

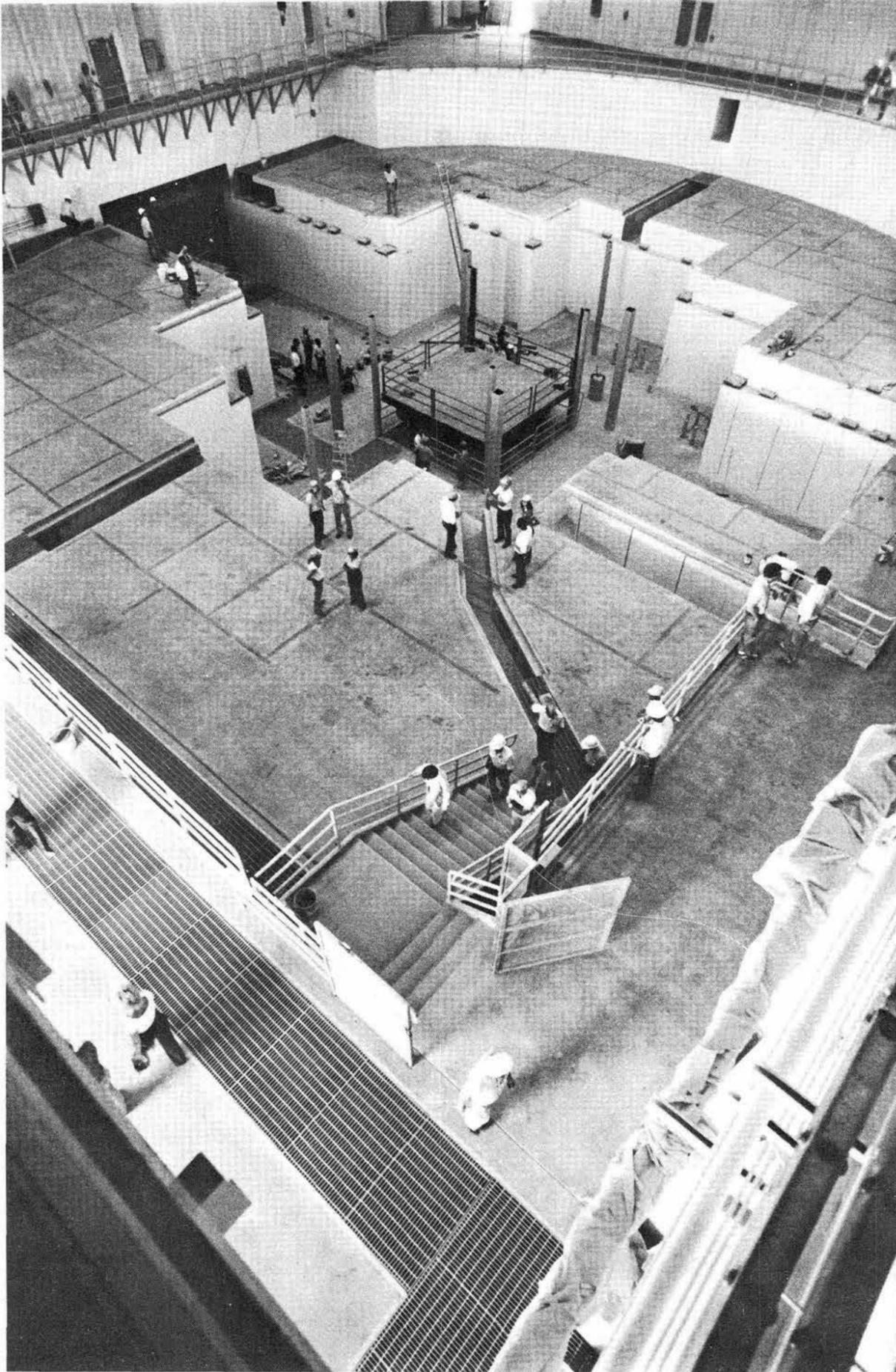


LAB NEWS

VOL. 35 NO 16

SANDIA NATIONAL LABORATORIES

AUG. 5, 1983



SOMEDAY this giant tri-level space in Bldg. 983 will house a world-class accelerator, the largest of its type in the world (LAB NEWS, July 8, 1983). Called PBFA-II (for Particle Beam Fusion Accelerator, second version), it will deliver (for a few billionths of a second) some 50 times the world's electrical generating capability. Some comparisons:

	PBFA-I		PBFA-II	
	In	Out	In	Out
Voltage	100 kV	2-4 MV	100 kV	2-16 MV
Power	70 kW	30 TW	200 kW	100 TW
Energy	4 MJ	1 MJ	14.5 MJ	3.5 MJ
Duration	90-120 s	40 ns	120 s	40 ns

(kV - thousand volts; MV- million volts; kW - thousand watts; TW - trillion watts; MJ - million joules; s - seconds; ns - billionths of a second). The first multi-module shot is scheduled for January 1986.

Radiation-Resistant

Photodiodes Developed

A new type of photodiodes — 20 to 30 times more resistant to the effects of x-ray pulses and significantly more resistant to long-term exposure to gamma radiation than commercially available silicon devices — has been developed by a team coordinated by Jamie Wiczer (1142).

Photodiodes, or photodetectors, are similar to solar cells — they are semiconductors that convert light directly into electrical current. However, instead of being designed to maximize the conversion of sunlight into electrical power, photodiodes accurately convert a time-varying optical signal into a similar time-varying electrical signal. In contrast to solar cells, photodiodes can be very small — a diameter smaller than the thickness of a straight pin.

These devices are often used as part of an optical fiber communication system in which a signal from a light-emitting diode (LED) or laser diode propagates through an optical fiber to a photodiode detector. Such devices are needed where intense x-ray pulses are a problem (weapons-related devices) or where radiation levels are routinely high (in nuclear reactor instrumentation or some earth satellites).

Silicon photodiodes in these applications are susceptible to radiation-induced electrical current noise. Efforts to reduce radiation-induced noise in silicon photodiodes have typically involved size reductions that sacrifice optical response.

The Sandia team has developed a way to reduce significantly this radiation-induced noise so meaningful signals can be transmitted in these harsh environments.

“With the new photodiodes in an optical fiber communication system used in an ionizing radiation environment, we can achieve signal-to-noise ratios that equal those of a system using silicon photodiodes but with lower optical power levels, less stringent electrical requirements, and substantially less shielding,” says Jamie.

A key to the new device's radiation hardness is an optically active region (the layer of a diode that absorbs light and converts it to electric current) less than one micron thick. Silicon photodiodes typically need an active region tens to hundreds of microns thick to produce an equivalent optical response.

By making the active region thin, the team was able to, first, limit the volume of the device that is subject to ionizing radiation and thus reduce unwanted radiation-induced current. This is possible because the gallium arsenide active layer has a “direct” bandgap. (Devices with a direct bandgap are more efficient absorbers of light than those with an indirect bandgap.) Second, the new photodiode has a double heterojunction structure. The electric fields created by such a structure also contribute to its insensitivity to ionizing radiation. (A heterojunction occurs at an interface between dissimilar semiconductor materials within the same crystal lattice.)

These internal electric fields essentially

(Continued on Page Two)

Antojitos

The Perils of Literacy--My favorite bumper sticker is "ILLITERATE? WRITE FOR FREE HELP." Those of us of the print persuasion chuckle over such left-handed (about which more below) tributes to our sensory superiority, but reading sometimes causes a "What was that again?" reaction --a sort of verbal doubletake that can cross your eyes. Three recent examples--

1. From the Catalog of Courses in the Individualized Learning Center: "Orson Wells [it's Welles] is host of this tape [Who's Out There, a videocassette] which examines the question of the existence of life in the university." Now that's a question that deserves all the attention it can get.
2. From a want-ad in the Albuquerque Journal on 7/21: "New Mexico Highlands University announces an opening for a tentative full-time, temporary position for the coming school year with some possibility of renewal. M.A. required; candidates lacking the Ph.D. must present very substantial experience...." My advice to the successful applicant--rent, don't buy.
3. From AT&T News of 7/14: "In that regard, AT&T News, the all-employee publication, will, as a result of divestiture planning, move, effective with this edition, from a biweekly publication schedule to a monthly publication schedule." And what do you become after such a surfeit of commas? Commatose.

* * *

Lefthandedness and Language--While it's true that language was undeniably constructed by males, the task was just as undeniably restricted to right-handed males, a smug little breed content in its conviction that right makes Right. Consider:

1. Our word sinister, with all its villainous overtones, comes directly from the Latin for "on the left side." The folk etymology here is that when good (i.e., right-handed) people shifted their weapons to their left hands in order to greet you with a handshake, you could be reasonably sure you weren't going to be clubbed (with any real efficiency anyway). With left-handed folk you couldn't be sure. Now that's sinister!
2. Our word gauche (meaning crude, lacking the social graces) comes from the French for--you guessed it--left-handed.
3. Our word dextrous (now meaning skillful and competent with the hands) comes originally from the Greek word for "situated on the right," an obvious reference to the hand of skill and competence. (It would, of course, be great to be ambidextrous--equally skilled with both hands. But even those who would give their right arms to be ambidextrous seldom achieve it.)

Yes, some recent research suggests that the right side of the brain is dominant in left-handed people, leading to the conclusion that only left-handers are in their right minds. Now that's a true left-handed compliment.

●BH

Ask not for whom the bell tolls and you will pay only the station-to-station rate.

Continued from Page One

Photodiodes

isolate the diode's electrically active region from the substrate, where unwanted radiation-induced current carriers are created.

To fabricate these radiation-resistant photodiodes, liquid phase techniques are used to grow layers of different arsenides on a gallium arsenide substrate.

The new photodiodes and commercially available silicon diodes were tested and compared in a pulsed ionizing radiation environment at Sandia's REBA, a flash x-ray test facility. In terms of the ratio of a diode's optically induced signal current density to the ionizing radiation-induced current density, the best-performing Sandia diode proved to be 25 times better than the best commercially available silicon devices.

Experiments to determine the permanent damage to photodiodes caused by long-term gamma radiation exposure were conducted in Sandia's Gamma Irradiation Facility (GIF). Five types of Sandia diodes and seven types of commercially available silicon diodes were exposed to total doses up to 100 megarads (Si). Both sets of devices showed moderate degradation in optical sensitivity -- principally materials damage that resulted in less efficient conversion of photons to electrical current. But the optical response of Sandia's diode was demonstrated to be at least as insensitive to the effects of long-term radiation exposure as the best performing silicon devices tested and the electrical characteristics of Sandia's diode degraded considerably less than did silicon diodes.

