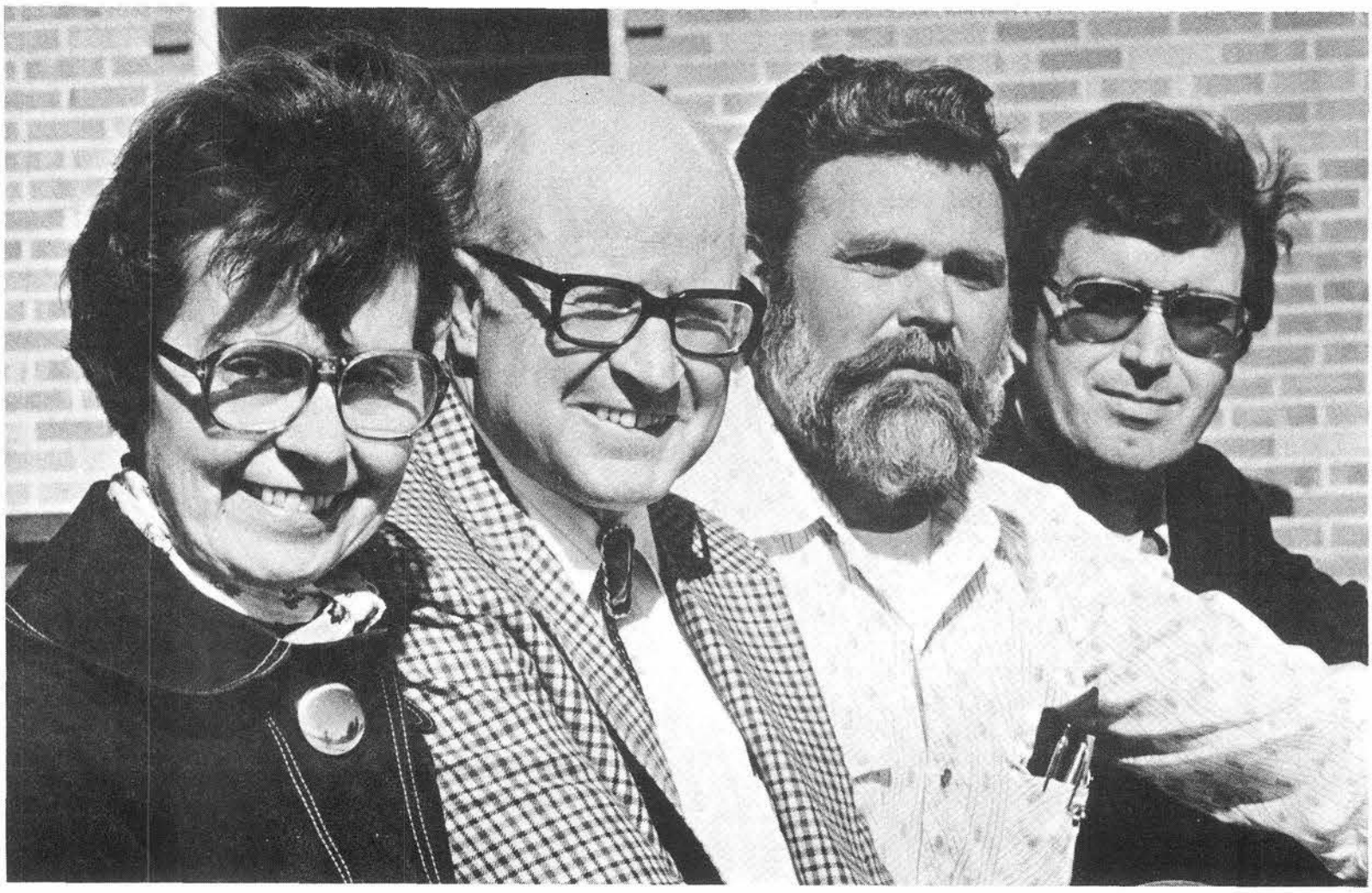


FOUR BELIEVERS IN SAVINGS BONDS. For a variety of reasons, all four are enthusiastic participants in Sandia's payroll savings plan. From left: Rosa Steele (2626), Howard Lindell (4311), Duane McCauley (9713) and Roger Hagengruber (1351).

The Answer To...

Why Buy Bonds?

Monday marks the beginning of Sandia's annual Savings Bond Drive—a two-pronged drive aimed at both signing up new participants in the Payroll Savings Plan and encouraging those already enrolled to increase their investments. There will be a company-wide distribution of brochures, and solicitors will be out and about. As always, the drive will prompt questions. The key one is: "Why? Why buy bonds?"

We know that bonds are popular with Sandians because payroll deductions in FY '77 ran a little over $1.5 million. FY '78 deductions (projected through the end of the fiscal year) are running a hundred thousand or so ahead of that.

Why, in fact, do Sandians buy bonds?

First, we talked with Bill Martin (3430), Chairman of Sandia's campaign; with Glenn Fowler (VP 1000), who is chairman of the State drive and with Morgan Sparks, president of Sandia and chairman of Albuquerque's bond drive. To all we asked: *Why buy bonds?*

•Bill Martin took instant exception to our terminology: "We're not asking people to buy anything," he said. "We're encouraging them to save. Bonds aren't purchases, they're savings—savings that pay good interest."

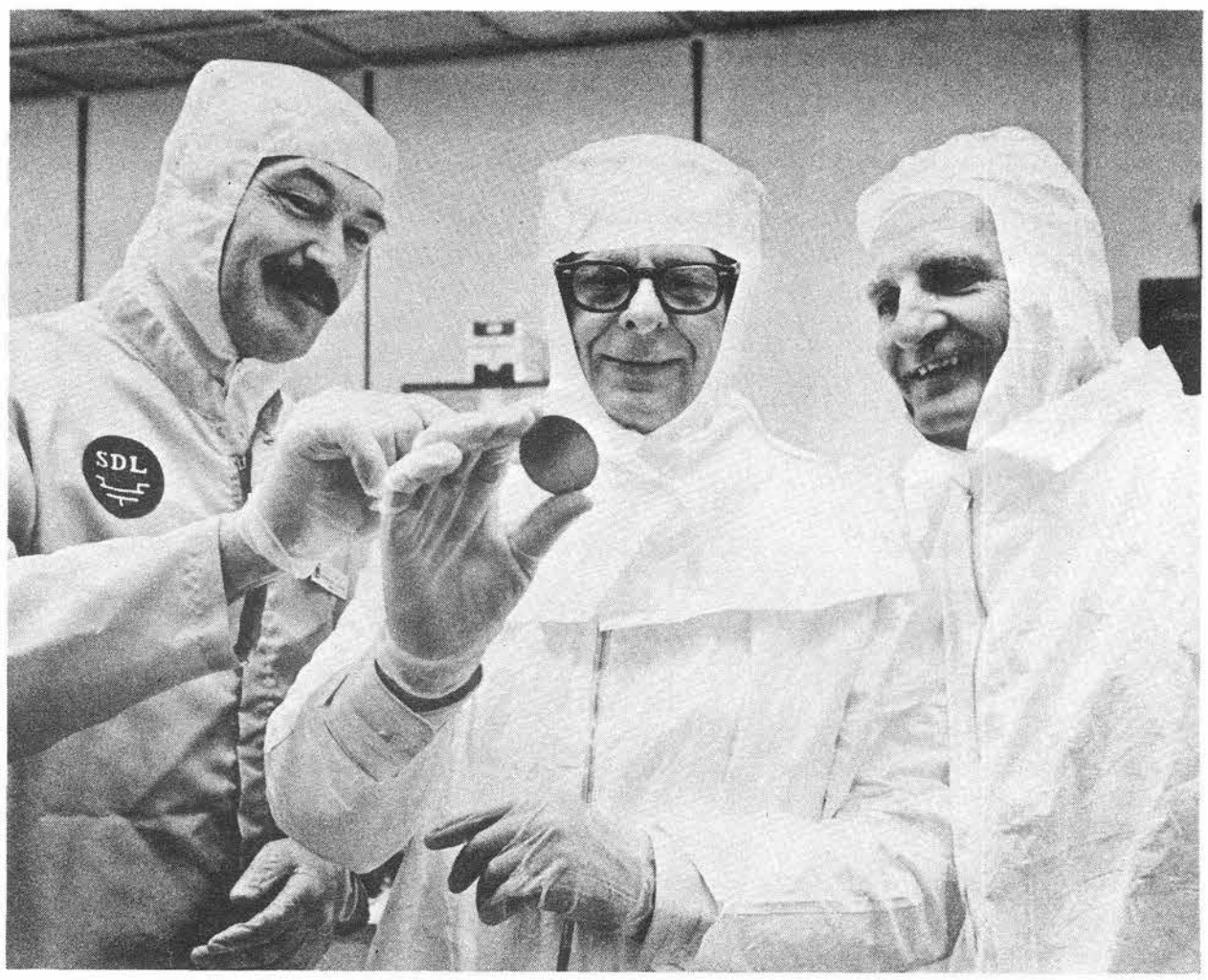
•Glenn Fowler ticked off a couple of advantages: "The interest earned is subject only to Federal income tax—and then only

[*Continued on Page 7*]

LAB NEWS

VOL. 30, NO. 8 APRIL 14, 1978

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



JAMES HERBERT, Executive VP of Western Electric and a member of the Labs' Board of Directors, admires wafer developed in Sandia's Semiconductor Devices Lab. Bill Spencer (then 2100, now 8100), at left, and President Sparks accompanied Mr. Herbert who was at the Labs for two days of briefings. Super clean room atmosphere in lab calls for all-enveloping smocks and bournous.

Shock Tube Tests Underway

In Sandia's shock tube facility a Boeing KC-135A fuselage section—12 feet in diameter and 12 feet long—is undergoing simulated nuclear blast overpressures. The work is being performed for the Defense Nuclear Agency, the Boeing Company, and the Air Force Weapons Laboratory under a reimbursable arrangement. The blast tests are conducted with the fuselage mounted within the 19-foot diameter explosively-driven blast tunnel.

In the test series, the tanker fuselage will be exposed to a number of shocks created by HE charges of various weights and detonated at the small end of the 700-foot-long shock tube.

Data from 100 channels of pressure and strain measurement are collected. The data show dynamic structural response and shock reflection factors as a function of shock strength, fuselage orientation to the blast, and fuselage internal pressure. These data will be compared to analytical prediction.

The work is centered in Division 9333 under Floyd Mathews. Project leader for blast testing is Manny Vigil. Tom Witherspoon and Donna McConnell are responsible for data instrumentation and recording. Gary Laabs is responsible for test setup and arming and firing. Ray Gonzales, Frank Garcia and Margo Greigo (all 9718) provide test setup support. Frank Hensley (9412) provides photometrics coverage. Harold Rarrick (9414) is test program manager.

Retiree Deaths

Ora Nairn (76)	1-18-78
Luis Garcia (63)	1-19-78
Marshall Servis (72)	1-20-78
Wilbur Schaffer (86)	2-24-78
Ralph Larsen (76)	3-1-78
Hugh McLaren (63)	3-2-78
Benjamin Fisher (59)	3-2-78
John Marquis (74)	3-8-78
Everett Johnson (76)	3-17-78
Al Banks (68)	3-27-78

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.
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so does russell smith

bruce hawkinson & lorena schneider report livermore

Afterthoughts

Don't let it go to your head--In a Harris survey of 1520 adults concerning the perceived prestige of various occupations, some of us here at Sandia do pretty well and others of us--well, here are the stats.

	Perceived Prestige (%) Very Great	Considerable
Scientists	66	25
MD's	61	29
Lawyers	36	37
Engineers	34	43
Athletes	26	32
Journalists	17 (hmm)	37
Bankers	17	39
Politicians	17	25

Don't be sad if your fellow man regards you with something less than awe. You're better off than salesmen, who scored only 6% in the "very great" prestige category, with 74% of respondents stating that the poor salesman has only "some" or "hardly any" of that wonderful stuff.

* * *

Dog days--We recently alienated non-smokers with criticism of their complaints about second-hand smoke, and now we'd like to take on dog-owners (and we've been one for many, many years.) Our thesis is that most of them aren't too bright when it comes to the care and treatment of our best friend. To wit:

--they permit their dogs to become fat.
--they lock the animals up, usually in the back yard and totally alone, and then wonder why the dogs become neurotic.
--finally, and worst of all, they impart no training whatever to their dogs, the result being an undisciplined animal that won't come when called, jumps up on people, cadges food at the dining table, and generally is your canine equivalent of the genus slob.

We'd be sympathetic if these dog problems had some dimension of complexity. But these are simple problems with simple remedies:

--like a fat person, the fat dog has had too much food. Perhaps it's difficult for the dog-owner to exert the self-discipline necessary to control his own waistline, but surely he doesn't have to inflict his extended appetite upon his dog.
--a dog is a social creature, perhaps even more so than we. In the wild state, as everyone knows, the canine runs in packs. To lock one up in solitary, i.e. alone in the back yard, is a cruel and unnatural act and the dog responds accordingly--he becomes mean.
--if an owner doesn't know how to train his dog, there are all manner of training courses offered by kennels and, for that matter, manuals are available that explain how-to. It's really not difficult to bring bowser around, even for the obtuse breeds, and--contrary to axiom--you can teach an old dog a few new tricks.

