



TWENTY-FIVE new Sandians started four- and five-year apprenticeship programs at the Labs last week. More than 800 applicants were screened for the openings in the machinist, electronics, materials processing, and plant technician programs.

The machinist and electronics programs require 8000 hours of training for completion, the rest, 10,000 hours.

LAB NEWS

VOL. 27, NO. 19

SEPTEMBER 19, 1975

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

Inside —

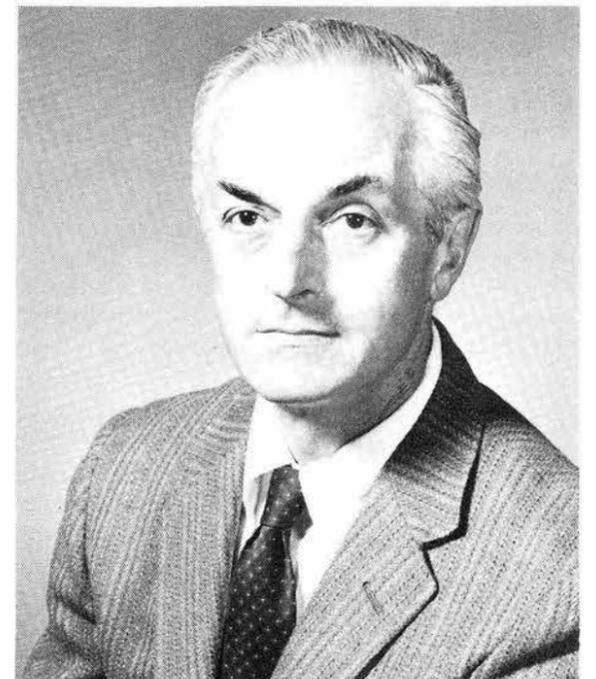
- **Retirement Plan Annual Report**
Page Eight
- **Melt Lab**
Page Five
- **Retirees' Annual**
Page Seven

Eugene Reed New VP-2000

Eugene Reed, executive director of the Ocean Systems Division of Bell Laboratories, has been named to succeed Klaus Bowers as vice president of the 2000 organization on Oct. 1. Mr. Bowers is returning to Bell Labs.

Mr. Reed joined Bell Labs in 1947 and for several years was engaged in the development of electronic components. In 1961 he was appointed director of the Solid State Device Laboratory in Allentown, Pa. and, five years later, executive director of the Solid State Components Division. From 1971-1973 he shifted to a staff assignment and had responsibility for education, technical recruiting, and salary administration. In 1973 he was appointed to his position in the Ocean Systems Division.

His BS degree in EE is from the Univ. of London, while MS and PhD degrees in EE are from Columbia. Mr. Reed is the author of many technical articles and a Fellow of IEEE. In 1971 he was elected to the National Academy of Engineering.



Eugene Reed



Ron Bentley



Ray Bair

Supervisory Appointments

RON BENTLEY to supervisor of Electronic Measurements Division 9471, Tonopah Test Range Department effective Sept. 1.

Ron joined Sandia in September 1965 after earning a BS in EE at the University of Florida. As a member of the Technical Development Program, he attended UNM and earned a Master's degree in EE in 1967. At Sandia, he has worked in design and development of airborne and ground digital data acquisition systems.

He is a member of IEEE and a volunteer with the Boy Scouts. Ron enjoys fishing and camping. He and his wife Gloria and teenage daughter and son will be moving to Las Vegas.

RAY BAIR to supervisor of Electronic Design Division 2648 effective Sept. 1. Ray joined Sandia in July 1967 after earning a bachelor of science degree in electrical engineering from Washington State.

For his first two years at Sandia, Ray worked in advanced component development and attended UNM under the Technical Development Program. He earned his master's degree in EE in 1969. He was project engineer for an electronic multiple code coded switch and recently has worked in integrated circuit design.

From 1959 to 1963 Ray was in the Navy, spending most the time aboard a destroyer in the Pacific.

He is a member of the IEEE and a past president of the Albuquerque Montessori Society. Leisure time activities include hiking and woodworking. Currently he is taking classes at UNM working toward an MA in business administration.

Ray and his wife Carol live at 10207 Karen NE with their two sons, ages 2 and 6.

ENERGY SAVINGS

COMPARED WITH USAGE IN BASE PERIOD - JULY 1972 THRU JUNE 1973
CURRENT REPORTING PERIOD ENDING AUG. '75

ELECTRICITY	BASE PERIOD 92276 MWH	
	1975 73279 MWH	20.6% SAVED
STEAM PLANT FUEL EQUIV. OIL	BASE PERIOD 224,583 BBLs	
	1975 197,616 BBLs	12.0% SAVED
VEHICLE MILES	BASE PERIOD 2468,000 MI.	
	1975 1,885,000 MI.	23.6% SAVED

Work-Leisure Survey To Begin Next Week

Sandia Laboratories will participate in a survey of employee attitudes being conducted by UNM's Joseph Champoux, a professor in the School of Business and Administrative Sciences. The survey is part of a series of studies being conducted by Professor Champoux in various parts of the country.

Next week, about 1000 Sandians will receive survey packages through company mail. Participation is entirely voluntary. The sample was drawn randomly from the total Sandia workforce. No names or identifying information are required. All materials mailed are identical and are not coded in any way. Professor Champoux will have no access to Sandia information except that provided by the questionnaires. Return envelopes are included in the packages so that the completed questionnaires can be mailed directly to Professor Champoux. And no one at Sandia will ever see any individual's responses. Complete anonymity and confidentiality are therefore assured.

Sandia participation was arranged by Robert Edelman, Director of Personnel 4200, and the study is being coordinated by Lynn Rigny of the 4250 staff.

Professor Champoux asks participants: "Please complete the questionnaire as soon as you can and mail them directly to me. The success of this study depends upon your complete participation and a frank and honest evaluation of your experiences."

A report on this study is expected in about one year, and copies will be made available in the Tech Library.



Congratulations

Mr. and Mrs. Joe Lucero (2515), a son, Joseph Estevan, Aug. 30.

To Charles (3621) and Veronica Velasquez, a daughter, Aug. 25.

To Tom (1247) and Esther Mayer, a son, Andrew Joseph, Aug. 23.

Sympathy

To Nicasio Nolasco (9722) on the death of his wife in Albuquerque, Aug. 31.

To Florencia Valtierra (9712) on the death of her sister in El Paso, Sept. 8.

Events Calendar

Through Sept. 21 — New Mexico State Fair

Sept. 19-21 — Classics Theater Co., "Romeo & Juliet," 8:15 p.m.; 21st 2:15 only, Popejoy Hall, 277-3121 or 293-7301.

Sept. 20 — NM Mt. Club, Crest to Cienega, 6 miles, Western Skies, 8 a.m.

Sept. 20 — Albuquerque Community Concert Assn., "Chinese Acrobats of Taiwan," 8:15 p.m., Civic Auditorium.

Sept. 21 — Museum of Albuquerque: opening, "Contemporary Indian Prints," through Nov. 30.

Sept. 21 — NM Mt. Club, Jemez Mountains, 5-7 miles, 8 a.m., Gulf Mart

Sept. 23 — Ballet Azthán of Mexico, "Fiesta Folklorico", 8:15 p.m., Popejoy Hall.

Sept. 26-27 — Albuquerque Symphony Orchestra, 8:15 p.m., Popejoy Hall.

Sept. 27 — Football: UNM vs Colorado State University, 7:30 p.m., UNM Stadium.

LAB NEWS

Published every other Friday

SANDIA LABORATORIES

An Equal Opportunity Employer
ALBUQUERQUE, NEW MEXICO
LIVERMORE, CALIFORNIA
TONOPAH, NEVADA

Editorial offices in Albuquerque, N.M.
Area 505 264-1053
ZIP 87115

In Livermore Area 415 455-2111

john shunny is editor
&
don graham ass't. editor

bruce hawkinson & norma taylor write
bill laskar does picture work
gerse martinez lends a hand
&

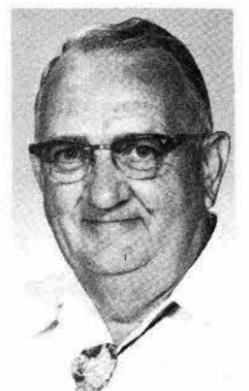
lorena schneider reports on livermore

LAB NEWS
PAGE TWO
SEPTEMBER 19, 1975



Death

Aaron Lawrence of Physical Standards Division 9531 died Sept. 12 after a long illness. He was 62. He had worked at Sandia since July 1952. Survivors include his widow and two sons.



LIVERMORE NEWS

VOL. 27, NO. 19

LIVERMORE LABORATORIES

SEPTEMBER 19, 1975

Goal \$45,000

LEAP Campaign Next Week

This year's LEAP fund raising drive gets underway Monday, Sept. 22, with employee meetings describing the program to be held throughout the Labs. During the week-long campaign, squad leaders and solicitors will contact each person individually.