The development of the new photodiodes resulted from an awareness that the performance of such devices was likely to be significantly degraded by an ionizing radiation pulse. A joint effort involving the skills of several Sandians and a series of analytical and experimental approaches led to the new diodes. Key people, in addition to Jamie, were: Chuck Barnes, Russ Keefe, Len Hansen (all 1142), Ralph Dawson, Gordon Osbourn, Richard Chavez, Jay Snelling, and Tom Plut (all 1141). Several members of the team also played major roles in the development of strained-layer superlattices (LAB NEWS, June 12), a program that has some similarities to the photodiode work.

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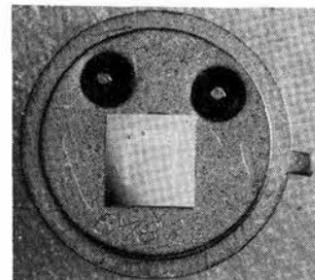
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NEW PHOTODIODE (above) is exceptionally resistant to effects of ionizing radiation. The diode itself (the squared horse-shoe portion of the device) is actually only 1 mm (0.0040 inch) across. Two of the device developers are (left) Russ Keefe and project coordinator Jamie Wiczer (both 1142).

They Don't Get Paid, But . . .

They're Amply Rewarded

VOLUNTEER — Webster's definition: "One who enters into or offers himself for a service of his own free will." To many organizations and agencies, volunteers — male and female — are the lifeblood of their operation. If it weren't for these people, the majority of the charities, service organizations, and even city agencies such as libraries would cease to function. Sandians are well aware of that fact, and many of them go beyond awareness into action.

Volunteering covers the whole spectrum of tasks — from "go-fer" type errands to running large budget projects such as airshows, rodeos, parades, and million-dollar fund-raisers. The Tri-Valley has a never-ending need for hundreds of volunteers every week. It's not surprising then that a few years ago a new agency sprang up to fill those needs. That organization, the Valley Volunteer Center, now has several paid staff members as well as hundreds of volunteer "connections" with clubs, governmental agencies, and service and charitable groups as well as schools and hospitals.

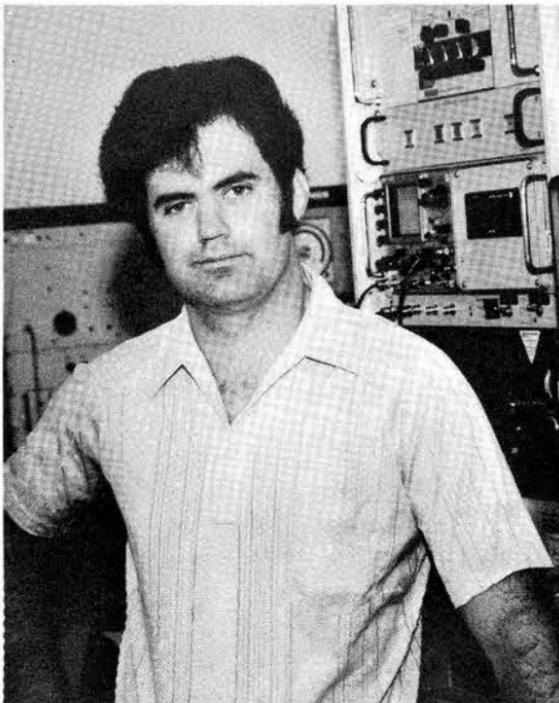
Sandia recently surveyed employees to determine their willingness to volunteer their skills and received a fair response from those interested in a variety of fields. Several people also listed current outside volunteer activities that show a diversity of talent on the part of Sandians.

Such avocations as volunteer firefighter, reserve police officer, symphony musician, scoutmaster, church youth leader, CPR instructor, amateur radio communications worker, hospital aide, and PTA officer are among the many mentioned by Livermore employees.

Today the LAB NEWS takes a closer look at four volunteers and their areas of interest as a representative sampling of what free time opportunities for service there can be.

* * *

Scott Anderson (8413) was recently named chairman of the Social Concerns Committee for the City of Livermore. A one-and-a-half year member of the committee,



SOCIAL CONCERNS committee head Scott Anderson (8413)



4-H LEADER Donna Barnhouse (8332)

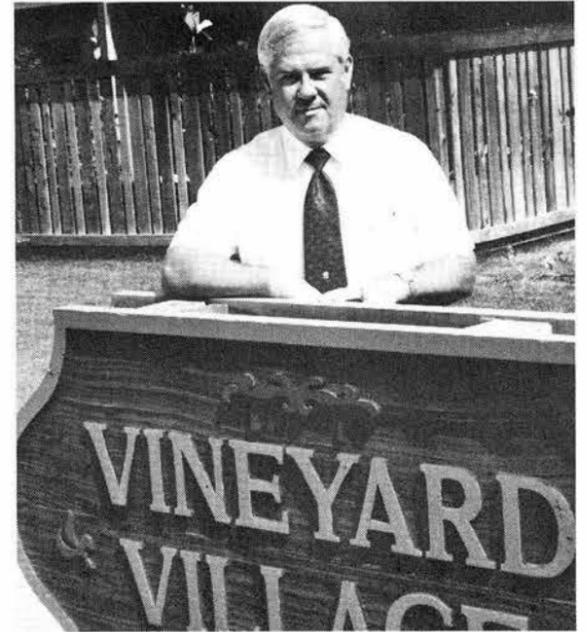
Scott enjoys the opportunity to study issues regarding housing and community development funding, problems of the homeless in the valley, and social service agencies. The group is an advisory body to the city council and also conducts workshops such as the recent "You and Your Aging Parents" for community residents. Scott also is helping to organize the Neighborhood Council concept in Livermore. This nationwide loose-knit organization offers a program to organize neighborhoods as support groups and to provide a communications link between such geographical units and outside agencies. He is looking for more people with an interest in this program and would welcome fellow volunteers into it.

* * *

Donna Barnhouse (8332) has always had an interest in animals. As a result she is an assistant leader for the Del Arroyo and Crane Ridge 4-H groups. She works with her daughter who is a teen leader of the Del Arroyo group in rabbitry. Donna chauffeurs



SOCGER OFFICIAL Ken Mitchell (8168)



HOUSING PROJECT treasurer Bob Crow (8216)

4-Hers around the Bay Area to rabbit shows and rabbitries. She also works with another Sandian, Dick Finn (8274), as swine group leader for Crane Ridge. Donna's other sparetime activities have included being a scorekeeper for the Granada Little League and working in Cub Scout pack fund-raising campaigns.

* * *

Bob Crow (8216) serves on the board of directors of the Interfaith Housing Inc. in Livermore, which provides two housing projects for the elderly and handicapped. For the past three years Bob has also been treasurer. He and his wife Jenny became involved in this volunteer effort through service on the outreach committee of St. Bartholomew's Episcopal Church. Retired Sandian Jerry Maloney was one of the original instigators of the housing agency, which is considered a "model project" by the Department of Housing and Urban Development in Washington.

* * *

Ken Mitchell (8168) has been involved in the Livermore soccer program for the past 13 years as a coach and referee. Over the last 10 years he has also instructed adults on how to teach soccer to youth. He is a member of the California Youth Soccer Association (CYSA) state coaching staff. As a part of that activity, he took the state's Under-17 select team to Sweden and Denmark in 1980. His team captured the Uddeholm European Cup Tourney. Ken served as the first coach coordinator for the combined Livermore Soccer Club in 1975 and has been organizing coaching clinics around the state for the CYSA. He is proud to say that all five of his children, now ranging in age from 10 to 27, have played soccer as well.

* * *

The four volunteers highlighted in this article are just a few of the many at Sandia who spend their free time in helping others. Those who have not yet filled out the volunteer survey form or who need a copy can contact Personnel in M021.

High Speed Exchange of High Technology



Cecil Land (1112) was the recent recipient of a research fellowship awarded by the Japan Society for the Promotion of Science, a government-industry program which awards about 200 short-term fellowships annually to eminent senior scientists from around the world.

Cecil presented 16 formal research seminars during a 28-day period (June 12 - July 9) while visiting 23 Japanese research institutions — government, industrial, and university laboratories.

Cecil's presentations described his recent research with emphasis on those aspects of most interest to the particular audience he was addressing. There were no interpreters. His audiences were technically knowledgeable in English. He discussed image and information storage in ion-implanted and thermally diffused PLZT ceramics and electrooptic devices fabricated from PLZT.

A Distinguished Member of Technical Staff, Cecil holds 10 U.S. patents for ferroelectric and electrooptic devices. Since the first prototype device using the electrooptic imaging properties of PLZT ceramic was developed in 1971, the material has been much improved. In recent experiments, Paul Percy (1110) and Cecil have used ion-implantation and thermal diffusion to increase the photosensitivity of the material by more than four orders of magnitude.

In Japan, Cecil was particularly interested in the advanced work being done at industrial research laboratories using thin-film, single crystal variations of PLZT ceramics. The materials are being developed for use in integrated optics circuits. They will be used also in fiber-optics communications systems.

"The commercial possibilities are overwhelming," Cecil says. "These devices will be in great demand with the advent of fiber-optic trans-oceanic communications cables and with the development of optical handling, storage, and transmission of information in large computer networks.

"The entire technology associated with optical information handling, storage, and transmission has a high level of interest in the Japanese scientific community — perhaps as high as that of any other area of applied science."

At Matsushita Central Research Labs in Osaka, Cecil saw a possible commercial adaptation of a concept first explored at Sandia — three-dimensional television.

"It is quite realistic," Cecil says. "What you see is an excellent three-dimensional scene apparently extending both inside and outside a standard television cabinet. I ducked several times while watching demonstration video tapes."

The appearance of three dimensions is achieved by photographing a scene with two video cameras positioned so as to obtain stereoscopic perception. The cameras are timed to alternate transmission of images

many times a second, but only one image is transmitted at a time. On a standard television set, the screen receiving this alternating image appears blurred and fuzzy to the naked eye. However, the viewer is provided with wireless, remote-controlled goggles resembling Sandia's flashblindness protective goggles and employing similar PLZT material which can be switched from transparent to opaque in synchronism with the transmitted images.

The goggles switch from left eye to right in time to match the alternating images being transmitted by the stereoscopic cameras. The switching speed is fast enough to minimize flicker, thus the brain "sees" a continuous and sharp three-dimensional image.