Why bother? Consider: the dog is a truly major addition to your family, one that's going to be around for a dozen or more years. But only you can make those years rewarding. *js

CAREER STIMULATION DAY is the occasion for Anne Turbett, a chemist in Chemical Metallurgy Division 5831, to explain to these young people what being a chemist is all about. Fifty students from city high schools toured Sandia work areas in which various technical disciplines are pursued. Anne is in her lab in Bldg. 892.

LIVERMORE NEWS

VOL. 30, NO. 8 LIVERMORE LABORATORIES APRIL 14, 1978

Buff Restores Indian Cycles

Increased gas and automobile costs mean little to Ron Wishart (8346), although he commutes some 70 miles daily between his Walnut Creek home and Sandia Livermore. Only if it's raining does he take a car; otherwise he hops on one of his motorcycles, something he's been doing since he was a teenager.

And he has plenty of cycles to choose from. The Wishart backyard resembles a museum, with several sheds that house 14 Indian motorcycles. Built from 1903 to 1953 and actually called "motocycles," Indians were some of the finest cycles ever produced, Ron claims.

Five of the Indians are restored to original condition and running; the other nine are in various states of restoration. "Because most were really rusty and incomplete when I got them, I've needed a lot of spare parts which are difficult to find," Ron says. "Some parts are available, but I have to make a good many, especially fenders, in my own shop."

Ron was a factory racer for the Indian company for seven years between 1933 and 1940 and still holds the flat track speed record at Springfield, Ill., where he averaged more than 95 miles an hour for 150 miles. That record can never be broken—a shopping center has been built on top of the track!

Ron also rode in motodromes—maneuvering his motorcycle on the vertical walls of wooden silos which were moved from fair to fair as an entertainment attraction. Whenever the circus came to town, he'd challenge the circus riders to an exhibition.

It wasn't until five years ago, when he acquired a box of assorted Indian parts, that Ron began collecting seriously. Since then, he's travelled as far as Kansas City to pick up a motorcycle. His most recent acquisition, a 1951 Indian Warrior of which only 460 were ever made, he bought blind from a fellow in Albuquerque.

Last June, his 1940 Indian Four Cylinder, considered the American classic in motorcycles, and his 1941 Bonneville Sport Scout took first and second awards in the Fifth National Show of the Historical Vehicle Restoration Association in Berkely. In October, he won first place in the National Antique Motorcycle Club show in Los Angeles, again for the '41 Sport Scout.

"Not only is this Sport Scout my favorite model," comments Ron, "it has an unusual history. After being sold in 1942 to go to China, it was crated and shipped to the dock in San Francisco, but never left. It drifted around until 1952 when a local resident bid on the unopened box at an auction. I bought it from him, still virtually unused, in 1973. Today, it has gone only 9000 miles and is absolutely original."

Ron and his wife Ruth agree that not until you go by motorcycle do you realize how much you miss when you go by car. They once logged over 1000 miles in a single vacation day. They also cover many miles enroute to various West Coast antique motorcycle events.

For motorcycle enthusiasts: Ron's two prize-winning models will be on exhibit during the upcoming Antique Car Show (motorcycle class) at the Concord Pavilion on April 23.

RON WISHART (8346) lines up Indians in his backyard. The award-winning '41 Sport Scout (in foreground), entirely original with only 9000 miles, is Ron's favorite.

ON TO LIVERMORE!—Bill Spencer (was 2100, now 8100) wasn't all that exuberant on the eve of his departure to SLL, but perhaps he has in mind poet Robert Frost's words, "I met a Californian who would talk California—a state so blessed, he said, in climate none had ever *died there a natural death.*" Bill holds memento of his SLA tour presented to him at going-away luncheon.

Speakers

Lee Radosevich (8132), "Criteria for Selection of the Thermal Storage Unit for the $10MW_e$ Solar Plant to be Built in Barstow, Calif." and "Energy Storage Requirements for Advanced Central Receiver Projects"; Taz Bramlett (8131), "Promising Thermochemical Storage Technologies"; Jim Woodard (8326), "Optimum Dispatch Storage for Solar Power Plants in a Conventional Electric Grid"; and Joe Iannucci (8326), "Value of Seasonal Storage," Storage Applications Workshop, Solar Energy Research Institute, Feb. 14-15, Golden, Colo.

John Smugeresky (8312), "Alloys of Beryllium with 0.4 to 2.1 Atomic Percent Copper"; John Smugeresky and Sam Myers (5111), "Processing Materials with High Energy Ion Beams"; Bob Bradshaw (8313) and Ron Stoltz (8314), "High Temperature Oxidation Sulfidation of Modified Nickel Chromium Alloys"; and Dan Dawson (8314), "The Corrosion Fatigue Crack Growth Behavior of Alpha Beta Titanium Alloys," 107th Annual AIME Meeting, Feb. 26-Mar. 2, Denver.

Sympathy

To Frank Murar (8345) on the death of his mother-in-law in Albuquerque, Feb. 22.

To Grace Campbell (8264) on the death of her mother-in-law in Oroville, Calif., Feb. 26.

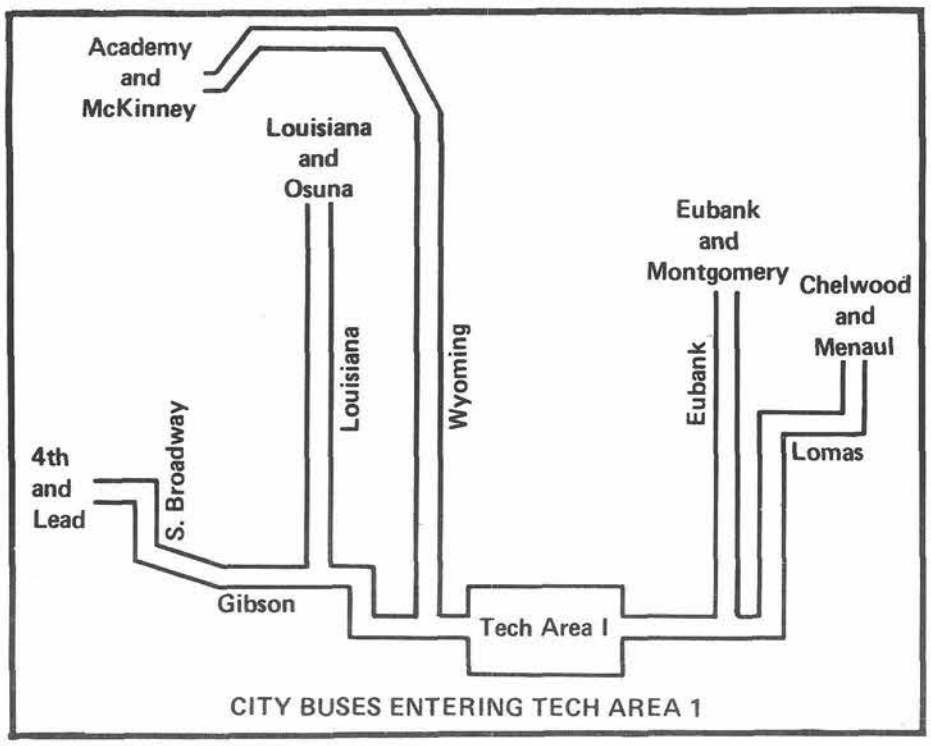
To Pat Clark (8433) on the death of her husband in Hayward, Feb. 26.

To Ernie Mikles (8433) on the death of her father in Charleston, Ark., March 15.

To Chuck Thomas (8346) on the death of his father in Palo Alto, March 7.

To Mike Stephenson (8366) on the death of his daughter in San Francisco, March 11.

SANDIA TRIPPERS are no more after April 28, but five city buses will continue to enter Tech Area I. Points of origin are shown here. Under city's new grid system, Sandians who do not live within walking distance of one of these five routes will generally be able to bus-and-transfer to a bus that takes them into the Tech Area.



CITY BUSES ENTERING TECH AREA 1

Grid System for Buses Starts in May

Albuquerque's Mayor Rusk has said, "go" and, on May 1, the city bus service undertakes a new mode of service that promises to bring buses to some 80% of the population. The present system reaches only 60%.

Phase one of the service will place city bus routes in a grid pattern along all major east-west arterials between Montgomery and Gibson Blvds. and on major north-south streets between Coors and Juan Tabo Blvd. Service in the south valley and the west side will be similar to that existing. Buses will operate 30 minutes apart on weekdays, from 6:30 a.m. to 7:30 p.m., and on a less frequent basis on weekends.

For Sandians, the trippers will be no more as such, but five special peak hour buses will enter the Tech Area (see map). The bus passes sold by the Credit Union ($6 for 22 rides) will continue to be usable and, for that matter, may now be used anywhere on the bus system (if you transfer, however, be sure to get a transfer slip). If you prefer, you may use tokens (20 for $6) or pay the adult fare, 35 cents in exact change. Another option is the bus commuter's pass—$11 per month for an unlimited number of rides.

Jeff Gammon (3725) of the Employee Transportation Committee has been chief liaison between the Labs and Sun-Tran. "Some Sandians will be inconvenienced by the new setup," Jeff says. "On the other hand, others may find that the grid system now makes it feasible for them to take the bus to work. All in all, it's a good system for all of Albuquerque."

The arrival of 24 additional buses in May 1979 will initiate phase two of the system. It will increase the frequency of service on certain routes, reducing the 30-minute separations to 15 minutes. The city currently has about 60 buses in service. In late 1979, when phase three goes into effect, Sun-Tran will have 115 buses operating on schedules from five to thirty minutes apart, depending upon route.

The expanded service is expected to increase Sun-Tran's budget from its current $3 million to an estimated $6.7 million by 1979-80. The '78 legislature recently passed a bill to allow a county-wide referendum, now scheduled for November, which would pass upon a two-cent gasoline tax to support public transit. If passed, monies from this source are estimated to be on the order of $5 million.

Final details and schedules are still being worked out. System maps and schedules are expected to be available in late April. Downtown newspapers will also carry maps and other information as material becomes available. "Sun-Travelers" will be riding city buses during the transition period to explain the change and to provide bus information to passengers.

Sandia employees will be kept informed of late-breaking news about the new bus system by means of the Sandia Bulletin.

Properly programmed, a nap is the surest route to a higher score on a quiz. A six-year study at the University of Colorado shows that a nap after studying (and before an exam) improves one's ability to recall. Apparently sleep slows down the memory's decay rate. Sleeping before (or instead of) studying doesn't help at all the researchers report—nor, we presume, does sleeping during or after the exam.

Labs Scientist Honored

Joe Harris of Applied Physics Division 2353 was recently honored by election to membership in the Bohmische Physical Society. Members are chosen for the contributions to the field of particle-solid interactions by independent, original research.

Object of the Society is "to promote the advancement of knowledge of the interaction of particles with solids and to encourage exchange of information between scientists and engineers engaged in research or development in the field of particle-solid interactions."

Membership in the Bohmische Physical Society is international and includes scientific members in Japan, Sweden, Denmark, Germany, Italy, United States and other countries.

Events Calendar

Through April 23—"Lullaby," Barn Dinner Theater, 281-3338.

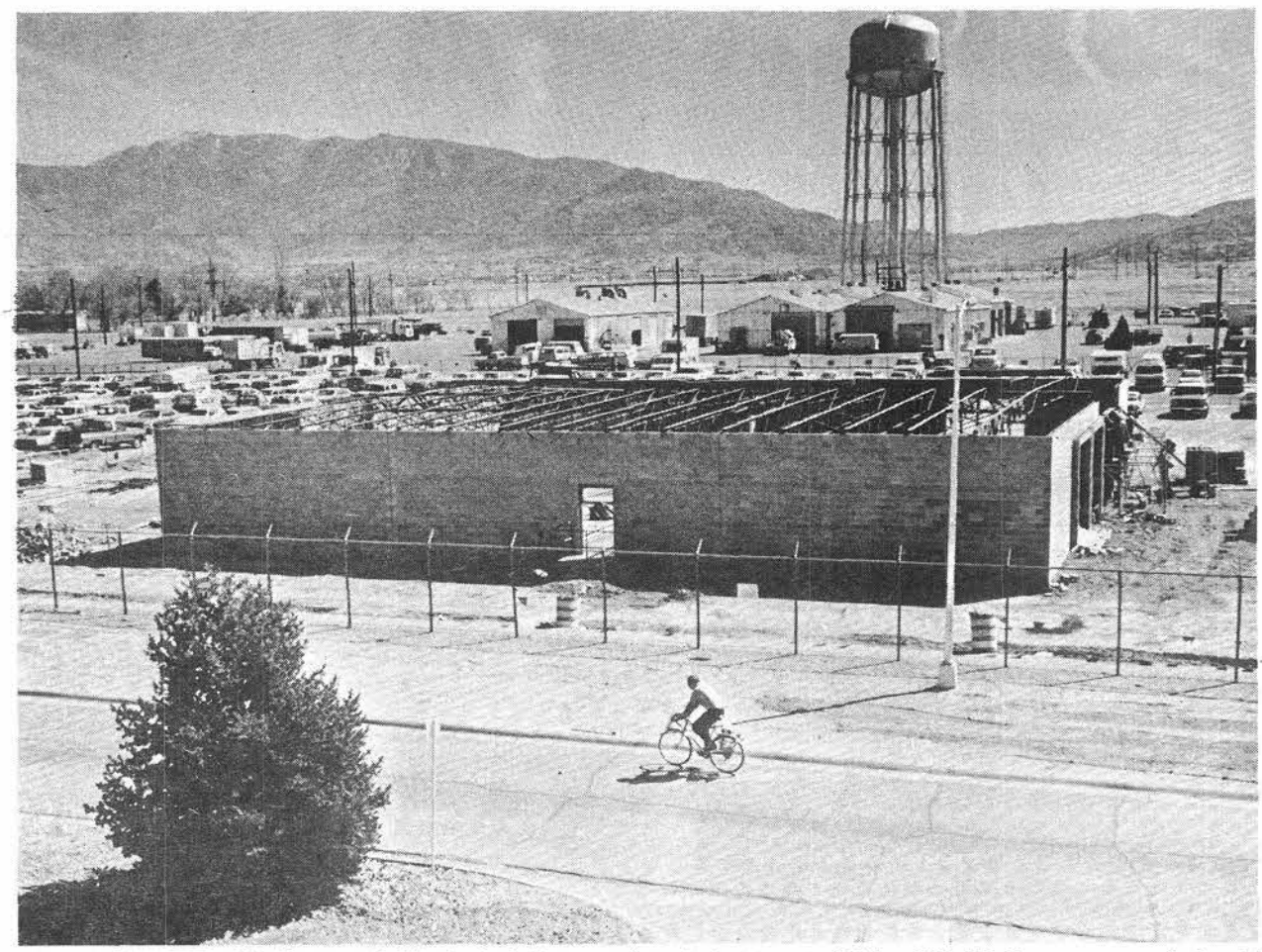
April 14, 15—New Mexico Symphony Orchestra and Chorus perform Verdi's "Requiem," Popejoy Hall, 8:15 p.m.

