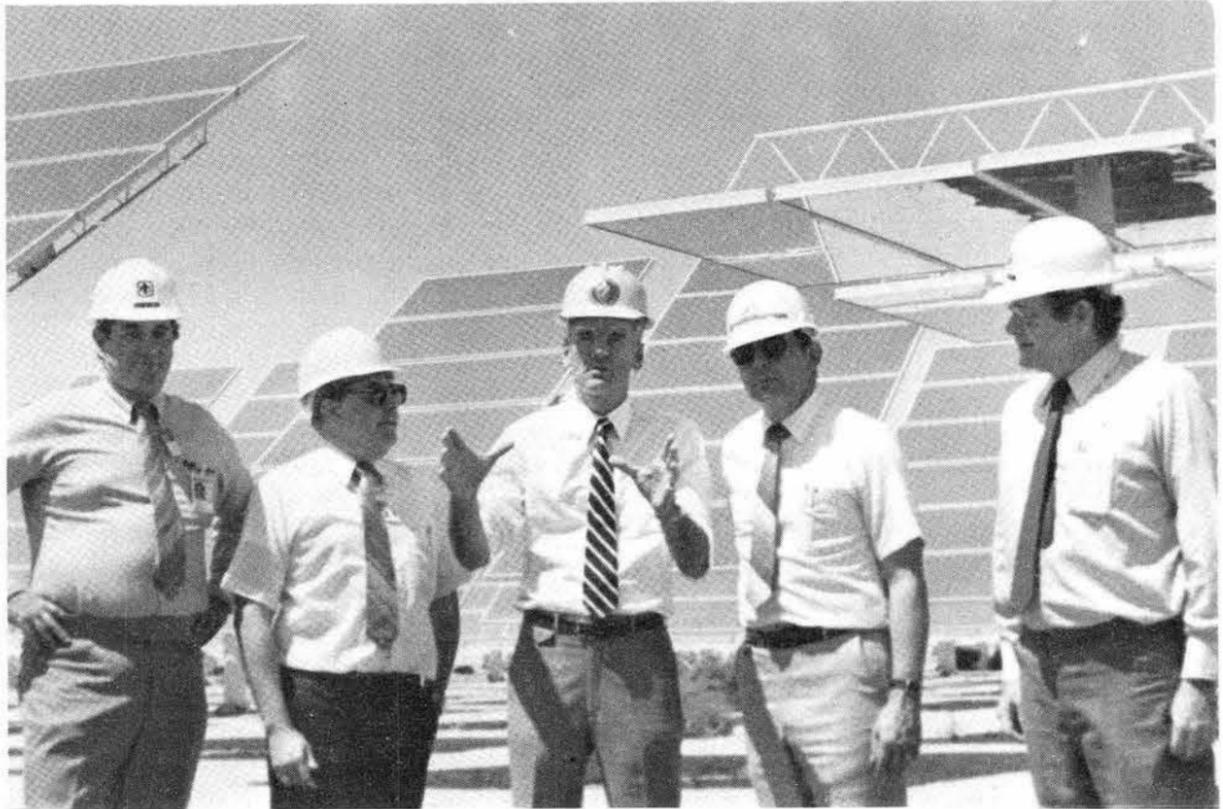
A Look Back — With Pride

"Our experiments are for a purpose; our purpose is not to experiment!" Murphey's law? No, *Byron Murphey's* philosophy. The retiring director of Applied Research (8300) made the statement many years ago when he was scientific advisor to the test manager at the Nevada Test Site, and he meant what it said: Experiments based on well-thought-out and planned research were done for a purpose; there was no place for guessing or speculation.

Byron has retired after 29 years with Sandia, the last 12 of those as director at Livermore, and he is proud to point to several of his former staff who have gone on to become directors themselves — including Arlyn Blackwell (8200), Dan Hartley (8500 first, now 8300), Jack Wirth (2300), and Harry Saxton (2500).

He's proud too of the growth in his area of responsibility, probably more growth than in any other area at Livermore over the past decade. He has overseen the development of the Tritium Research Facility (now under 8400), the tremendous expansion of the Computing Center, and the construction of the Combustion Research Facility, which was in 8500 and now is returning to the directorate Byron is leaving.

Looking at some of the exciting work that has taken place in 8300, Byron mentions such programs as hydrogen and helium embrittlement (the experimental and theoretical treatment of room temperature trapping of these gases and their isotopes in metals), raman spectroscopy that aids in understanding what goes on inside



SECRETARY OF ENERGY Donald Hodel (center) visited Solar One near Barstow for the first time on Aug. 26 for a briefing and tour. Shown with him in the heliostat field are from left to right: Solar Central Receiver Department Manager Jim Wright (8450), recently appointed DOE/SAN manager Richard DuVal, Southern California Edison senior vice president Larry Papay, and technical site manager Jim Bartel (8452). The 10 MWe solar central receiver plant in the Mojave desert produced its first net electrical power in April 1982 and was dedicated last November. The plant is now in the midst of its startup and experimental test phase with Sandia Livermore designated as the technical manager for DOE.

flames, and currently the completion of the pumped limiter (now being shipped to Germany where it will be installed at the TEXTOR Tokamak near Juelich).

Tools of the trade he has seen greatly improve during his directorship include the handheld calculator, the first one being the HP-35 in 1972; calculators are now being replaced by computer terminals for nearly every member of the technical staff. He recalls the second CDC 6600 arriving in Livermore and now can point to the Cray 1S, which is equivalent to 20 CDC computers.

In the laboratories the most striking change he has witnessed is the introduction of small computers that collect data on the spot, replacing the old strip chart recorders that were "state of the art" a few years back.

Over the years Byron has served on several key Sandia committees and has been scientific adviser at the Nevada Operations Office. His committee assignments include some 15 years as chairman of the Sandia Reactor Safety Committee; he is a longtime member of the Sandia Computer Committee and chairman of the Facilities Safety Appraisal Committee for 8000. He singles out Perry Lovell and the Hazards Control Division 8263 as a very competent group he has enjoyed interacting with while at Livermore.

Expressing a personal opinion on the future of the national laboratories, Byron says the country "will continue to need all three weapons labs. I feel strongly that

there is lots yet to be done in the way of continuing to ensure that our weapons are reliable and safe and available in the event that they might be required. We simply can't afford to rest on our laurels; we must continue to provide new options for the nation's military.

"The three weapons labs are healthy because their main mission has been to provide nuclear weapons designs for the country. That should continue to be our principal mission. I think it's silly to argue about whether all three should share one mission, because the nation has many problems to which we can make contributions. I think it's appropriate to call on the labs to also do work in other fields, and I would expect that to continue to be the case."

Asked what he thinks about opportunities for technical people entering the field, he replies. "Sandia must be one of the best places for an engineer or scientist to have a career. People who have ability are certainly encouraged. They have equipment provided to them that allows them to do the research they want to accomplish. And research at Sandia is always connected with something that matters, which I believe is very important."

What about his plans? Byron and his wife Doris are taking a trip to Europe for a transition into retirement, but they expect to remain in Livermore and hope to do more "birding" with binoculars and camera, something that has been a favorite pastime of theirs for many years.

Willis's 'Invisible Broom'

foot of air — not good enough for the assembly of delicate weapon components.”

The problem, Willis discovered, was that air-flow patterns in conventional clean rooms were not uniform and therefore could not remove airborne contamination from the room as quickly as it was introduced. “It was like taking a bath in dirty water,” explains Willis.

So Willis designed a clean room that was “like bathing in a moving stream.” He determined that single-pass, unidirectional air flow could go a long way toward resolving the problem. To achieve such an airflow throughout a clean room, air inlets and outlets had to occupy the entire ceiling and floor of the clean room.

An 8-by-10-foot clean room was constructed and became operational in late 1961. It contained a single work bench, high-efficiency particulate air (HEPA) filters formed the wall from floor to ceiling behind the work bench, and the floor was 100 percent grating.

A large uniform flow of filtered air (defined as “laminar flow”), sweeping down across the work area, removed particles from the room. This simple idea resulted in an environment more than 100 times cleaner than conventional clean rooms and 40 to 60 percent cheaper to maintain.

Willis's design proved so efficient that a large downflow clean room was soon built at Sandia. In April 1962, Willis presented the first formal paper on his clean room work to the national meeting of the Institute of Environmental Sciences in Chicago.

Although a number of publications across the country had picked up the story in the early months of 1962, the big payoff came in April when TIME magazine ran a story in its science section on Sandia's clean room breakthrough. This article quickly brought the new technology to the attention of government and industry, both in the United States and abroad.

“A great deal of the success of the clean room technology transfer must be attributed to Sandia's own public relations,” says Willis. “I can't recall all of the personnel who were involved, but the names I do remember are Jim Mitchell, Bob Gall, Louis Erne, Bill Laskar, Wright Van Deusen, Bob Colgan, Ted Sherwin, and Don Graham. All these people, among others, did a terrific job. They were all very professional and extremely helpful. The publicity wasn't overdone — it was factual and straightforward. I look back on my relations with them with appreciation.” (See related feature.)

It soon became apparent that the number and kind of businesses that clean rooms affected were tremendously varied: electronics, pharmaceuticals, hospitals, biological, aerospace, food processing, and many more. These represented so many different contamination problems and widely varying goals for control that by 1963 the need for a standardized definition for clean rooms was highly evident (again, see related feature).

