

Better Than It's Ever Been

Ed. Note: President George Dacey recently shared with members of Public Affairs and Employee Communications Department 3160 his current views of Sandia's past, present, and future. This summary of that discussion represents Mr. Dacey's second "State of the Labs" message since he was named president in August 1981; his first such message was carried in the April 1, 1983 LAB NEWS.

SLN: Let's begin with Sandia's bread and butter — our weapons programs. From what we hear in the LAB NEWS, 1983 was a very busy year.

GCD: That's true. We had our highest level of activity in years — a dozen programs in one phase of development or another — and we passed a number of major milestones. All in all, it was a most successful year.

SLN: What are some of those milestones?

GCD: The two most important ones have to be the deployment of the W84 warhead for the GLCM [ground-launched cruise missile] and the W85 warhead for the Pershing II for NATO deployment. When Sandia was tasked to deliver those warhead systems by the end of 1983, we weren't sure we could do it. Each had very tight time schedules that stressed the whole system — the Labs and the production complex. Completing them was an extraordinary accomplishment demanding close teamwork on both sides.

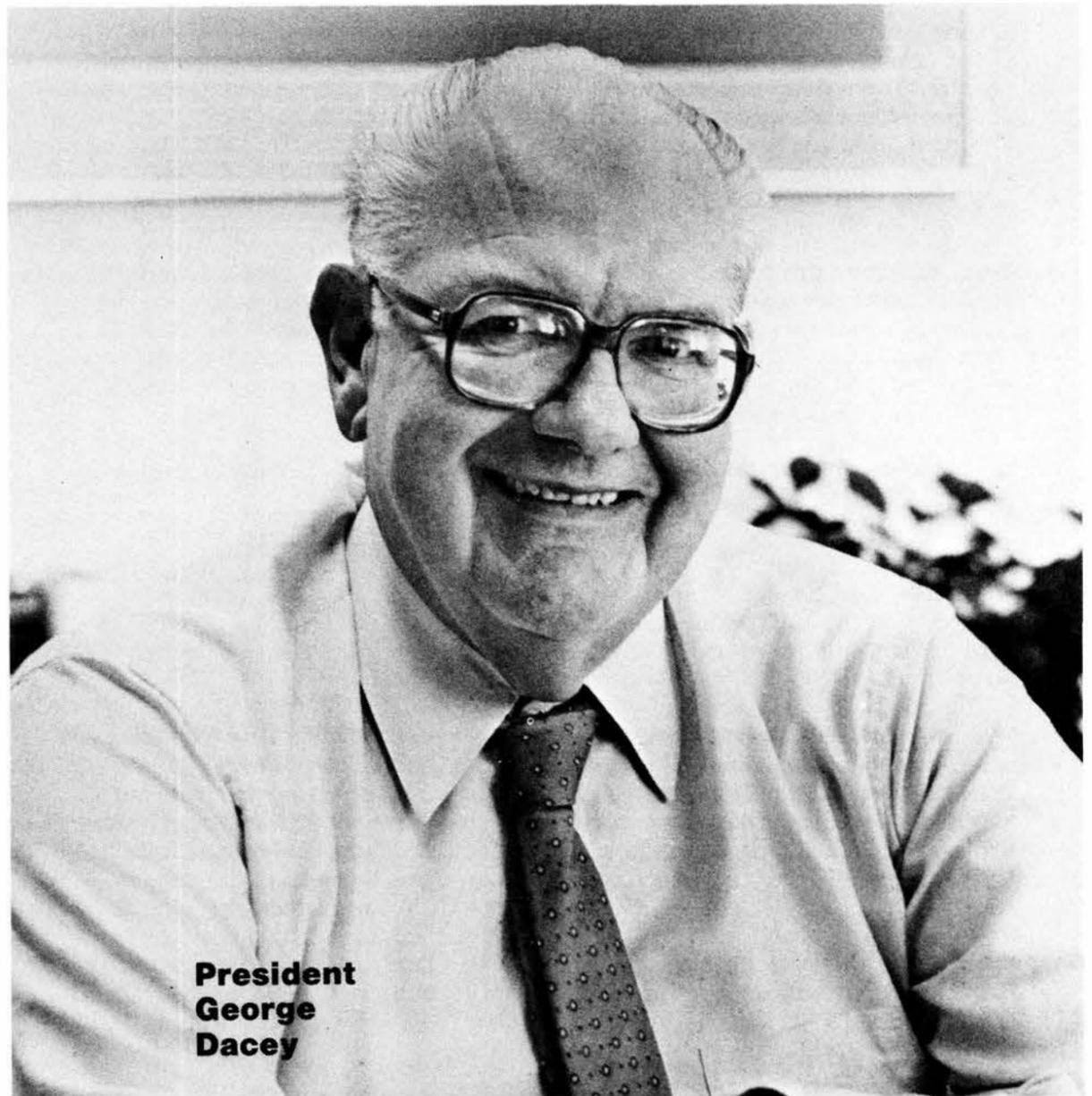
But, thanks to a herculean effort, we succeeded, and the political implications of that are important. A major factor in arms control negotiation was our ability to demonstrate that NATO meant business. Then too, meeting the schedules and deploying the missiles in Europe was important to the US — and to all of NATO, for that matter. It's something all of us who were involved, directly and indirectly, can be proud of.