April 18—Sportsmen Concerned for New Mexico, monthly meeting, Desert Inn, 918 Central SW, 7:30 p.m.

April 19—"My Fair Lady," UNM Cultural Entertainment Series, Popejoy Hall, 277-3121.

April 19-22—"Rediscover New Mexico" travel show sponsored by the Albuquerque CofC, Winrock Center, W-F 12-9 p.m., Sat 10 a.m.-6 p.m.

April 22—Free concert by the Duke City Band, Civic Plaza, 1 p.m.


MAXIM'S WEST?—Well, sort of. It's the Labs' new cafeteria just east of Bldg. 860. Walls are up, roof should be on soon, and the summer should see its opening. We think it should bear a name—any suggestions?

Take Note

"Textiles New Mexico 1978" is the title of the latest exhibit at the Albuquerque Museum, running from April 16 to July 16. The exhibit is a joint presentation of the museum and Las Aranas Spinners and Weavers Guild, and it represents results of a juried competition of textiles and textile techniques produced by New Mexico crafts people. All work is of original design.

* * *

Hal Pruett (2532) has sent us the agenda for the first meeting of the Sandia Microprocessors Users Group, to be held April 18 in Bldg. 815 from 8 a.m. to noon. It's a new endeavor, and Hal urges all interested Sandians to participate. Six presentations relating to microprocessors are planned and time is allocated for discussion.

* * *

Colloquium for next week features Peter Glazer of Arthur Little, Inc., who will talk on "Solar Cells in Space," which has to do with how energy might be beamed to earth from space. The talk is set for April 19 at 10:15 a.m. in Bldg. 815.

* * *

Attention pilots: next Thursday, April 20, the Albuquerque ATC Tower and the ARTC Center are sponsoring a pilot/controller forum in the International Room of the airport terminal building, from 7 to 9 p.m. The agenda includes presentations on radar procedures and services available to the VFR pilot in the terminal area and en route, plus other topics relating to the pilot/controller exchange. There is no charge, and parking lot tickets will be validated.

* * *

The New Mexico Symphony Chamber Orchestra will present a concert on Sunday, April 23, at 4 p.m., in Woodward Hall at UNM. Admission is free. The Chamber Orchestra will play works composed especially for a musical group of that size, with selections by Haydn, Vivaldi and Bizet. Bassoonist Martha Beauchamp, a member of the NMSO since 1952, is featured soloist in the concert.

* * *

Also on Sunday, April 23, the Albuquerque Museum will be presenting a slide show/lecture, "The History of Albuquerque," at 2 p.m. in the Main Gallery of the Museum. Two speakers will share the program. Donald Cutter, professor of history at UNM and editor of the New Mexico Historical Review, will speak on Spanish and early American History. Calvin Horn, UNM Regent and local publisher, will discuss Albuqerque's recent history and development.

* * *

Stamp collectors past, present, and future will enjoy ALPEX on April 21 to 23—the Albuquerque Philatelic Exhibition to be held at the Hilton Inn. Exhibit co-chairman Jim Cocke (4314) reports that there will be some 50 frames of exhibits in three categories. Society president is Pete Kaestner (1223). ALPEX admission is free and the public is invited.

* * *

Retiree Clair Haut has an exhibit of her paintings on display this month at the First Unitarian Church, 3700 Carlisle NE. Hours are 8 to 5 Mondays through Fridays, Sunday afternoon from 1 to 4.

* * *

Louise Bland (3322) called to remind us again of one of Sandia's health education programs. "We've got an extensive videotape library," she told us, "a library dealing with common health programs ranging from alcoholism to ulcers." The tapes are used by Sandia physicians to supplement patient care—and the tapes are available to employees who would like to increase their understanding of common medical problems. Tapes on other topics like First Aid, the Heimlich Maneuver, the Role of Exercise in Cardiovascular Fitness and Back Safety are also available. A complete list of tapes was published in the *Lab News,* March 17. Tapes can be viewed in Medical, room 117, from 12:30 to 4:45 p.m. Call Louise at 4-1205 to schedule a viewing time.

SAM JOHNSON (9751) inspects a sidewalk/curb cut, part of a project to modify all sidewalks and curbs in Tech Area I for wheelchair access. It's one of several projects being made to accommodate employees with handicaps.

For Those With Handicaps

Making It A Little Easier

A 16-page document with the imposing title of "Affirmative Action Program for the Handicapped and the Disabled and Vietnam Era Veterans" has been updated for 1978 and a copy sent to every supervisor at all Sandia locations.

At an abstract level, this document reaffirms Sandia's commitment to seek out, hire and promote qualified handicapped and Vietnam veterans. "Our goal," says Bob Garcia, Director of Personnel and Special Assistant to the President for Equal Opportunity, "is to match the demands of the job to the capabilities of the individual. That way, impairments disappear as job factors."

Once hired, any barrier which interferes with an employee's mobility must be removed. And specific provision must be made for their safety. Sam Johnson's Plant Engineering Planning Division 9751 works at making it so. During the past year they have intensified their efforts to accommodate on-roll employees with handicaps—and to insure that future facilities are designed with them in mind.

"We have projects underway," Sam says, "to install rotating beacon lights in restrooms to signal fire alarms to deaf employees. And we're continuing to modify restrooms for easier access by people in wheelchairs."

Ultimately, all sidewalks and curbs in Tech Area I will be modified for wheelchair access. Phase I, now nearly complete, involves 27 sidewalk/curb modifications.

"We met with our Labs People who travel in wheelchairs," Sam told us, "and determined their work routes. Other accommodations include ramps into buildings, modified restroom facilities, improved parking and planning to insure safe exit from buildings in emergencies."

Vern Duke, fire protection engineer in Planning Division 9751, told us that fire team members are assigned to help physically impaired individuals in the event of fire. Vern adds that flashing lights are installed at work stations for the deaf, and that the KAFB fire department has a list of work locations of impaired employees to assist in search or rescue if the need should occur.

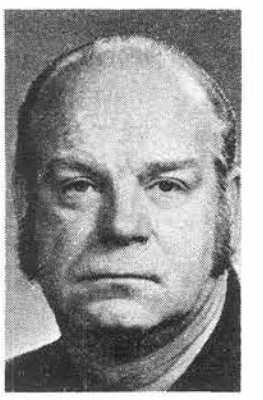
"Our goal," Sam sums up, "is to provide whatever help and assistance the employee needs to be a fully functional and productive member of the staff."

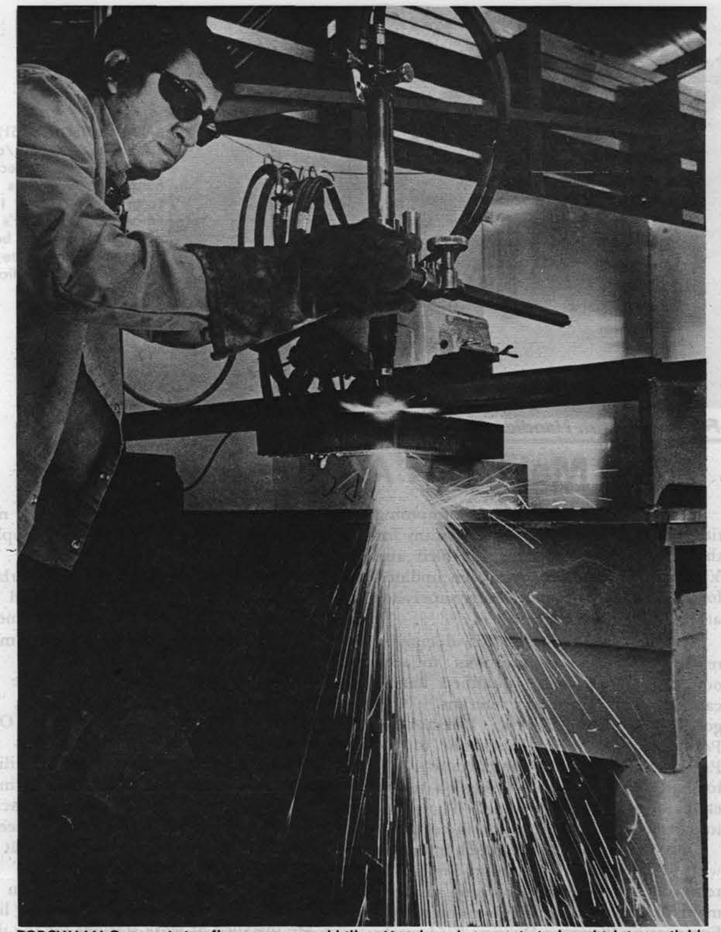
Death

John Farner, a machinist in Division 9581, died April 10 in a fire at his home. He had rescued his family and then returned inside when he was overcome. He was 45.

He had worked at the Labs for 27 years.

Survivors include his widow, five daughters, and a son.





TORCHMAN George Lujan flame cuts metal billet. Metal stock up to six inches thick is available. Workers in raw stock warehouse all handle a variety of cutting tools.

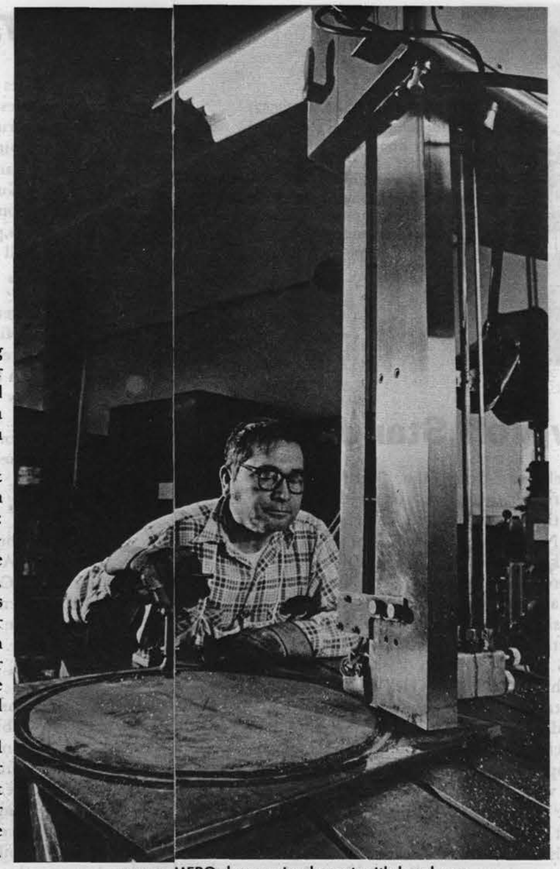
Raw Stock Warehouse

It's A Supermarket Of Sorts

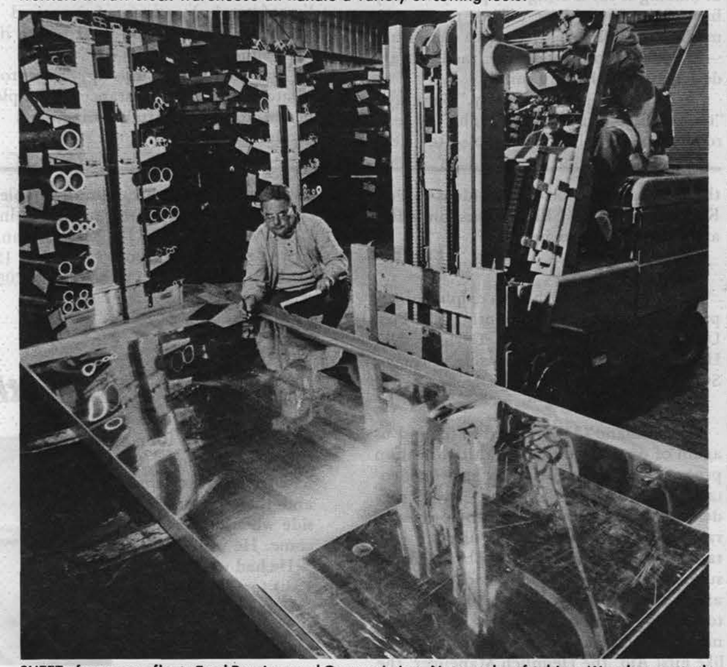
If you suddenly develop a pressing need for, say, some two-inch-diameter aluminum stock, or maybe it's several Douglas fir 2 by 4's, or perhaps a door-sized sheet of copper, would you know where to go?

