

# LAB NEWS

VOL. 32, NO. 3

FEBRUARY 8, 1980

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



## Earthquakes Jar Sandia Livermore

An earthquake measuring 5.5 on the Richter scale shook Sandia Laboratories Livermore at 11 a.m., Thursday, Jan. 24, and a second moderate quake struck the area at 6:33 p.m., Saturday, Jan. 26.

The Thursday trembler lasted nearly 30 seconds and was followed by two aftershocks within a three-minute period—registering 5.2 and 4.8. That same night more aftershocks occurred—the largest being 4.4 and 4.6—and others followed the next day. Then, on Saturday night, another quake in the series along the Mt. Diablo and Greenville faults registered a

5.6 but lasted only about 10 seconds and so did less damage.

Fortunately, no serious injuries or structural damage was sustained at SLL, although 13 employees did suffer minor scrapes and bumps. These included multiple contusions occasioned by a cabinet falling on a Sandian inside a storage vault at LLL; another employee fell from a 10-foot ladder, injuring his knee; a staffer injured his hand while withdrawing it from a piece of mechanical equipment; another was struck by a skidding motor; and one more was hit on the head by a falling light

fixture. None required hospitalization.

The power was out for a few minutes, and all buildings were evacuated as a precaution against stronger aftershocks. Employees were then dismissed for the remainder of the day while crews from Plant Engineering (8250) and the Security Division (8261), as well as key laboratory personnel evaluated the grounds and buildings for any hazards, including structural damage, which might cause collapse when aftershocks struck. None was found.

Most of the operational damage oc-

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# Afterthoughts

Time to collect some dues--Our Olympic athletes are understandably chagrined by the prospect of their not going to Moscow. After all, this is the dream of their young lifetimes, and selection for the Olympics came only after years of grinding physical work. It's tough... yet there are worse things that can befall and have befallen other young Americans in the last four decades as part of this country's dues-paying system. As instruments of national policy (and that is what the Olympic athletes now are), young Americans in the 1940s, 50s, and 60s were uprooted and sent to foreign lands. They were deprived of their liberty, their pursuit of happiness and, in many cases, their lives. We are thankful that the generation of the 70s has managed at least to escape the trauma of war, but now some of that generation--the Olympic few--are asked to pay their dues. Unfair? Sure, but international conflicts have a way of singling out a few to pay a disproportionate price--some die, some are maimed... and some don't make it to the Olympics.

\* \* \*

Read & weep--If you thought your tax bite for Social Security was a little stiff last year, then you may want to pass on quickly to something else because we have gloomy tidings. The Feds will this year take \$1587 for SS if you earn \$25,900 or more. The tax rate is 6.13%. Last year the take was \$1403. Know what it was back in '37? Thirty bucks... and that was for the entire year.

\* \* \*

"I've always felt America was a quantum jump ahead of the rest of the world in hope, creativity, freedom of expression, idealism... I've always felt painfully uncomfortable in Europe. It's such a museum of outmoded reverence for tradition."

Timothy Leary in a newspaper interview

\*js

## New Computer Ed Center Opens

A new Computer Education Center opens in Bldg. 880, Rm. D-10, on Tuesday, Feb. 12. A project of the Computer Consulting & Training Division 2614 under Al Iocoletti, the Center provides facilities for individual and small group study of a large selection of computer-related courses, including both staff and computer operator training.

An outstanding feature of the Center is a Control Data Corporation Plato terminal -- a computer network devoted to the presentation of educational material via interactive programs. The Plato system has extensive graphics and animation capabilities.

"Plato is an individual tutor," says Gary Shepherd, project leader for the Computer Education Center. "It's programmed to respond to student answers, provide encouragement, emphasize points and work at the student's own pace. With worldwide resources, Plato offers an almost unlimited supply of courses."

Plato can also simulate an "on-line" computer, enabling a trainee to practice all control functions including bringing up or dumping a system, operations not feasible on an actual on-line computer without disrupting services.

In addition, the Center features a growing library of video tape courses, individual playback areas, and links into the Sandia computing networks. A student can use the Center facilities to develop new programs, test them, and enter them into the network.

The facility also provides small group study areas with a host of supporting audio-visual equipment.

"A wide variety of computer-oriented courseware is offered," Gary says. "Some video classes are already available in the processing of administrative data. On the scientific side, there will be courses (often a combination of Plato and video tape) in timesharing and on various computing languages. Detailed announcements of course offerings will be sent to readers of the *Sandia Computing Newsletter*."

The Center will be open during normal working hours with staff available to assist students. The Center will also be open during evenings and weekends for students who wish to pursue course work out of hours. Arrangements for course materials and schedules should be made during working hours with Betty Straba (2614), 4-1342 or 4-5204. Questions concerning the suitability of various administrative data processing courseware should be addressed to Chris Morgan (5641), 4-3867.

"Everyone interested in computer education is invited to attend the open house all day Tuesday," Gary says. "Betty and I will be there to discuss the Center operation and individual training needs."



INDIVIDUAL STUDY CARRELS with extensive video tape and audio visual equipment are features of the new Computer Education Center in Bldg. 880, Rm. D10. Betty Straba and Gary Shepherd (both 2614) will assist with course material and scheduling. They invite you to an open house at the Center Tuesday, Feb. 12.



GARY SHEPHERD (2614), project leader for the new Computer Education Center, demonstrates the Plato terminal, an interactive computer network of educational programs.

## Speakers

R. L. Iman (1223), "The Rank Transformation as a Bridge Between Parametric and Nonparametric Statistics," invited lectures, Department of Experimental Statistics and Mathematical Science, NMSU, Jan. 14-15.

Gil Cano (4423), "Visual Investigation of Reactor Fuels Response to Simulated, Hypothetical Accident Sequencing," invited presentation, Jan. 16, Nuclear Research Center, Karlsruhe, West Germany.

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FIVE-FUZE configuration on a modified Honest John rocket was tested recently at Tonopah Test Range as part of a project for the Army's Harry Diamond Laboratory. Diamond is the developer of a fuze for the Army's General Support Rocket. The hydra-headed nosetip provided testing for five separate fuzes on a single rocket. Test director was Wayne Lathrop (1173); Harold Rarrick was test project manager.



A WISE OWL AWARD went to Conrado Otero (1482) for wearing his safety glasses right through to the end of the day. On Dec. 21, late in the afternoon, Mechanical Fabrication Section was cleaning up for the holidays. No one's quite sure what happened, but as nearly as it can be reconstructed, an unidentified flying object (probably a small piece of metal) struck Conrado's glasses just about the time another worker closed a roll-away tool box. No compressed air was being used at the time and no machines were in operation. Whatever the object was, it fractured the glass three ways from center, pointing out again that to avoid severe or lost-eye injuries, we need to wear safety glasses at all times in areas like the shop, not just while operating machinery.

## Fun & Games

*Skiing*—On Sunday the 10th, the Ski Touring Club will meet at Goodwill on San Mateo at 7 a.m. to combine forces for a tour of Fenton Ridge in the Jemez. It's a "Class I-II" tour, meaning easy to intermediate. The Club has a general meeting on Thursday, Feb. 14, at 7:30 p.m., at St. John's Church, 2633 California NE.

\* \* \*

*Arts & Crafts*—The Base Arts & Crafts Shop is introducing a watercolor class in February. They'll continue to offer classes in photography, pottery, leather, ceramics and tole painting (obviously for those who like to paint toles). Sign-ups are now in progress—call 4-0222.

\* \* \*

*Boating*—The Coast Guard Auxiliary is again offering boating safety courses in sailing and power boating. Both classes begin Feb. 25, at 7 p.m., run for 13 weeks, and are held at Christ Lutheran Church, 7701 Candelaria NE. The \$7 fee includes cost of the text. Pre-register by calling 255-3483 or 298-3723.

\* \* \*

*Running*—The Duke City Dashers plan to host a "Corporate Cup Track and Field Meet" in Albuquerque in May or June in which men and women from various companies would compete and be scored as a team. Highest team score would get the Corporate Cup. A number of events would be held, and contestants would be age bracketed. Needed now for planning purposes are some numbers, like how many people are likely to enter. If you think you might be interested in such a meet, send your name, organization and phone

number to "Corporate Cup," LAB NEWS. This is not a commitment, only an expression of interest. And, if you have any ideas about the events themselves, then send them along, too.

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*Archery*—Sandia Archers will hold a "Straw Poll" shoot on Sunday, Feb. 17, at their range at the south end of Wyoming Blvd. just east of the Trestle site. Register between 1:30 and 2:30 p.m. The meet is open to all, and prizes will be awarded in freestyle and barebow classes. More information: Dean Pershall, 4-7528.

### Congratulations

To Mr. and Mrs. Basil Steel (1764 and Brenda formerly of 3144), a daughter, Bridget Jocelyn, Jan. 22.

To Mr. and Mrs. Steve Gonzales (OYOC at UC/Berkeley), a daughter, Marissa Margaret, Jan. 20.