Willis achieved laminar air flow by forc-

ing air through fiberglass HEPA filters which filtered out 99.97 percent of all particles three-tenths of a micron or greater in diameter (bacteria average eight-tenths of a micron in diameter). The air moved at a velocity of around 100 feet a minute which resulted in 600 air changes in each volume of space every hour.

Industry quickly adopted the laminar clean room design. Willis's original 8-by-10-foot prototype was converted by Western Electric into a 20,000-square-foot clean room for the assembly of pushbutton phones; RCA assembles television picture tubes in a facility of the same size at Lancaster, Penn.

The clean room concept has also had a major impact on the medical field. Hospital pharmacies use “clean benches” — an adaptation of the clean room concept — for mixing machines. Employing the air hood apparatus, also invented by Willis, the clean bench applies laminar air flow principles to a limited work area.

“Penicillin particles in the air had been getting mixed in with other drugs,” explains Willis. “The clean bench immediately put an end to that kind of contamination.”

By 1966 a number of hospitals were planning laminar flow operating rooms. The first to install a “laminar flow operating suite” was Albuquerque's Bataan Hospital (now Lovelace Medical Center); see box.

In the next five years, the number of operating rooms using laminar flow systems increased to more than 300; by the mid 1970s there were over 1000. In addition to its use in surgery, laminar flow was applied in two cross-flow patient treatment rooms (later increased to 22) at M.D. Anderson Hospital in Houston, Texas. These facilities were used for chemotherapy treatment of leukemia patients.

The list of laminar flow applications is seemingly endless. By the mid-1970s, more than 50 U.S. companies were manufacturing laminar flow equipment and marketing it around the world. Customers included NASA, which installed a number of large clean rooms for the space program; manufacturers of solid state devices; food packing plants; and the manufacturers of pacemakers.

“It's been a \$200 million a year business in the U.S. alone, according to several manufacturers of clean rooms,” says Willis. “Although the number of manufacturers has decreased somewhat due to mergers, the business is as strong now as it ever was.”

After inventing the laminar flow clean room, Willis didn't just sit back and let others continue the work. He spent 10 years as an unpaid consultant to NASA as well as to Zenith, Motorola, RCA, Western Electric, and Bell Labs. “I helped set up an enormous outfit for Texas Instruments,” says Willis. “And I also helped a lot of hospitals set up their clean rooms.”

Willis has received many honors in his long and fruitful career, but perhaps the one

'Surgically Clean' Gets A New Meaning

The first operating room in the United States to convert to laminar air flow was in Bataan Memorial Hospital (now Lovelace Medical Center) in Albuquerque.

In 1961, Willis Whitfield had met with Dr. William Lovelace, a co-founder of the Lovelace Clinic and Foundation, to discuss the medical applications of the new invention.

During World War II, Lovelace had been Chief of the Aeromedical Research Laboratory at Wright Patterson AFB. As medical director of NASA, he continued his interest in aerospace medicine and became aware of Willis's development of the laminar air flow clean room at Sandia.

A series of bacteriological tests was conducted in the Sandia clean room between 1961 and 1965 that showed that a laminar air flow operating room would significantly reduce the possibility of airborne contamination from pathogenic bacteria. As a result, a vertical laminar air flow system was installed in an existing operating room in Bataan Hospital and first used on Jan. 3, 1966. Although this operating room was recently dismantled, another “cross-flow” room set up in 1971 is still in use.

he is most proud of is the Holley Medal presented to him in 1969.

Bestowed on “one who by some great and unique act of genius of an engineering nature has accomplished a great and timely benefit,” the award enabled Willis to join the ranks of other Holley Medal recipients like Henry Ford, Edwin Land (Polaroid camera), William Shockley (transistor), Carl Norden (bombsight), and Harold Edgerton (strobe light).

In addition, he's had an award named after him — the Willis J. Whitfield award, established in 1981 by the Institute of Environmental Sciences.

That original clean room is still around just east of Bldg. 892 — it's now being used as a biology lab for the sludge program. Humble as it may appear, the little building marks the beginning of a new era. • cm



“Unless French becomes an accepted scientific language, French citizens will continue not to understand science, and our scientific production and quality will remain limited,” according to Bernard Cassen, director of the office for promoting French as a scientific language. This reasoning does not convince many French scientists. “If I publish in French, no one will read me,” physics professor Marcel Froissart complains. What will happen if all future conferences in France must be held in French? “There will be no more conferences here,” he answers bluntly.

— Christian Science Monitor

Laminar Air Flow Attracted National Attention

Not only was laminar air flow a timely solution to contamination problems threatening to impede rapid development of microelectronics, it had a more modest local effect as well: it permitted an auspicious start for the Labs' national media publicity effort.

Sandia was just emerging in 1961 from the cloak of secrecy surrounding the early days of atomic weaponry. The Labs was little known nationally, but already creating new science and technology of interest in the private sector.

To accommodate this buildup of new knowledge, Ted Sherwin, then supervisor of the Public Information Division, decided to begin an expanded effort to disseminate information on Sandia science to the national media, and hired me to get the program rolling.

The first significant item of technology to appear was laminar air flow. It was publicized in a full-page story in the January 5, 1962, LAB NEWS, and I issued a news release on the topic later that month.

The story was widely used, but the big play came from the TIME article on April 13, 1962, a story based on information provided to a local TIME correspondent, Arch Napier.

I remember that Napier, a whimsical fellow who now writes humorous pieces for the national press, brought a look of pain to Willis Whitfield's face when he asked whether the idea of letting airborne particles fall through the grid on the clean room floor was inspired by a similar technique used to dispose of droppings in chicken houses.

Although that bit didn't make it into the TIME article, the story did generate about a thousand inquiries — several from investors wanting to know where they could buy stock in "Sandia Corporation," as the Labs was then known.

Oddly enough, the barrage of publicity preceded the filing of the patent on laminar air flow. Although the concept was disclosed in December 1961, the patent wasn't filed until May 14, 1962.

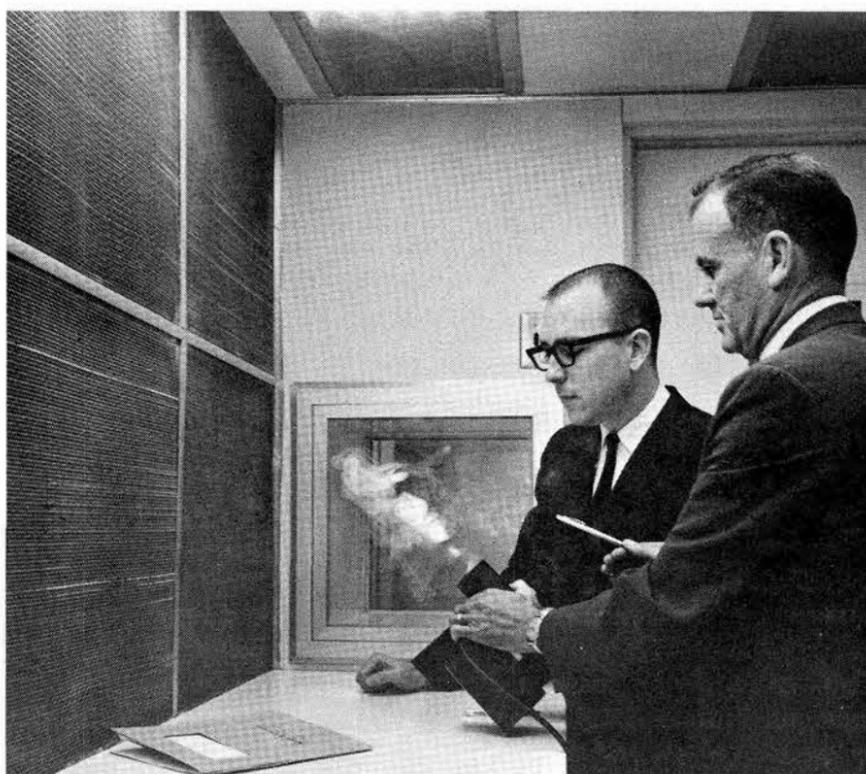
Initially, it was felt that it was going to be difficult to patent clean air, but the response from the TIME article helped convince the AEC (Atomic Energy Commission, a forerunner of DOE) that it would be worth a try.

The broadly based patent issued on November 24, 1964, was followed by one on a clean hood in September 1966. The first has now expired, and the second will expire this month.

Long before the patents were issued, laminar flow had become the backbone of a new federal standard for clean rooms and stations.

The first meeting to establish the new standard was held at Sandia in April 1963, with some 150 representatives of government and industry in attendance. By December the standard had been adopted and issued — six months or so to do a chore that often takes that many years.

The creativity that Doug Ballard and J. Gordon King, amongst others, applied to cutting through the governmental red tape



LOOKING VERY 1960ish, Jim Mitchell (3160) observes as Willis Whitfield demonstrates how the laminar air flow in his new clean room design clears a room of dirt particles. Jim was instrumental in generating the publicity that brought the laminar clean room design to the attention of industry and government.

was exceeded only by Willis's initial burst of genius.