Chairman Bill Ryan (8264) says the goal of \$45,000 set by the committee appears to be realistic for the 1975 drive, and employees will be encouraged to increase their contributions to meet the target.

Bill notes that through LEAP Sandians contribute only once, their contributions go to support local service agencies, the United Way of the Bay Area (formerly the United Bay Area Crusade) and national health agencies through the Bay Area Combined Health Agencies Drive (CHAD). "In a combined drive, we are able to spread funds farther and reach more people," he continues. "This is what LEAP is all about — assisting those who need help in the most efficient way."

After investigating and studying a number

of proposed beneficiaries, the employee committee voted to allocate this year's funds to seven local agencies, to CHAD with 12 member agencies, and to the United Way agencies. Here is the breakdown:

	Allocation percent
LOCAL AGENCIES	16
Nursery School Scholarship Fund ...	5.0
Livermore-Amador Valley	
Emergency Fund Center	5.0
Buenas Vidas Youth Ranch	3.0
Twin Valley Counseling Services	1.0
Valley Youth Services	1.0
Connection5
Salt Shaker Hotline5
NATIONAL AGENCIES	
Bay Area Combined	
Health Agencies Drive (CHAD)	18
UNITED WAY OF THE BAY	
AREA AGENCIES	65
RESERVE	1
TOTAL	100 percent

New on the list are two local agencies — Buenas Vidas Youth Ranch (see accompanying article) and Salt Shaker Hotline, a drop-in counseling service for young people and adults with emotional problems stemming from alcohol or drug addiction.

As Vice President Tom Cook (8000) points out in his letter to all SLL employees, "Everyone of us benefits in some way from LEAP contributions. When we support programs that help people in need, aid medical research, strengthen youth programs, or help to keep open communications among people, those contributions make our community a better, healthier, more stable, less threatening place to live for all of us and for our children — not just for those who receive aid."

Sympathy

To Lewis Clauson (8185) on the death of his mother in Santa Clara, Calif., July 14.

To Tom Jennings (8332) on the death of his father in Chicago, Ill., July 29.

To Bill McGuire (8431) on the death of his mother-in-law in Philadelphia, Pa., July 17.

To Bess (8266) and Rocky Roach (8423) on the death of their son in San Jose, Calif., Aug. 7.

To Ollie Thomas (8346) on the death of his mother in Palo Alto, Calif., July 25.

To Bill Zinke (8114) on the death of his father-in-law in Oslo, Minn., July 21.

To Sandi (8184) and Wayne Chrisman (8334) on the death of her mother in Albuquerque, Aug. 8.

To Tom Brumleve (8184) on the death of his father in Mattoon, Ill., Aug. 19.

To Art Clark (8114) on the death of his mother-in-law in Modesto, Calif., Aug. 17.

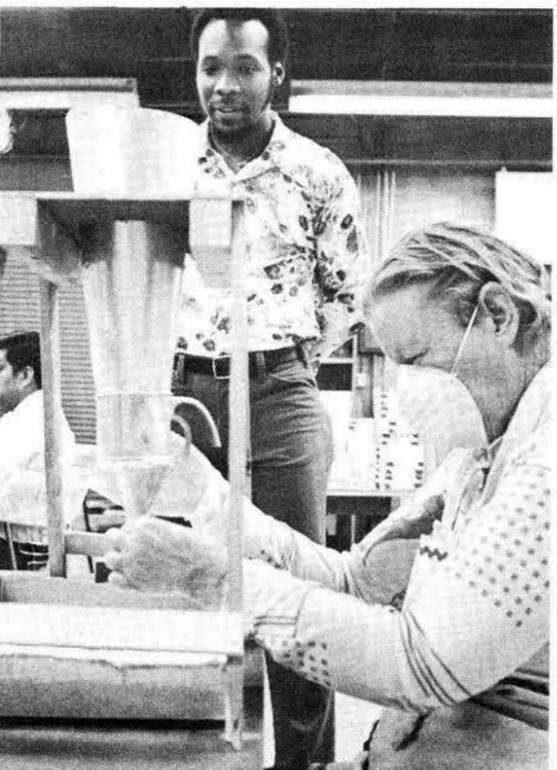
To Bob Hauff (8431) on the death of his father-in-law in Anacortes, Wash., Aug. 18.



LEAP chairman Bill Ryan (8264) examines pottery produced at the Livermore Garnet Austin Center for the Mentally Retarded.



LOCAL 4-H AND OTHER GROUPS help with renovation of Buenas Vidas Ranch, which operates as a home for troubled youths. Buenas Vidas is a new recipient of LEAP funds this year.



FRED JOHNSON (8423) watches operation of filling and sealing plastic bags with dessicant in the workshop of center for mentally handicapped. Work is done under subcontract to local manufacturing company.

LEAP Committee Visits Local Agencies

A number of LEAP committee members recently toured two local agencies that use LEAP funds. First visit was to the Garnet Austin Center for the Mentally Retarded, which provides a rehabilitation and activity program for some 20 mentally handicapped persons.

"They are doing meaningful work," remarks Fred Johnson (8423). "The handicapped should have the opportunity to do for themselves. It's gratifying to see United Way funds being used in the local area."

Buenas Vidas Ranch, a new LEAP agency this year, was also visited. Located at the end of Arroyo Road in Livermore, Buenas Vidas is a home for troubled youths. The 89-acre ranch facility offers a rural environment, and restoration work on most of the old buildings (it was formerly a sanitarium) is underway.

Authors

Jack Dini and Rudy Johnson (both 8312), "Evaluation of an Electroplated Joint in Dissimilar Metals," SAMPLE QUARTERLY of the Society for the Advancement of Material and Process Engineering, Vol. 6, No. 2

Larry Weirick (8312), "Effect of Heat Treatment Upon the Stress Corrosion Cracking of Mulberry (U-7.5 Nb-2.5 Zr)," CORROSION, Vol. 31, No. 1.

Rand German (8312), Ray Mar (8313) J.C. Hastings (San Joaquin Delta College), "Sintering Behavior of Boron," AMERICAN CERAMIC SOCIETY BULLETIN, Vol. 54, p. 178

Cornelius Coll (8341) and G. Beni (Univ. of Calif.), "Thermoelectric Power in Half-Filled Bands," PHYSICAL REVIEW B, Vol. 11, No. 2

Walt Bauer (8334) and George Thomas (8313), "Carbide Formation on Nb Surfaces During High Temperature H Irradiation," JOURNAL OF VACUUM SCIENCE AND TECHNOLOGY, Vol. 12, p. 490



MAS/MLS TRAINEES working towards a graduate degree are (l to r) Serafico Carillo, Felix Almaraz, Katrina Person, Marian Van Delinder, David Devore and Daniel Brewer. In photo at right, they are Tom Rathke, Hazlet Edmonds, Kathy Pitts, and Joe Montoya. (Trainee Julian Bartlett missed the photo.) Training programs last three years.

Advancement From Within

MAS/MLS Program Is Announced

A number of Sandians are beginning three-year programs aimed at qualifying them as professional staff members at Sandia. The MAS (Member of Administrative Staff) and MLS (Member of Laboratory Staff) Trainee Programs enable an employee to enrich and supplement graduate education with work experience in the same field. And, while gaining the experience, the employee has the oppor-

tunity to show that he or she can perform work at a professional level. Successful completion of the three-year program means promotion to MAS or MLS.

The MAS/MLS Training Program is now in effect throughout the Labs; program openings develop when the director of an organization agrees to fill a staff slot with an MAS/MLS trainee rather than through

outside hire. The opening is then posted.

An employee candidate should have a bachelor's degree, a high performance rating and the recommendation of his or her supervisor. Applicants must successfully engage in graduate study in a field related to their work assignment during the program. Academic work is performed under the Labs' Educational Aids Program.



ONE DOWN, four to go. These students have completed one year of a five-year program leading to the ESA (Engineering Science Assistant) or EDA (Engineering Drafting Assistant) levels at Sandia. They were selected through the posting/bidding process on the basis of their motivation and potential. The program includes on-the-job training and CRI (Criterion-Referenced Instruction; see LAB NEWS, Aug. 22, 1975) classes. Pictured, standing: Sharon Husa (9650), Dorothy Troy (9532), Jim Salas (2414), Carmel Chavez (2434), and Richard Padilla (9412). Sitting: Shirley Pino (9650), Sandra Anderson (9531), Anita Roybal (1221), Estrella Vega (2334), and Fay Tomashiro (9412). Kneeling: Daniel Sanchez (2342), Ted Chavez (2522), and Frank Lasky (2522). Robert Sanchez's (2433) presence was desired elsewhere when this was taken; he was honeymooning.



WHEN Ken Campbell of Mechanical Inspection Section 3613-2 decided to retire, coworkers noted his penchant for bolo ties and came up with this model. Those are "certified Tech Area cafeteria rocks" in the upper corners.