### Sympathy

To Milo Navratil (1584) on the death of his father, Dec. 9.

To Paula (1582) and Steve Stronach (1522) on the death of her daughter and his sister, Dec. 23.

To Bob Gray (2351) on the death of his mother, Jan. 16.



Buckminster Fuller believes that all of us begin as scientists. "Children," he says, "are born true scientists. They spontaneously experiment and experience and re-experience. They smell, taste, bite and touch-test for hardness, softness, springiness, roughness, smoothness, coldness, warmth. They heft, shake, punch, squeeze, push, crush, rub and try to pull things apart. True scientists deal only in the experienceable and base their assumptions only upon the physically redemonstrable behaviors and characteristics."

## Take Note

The meeting of the century is coming up for ASME Feb. 12 in the Cabaret Room of the Albuquerque Hilton. The National President of ASME, the Region VIII VP and Albuquerque's Mayor, Dave Rusk, will be on hand to help ASME celebrate its 100th anniversary (and the 30th of the N.M. section). Governor King has proclaimed the week of Feb. 10 "ASME Centennial Celebration Week" in New Mexico and to celebrate, there's been a special bottling of N.M. Section ASME wine. Reservations ASAP with the telephone committee, Dan Swenson at 844-4295 or Kathleen McCaughey at 844-1573.

\* \* \*

For a \$25 contribution, The Friends of Music, a non-profit outfit that provides scholarships to talented music students at UNM, will arrange for a vocal trio to appear at your door—or under your balcony—at the appointed hour to serenade your valentine. The Friends say benefits are two-fold: you'll be promoting romance as well as lending tax-deductible support to the musical community. They also offer a new program—"Rent-A-Musician." UNM faculty members or gifted students perform in your home; cost is \$50 and up. Call the UNM Music Department, 277-2126, if you're interested.

\* \* \*

For all you trout lovers, Feb. 28 is a date to mark on your calendar. Tom Robson informs us that the Rio Grande Chapter of Trout Unlimited holds its annual banquet that night. For tickets and info, call Tom at 293-1853.

# Healthy People

By Judy Ewing, MD  
Sandia Medical

[Editor's Note: Learn more about lifestyle and health relationships by attending Dr. Ewing's presentation, "Healthy People," on Tuesday, Feb. 12, 12-12:30 p.m., in Bldg. 815. This presentation initiates a six-part series on lifestyles and health. The following article covers some of the main points in the lifestyle/health relationship.]



My thoughts are in no way intended to be morbid, but I would like to choose the way I die. Somewhere around the age of 90, I would like to be killed instantly by a large avalanche while I'm cross-country skiing.

"Ridiculous," you say. "No one gets to choose the way one dies. You just take your chances, and the likelihood is you will die at the age of 70 from a heart attack. You haven't been able to ski for years since that last stroke, and besides, it was such a pain having to carry that oxygen bottle around with you all the time."

Not so, I say! I have a great deal to say about how I die. And every day here at Medical, I see many of you making your decisions about how you will bow out.

Are you aware that seven of the ten leading causes of death are related to lifestyle, i.e., how we choose to live? It's a medical truth that your choice of

- what you eat,
  - whether you smoke,
  - whether you exercise regularly,
  - how you use alcohol and
  - how you control your blood pressure
- has a great bearing on how you choose to die.

Our choices in food left us Americans with approximately 2 billion pounds of excess blubber last year. Deaths related to this choice subtracted about seven years from our average life span. We chose to smoke over 600 billion cigarettes last year, and lost 5 minutes of our life with each cigarette.

We choose to talk about riding our bikes or going for a brisk walk as soon as it is warmer, cooler, less windy, more of a breeze, etc., rather than doing it. We continue just to talk about it, even when we learn that people who exercise regularly have lower risk of developing cardiovascular disease by a factor of one-and-a-half to two.

We decided to drink over 50 billion bottles of beer and over 800 million gallons of wine and other booze last year; with the resultant illnesses and accidents, we again lost many lives.

Of 11 million Americans who know they have high blood pressure, only six million choose to do anything about it, and only three million really keep it under control. Yet we know that people with uncontrolled high blood pressure have two to three times

the rate of coronary heart disease as those without high blood pressure.

So you see, our lifestyles—our choices—determine to a very great extent not only how we die, but also what the quality of our life will be in the years we have to live.

We Americans have already experienced one revolution in health care in the 20th century. In 1900, infectious diseases such as diphtheria, pneumonia, tuberculosis and gastrointestinal infections were responsible for 580 deaths per 100,000 in the population. The average life expectancy was 47 years. Now, 80 years later, about 30 people per 100,000 population die from these causes, and our life expectancy is 73 years.

These remarkable achievements came from discovery of the causes and preventions of major killers in our population. We discovered specific disease-producing agents; we developed effective medications for cure, and we found vaccines to prevent the diseases.

Today, we are again on the brink of another revolution. We perceive that the major killers are chronic diseases such as cardiovascular disease (heart attacks and strokes), cancer, and lung disease. We have been able to discover the major causes of these diseases, and we know what can be done to prevent most of them. But the salient difference in this new health revolution is that we can't provide cures or immunity by vaccine—we have to change our lifestyles. This change is indeed difficult for us to make.

I've long felt that if people are given enough understandable information, they will make wise and proper decisions regarding their health. Sandia Medical would like to provide you with some of this information in the fond hope that you will begin to make wise health choices. "Healthy People," a six-session series, will be presented at noon on the second Tuesday of each month in Bldg. 815. Series titles include: Healthy People; Your Health—Take Charge; Eat, Drink and Be Merry; High Blood Pressure—Prevention and Control; Not Exercising? What's Your Excuse?; It's Breathe! Don't Smoke; and Buckle-Up—Seat Belts and Child Restraints.

I hope you'll choose to join me in my cross-country ski trip 70 years (more or less) from now!

## Death

Thomas McMahon of Remote Areas Maintenance and Test Support Division 3618 died suddenly Jan. 26. He was 51.

He had worked at the Labs 22 years.

Survivors include a daughter and a son.



## Supervisory Appointments

ALICE MORGAN to supervisor of Travel and Relocation Division 3256, effective Feb. 1. Joining the Labs as a secretary in July 1963, Alice has worked as an engineering release editor and has held several positions in the personnel, purchasing and accounting organizations. She was promoted to supervisor of Payment Control and Accounting Section in 1971 and, since then, has supervised several groups in the accounting organization, primarily in payroll and travel and relocation work.

Alice earned her BBA and MBA from UNM. She has held many offices in the United Way's Family Counseling Service. Other interests include skiing and sewing. Alice's husband Al works for the Federal Aviation Administration.

\* \* \*

JACE NUNZIATO to supervisor of Fluid Mechanics and Heat Transfer Division I 5511, effective Feb. 1. Joining the Labs in 1969, Jace was assigned to a group investigating stress wave phenomena. Most of his work since then has been concerned with the initiation and detonation of explosives and the construction of theoretical models to study these phenomena.

Jace earned his BS in aeronautical engineering from Rensselaer Polytechnic Institute and his MS and PhD in applied mechanics from West Virginia University. He is a member of the American Society of Mechanical Engineers, the American Physical Society and the Society of Rheology. Off the job, he enjoys backpacking, camping, fishing and church activities. Jace and his wife Alice have two children.

\* \* \*

DODY HOFFMAN to supervisor of Administrative Security Standards Division 3431, effective Feb. 1. Since coming to Sandia as a messenger in 1956, Dody has been a division and department secretary and, after transferring to the security organization in 1975, has worked with document control and education and systems studies and appraisals. Since March of last year, Dody has been supervisor of Systems Analysis Section 3212-1.

Under Sandia's Educational Aids Program, Dody earned her bachelor's degree from the U of A, and her MS in public administration from UNM. She and her husband Jim (4212) share an interest in Indian pottery and gardening. The Hoffmans live in NE Albuquerque.

\* \* \*

JIM PLIMPTON to manager of Engineering Sciences Department 1110, effective Feb. 1. Jim joined Sandia in 1961 and was assigned to a radiation measurements group working on a high altitude test series. He was promoted in 1967 to supervisor of a division that performed diagnostics on underground nuclear tests. For the past three years he has supervised the Experiment Division 1116. The division has assignments in projects relating



**SUPERVISORY APPOINTMENTS**—Jace Nunziato (5511), Alice Morgan (3256), Sam Thompson (4444) and Jim Plimpton (1110), seated. Dody Hoffman (3431) was unavailable for photograph.



**PROMOTED**—Standing, left to right: Lou Cropp (4445), Gary Derbenwick (4426), Roscoe Williams (3426). Seated: Bob Durand (3741) and David Larson (5513).

to weapon effects, containment, high explosive events, fossil energy, and nuclear waste storage.

Jim earned a BS in physics from Wesleyan University and his PhD, also in physics, from Iowa State. He is a member of the American Physical Society. His interests are family—wife Donna and two children—church, music and jogging. The Plimptons live in the NE heights.