Despite the standard, the elegant simplicity of the laminar flow idea wasn't universally appreciated. One manufacturer of conventional clean rooms, about to be bankrupted by the new concept, claimed that the laminar flow rooms were grossly misrepresented because they would require thousands of dollars annually to maintain.

He calculated that the absolute filters in the rooms and benches would clog up almost immediately, requiring either constant cleaning or quick replacement.

He had conveniently overlooked the fact that once the flow of air in the room had made one cycle through the filters it remained clean except for the small amount of new air introduced into the system and the limited amount of contamination generated in the room itself.

The result was, of course, that the filters lasted for years with little or no maintenance. The charges of misrepresentation were widely aired, however, causing a bit of anguish at the Labs.

Runners Needed

Carrying a Torch for the Olympics

So you won't run in the '84 Olympics after all. How about the next best thing?

Runners from throughout the Bell System will escort the Olympic flame on a 12,000-mile route through all 50 states, ending in Los Angeles in July. So far, 85 slots have been filled; 115 slots are open. Sandia runners who meet the qualifications can be selected to join the Olympic Torch Relay Cadre Team.

Don't put on your Nikes yet. In addition to meeting the fitness qualifications, you must be willing to use as many as six vacation days between May 8 and July 28 and live out of a caravan of 14 motor homes while on the road. Those selected will run 10 miles a day (five miles twice a day) for seven days through all kinds of climate and across all kinds of terrain while carrying or escorting another carrier of the 2½-pound Olympic torch. Transportation and food ex-

Laminar flow has proved to be such a perfect answer to clean room contamination that it has precluded all competitors and refinements. There are no second-generation clean rooms, and the first one built more than two decades ago cleans as well as one built today.

— Jim Mitchell (3160)

Mountain Running Seminar

Mountain Running/Fitness Over 40 — Something exciting and unique takes place Oct. 21 at the C-Club from 5 to 9 p.m. It's a seminar on mountain running and fitness over 40 with some of the foremost experts on the subject giving talks and presentations. John Cappis, Klaus Weber, Drs. Norm Katz and Kay Stevens, and even Jesse Castaneda will cover specific topics such as the joy and dangers of mountain running, preparing for ultra events, the physiology of aging, a psychological approach to long distance running and fitness, etc. Films and slides plus a buffet will round out the program. All fitness-conscious people, 40 or not, are invited. Cost is \$7.50. Advance sign-ups are required: Margaret Johnson at 265-6791.

penses will be paid by AT&T Communications.

To be considered a candidate for the cadre team, your time must meet at least one of these criteria:

Distance	Men	Women
¼ mile	60 seconds	1 minute, 8 seconds
1 mile	5 minutes, 12 seconds	5 minutes, 48 seconds
5 miles	30 minutes	34 minutes
10 kilometers	37 minutes, 12 seconds	43 minutes
10 miles	1 hour, 3 minutes	1 hour, 15 minutes
26.2 miles	3 hours	3 hours, 30 minutes

If you are interested and have been a Sandia employee at least since June 1, 1983, fill out an application form at the LAB NEWS office (Bldg. 814) and mail it to the address on the form so it arrives by Sept. 30. Members of the team will be announced by Nov. 1.

Take Note

Gil Wallace, project leader of the Pressure Safety Lab 3441, presented Sandia's Pressure Safety Course to 30 students last month at the Naval Avionics Center (NAC) in Indianapolis. NAC provides R&D functions for the Department of the Navy, and is in the process of establishing a pressure safety lab and program patterned after the SNL program. Jim King (7400) chairs the Pressure Safety Advisory Committee that developed and administers Sandia's program.

* * *

Ron Iman (7233) presented two invited papers at the 1983 annual meeting of the American Statistical Society in Toronto, Aug. 15-18. "Rank Transformation Procedures" was an invited tutorial paper; the second presentation was "Design Consideration for Selecting Input to Risk Assessment Models."

Ron also was the author of "Harmonic Mean," published in the *Encyclopedia of Statistical Sciences*, John Wiley & Sons, Inc.

* * *

Next week, Sept. 17-24, is Sexual Assault Awareness Week and, throughout the country, rape crisis centers, women's groups, and mental health centers are participating in activities to draw attention to this serious problem. Two of these activities start at 8 a.m. tomorrow — a two-mile run and a 10K race at San Gabriel Park. Other events include lectures, a concert and play, and a night march. For more information call Sandi Gonzales-Smith, 843-2872.

* * *

Sandia National Laboratories Women's Leaders Day is Sept. 23. The Women's Program Committee will host about 80 women leaders from throughout New Mexico. The event is designed to promote interaction between Sandia and state educational institutions as well as agencies that serve women. Sandia's outreach efforts in this area will benefit by being able to identify qualified women applicants and to prepare female students to meet Sandia's future needs.

The program includes addresses by President Dacey, VP Ray Powell (3000), Bob Garcia (3500), Herb Pitts (3530), and George Banos (3510). Sandia's Women's Program Counselor, Yolanda Padilla-Vigil (3511), will welcome the group.

* * *

The Albuquerque International Balloon Fiesta will be held Oct. 1-9. This is the 200th birthday party of ballooning and the 12th annual Fiesta held in Albuquerque. Included in this year's nine-day program are spectacular weekends of mass ascensions, the third annual gas balloon race, Navy Leapfrogs and Army Golden Knights precision parachute teams, a kite-flying contest, Morgan horse dressage demonstration, NM Symphony Orchestra and high school band concerts, Fiesta parade, Air Force Thunderbirds, chile cook-off, Bicentennial Costume Ball, radio-controlled aircraft, and more.

More volunteer chase crews and trucks are needed to help launch and retrieve the expected 400 hot air balloons. Copies of the Fiesta program are available at the LAB NEWS office, in Finance, or from Ruth Birdseye (7631). For information, call the

Fiesta Committee on 883-0932 or Ruth on 255-6328.

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The American Lung Association of NM is sponsoring a six-week "Freedom From Smoking" clinic 7-9 p.m., on Thursdays, beginning Sept. 22, at the organization's office, 216 Truman NE. The clinic costs \$35 and enrollment is limited so anyone interested should contact the Lung Association soon. Call them at 265-0732.

* * *

Exide Corporation will present a technical seminar on the sizing and maintenance of stationary and solar type storage batteries on Tuesday, Sept. 27. The all-day meeting will be held at the Albuquerque Hilton Inn. Lunch will be provided by Exide. Call Exide's representative, Arnie Allen at 247-3656 by Sept. 23 to confirm attendance or for more information.

* * *

The eighth annual ACM Pro-Am Programming Contest, sponsored by UNM Computer Science Department, the UNM Computing Center, and the local student ACM chapter, will be held tomorrow, Sept. 17, at the Engineering Annex on the UNM campus. The contest will run from 1 to 7 p.m., with team briefings at 12:30 for discussion of rules and terminal and room assignments. Entry fee is \$5 per team of two and the deadline is today! A post-contest party will be held immediately following the contest and team rankings will be announced. For more information, call 277-3112.

* * *

Mark McAllaster (1822) won a first place award in the 1983 metallography contest sponsored by the American Society for Metals and the International Metallographic Society. His submission, "Improved Ductility in U-Cr Alloys," was based on research in which he used optical metallography and scanning electron microscopy to identify the microstructural cause of low ductility in U-Cr casting alloys, and then developed a heat treatment that successfully modified the microstructure and improved the ductility by a factor of five.

* * *

The NM Chapter, American Vacuum Society will offer a Vacuum Science and Technology course at the Hilton Inn on Sept. 26-29. Course instructor will be Billy Powell of Los Alamos National Laboratory. Course fee is \$300. For more information, contact Merrill Chamberlain (1823), at 4-8749.

* * *

The third annual NM DECUS meeting will be held Sept. 29-30 at the Four Seasons Hotel in Albuquerque. The DECUS meeting serves as a forum for information exchange between users of Digital computers and representatives from Digital Equipment Corp.

A preliminary program is available that lists the sessions and times. For more information contact Patricia Allen (3416) at 6-2458, or Ron Trellue (7523) at 4-0955.

* * *

A conference on magnetic reconnection will be held at the J. Robert Oppenheimer Study Center at Los Alamos National Lab on Oct. 3-7. Co-sponsors with LANL are the

American Geophysical Union, the Institute of Geophysics and Planetary Physics of the University of California, the National Science Foundation, and NASA.

Magnetic reconnection is a process in the physics of plasmas whereby energy of magnetic fields is converted into motion and heat of plasma. Its occurrence was first postulated about 35 years ago to explain the very rapid energy release in solar flares. It has since been found to play a vital role in the physics of planetary magnetospheres and to influence experiments conducted in thermonuclear fusion research.

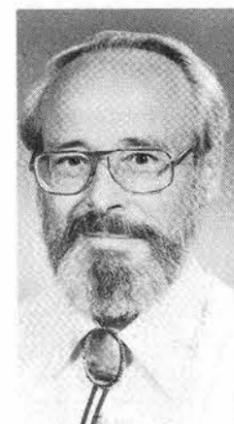
The program will feature talks by many of the leading investigators in space, solar, and lab plasma research. Cost is \$65 for AGU members, \$75 for non-members. After Sept. 19, add \$10 to both. Those wishing further information about the conference should contact the chairman, Edward Hones, Jr., at LANL. His Mail Stop is D438, and his phone is (FTS) 843-4727.