Recreation Notes

FUN & GAMES

On Saturday Sept. 27, the Outdoor Skills Fair will be held at both Los Altos Park and at Winrock Shopping Center. Demonstrations and exhibits of outdoor activities are scheduled to be run from 10 in the morning to 4 in the afternoon.

* * *

Sandia Runners Ass'n. — Upcoming in Socorro next month is the "M" Mountain Nine Miler, to be run Sunday Oct. 5, starting at 10. You don't run up the mountain, just around the trails at its base. Entry forms are available in the LAB NEWS Office.

Road Runners meet on Sunday, Sept. 21, at Western Skies for a series of running events in that area. First event goes off at 1:30 p.m.

* * *

Hadto come — Now there's a group that gets its kicks from pocket calculators. The Albuquerque Programmable Pocket Calculator Users Club is holding its first regular meeting Tuesday, Oct. 14, at 7 p.m. in Suite 229 of the Citizens Bank, 2500 Louisiana NE. Ray Elosua, 292-0780, is APPCUC mentor.

* * *

Sandia Tennis Ass'n — Singles fall tournament is set for Oct. 11 and 12 and the doubles for Oct. 25 and 26; entries, @\$1, should be in to Jean Langston, 4210, by Oct. 3 and 17. All Sandia and ERDA people are eligible.

The Tennis Committee is considering competition between division, department, and VP teams. Interested? Tell Jean or Bert Lindsay (2142).

* * *

Coronado Ski Club — Will hold its annual walkdown of Sandia Peak on either Sept. 28 or Oct. 5. Bring a picnic lunch, throw rocks off the trail or at each other, and get those tremendous legs girded for the big schuss.

Be sure to get your Ski Club membership in to Joyce Sanchez (2410) ASAP.

* * *

Audubon Film Series — Sandia retiree Bill Stamm reports that the popular series of wildlife films will again be sponsored this fall by the Audubon Society, the Mountain Club and the Sierra Club. Five films are being offered and will be shown at Popejoy Hall, one per month, starting in November. The sponsoring organizations derive proceeds only from mail sales, so Bill urges customers to purchase their season tickets accordingly. Cost for an adult for five admissions is \$7, for an adult over 65 \$4, and for a student \$4. Checks should be made out to Audubon Wildlife Film Series, and the mailing address is P.O. Box 3457, Albuquerque, N.M. 87110.

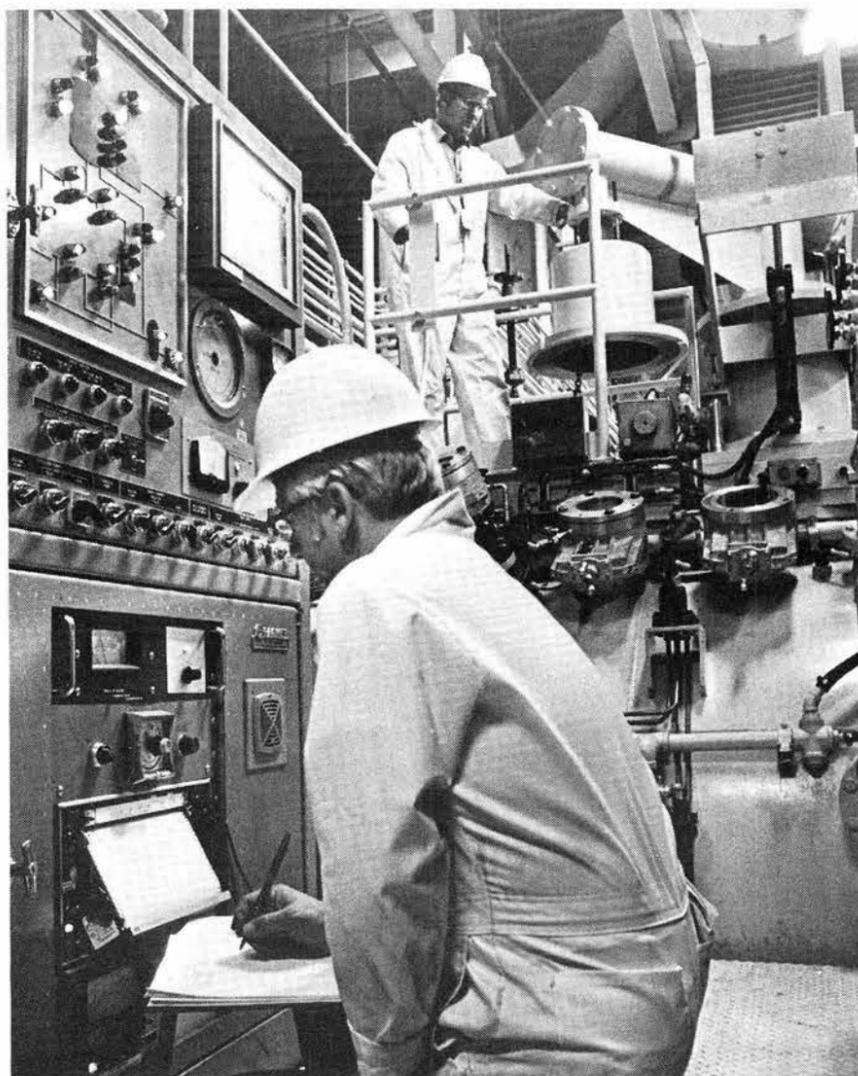
Speakers

H.J. Stein (5112), "Annealing of Memory-Quality Si-Nitride," Conference on the Preparation and Properties of Electronic Materials, Aug. 25-27, Princeton, N.J.

J.A. Panitz (5114), "The Crystallographic Distribution of Rhodium Helide ($RhHe_2^+$) Molecular Ions"; R.J. Walko (2412), "High Field Electrical Contact Damage at Subarc Voltages"; J.A. Panitz, "Signal Processing in the Atom-Probe FIM, International Field Emission Symposium, Aug. 25-29, Atlanta, Ga.

M.M. Widner (5241), et al., "Target Irradiation Studies Using Relativistic Electron Beams," Seventh European Conference on Controlled Fusion and Plasma Physics, Sept. 1-5, Lausanne, Switzerland.

J.E. Schirber (5150), invited paper, "Electron Transitions Under Pressure"; Schirber and R.L. White (5151), "Pressure Derivatives of Fermi Surface Cross Sections by the Solid He Phase Shift Method," International Conference on Electronic Properties of Solids Under Pressure, Sept. 1-5, Leuven, Belgium.



INSIDE THE MELT LAB, Joe Dal Porto (5833), foreground, checks the immersion thermocouple readout to determine temperature inside the melt crucible. Bob Fisher (5833) operates vacuum charging crane.

Minimizing Macrosegregation

Sandia's Melting and Solidification Lab

Next winter, take a close look at the ice that forms against a window pane on a cold day. You'll likely notice some shapes like tiny fir trees inside it. They're dendrites and are caused by instabilities in the solidification process as water freezes to ice.

Unlikely though it may seem, almost all metallic alloys in ingot form exhibit the same trait as the ice, namely dendritic solidification.

The tiny irregularities don't matter much when they're outside your window. But they can matter a great deal when they're part of a metal ingot.

In general, metallic alloys solidify over a range of temperatures; the greater this range, the more pronounced the compositional difference between the center of the dendrite stalk or "fir tree trunk" and the liquid at the solid-liquid interface. If thermal instabilities (causing sudden changes in the solidification rate) are introduced, then changes in fluid motion take place in the space between the dendrites.

This can result in large compositional differences throughout the ingot. This phenomenon is known as macrosegregation; since the distances between these segregated areas are large (on the order of inches), it is not practical to level the compositional differences by diffusion. Hence the segregation pattern is locked into the material and can only be removed by remelting.

Macrosegregation is the subject of the applied research going on in the Melting and Solidification Laboratory in Area III operated by Process Metallurgy Division 5833.

Reducing the amount of macrosegregation, or achieving a more homogeneous alloy in industrial sized ingots, is a primary goal of the lab and its inhabitants — Frank Zanner, Bob Fisher, and Mike Hosking (all 5833).

"We have a good idea what happens,"

says Frank, "and we're learning about how to control macrosegregation and thus produce more uniform alloys. Our basic research technique is to cast electrodes (up to 200 mm in diameter and 900 mm in length) in our vacuum induction furnace. With this furnace we can cast alloys to precise chemistries while closely controlling melt temperature, furnace pressure, furnace atmosphere, and amount of stirring of the molten metal.

"The electrodes are then remelted in our vacuum consumable arc remelt (VAR) furnace. With this furnace we can closely control the solidification process. We hope to learn how to control macrosegregation by introducing external magnetic fields — these control movement of liquid metal in the interdendritic spaces — and by closely controlling the metal transfer through the DC arc.

"Incidentally, these two furnaces and the kind of controls we have over them make our facility one of the finest melting and solidification laboratories in the world."