\* \* \*

**GARY DERBENWICK** to supervisor of Radiation Physics and Diagnostic Division 4426, effective Feb. 1. Since coming to the Labs in June 1974, Gary has been chiefly concerned with development of radiation hardened integrated circuits. Before Sandia, he worked at Bell Labs for three years in the fields of device physics and integrated circuits.

Gary earned a BS in EE from the University of Connecticut and his MS and PhD from Stanford, also in EE.

A violinist, Gary is concert master of the Albuquerque Philharmonia and co-principal of the Chamber Orchestra of Albuquerque. He enjoys running and travel. He and his wife Elaine and their three daughters live near UNM.

\* \* \*

**ROSCOE WILLIAMS** to supervisor of Custodial Services Division 3426, effective Feb. 1. Joining Sandia in March 1966 as a personnel clerk. Roscoe later became a motor pool dispatcher and, since 1974, has supervised Transportation Section 3421-3.

Roscoe is a retired U.S. Army First Sergeant with 20 years of service in Alaska, Japan and Germany. Off the job, he enjoys gardening, traveling and fishing. Roscoe and his wife Minn have two children and live in NE Albuquerque.

\* \* \*

**BOB DURAND** to supervisor of Purchasing Division 3741, effective Feb. 1. Bob has been with Sandia since February 1948, first with the receiving organization; later he worked as a purchase analyst and for many years was a purchasing section supervisor. His most recent assignment has

been with Small-Value Procurement Section 3741-2. He has attended business administration classes at UNM.

Bob has long been associated with the American Legion and currently holds the highest state office in that organization—National Executive Committeeman; he's also associate director for the New Mexico Boy's State program.

Bob and his wife Betty have two children and live in NE Albuquerque.

\* \* \*

**DAVE LARSON** to supervisor of Fluid Mechanics and Heat Transfer Division III 5513, effective Feb. 1.

Following graduation from Brigham Young University with BS in ME, Dave joined Sandia in 1966 as a member of the Technical Development Program. He went on to earn his MS from UNM and, in 1970, entered the Doctoral Study Program; he obtained his PhD, also in ME, from Purdue. Dave initially worked on reentry aerothermodynamic analyses for the SNAP programs. He later moved into the heat transfer and fluids groups where he has worked on transportation safety, solar projects and, most recently, on magma and other geothermal projects.

Dave is a member of AIAA; he spends much of his time working with his church. He's in the process of turning a full basement into living area. Dave and his wife Carma have five children and live in the NE heights.

\* \* \*

**SAM THOMPSON** to supervisor of Thermal Hydraulic Analysis Division 4444, effective Feb. 1.

Since coming to Sandia in July 1966 as a staff member in a theoretical physics division, Sam has worked primarily in radiation hydrodynamics programs. Responsibilities in his new position encompass reactor safety related programs.

Sam earned his BS in physics from Murray University (Ky.) and his PhD in astrophysics from the University of Kentucky. He holds memberships in the American Physical Society and the Ameri-

can Nuclear Society. Sam is a member of the board of directors of the Coronado Ski Club; at home, he's a do-it-yourselfer and enjoys camping. Sam and his wife Lee have two children and live in NE Albuquerque.

\* \* \*

**LOU CROPP** to supervisor of Systems Safety Information Division 4445, effective Feb. 1.

Lou joined the Labs in September 1962 as a staff member in an auxiliary power supply group working on heat transfer studies for rocket tests. He was a project engineer in the space isotope power supply program, initiated programs for power testers in the computing organization and worked for over five years with the nuclear safeguards directorate. Since September 1979, Lou has been assigned to Nuclear Facility Analysis Division 4414.

Lou graduated from the University of Colorado with a BS and MS in ME. His leisure activities include skiing, jogging and backpacking. He and his wife Vi have two children and live in Southeast Albuquerque.

\* \* \*



**PAT COX** to supervisor of Systems Analysis and Computer Applications Division 3734, effective Feb. 1.

Pat joined Sandia in September 1975, working in stores management and purchasing planning until 1978 when she was promoted to supervisor of Data

Collection & Computer Application Section 3732-3. Before coming to the Labs, Pat was assistant to the dean of the college of business at Wichita State University; she also taught business courses and performed systems analysis at the college.

Pat earned her BA and MA in business from Wichita State. Her interests off the job include hiking, skiing and tropical fish. Pat's husband John is an accountant with an Albuquerque firm. They live in the NE heights.

## The human dimension—

- Jim Hopwood (8423) reports that his brother called hurriedly from Florida because TV programming there had been interrupted for a special bulletin on a nuclear explosion in Livermore—but no mention was made of an earthquake.
- Joan Hall (8300) certainly chose the right moment to run an errand. "While I was gone, a six-foot storage safe fell on my desk and chair, knocking the typewriter off the desk."
- "My 17-year-old son Curtis got a fractured ankle when he tumbled down the stairway while trying to flee the house," says Marlin Pound (8214). "He's now wearing a cast."
- Guy Prescott (8271) reports his microwave oven ended up on a drawer that had vibrated open, while his free-standing fireplace moved two and a half feet and the chimney stack fell down. In the garage, the drill press and band saw turned over, and a boat hanging from the rafters fell down, hit his oxygen acetylene tank, knocked that over, hit a stool and stopped. Another four inches, he says, and it would have struck the valve on the oxygen tank (2500 pounds of pressure) and that tank would have been a half mile away.
- Wil Gauster (8347), after several weeks of trying, finally gets through on a business call to Germany. From his contact on the other end comes, "How is everything in California?" Wil replies, "The ground's starting to shake. We're having a great earthquake. Have to hang up."
- The mobile homes on each side of Blitz Krieger's (8329) were shaken off their foundations, as were most of the homes in the hard-hit Sunrise Mobile Park, but his sustained only minor damage. "I'm finally cashing in on my prayer chips," comments Blitz.

## Take Note

"Damned If You Do and Damned If You Don't, the Quandary of the Olympic Athlete," is the title of a talk on Friday, Feb. 15, at noon in the LLL Auditorium by Prof. Thomas Tutko, whose field is athletic psychology. A well-known personality in the sports world, the professor of psychology at San Jose State is first in a series of speakers engaged to present programs of interest to LLLRA members and to the Labs' staff. Bill Wilson (8341) will be introducing Prof. Tutko.

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## Earthquakes Jar Sandia Livermore

curred when files and cabinets toppled, dumping their contents onto the floor. The SLL library had hundreds of books thrown from its shelves, and the Purchasing Division (8264) in Building 911 had scores of files spilled over the floor from the open-ended vertical files. Then, after things were cleaned up on Friday, the same scene greeted staffers the next Monday after the Saturday night quake.

Heavy cabinets fell over in the tool room when drawers opened during the shaking, and ceiling panels fell in several areas.

The 174,000-gallon standby fuel tank was wrenched from its foundation bolts and its sidewalls slightly buckled. Some oil sloshed over the top, but no leaks were found in the tank.

Six windows were broken in Building 912, and computers, a 3 MeV ion accelerator, and other heavy equipment slid from six inches up to two feet.

H. J. Degenkolb and Associates, consultants for seismic and structural planning at SLL, was called in. Their preliminary findings indicate that while there are numerous cracks in the masonry, no major structural damage has been found.

The Tritium Research Laboratory reported no structural or experiment damage at all. A check of TRL systems, performed immediately after the quake, showed them to be in good working order.

Also fortunately, no construction workers at the Combustion Research Facility were injured, although some metal

panels buckled and a stack of metal doors was scattered.

At a meeting with SLL supervisors the day after the quake, VP Tom Cook (8000) reported on the damage situation and thanked the staff for responding to the crisis calmly and professionally.



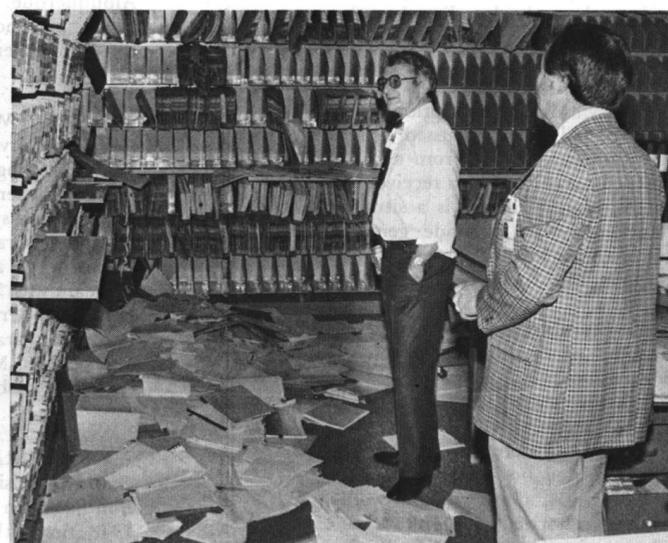
EVACUATED SLL EMPLOYEES waiting outside Building 911 gather around a portable radio to hear news reports of the quake.