* * *

The Albuquerque Association for Gifted and Talented Students will hold its fifth annual conference for parents and educators of gifted children on Oct. 22 from 8 to 5 at the Albuquerque Academy. Theme of the conference is "The Pursuit of Excellence: Can We Meet the Challenge?" Two nationally known speakers, Ken and Gina Riggs, will be featured. For a brochure or more info, contact Judy Hudenko at 293-4274 or Regina Hunter (6413) at 6-6337.

* * *

The South 14 Bookstand - The stylized symbol of the sun, the one that appears on our license plates and upon the state flag . . . where did it originate? In *New Mexico, The Shining Land* (UNM Press), author John Sinclair, explains that it sometimes is called the Zia symbol because the design comes from the Zia Pueblo, a few miles northwest of Bernalillo on State Road 44. New Mexico hasn't always used the Zia symbol; in fact, it wasn't adopted until 1925 when the governor signed a bill creating the official flag with this symbol, done in scarlet and a field of yellow. Sinclair, now in his 80s, came to New Mexico as a youth from his native Scotland and worked and lived as a cowboy. But it is his writing skill that has made him legendary, and this collection of essays, anecdotes, and a few tall tales about our shining land shows the full measure of the skill. In paperback, *New Mexico, The Shining Land* is \$10.95; you can pick up a copy at the LAB NEWS in Bldg. 814.



Death

Thomas Flanagan of Data Systems Development Division I 7121 died Sept. 6 after a long illness. He was 52.

He had worked at the Labs for 25 years.

Survivors include his wife and two daughters.



TRINITY SITE TOUR — The world's first atomic device, wired with detonation and measurement cables, awaits its detonation in a steel shed atop a 100-foot tower at Trinity Site in the northern portion of White Sands Missile Range. Exploded in the early hours on July 16, 1945, the tower was vaporized. Today a monument marks Ground Zero at the site where the tower once stood 38 years ago. This year's Trinity Site tour will be conducted on Oct. 1. Caravans will form in the Alamogordo K-Mart parking lot for an 8 a.m. departure. A second caravan will leave from the White Sands Missile Range Stallion Range Center gate at 9 a.m. The Stallion gate is at the north end of the missile range, about 17 miles from San Antonio, N.M. on Highway 380. The Alamogordo caravan will make a 180-mile round trip to and from the site. The Stallion caravan will travel about 50 miles round trip. Visitors will be allowed to remain at Trinity Site about 90 minutes. During this year's ceremony, the featured speaker will be Marvin Wilkening, who was with the original Manhattan Project and part of the Fermi group at the startup of the first nuclear reactor in Chicago in 1942. (U.S. Army photo)

EXPERTISE REVISITED



"Fooling around with alternating currents is just a waste of time. Nobody will use it, ever. It's too dangerous . . . it could kill a man as quick as a bolt of lightning. Direct current is safe." (Thomas Edison, 1847-1931)

Quoted in Norman Augustine, *Augustine's Laws* (New York: American Institute of Aeronautics and Astronautics, 1982).



VIA VOLUNTEERS manned the phones at KNME-TV on Aug. 28 to help out in the station's annual fund-raising drive. Standing are Ed Clark (1634) and Steve Goldstein (7254). In the back row (l to r) are Jim Tinker (0141), Tom Ashwill (3642), Jerry Kennedy (7130), Art Arenholz (10), and Rebecca Siegel (9724). In the front row (l to r) are Mary Clark (Ed's wife), non-Sandian Debi Gentry, Lynn Peters (3155), Karen Shane (3163), Bernice Sanders (ret.), Pat Childers (0301), and Darlene Goldstein (Steve's wife).

Here are some current volunteer opportunities for employees, retirees, and their families. If you are interested, call Karen Shane (4-3268).

AMIGOS DE LAS AMERICAS is an organization that provides an opportunity for young adults to serve public health needs in Latin America. The group needs adult volunteers to supervise high school Amigos who are selling carnations at the State Fair for a fund-raising project.

MANZANO DEL SOL NURSING CENTER is looking for volunteers to serve as hosts at monthly birthday socials, as arts and crafts decoration leaders, and as stock cart vendors.

ADELANTE DEVELOPMENT CENTER serves severely mentally retarded and emotionally disturbed adults who are employed in the agency's vocational skills program. Adelante needs volunteers to teach a variety of subjects, including money and time skills, music, arts and crafts, and writing. Adelante also needs



News

volunteers to perform general maintenance.

CONTACT and UNM'S AGORA are crisis intervention agencies that need hotline volunteers.

ALL FAITHS RECEIVING HOME FOR CHILDREN needs two or three persons (one with masonry experience) to build a block wall (about 100 sq. ft.) around a garden.

ALBUQUERQUE LITTLE THEATRE needs an electrician to install lights in a small new performance area.

Lujan Addresses Sandians

Taking advantage of the August recess (or "district work period" as it's sometimes called in Washington), Congressman Manuel Lujan recently visited Sandia to provide some insights on the upcoming legislative session.

Referring to the extensive and varied legislation that will be taken up — from abortion to survivors' benefits, Lujan quipped: "The government is very thorough — we regulate you before you're born and after you're gone."

Some highlights of Lujan's talk:

Social Security: We were \$168 billion in the hole, but now I think we've got it cured. We must have done the right thing because everybody was mad at us. Taxes were raised and the minimum retirement age was raised to 66 — although it won't be in effect until 2006. Increased life expectancy plays hell with Social Security.

Defense: In the 1950s and 1960s, the U.S. had the best and most modern defense in the world. But just like a car bought in the 1960s, our defense is out of date today. Most of our B-52 bombers are older than the pilots who fly them.

Sandia Labs: Sandia owes the stability it enjoys to defense spending. It now has to pay [state] taxes like anyone else — it's just another way of transferring federal funds to the state. Sandia is now better off in its construction program. Last year Sandia and DOE spent \$1.3 billion in the state — \$1000 for every New Mexican.

Role of Labs: Sandia came out very well in the ERAB [Energy Research Advisory Board] and White House Science Council's reports. Some of the report's recommendations are already in effect at Sandia. [See LAB NEWS, Aug. 19, 1983.] The report recommended that 5 or 10 percent of the [national labs'] budgets be discretionary so funds can be moved about as the need

Swimming — Sandians do indeed have access to the military's indoor Olympic Pool, and it's free of charge. Show your employee ID and take advantage of this fine facility during the fall and winter months. Current hours: M-F 11-1, lap swimming only; T-F 4-7 open swim; Sat 11-5, open swim, and Sun 1-5, open swim.

Aerobic Dance — Donna Ness says she'll be fully recovered from her knee surgery (it wasn't job-related; she was attacked by an irate TV set) and ready to lead her legions of leggy ladies (and others) through another 10-week session of aerobic dance. Classes start Sept. 19 and meet from 9:30-10:30 or 5:30-6:30 on Mondays and Wednesdays in the C-Club ballroom. Call Donna at 255-6314 or 293-0316 for more info — or just show up for class on the 19th.

Aerobic Workout — The people who brought you aerobic dance now bring you a new twist to exercise — aerobic exercise. It's a back-to-basics program for men and women that provides a high caloric-burning



AFTER SPEAKING at a Colloquium last week, Rep. Manuel Lujan (right) enjoyed an informal lunch in the Sandia cafeteria with Charlie Winter (400) and Tom Cook (20).

arises. It recommended multiyear funding so we wouldn't have to scramble around for money every year. I disagree with the notion of mission-oriented labs — the report said Sandia and Los Alamos should stick to weapons. But much energy research is also related to weapons.

The report also called for closer lab ties with universities and industry. We must look for new and better ways of strengthening these ties, which would benefit all three groups. There's very good cooperation already in the Space Power Program.

Space Station: We have the technology and could put one up tomorrow, although it would be expensive. But we have to know why we're doing it: Is it for national pride, to beat the Russians? No, the only good reason is to keep up our technology. There's competition also from Japan and France. Separation of organic matter in an orbiting lab can lead to a permanent cure for diabetes.

Nuclear freeze: No one wants war, but unilateral dismantling leaves us at the mercy of the Soviets. I would support a mutual, verifiable freeze if that could be worked out with the Soviets through negotiations.

Central America: This issue takes up a

lot of our time in Congress. Vietnam and Korea were a million miles away as far as most Americans were concerned. But here in Albuquerque we're closer to El Salvador than we are to Washington, D.C. Some people say it's a civil war, leave 'em alone. But we don't want Soviet and Cuban intervention — it's not in our interest to let them dominate the area. I see merit in the Contadora proposals — Central America's problems aren't going to be solved with rifles. Let's sit down and talk with all of them, including Fidel Castro and the Nicaraguans, and see if they mean what they say about wanting to lessen tensions.

The environment: We want recreation and wilderness areas but our energy needs are vital also. We need some kind of balance. We'll be looking at legislation to control toxic pollutants such as acid rain and auto emissions.

The Soviet downing of the South Korean airliner: The UN is our first option. Through our action there, we got the Russians to finally admit they did it. I think it's great that we deny them landing rights and refuse to unload their ships. Cause them some discomfort. I don't think we should stop the arms talks — we're not in these discussions for their benefit, but for ours.