Another source of pride is the development of the B83, the new strategic bomb. It has all of the modern technological features that improve its safety and command-and-control capabilities and thus ensure that it can only be used as directed by the President of the United States. The B83 is, in fact, the largest and most complex single job that Sandia has ever tackled.

The DOE complex also achieved FPU [first production unit] on the W80-0 for the sea-launched cruise missile last year. This was a smaller program for Sandia than the ones I mentioned earlier because it is a close kin of a design already in production.

SLN: What lies ahead in terms of weapon programs?

GCD: Plenty of work. The national debate on the MX (or, as it's now being called, the Peacekeeper) seems to be behind us, and we're confident that development can proceed. But those earlier uncertainties followed by a rather intense schedule for delivery have put extraordinary demands on our manpower. While we're succeeding in staying on schedule and we fully expect to meet upcoming schedule



**President
George
Dacey**



LAB NEWS

VOL. 36 NO. 6

SANDIA NATIONAL LABORATORIES

MARCH 16, 1984

dates and obligations, it too is turning out to be a stressful — as well as big — program.

And then there's Trident II — a major new start. Some questions remain — where are the Tridents really going to be deployed in the long run and what kind of capabilities do they have to have to survive different environments? But once we finish that program, we will have played a key role in completing the development of modern weapons for all of our strategic ballistic missile forces — sea-launched, air-launched, and land-launched.

Looking further out — future Navy tactical weapons are likely to be even more challenging and may utilize some of our long-standing technology. The Soviets may be capable of deploying submarines under the polar ice caps. They would lurk around down there, hoping you can't find them. Future ASW [anti-submarine warfare] weapons must be responsive to the kinds of ASW requirements that will be needed in the future. So let's put it this way: a new generation of submarine-launched missiles — and of submarine warfare in general — creates a whole set of very challenging

problems for us in the future. It could be a big job.

SLN: How did the cancellation of the W82 nuclear artillery shell last year affect us?

GCD: We had enough work that we could move the people from the W82 into other areas, so we weren't affected in that way. But I was troubled that NATO hasn't been able to come to grips with exactly what the role of nuclear artillery is going to be in our future military posture in Europe. What are the relative roles of short range rockets versus artillery, for example? So Sandia must deal with these cancellations without really understanding how to prepare for whatever the future requirements are going to be.

Along this line, the Congress has asked the administration to propose by this May a revised theatre nuclear force posture for Europe. The Secretary of Defense will make the official proposal, but we're helping the DoD think through all the technological options that might be included. Of

(Continued on Page Six)

Antojitos

A Mess, Literally One of Murphy's laws of housekeeping is simply "Dust breeds." I was reminded of it by the Feedback item last issue on the trash that too often ends up decorating our fences. Here we are—a high-technology lab that prides itself on developing some of the most intricate devices the world has ever known in labs that meet rigorous standards of cleanliness—like one part of dust in one million parts of air—and our fences are filthy. It's like dandruff on a dermatologist.