At Sony Development Labs in Tokyo, Cecil also saw a completely new PLZT color separator filter used in front of the view-screen of black and white viewfinder monitors on vidicon cameras to convert this black and white image to color. "Very impressive," Cecil says — a phrase he also applied to the ceramics research at Toyota Central Research Laboratories. However, he was not shown the firm's new ceramic engine development.

"Absolutely fantastic," is the way Cecil described the laser audio disks of Sony and Matsushita. "The optical recording and optical playback of sound in digital rather than analog format appears to be the future for sound recording," he says. "The dynamic range and noise suppression is at least 100 times better than that of conventional tape or records."

"In Japan, business is conducted differently," Cecil continues. "The laser audio disk is commercially very valuable. Sony holds the patents, but they've licensed their closest competitor, Matsushita, to manufacture commercial units. This is unheard of in the U.S."

Cecil's host in Japan was Professor Terutaro Nakamura of the Institute for Solid State Physics, University of Tokyo.

"I was treated like visiting royalty," Cecil says. "The hospitality was red carpet and black limousine all the way. You could develop some expanded ego problems. My wife Betty who accompanied me (but did not attend technical sessions) kept saying, 'Calm down, remember where you're from.' But I could get used to that kind of treatment . . ."

feed back

Q. Conducting business over the phone has become a serious problem. The FTS system is overcrowded and simply does not work in some areas (the New Jersey and Washington areas, for example). Until recently, we were able to dial direct (9-1-number) when necessary. Automatic equipment now prevents that. The commercial operators now say our lines are restricted and will only place collect calls.

Even the FTS operators are frustrated. They are very courteous, but seldom are able to help. I usually give up after 12 to 20 attempts to place a call.

What alternatives do we have?

A. Direct Distance Dialing (DDD) access to locations served by on-net FTS or automatic off-net FTS was restricted by DOE/AL because information obtained from Station Message Detail Recording (SMDR) data concerning calls from the KAFB No. 1 A-ESS indicated that DDD was being used without sufficient attempts to use FTS.

The General Services Administration is aware of some of the shortcomings of the FTS network. GSA is currently conducting a survey to evaluate the quantitative and qualitative degradation of the system. The current standard for FTS calls is for an average of 95 calls out of 100 attempts to be completed without encountering a system busy.

When it is necessary to place a toll call because the FTS is not available, tell the long distance operator that the call is a Sandia Laboratories call. The long distance operators have been instructed to process these calls without challenge. If you encounter problems, tell Jim Porter on 4-7640.

R.J. Detry - 2600

Q. A dangerous traffic condition exists in the evening near the Eubank gate. The traffic coming from the south on 20th Street has a difficult time determining whether there is a vehicle in the south lane of G Street because vehicles often pull into this lane as they approach the gate.

I think the traffic on G Street should keep to the left so the traffic from 20th Street could use the right lane.

A. We are investigating the possibility of having eastbound motorists merge left as you suggest. A traffic count in December 1982 did not indicate the need for a change. However, we will be conducting a new traffic count; and if these data indicate a change is necessary, we will make the recommendation to the KAFB traffic engineer.

R.W. Hunnicutt - 3600

A Comment. I just finished reading complaints about parking in a recent LAB NEWS. Sandians should be thankful they don't work downtown, as my wife does. If she parks underground, she walks only two blocks but she pays \$3 per day. If she parks in one of the lots aboveground, she walks four to 10 blocks and still pays \$1 per day. The parking here is free and I appreciate it. I'm not complaining about my wife's parking situation either. I'm thankful that she has a job, that we have a car for her to drive, and that she has two legs that she can walk on. If people would only stop to think about how good they really have it, they might not complain so much about so little.

Take Note

Those Sandians of an inventive nature may be interested in knowing that a state-wide group, tentatively called the NM Innovation and Technology Association, is forming. The primary organizer is Al Goodman, president of the local inventors club; others include Alex Mercure, head of the state's Commerce and Industry Department; Bill Gross, professor of engineering at UNM; and Bob Stromberg (400), Sandia's technology transfer person. The purpose of the new association is to link those people throughout the state who are interested in innovation, the marketing of new concepts, technology transfer, etc. The first meeting is at 9 a.m. on Aug. 6 in Room 218 of the Mechanical Engineering Building at UNM.

* * *

The lunchtime fun continues throughout August with KAFB's Morale, Welfare, and Recreation Division presenting the following free concerts and entertainment from 11 a.m. to 1 p.m. on Wednesdays at the Parade Grounds:

Aug. 10 — Big Band Sounds (20 pieces); Demonstrations: Painting techniques and Art Display

Aug. 17 — Voyager Band (top 40); Face painting; Demonstration: Airbrush & Ceramics

Aug. 24 — Alma (Jazz band); "Grover" & Mike (puppetry); Demonstration: Tole Painting on Wood

Aug. 31 — Donny & The Beamers Band (music from the 1950s); Magic Show; Demonstration: Calligraphy

For more information about these events, call Que Pasa Recreation Center at 4-5420.

* * *

The Society for the Advancement of Material & Process Engineering (SAMPE) has established a Fellows Program to provide recognition of members for distinguished contributions in the fields of materials and processes and to develop a broadly based forum for technical and professional leaders to serve as advisors to the society.

Gene Frye, Division Supervisor (7472), is among the recipients of the SAMPE Fellows Award who will be honored at a formal dinner in October in Cincinnati, during the 15th National SAMPE Technical Conference.

Selection criteria for this award include outstanding contributions to the field as reflected in published papers, books, patents, inventions and professional recognition; sustained high level performance; and chapter and society activities.

* * *

The South 14 Bookstand — Could you survive out there with nothing in your pack except one slim book? If the book was *Edible Native Plants of the Rocky Mountains* by Harrington & Matsumura (UNM Press), you'd have a chance. It starts off with the bad news, Poison Plants, but it's on to brighter perspectives after that: Potherbs (like spinach), Young Shoots (like asparagus), Salads (like lettuce), Roots and Underground Parts (like radish), Fleshly Fruits (like apple), and more. If not a



STAN LOVE (3522) and GARY SCRIVNER (2322)

Supervisory Appointments

STAN LOVE to supervisor of Education and Training Division II 3522, effective July 15.

Stan came to the Labs in 1962 as an ESA doing component evaluation work in the quality assurance organization. Later, as a staff member, Stan developed laboratory and flight test programs in QA. He then moved into the energy field; he was named project leader for an underground coal gasification program in 1978. For the past few months, as part of a cooperative program between Sandia and UNM, Stan has been acting director of UNM's electronics technology program.

He earned an associate degree in electronics technology from Penn State and a bachelor of energy degree from UNM in energy and power systems. Stan enjoys camping with his family and working with young people — a project of his evening Op-

timist Club. Stan and his wife Shirley have five children. They live in NE Albuquerque.

* * *

GARY SCRIVNER to supervisor of Electromagnetic Applications Division 2322, effective July 15.

Gary joined Sandia in 1964 as a member of the Technical Development Program. He worked primarily in the fields of dynamic analysis and component vulnerability. Gary left the Labs in 1973 and for five years worked on satellite vulnerability for the Computer Sciences Corporation. Since returning to Sandia in the fall of 1978, he's worked with the Phase I/Phase II group in weapon development.

He received a BS in engineering science from Notre Dame and an MS in ME and PhD in nuclear engineering, both from UNM. Gary enjoys racquet ball, reading, and outdoor cooking. He and his wife Mary Jo have two children and live in the NE heights.

Retiring



Jim Mashburn (5121)



Alexander Beck (7652)

cornucopia, our native plants would get you by (if you're not a fussy eater). The book is well illustrated, and the author even provides recipes. In paperback, it's \$9.95 at the LAB NEWS office in Bldg. 814.

* * *

Retiring this month and not shown in LAB NEWS photos are Louis Narvaiz (2421), Allen Hall (7485), and William Roherty (334).

Deaths

Warren Merritt of Command and Control Division 2335 died July 22 after an illness. He was 62.

He had worked at the Labs since February 1948.

Survivors include his wife and two daughters.

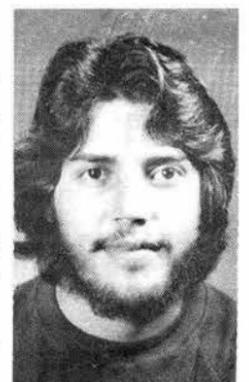


* * *

Joe Estrada, a machinist apprentice in Division 7481, died July 25 after a long illness. He was 26.

He had worked at the Labs since September 1978.

He is survived by his wife and daughter.



Events Calendar

- Aug. 5-28 — "The Subject was Roses," Vortex Theatre, Fris. & Sats., 8 p.m.; Suns., 2:30 p.m., Buena Vista at Central, across from UNM.
- Aug. 6-7 — Collectors Show Case, Ag. Bldg., State Fairgrounds, 265-1791.
- Aug. 7 — La Luz Trail Run, 8 a.m., Juan Tabo picnic grounds, 298-9330.
- Aug. 11-15 — 109th Annual Our Lady of Belén Fiesta; parade, carnival, dances, Our Lady of Belén Parish, 1-864-4385.
- Aug. 11-14 — 62nd Annual Intertribal Ceremonial, more than 50 Indian tribes; parades, dances, rodeos, arts & crafts, food. Red Rock State Park, Gallup. 1-863-3896.
- Aug. 17 — "Ceremonial Patterns in Navajo Weaving"; discussion of patterns used in weaving, using examples from museum's collection, Maxwell Museum of Anthropology, 277-4404.
- Aug. 18-20 — Bernalillo County 4-H Fair, State Fairgrounds, 265-1791.
- Aug. 19-21 — Antique Show & Sale, Convention Center, 766-7660.
- Aug. 19-21 — Bike Tour, guest ranch at Cuba as headquarters; ride into surrounding country each day; leave Albuquerque late Fri., return Sun., NM Touring Society, 294-4038 or 883-1485.
- Aug. 19-21, — Jazz Showcase in Telluride. 303/728-3614.
- Aug. 19-21, 26-28 — Albuquerque Civic Light Opera, "Anything Goes," Cole Porter musical, 8:15 p.m., Sun. matinee, 2:15 p.m., Popejoy.



HELL'S BRIEFCASE

Takeshi Imai, of São Paulo, Brazil, has filed a European-[patent] application ... on a unique form of personal transport ...

It describes a miniature motor cycle which folds down into a briefcase. The driver lets the train take the strain for the main journey. On arrival, he opens up the briefcase to reveal his personal transport. It looks rather like a motorized version of a child's two-wheeled scooter, with upright handlebars. But instead of scooting, the rider stands on two side plates, while a small petrol engine drives the rear wheel.