The lab also participates in alloy development programs by melting and casting materials to precision chemistries and controlled solidification conditions. For example, they supplied A286 (a precipitation hardened stainless steel) to John Brooks (8314) for a welding study, 304 stainless steel with varying carbon levels to Jim Swisher (8313) for an austenite stability study, and they currently have plans for making a series of maraging steel chemistries to achieve yield strengths in the 400 to 500 thousand-psi range.

Dick Schwoebel's Department 5820 provides extensive assistance with on-line-chemical analysis and standards analysis support. In addition Lee Bertram (2642) is developing a computer code to attempt to predict the amount of macrosegregation expected from a particular set of solidification conditions. • bh

Take Note

George Bradley (1221) was recently elected to the national board of the 700,000-member Woodmen of the World. George has held a number of offices in the local fraternal organization and was instrumental in establishing the Woodmen's 40-acre Youth Camp in the Manzanos. The Camp provides a week of outdoor recreation for some 700 youngsters each summer.

* * *

Planned Parenthood Association, Inc., is collecting books for its second annual book sale. Donations may be deposited in collection boxes at most branches of the Albuquerque National Bank and at the organization's office, 113 Montclair SE. Pickups of large donations may be arranged by calling 265-3722.

* * *

In the past the Base has followed city practice in enforcing the school zone speed limit (15 m.p.h.) only during the times the children were going to or coming from school. Now the school zone speed limit is being enforced between 8:30 a.m. and 3:30 p.m., and the flashing amber light will be on. This action is necessary because crossing guards are no longer available for duty.

* * *

Anyone want the Federal Register? The Equal Opportunity organization (200) subscribes to the Register, reviews each issue for material of interest, and generally has no further use for the issue. Call Mollie Miller, 4-9342, if you'd like her to send the Register to you.

* * *

An exhibit of photographs by LAB NEWS editor John Shunny is on display in the Technical Library.

* * *

The American Nuclear Society Trinity Section holds its first meeting of the season of Sept. 26 at the La Posada Inn, 330 East Palace, in Santa Fe. A social hour at 6:30 will be followed by dinner at 7:30 (\$6). Speaker is UNM Prof. Robert Long, whose subject is "The Energy Crisis: Will Americans See the Light?" Guests as well as members are welcomed, and reservations should be made by noon, Sept. 24, with Jon Ruescher, 4-7123.

* * *

LAB NEWS doesn't carry family items (because there are too many of them), but this one is unusual. Chris Padilla (9631) relates that his Mom and Dad observed their 70th wedding anniversary last week. Christobal is 93 and Lena is 88. They reside in town by themselves, maintain a big garden, and enjoy good health. Originally from San Antonio (south of Socorro), they came to Albuquerque around 1910; he worked for the AT&SF for 49 years. Mike Robles (2632) and Julian Lovato (4276) are also members of the clan.

* * *

Dr. Frank Hibben of UNM's Department of Anthropology will speak at a meeting of ASME Tuesday, Sept. 23, at 8 p.m. at the Coronado Club. He will discuss "Africa — Past and Present." Beer and a cold cut buffet will precede the meeting. For reservations, call Joe Abbin (2324), 4-5759.

Andy Lieber Returns From Germany

A leave of absence that lasted for more than two and a half years was completed recently when Andy Lieber returned to the Labs to become manager of Systems Studies Department 4730.

Assigned to the Advanced Research Projects Agency of DoD in the fall of '72, Andy set up and directed one of the two ARPA overseas regional offices. His office was near Stuttgart, Germany, with the HQ US European Command, but Andy's area of concern extended throughout Europe, the Middle East and much of northern Africa. His job: to help bring modern technology to bear on defense problems for both U.S. and allied forces, and to observe and report upon technical-military problems. He thus worked closely with both military and civilians on all levels and from many countries. His contacts ranged from tank drivers critical of turret design to Air Force generals concerned with tactical deployment of aircraft.

After his first year, Andy picked up an additional title when he became R&D Adviser to the Deputy Commander-in-Chief of U.S. Forces in Europe. As a member of General Eade's staff, he participated in the day-to-day operations of the headquarters



Andy Lieber

and in many of the activities of the forces.

To get a feel for his territory, Andy reports that he traveled over a hundred thousand miles in his first year. "Ran out of pages on my passport," he says. The Lieber family enjoyed Germany and lived in a small community near Stuttgart. Andy speaks highly of his neighbors and the friends he made in Germany. "Some of the best people we ever met. I know that many of them will remain life-long friends."

Geothermal Well Logging Workshop Held

Problems in geothermal well logging is the central topic of a Workshop on Geophysical Measurements in Geothermal Wells, being held at the Airport Marina Hotel September 17-19.

The workshop — a response to the growing interest in geothermal energy — is sponsored by the Energy Research and Development Administration and the U.S. Geological Survey. Sandia Labs has arranged the workshop and is serving as host.

Approximately 90 representatives from industry, universities and government laboratories have been invited to the workshop to hear presentations by experts in geothermal energy, well logging and high temperature technology.

"One of the requirements for efficient

development of geothermal energy with minimum environmental impact is the ability to obtain accurate information about the reservoir and the wells drilled to tap the reservoir," says Max Newsom, supervisor of Sandia's Drilling Technology Division 5718.

"Well logging is one means of obtaining this information; however, problems arise when logging instruments developed for use in logging oil wells are lowered into geothermal wells where the temperatures are much higher and the geologic formations quite different.

"The workshop has been arranged to discuss these problems and to produce recommendations which will lead to their solution."

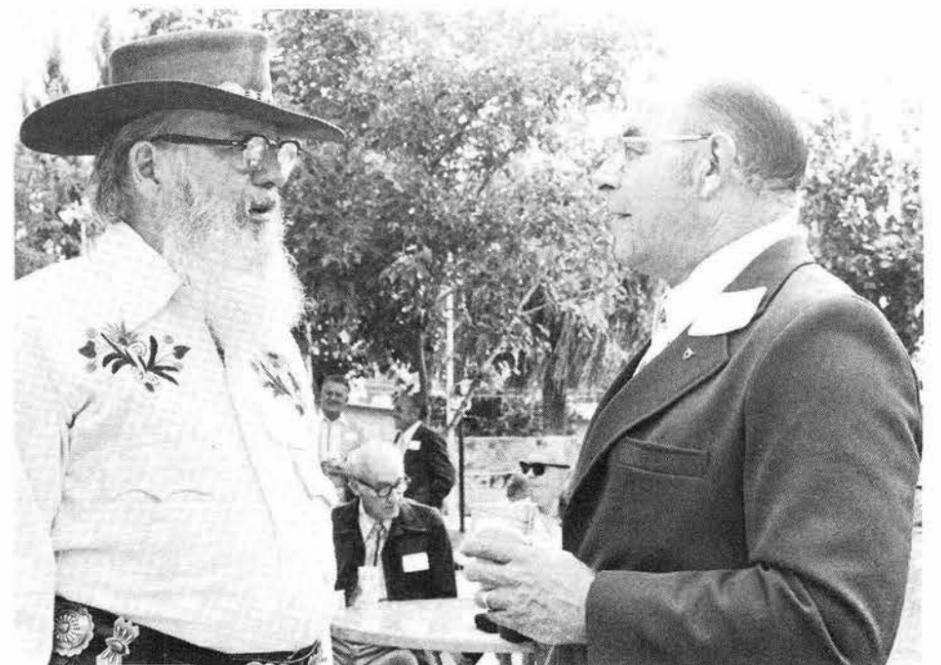
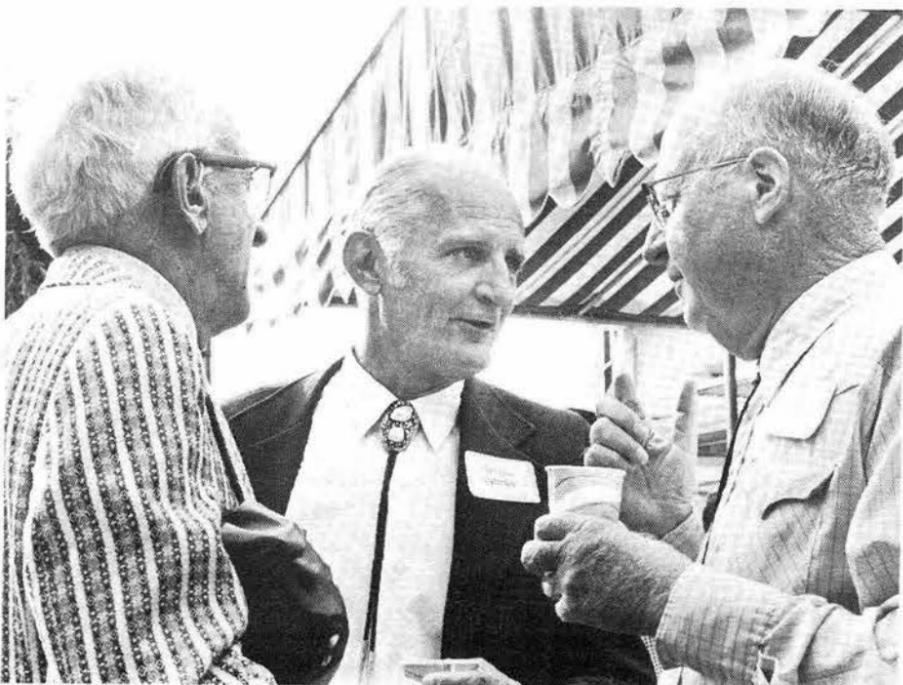


SANDIANS INVOLVED in the upcoming Employees Contribution Plan campaign recently toured a number of United Way agencies to gather first-hand information on the work of the organizations. Here the group watches a training session at the Albuquerque Hearing and Speech Center. ECP drive will start at Sandia Oct. 3. United Way goal is up 10 percent this year.