Yes, dust breeds, and the wind is the midwife. But trash breeds too. In fact, Data Amassing Division 9432 tells me that every seven seconds a Sandian drops a piece of trash. What we must do is find that Sandian and fire him/her! No, more seriously, what we must do is to rethink the consequences of our actions: I drop a gum wrapper, you toss a cigarette butt, they see that mess and think "Well, someone is going to have to clean up here anyway, so tossing this tab run trimming won't hurt." And we, collectively, have a nascent landfill resembling the aftermath of a ticker tape parade.

We do have trash containers—every hallway is punctuated by them. And pockets and purses work well as staging areas. Next time you feel the urge to desecrate the floor with your flotsam or the great outdoors with your ordure, stick it in your pocket or your purse until you find it overwhelmingly convenient to deposit the trash in a container.

* * *

The Evel Knievel School for Traffic Engineers Every time the state publishes another list of the city's most dangerous intersections, I look for Lomas and Tennessee. If people who are using Tennessee avoid an accident there, it's because they are not following the prescribed traffic lanes. At that intersection, motorists southbound on Tennessee who wish to turn east on Lomas have a special left turn lane to wait for the green light. Motorists northbound on Tennessee who wish to proceed across Lomas are directed by the traffic lanes to crash head-on into those waiting to make the left turn. Surely the traffic engineers who designed that intersection won't have anything to do with the upcoming redesign of the I-40/I-25 intersection, will they? Well, will they? ●BH

* * *

El que no llora no mama. (The one who doesn't cry doesn't eat—or the squeaky wheel gets the grease.)

Medical Corner

Child Rearing In the '80s

Discipline is one sticky subject for any parent. Adolescence is another. The Parent Center of the Albuquerque Public Schools Special Education Department, in conjunction with Sandia's Medical Department, will present two seminars at Sandia, "Assertive Discipline: A Plan for Change" (in two parts) and "Living with Your Adolescent" (also in two parts), this month and next.

The seminars will be led by Jo Paroz, a teacher and special education coordinator for APS and for the Parent Center. The Center's task is to strengthen the relationship between home and school. "Our philosophy is that an effective working relationship between parents and teachers enhances the growth, development, and school success of children," says Jo. "True education is a partnership between home and school.

"At the Parent Center, we've become increasingly aware of the need to develop innovative strategies for reaching parents. The rise in the numbers of working parents and single parents — and the resulting time constraints — contributes to pressures on families that often require a new approach to home-school contacts. It's our philosophy that parents should be offered a wide variety of opportunities to work with members of the school staff." The Center's "industry outreach program" is a major step in this — and Sandia's — direction.

The seminars offered to Sandians are designed to assist parents in expanding their skills and knowledge about child rearing in the 1980s. The schedule and topics:

March 21 Assertive Discipline: A Plan for Change, Part I

March 22 Assertive Discipline: A Plan for Change, Part II

April 4 Living With Your Adolescent, Part I

April 5 Living With Your Adolescent, Part II
All seminars will be held in Bldg. 815 (outside the Tech Area; spouses are welcome) and will run from noon to 12:30. For further information, contact Arlene Price (3330) on 6-0021.

Events Calendar

March 17 — NM Symphony Orchestra, St. Patrick's Day Concert, free admission, 8:15 p.m., KiMo.

March 17-18 — Albuquerque Gem and Mineral Show, Ag. Exhibit Bldg., State Fair Grounds, 293-6215.

March 21 — Old Town Walking Tours

resume (Wed., Thurs., & Fri., 11 a.m., Sat. & Sun., 1:30 p.m.), Albuquerque Museum.

March 22 — Alexander Lagoya, classical guitarist in concert, 8 p.m., KiMo.

March 23-25 — La Zarzuela de Albuquerque (musical theatre company), "La Verbena de la Paloma," a Spanish operetta; 8 p.m., 2 p.m. matinee on 25th, KiMo.

March 22-25, 29-April 1 — "Paint Your Wagon," Albuquerque Civic Light Opera, 8:15 p.m., *2:15 p.m., Popejoy.

March 27 — Audobon Film, "Micronesia Naturally," 7:30 p.m., Popejoy.

March 30 — Karen Steele Dance Quintet, 8 p.m., KiMo.