The answer is to the Metal Stock & Service Support Section 9582-4, which stocks some 900 items of all origins: ferrous and non-ferrous metals, plastics, and woods. The materials come in various forms—sheet, plate, tube, bar and angle—and people in this group will saw, shear, flame cut or otherwise provide what you want in whatever dimensions you want. For that matter, if you already have the material and need it cut to size, they'll be happy to oblige.

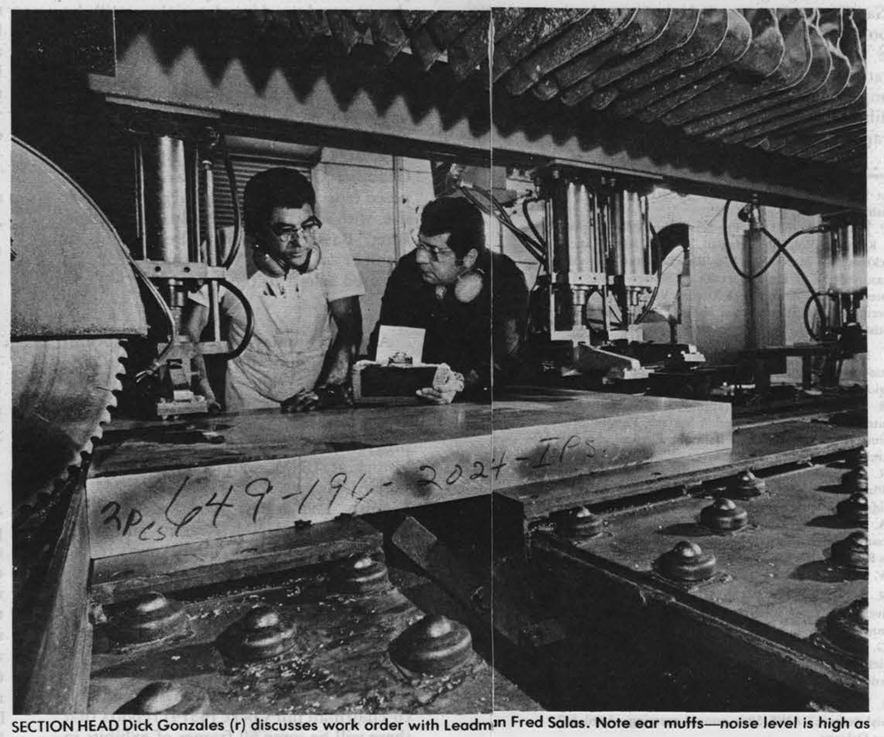
Dick Gonzales heads the group, and he reports that you can call in your request or, if you prefer, you can visit them in Bldg. 890 to place your order and even wait for it to be filled. These photos show some of their activities.



JOE ROMERO does a circular cut with band saw.



SHEET of copper reflects Fred Ramirez and George Lujan. Note racks of tubing. Warehouse stocks 900 items for use by Labs.



SECTION HEAD Dick Gonzales (r) discusses work order with Leadman Fred Salas. Note ear muffs—noise level is high as blade rips through large specimen.

Continued from Page One

Why Buy Bonds?

when the bonds are cashed. They can be extended after maturity, and they draw interest at the rate in effect on the date they're extended."

•Morgan Sparks summed it up this way: "Savings bonds subscribed through payroll deduction are a painless way to save. You set aside specified amounts weekly or monthly and receive bonds through the mail when you've saved enough to buy them. Once you sign an authorization card, Sandia takes care of the rest."

* * *

Then we turned to the buyers, the individual Sandians who buy E Bonds as a significant part of their savings and investment plans. "Why," we asked, "do *you* buy bonds?"

Their responses dealt with three broad categories: education, retirement and investment diversification:

•*Roger Hagengruber* (1351): "I'm 35 years old," Roger told us, "and I've got three children—two teenagers and an 8-year-old. Since college costs keep going up, I decided five years ago it was going to take some discipline (even some sacrifice) if my kids were going to have the same flexibility I had when it comes time to choose a college. I signed up for bonds and every month since then a percentage of my salary has gone to savings."

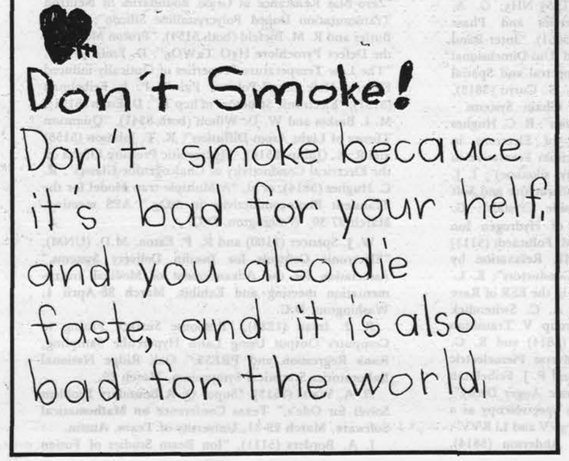
•*Duane McCauley* (9713) and *Howard Lindell* (4311) have both been buying bonds since the 1950's. Duane started in 1956 when he was in the Marine Corps, Howard in 1957 when the Payroll Savings Plan began at Sandia. "I've never cashed a bond," Duane says, "though I have converted some to Series H bonds that pay me a dividend check every six months. I've got some AT&T stock, too, but Series E bonds are the mainstay of my retirement savings plan." Howard put it a little differently: "I've used bonds as a way of deferring income. My plan is to cash them as I need them after I retire. My income will be lower then and I'll pay a much lower tax rate on the earned income."

•*Rosa Steele* (2626) and *Norb Molter* (9651) both agree that saving bonds belong in a diversified investment program. "They're conservative," Rosa told us. "They're steady and sure and very secure—not like stocks, which can be quite volatile. Over the years, I've cashed some bonds to meet emergencies, or to take advantage of real estate opportunities. But I'm still holding most of them. For short term needs, I'd rather borrow than cash bonds. I'm saving them for retirement."

"The return on savings bonds," Norb says, "can be substantially more than most people realize. With stocks and bonds, the brokerage fees eat into the profits. So do taxes. Dividends on Certificates of Deposit are taxed as current income, too, which reduces their rate of return to the point where savings bonds are competitive—especially if you don't cash them until after you retire."

* * *

Maybe you need more facts. For starters, read the two brief brochures coming your way next week: *Facts About Series E Savings Bonds* and *You Can Be One Third Richer*. Past that, talk with your immediate supervisor or your organizational bond drive rep.



OUT OF THE MOUTHS OF BABES. Andrea Chavez, daughter of Ray Chavez (3155), is only a first grader at Queen of Heaven Grade School. Signs of that are evident in this poster she brought home recently. Her spelling may be a little Revolutionary (Colonial, even) but her message comes through loud and clear.

Speakers

R. L. Iman (1223), "Sensitivity Analysis Methods for the Movement of Radionuclides in the Environment," and "The Use of Rank Regression and PRESS in Model Building," Department of Statistics Symposium, March 23-24, Kansas State Univ.

R. C. Lincoln (5444), "Relative Areal Requirements for Bedded Salt Disposal of LWR Wastes from Several Fuel Cycles"; T. A. Sellers, W. C. Fienning and A. E. Winblad (all 1761), "Engineered Safeguards System Activities at Sandia Laboratories for Back-End Fuel Cycle Facilities"; P. D. O'Brien (1142), "The Back End of the Nuclear Fuel Cycle: The View from the Caboose," ANS National Topical Meeting, March 19-22, Savannah, Ga.

B. Morosin (5154), "Crystal Structure of Tetra-t-Butoxytriberyllium Bistetrahydroborate, $C_{16}H_{44}Be_3B_2O_4$," and "Crystal Structure of $HUO_2PO_4 \cdot 4H_2O$ and $(NH_4)_4Fe(CN)6 \cdot H_2O$"; E. J. Graeber (5822), "The Secondary Explosive, 5-Cyanotetrazolatepentaammine-cobalt(III) Perchlorate," American Crystallographic Association spring meeting, March 19-24, University of Okla., Norman.

R. E. Allred and H. K. Street (both 5844), "Improvement of Transverse Composite Strengths: Test Specimen and Matrix Development"; R. E. Allred and A. M. Lindrose (both 5844), "The Room Temperature Moisture Kinetics of Devlar 49 Fabric/Epoxy Laminates," 5th ASTM Conference on Composite Materials Testing and Design, March 21-22, New Orleans.

E. P. EerNisse (5133), "Ion Implantation," APS Visiting Physicists Lecture, March 22, Washington University, St. Louis, Mo.

J. L. Hartley (2553), "A Method for Measuring the ppm Moisture Sensing Limitations of Mass Spectrometers in Testing Small Packages," and "Parts-Per-Million Vapor Generating System Used to Simulate Moisture in Small Integrated Circuit Packages," Moisture Measurement Technology for Hermetic Semiconductor Devices, NBS, March 22-23, Gaithersburg, Md.

K. L. Brower (5112), "Electron Paramagnetic Resonance Studies of Al Centers in Fused SiO_2"; R. C. Hughes (5814) and D. Emin (5151), "Small Polaron Formation and Motion of Holes in SiO_2"; G. W. Arnold (5112), "Vibration and Electronic Spectroscopy of Ion-Implantation-Induced Defects in Fused Silica and Crystalline Quartz," International Topical Conference on the Physics of SiO_2 and Its Interfaces, March 22-24, Yorktown Heights, NY.

C. H. Kraft (1763), "Speed, Acceleration and Pulse Prediction Calculations on Test Vehicles with Wheel Pulse Generators," IEEE Vehicular Technology Conference, March 24, Denver.

A. J. Russo, F. G. Blottner (both 1261) and K. J. Touryan (1260), "Transient Behavior of the Fluid and Electrical Properties in the Turbulent Boundary Layer of an MHD Channel,"; M. R. Baer (1262), "A Two-Dimensional Pulverized Coal combustor Model"; J. G. Taylor (1333), "The Alagging MHD Generator: A Parametric Study," 17th Symposium on Engineering Aspects of MHD, March 27-29, Stanford Univ.

W. R. Wampler and W. B. Gauster (both 5111), "Positron Annihilation Studies of Quenched Aluminum and Copper"; G. W. Arnold (5112), "Ion-Implantation Induced Optical Absorption in a-Al_2O_3"; H. H. Madden (5114), "The KVV Auger Lineshape of Beryllium"; H. T. Weaver (2354) and J. E. Schirber (5150), "Pressure Derivative Sign Reversal for Proton Spin-Lattice Relaxation Times in $TaS_2 \cdot NH_3$; G. A. Samara (5130), "Dielectric Properties and Phase Transitions of $KMnF_3$"; S. K. Lyo (5151), "Inter-Band Absorption in a Strongly Correlated Uni-Dimensional Half-Filled Hubbard Band," and "Spectral and Spatial Diffusion in a Disordered System"; J. G. Curro (5813), "Computer Simulation of Multiple Chain Systems - Concentration Dependence of Properties"; R. C. Hughes (5814), "Transport and Trapping of Electrons in Sapphire"; L. A. Harrah (5811), "Excimer Formation in Fluid Solutions of Poly (methyl-phenyl siloxane)"; I. J. Fritz (5132) and B. Morosin (5154), "Structure and Soft Mode Behavior of Two Chalcogenide Crystals"; G. Morosin (5154), "Crystal Structure of Hydrogen Ion Conductors," P. Richards (5132), D. M. Follstaedt (5111) and E. L. Venturini (5132), "NMR Relaxation by Paramagnetic Impurities in Li Ion Conductors"; E. L. Venturini (5132), "Interaction Effects in the ESR of Rare Earth Ions in Scandium Hydride"; A. C. Switendick (5151), "Electronic Structure of Group V Transition Metal Hydrides"; R. A. Anderson (5814) and R. G. Kepler (5810), "Inequality and Converse Piezoelectric Coefficients"; M. L. Knotek (5155) and P. J. Feibelman (5151), "Ion Desorption by Interatomic Auger Decay"; D. Jennison (5151), "Auger Electron Spectroscopy as a Local Probe of Atomic Charge: Si $L_{2,3}VV$ and Li KVV"; R. G. Kepler (5810) and R. A. Anderson (5814), Pyroelectricity in Polyvinylidene Flouride"; K. K. Murata (5151), "Percolation with Interactions"; L. J. Azevedo (5151), "Very Low Temperature Thermal Conductivity of Polysulfur Nitride, $[(SN)_x]$"; C. H. Seager and G. E. Pike (both 5155), "Voltage Dependence of Semiconductor Grain Boundary Resistance"; D. H. Seager (5155), "Zero-Bias Resistance of Grain Boundaries in Neutron Transmutation Doped Polycrystalline Silicon"; M. A. Butler and R. M. Biefeld (both 5154), "Proton Motion in the Defect Pyrochlore H_3O $TaWO_6$"; D. Emin (5151), "The Low-Temperature Properties of Optically-induced Electron-Hole Small-Polaron Pairs"; P. J. Feibelman (5151), "Electronic Structure of hcp Ti"; D. Emin (5151), M. I. Baskes and W. D. Wilson (both 8341), "Quantum Theory of Light Atom Diffusion"; R. T. Johnson (5155) and R. K. Quinn (2516), "Hydrostatic Pressure Effects on the Electrical Conductivity of Chalcogenide Glasses"; R. C. Hughes (5814), et al, "A Multiple-trap Model for the Transient Photoconductivity in SiO_2," APS meeting, March 27-30, Washington, D.C.