LOOKING OVER SPILLED books in the SLL library is Gene Aas (8266).

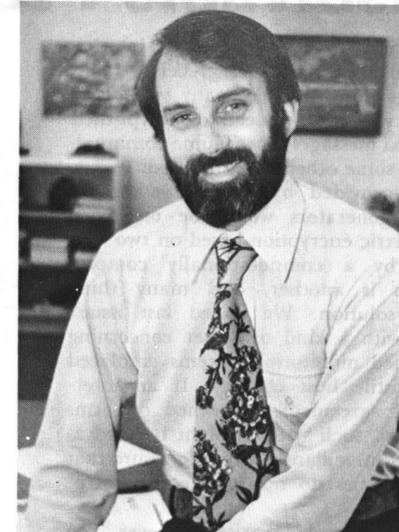


MOVING THE PELLETRON 3MeV ion beam accelerator back into position in Building 912 after it shifted six inches during the quake are (from left) Darryl Beers, Dan Morse, Al VerBerkmoes, Ken Wilson and Art Pontau (all 8347) plus Jim Schroeder from National Electrostatics, builders of the equipment.



SURVEYING SCATTERED files in Purchasing Division (8264) are Tom Cook (8000) and Marv Glaze (8265). This office suffered a second spill two days later when the second trembler hit.

## Supervisory Appointment



ROB RINNE to manager of Systems Studies Department 8320, effective Feb. 1.

Joining SLL's advanced systems research organization in 1966, Rob performed analysis on a variety of tactical and strategic weapons systems. Later, while on leave of absence from Sandia, he served two years at AEC Headquarters in Germantown on the staff of the Division of International Security Affairs and the Office of Planning and Analysis. Returning to Sandia, he was promoted to supervisor of Systems Studies Division in 1974. For the past year, he has been technical assistant to VP Tom Cook and a member of SLL's Planning Staff.

Rob received a BA degree from UC/Riverside, an MA from the University of Virginia under a DuPont Fellowship, and a PhD, also from the University of Virginia under Sandia's DSP program, all in mathematics. Although his favorite hobby is photography, Rob currently spends most of his leisure time designing a summer home he will soon construct near the Russian River. He, his wife Carole, and their two daughter live on Canyon Creek Drive in San Ramon.



SURVEYING the program for the ASME conference, "Energy in the Eighties," are (from left) Chairman Bill Alzheimer (8120), Alec Willis (8444), Larry Weingarten (8121) and Roger Baroody (8410). Conference is set for Feb. 20, will be held at Dunfey Hotel in San Mateo. In foreground is the model of the Barstow Solar Central Receiver facility.

## Our Energy Consumption — Results Mixed

Plant Engineering Director Ward Hunnicutt reports that the Labs' energy reduction program, started last April following President Carter's executive order, has achieved "good results for gasoline, fair for natural gas and poor for electricity."

Comparing the April through December consumption for 1979 against that for the same months in 1978, natural gas use is down 3.7%, electricity is up 1.2% and gasoline is down an impressive 14.7%. The President's goal is a 5% reduction in the use of natural gas and electricity and 10% for gasoline.

Electricity and natural gas account for over 90% of the Labs' energy use, gasoline less than 3%. This means that our total energy reduction has only been about 1%. "Our biggest problem is electricity," says Ward. "Our most significant electricity conservation has resulted from disconnecting of light fixtures. We estimate this saves over 2300 megawatt hours per year—about 3% of the 1979 use."

"Our other significant electrical savings comes from shutdown of heating, ventilating and air conditioning (HVAC) equipment. We used to operate this from 6:10 a.m. 'till 4:30—now some systems start at 7:30 and are turned off at 4 p.m. Others operate only intermittently. Additional systems are having intermittent timers added. In spite of these efforts, the bottom line shows that our electricity use has increased."

Ward notes that the Labs has tightened up energy conservation measures to the maximum, yet remains obligated to meet the more stringent energy reduction goals. He asks each Sandian to review his or her energy consuming activities and look for ways to reduce that consumption—especially of electricity.

## feed back

*Q. Why not insulate the exterior walls of our concrete and brick buildings with a layer of polyurethane foam? Instead of the wall being a source of heat loss, it becomes a thermal mass with attendant benefits of temperature averaging.*

*A. Your suggestion to insulate the exterior of buildings is a good one, both from comfort and energy conservation standpoints. When we have considered additional insulation in the past, the economic analysis has yielded a poor payback. But with the increasing cost of utilities and the 65°F requirements, we are looking at these projects again. We do have to budget for such projects and engineering and economic analyses are required. I hope that we will be able to improve some of the buildings by adding insulation.*

— R. W. Hunnicutt—3600

# Solving Unsolvable Problems

[Editor's Note: Last issue, we laid the groundwork for this more specific discussion of asymmetric encryption, a new cryptographic approach with revolutionary implications in both the military and civilian spheres. To move from theory to practice, we talked with Tom Edrington [5613], who heads the Labs' "Asymmetric Encryption Applications Study Group," and Gus Simmons, Manager of Applied Mathematics Department 5640, where most of the theoretical work on asymmetric encryption has been done.]

The nature of secure communications has changed so radically that secrecy is no longer the be-all and end-all of security systems. With computers taking over the day-by-day operations of banks and businesses, and the physical safety of the world dependent upon continuing and absolute control of nuclear weapons, new factors are entering the cryptosecurity arena.

Besides the classical objective of hiding message content (which may or may not be a consideration in current crypto requirements), it may also be crucial to verify the authenticity of the message; that is, to be absolutely sure that the message received was originated by an authorized transmitter, and was not intercepted and modified by an adversary.

In the era after World War II when spies were deep planted, waiting years sometimes before they surfaced to send a vital message using a one-time key, they were able to employ a symmetric cryptosystem that met both modern requirements—secrecy and authentication. But a one-time key is just that, good for one-time use only,

and subject to the severe constraint that the transmitter and the receiver must exchange in advance as many symbols of secret key as they will need to encrypt their plain-text messages. For volume communications, some other way is needed.

Keys provided by pseudo-random sequence generators would be one way. Asymmetric encryption based on two keys linked by a computationally complex problem is another, and many think better, solution. We ended last issue's article with a kind of teaser concerning unmanned monitoring systems emplaced in a hostile host country. If an international agreement is reached on arms limitation, such systems might be used as part of a surveillance system to assure that host countries do not violate the agreement.

A difficult problem arises, however. The data must be made available in plain text to the host country so they can verify that only the data agreed to is being transmitted, but we must keep the encryption key secret in order to verify that the information we receive is authentic, not false information encoded and transmitted by the host country to deceive us.

Before asymmetric encryption, this is the sort of secure communications problem that seemed unsolvable. Under the circumstances just described, we could meet our own needs by using a computationally complex key in a symmetric crypto system. But there would be no way of satisfying the needs of the host country. If we gave them the decryption key so that they could verify that we were sending out only authorized data, the whole system would be compromised. Since coding can be inferred

from decoding in a symmetric system, we would have no way of confirming that the information we received was generated by the monitor and not by the host country.

Asymmetric encryption, however, permits us to meet both our needs and those of the host country. Our encryption device, securely sealed inside the monitor system and protected by tamper-proof sensors, could generate two messages for each transmission—one in plain text, one encrypted.

At this point, the prime advantage of asymmetric encryption becomes clear. Because encryption cannot be inferred from decryption, the decryption key can be safely given to the host country. They could decrypt the coded message, compare it to the plain text and verify that we're sending only authorized data.

We meet our own needs in exactly the same way. By comparing the plain text and the decoded text, we know the host country has not tampered with the data. They can decode, but have no way of inferring the coding key. We know they can not encrypt and transmit false data.

Asymmetric encryption also holds promise for battlefield communications. A field commander sends several scouting teams into enemy territory. He gives each team its own communications equipment and its own asymmetric encryption/decryption keys. Assume one team (or more) is captured and tells all (including the content of messages already sent plus the fact that at some point the commander will send a message calling all teams home).

Symmetric cryptosystems could lead to disaster in such circumstances. But not asymmetric systems. The enemy, using the captured equipment can send messages to headquarters. They can also decode messages from headquarters. But there's no way they can send false information to other teams (like a premature recall message) since they don't possess the headquarters encoding key (and can't infer it). They can't read messages sent to headquarters by other scouting teams, either, since the only decoding key they have is the one for messages from headquarters.

Sandia Labs has a number of projects for which asymmetric encryption seems tailor made. Already discussed is the sending of authorized data from a potentially hostile host country to a receiver in a friendly country. A variant is a situation where authentic data is made generally available with no fear of forgery, a situation typified by the "hand geometry" project.