March 30-31 — "Arsenic and Old Lace," classic comedy starring Bill Daily, Albuquerque Little Theatre, 242-4750.

Sympathy

To Paul Martinez (1531) on the death of his son, Feb. 6, in Spain.

LAB NEWS

Published Fortnightly on Fridays

SANDIA NATIONAL LABORATORIES

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LIVERMORE, CALIFORNIA
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THE VICTORIAN COMPUTER-MAKER



"Born ahead of his time" is a fascinating idea. . . . More recently, the phrase is used about Charles Babbage. Not yet a household name, I suspect he soon will be because Charles Babbage (1791-1871) is the father of the modern computer. . . . His first was what we would call a calculator. He called it a Difference Engine. This was a machine designed to compute tables of numbers and automatically print out what they computed. . . . What is especially noteworthy about the development of this first computing "engine" is that Babbage built it with government funds. It was one of the first large-scale public investments in science. . . . A brilliant mathematician and a skillful tinkerer, Babbage was very much a man of his own time. For the 19th Century was the age of machines in Britain when high society was open to a thinker who blended theory and practice. Not only did his contemporaries fund his scientific research, but they honored him with social recognition.

—Betty Ann Kevies in *Los Angeles Times*

EXPERTISE REVISITED



"There is no hope for the fanciful idea of reaching the moon, because of insurmountable barriers to escaping earth's gravity." (F.R. Moulton, astronomer, University of Chicago, 1932)

Supervisory Appointments



DON BOHRER to manager of Systems Development Department I 8160, effective March 1.

Don came to Sandia Livermore in June 1959 where he began working on the flight test program for the W45. He has been involved in components and systems work over the years and in May 1969 was promoted to supervisor of a weapons test division. His most recent division was the W79 and W82 systems project group, where he has been since 1974.

He earned a BS in ME from Oregon State University.

Don and his wife Judee reside in Livermore with one daughter who is a high school freshman. They have two other girls, a freshman at Cal Poly and a junior at Chico State. Don's hobbies are woodworking and photography, including the darkroom work.



JIM HOPWOOD to supervisor of Calibration and Repair Section 8416-1, which has been newly created under the Measurement, Standards and Photography Division, effective March 1.

He joined Sandia in June 1960, moving to Livermore from Ft. Worth, Texas. His first assignment was to set up a repair and calibration lab for small test equipment and instruments. In 1966 he moved into the instrumentation development group, and in 1971 to the Model Labs Division to repair numerically controlled machine tools and welding equipment. Most recently he has been in the Electronics Technology Division where he designed welding controls and data recording systems.

Jim earned an AA degree in electronics from the DeVry Technical Institute in Chicago. He and his wife Marilyn have three grown children and one son at home with them at Bethel Island. Their outside interests include water-related sports and backpacking.