Retirees' Annual For '75

The monsoon came early, the Coronado Club held its collective head, and someone made the painful decision: "OK, let's move it inside." Squeezing the 800-plus guests inside was an exercise in packaging, but then the rains ceased and the crowd overflowed into the patio. (Above) the wall-to-wall table arrangement; (left) former president Monk Schwartz with Marian (4256) and Lou Jacot; (below left) Walt McNair, Morgan Sparks and John Findlay; (below right) Bert Quelle — we think — and Stan Horn (4256).



Sandia Retirement Plan Annual Report

Director of Personnel Bob Edelman has furnished LAB NEWS with the following statement concerning Sandia's Retirement Income Plan.

"Each year Prudential Insurance Company of America, Sandia's pension fund Administrator, furnishes us with financial and actuarial reports dealing with the operation of the Sandia Retirement Income Plan and the Group Annuity Contract we have with them. This letter (below) summarizes the reports furnished to us and

gives an overview of the Plan's operations. While the report speaks for itself, several comments are in order.

"The year 1974 proved to be the second consecutive disastrous one for the Stock Market. Following an 18 percent drop in 1973, the Standard and Poor's 500 Stock Index declined another 30 percent in 1974. The performance of Prudential's common stock portfolios generally mirrored that of the market itself.

"In the future, for those employees who

do not retain the variable annuity, the gains or losses reflected in the Common Stock Account (minus \$19,752,000 in 1974) will accrue to the Plan and not to individual employees or retirees.

"The funding requirement of \$172,394,000 is based on past and future benefits for active employees on roll as of December 31, 1974. Employees are estimated to retire on the average at age 62. Sandia will fund the plan at a rate adequate to meet the present and future liabilities as determined by sound actuarial principles."

<p>The Prudential Insurance Company of America Western Home Office P. O. Box 2314, Terminal Annex Los Angeles, California 90051</p> <p>Charles T. Eckman Director of Group Pensions Group Pension Department</p> <p style="text-align: right;">September 11, 1975</p> <p>Mr. Robert J. Edelman Director of Personnel Sandia Laboratories Albuquerque, NM 87115</p> <p>Dear Bob:</p> <p>Each year Prudential furnishes you with financial information with respect to the operation of your Group Pension Contract. This together with the periodic actuarial valuations enables you and the other executives of Sandia to monitor the operations of your plan. During recent discussions you asked if I could produce a combined, simplified explanation of the above reports which would give you the highlights of our relationship with a minimum of explanation. Here goes!</p> <p>At the end of 1973, Prudential held - \$213,315,000 partly invested in our General Account (mostly fixed dollar type) and partly in a Common Stock Separate Account.</p> <p>During 1974, Sandia gave us - \$ 10,485,000 and your employees gave us - \$ 4,368,000 for a total additional investment during 1974 of - \$ 14,853,000</p>	<p>During 1974, net investment earnings from the General Account was - \$ 10,043,000 and from the Common Stock Account dividends as well as realized and unrealized capital losses was - \$-19,752,000 for total net investment earnings during 1974 of - \$ -9,709,000</p> <p>We made annuity payments of - \$ 3,226,000 to your retirees during 1974. We returned to employees who terminated or died - \$ 788,000 and had administrative expenses and premium taxes of - \$ 127,000</p> <p>At the end of 1974, we held - \$214,318,000 of which employee contributions and interest amounted to - \$ 55,060,000.</p> <p>The present value of all anticipated Plan benefits, based on sound actuarial principles, for your active and retired employees as of 12/31/74 is - \$386,712,000 subtracting funds on deposit of - \$214,318,000 leaves a future funding requirement of - \$172,394,000.</p> <p>Bob, I hope the above is helpful.</p> <p style="text-align: right;">Sincerely, <i>Buck</i> C. T. Eckman Director, Group Pensions</p>
---	---

ASSETS OF THE PRUDENTIAL INSURANCE COMPANY OF AMERICA December 31, 1974

(\$ in billions)

	\$	Percent of Total
General Account:		
Bonds	13.0	36
Mortgage Loans on Real Estate	12.3	34
Common Stocks	1.6	5
Loans on Policies	1.8	5
Real Estate	1.4	4
Preferred Stocks	1.0	3
All Other Assets	2.1	6
Separate Account:		
Primarily Common Stocks	2.6	7
Total Assets¹	35.8	100

¹Source: Prudential's Annual Report (available in Benefits Administration Division, 4212).

Sandia Laboratories and its employees' equity is about .6 of 1 percent of Prudential's total assets of \$35.8 billion. This amounts to \$214 million of which \$147 million is invested in the General Account and \$67 million in the Separate Account.

Prudential's Schedule of Securities lists bonds and stocks owned by them covering a broad range of several thousand industrial and public utility corporations. Not included in the Schedules are listings of several thousand properties where Prudential holds a mortgage or owns the property.

Comments Available

Alan Pope (5600) has gained a reputation for his knowledge in financial matters, and he has studied the Labs' new retirement plan. A copy of his "Comments on the New Pension Plan" can be obtained by calling 4-7812.

LAB NEWS
PAGE EIGHT
SEPTEMBER 19, 1975



R.B. Pettit (5842) and W.J. Camp (5151), "Percolative Conduction in Semiconducting Liquid Selenium-Thallium Mixtures," Vol. 35, No. 3, PHYSICAL REVIEW LETTERS.

P.H. Holloway (5825) and J.N. Sweet (2431), "Correlations Between Interfacial Oxides and Resistance Changes for W Contacts on Heavily Doped Si-Ge," Vol. 27, No. 2, THIN SOLID FILMS.

R.J. Baughman (5154), "Czochozalski Crystal Growth of Sodium Beta-alumina," Vol. 10, No. 7, MATERIALS RESEARCH BULLETIN.

R.H. Marion (5847), "On the method of Obtaining the Residual Stress, Stacking Fault Probability and Other Parameters from an Analysis of Peak Shifts of Several Bragg Peaks," Vol. 8, Part 4, JOURNAL OF APPLIED CRYSTALLOGRAPHY.

C.W. Mendel (5242), "Apparatus for Measuring Rapidly Varying Electric Fields in Plasmas," Vol. 46, No. 7, THE REVIEW OF SCIENTIFIC INSTRUMENTS.

G.A. Samara (5130), "On the Herzfeld Theory of

Authors

Metallization: Application," Vol. 33, No. 2, CHEMICAL PHYSICS LETTERS.

P.A. Miller (5242), "Interaction of a 15-kJ Relativistic Electron Beam with a Mirror-Confined Plasma," Vol. 27, No. 3, APPLIED PHYSICS LETTERS.

F.G. Yost (2432), "An Extension of the DeHoff Growth Path Analysis," Vol. 6A, Aug. 1975, METALLURGICAL TRANSACTIONS.

E.J. McGuire (5211), "Auger Spectra of the Noble Gases. II Argon," Vol. All, 1880; and "Auger Cascades in Aluminum," Vol. All, 1889, PHYSICAL REVIEW.

P.J. Brannon (1116), J.P. Anthes (5214), G.L. Cano (5000) and J.E. Powell (5225), "Laser Focal Spot Measurements," Vol. 46, No. 8, JOURNAL OF APPLIED PHYSICS.

D.K. Brice (5111), "Recoil Contributions to Ion-Implantation Energy-Deposition Distributions," Vol. 46, No. 8, JOURNAL OF APPLIED PHYSICS.

D. Emin (5155), "Phonon-Assisted Transition Rates. I. Optical Phonon-Assisted Hopping in Solids," Vol. 24, No. 3, ADVANCES IN PHYSICS.