Fun & Games

workout with increased time directed to flexibility, stretching, and floorwork. (Hey, guys, no dance routines!) Classes meet Mondays and Wednesdays at the C-Club at 4:45. So rejoice, those of you who have been crying for some exercise right after work. Then go beyond rejoicing and sign up to participate in this latest of aerobic exercises. Call Karen White at 293-0316 or Donna Ness at 255-6314 now — classes have already begun.

Vacation — Even people who play for a living have to take a vacation once in a while. So recreation program manager Tom Lenz will spend Sept. 17 through Oct. 2 developing radiation-softened semiconductors. All questions concerning SERP (Sandia's recreation program) that need answers right away should go to Margaret Johnson at 265-6791.

Golf — A "Dolls & Guys Golfun Tourney" to benefit the Cystic Fibrosis Foundation will be held Sept. 30-Oct. 2 at the Paradise Hills Country Club. It's a "lady invites gent" event with all golfers with estab-

lished handicaps invited to participate. Several social gatherings, including a barbecue, will punctuate the competition. A charitable donation of \$150 per golfer (or \$40 per non-playing guest) will go to the Foundation, which fights the number one genetic killer of children and young adults. For info or reservations, contact Susan Craig at 255-7507.

Clogging — Beginning classes in this aerobically sound and aesthetically exciting art begin Sept. 27 from 7 to 8:15 at the YWCA on 4th and Lead (free, well-lighted parking). Dennis and Doris "Nims" Huffman are the instructors. It's for the whole family — current cloggers range from 4 years old to grandparents. Adults: \$1.50 per session. Kids: 75¢. More info from Chuck Clendenin (2611) or Virginia O'Neil (3152).

Classes — KAFB's Arts & Crafts Center has a class in auto maintenance and repair that begins Sept. 19 and a class in basic woodworking that begins Sept. 21. Call 4-0222 for more info.

Supervisory Appointments

CAROL KAEMPER to supervisor of Section 21-1, Secretarial Coordinator for Organizations 5000, 6000, and 7000, effective Oct. 1.

Carol first joined Sandia in 1957 in the Personnel organization. Since that time (including three child-care leaves of absence), she has been a secretary with the manufacturing engineering group, employee services, reactor operations, technical library, and the fusion organization. In 1975 she was promoted to secretary of the fusion department, and later transferred to the fluid and thermal dynamics department. She was promoted to secretary for the engineering sciences directorate in 1979. A year later, she transferred to Personnel Department 3500, working with the industrial psychologist. Since June 1982, Carol has been executive secretary to Orval Jones (5000).

Carol is completing her degree in psychology at the U of A. She's a handwriting analyst and enjoys camping, swimming, and country/western dancing. She and her husband Jack have three children with one at home; they live in the SE heights.

* * *

JOE RUGGLES to supervisor of Plant Engineering Scheduling and Control Division 3661, effective Aug. 26.

Joining the Labs in 1958, Joe worked for 10 years in design drafting and four years as a programmer in engineering information division. He later worked in assets management division and the financial systems division, where he did systems analysis and design of a new financial system. Joe returned to assets management and for three years was the project leader for the redevelopment of the property management system. In 1982 he was promoted to supervisor of Project Management Systems Section 3661-1.

Joe earned his BBA in accounting from UNM under the Educational Aids Program. He is vice-president of the Board of Directors of the Sandia Federal Credit Union. Joe enjoys hunting, fishing, tennis, and water skiing. He and his wife Nancy have three sons and live in the NE heights.

* * *

BOB EASTERLING to supervisor of Statistics, Computing, and Human Factors Division 7223, effective Aug. 16.

Bob has worked with Sandia's Reliability Department since joining the Labs in 1967, with the exception of two leaves of absence. During the spring semester of 1974, he was a visiting lecturer at the University of Wisconsin and, from July 1975 until June 1977, he completed an assignment with the Nuclear Regulatory Commission in Washington, D.C.

Bob earned his BS, MS, and PhD in statistics from Oklahoma State University. He is a member of the American Statistical Association, American Society for Quality Control, American Association for the Advancement of Science, and the Society of Risk Analysis. He has just completed a three-year term as editor of *Technometrics*,



CAROL KAEMPER (21-1), JOE RUGGLES (3661), BOB EASTERLING (7223), and CLAUDE POTTER (3435)

the *Journal of Applied Statistics*. He enjoys biking, backpacking, and playing a bluegrass banjo. Bob and his wife Judy and their two children live in the NE heights.

* * *

CLAUDE PORTER to Lieutenant in Security Operations Division II 3435, effective Aug. 12.

Claude joined the Labs' Security organization in August 1981 as a member of the "extra board" force. He became a full-time security inspector in April 1982. He attends the University of Albuquerque, majoring in criminology. Claude enjoys bow hunting, fishing, and competitive pistol shooting. He and his wife Linda and their two children live in NE Albuquerque.

* * *

LOUIE TRUJILLO to Lieutenant in Security Operations Division II 3435, effective Aug. 12.

He joined the Labs' Security organization in December 1979 as a member of the "extra board" force and became a full-time security inspector in August 1981. Louie has an associate degree in police science and criminology from the U of A. He is a Gunnery Sergeant in the Marine Corps Reserve; he has served 16 years with the Reserve with four years active duty. Louie is a Vietnam combat veteran, serving 18 months there during 1969-70. He enjoys hunting, fishing, softball, and pistol shooting. Louie and his wife Myrna have two children and live in the NW valley.

* * *

CATHY TURPIN to supervisor of Second Shift Operations Section 2141-3, effective Aug. 1.

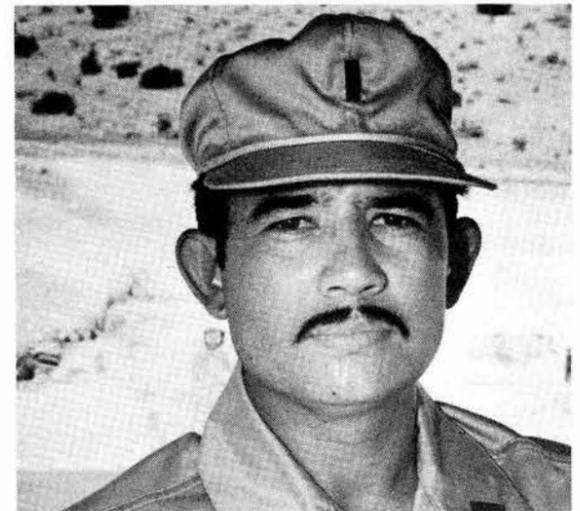
Cathy joined Sandia in November 1980 as a process technologist in integrated circuit fabrication.

She received her BS in biology from Wayland College (Plainview, Texas), and attended graduate school at the University of Arizona. Cathy enjoys biking and horseback riding. She and her husband Danny are awaiting the completion of their new home being built in Tijeras.

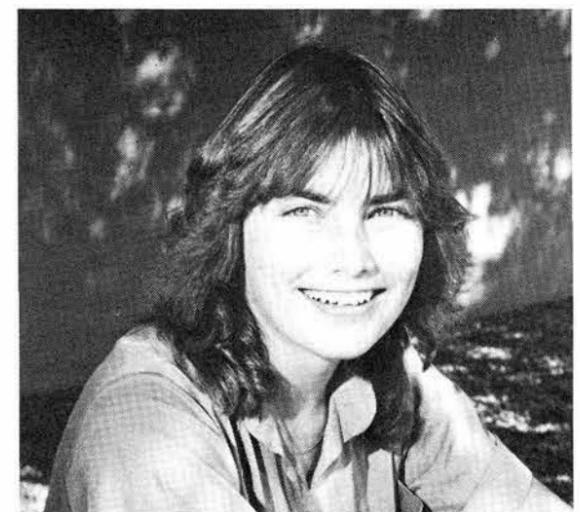
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GRANT AGUIRRE to Lieutenant in Security Operations Division II 3435, effective Aug. 12.

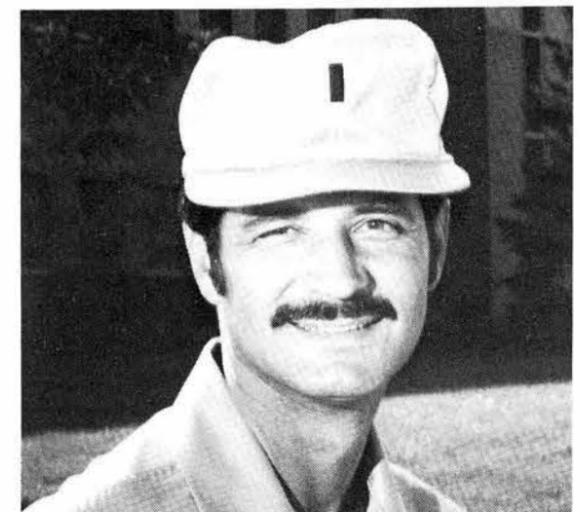
Grant joined Sandia's "extra board" security force in September 1978 and became a full-time security inspector in November 1979. Before joining the Labs, he was a math teacher at the Los Lunas high



LOUIE TRUJILLO (3435)



CATHY TURPIN (2141-3)



GRANT AGUIRRE (3435)

school for 10 years. Grant earned his BS in math from the U of A. He enjoys competitive pistol shooting and has been a member of the Labs' pistol team for two years. Grant and his wife Shirley have a daughter and live in the South valley.