This project aims at automating the identification of authorized people at remote locations. An employee's hand geometry (finger length, etc.) is carefully measured. Average measured values are then encoded using secret asymmetric keys and then recorded on magnetic identity cards. These cards, along with passwords, allow those authorized to enter remote sites. The employee enters a portal, gives the password, runs his identity card through the reader while having his hand

BY YOUR HAND YOU SHALL BE KNOWN. Project leader Earl Chapman (1759) looks on as Larry Wellhard (who wrote the software) demonstrates an automated system for controlling access at remote locations. Currently being tested and evaluated at the Zero Power Plutonium Reactor facility in Idaho Falls, Idaho, the system uses information partly supplied by the employee, partly by the system itself. Identification card contains data on employee's weight, his hand geometry (left and right), and identification number, areas to which he is permitted access and expiration date of the card. This data is encrypted using asymmetric encryption and recorded on magnetic striping. To gain access, employee must give an authorized password, punch in an acceptable identification number. Then the card is inserted in the reader. A microprocessor decrypts data on the card and compares it with measurements made of employee's hands.



## CREDIT UNION REPORTER

by C. L. Turner, Manager

### ANNUAL MEETING

At our 32nd annual meeting on Jan. 24, three vacancies were filled on the Board of Directors and one on the Credit Committee. Re-elected to the Board were Joe Maldonado (9714) and Clarence Sandy (1211). Fred Martinez (3213) was elected to replace Willie Garcia who chose not to run again. Other members of the Board are: Charles Barncord (3200), Ron Bodo (3221), Marvin Daniel (2113), Leo Gutierrez (8400), Robert Luna (4551), Joe Ruggles (2625), C. L. Turner (Credit Union) and Elsie Wilkins (1001).

Michael Heller (Credit Union Loan Department Manager) was elected to serve on the Credit Committee. Other members of the Credit Committee are John Anaya (3741) and Richard Marmon (1474).

Winners of the drawing were: John Weydert (1767) - \$500, Lettie Carroll (4343) - \$300 and Thomas Klimowicz (8312) - \$200.

On Jan. 25, the Board met to elect officers for 1980. Those elected were: Marvin Daniel, president; Elsie Wilkins, vice president; Joe Maldonado, secretary and C. L. Turner, treasurer.

## Events Calendar

- Feb. 8-9—NM Symphony Orchestra Concert, 8:15 p.m., Popejoy.
- Feb. 9, 16-17—AAU Indoor Track Meet, Tingley Coliseum, 292-1552.
- Feb. 13—Friends of UNM Libraries Lecture Series: Dr. I. N. Berlin, M.D., "Learning To Solve Problems, It's Importance to the Mental Health of Children and Adults," Zimmerman Library, Anderson Room, 7:30 p.m.
- Feb. 16-17—Albuquerque Children's Theater presents "Alice in Wonderland," 1:30 & 3:30 p.m., Popejoy, 268-6561.
- Feb. 17—Music Vesper Series: Elizo Virsaladze concert, Russian pianist, 4 p.m., First United Methodist Church.
- Feb. 17—UNM Jazz Bands, 8:15 p.m., Keller Hall, UNM.
- Feb. 17-19—Ballut Abyad Shrine Circus, Tingley Coliseum, 268-6646.
- Feb. 22—Navajo Rug Auction, 7 p.m., Crownpoint, NM elementary school.
- Feb. 22-23—Albuquerque Opera Theater, "The Merry Widow," 8:15 p.m., Popejoy.
- Feb. 22-23, 29 - March 1, 7-8, 14-15—"Don't Drink the Water," 8 p.m., Tiffany Playhouse, 3211 Central Ave. NE.
- Through March 2—Juan Quezada and the New Tradition, contemporary pottery exhibit, Maxwell Museum of Anthropology, UNM; hours: M-F, 9-4; Sat., 10-4; Sun., 1-5.

 It's not often that scientific description approaches the borderline of poetry. That it sometimes does, we offer this quote from the *Georgia Review*: "From space we are able to look back upon the earth as we cannot otherwise see it, distant, whole, a small and colorful speck in an otherwise dark void. It is more mysterious and awe-inspiring than we had thought, apparently unique in the universe."



Bob Lederer (1754) has been involved with practical applications of asymmetric and public key encryption as long as others at Sandia have been working on the theoretical aspects.

His first application was to develop the algorithm for the "hand geometry" system of personnel identification. His current project: a secure monitor to measure the output of gas centrifuge uranium enrichment plants—a possible solution to a problem posed by the International Atomic Energy Agency.

In the picture above, Bob is debugging the encryption portion of the microprocessor at the heart of the self-contained monitoring system. When the monitor is installed at Oak Ridge in June for operational testing, a sensor inside a sealed container will read gamma radiation and convert those readings to percentage of enrichment. This data will be

encrypted and transmitted. In actual practice, those concerned could verify, by decrypting the data, that the uranium was being enriched to no more than three or four percent, the maximum required for reactor-grade uranium. (Weapons-grade uranium is enriched to a much higher percentage.)

Bob has been involved on the conceptual side of encryption, too. He devised a way to use a multiple-key encryption process to increase the level of data security provided by public key encryption. He's also developed a technique to significantly increase the encryption rate and worked out a method for the microprocessor to develop its own keys. On command, the microprocessor seeks out two large prime numbers, makes a key set and discloses only the decryption key. If anyone tampers with the microprocessor, it destroys the encryption key and automatically constructs another key set.

measured. The data on the magnetic identity card is decrypted and compared with the hand measurements just taken. If the two sets of data match and the password checks out, the employee is given entry.

At present, the various Safeguard projects are priority subjects for application of asymmetric encryption techniques at Sandia. According to Tom Edrington (5613), head of the Applications Study Group, more applications may be ahead for asymmetric encryption in areas like command and control of nuclear weapons.

• cec

### Feb. 21 Luncheon Honors Engineers

Don Schroeder (2648) reports that National Engineers Week is set for Feb. 17-23. To mark the occasion, a luncheon is scheduled for Thursday, Feb. 21, at the Hilton Hotel, with the featured speaker being LeRoy Culbertson, VP of Phillips Petroleum. The lunch begins at noon, costs \$6, and you can get tickets from Don, 4-4921 or 344-1011.

### Back Class Offered by Medical

Got a back problem? Learning and practicing exercises to strengthen your back, as well as learning how to relax when your back is tense, are keys to a healthy, trouble-free back. Back exercises and relaxation techniques will be taught in a class sponsored by Sandia Medical and jointly taught by a physical therapist and an instructor in body awareness.

Two sessions of classes are now open for enrollment—one begins March 4, the other April 1. Each class meets Tuesdays and Thursdays for four weeks from 5-6 p.m. Enrollment is limited to 15. To register, fill out the form below and mail to Wanda Cupp, 3332-1.

Name \_\_\_\_\_

Org. \_\_\_\_\_ Telephone # \_\_\_\_\_

March class \_\_\_\_\_ April class \_\_\_\_\_  
(Please circle one to indicate preference)

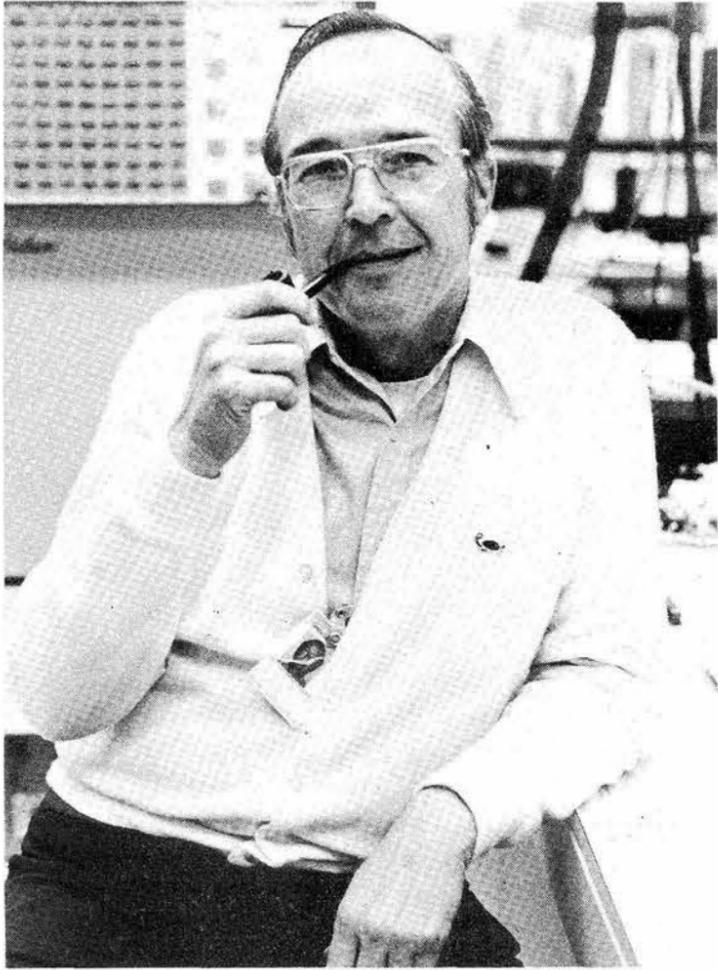
**MILEPOSTS**  
**LAB NEWS**  
**FEBRUARY 1980**