W. J. Spencer (2100) and R. P. Eaton, M.D. (UNM), "Electronic Controls for Insulin Delivery Systems," Association for the Advancement of Medical Instrumentation meeting and Exhibit, March 28-April 1, Washington, D.C.

R. I. Iman (1223), "Response Surface Fitting to Computer Output Using Latin Hypercube Sampling, Rank Regression and PRESS," Oak Ridge National Laboratories Statistical Symposium, March 29.

H. A. Watts (2613), "Supor Q: A Boundary Problem Solver for Ode's," Texas Conference on Mathematical Software, March 29-31, University of Texas, Austin.

J. A. Borders (5111), "Ion Beam Studies of Fusion First-Wall Materials," Seminar at NRL March 30, Washington, D.C.

P. J. Modreski (5831), "The September 1977 Eruption of Kilauea Volcano, Hawaii," The Rio Rancho Rockhounds, March 7, Rio Rancho; and "In Situ Measurements of the Properties of Molten Lava: The September 1977 Eruption of Kilauea Volcano, Hawaii," Meeting of the Albuquerque chapter of the American Statistical Assoc., March 9, Albuquerque.

J. M. Hueter (3521), "Creativity," session keynote, National Recreation and Park Association, Southwest Regional Conference, March 14, Albuquerque.

R. S. Blewer (2353), "Trapping and Reemission of Deuterium in Stainless Steel," Surface Physics Symposium general meeting, German Physical Society, March 6-10, Munich, Germany.

R. A. Graham (5131), "Techniques for Measurements of Plane Waves of Uniaxial Strain," Nonlinear Waves in Solids Workshop, Univ. of Ill., March 21-23, Chicago.

A. L. McFall (5735), "The Design of an Improved Pressure Coring System," Fourth Semi-Annual Enhanced Gas Recovery Review Meeting, March 21-23, Las Vegas, Nev.

R. A. Gerber (5212), "The HF Laser as a Laser Fusion Driver," Univ. of Minn. EE Colloquium, March 30, Minneapolis.

G. Pike (5155), "Electrical Conduction Mechanism in Thick Film Resistors," Materials Research Seminar, Purdue Univ., April 13, Lafayette, Ind.

J. L. Jellison (5833), "Pulsed Laser Welding of Molybdenum," AWS 58th annual meeting, April 3-7, New Orleans.

DAVE BRAUDAWAY (2552) developed this standard volt apparatus whose accuracy is comparable to that maintained by the National Bureau of Standards. Superconducting circuits and Josephson junctions were used.

Congratulated by NBS

Sandia Develops New Volt Standard

Dave Braudaway of Electrical Standards Division 2552 has developed a standard volt comparable in accuracy to that maintained by the National Bureau of Standards.

No small task, the accomplishment borders on the far edges of technology. In a congratulatory letter, Barry Taylor, chief of the electricity division of the National Bureau of Standards, said, "I simply had to write to congratulate you on the outstanding success of your Josephson voltage standard work. I am truly impressed by the fact that recent volt transfers between NBS and Sandia show our two Josephson volts to be in agreement within about 0.02 parts per million. ...You have every reason to be proud of this accomplishment inasmuch as Sandia has become the first non-national standards laboratory in the world to successfully construct a Josephson voltage standard!"

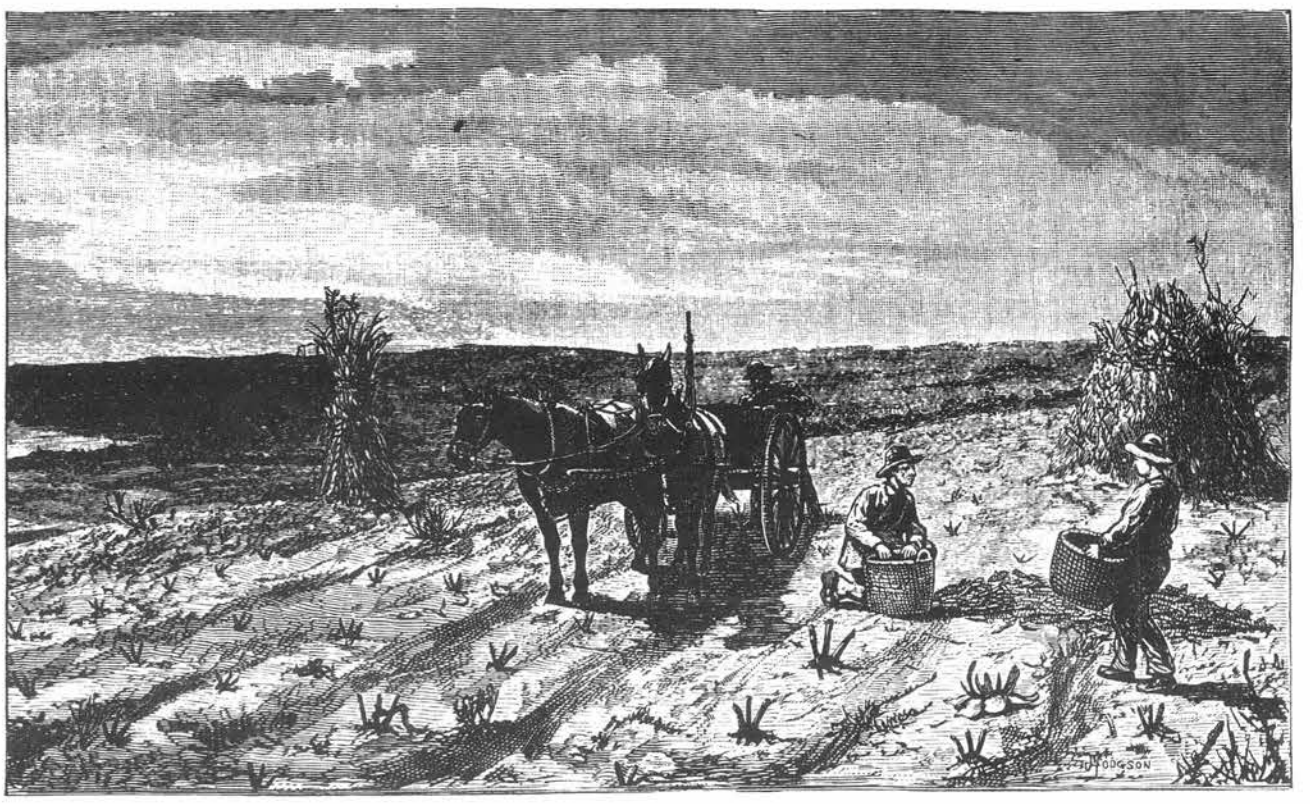
For years, since its development late last century, the world's standard volt had been maintained by electro-chemical cells. It bothered standards people that the volt was not based—like other standards—on a natural physical constant. So they were pleased when, in 1972, the "cold volt" was developed from the Bardeen-Cooper-Schrieffer theory of superconductivity and the theoretical analyses of Brian Josephson (all Nobel prizewinners). As a result of that work, the standard volt is today based on microwave frequency. The frequency to voltage conversion depends only on the physical constants e (charge on the electron) and h (Planck's constant). The U.S. legal volt is defined as $2e/h = 483.593420$ THz/V.

Starting with the voltage (5 to 10 mV) produced by superconducting Josephson junctions supplied by NBS, Dave developed the apparatus to permit comparison with standard cells at about one volt. The goal was to be accurate within one part in 10 million. Result of the comparisons with NBS indicate that Dave's apparatus was actually significantly better than the design goal.

Sandia operates a primary standards laboratory serving the weapons agencies of the DOE. Through transfer and certification of reference standards within the complex, precision instrumentation is calibrated so that highest quality of weapons is assured.

Vista New Mexico

The Soldier-Farmer Experiment



In 1851, about 1000 Army troops were thinly spread at 11 tiny outposts in the Territory of New Mexico. Fort Union, some 30 miles north of present-day Las Vegas, and built in 1851 with Army labor, guarded the Santa Fe Trail. It became headquarters for the Ninth Military Department when Col. Sumner moved his command there from Santa Fe.

Col. Sumner had clashed with Governor Calhoun over arming civilians to provide a force to fight Indians, and was known to have little regard for non-soldiers. Justifying the move of his command to Fort Union, he called Santa Fe, "that sink of vice and extravagance." He reported that "withdrawal is vital as regards discipline and economy," and that he had found that "most of the troops have become a high degree demoralized due to vicious associations..." Also, the "evils were so great he did not expect to eradicate them entirely, but by moving away would be able to bring the troops together for discipline and instruction."

The fort was to be both supply depot and a base for troop movement in the military district. About the time construction began, the Secretary of War ordered Army posts in the southwest to begin soldier-farming operations as an economy move. It was reasoned that these government farms, cultivated by soldiers, would make the Army of the West self-sustaining.

The troops at Fort Union were already cultivating a garden and were able to partially supply the post with vegetables. Ocate, 25 miles north of the fort, was chosen for the site of the experimental farm. The site had a "delicious spring" and "several ponds, one lake and a river six miles below." These would provide water for the stock and for irrigation. Sgt. Pollock was named "head-farmer-soldier," and Ocate would be the chief supply ranch for forage and grains.

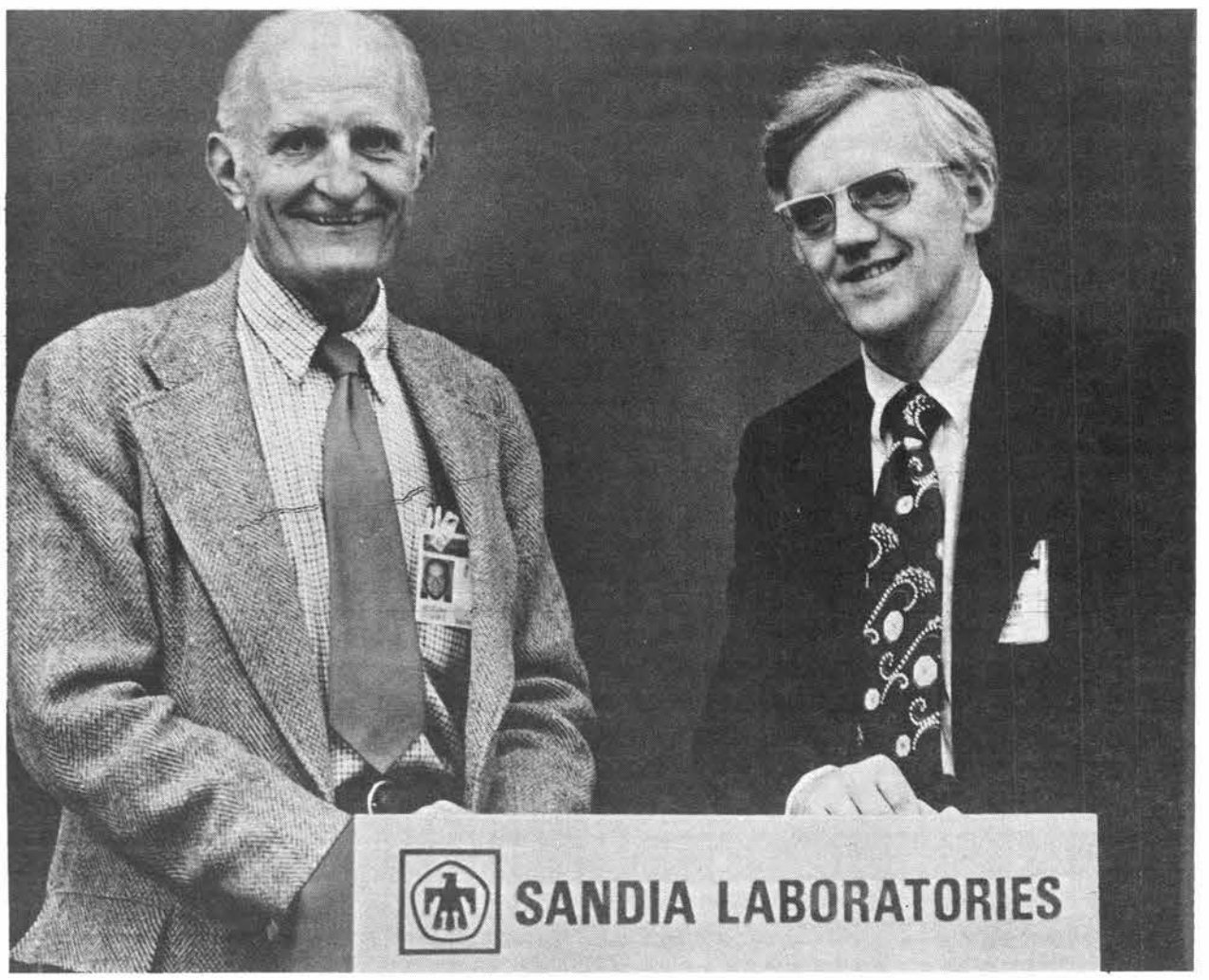
The land at Ocate was leased from a Manual Alvarez, who apparently had agreed to the lease, but later hired a lawyer to break it. Because of the dispute, no land was tilled during the first growing season, but Sgt. Pollock was cutting the wild hay for winter use. Residents at the fort worried, however, when late in the season the slow harvest yielded only 30 tons of hay. With 900 head of cattle and several hundred horses and mules, the Army would probably have to buy feed for the coming winter.