— *New Scientist*

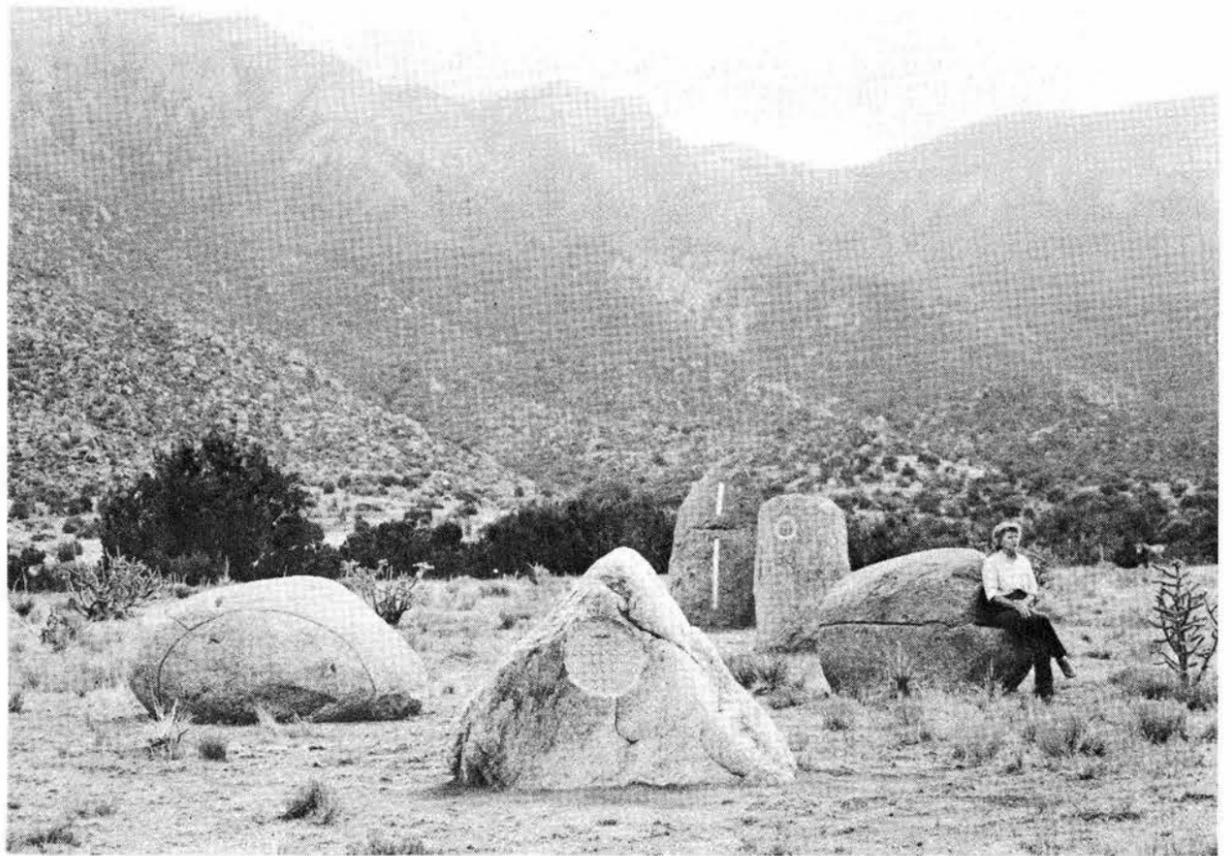
Retiree Roundup

Boredom Never Had A Chance

When Alan Pope retired from Sandia in 1977, he was worried that he would be bored with too little to do. He had planned to relax, play some tennis, and (with his wife Caroline) travel to visit their children. But just in case boredom started to creep in, he started his ninth book, "Modern Investing in No-Load Funds." Most of his other books were college texts on aerodynamics and wind tunnels.

Boredom never had a chance! Alan got on the lecture circuit on the subject of "energy" and spoke to 130 clubs across the country. More recently, he's traveled throughout the country to speak about investments and IRAs.

The revised edition of "Wind Tunnel Testing" is now on the market; Alan says the original version has been a world standard for 37 years. The John Wiley Company of New York agreed to publish his book on investing if he would double its size. Now called "Successful Investing in No-Load Funds," the book became available last



THE ELENA GALLEGOS LAND GRANT, with the Sandias behind and the city below, is the site of this memorial to Phil Tollefsrud. Artist Billie Walters rests on one of the granite boulders in her stone sculpture.

Stone Sculpture Commemorates Sandian

A 1% for Art project will be dedicated in memory of former Sandian Phil Tollefsrud on Aug. 6 at the entrance to the Elena Gallegos Land Grant. Phil died, at age 38, in 1976. His interest in open space and wilderness conservation contributed to the formation of the Open Space Task Force — a group of interested citizens working with the city government to foster open spaces for Albuquerque. Because the city obtained the Elena Gallegos land for open space use, it was fitting to use the 1% for Art project to create a memorial to Phil.

The 1% for Art program was created in 1978 and provides that projects in the city's capital improvement program include an amount for works of art equal to one percent of the total cost. Many of these commissioned art works are now in place in city parks and public buildings.

Local artist Billie Walters was selected by the City Art Commission to do the Tollefsrud memorial. Her proposal, one of 75, was submitted after she studied the site and learned as much as she could about Phil's life. The memorial could be called stone sculpture. Billie selected five large boulders, weighing several tons each, and had them placed in an amphitheater-like setting with a vista of the city below and the Sandias behind, beyond, and around. She enhanced the natural contours and markings on the stones to convey hints of symbolism — continuity, earth, moon or sun, and unity. The open space setting of the work, with the emphasis on its environment, is a fitting memorial for a man like Phil.

His friends and acquaintances, as well as the public, are invited to attend the dedication. The area, normally closed to the public but scheduled to open next year as a park and daytime picnic facility, will be open tomorrow from 8:30 to 2 p.m. Turn east off far north Tramway Blvd. and follow the signs. The dedication ceremony begins at 9.

month in bookstores across the country. (Alan says that anyone who wants an autographed copy, \$19.95, can give him a call on 255-6702.)

His activities are not limited to writing and lecturing. He serves on the zoo board, New Mexico Council on Crime and Delinquency, and the Crime Victim Assistance Association. He's a member of the NM Supreme Court's Committee for Court Improvements, the Law and Justice Committee of the Chamber of Commerce, and the Goals for Albuquerque Committee for the Mayor.

During their travels, Alan and Caroline found a place on the water near Punta Gorda, Fla., where they plan to spend the winter (watch out, fish; you'll be organized before you know it!).

Alan's message to prospective retirees is simply don't let yourself become bored — there's lots to be done if you show an interest.



The ECP

EMPLOYEE CONCERT PARTY

GEORGE DACEY and a belly-dancer are among the featured performers who will participate (separately) in the ECP-sponsored Employee Concert Party on Monday, Oct. 3, from 11:30 to 12:30 on the library mall. The deadline for signing up is Aug. 15. Contact Ellen Cronin (4-7019) for more information.

Fun & Games

Running — Master Runners Unlimited presents the Masters Magic 1-mile race for men and women 40 years or over on Aug. 21 at 8 a.m. The race starts at Park and Silver, covers one mile of paved road, and finishes at 2nd and Central. Age groups will be broken into five years each with custom medallions awarded to the first three finishers in each age group. Registration will be accepted until 1 p.m. on Aug. 20 at Gardenswartz Sportz on Menaul, Sun Sports, or Gil's Runnershoe World. Contact Jack Tischhauser (2640) on 4-1041 for more information.

* * *

Rifle and Pistol Matches — Sandia shooters won eight individual National and Regional awards in the 1983 NESRA-NRA Rifle and Pistol Matches. Don Bliss (ret.) won a rifle award. Pistol winners included Dave Bennett (6415), K.K. Ma (2331), Ray Mosteller (7132), Bob Davis (1221), and Wayne Ebaugh (5216). Psyched out by the pressure of knowing they stood to win Sandia T-shirts, the team shooters failed to produce this year. But just wait till next year!

* * *

Bowling — Sandia Bowling Association announces that the annual meeting of the membership will be held on Aug. 23 at 4:45 p.m. at the Coronado Club. Bowler-of-the-month prizes for the past bowling season will be awarded, and officers will be elected for the coming season. Door prizes and refreshments too. The meeting will be the kick-off for enrolling members for next season. So all bowlers (including retirees), please mark your calendars and make plans to attend.

* * *

Golf — Recent winners of the Fred Given Memorial Golf Tournament, held July 9 at the University South Course, were: first flight, Bill Lutgen (7652); second flight, Darryl Dew (contract employee, 1233) and third flight, Thomas Ashwill (3642). Leon

Chapman (6416) was low gross winner with his round of 74. The next Sandia Golf Association Tournament will be on Aug. 12 in Los Alamos. Members, watch for fliers.

* * *

More Bowling — The Women's Sandia Labs Bowling League has individual openings available for the fall season. If you are interested in joining a team, contact Bonnie Roudabush (7223) on 6-1662 or Dora Gunckel (6410) on 4-4052. League bowling will begin on Sept. 1 at 6:20 p.m. at Holiday Bowl.

* * *

Hotel Health Club — The Sandia Employee Recreation Program announces that a new twist has been added to the health/fitness rage in Albuquerque. A well-known hotel in town is offering a corporate membership for use of its health and fitness facilities. Some of the amenities include a universal gym, whirlpool, sauna, and swimming pool. If 10 Sandians join this program, the cost will be \$150 per person per year. Carla Chirigos (7472) is coordinating the effort; more information about the program is available at 4-9941.

* * *

Tole Painting — For persons who have taken the first class for beginners and wish to learn more about tole painting, an intermediate tole painting class begins Aug. 11. Call the Arts & Crafts Center, 4-0222, for more information.

* * *

Jewelry Fabrication — A class in jewelry fabrication will start Aug. 6 at the Arts & Crafts Center. For more information, call 4-0222.

* * *

Aerobic Dance — A short (six-week) aerobic dance class will start Aug. 8. Classes meet Mondays and Wednesdays from 9:30-10:30 a.m. or 5:30-6:30 p.m. at the Coronado Club ballroom. Donna Ness is so dynamic you'll have fun as you dance your way to fitness. More info from Donna at 255-6314 or 293-0316 — or just show up at the first class.



News

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

KNME-TV5 is holding its summer pledge drive this month. Sandia's slot for "phone friends" to assist with the on-air drive is Sunday, Aug. 28 from 1:15 to 6:45 p.m.