MILEPOSTS

LAB NEWS

SEPTEMBER 1983



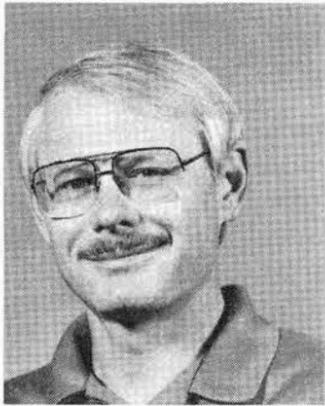
Pat Ulibarri (1240) 15



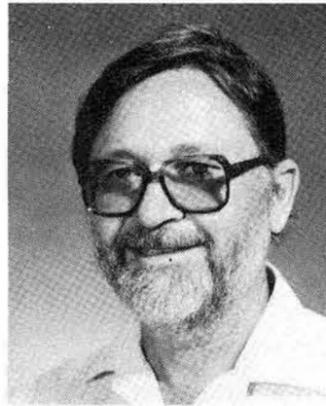
Pete Morris (3313) 25



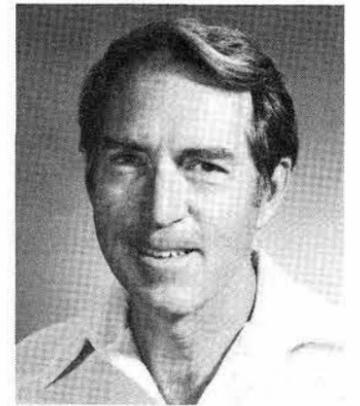
Bill Jacoby (3433) 25



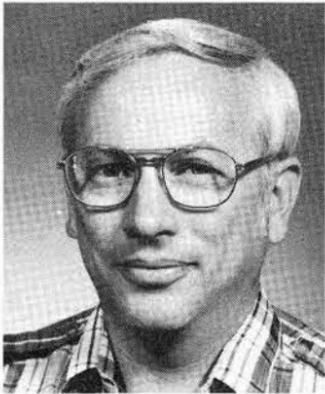
Bill O'Neal (3313) 15



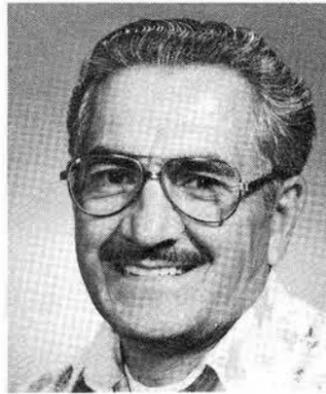
David Brice (1112) 20



Harry Hardee (1541) 20



Cliff Condit (3425) 20



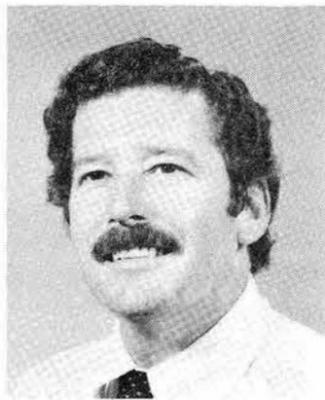
Joe Lucero (1652) 20



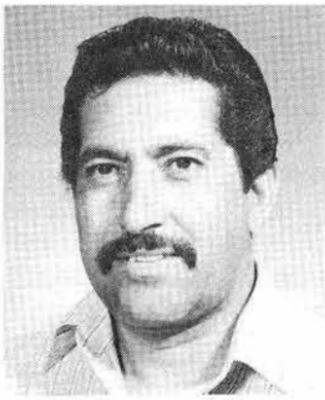
Dan Poole (3416) 15



Fred Vook (1100) 25



James Kelsey (6241) 15



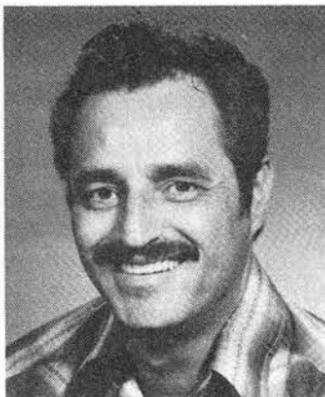
Bernie Vigil (7654) 15



Jack Teta (3715) 20



Glenn Folkins (5137) 30



John Aragon (6445) 15



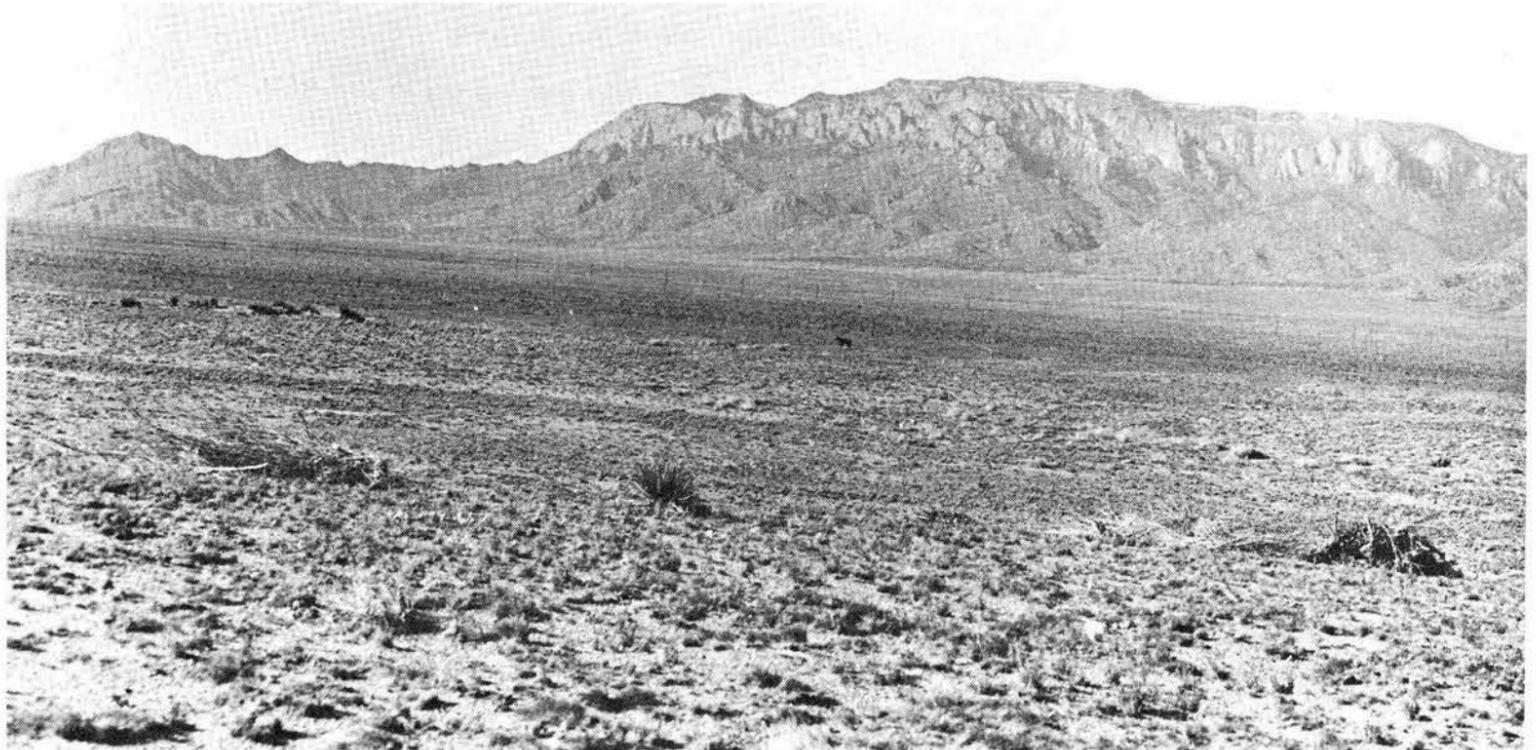
Evelyn Brown (3413) 10



Bill Gardner (7500) 35

Favorite Old Photo

Look Familiar? This scrub land was probably going for \$100 or less per acre. The photo was taken at the corner of Lomas and Louisiana, at the edge of the Fairgrounds. The year: 1948. (Doug Ballard — ret.)