Willard Randall - 3618 25



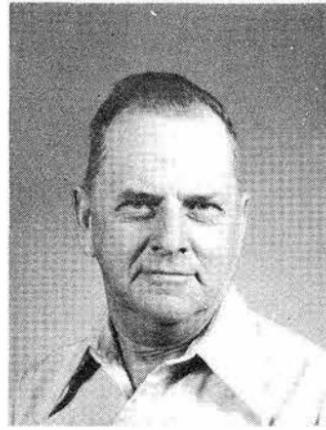
Nick Bourgeois - 1736 25



Allen Asselmeier - 2117 20



John O'Hare - 1521 10



Dennis Benedict - 3421 25



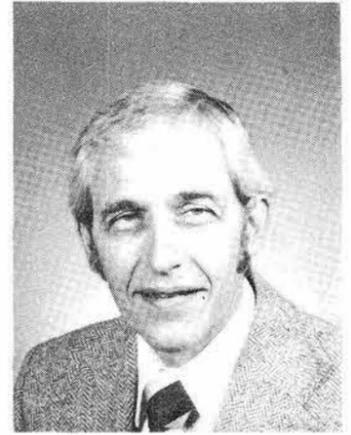
Gene Hauser - 1587 10



Randy Swier - 1583 10



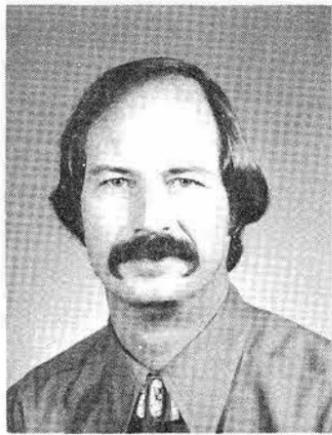
Jerry Durrie - 4325 30



Jon Reuscher - 4450 15



George Smith - 8322 25



James Campbell - 1255 15



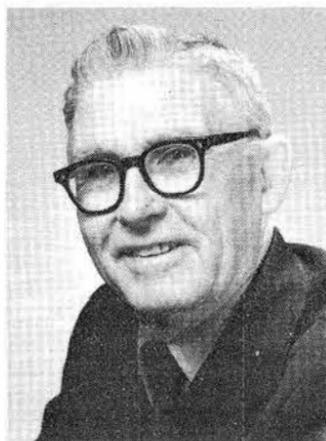
Mike Ferrario - 8116 20



John Andersen - 1721 25



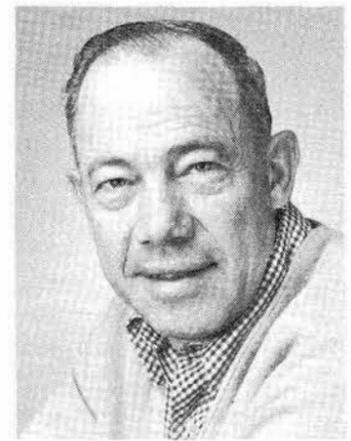
Vickie Jaramillo - 3144 15



George Mincks - 8257 30



Robert Erickson - 2552 25



Dick Cook - 8272 25



THESE are smiles of achievement, prompted by recent reclassifications in status recommended by the Technical and Administrative Classification Review Committees. Seated on wall, from left, Wanda Whitham (3253, to MAS), Elveta Patrick-Roblyer (3252, MAS), Bobbi Voelker (3151, MAS), Richard Johnson (2342, TSA), Robert Simpson (2112, MTS), Jerry Stauffer (2113, MTS), Leo Doyal (2112, TSA) and Jerry Bollig (2626, TSA). On steps, Elwood Alexanderson (5623, TSA), John Mareda (2351, TSA), Ken Grant (3643, TSA), Bruno Navalesi (3241, MAS) and Lewis Sisneros (3723, MAS).

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4. Use home telephone numbers.
5. For active and retired Sandians and DOE employees.
6. No commercial ads, please.
7. No more than two insertions of same ad.
8. Include name & organization.
9. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

**MISCELLANEOUS**

**MAG WHEELS**, 4 14x6 5-hole, alum. wheels w/caps, fit most Fords, AMCs & Chryslers, \$80. Lesperance, 255-1237.

**SHOI** motorcycle fairing, various motorcycle accessories, sell or will consider trade. Edmund, 883-9520 after 6.

**'76 COACHMAN** 10' camper, stove & oven, ref., toilet, sink & shower, hw heater, heater, 3 jacks. Eisenberger, 293-5162.

**USED FURNITURE**: 2 couches, 7 chairs, 3 desks, chest, bed, table, lamps, etc.; washer & dryer, boy's bike, more. Seager, 299-4137 or 299-3332.

**700-15** mud/snow 6-ply tire on 5-hole wheel, \$12 ea., \$20 both; Craftsman medium duty drill stand for 1/4" to 3/8" pistol-grip drills. Hyde, 268-2885.

**SNOW TIRES**, B78-13, almost new, on Vega wheels, balanced, \$50 for pair. Jones, 255-7924.

**LADIES'** Sunstar briefcase, flexible w/pockets, rust color, never used, \$35. Bell, 298-2446.

**TWO JR** 78x15 radial Firestone snow tires, 80% or more tread remaining, \$100 or best offer. Nelson, 881-0148.

**20,000 BTU** gas space heater, vented, thermostat, \$60; GE trash compactor, \$110. Guttman, 243-6393.

**FOAM** studio lounge bed, \$45; single maple bed w/springs & mattress, \$60; 6' couch, \$80. Young, 292-2805.

**TABLE** w/4 chairs; dark stained oak shelf for wall mounting; trumpet w/case. Romero, 865-5681.

**GRILL** for 1972 Olds Cutlass, \$15. Hesch, 881-9874.

**FREE PUPPY**, male shepherd/collie cross, has shots. Dellin, 293-8318 after 5:30.

**8 1/2'** WILLIAMSCRAFT camper, heater, \$1000. Argo, 877-5415.

**SKIS**: men's 9 1/2 Trappeurs, \$75; 180cm Truckers w/Look Nevadas, \$95; 195cm Harts w/Look Nevadas, \$175; 205cm Harts, \$60. Lassiter, 298-2461.

**PERSIAN KITTEN**, black male, house-broken, has shots, registered w/papers, \$90. Kent, 884-8842 or 881-2974 after 5.

**FREE** to good home: 6-yr.-old St. Bernard, needs running room. Bordlemay, 883-4926.

**AIREQUIPT** color slide trays, \$1 ea. Miller, 268-5992.

**SNOW TIRES**: G78x14 BSW on 5-hole Ford wheels, 2 for \$50. Booker,

299-3554.

**LADIES** quartz Seiko watch, gold band, \$200. Arnold, 296-5712.

**WURLITZER** Funmaker organ, Italian provincial walnut, 3 1/2 yrs. old, \$2995. Zudick, 293-4096.

**BATHROOM** mirror, 2'x3' w/attached medicine cabinet, \$25. Pewe, 884-3682.

**WASHER & DRYER**, \$150 and \$100 or \$200 for pair; Sears push mower, best offer. Clark, 296-3924.

**BEDROOM SET**: contemporary, dbl. headboard, dresser, armoire, nightstand, \$275; firm mattress set, \$30; sofa, 80", gold herculon, \$65. Molecke, 296-5850.

**BEDFRAME**, metal, adjustable, box spring & mattress, twin size, \$30; studio couch, 32x76, needs pad, \$20. Joseph, 299-6989.

**COMPUTER**: 16K RAM, ROM basic, video, RS232, 8080 CPU. Belding, 294-7443.

**SEARS** 23" console TV, b&w, \$75. Beatty, 299-3429.

**THOMAS ORGAN**, model 153, Color Glo, auto. rhythm, auto. chord, 2 keyboards, 13 bass pedals. Chandler, 292-3893.

**BULLWORKER** 2 exerciser w/carrying case, \$25. Gerlach, 299-9084 after 6.

**AKC** reg. 10-wk.-old English Pointer puppies, excellent pedigree. Wilson, 281-1453.

**COLOR TV**, Magnavox 19" table model, high voltage problem, no reasonable offer refused. Kubiak, 265-6525.

**'72 APACHE** Mesa hardtop camper trailer w/furnace & refrigerator, \$1500. Grady, 296-4077.

**LAZY BOY** velvet rocker recliner, \$145; new end table, hexagon comode, contemporary, \$48. Paul, 299-6387.

**WATER PUMP**, fits '71 Olds 350 w/o AC, used for 150 miles. Smaardyk, 299-7077.

**PRINCE** tennis racket, new strings, 4 1/2 grip, \$35. Healer, 298-6967.

**'66 MUSTANG SEATS**, 1 good, \$30; other one complete but in pieces; Ford PU 1/2 ton 8-lug wheel, \$15. Bland, 265-6286.