RIO GRANDE ZOO is looking for weekday docents to give animal-oriented talks at schools, libraries, and senior centers, as well as at the zoo. An introductory coffee for prospective docents will be held on Tuesday, Aug. 16 at 10:30 a.m. in the zoo barn. Admission is free.

AMERICAN CIVIL LIBERTIES UNION is holding its fund-raising "Adventure Auction" on Saturday, Sept. 24, from 5 to 10:30 p.m. at the old airport terminal. ACLU needs persons to help with errands now and to be stage hands during the auction.

UNITED WAY is recruiting volunteers for "Helpline," its telephone information and referral service. A training session will be offered later this month.

THE STOREHOUSE provides food, clothing, and furniture to the needy. It needs help in the following areas: public relations (for a week each year), TV repair, and clothes mending.

Smoke Masks: Not Recommended

It's not the fire that kills you — it's the smoke. So buy one of the personal filter-type smoke masks now on the market and be safe forever more? Maybe not.

The National Fire Protection Association has "declined to recommend" smoke masks because of what the association calls "serious limitations with filters in protection against the conditions created by burning materials." These limitations include:

1. **Insufficient protection against oxygen deficiency.** Personal filter-type smoke masks offer no protection against oxygen deficiency, which is common during structural fires.

2. **Uncertainty of protection against toxic gases.** These smoke masks vary widely in their ability to neutralize toxic products of combustion, and the type and concentration of toxic products can greatly reduce the operating life of the filter.

3. **Lack of user training.** People will have to put on and use smoke masks under emergency conditions without prior training and without supervision. Time spent in attempt-

ing to put on an unfamiliar mask could well be better spent seeking a safe exit route. Critical time could be wasted, perhaps under poor lighting conditions, in attempting to read instructions on mask use.

4. **No service life indicator.** Smoke masks have no service life indicator that can be easily recognized by the average user. But it is important to know whether the mask is ready for service before putting it on. Also, every filter-type respirator has a limited shelf life, and the problem of identifying when that shelf life has expired has not been addressed.

5. **Uncertainty of use in fire incidents.** Filter-type respiratory protective devices have been prohibited for use by fire fighters because the user cannot determine under what conditions during a fire it is safe and not safe to use them. Conditions during a fire are highly unpredictable and change rapidly.

6. **Certain federal respiratory protection requirements not met.** OSHA (Occupational Safety and Health Administration) regula-

tions state that for respiratory protection against unknown quantities of contaminants in the atmosphere, or for protection against oxygen deficiency or high concentrations of gases or vapors, self-contained breathing apparatus is considered suitable respiratory protection. Such apparatus contains a supply of air or oxygen that is independent of the atmosphere in which the wearer is located. Filter-type masks are not self-contained breathing apparatus.

7. **Masks not NIOSH/MSHA-certified.** OSHA regulations designate the National Institute of Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH/MSHA) as the sole agencies for testing and certifying respiratory protective equipment in the United States when required by law. But, currently, none of these personal filter-type masks have been NIOSH/MSHA-certified as providing protection against all threats associated with the products of combustion, and NIOSH has no certification programs for such masks underway.



JUST BEFORE the fog rolled in — and all over — Wilson Brooks (5112) at Sunset Beach, Ore.



A NAMESAKE establishment specializing in crustaceans, Bodega Bay, Calif.

Unusual Vacation

Coasting Down the Coast

Looking for something new to do this summer? How about bicycling from Seattle to San Francisco? Cheap, lots of fresh air, and plenty of exercise. Interested? Well, read on — Wilson Brooks (5112) made just such a trip last year, and he dropped by to tell us about his experiences.

"I packed my 18-speed Bertin into an airline bike box, and hopped a flight to Seattle," he says. "I carried 45 pounds of gear, including a one-man tent, cooking utensils, a sleeping bag, camera, and tripod. All this stuff was distributed among five bags — two sets of saddle bags and a handlebar bag."

"In four weeks, I covered more than 1300 miles, averaging between 50 and 60 miles a day — a nice leisurely pace. With four weeks for the trip, I was able to take days off, say when the weather was bad and I just wasn't in the mood to get out on the road and pedal."

From Seattle, Wilson took a ferry to the San Juan Islands in Puget Sound and then continued on to Victoria, capital of British Columbia. "With a bike," he says, "there's never a problem getting on a ferry. I spent a day and a half in Victoria just wandering around. It's a beautiful city with a lot of history, culture, and flowers, especially in Butchart Gardens."

Taking the international ferry back from Vancouver to Seattle, Wilson headed down the east side of the Olympic Mountains to avoid the rainier Western slopes. In Oregon, the route took him along the coast which was "absolutely spectacular." But one morning, at Sunset Bay, Wilson ran into the "thickest fog I've ever seen — it felt like rain."

"Feeling depressed and in no mood to bike through the fog," he continues, "I checked into a motel at around noon, bought a six-pack of beer, and watched old movies on TV the rest of the day. The next morning dawned bright and clear, and I was back on the road once again."

Wilson relied on bike maps to make his way down the Northwest coast. Similar to the automobile club's "trip-tiks," these

maps show scenic and relatively lightly trafficked routes; the maps also indicate locations of "hiker-biker" campgrounds.

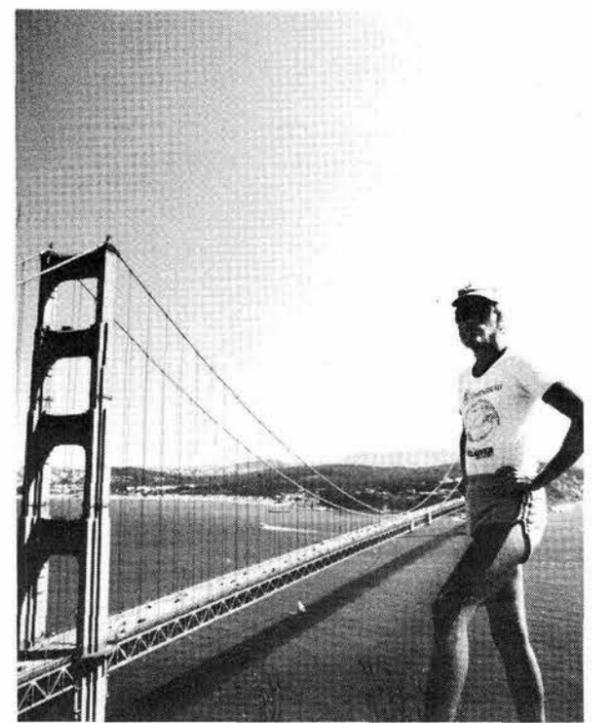
Generally, Wilson had his suppers at "mom & pop" restaurants — "the best food and lots of it." He cooked at least one meal a day, usually breakfast at the campground — often whole grain cereal, coffee, and bran muffins with peanut butter. For lunch, Wilson bought fruit and fresh pastries from bakeries along the way.

"Part of the fun was meeting people along the way," says Wilson, "other bikers mostly, including a Canadian who traveled with me off and on, and a group of 12 bicyclists that I met just north of Crescent City, California. They'd just spent three months traveling cross-country from New York. This was one purpose of my trip — to get involved with other people by traveling alone. It was a chance to make new friends and reflect on these friendships, to see scenery and share experiences with others."

On Labor Day weekend, Wilson pedaled across the Golden Gate Bridge into San Francisco. He continued south to Millbrae where he stayed with friends for a couple of days before biking to the airport to catch his flight back to Albuquerque. In the interim, Wilson unwound by sampling the local vintners' products at the Millbrae Arts and Wine Festival.

"The trip was surprisingly smooth," Wilson sums up, "because I did some research beforehand and tried to be as well-prepared as possible. It was a great way of seeing a particularly beautiful part of the country and meeting a lot of marvelous people. I'd do it again even if it cost twice as much."

Logistics: The month-long trek cost \$1000, including both air fares and a once-a-week motel room. The airline charge for shipping the bicycle was \$12. Wilson arranged for mail pickups along the way and once a week mailed home film and souvenirs he had purchased along the way. He took a lot of pictures and plans a slide show soon.



JOURNEY completed, Wilson relaxes next to the Golden Gate Bridge.

THINGS ARE TOUGH ALL OVER DOWN UNDER!



In Australia the onset of winter brings the prospect of millions of cold or frustrated sheep. And the country's koala bears have never been so insulted. First the sheep. It seems that the thousands of New Zealanders working in Australia have introduced a steel comb 13 millimeters (about half an inch) wider than the standard size agreed upon between wool growers and the shearers of the Australian Workers' Union. The shearers get paid per sheep shorn, and they presumably can shear more sheep in the same amount of time with a wider comb. But they feel that eventually wider combs might cost some jobs, and they are determined to enforce use of the union-stipulated combs. So the shearers have gone on strike. This is hard on the sheep, many of which are getting quite woolly. So bulky, in fact, that they have difficulty mating. If the shearers go back to work soon, the late shearing will make the next few months quite chilly for many sheep. Radios will announce "sheep alerts" in particularly cold weather, and growers will have to rush out with thousands of small plastic coats to protect their flocks. And then there's John Brown, the new minister for sport, recreation, and tourism. Addressing a gathering on the need to promote Australia as a "more diverse tourist destination," Brown heaped scorn on the country's most beloved creature, the koala. "The belief of Americans that they are a lovely, cuddly little bear is fairly well exploded when they get here and pick one of the rotten little things up," Brown told shocked tourism industry leaders. "They find it's flea-ridden, it piddles on you, it stinks and it scratches." Koala specialists conceded there was some truth in Brown's remarks. The normally dozy marsupial, a member of the wombat family and distantly related to the opossum, can be ill-tempered if handled and, if frightened, it might also tend to urinate. "But it's not like they come roaring down out of the trees to pee on you," says a koala specialist.