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7. No more than two insertions of same ad.
8. Include name and organization.
9. Housing listed here for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

PREWAY free-standing fireplace, \$45 OBO. Dink, 293-0299 after 6.
 FREE kittens. Daniel, 296-4231.
 CANOE, 13' Coleman, w/paddles, \$200. Chorley, 296-1454.
 STORM DOOR, 36"x80", \$25; Leno weave drapes, 80"x84", \$20. Wafer, 268-5429.
 STUDIO COUCH, \$30; studio bed, \$25; SCR sp. controller for electric car, 96 volt 400 AMP, \$175. Bassett, 898-1840.
 STEREO, Sanyo JXT44 AM/FM, cassette, turntable, separate woofers & tweeters, cost \$300 at discount in '82, sell \$140. Holmes, 292-0898.
 GOLF SET: ladies' complete set w/bag, \$100; Yamaha alto saxophone, \$300; truck tire, 14x600, new, \$15. Claassen, 821-9180.
 REYNOLDS cornet, \$100. Stirbis, 821-5344.
 SHELVING: hard pressed particle board w/wood edging, 14, 16 & 18" wide, 57" long, \$1 ea. Houghton, 299-3386.
 NEW standard encyclopedias, all 1982, Child Horizons, 10 vols.; Classics, 14 vols.; w/bookcase, \$600. Owen, 299-3487.
 GARAGE SALE: Sept. 16-17, 9 a.m. to 4 p.m., 1406 Morningside NE. Peterson, 256-7514.
 SLEEPING BAGS, Coleman, 2 ea., 3-lb., new, never used, 23x72, \$10 ea. Rainhart, 821-3690.
 JENN-AIR range, convection oven, grill, griddle, rotisserie, shisk-ke-bab, \$550. Brown, 298-1303.

4 PAIRS maple bunk beds, complete w/mattresses. Jones, 299-9032 weekday evenings.
 YAMAHA B³ clarinet w/case, used for 9 mos., \$190. Harstad, 298-6551.
 TAN Naugahyde covered recliner, \$50; 4-dwr. legal size file cabinet, \$175; 4-spd. record player, \$15. Corn, 881-7568.
 CORNET, Evette & Schaeffer, w/case, \$100. Solberg, 884-8413.
 HIDEABED SOFA, \$75; stereo, \$35; 2 table lamps, \$6; free blender (buttons stuck). Robinson, 255-0114.
 FREE horse manure. Robinett, 344-6507.
 GE B/W 15" TV, \$30. Simons, 821-9343.
 ONE SEAT still open to the Confederate Air Force Show, Oct. 7-9, in a Cessna 182 RG. Stan Edmund for info. 881-7974.
 AVANTI PDL II base station antenna, dual beam, CB/Ham ability, 20' mast, all cables, rotor control incl. Mowry, 892-9666.
 REMINGTON 700 ADL, 30-06, Weaver 4X, padded case, cleaning kit, ammo, \$240; IBM electric typewriter, office model, elite type, plus heavy duty typing table, \$220. Kureczko, 298-1577.
 BEER tap, complete, \$70; Coors bar lamp, \$15; ladies ski boots, 6-7, nearly new, \$75. Lassiter, 299-1492.
 QUEEN SIZE Sealy Posturepedic mattress & box spring, \$60; car top carrier, fits Scout, capacity 500 lbs., \$80. Anastasio, 821-4245.
 SWIVEL office chair; girl's 20" bike; octagan dark oak coffee table, 38" across; metal typewriter table. James, 294-6837.
 WHEELS: 15"x6 1/2", 5 holes, General Motors, 3 ea., \$10 ea. Burton, 869-2541.
 SEARS automatic water softener, \$100. Sims, 294-3683.
 NEW Winchoke, 12 ga., XF, \$10; new Interarms Falcor O&U skeet shotgun, SST, SE, \$435. Klett, 884-8354.
 KENMORE sewing machine w/cabinet, \$75; Kenmore gas burner units w/griddle, \$125; Kenmore vent-hood w/fan & light, \$75. Nogaes, 268-8487.
 STEREO, AM-FM-8 TK player, 15" speakers, \$25. Hesch, 294-3298.
 SHELL for 1/2-ton pickup, insulated, paneled, overhead light, \$275 OBO. Gonzales, 344-9832 after 5.
 FREE PUPPIES: mixed Doberman, German Shepherd & Samoyed, 4 females, 1 male. Andersen, 294-8624.
 ADULT Western saddle, \$300; gold shag carpet & pad, 20+ yds., \$50; pink plush carpet & pad, 20+ yds., \$50. Schroeder, 344-1011.
 IBM typewriter, \$125; want to buy canning jars (Mason, Kerr or Ball). Wallace, 294-2870.
 PHOTOVOLTAIC ARRAYS: 55 watt, \$300; 12 watt, \$75; both are 36

cell series connected. Scott, 281-2633 after 5.
 BOY SCOUT uniform, complete w/cap & belt, neck size 13, almost new, \$20. Mora, 821-6759.
 ARKLA GAS GRILL, redwood tray, used 1 season, \$100. Black, 296-8414.
 HANGING FIREPLACE, ski lodge style, 360" screen, 37" dia., 57" ht., black, 4 suspension chains, \$300. Talbert, 298-9036.
 OBOE & student clarinet. Blottner, 298-9459.
 ENCYCLOPEDIA BRITANNICA, 15th (latest) edition, new \$1100, sell for \$500. Hulme, 299-7715.
 VIOLIN, full size Roth, includes case & bow, \$350. Barnard, 256-7772.
 UTAHN roping saddle, rawhide covered tree, fleece lines, \$380. Nichols, 296-8259.
 FIBERGLASS car top carrier, 36x42x20; girl's 20" bicycle; 10-dwr. dresser; toy box; matching twin beds; amateur radio receiver & trans. (tube type). Richards, 865-7158.
 '72 YAMAHA #175, \$300; 8x10 Wenzell deluxe tent, sleeps 6, \$100; bed frame, chest, dresser, all wood, \$125. Duimstra, 299-6106.
 WHIRLPOOL electric range w/dbl. oven, avocado. Burchett, 299-1689.
 RICHDEL GENIE 6 station watertimer, new, \$25; Radio Shack digital multimeter, #22198U, \$29; AM-FM car radio, Radio Shack, unused, \$15. Mason, 299-2836.
 KITCHEN TABLE, avocado, w/leaf & 4 gold chairs, table extends to oval w/leaf, \$100. Kelly, 293-2475.
 HIDE-A-BED, \$125; captain's bed w/mattress, \$150; four-piece bedroom wall group, \$75; Danish 2-cushion chair, \$20. Keltner, 298-7888.
 JACKMAN WHEELS, four 15"x10" w/6-hole pattern to fit Chevy, comes w/tires, lug nuts & caps. Irwin, 822-1831.
 REFRIG., \$320; small terrier-cross dog, 1 yr. old, \$25. Hays, 298-6124.
 GOLD Hotpoint refrig., 13', used 2 months since reconditioning, \$125. Sundberg, 266-4497.
 KAYAK, Phoenix Cascade, spray skirt, flotation bags, laminated paddle, adjustable footpegs, used twice, \$400. Cunningham, 268-1635.
 SEPT. 24, 3-person garage sale, stuff plus moped, car, tires, camera, etc., 8 a.m. to 5 p.m. Graham, 11137 Newcomb NE.

TRANSPORTATION

'79 SUZUKI GS425EN, 2500 miles, always garaged, \$1100 OBO. Stump, 293-1272.
 '78 SUZUKI DR370 dirt bike, low miles, \$550. Apple, 292-2049.
 GIRL'S bike, \$20; men's bike, \$20; Sears push mower, \$25. Schelby, 268-8926.

'63 VW Bug, engine recently rebuilt, \$600. Gorman, 898-9300.
 '75 PINTO w/'80 engine; new tires, starter, battery, seat covers; 4-spd., radio. Mills, 299-2130.
 '75 VW Bus, make offer; Red Dale camper, fully self-contained, 4 hydraulic jacks, make offer. Gonzales, 881-1762 after 5.
 '82 CELICA GTS, white, AC, PS, AM-FM cass., equalizer, sunroof, sport pkg., \$11.5K firm. Noel, 888-2630 after 5.
 '82 HONDA XR500R, licensed, \$1500 OBO. Malm, 293-2127.
 '76 BUICK LeSabre, 66K miles, Blue Book \$1925 OBO. Morrison, 877-7425.
 '72 TRIUMPH 650 Bonneville motorcycle, rebuilt & customized, \$2000 OBO. Gonzales, 344-4933.
 '80 CHEV. 4x4 Luv pickup, custom paint, Jackman wheels, lg. custom insulated camper shell, 28K miles, cass. player, CB, 20+ mpg, \$5125. Bland, 265-6286.
 '76 DODGE van, 3/4-ton, AC, table, ice box, carpet, captain's chairs, new tires, \$4500. Brown, 897-1948.
 '81 SUZUKI RM-80, new chain, sprockets & rear tire, \$495 OBO. Healer, 298-6967.
 '80 DATSUN 210 deluxe, 5-spd., AM/FM, AC, 46K miles, \$3750. Lewin, 822-8579 after 5.
 '52 CHEV. pickup. Garcia, 888-2487.
 '76 YAMAHA RD400; '78 Yamaha DT-175, best offer. Swahlan, 294-2126.
 '72 MERCURY Cougar XR7, \$500. Navratil, 293-5527.
 '73 MAZDA RX-3, 55K miles, \$1000. DeVargas, 293-7671.
 '81 VW Scirocco, AC, 5-spd., 34K miles, AM/FM/tape, new HR rated tires, \$7300 OBO. Kessell, 266-2094.
 '75 AUDI 100LS, AC, tinted windows, new interior, stereo/tape, \$2000. Pate, 293-5393.
 '71 TOYOTA Corona MK II, 20K miles on overhaul, new trans., \$1100 OBO. Pedersen, 294-8566 after 5.
 '76 VW Scirocco, 4-spd., AC, AM/FM, 5 brg. head, new upholstery, 25/35 mpg. Aeschliman, 281-1227.
 '80 HONDA XL85S, street & trail bike, \$590. Fisher, 881-8072.
 '82 MUSTANG GT, black, V8, PS, AC, cruise, tilt wheel, power windows, stereo-cassette, rebuilt motor, sheepskin covers. Roberts, 265-3281.
 '78 COUGAR 4-dr. Brougham, 58K miles, PB, PS, AC, AM/FM-cass., Road Handler tires, padded vinyl roof, one owner. Priddy, 884-8392.
 '70 FORD Galaxie, 351c, 4-dr., AT, \$300. Alder, 296-4527.
 '76 MUSTANG II, hatchback, rebuilt engine, new clutch, new elec. system, cruise control, A/C, PS, 4-spd, 4 cyl., \$2200 OBO. Gwinn, 299-7167.
 '79 SUZUKI 850, shaft drive, \$1400 OBO. Morosin, 298-0994.