MILEPOSTS

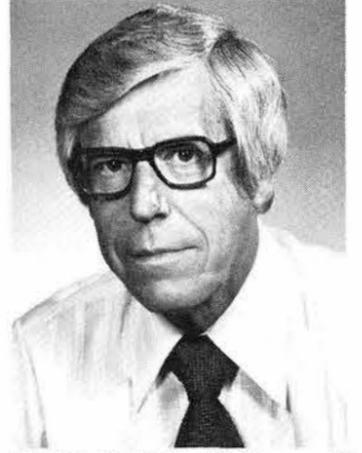
LAB NEWS

September 1975



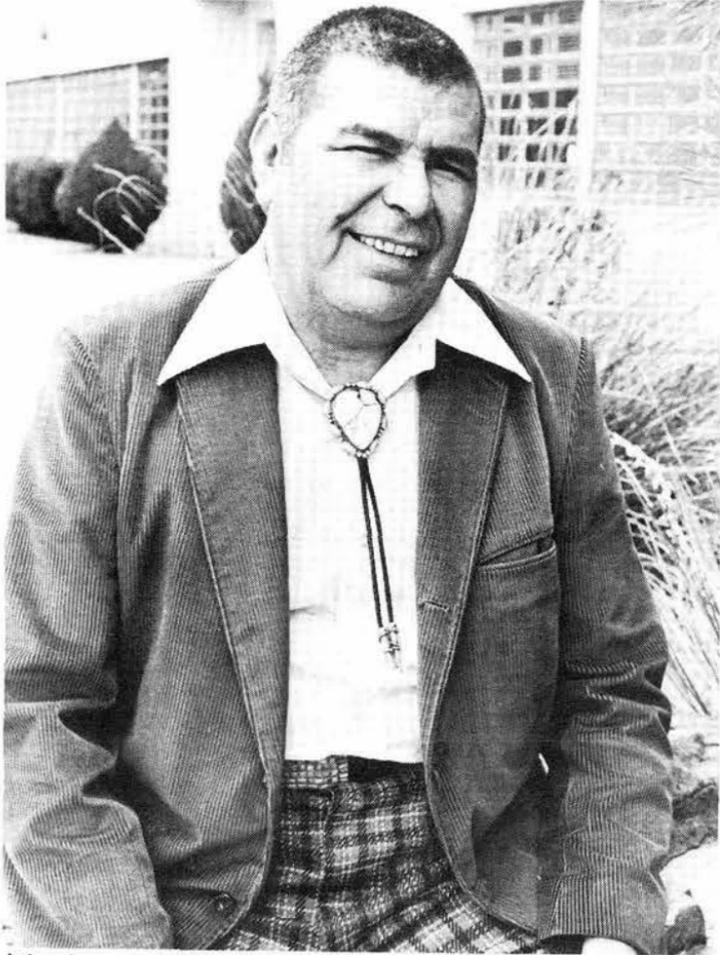
Richard Padilla - 9412

10



Gordon Barnett - 9343

25



John Anaya - 3616

25



Victor John - 3621

25



Wilburn Walker - 9550

25



Neta Tyler - 3732

15



Ed Shoaf - 3646

10



Billy Neil - 1135

25



Wallace Eder - 9634

25



Don Weldon - 4252

25



Ernesto Montoya - 3621

10



James Murray - 1135

25



Leonard Hansen - 5112

10



Raymond Foster - 1131

10



Martin Dieter - 2645

20



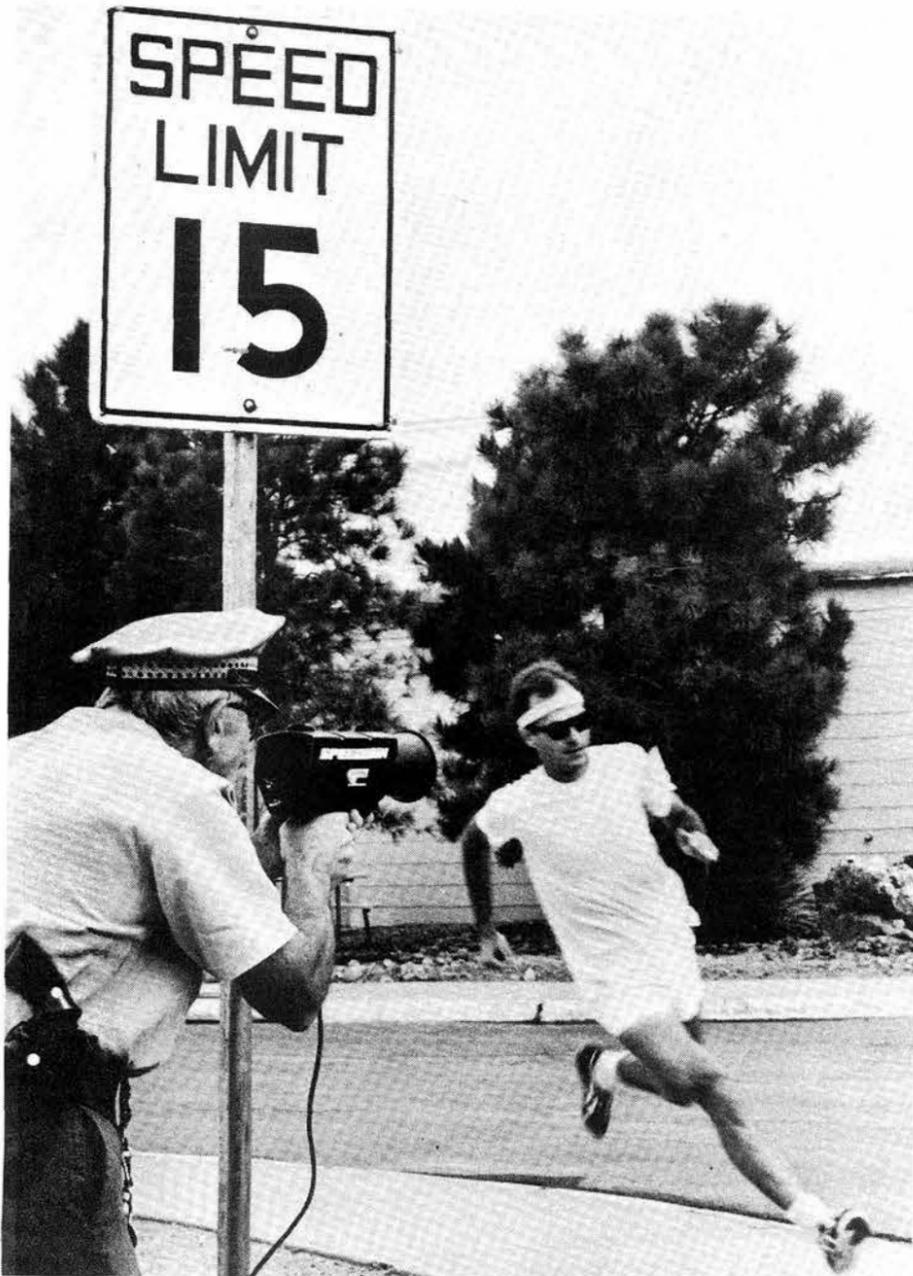
Larry Verzi - 1135

20



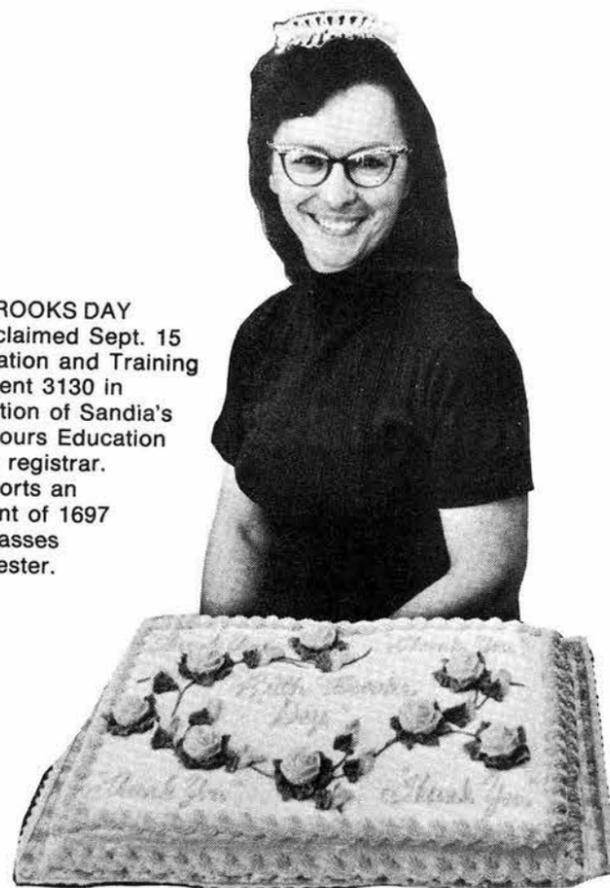
John Atencio - 3647

25



IT'S 15, BUSTER, by foot and by wheel in the Tech Area, and George Dingman (9550) has the speedgun to prove it. He also has a good supply of citations, the kind they don't award for heroism under fire. George quickly overtook Stewart Kohler (2326), who was rushing to pick up his copy of LAB NEWS.