Sympathy

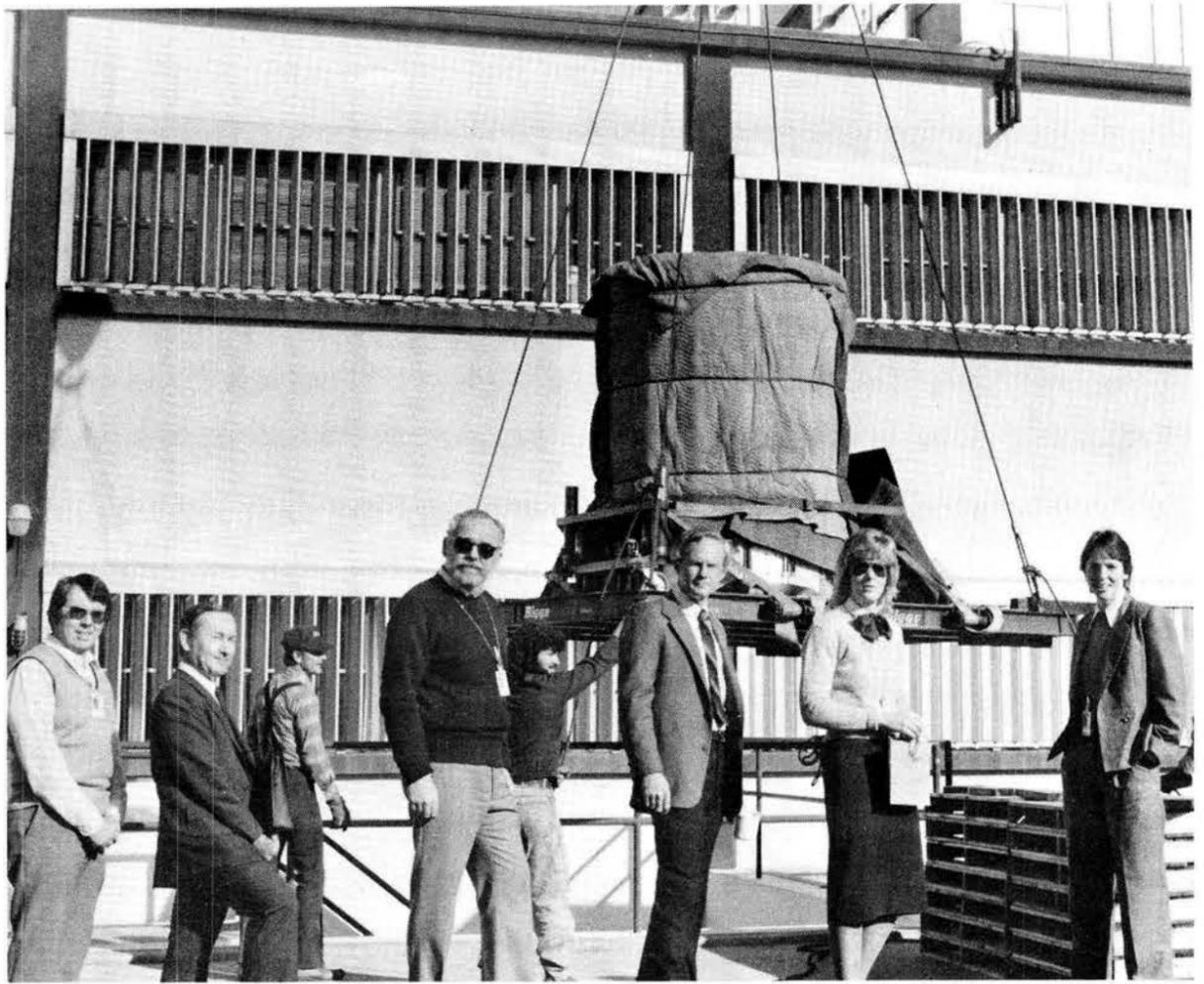
To Bob Ware (8263) on the death of his father in Hollywood, Fla., Feb. 5

To Jim Ringland (8228) on the death of his father, Dec. 31, in Hagen, Wis.

To Tom Prast (8351) on the death of his twin brother in San Diego, Feb. 17.

To Alice Rogers (8122) on the death of her father in Modesto, Feb. 27.

To Betty Mayer (8411) on the death of her mother in Lodi, Feb. 18.



OVERSEEING THE UNLOADING of Sandia's latest supercomputer, the Cray-1S/1000, are: (from left) John Barnhouse (8236-1), Cray Research account manager Charles Breckinridge, Gary Drummond (8236), Bob Huddleston, Linda Barncord and Dona Crawford (all 8235). With the arrival of the second machine, Sandia Livermore now has two Crays, each with a million word capacity. In July, one will be upgraded to two million words. The new system was unloaded by crane and lowered into the freight area of the underground computing center.



SANDIA LIVERMORE NEWS

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CAREER DEVELOPMENT Job Fair was held during Black History Week at Oakland Technical High School under the sponsorship of the Minority Education Assistance Training Society whose president is Marvin Kelley (8444). This second annual career fair attracted some 1700 students. Seminars and booths provided information in business, engineering, technology, and science fields. Here, Leonard Morris (8413; left) and Gary Foster (8271) explain the functions of an H-P computer to a student participant. Others taking part included Barry Bolden (8161) and Shelia Daigle (8163).