**CHAIN SAW**, 10" Remington elec., \$40; Trail-eze wind deflector, \$40. Beegle, 296-5300.

**'77 25' WILDERNESS** 5th wheel trailer, self-contained, dbl. door refrig.-freezer, AC, TV antenna. Warden, 266-8452.

**3 MATCHING** limed oak living room tables; limed oak bdr. suite; Conlon cabinet ironer; misc. small items. Wheeler, 265-2187.

**TIME LIFE** nature books, 24 volumes, \$50. Marder, 268-9643.

**BOSTROM** air suspension seats for pickup trucks and 4WD vehicles, gold and black, \$250. Barnette, 298-9227.

**STEREO** equipment, Kenwood amplifier, 55 watts, \$225; Craig cassette recorder deck, \$65. Babicz, 299-5938.

**MUD/SNOW** tire, tube, 750-16, 6-ply; printing press, Davidson Dualith mod. 500. Hamilton, 869-2718.

**CASE**, Armstrong, for silver piccolo (ebony won't fit), \$15; fireplace screen & tools, \$18. Lewis, 883-8454.

**HIDABED**, recliner, two upholstered chairs, small round mahogany table, kitchen table w/4 chairs. Riley, 869-2119.

**CAMPER SHELL** for LWB pickup, 2x6x8, aluminum over wood frame, 3 windows, vertical door, \$50 or best offer. Hochrein, 299-5225.

**TIRE CHAINS**, H78-15, J78-15, others, \$18 set. Cook, 869-6921.

**DOWN JACKET**, Frostline Tundra w/hood and stuff sack, XL size, med. blue, \$55. Stevens, 884-7984.

**NIKKOR** 50mm, f1.4 lens, AI converted, \$120. Passman, 821-4999.

**TIRE**, new white wall 78x15, \$30; HR 78x15 steel belted radials w/rim, \$15. Padilla, 877-2116 after 5:30.

**NURSE UNIFORMS**, size 8 & 10, \$6. Coalson, 298-0061.

**METAL STORAGE BOXES** for 35mm slides, 200 per box, 3 boxes, \$2.50 ea., all for \$7. Merritt, 884-8487.

**SONY STEREO**, portable, reel-to-reel tape recorder w/microphones, will connect to component system, many tapes. Linnerooth, 884-8615.

**ELEMENTARY SCHOOL DESKS**, quality steel and wood construction w/Formica writing surface, storage under seat, \$20 each. Atkins, 298-5762.

**MAYTAG** washer & dryer, \$100; girls' 26" 10-SP. bicycle, \$50; SCM portable typewriter, \$25. Fuller, 294-3089.

**CAMPER SHELL**, fits standard bed Datsun or other small pickups, Idle Time, \$100. Bisbee, 293-0356.

**BIKES**: Boys' 20", Girls' 20", new thorn-proof tires, \$15 ea. Snyder, 296-5771.

**RACING GO-CART**, bug sprint frame w/Mac 92 engine, \$350. Schultheis, 881-7269.

**MATCHED TIRES**, four, P 195/75 R14 steel belted radial 721, 12,000 mi., \$100. Steele, 877-1225.

**TRANSPORTATION**

**'65 PONTIAC** Tempest convertible, price negotiable. Franklin, 867-5087.

**'78 ZEPHYR**, 6-cyl., 27,500 miles, luxury interior, AT, AC, PS, PB, \$4100. Dossey, 294-1167.

**'73 4-DR.** Malibu, AT, AC, PB, PS, 15 mpg, \$1000. Morgan, 256-7994.

**'72 BUICK** LeSabre, PS, PB, AC, blue w/white vinyl top, \$795. DuBrock, 821-6137 after 5:30.

**'67 CAMERO**, 327 engine, 3-spd., \$1400. Kane, 821-4217.

**'72 VOLKSWAGEN** pop-top camper, \$2700. Wray, 294-2019.

**PICKUP & CAMPER**, Travel Queen, self-contained, 1/2 ton Ford, one owner, AC, PB, PS, AT, dbl. tanks. Stewart, 293-5083.

**MOTOR COACH**, 28' Pace Arrow, 1978, 8500 miles, 6.5KW power plant, dual roof AC, etc., assume Credit Union loan. White, 281-1388.

**'73 KARMAN GHIA**, \$2750; '70 Cad, \$450. Hansen, 869-2716.

**'78 CHEVY** PICKUP, 4-wd. AT, PS, PB, camper shell, snow tires, 11,000 miles, many extras. Scott, 345-4929.

**'77 PLYMOUTH** Volare premier str. wgn., 4-dr., 318 V8, AT, all pwr., AC, roof rack, reclining seats, below book. Pyzel, 883-0291 after 5.

**'77 HONDA** CVCC hatchback, 4-spd., AC, AM/FM stereo, new radials, 34,000 miles, \$3500. Gallegos, 268-6416 or 881-3289.

**'74 OLDS** Cutlass Supreme, 4-dr., PS, PB, AC, \$1550 or best offer. Iverson, 869-3123.

**'73 DODGE** Coronet Custom, AC, PS, PB, AT, 69,000 miles, offer; '74 Datsun B210, under 50,000 miles, 30 mpg city, \$1900. Plut, 266-9910.

**AIRPLANE**, 1976 Piper Arrow, Midtime engine, well equipped, \$31,000. Payne, 299-5966.

**'71 DATSUN** 510, reg. gas. Klein, 821-8768.

**10-SPD.** Columbia lt. wt. medium frame, center pull brakes, skinny tires, \$60. Baxter, 344-7601.

**GMC PICKUP**, C1500, 6-cyl., 4-spd., 45,000 mi., \$2500 or best offer. Green, 266-8866.

**'79 OLDS** Delta Royale, 4-dr., AC, cruise control, AT, rear window defrost, etc., 20 mpg, wholesale. Yuhas, 293-3164.

**'65 FORD** WAGON, 352 V8, runs, \$175 or best offer. Muir, 883-7933.

**'79 CAMARO** Z-28, 350, 4-spd., power & tilt steering, PB, AM radio, rear window defogger, black. McNamee, 265-4935.

**'78 YAMAHA** DT 125E motorcycle, 6800 mi., \$825 or best offer; Simpson helmet w/faceguard. Hyde, 268-2885.

**'77 LTD** II wagon, PS, AC, AT, luggage rack, new tires. Johnson, 822-0169.

**'67 DATSUN** 4WD Nissen Patrol, rebuilt engine, heavy grill guard, spotlight, ski rack. Summers, 881-7765.

**'57 CHEVY** Belair hardtop, all stock. Graeber, 298-0662.

**'73 IMPALA**, AT, AC, PB, steel radials, \$1100 or best offer. Harrington, 292-2034 after 5.

**'76 FORD** Gran Torino 4-dr., below book, \$1900. St. Clair, 293-4890.

**'70 OLDS** Delta 88, one owner, PS, PB, AC, elec. ignition, \$850. Stephens, 265-5341.

**'73 DODGE** 1/2 ton club cab pickup, 4-spd., PS, PB, radio, camper cover, one owner. Jones, 299-9032.

**'74 JEEP** Cherokee 4WD, 6-cyl., 3-spd. hubs, AM/FM, air, PS, 94,000 miles. Eagan, 281-5696.

**'73 CHEVY** PICKUP, heavy duty, 1/2 ton, AM/FM, AC, PS, PB, \$1800 or best offer. Gallegos, 836-4974 or 344-3290.

**REAL ESTATE**

**3-BDR.** custom brick w/full basement, fp, oak floors, 2 1/2 baths. Wheeler, 265-2187.

**3-BDR.** brick, pitched roof, Ridgecrest/Parkland Hills area, den w/fp, study, 3 baths, 2-car garage, landscaped, immediate possession. Pitti, 256-1629.

**TAYLOR RANCH** Bailey & Ward Windsor model, partially landscaped, 3-bdr., fp, \$17,200 down, \$64,000 full price. Whalen, 897-2902.

**MOBILE HOME**, adult section North Hills Park, Mark V, 14x72', 3 bdr., 2 baths, skirting, patio cover, storage bldg., fenced yard, \$15,500. Seiglitz, 898-5939.

**3-BDR.** custom Ashcraft, 2 1/2 car garage, basement; 1, 1/4, 1/2 baths, hardwood floors, fp, extra insulation. Sutherland, 266-1734.

**FOR RENT**

**3-BDR.**, 1 1/2 bath, near Manzano HS, several extras, enclosed yards, \$395. Lindsay, 299-7454 or 256-7190.

**3-BDR.**, 1 1/2 bath, den, all appliances, in West Mesa, owner's home, avail. April 1. \$400/mo. Gonzales, 831-2256.

**NEW** condominium on Maui, Hi., completely furnished, white sand beaches, \$200/week. Parker in Abq., 821-5999; Schmedding in Tucson, 1-602-299-0215.

**4-BDR.**, 1 1/2 bath, carpet, drapes, newly remodeled, landscaped, Lomas & Tramway, \$450. McCoy, 821-2509.

**3-BDR.**, 1 1/2 bath, close in N.E. Hts., walled yard, water paid. \$350/mo., 1st & last, \$100 DD, with lease. Caldes, 281-3272 after 5.