—Manchester Guardian

MILEPOSTS

LAB NEWS

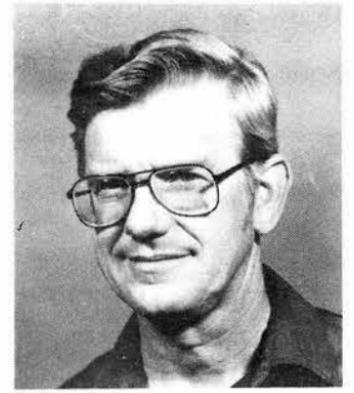
AUGUST 1983



Al Wilshusen - 2344 15



Richard Oliveira - 7126 25



Jim Kennedy - 2513 15



George Kinoshita - 6227 30



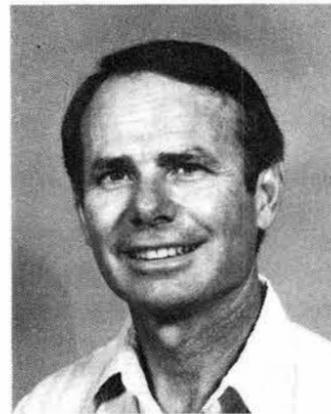
Tom Priddy - 1522 20



Don Benton - 8411 30



Bob Ware - 8275 35



Ron Syler - 5232 25



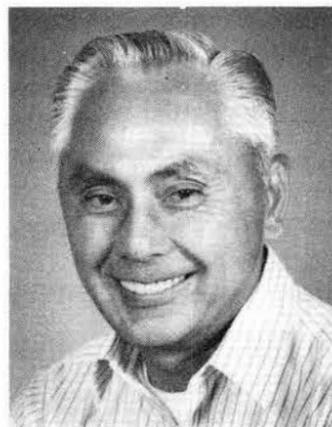
Edwin Moss - 2632 20



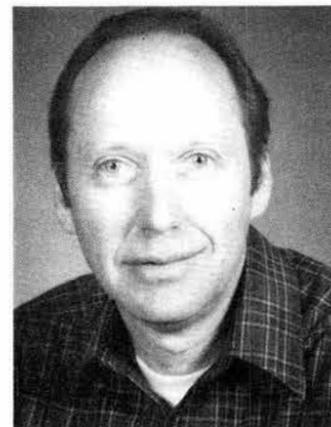
Carl Sisson - 1512 25



Jim Carrell - 8442 30



Hesa Yano - 8215 25



Ralph Kelley - 8411 30



Bill Zagar - 7657 25



Ray Leri - 8265 - 25



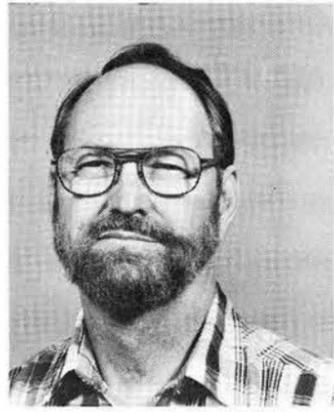
Chuck Stockley - 8411 30



Leon Seibel - 8445 20



Mike Rogers - 8162 20



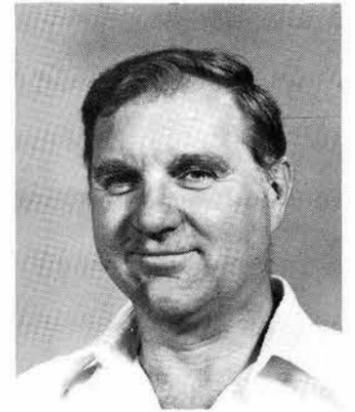
Bob Morris - 1124 20



Fred Clifford - 2124 20



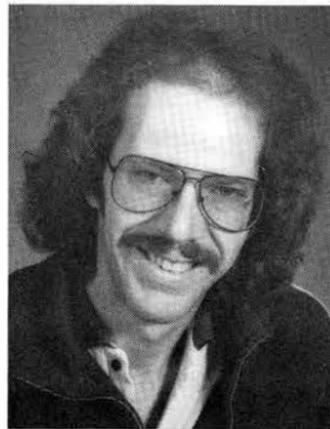
Larry Jennings - 7601 15



Andy Oravec - 7633 15



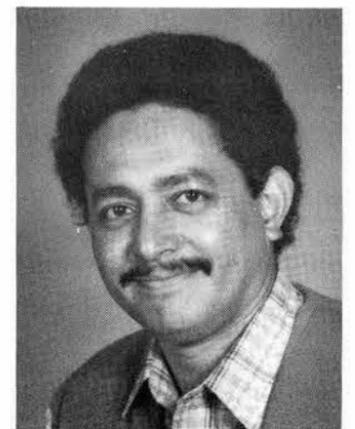
Tom Marker - 4120 35



John Warmouth - 8262 10



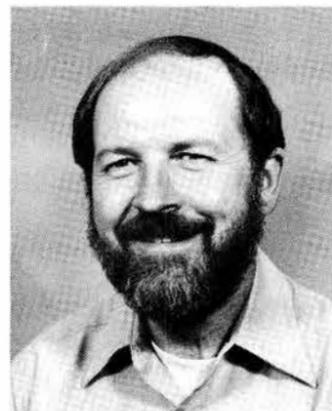
Ray Ng - 8441 15



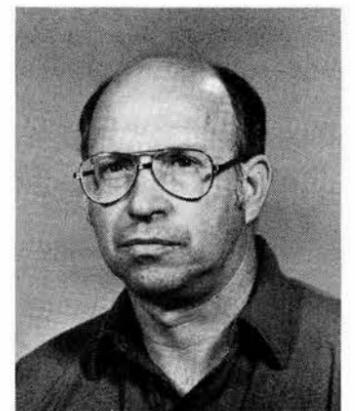
Mel Lagasca - 8334 15



Merrill Jones - 2553 35



Jim Kaiser - 3413 15



Dale Hill - 7533 25



Marie Dremalas - 8161 20



Ray Mosteller - 7132 25



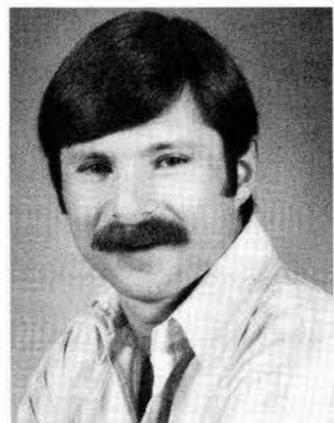
Paul Bahr - 2363 30



Dick Dillon - 3180 25



Tom Brumleve - 8453 25



Mark Higuera - 8412 10



Marybelle Romero - 3741 15

Congratulations

Gary (1265) and June Montry, a daughter, Jennifer June, July 13.

Stephen Slutz (1265) and Linda Larson married in Albuquerque, July 16.

Kerry (2115) and Lisa Sturgeon, a son, Jonathan Kerry, July 14.

Roger (7655) and Cynthia Woodrum, a daughter, Rachel Ann, July 15.



If the aircraft industry had evolved as spectacularly as the computer industry over the past 25 years, a Boeing 767 would cost \$500 today, and it would circle the globe in 20 minutes on five gallons of fuel. Such performance would represent a rough analogue of the reduction in cost, the increase in speed of operation, and the decrease in energy consumption of computers. The cost of computer logic devices is falling at the rate of 25 percent per year and the cost of computer memory at the rate of 40 percent per year. Computational speed

has increased by a factor of 200 in 25 years. In the same period the cost, the energy consumption, and the size of computers of comparable power have decreased by a factor of 10,000.

The result is the advent of the personal computer, which for less than \$500 can put at the disposal of an individual about the same basic computing power as a mainframe computer did in the early 1960s and as a minicomputer did in the early 1970s.

— *Scientific American*

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

MISCELLANEOUS

REGISTERED quarterhorse gelding, ribbon winner, 10-yr old, \$3500. McKay, 266-8821.

POWER mower, Sears, \$55. Biltz, 265-8274.

PIANO, Baldwin, Acrosonic spinet, cherry wood, bench. Bonner, 299-7413.

STOVE, Modern Maid Corning-type top, avocado green, \$226 or best offer. Sherman, 292-3297.

MURRAY 24" 10-speed bike, \$50; upholstered chair, \$45; pedestal TV stand; trailer mirrors, fits car; Hitachi AM car radio. Bliss, 296-3752.

FIREPLACE, Majestic 28" wide, includes triple-walled flue, slightly used, value \$500, will take \$150 or best offer. Brown, 293-4322.

HP 41C w/cardreader, IL module, quad memory, time, X functions, case and instructions, \$500. Luna, 296-5123 after 5:30 p.m.

FOUR 12-15 LT RV tires, Grand Prix, \$160. Benton, 877-2473.

TWIN bed set, hand-crafted; GE stereo record player; 13 and 16-in. bar-link chains. Aeschliman, 281-1227.

BELL Star helmet, 7/8, \$25; 4-wood directors chairs, \$2 ea.; Whirlpool trashmasher, never used, \$150. Butler, 292-8823.

FOUR, 15-in. 8-hole tire rims w/tires (fit Chevy), \$65. Tapia, 294-4139 after 5 p.m.

SEARS Coldspot, 19.5 cu. ft. upright frostless freezer, \$150; full-size roll-away bed, \$50. Lewis, 296-3676 after 5 p.m.

THREE office copiers, all recently reconditioned by factory-trained technicians, priced from \$100 to \$400. Rea, 296-4620.

TELESCOPES: Bushnell 9 to 30 power zoom, \$20; Bauscope handheld 10 power, \$7.50. Moyer, 881-3879.

SOFA, green velvet, French provincial, \$200; sofa, flowered print, \$100; recliner, green tweed, \$50. Bernyk, 836-0691 or 898-9045.

CAMPER, sleeps 2, 4'x8' on pickup bed, insulated & paneled, no over-cab, \$200. Creveling, 898-1530 after 7 p.m.

PERSIAN rug, 8'x12', beige and brown tones, \$750 or best offer. Levy, 821-2294.

DOUBLE size mattress, box springs on frame w/solid wood, Henredon traditional headboard, \$120. Kinney, 298-5281.

BEEF calves, \$500; lg. wooden roll about tool boxes, \$90; egg incubators \$350 & \$50; baby ducks, \$3 to \$5; breeding cows, \$450. Lackey, 898-6638.

MICROWAVE, Magic Chef, standard RV built-in type, never used, removed from RV. Marker, 298-3985.

16 MO. old Appaloosa filly, extensive ground training, show quality, \$1000 or best offer. Dawn, 766-3884 or 865-6720.

FRENCH Provincial BDR. set, white, w/dresser, canopy bed, mattress/box springs, all wood, lg. mirror, \$420. Hall, 299-0009.

'67 REMINGTON 700 ADL, 30-06, Weaver 4x, case, ammo, cleaning kit, \$290; Remington nylon 66, w/case, \$75. Kureczko, 298-1577.

TV, Heathkit, 25 in., model GRO-900-5, in lg. wood cabinet, \$100. Miller, 268-5992.

PUPPIES, English setter, 9-wks old. Maciolek, 877-6858.

JVC stereo receiver, 50 w/c, \$150; Hitachi direct-drive turntable, Audio-technica Shibata stylus, \$125; electric mower, Sears, used once, \$125. Mondy, 292-5286.