In the second year of his command, Col. Sumner reported to the Army's Adjutant General that the farming operations were the one instance in which he had not had the "success I expected." Nevertheless, he was still convinced the scheme was practicable.

The farm continued to plague the Fort Union commander. A civilian farmer had been hired, but problems still existed. Late in the second growing season, a report stated that even with the vegetables raised at the fort, plus the 50 acres of corn and 75 tons of hay from Ocate, the soldier-farming operation in New Mexico was $14,000 in debt. Further, an investigation disclosed that "the soldiers doing duty at the government farm had been paid extra pay!"

Col. Cooke took over from Col. Sumner in 1853. He, too, tried to discover why the farm was not successful. Sixty acres of corn had been planted that spring, and once again the harvest was slow. Col. Cooke dispatched two additional men to Ocate, "expecting that much better progress will be made in gathering the corn." That didn't help either.

Finally, Col. Cooke requested the Commander of the Military Department of New Mexico to relieve him of responsibility for the farm. He noted that each of the 10 soldiers assigned to Ocate post cost the government $217 per year, the farmer's wages were $750, a laborer's wages and rations amounted to $181, and the farm had produced only $176 worth of hay. He continued, "It will leave for the cost of corn $5.14 per bushel, about $12.85 fanega, which then has to be transported twenty miles. Corn can be bought in the territory, delivered, on the average for about $3 the fanega." That did it. Shortly, farming operations ceased at military posts in New Mexico, and the concept of the soldier-farmer was put to rest. (A *fanega*, incidentally, is today defined as a Spanish unit of grain measure amounting to 1.6 bushels.) •nt



JEROME MILES, Controller for the Department of Energy, was a visitor to Sandia this week. President Sparks is shown with him during the briefing session. Mr. Miles also toured Areas III and V and other Labs facilities.

Authors

R. C. Hughes (5814), "High Field Electronic Properties of SiO_2," Vol. 21, No. 1, SOLID-STATE ELECTRONICS.

P. J. Feibelman (5151), E. J. McGuire (5211) and K. C. Pandey, "Theory of Valence-Band Auger Spectra: GaAs(110)," Vol. 16, No. 2, PHYSICAL REVIEW B.

D. R. Jennison (5151), "Lithium Local-Orbital Energy Bands Using Kohn-Sham and Near-Hartree-Fock Exchange," Vol. 16, No. 12, PHYSICAL REVIEW B.

J. R. Adams, W. R. Dawes (both 2144) and T. J. Sanders, "Radiation Hardened Field Oxide," Vol. 24, No. 6, IEEE Transactions on NUCLEAR SCIENCE.

C. E. Barnes (5133), "Development of Efficient Radiation-Insensitive GaAs-ZN LEDS," Vol. 24, No. 6, IEEE Transactions on NUCLEAR SCIENCE.

G. F. Derbenwick and H. H. Sander (both 2144), "CMOS Hardness Prediction for Low-Dose-Rate Environments," Vol. 24, No. 6, IEEE Transactions on NUCLEAR SCIENCE.

J. A. Halbleib (5231) and M. M. Widner (both 5241), "Field-Enchanced REB Deposition and Bremsstrahlung Production," Vol. 24, No. 6, IEEE Transactions on NUCLEAR SCIENCE.

K. W. Mitchell (5133), "Optimizing Photodetectors for Radiation Environments," Vol. 24, No. 6, IEEE Transactions on NUCLEAR SCIENCE.

F. N. Coppage (4343) and R. W. Martin (4312), "Gamma-Induced Voltage Breakdown Anomaly in Schottky Diode"; F. N. Coppage and D. C. Evans (9621), "Characteristics of Destructions from Latch-up in CMOS," Vol. 24, No. 6, IEEE Transactions on NUCLEAR SCIENCE.

R. E. Cuthrell (5834), "The Role of Ion Aggregates in Rebinder-Westwood Environmental Effects on Wear as Monitored by Acoustic Emission," Vol. 49, No. 1, JOURNAL OF APPLIED PHYSICS.

D. J. Johnson (5244), et al, "Spatially Resolved EUV Emission from Focused REB Discharges Into Thin Targets," Vol. 49, No. 1, JOURNAL OF APPLIED PHYSICS.

J. B. Rundle (5163), "Gravity Changes and Palmdale Uplift," Vol. 5, No. 1, GEOPHYSICAL RESEARCH LETTERS.

M. M. Karnowsky (5832), R. P. Clark (2523) and R. M. Biefeld (5154), "The Phase Diagram of the System Li_2CrO_4-K_2CrO_4," Vol. 23, No. 1-2, JOURNAL OF SOLID STATE CHEMISTRY.

M. G. Thomas and B. Granoff (both 5731), "Coal-derived Product Effects on Viscosity," Vol. 57, No. 2, FUEL.

D. Jennison (5151), "Auger Electron Spectroscopy as a Local Probe of Atomic Charge: Si $L_{2,3}VV$," March 1978, PHYSICAL REVIEW LETTERS.

R. J. Leeper (5142) and M. T. Buttram (5246), "A Study of the Reactions $\pi^- p \to \pi^+ \pi^- n$ and $\pi^- p \to K^+ K^- n$ at 1.98 and 2.41 GeV/c," Vol. 16, No. 7, PHYSICAL REVIEW D.

R. M. Biefeld (5154), R. T. Johnson (5155) and R. J. Baughman (5154), "Effects of Composition Changes, Substitutions, and Hydrostatic Pressure on Ionic Conductivity in Lithium Aluminosilicate and Related Beta-Eucryptite Materials," Vol. 125, No. 2, JOURNAL OF THE ELECTROCHEMICAL SOCIETY.

J. S. Pearlman (5214) and G. H. Dahlbacka (LLL), "Emission of RF Radiation from Laser-Produced Plasmas," Nol. 49, No. 1, Communication, JOURNAL OF APPLIED PHYSICS.

L. Baker (5241), "Stability of Ablation and Combustion Fronts," Vol. 21, No. 2, THE PHYSICS OF FLUIDS.

W. R. Wampler and W. B. Gauster (both 5111), "Positron Annihilation Studies of Quenched Aluminum," Vol. 8, No. 1, JOURNAL OF PHYSICS.

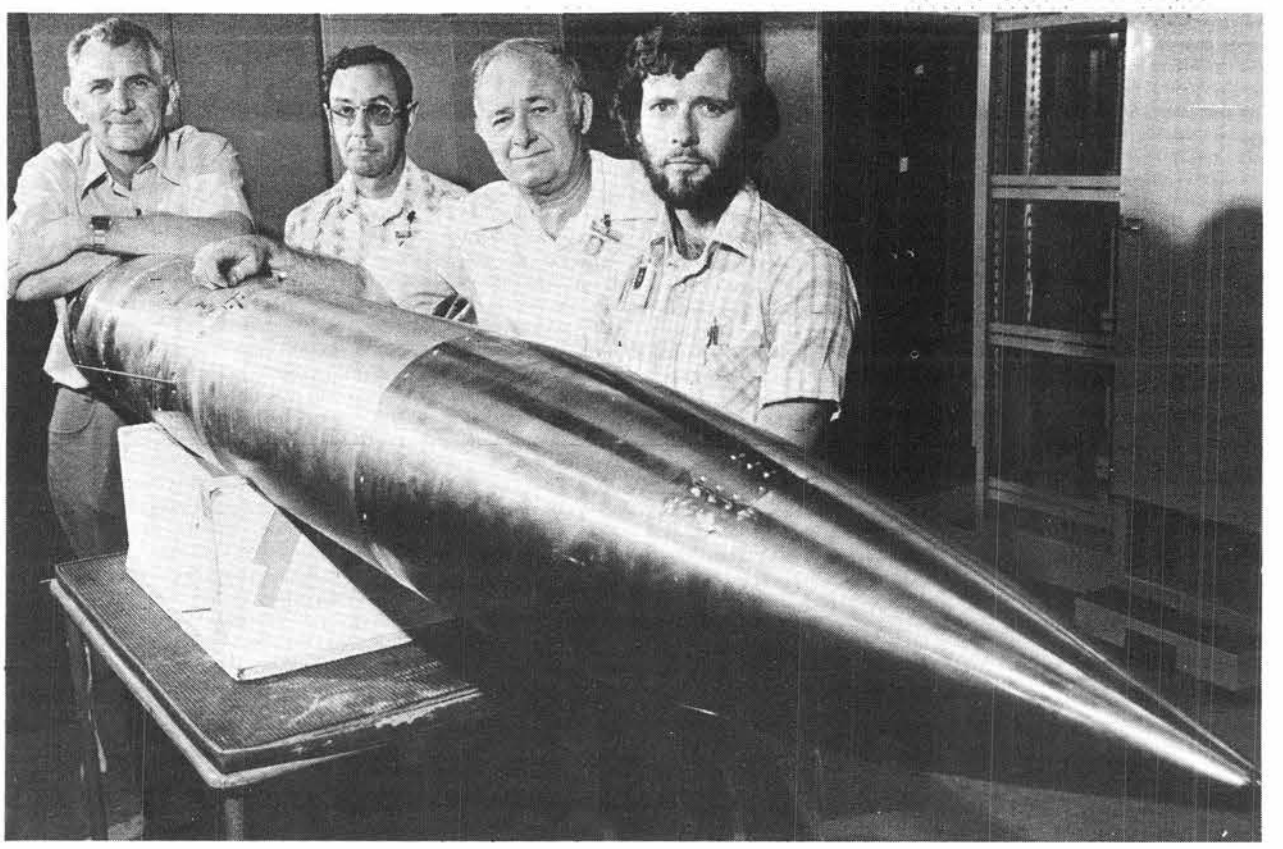
P. J. Fiebelman (5151) and E. J. McGuire (5211), "Valence-band Auger Line Shapes for Si Surfaces: Simplified Theory and Corrected Numerical Results," Vol. 17, No. 2, PHYSICAL REVIEW B.

M. J. Landry (9412), "Exploding PBS Film Q-Switch Laser," Vol. 17, No. 4, APPLIED OPTICS.

M. A. Sweeney and M. M. Widner (both 5241), "Thick-Shell Shock-Focusing Electron Beam Targets," letter, Vol. 18, No. 3, NUCLEAR FUSION; M. A. Sweeney, "Thermodynamic Inconsistency of the Modified SAHA Equation at High Pressures," Vol. 220, No. 1, Part 1, THE ASTROPHYSICAL JOURNAL.

Congratulations

Mr. and Mrs. David Bennett (5412), a son, Grant Daniel, April 1.



HIGH ALTITUDE RESEARCH—Ted Krein, Ernie Niper, John Smelser and Jerry Winker (all 1327) are readying two Nike-Tomahawk-12 rocket systems with payload experiments designed by LASL to inject barium plasma into the ionosphere. Sandia is providing the rocket booster systems, telemetering and attitude-controlled payloads, and launch facilities at Tonopah Test Range. The project is part of continuing upper atmospheric research on electromagnetic wave propagation. The launches are scheduled between May 6 and 12th at sunrise.

Fun & Games

Biking—The 6th Annual Tour of the Rio Grande Valley is set for Sunday, April 23, starting from the UNM campus at Central and Cornell at 6:30 a.m. Riders may elect the 50 or the 100 mile tour and, based on the turnout of recent years, more than 300 are expected. Sag wagons follow the pack, so if you suffer a breakdown—mechanical or physical—you won't be stranded. Entry forms and other info: LAB NEWS, 4-1053.

We like the observations of Ralph Hirsch, executive director of something called the Bicycle & Pedestrial Transportation Research Center in *Family Safety:* "Running stop lights or making illegal turns puts the cyclist in an unfavorable psychological position, because the motorist regards him as an outlaw. The motorist thinks, 'The hell with him. He doesn't obey rules I would be ticketed for, so why should I treat him as an equal?' "

* * *

Skiing—The Coronada Ski Club held its end-of-season election of officers late last month with these results: president, Frank Biggs (5231); VP, Dale Buchanan (4312); secretary, Rick Sneddon (DOE); treasurer, Al Thornton (2524); membership, Fred Schkade (1281); trip chairman, Lyle Wentz (4323); fast trip captain, Bob Butler (5233); and area representative, Walt Westman (ret'd.)