**2-BDR.**, unfurnished apt., dishwasher, range & refrigerator, storage room, laundry facilities, north of Lomas on Chelwood & Sandia bus route. Wiczor, 296-4496.

**2-BDR.**, apt., near Sandia, washer/dryer, CTV. Key, 296-4168.

**WANTED**

**DINNER PLATES**, Noritake Marguerite pattern. Jones, 255-7924.

**SNOW SHOES** suitable for a small adult, preferable w/neoprene bindings. Stearns, 281-3872 after 6.

**LOADING PRESS** for rifle or pistol; dies for .38, .45, 30.06. Morgan, 256-7994.

**TO COPY** video or stereo recording of Jan. 14 broadcast featuring Luciano Pavarotti. Silverman, 298-1308.

**CAR POOL** from UNM law school area to Sandia, hours & gate flexible. Hertel, 255-0329.

**FIREWOOD**, split or not, 24" long or shorter, pinon or cedar, can haul, best offer under \$90/cord. Hawkinson, 281-5239.

**OWNERS' MANUAL** for TI SR-51A. Randle, 867-2668.

**FEMALE** roommate, nonsmoker, to share 3-bdr., 2 bath, furnished home in NE, \$150/mo., including all utilities, except telephone. Plein, 884-3749, evenings.

**LOOKING** for various plants: strawberries, blackberries, lilies, mums, daisies, or what have you. Orr, 345-0631.

**WILL** babysit in my home, 1 yr. & up, SE heights. Silva, 255-3723.

**RIDE** or carpool from Gonzales & Sunset Rd. SW to Area I. Metzgar, 242-1028.

**'73 BUICK** factory service manual. Scheiber, 298-0904.

**OVEN**, built-in, elec., must fit opening 22" wide, 26" high. Moss, 298-2643.

**NEIGHBORHOOD DRAMA PROJECT** needs couch, easy chair, end tables & DR chairs for children's production, tax deductible. Shepherd, 296-1238 after 8.

**GOLDEN RETRIEVER** or similar dog. McIlroy, 299-1382.

**RIDE** OR JOIN a carpool, vicinity Moon and Candelaria. Karver, 299-8229.

**BARBELL WEIGHTS** in range of 20 to 50 lbs. ea. Prevender, 299-5253.

**FEMALE ROOMMATE** to share 3-bdr. home, approx. 4 mi. east of base. Martinez, 294-8134.

**METAL DETECTOR** with instruction manual. Brinkley, 255-2783.

**SOMEONE** to do day's work spading garden. Kindschi, 256-0531.

**LOST AND FOUND**

**LOST** Gold key chain w/pen knife, brown glass case, yellow plastic elec. entrance card, brown vinyl briefcase.

**FOUND**—RH man's brown leather glove, man's black leather RH glove, 1 pink suit/coat button, artificial corsage. **LOST AND FOUND**, Bldg. 814, 4-5677.

# Western Hoedown Scheduled Feb. 16

TONIGHT at Happy Hour Gary Waters entertains in the main lounge, Sangre Caliente holds the ballroom. Sirloin or king crab tops the buffet spread. Next Friday, Feb. 15, choose between baked trout or duck for your buffet special, listen to Joseph Salazar entertaining in the lounge or dance to Crosswinds in the ballroom. To reserve buffet tickets, call the Club office, 265-6791, by mid-week.

THE BIG ONE this month is a Western Hoedown Saturday, Feb. 16. Elton Travis and the Westernaires play for dancing while "wrangler steak and fixin's" is the dinner special. Tickets are \$7.50 for members, \$10 for guests and must be picked up tomorrow.

CORONADO GRANDSQUARES invite all squaredancers to join them Monday, Feb. 11, from 8:30 to 10 for a special Valentine's Day party. Between dancing, refreshments will be served.

SANADO WOMEN, husbands and friends gather at the Club Tuesday, Feb. 12, for a potluck dinner and dancing. The Albuquerque Civic Light Opera will present a musical program. Call Donna Urish, 299-1456, right now to find out about reservations.

ALL SANDIA and DOE employees are eligible for Coronado Club membership. You're cordially invited to a membership party Thursday, Feb. 14, starting at 7 p.m. There'll be an open bar, snacks and information booths with people to tell you about C-Club recreation, parties, special interest groups, the Sanado Women and other good things about C-Club member-

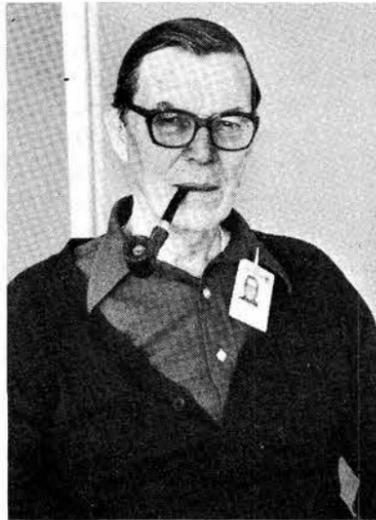


William Brown (1522)



Walter Cihak (3411)

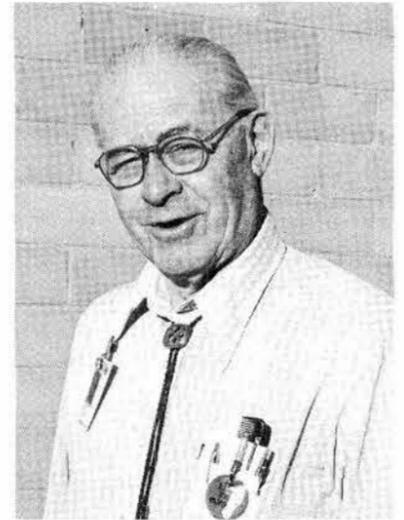
## Retiring



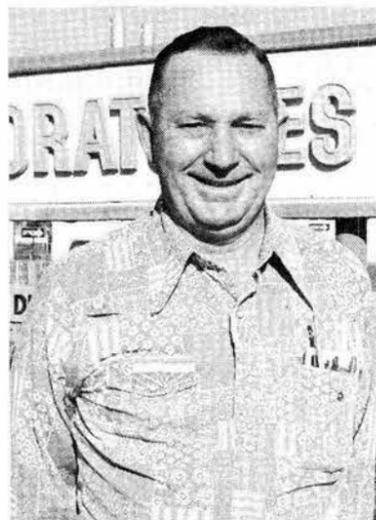
Geoffrey Lynch (3434)



Gil Weaver (3421)



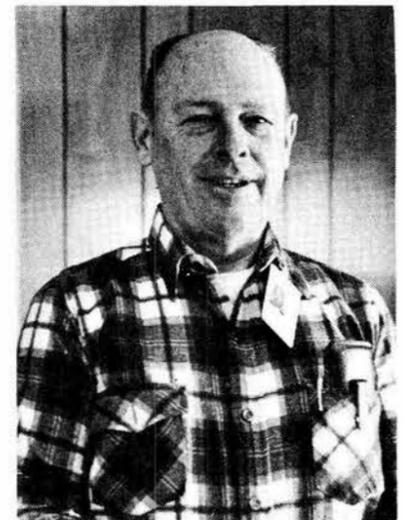
Ralph Hendrix (3417)



Willie McCabe (2141)



Adolfo Sanchez (1474)



Frank Dain (4479)

ship. There's no initiation fee, and dues are \$5 per month. It's the best private club buy in the city.

CORONADO SKI CLUB meets Tuesday, Feb. 19, at 7 to see movies and hear Tom Long discuss the Sandia Peak Ski School.

CORONADO TENNIS CLUB has a few memberships open. Singles are available for \$160 initiation fee and \$20 a year, family memberships for \$200 and \$25 a year. The initiation fee is refundable. Call Gary Snow (2531), membership chairman, 4-8648, for details.

FRANK GALLEGOS (3510), C-Club publicity director, reports that the Club will take reservations for next year's Christmas parties any time now. Call the Club office.

TRAVEL—Another "Real Mexico" trip is scheduled April 1-15. Fly to Guadala-

jara, tour Mexico City experiencing the culture, art, language and people along the way. Then fly back to Guadalajara and from there to Albuquerque. The 15-day trip costs \$550 including all transportation, lodging and meals. Lyle Thompson, trip leader, will present a slide show and discuss the trip at the Club on Feb. 25 at 7 p.m.

During the spring school break, take the kids to Disneyland. The Club's package, scheduled April 1-4, includes air fare, motel, tickets to Disneyland, a Catalina Island tour, other goodies. Cost is about \$253 for adults, \$179 for kids.

How about Puerto Vallarta May 4-11? Fly there and spend seven nights at the luxurious Plaza los Glorias beach resort. The package costs \$355, double occupancy. See Travel Director Frank Biggs (4231) in the lobby tonight between 6 and 7 for details.

UPCOMING EVENTS—Kiddie Carnival Feb. 23; Shrimp Peel Feb. 22.