SAM's Photofact for TVs, Sears, 564-50384150, Pennys 685-1701, \$2 ea. Markowitz, 294-0332.

SAILBOAT, AMF puffer, 12'6", 2-sails, center board, trailer, \$1400. Cazola, 268-4278.

SOFA w/bed & 2-wing-back chairs. Maddox, 281-5683 after 5 p.m.

FOUR kitchen chairs, \$25; 42" kitchen table, no legs, \$22; bookcase, 76" long, 30" high, 13" deep, \$40. Sublett, 884-4426.

MOVING cartons from household move w/packing paper, take all for \$10. Cooper, 268-0007.

NIKKORMAT FTN w/28 to 85 mm zoom Macro lens and camera case, \$250. Laskar, 299-1024.

PORTABLE washer, Kenmore, 3-cycle, 2 yr. old. Make offer. Beeson, 294-8791.

NIKON 35mm camera, lens, case & small tripod, \$100. Adriance, 292-7471.

AM/FM stereo cassette tape recorder, 10"x17", dbl. microphones, headphone jack, auto stop. Negin, 266-1983.

EXECUTIVE desk and chair, 3'x6', \$450. Breece, 296-9495.

FOUR tires, Goodrich, 12 R15 radial, all terrain tires on white spoke 8-hole wheels, under 4000 miles, \$400. Schellnase, 256-1238.

MONITOR Taxan III high resolution RGB, 15MHz bandpass, analog input, compatible IBM & Apple III, \$440. Chu, 298-1073.

TWO 6.50x16 6-hole Chevy wheels/tube type tires, used 500 mi, 1-snow, 1-regular tread, \$30 ea. Getz, 299-4865.

110 FT. chain link fence, 5 ft. tall, 5 corner posts, 6 line posts, top rail, 36" walk-thru gate, \$125. Bower, 298-8187.

DRAG specialties Air/Gel bag touring seat for 1980-83 Honda goldwing, \$100. O'Connor, 298-5695.

TOOL shed, 9x10 ft., Anchor Kit in original carton, \$149 for both. Savitt, 293-0443.

HANDGUN, Ruger Speed Six, double action, 357 cal., blued, 2 3/4" barrel w/Bianchi shoulder holster, \$200. Rasmussen, 266-1097 mornings.

TRUMPET, Conn, new, \$200; built-in GE elec. stove, bronze, make offer. Arana, 299-1214.

GAS TANK, 28"x23"x4", 11-gal., w/elec. fuel pump, \$15. Berg, 296-2695.

CAMPER SHELL for long narrow bed, \$75 or best offer. Rarick, 293-0644.

DOBERMAN-PINSCHER, neutered, 3-yr., shots, obedience trained, \$100. Cundiff, 256-0043.

MOVING SALE: 5815 Villa Dr. NE, near Eubank/Juan Tabo intersection, Aug. 6 only, after 8 a.m. Roblyer, 293-9695.

RADIAL ARM table saw, 10" Craftsman, \$250; wagon wheel, \$30; alum. 32" screen door, hinges right, \$8. Peterson, 256-7514.

FREE: 4-mo. old black male kitten, likes the outdoors. Bargman, 842-9735.

TWO lg. 4-dwr. storage units; one small, 2-sliding door storage unit, dept. store type. Mozley, 884-5225, 299-4204.

TENT, canvas, 8x10, \$40. Mora, 821-6759.

QUEEN SIZE sleeper sofa, \$350; table set, \$75; dresser, \$100; recliner, \$50; all 6 mos. old, best offer. Smith, 296-9423.

BEDROOM SUITE: Queen size headboard, 2 nightstands, chest of drawers, triple dresser, solid wood; toaster oven. Chavez, 298-2405.

TWO LOVE SEATS or sectional, custom built, solid cherry frame, beige & gold brocade fabric. Randall, 821-0388 after 6.

KENMORE refriger. air conditioner, 5000 BTU, 120V, \$150. Switzer, 296-6527.

YARD SALE: Aug. 6th only, glass, kitchenware, children's books, toys, misc. 1300 Ridgecrest Pl. SE, near San Pedro-Gibson. O'Bryant, 268-9049.

TWO matched single hideabeds, \$50 ea.; formica dinette table, leaf, 4 upholstered chairs, \$75; brown range hood, light, blower, \$10. Spatz, 299-0410.

INTERNATIONAL 304 transmission & parts, \$60. Burress, 298-5061.

GARAGE SALE: Aug. 5-6, queen mattress set, cameras, kitchen utensils, linens, motors, shop equip., vacuum, knick-knacks, 9500 Avenida de la Luna NE. Marrs, 821-5144.

DRUM set, \$500; roll bar pads, \$25; motorcycle helmets, \$5; Honda 750 gas tank, \$75. Hinkel, 298-8226.

WROUGHT iron chairs, \$30 ea.; port. potty, \$30; color TV/phone console, \$85. Flesner, 265-2136.

FREEZER, Amana upright, 14 cu. ft., \$75. Roh, 869-2108.

TRANSPORTATION

'79 KAWASAKI K2-750, windshield, custom seat, adjustable backrest, luggage rack & saddle bags, \$1395. Duffy, 892-1156.

TANDEM bicycle, Gitane 10-speed, \$550. Rivord, 296-9151.

'69 FORD, F-250 pickup, PS/PB/AT, CID, limited slip diff, \$1200. Roh, 869-2108.

'68 CORTEZ motorhome, \$12,000. Bahrs, 881-5199 after 5 p.m.

'83 MOTORCYCLE, Yamaha Virxim, shaft-drive, liquid cooled, sport fairing, black-gold, 550 cc, 2200 miles. Rasmussen, 266-1097 mornings.

'73 COUGAR, turquoise, PS, PB, PT, PW, 351 2V, \$3000. Bernyk, 898-9045 or 836-0691.

'81 GMC, 3/4-ton truck, LWB, AT, AC, PS, PB, 25K miles, \$5950. Chavez, 836-1625.

'76 VW Scirocco, 4-sp, 1500 cc, 60K miles, York A/C, AM/FM, SBRs, 5-BRG head, new upholstery, 25/35 MPG, Aeschliman, 281-1227.

'80 CHEV Citation, Hatchback, V-6, AT, AC, PS, PB, cassette tape deck, \$3600. Miller, 268-5992.

CLARINET, Yamaha, 2 yrs old, w/case, \$175. Reda, 821-3817.

'68 VW Beetle, new brakes, dampener; recent rebuilt engine, passed emission inspection. Dale, 255-3611.

'73 MERCURY Montego, 4-dr., AC, PS, AT, 351 cu. engine, \$1500. Rugh, 293-8581.

ROGER Decoster dirt bike w/maxy cross alloy crank set, tuffneck, red-line V bars, \$150 OBO. Otts, 884-5072.

'78 YAMAHA XS-1100, new exhaust system & many more custom accessories, \$2400. Brion, 255-1834.

'79 MAZDA RX-7, 35K miles, GS, 5-sp., AC stereo cassette, AM/FM, \$6900 OBO. Perkal, 299-5040.

'72 MGB convertible, 6000 mi., 4-sp. manual, spoke wheels, radio, \$2500 OBO. Dean, 296-3264 after 5:30 p.m.

SCHWINN bicycles, mens-26" 3-speed; girls-20" coaster, \$50 ea. Conrad, 298-2691.

'81 SUZUKI PE 250, 500 miles, no racing, \$1300. Turner, 293-8938.

'81 CITATION, 4-dr., hatchback, loaded w/options, V6, 28K miles, \$5000 OBO. Sturgeon, 299-3523.

'80 HONDA XL185S, street legal, trail ready. Fisher, 881-8072.

'78 FORD Fairmont stn. wgn., \$2495; '77 Oldsmobile Starfire, \$1949. O'Neil, 892-6752.

'82 HONDA Goldwing, interstate radio, cover, 2-helmets, less than 10K miles, \$4500. Stout, 281-3108.

22 FT. deep V fiberglass cabin cruiser, 180 HP, I/O Holsclaw tandem trailer, hydraulic brakes, full canvas, \$6100. Getz, 299-4865.

'76 FIAT X1/9, 4-cyl., mid-engine, 44K miles, new rear tires, alternator, battery-removable top, \$3000. Mika, 296-5918 after 5 p.m.

'81 VW, LX pickup, 5-sp., diesel, A/C, AM/FM, shell, 14K miles, \$6500. Westrich, 293-9184 after 5 p.m.

'81 GS 450 SUZUKI, 6000 miles, metallic grey, \$1450. Hickerson, 892-6699.

'80 HONDA CM200T, 1800 miles, \$750 or offer, helmet & cover included. Cieslak, 294-0371.

'78 TOYOTA Corolla liftback, 2-dr., 5-sp., AC, AM radio, cass., \$3200. Caskey, 294-3218.

'69 DATSUN 2000 roadster classic convert., orig. body, rebuilt trans., hard top included. Bargman, 842-9735.

BICYCLES: girl's, \$30; boy's, \$20. Mora, 821-6759.

'72 F100, 300 6 cyl., 4-sp., 2 tanks, AM-FM-8TK, chrome spoke wheels, new tires. Luikens, 884-1172.

'71 TOYOTA Corona 4000R, 4-sp., AM-FM, +100K miles, \$625. Newquist, 281-2674.

'80 SUZUKI 450E, fairing, Bates trunk, 9000 miles, \$775 firm. Mowrer, 281-5595.

'80 SUZUKI GS 550E, 16K miles, extras, \$1250; consider Honda Trail 90/110 as partial trade. Bryant, 299-1292.

'80 PLYMOUTH Champ, 4-sp., 36K miles, \$3000 or best offer. Assink, 345-2957.

SAILBOAT, '75 Hobicat, 16', w/trailer, \$1750. Stone, 344-9813.

'76 PINTO, 2-dr., 4-cyl., 4-sp., canary yellow, AM-FM-cass. stereo, 54K miles, \$2000. Christopher, 299-5712.

'79 PLYMOUTH CHAMP, 4-sp. twin stick, 2-dr. hatchback, tan, 29K miles, \$2750. Matzen, 294-8734.

'76 HONDA Civic CVCC wagon, 35+ mpg reg. gas, AM-FM-cass., new engine, clutch, shocks, tune-up, oil change, \$2400. Brooks, 883-1485.

REAL ESTATE

COUNTRY adobe home, Encino, NM, 2-br., bath, detached garage w/workshed, \$35,000 or best offer. Gonzales, 296-9055.