RUTH BROOKS DAY was proclaimed Sept. 15 by Education and Training Department 3130 in appreciation of Sandia's Out-of-Hours Education Program registrar. Ruth reports an enrollment of 1697 in 101 classes this semester.



sandia PEOPLE Report



LAB NEWS' answer to Truman Capote, Bruce Hawkinson, cavorts with his latest opus, "Graphic Arts." Bruce did the book for the State Department of Technical Education. "Don't miss chapter 23 — the one on strippers," exclaims the author.



EDDIE GARCIA (9332), leader of the "Emeralds," recently recorded an album of soft rock and ranchera music called "Mi Pecosita" which means "Little Freckle Faced One." Eddie's six-piece group is appearing at the Spanish Village during the State Fair.



EDUCATION AND TRAINING are a never-ending activity at Sandia, and the Labs produces many graduates. Bob Flaxbart (9710), above left, prepares to congratulate graduates of the 5-year maintenance apprentice program: Steve

Gonzales, Leo Dunn, Curt Domme, Tom Undieme, Joe Romero, Rich Sena, Jerry Smith, Ernie Duran, and Gerry Gallegos. Standing tall is Sam Dodson.

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

CLASSIFIED ADVERTISING
 Deadline: Friday noon prior to week of publication unless changed by holiday.

RULES

1. Limit 20 words.
2. One ad per issue per category.
3. Must be submitted in writing.
4. Use home telephone numbers.
5. For Sandia Laboratories and ERDA employees only.
6. No commercial ads, please.
7. Include name, and organization.
8. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

DISPLAY CASE, glass, 4 shelves, sliding doors, 41" high, 21" deep, 49" wide, \$85. Rush, 299-6494.

BICYCLE, boy's 20" 3-sp., needs minor repair, \$25. Palmer, 299-4722 after 2:30.

WHITE PUPPY; luggage; popcorn popper; reducing machine; twin beds, much misc. Self, 296-4137.

DISHWASHER, Sears portable or built-in, gold, 5 cycles, 1 yr. old, \$175. Cummings, 292-0524.

STEREOS, two portables, GE Twinline 500 & Zenith LPS 80, \$40 ea. Biefeld, 821-8287.

MATCHING WASHER & DRYER, Sears deluxe model 800, 9 yrs. old. Edwards, 299-5578.

TRASH BAGS, \$4, box of 50, South Hwy 10 Project, LAB NEWS office.

WARM UP SUIT, double knit, cerulean blue, medium, never worn, \$20. Shunny, 265-1620.

RAILROAD BOX CAR, insulated, \$1800. Jaramillo, 865-7081.

TAPE DECK, reel to reel, Sony Model 777 S-4, \$200. Jones, 298-8492.

ALTO SAXOPHONE, Buffet student model w/case, lyre, \$175. Reynolds, 256-3670.

BESSON CORNET, case & stand, \$75. Devers, 296-3134.

ABOVE GROUND POOL, 21 x 12 x 4, filter, heater, cover. redwood decks,

cleaning attachments, \$450. Burd, 294-0132.

PUPPIES, Yorkshire terrier, AKC reg., 6 wks. old, 2 males, 1 female. Cronin, 881-4422.

BROWNING .243 rifle, safari grade, heavy barrel, new in box, \$325. Tollison, 298-9360.

DINNERWARE, Franciscan "Desert Rose" service for 8, \$75. Johnson, 255-5427.

OAK BUNK BED, \$60; girl's 24" bicycle, \$25; wall furnace, 35000/ 24500 BTU, \$50; 72" bifold closet doors, \$5. Bryant, 299-8315.

ALUMINUM WINDOW w/screen, 36" wide, 60" high, \$8; '73 Yamaha 100 MX, engine overhauled, \$350. Navratil, 293-5527.

SOFA BED & matching chair, gold tweed, newly upholstered, \$225. Cyphert, 298-2819.

ELECTRIC RANGE, 40" Frigidaire, two-oven, used 7 mos., \$50. Creveling, 898-1530.

UTILITY BOX for pickup, fits wide bed, \$35; H-78-15 tire, mounted & balanced, \$30. White, 293-2219.

BIKE, girl's 20", Sears standard, blue and chrome. Andersen, 293-1142.

ELECTRONIC TEST equipment, Hewlett-Packard, Leeds Northrup, Eldorado, General Radio, meters, solid state counter, signal generators, more. Howard, 281-5279.

26" GIRL'S BIKE, thorn proof tubes, \$20; washing machine, needs pump impeller, \$15; portable clothes washer, \$35. Bassett, 898-1840.

BULLSNAKE, male, \$20; with accessories, \$25. Kenna, 298-6059.

TAPE TRANSPORT, 7-channel, Ampex, FR-100A, \$400 or best offer; kid's car seats, Ford Tot-guard, \$15. Kobs, 298-9133.

CROCK POT, Rival, 4 1/2 qt., used twice. Denny, 268-0004.

300 SAVAGE model 99 w/case; 270 Remington model 760; 4x scope w/case; half size violin. Cyrus, 898-4038.

USED SEWING MACHINE, industrial, \$150; bed & dresser, blond, \$100. Klemm, 298-9541.

WINDOW, aluminum frame, 4'x4'; bathroom sink; electric stove, Tappan, bronze color; large picture frame w/glass. Nelson, 881-0148.

SAXOPHONE, E-flat alto, Holton, w/case, reeds, neck strap, etc. \$95. Tidmore, 298-9164.

AQUARIUM, O'Dell, 30-gal. w/stand, everything complete, \$95. Miller, 266-7563 after 5.

BABY STROLLER, \$15; Gerry baby carrier, \$10; high chair; \$7. Spoeneman, 292-2722.

4-CHANNEL SYSTEM, 240W Lafayette receiver, Garrard turntable, Teac, reel to reel, Model A1200U, 4 Utah speakers, \$1200. Eagar, 298-0522.

RHODES 10-speed bike, 1 yr. old; Winchester pellet rifle; 2 pr. western boots. Trollinger, 268-3414.

CLARINET, LeBlanc B-flat w/case, \$100. Goodwin, 266-6216.

BIKE RACK; 2 queen size bedspreads, green, beige; 2-pair matching drapes, 110 x 48 and 136 x 87. Adams, 881-6836.

CHILDCRAFT BOOKS, set of 15; Jr. Classics, set of 10; Bible Story books, 8; group of other books. Smith, 299-7151.

STUDENT VIOLA, 14", \$110. Beattie, 898-2706.

TRUMPET, Getzen Capri, \$200; Bundy trumpet, \$150. Parrish, 299-2043.

DRAWING TABLE, 30"x42", adjustable, w/self-aligning horizontal square, \$50; free kitten, taffy, 10-wks. old, box trained. Stevens, 299-6086.

BUILDING MATERIALS, used, kitchen counter top, 12-pane steel casement

window, sinks, screen door, exterior door, brick, wire. Freyermuth, 299-2053.

WESTERN SADDLE, breastplate, leather halter, English girth, Pelham bit, other tack. Cafferty, 898-3102.

FOUR TIRES, rims & hubcaps for '73 VW bug, \$60; mufflers for '73 bug and VW bus, \$5 each. Jones, 296-1755.

TRANSPORTATION

'71 YAMAHA Enduro, 250 cc, buddy seat, 6500 miles, \$595; Encyclopedia Americana, '58 edition, complete w/dictionary, \$10. Coalson, 298-0061.

BUG SPRINT KART, racing setup, IKF 80cc McCulloch class, \$300. Palmer, 299-5082.

'75 MERCURY Monarch Ghia, 5700 miles, loaded; refrigerator/freezer, \$50; ping pong table, \$15. Hopper, 292-3059.

'71 CHEVY Suburban, factory AC, AT, PS, PB, 350 CID, radials, \$1500. Hawkinson, 281-5239.

'73 NOVA, 6 cyl., 2 dr., \$225 below book; electric guitar and amplifier w/speaker. \$70. Chavez, 831-2296.

'73 CHEVY Cheyenne 3/4 ton, AC, AT, PS, PB, positrack, 2 tanks, cab height rack, 11,500 miles, \$4195. Pappas, 881-3440.

GREMLIN X, '71, new rear tires, \$200 under book, \$1350. Shepherd, 299-9066.

'72 FORD van, Club Wagon Custom, V-8, AT, PS, PB, AC, CB and AM/FM radios, book \$3450, sell for \$3295. Furney, 298-5803.

'55 FORD dump truck, 8 yd., 2 speed axle, \$900. Jaramillo, 865-7081.

'66 MUSTANG, AT, PS, PB, convertible, mag wheels, \$500. Angel, 299-4615.

'59 T-BIRD, restored classic, light blue with red and

cream interior, \$2500. Chacon, 294-0065.

'71 HONDA CT-70 trail bike, 1900 miles, \$225. Hole, 268-5667.

'74 KAWASAKI, 175cc Enduro, 60+ mileage, 4400 miles, \$600. Stanley, 296-7623.

'68 DUCATI, 450 hp, new clutch, cable. Spatz, 299-0410.