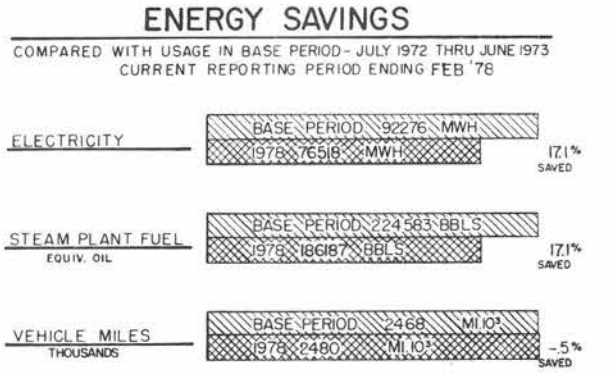
Question: do you find skiing just a little expensive? We're referring to the price of lift tickets, from $9 locally up to $12 at other areas in New Mexico. Consider then the cost at ski areas near Salt Lake City, from which we've recently returned: Alta - $7; Solitude - $7; Brighton - $6; and Snowbird - $8. Like New Mexico ski areas, these are on national forest lands, leading one to wonder why the disparity should be so marked.

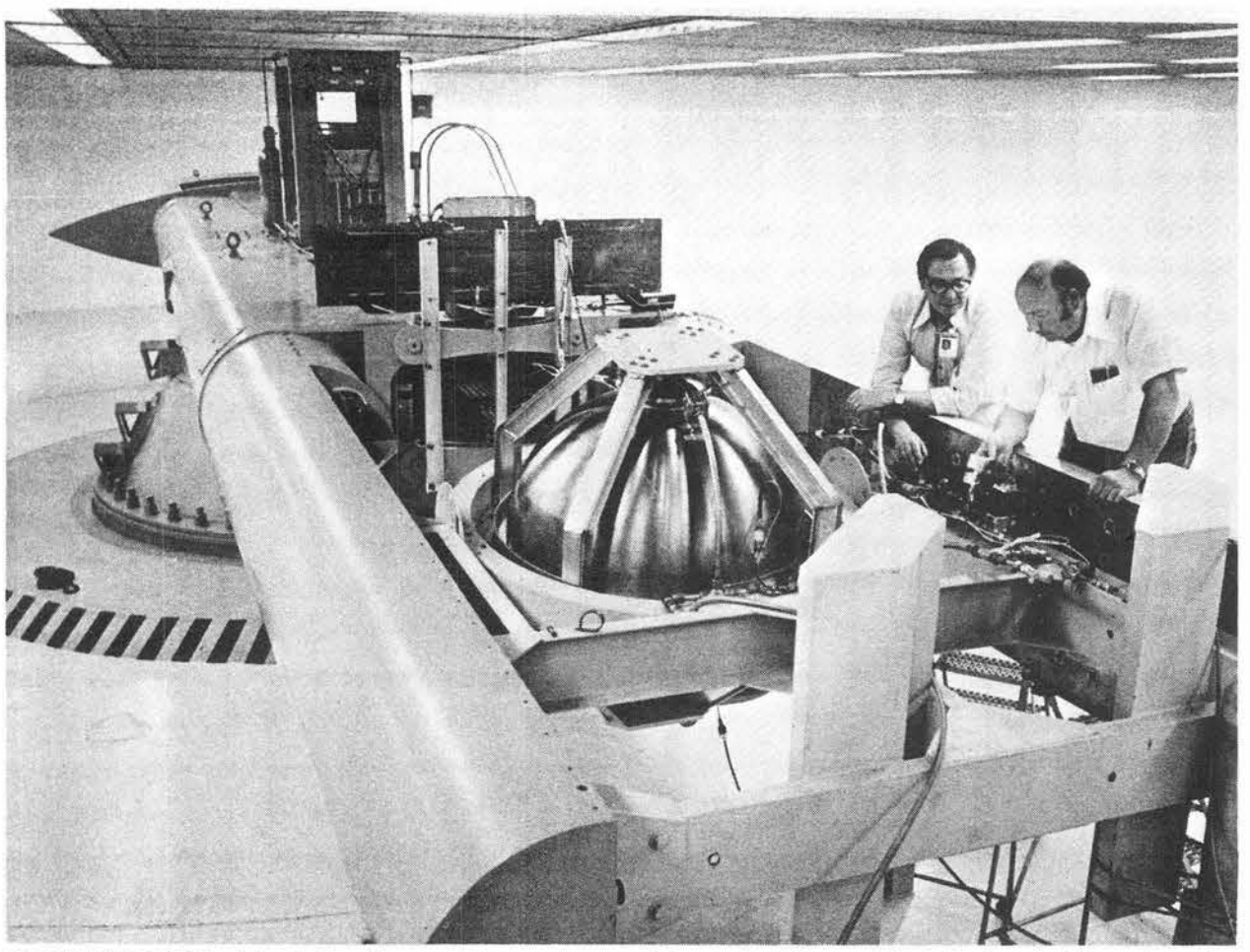
* * *

Triathlon—With the opening soon of the Olympic Pool, this event has been set for Sunday, May 14, and will be sponsored by the Coronado Club as part of its recreation program. Format remains the same as last year: a 10-mile bike ride, followed by a 5-mile run, followed by a ¼-mile swim, all performed here on the Base. Last year's Triathlon—the first—had 35 entrants, and many more are expected this year. Entry forms and other info: LAB NEWS, 4-1053.

* * *

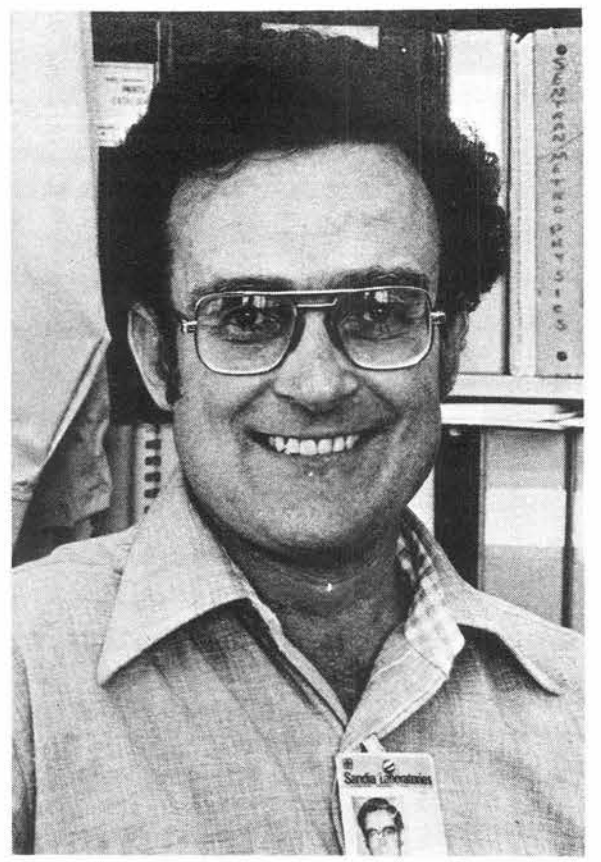
Skateboarding—Most of us are (take one or more) too old, too stuffy or too chicken (or too smart?) to ever have a go at skateboarding. But just in case you're seized by the impulse to try Junior's board just once, consider this quote from *National Safety News:* "A 30-fold increase in skateboard injuries, to a total of 106,000, as well as at least 28 deaths, was reported for the year ending June 1977... (A) year-long study revealed that lack of skill is a major factor... One third of the injuries occurred to persons who had been skating for less than one week and most of these were injured the first time they tried skateboarding."





SPACE SHUTTLE fuel tank for the reaction motor used to control the craft while in orbit is undergoing acceleration tests in Area III on Sandia's centrifuge facility. Test program manager Harold Rarrick (9414) and test engineer Don Fulton (9331) discuss the reimbursable project being performed for NASA-contractor Martin Marietta. The titanium tank and its intricate internal plumbing are subjected to g-forces up to 3.6. In several of the tests, flow rates in the tank will be checked while the centrifuge is spinning. The fuel and tank weigh about 2000 lbs.

Retiring



Jim Reed (1334)

Even if you consider your dog a member of the family, we doubt he'll ever qualify for braces under the Laboratories' current dental plan—even if your vet recommends them. And that's exactly what a Doctor of Veterinary Medicine in Baton Rouge does recommend for snaggle-toothed pups. "A crooked bite," says the good doctor, "may impair your dog's ability to eat properly—not to mention the catastrophic effects such a dental condition might have on his ability to function as a guard dog."

Sympathy

To John Timmons (3711) on the death of his father in Rensselaer, Ind., April 3.

To Hank Neues (9512) on the death of his father in New Jersey, Feb. 5.

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4. Use home telephone numbers.
5. For active and retired Sandians and ERDA employees.
6. No commercial ads, please.
7. Include name and organization.
8. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

TRASH BAGS, city-approved, $4, South Hwy 14 Project. LAB NEWS office, Bldg. 814.

MODEL 680 Sioux Valvegrinder, superflow 110 w/V8 adapter. Wood, 266-9229.

MIRRORS for trailer, mount on front fenders, removable, $15 pair. Giddings, 298-6221.

TENNIS RACKETS, Head Comp I strung w/VS gut, 4½ light, $40; Wilson T2000 w/new grip, $25. Peak, 262-0088.

OUTBOARD MOTOR, Sears 3½ hp, can use remote fuel tank, $90. Wallace, 296-6556.

PROPANE TANK w/pressure valve, upright, $22; recliner chair, wingback, nylon felt, spring constructed, maple finish, green & blue upholstery, $50. Dancy, 299-8223.

COUCH, contemporary, 90-in., 3-cushion, earth tone upholstery, pecan wood accent. Hoffman, 296-0124.

TOASTER OVEN, $5; telephone amplifier, $10; can opener, $4. DeLollis, 299-5384.

REFRIGERATOR, $80; 3-hp lawn mower, $20; couch $40; large living room mirror, $40; cabover camper and jacks, $1300. Falacy, 293-2517.

SEWING MACHINE, Kenmore, $100; dinette set w/6 chairs and leaf, $60. Landry, 296-1784.

CHAISE, light tan upholstery, modern, $50. Moore, 268-9658.

MASSEY-FERGUSON snow blower for small tractor, $150. Flores, 877-7802.

OLYMPUS OM-1 camera, F1.4 50mm lens, semi-hard case, Vivitar 283 flash, $358.25. Kramm, 281-5379.

MINOLTA 110 zoom SLR camera w/case, 25-50mm zoom macro lens, 6-mos. old, $125. Nordstrom, 296-0619.

BUNK BEDS, black wrought iron frame w/ball casters, $80. Lorenzen, 298-5148.

STORAGE BUILDING, metal, 8'x10' w/wooden base. Hurt, 281-3675.

CAMPER SHELL for long wide bed, Chev., 38" high, insulated, paneled, $75. Womelsduff, 296-9485.

COLOR TV, 25-in. RCA, Early American, tube type, $125. Fite, 255-6943.

'72 GUARDIAN Camp trailer, 14' w/ two 5-gal. butane bottles, porta-potty, thermostat control heater, sleeps 4, $1200. Benedict, 299-3832.

WESTERN SADDLE, heavy duty, double rigged, latigo leather, for big person, big horse, $200. Baxter, 344-7601.

DESK, double pedestal, 34x60, $75; Culligan water softener, $30; boy's 20" bicycle, $20; bean bag chair, $20. Hill, 298-5925.

KITCHEN SINK, dbl. basin, porcelain on cast iron, w/faucet & strainers, $20. Anderson, 294-8451.

14' LARSEN fiberglass boat, 40 HP Evinrude motor, tilt trailer, $1495. Rugh, 242-9774.

1978 *Physicians Desk Reference*, colored illustrations of medications, includes cautions and side effects, $8.50. Veneruso, 292-0372.

TRUCK TIRE, Sears steel belted L78-16, LT tube, 6-hole rim, $50. Mattox, 821-3945.

PIANO, console, $500. Jones, 255-2106.

CURVED SOFA, $100; dbl. bed-size headboard, footboard and rails, $50; sprinkler heads, new, $2 ea. Collins, 292-0495.

MORSE zig zag sewing machine & cabinet, $170. Eads, 293-2617.

BIKES: sidewalk, 16" and 20" w/ training wheels, Baha Jrs., $25 pair or $15 ea. Connor, 268-9497.

PORTABLE TYPEWRITER, Olivetti, $30; 7.75x15 tire, $4; old theater chairs, $5 each. Guttman, 243-6393.

2 MICROPHONES, Shure Unidyne III & Sure Unidyne IV. Wilde, 293-2652.

RANGE HOOD, new, 30" white, 7" duct, $18; steel casement window, new, 51"x53", 12 lights, $30. Creveling, 898-1530.

BABY ITEMS, crib & mattress, $40; play pen, $10; GM car seat, $7; stroller, $7; back pack, $5; other items. Nielsen, 299-6740.

HIDE-A-BED, Kroehler, green, $80; wooden playpen, $10; child's feeding table, $15; child's table and chairs, $5. Lieberman, 299-7739.

ELECTRIC HEDGE CLIPPERS, 15", double edge, $16; 26" 3-speed boy's bike, $28. Horton, 298-4449.