'75 FIAT 124 coupe, less than 6K miles on rebuilt engine, \$2500. Draper, 281-2663 after 5.
 '73 FORD stn. wgn., one owner, 65K miles, loaded, Michelin tires, \$1800. Doyle, 884-5238 after 5.
 '74 KAWASAKI 900, orig. owner, low mileage, \$1000. Black, 292-5307, 296-8414.
 BICYCLE, Schwinn, 5-spd., \$15. Talbert, 298-9036.
 '79 HONDA XL250 Enduro, 1800 miles, \$800. Campbell, 294-6000.
 '80 PLYMOUTH Champ, AC, sunroof, AM/FM stereo, 4-spd., 28 mpg, new tires \$3700. Hamlet, 255-8146.
 '76 YAMAHA "Chappy", 4-spd., AT, 80cc, new tires, \$225. Sabisch, 298-8350.
 '70 CB100 HONDA, lg. sprocket, \$125. Sterk, 296-3453.
 '76 VW Rabbit, 4-dr. deluxe, \$1950. Gruer, 296-8163.
 '78 KZ400, adult ridden, Bates luggage, \$750 OBO. Furaus, 822-0146.

REAL ESTATE

CUSTOM 3-bdr., 1545 sq. ft., lg. LR w/cathedral clg. & fp, storage, heated pool, corner lot, owner finance w/lg. down, \$69K. Humble, 299-7820 after 1 p.m.
 LOT in North Valley, Dietz Loop, off Rio Grande Blvd., 0.6 acre, about 14 mi. from Lab. Smith, 242-9576.
 TWO ACRES, 7 miles east of Tramway, \$250K home on adjoining lot, electricity, proven water, \$39,500, assume 8 3/4% loan. Ray, 298-0408.
 SOLAR ADOBE, Corrales, 1/2 acre, 4-bdr., 1 1/2 bath, 2 kiva fp, lg. greenhouse, fruit trees, \$87K. Navarro, 897-1968.

LOST AND FOUND

FOUND — Water bottle left at Sandia Crest by rider of Trek bicycle on Aug. 20. Call George Fisk, 294-7252.
 LOST — WOMAN'S watch, gold-colored Citizen watch lost on 8/29 in Bldg. 821 or in parking lot of 823. Mary Moya, 296-8824.

WANTED

TRADE large residential lot with irrigation privileges, Strongherst Addition, for R-3 lot. Brown, 884-1343, 881-3772.
 '76-'79 CADILLAC Seville in good condition. Rogers, 293-8201.
 TENOR saxophone, rent or buy. Burton, 869-2541.
 GOOD, used fence charger. Richerson, 294-4970.
 FULL-TIME picture framer, must have high school diploma & 1 yr. experience framing pictures. Contact Sherryll Zuk (4-0222) at KAFB Arts & Crafts.
 A "HOT-WIRE" kit or transformer to keep pets out of flower beds, etc. Newcom, 293-5180.

Champagne Brunch Set Sunday

HAPPY HOUR TONIGHT sees a variety band called Eclipse on the bandstand playing a lot of nice tunes in a danceable style. The menu special is the Club's shrimp peel — about a pound of plump, juicy shrimp for \$7.75. In addition, the regular menu featuring fine steaks, seafood, and chicken is available. Happy Hour prices are in effect starting right after work and continuing through 8:30. Dining hours are from 6 to 8:30.

A CHAMPAGNE BRUNCH featuring roast beef and mushroom gravy, green chili and eggs, baked cod, an assortment of green and fruit salad, apple and cherry pie, and more is set for Sunday, Sept. 18. Price is \$5.75 for adults (includes glass of champagne) and \$3 for children 12 and under. For reservations, call 265-6791.

NEXT FRIDAY, Sept. 23, a country western favorite, Fandango, is on the bandstand, and barbecued beef ribs is the menu special for \$5.75. Karen Edwards instructs free western dance lessons from 7:30 until 8:30.

THE BIG ONE this month is Western Night on Saturday, Sept. 24, featuring the Isleta Poor Boys. There'll be a country western dance contest during the evening with \$50 for first place and \$25 for second place awarded. Prime rib is the dinner special at \$7.25. Reservations 265-6791.

TUESDAY TWO-FOR-ONE dining features 8-oz. bacon-wrapped filet mignon for \$12.95 on Sept. 27. Bob Banks entertains on the piano.

Dining hours are from 6 to 8:30, and reservations help.

THE FOURTH ANNUAL Coronado Club "Fun" golf tournament is set for Wednesday, Sept. 28. There are all kinds of fun things scheduled as part of the tourney, such as sinking a 30-foot putt with a pool cue. Being a *real* golfer might be a handicap. Sign up at the Club office now — entry fee is \$5. Participants may look forward to a full afternoon of craziness followed by a banquet at the Club.

CORONADO SKI CLUB sponsors its Ski Fair VI Tuesday, Sept. 30. This extravaganza features displays of equipment and attire plus information on most of the regional ski areas. The action starts at 5:30 on the patio with displays, demonstrations, and contests, then moves inside at 7 for a short business session, a talk on physical conditioning, a ski movie, and "fabulous" Ski Club drawings and door prizes. Bargain refreshments will also be available with free munchies and goodies. The Ski Club is the Club's largest special interest group with about 400 members. This kind of buying power gives members the best of bargain rates on lift tickets and on ski trips to area resorts, and a program of activities and events with more fun than most. The Ski Fair is the place to learn about all this; join up, and get the best ski deals around.

TRAVEL — You might still be able to get a seat on the Club's charter bus to Durango-Silverton Sept. 24-25. Visit the Aztec Ruins, try the Alpine slide, stay overnight in Durango, and ride the scenic railroad. Cost is \$95. Call right now.

Mazatlán travelers need to make final payments by Sept. 30. The trips are scheduled Oct. 31-Nov. 7 and Nov. 7-14 for about \$300. See Shirley McKenzie (7632) in the lobby tonight between 5 and 6.

feedback

Q. It appears that the area of the parking lot north of Bldg. 880 taken for the construction of Bldg. 891 is no longer required for that project. Its quick return to a parking facility for all employees certainly seems appropriate and would be much appreciated.

A. We have a contract to restore the old perimeter fence along 11th Street and remove the construction fence to restore parking northwest of Bldg. 880. This work will start just as soon as the Bldg. 891 construction contractor completes work; parking for about 180 cars should be available in October. The fence needs to remain until then because of the contract terms and the necessity of the contractor's site security until we assume control of the building for the construction of building occupancy features.

This parking site and adjacent parking areas will eventually be lost to new building construction in 1985 or 1986 (possibly sooner). At that time, additional parking to offset the loss will be provided east of the water tower.

R.W. Hunnicutt — 3600

Q. I realize that many secretaries have much to do. I also realize that some secretaries do not like to answer the telephone. But I find it disconcerting to call someone and have the phone ring and ring. I do not know if the person is out for the day, on vacation, just away from the desk, or does not wish to be disturbed. It is especially annoying to be on travel, call back to the Labs, and be faced with the same unanswered telephone. Furthermore, I believe it presents a poor corporate image to an outsider who is trying to contact someone at the Labs but is unable to get anyone or anything except a ringing telephone.

I believe it should be a required duty of every secretary at Sandia Labs to answer the phone after several rings.

A. The standard Sandia policy is still one of instructing secretaries to answer incoming calls in their office areas. Due to the increased typing requirements of many organizations, however, the PAX systems have been discontinued in order to help meet report deadlines. Even in those areas still using the PAX systems, secretaries are quite often not available for phone coverage since they are expected to prepare documents and vugraphs at word processor and/or computer terminals located outside secretarial offices.

Areas experiencing this problem might consider the use of "call forwarding" (page 6 of our telephone directory). This would enable staff to have phones answered by other members of the organization when they are on travel or vacation status.

S. Dean -11-1

Congratulations

Steven (1254) and Darlene Goldstein, a son, Aaron Michael, Aug. 31.

Jerry (1635) and Tara McDowell, a son, Ryan Christopher, Sept. 5.



SYRACUSE, CA. 215 B.C.; Archimedes discovers the displacement of water.

ALBUQUERQUE, A.D. 1962: Willis Whitfield discovers laminar air flow.