'68 PLYMOUTH Satellite wagon, factory AC, R&H, 318 V-8, 80,000 miles, no dents, new paint. \$700 or best offer. Christenson, 881-1903.

REAL ESTATE

5-BDR., 3-bath, 3-fireplace; adobe in Dietz Farms, Cleff built, 1 1/2 yrs. old, mountain view, \$79,500. Stark, 243-3110.

MOBILE HOME, '71 Skyline, 12x44, AC, skirting, patio cover, carport, landscaping, just outside Wyoming gate. Huerta, 293-2086.

WANTED

CLARINET for beginner. Cyrus, 898-4038.

SAIL & RIGGING from a "Kool Boat." Baxter, 344-7601.

POWER STEERING components for '59 or '60 Ford or Mercury. Chacon, 294-0065.

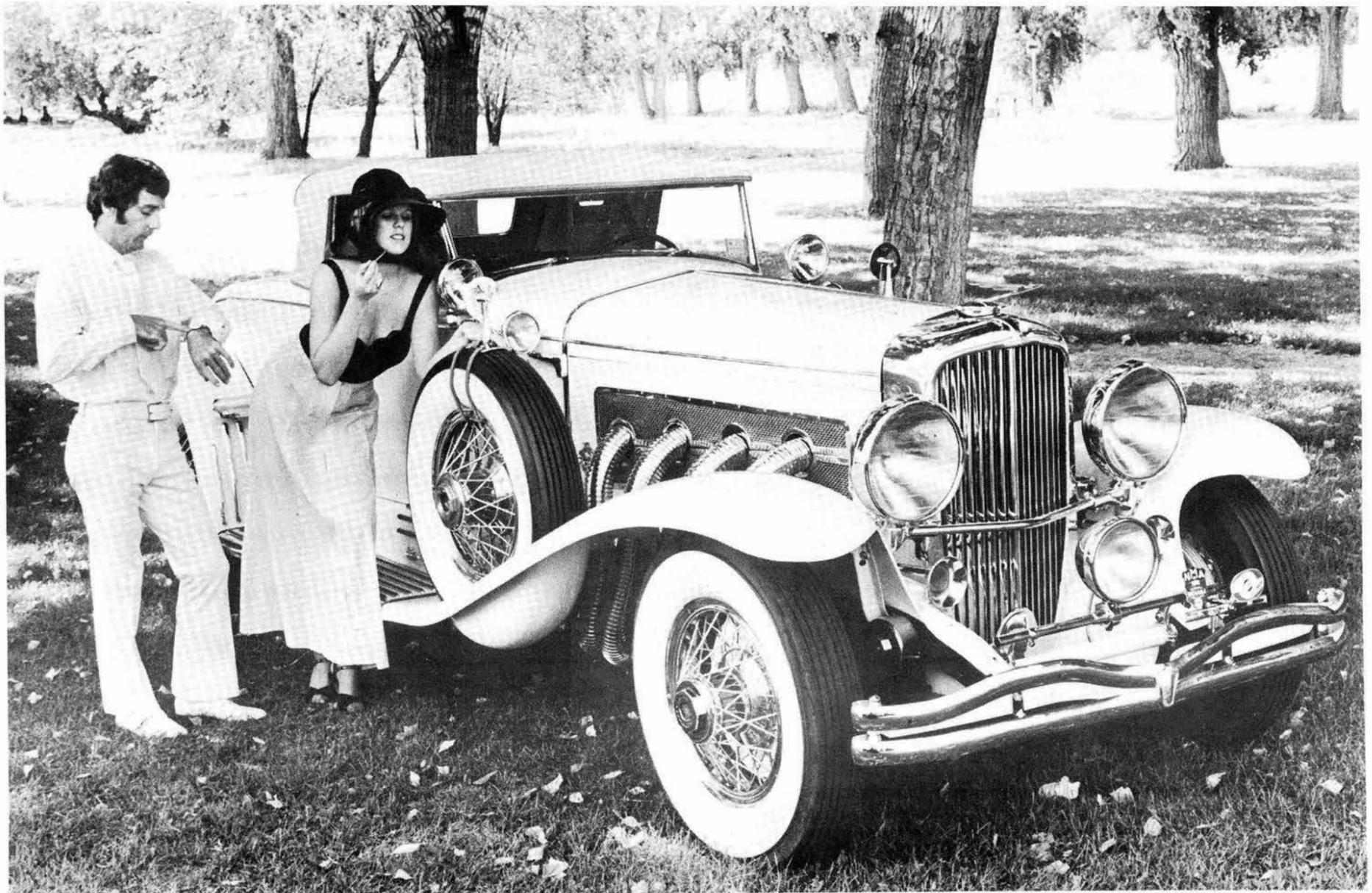
COFFEE TABLE and matching end table in good condition. Holloway, 294-0269.

FIFTH SANDIAN for car pool from Bosque Farms Loop Road. Hamilton, 869-2719.

POOL COVER for 18-ft. diameter swimming pool; old stained glass windows; bean pot for Franklin stove. James, 344-7854.

HOBBY TELESCOPE, moderately priced. Barnaby, 265-4353.

OUTBOARD MOTOR, lightweight, 4-5 hp. Mattox, 296-4149.



THREE CLASSIC BODIES (well, two anyway) — Bob Lassiter's (3132), waiting; Robyn Reeds', primping; and a '32 Duesenberg, just being. That's a scene with real appeal. For a different kind of a Peel, try the Shrimp, mañana. (If you missed

the reservation deadline, despair not. Watch this space for the next one — and be the first on your block to clutch a ticket or two.) (Speaking of clutches, the Duesenberg has a great one. For that matter, so does . . . well, let it pass.)

I'M — sorry. It's too late to get tickets for tomorrow night's Shrimp Peel. But if you're proud possessor of a pair, pulchritudinous panoramas of palatables await your pleasure. Shrimp, of course, plus fried chicken and more. (If you can bring a female Southern shrimp-shucker, you'll be one of those for

whom the belles peel.) During the post-Crustacean Period, you'll enjoy dancing together to Together.

TAKEN — a mini-vacation lately? Try the Happy Hours each Friday. Tonight, the C-Club staff will be frying up those chickens, barbecuing those ribs, blackening the eyes of those peas (Bam! Kapow!), sticking the corn back on those cobs ("stay in line there, kernels") and introducing *hushpuppies*, made from a recipe smuggled out of Georgia hidden in a bottle of moonshine. For dessert, some Honeydrops, a trio of makers of music of delight. Then, round the bend where your waistline was, comes the Midnight Special for dancing till Don (and Cathy and George and Alice and everybody) is ready to go home.

Next Friday, it's a Mini-Super Buffet. C-Club Manager Dave Foster says, "That means it's not as super as the Super Special-Occasion-Buffer (or SOB), but it's Superer than the common, ordinary, garden variety, run-of-the-mill buffet. We'll have three entrees . . ."

"Three what on trays, Dave?"

"Three . . . we'll have three main dishes: beef, ham, and shrimp Creole. We'll carve all but the Creole by hand . . ."

"Wouldn't a knife make it easier, Dave?"

"You know, you may have a point there . . ."

On stage, Denny and His Dextrous Digits will do "Arias from the Great (Soap) Operas." And then Natural Persuasion will persuade you naturally to dance.

Remember: Fridays — food, friends, fun at the Club.

* * *

ABACK — door to the Bubble (that's the swim pool with the hot air cover-up, just like

Watergate) isn't open anymore. Use the Basket Room entrance. Why bother? Because Winter Swimming is fun when you don't have to be a polar bear. Ask about Winter Swimming at the Office.

BY — the 30th, Mazatlan trippers should be in Anticipatory Ecstasy. But, alas, they'll be at the Club at 7:30 for final detailed instructions, questions/answers, pre-trip packets, and lessons in how to drink margaritas.

EVERY — year the deals on ski trips get bigger and better, thanks to the Ski Club. The

FRIDAY	SATURDAY
19 — HAPPY HOUR SOUTHERN BUFFET Adults \$2.95 Under 12 1.95 Honeydrops On Stage MIDNIGHT SPECIAL	20 — SHRIMP PEEL Cocktails @ 6 Dinner @ 6:30 Dance @ 8:30 TOGETHER Reservations Only
26 — HAPPY HOUR MINI-SUPER BUFFET Adults \$3.25 Under 12 2.25 Denny On Stage NATURAL PERSUASION	27 — TEEN DANCE 7:30 - 10:30 BLUE SNOW Members 25¢ Guests 50¢ (LOBO BUS - 6:45)

Club has its fall line of travel packages and a series of events for beginning skiers available now. \$6/family; \$7 later.

AFFRONT — shamelessly those non-gregarious types who don't take the bus to the Lobo games. There's no need to be a Lone Wolfer when a bus makes getting to and fro so effortless. Cheap too — 50 for members, \$1 for guests. Be there on the 27th for Happy Hour before the 6:45 departure time.

MORE INFO — 265-6791.