1890 sq. ft., 4-BR, 1 1/2-baths, approx. 30-yr old, 2-car garage, FP, D-LR, kitchen, \$72,000. Apprx. \$17,000 assumable 7%. Brandt, 299-9360.

PARKLAND Hills, SE, 2-BDR, den (or 3-BDR), LR, DR, extra room, 1 1/2-bath, corner lot, greenhouse, \$58,000. Boyes, 265-6357.

3-BDR in Parkside Estates (Copper/Tramway), FR, LR, 1 1/2 bath, covered patio, 10% FHA assumable, approx. 1400 sq. ft. Armandariz, 292-2148.

3-BDR., 1 1/2 bath, 1220 sq. ft., near Manzano High (Lomas/Chelwood), \$62K. Ochoa, 293-3316.

2-BDR., pitched roof adobe house, .4 acre, central heat/air, Belen, lg. garden area, peaches, apricots, grapes, fenced, \$49,500. Roblyer, 293-9695.

BELOW MARKET, NE, Bear Canyon, 2050 sq. ft., 3-BDR & office, den, LR, DR, near schools/shopping. Perkinson, 821-5206.

3-BDR. house w/lg. yard & RV access, 11528 Love, near Lomas & Juan Tabo, \$55K. Schubeck, 294-7088.

1.97 ACRES West Ella Drive, Corrales; unobstructed view of mountains, telephone & electrical, covenants, appraised \$50K. Erne, 299-0565.

WANTED

CAST iron weightlifting plates, barbells, dumbbells, and curling bar, any brand/size. Vargas, 243-1956.

BUY or BORROW: shop manual for '74 International Scout II. Clements, 293-5618.

BROWNING 22 automatic rifle, grade 3. Hall, 299-0009.

COMPETITIVE pitcher for fast-pitch female C-division city league softball team (Sandia sponsored). Contact Jaye Bullington/299-1433 or John Ulibarri/842-9197.

BOOKS: "No Man is An Island" by George Tweed; yearbook - 1947, Roswell AAF, Roswell, NM. Harris, 255-6577.

PACK horse paniers to rent or buy. Palmer, 296-2551.

"AMERICAN HERITAGE" magazines, 1955-1957. Weston, 255-1196.

BALLOON style bicycle wheels or inexpensive bike, prefer 24" or 26". Burns, 883-6625.

MYSELF & 2-yr.-old daughter want to rent furnished bedroom w/private bath/kitchen access for 1-2 months, beginning Aug. 27. Roybler, 293-9695.

EARLY 1970s Datsun pickup in good shape w/worn out engine. Miller, 281-3655.

TO RENT: mobile home or house in Sandias or Manzanos, starting as soon as Sept. Orear, 256-1941.

POWER winder A or A2 for Canon AE-1, will buy or trade for dichroic enlarger. Brooks, 883-1485.

LOST

MARC CROSS pen, sterling silver, lost 7/28 between Bldgs. 836 and 865, Rightley, 4-5246.

Chili Contest, Pool Party Tomorrow

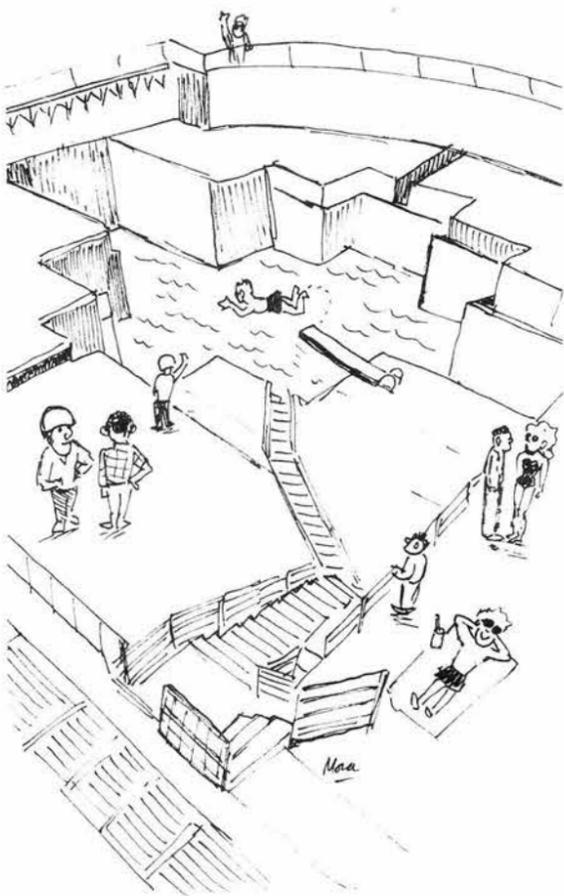
TONIGHT at Happy Hour a group called Borderline playing country and western is on the bandstand while crab legs are the dining room special at \$7.95. The Club's standard menu featuring fine steaks, seafood, and chicken is also available. From 7:30 until 8:30, Karen Edwards will instruct free western dance lessons. Next Friday, Aug. 12, bacon-wrapped filet mignon is the menu special while Westwind plays for dancing.

TOMORROW, the Club's First Annual Chili Contest and Pool Party gets underway at 11 a.m. If you haven't called the Club office to register for the chili contest, call 265-6791 *right now*. You bring a gallon batch of your special chili recipe to the party tomorrow, and a panel of judges headed by Club chef Larry Lucero awards a \$50 prize to first place, \$25 for second.

In the meantime, the Club is serving barbecued chicken with baked beans, cole slaw, and rolls for \$3 while the snack bar offers regular hamburgers, hot dogs, and fries. A mug of beer sells for 50 cents, margaritas for \$1.

A full schedule of games and contests for kids is planned, along with a western band called Flandango to play for dancing on the patio. Los Tapatios, a talented troupe of young Mexican folk dancers, will also perform. The event has all the elements for a fine summer day. Members show cards for admittance, guests pay \$1.

SPEAKING OF POOLS AND KIDS, the Club changes swimming hours in a couple of weeks when children return to school. During the days of Aug. 22-26 and Aug.



"PBFA-II? Nah, sorry fella — this is the new executive swimming pool."

Colloquium

Chemical Warfare: A Valid Threat

Even though soman, sarin, and tabun might sound like the names of Jabba the Hutt's sidekicks, they are instead classic nerve gases known as "G agents." They are just three of the most deadly among 70 chemicals considered for warfare. Soman is the most widely deployed Soviet nerve gas; two good-sized drops of the stuff on the skin kills in five minutes.

The detection and decontamination of such chemical warfare agents was the topic of a recent colloquium by Dr. Kenneth Hunter, a professor of immunology at the Uniformed Services University of the Health Sciences in Bethesda, Md.

Hunter said that some forms of chemical warfare date from antiquity, but it was extensively used in combat for the first time during World War I. In August 1914, the French employed a crude version of tear gas. However, the first great gas attack was by the Germans at Ypres in 1915. They released 150 tons of chlorine gas from canisters, a method highly dependent on the vagaries of wind. Later in the war, the Germans added deadly mustard gas, delivered in artillery shells, to their arsenal.

Russian soldiers suffered especially heavy casualties from gas attacks, which explains why, after the 1917 Revolution, the newly formed Red Army developed gas detection techniques early on. "The Soviets

now have magnificent decontamination equipment," says Hunter. "They can decontaminate a tank in 30 seconds. The U.S. military, on the other hand, is not prepared to deal with chemical warfare."

Gas was not used in World War II. Historians have surmised that the Germans might have feared retaliatory gas attacks or even that Hitler, who was himself gassed in World War I, had a deep aversion to its use.

Recent reports of "yellow rain" and use of other toxic weapons in Kampuchea and Afghanistan have again focused attention on chemical warfare. The U.S. and the U.S.S.R. are the only two countries possessing large stockpiles of chemical warfare agents.

Hunter described in detail the techniques that are being developed to detect soman, especially the use of monoclonal antibodies. "Preliminary results from our laboratory demonstrate the exquisite stereospecificity of certain anti-soman antibodies, and the potential of monoclonal antibodies in prophylaxis and therapy," he says.

Hunter added that he is interested in collaborating with Sandia to develop micro-sensing techniques that are both "instantaneous and supersensitive."

29-Sept. 2, the toddler pool and lap swimming will be open from 11 a.m. to 1 p.m. and between 5 and 6 p.m., Mondays through Thursdays. On Fridays, the pools will open at 4 p.m. and remain open until 6. Weekend hours remain the same — from 11 a.m. until 6 p.m. Saturdays and Sundays. Swim season ends with a giant pool party on Labor Day, Sept. 5.

TUESDAY TWO-FOR-ONE dining continues. Next Tuesday, the special is lobster tails for two for \$13.95. Arlen Asher and the Trio play cool jazz for background music, then shift to some old standards for dancing about 8 p.m. Dining is from 6 to 8 p.m. In addition to the special, the Club's regular menu is also available. Reservations help; call 265-6791.

On Tuesday, Aug. 23, the Club tries a mid-week hoedown. The special is western barbecued beef ribs with the works for \$9.95 for two. Karen Edwards instructs free dance lessons from 7:30 until 8:30; then Jim Meek and Country Showmen take over for dancing until midnight.

MARK SUNDAY, Aug. 14, to join the group at the Club's Sunday Champagne Brunch from 11 a.m. to 2 p.m. On the menu are scrambled eggs and green chili, baked ham with cherry sauce, barbecued chicken, sausage, salads, and desserts for \$5.95 for adults, \$3 for kids 12 and under. A glass of champagne comes with the brunch. Additional bottles are \$4 each. Again, reservations on 265-6791.

TRAVEL — Coronado Club trips coming up include: *China*, Sept. 18-Oct. 7, \$2810;

Caribbean cruise, Oct. 29-Nov. 6, \$1095; *Durango-Silverton*, Sept. 24-25, \$95; *Las Vegas*, by bus Sept. 11-14, \$124; or by air Sept. 11-13, \$146; *Mazatlán*, Oct. 31-Nov. 7 with TransGlobe Travel (Chet Fornero), \$299; or with Academy Travel, Nov. 7-14, \$297 (does not include Mexican tax); and *New Orleans* at World's Fair time May 25-29, 1984, \$555.



WHILE JOHN CLEARY (a.k.a. Phil Mead, 400) awaits the arrival of his son, he practices for their "talk." The scene is from Frank Gilroy's Pulitzer prize-winning play, "The Subject was Roses," presented by the Vortex Theatre, Aug. 5-28 (Fridays and Saturdays at 8 p.m. and Sundays at 2:30 p.m.).