TRANSPORTATION

SCHWINN BICYBLE, ladies, 5 speed, $50. Giddings, 298-6221.

GIRL'S BIKE, Spyder 20", thornproof tubes, chrome guards, basket, $25. Hurley, 298-2890.

'76 CHEVY SCOTTSDALE 4X4, ½ ton, AT, PS, PB, AC, 11x15 tires, white wheels, snap-on tarp, dual tanks. Elisco, 298-7273.

'71 VEGA, AT, 42,000 miles, new battery, two new tires, $500. Hays, 293-3386.

'68 CAPRICE, 396 V-8, AT, AC, PB, PS, radio, carb overhauled, $495. McClenahan, 294-8454.

'71 FIAT 128, low mileage, $1000. DeLollis, 299-5384.

'74 HONDA CIVIC hatch back, radio, AT, extra set of mounted mud and snow tires, shop manual, April NADA $2375, asking $2175. Roady, 832-4767 (Moriarty).

FLYING EIGHT CLUB seeks responsible individual to purchase existing full membership, $20/mo., C-150 $12/hr. wet, C-182 $22/hr. wet. Schkade, 293-7453.

'74 PORSCHE 914, 1.8 liter engine, AC, AM-FM stereo cassette. Chandler, 296-9788 or 299-4496.

'50 PLYMOUTH, $500. Chavez, 242-9140 after 9 a.m.

SCHWINN PIXIE two wheel convertible bike, basket, training wheels, $30. James, 294-6837.

'73 F350 FORD pickup, w/11-ft. self-contined Mitchell camper. Mauldin, 293-2079.

'70 VW BUG, new covers, new battery, new brakes, avg. retail $1075, sell $825. Cano, 296-6955.

'71 HONDA 450CB, helmet and manual, $475. Marshall, 298-4206.

'65 F-100 FORD pickup w/8 ft. Rivera cabover camper, $2900. Hole, 255-1444.

'74 DATSUN 710, 4 dr., steel belted radials, AM-FM 8-track stereo, $100 under book. Miller, 296-4531.

'68 CUTLASS S, PS, AC, AT, bucket seats, console, 350, 2-barrel, low mileage, $1000. Paul, 299-6387.

'73 CHEVY ½ ton pickup, 350 V8, 4-speed trans., $1600. Prevender, 299-5253.

'67 MGB, restored, white, new paint, top, interior, recent engine overhaul, Micheline tires, record of repair, $1995. Gregory, 268-2022.

'70 HONDA 50, $200. Torneby, 881-7170.

'74 VW THING, covertible, roll bar included, $1650. Ward, 281-5993.

'74 TRIUMPH Spitfire, 35,000 miles, $2200. Hamilton, 293-3640 after 5.

REAL ESTATE

MOBILE HOME LOT, ½ acre, well, utilities at lot-line, 3 miles south of Los Lunas, $6250. Smiel, 865-9081.

10 ACRES west of Coors, south of I-40, $500 acre. Mauldin, 293-2079.

COCHITI LAKE residential lot, paved street, utilities in, $5000. Payne, 299-5966.

HOLIDAY PARK, 3 bdr., FR w/FP, formal dining, LR, garden kitchen w/breakfast area, decorator accents, rear access, landscaped. Cook, 294-2348.

5-YR.-OLD HOME, 4 bdr., 1¾ bath, 1400 sq. ft., paneled den, carpeted, landscaped, Manzano High area, $43,500. Fjelseth, 296-2257.

FOR RENT

4 BDR., SE, 1¾ bath, furnished or unfurnished, den w/FP, carpeted, available about June 26. Gomez, 256-1584.

LAKE FRONT CABIN, Vallecito Lake near Durango, available day/week, fully furnished, modern, 3-bdr. w/ fp, vacation reservations. Croll, 881-7235.

2 BDR. APTS. in new fourplex, 940 Chelwood, unfurnished, $205 mo. plus utilities. Shear, 821-7846 after 4.

3 BDR., unfurnished, carpeted, den, LR, double garage, tri-level, kitchen builtins, extras, Menaul-Juan Tabo area. Hessel, 296-9124.

UNFURNISHED APT., 1 bdr., $150 & utilities or $180, no pets, off-street parking. Montoya, 255-8437, 544 Charleston SE.

3 BDR. in NE, 1¾ bath, den FP, all appliances, $340 mo., 1st & last deposit, lease, available April 15. Follstaedt, 883-1649.

WANTED

TO TRADE for smaller rig, 19-ft. Classic wooden Lightning, '41 reg. no. 452, restored, 29 ft. mast, dacron sails, spinnaker & trailer. Baxter, 344-7601.

MEMBERS for summer bowling league, non-smokers, mixed foursome. Long, 296-2590.

SERVICE/REPAIR manual for '67 Ford truck, F-250. Roady, 832-4767 (Moriarty).

HOME for cock-a-poo male dog, 2 years old. Rhoden, 293-5301.

RIDE from Graceland Apts. to Bldg. 800. Weiss, 266-2278 after 5.

TO BORROW copies of Guitar Player Magazine Nov. '74, Feb., Mar., Apr. '75. Jacklin, 298-3046 after 5.

EXERCISE BIKE. Stoever, 296-3717.

ODD JOBS for two teenagers, weekly lawn service, trash hauling. Nelson, 881-0148.

'60 to '70 FORD Ranchero, auto trans. AC, power brakes, steering. Conrad, 299-6568.

TO RENT: Motor Home for 1 or 2 weeks (depending on price) during summer, to sleep 6. Roth (Belen), 864-4080.

HANDYMAN JOBS for college student, yard cleaning, have pickup & tools. Stixrud, 298-0478.

LOST AND FOUND

LOST—Silver bracelet w/nugget type turquoise stones; ladies sunglasses w/brown lens and frames; large sunglasses w/brown rims (made in France); man's bifocal sunglasses w/plastic grey frames; brown cup-shaped keycase w/6 keys.

FOUND—man's blue 3-speed "Huffy" Smiel bicycle. LOST AND FOUND, Bldg. 832, 264-1657.

Coronado Club Activities

Fish Fry Tonight; Casino Operates Tomorrow at 7:30

TONIGHT, Happy Hour features a fish fry buffet and the big trumpet sounds of the Mellotones on the Bandstand. Club retirees will party starting at 4:30 in the El Dorado Room. Mike Michnovicz and accordion will entertain.

TOMORROW Las Vegas comes to the Rio Grande when the Club's casino opens at 7:30 p.m. Trade your $1 ($2 guests) admission for a bundle of play money and try your hand at blackjack, craps, roulette and all those good things. Another good thing is a special performance by belly-dancer Leila Ashmahan. The show is scheduled for about 8 p.m. just before Elton Travis and his country western dudes start playing for dancing. Sandwiches will be available, and a good time will be had by all. There will be door prizes galore.

NEXT FRIDAY'S Happy Hour features a roast beef buffet, a fashion show and the Prisoners loose on the bandstand.

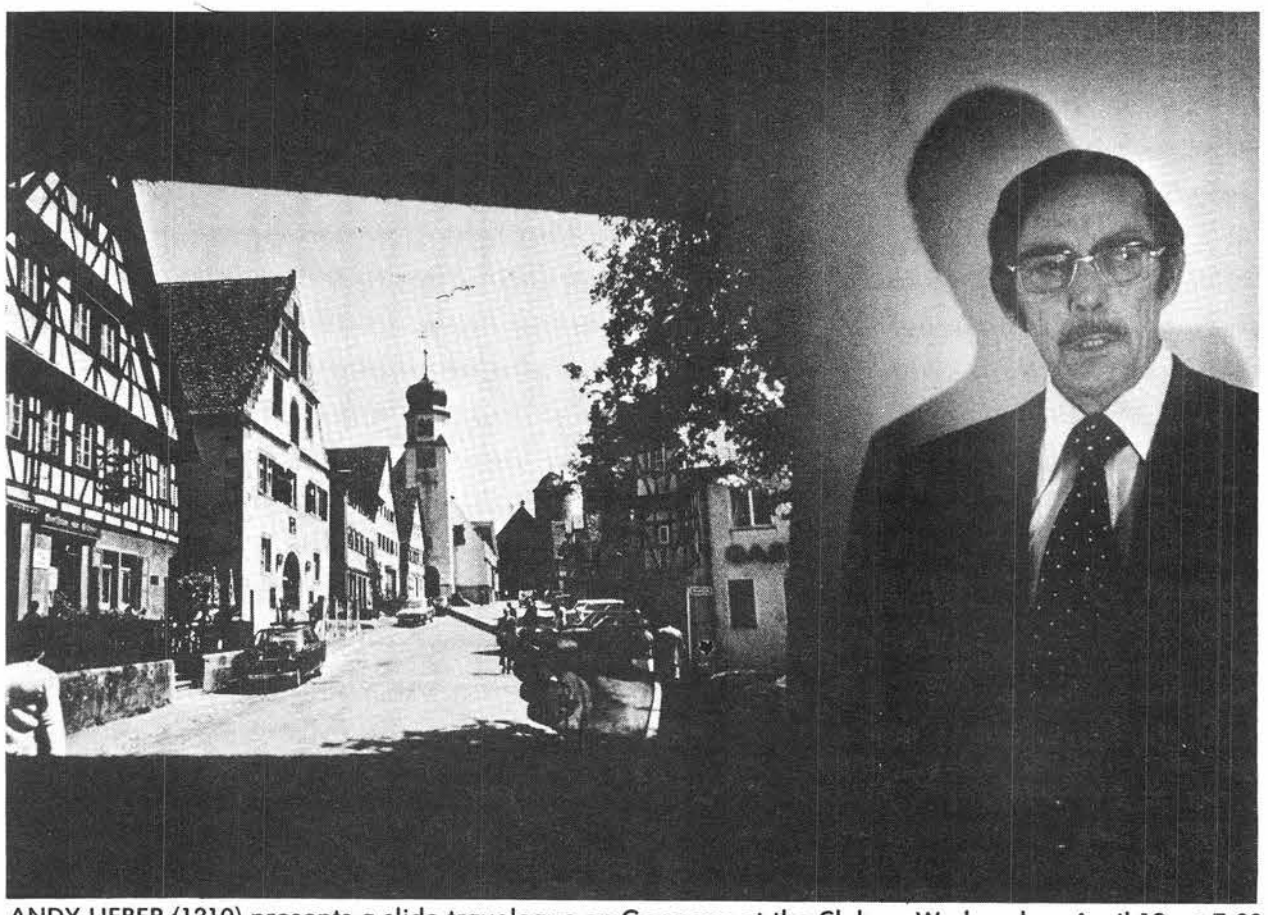
SINGLES will get organized at a meeting at the Club at 4:45 Wednesday, April 19. A program of activities will be planned. Plan to be there.

SWIM LESSON registration will be held from 9 until noon Saturday, April 22. Member parents must enroll their children.

TRAVEL DIRECTOR Ed Neidel (2166) will be in the Club lobby tonight from 6 to 7 with packages to Europe, Hawaii, Las Vegas and a raft trip down the Colorado River through the Grand Canyon.

CORONADO GRANDSQUARES square dance club is now organized, dances Monday nights at 8:30 at the Club, and is seeking new members. Call Mel Olman (1233), membership chairman, on 4-7701 if you would like to join. Vic (DOE) and Mary Berniklau are president-couple, Mike (9632) and Mary Lou Michnovicz are VP-couple and Nate (ret.) and Rita Wineberg are secretary/treasurer-couple.

UPCOMING EVENTS—Soul Session, April 29; Swim season opens May 27.



ANDY LIEBER (1310) presents a slide travelogue on Germany at the Club on Wednesday, April 19, at 7:30 p.m. Andy spent three years in Europe on assignment with the Department of Defense. Admission to the show is free; everyone is invited.

Sore Back? Here's One Answer...

More than 40 Sandians have already taken "The Y's Way to a Healthy Back," so says Wanda Cupp of Medical. "And most of them feel the course was beneficial—it helped with their back problems," Wanda reports.

With such good results, Medical will again offer the course sometime after April 18. Classes are held in Medical's building Tuesdays and Thursdays, start at 4:45 p.m., and are generally over by 6. A total of 12 classes is held.

Interested? Then send your name, organization, E-number and extension to Wanda Cupp—3322. She'll then contact you about the schedule.

FRIDAY	SATURDAY
14—HAPPY HOUR FISH FRY BUFFET Adults $3.50 Under 12 1.92 MELLOTONES 4:30 *Retiree Party*	15—CASINO NIGHT Games 7:30—10:30 Dancing 8:30—12:30 ELTON TRAVIS *Sandwiches Available* *Mbrs $1 Guests $2*
21—HAPPY HOUR ROAST BEEF BUFFET Adults $3.50 Under 12 1.92 *Fashion Show—7* PRISONERS	22— 9—Noon SWIM LESSON SIGN-UPS

NEW CONSTITUTION & BY-LAWS for the Sandia Recreation Council are held by Dan Padilla (1247), president of the Council. New provisions recognize recently assumed role of Coronado Club in Labs' recreation program. Max Newsom (1320), C-Club president; Bob Giersberg, C-Club recreation manager; Julian Lovato (3533), C-Club recreation committee director; and Eddy White (1739), secretary-treasurer for the Council, were present for the signing.