Supervisory Appointments



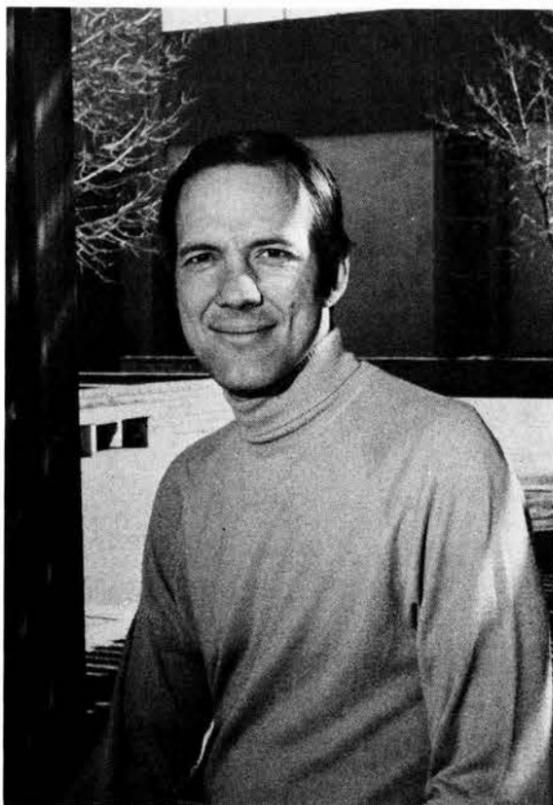
LARRY CHAVEZ (3435)

LAURENCE CHAVEZ to Lieutenant in Security Operations Division 3435, effective Dec. 16, 1983.

Larry joined the Labs' security force as an "extra board" inspector in September 1978; he became full-time in January 1980. Before coming to Sandia, Larry attended NMSU, then worked for the Forest Service and a for a local retail firm. He is a member of the Board of Directors of the Albuquerque Pre-School & Kindergarten Co-operative and enjoys ranching and outdoor sports. Larry and his wife Patricia and their daughter live in NE Albuquerque.

CLIFF HARRIS to supervisor of Security Applications Division 2331, effective March 1.

Joining the Labs in September 1975 as a member of the technical staff, Cliff worked with an organization developing unique signal generators. He was project leader on the development of trajectory sensing signal generators, and has worked on other digital signal systems for the weapons program.



CLIFF HARRIS (2331)

Cliff received his BS in EE from Texas A&M and his MS and PhD, also in EE, from the University of Arizona. He is a member of IEEE and the American Society of Quality Control. He enjoys racquetball and fishing. Cliff lives in the SE heights.



EARL MORRIS to supervisor of Test Operations Section II 7264-2, effective Feb. 10.

Earl joined Sandia at Pantex in February 1967 and has served in the systems test group since then. He earned his associate degree in EE from the University of Texas at Arlington and his BS in industrial technology from West Texas State University (Canyon).

He enjoys many hobbies but currently is interested in model ship building. Earl and his wife Pat have three children and live in Amarillo.

Retiree Roundup

The Lure of the North: And How It Catches Fish

Editor's Note: Retiree Vince White sent us a note to pass along to his ex-colleagues. He left his home in Seattle in late August with six other back-country enthusiasts and flew to Fairbanks; there they met their guide and a bush pilot who took them to Walker Lake. In Vince's words —

Beautiful Walker Lake is just south of, and under the highest peak in, the Brooks Range. We spent two days there becoming acquainted with life in a two-man tent, mastering the art of paddling a raft, and fishing. I caught a six-pound Arctic char and an eight-pound lake trout, which were delicious (the char was the best). With snow-capped peaks mirrored in the sky-

blue water, it was almost enough just to sit and gaze.

We then paddled our rafts for 140 miles down the Kobuk River through freezing rain, chilling wind, and dense dew. During our 12 days on the river, autumn turned to winter. We had one portage of about half a mile but rode the rafts the rest of the way to the village of Kobuk, home to about 32 Eskimos. We camped there on the gravel runway for two days, waiting for the snow to stop and the skies to clear up so the bush pilot could find our remote landing strip.

The grayling, pike, and salmon were cooperative; the scenery was beautiful; the weather was severe; and I had a wonderful trip.



Here are a couple of volunteer opportunities for Sandia employees, retirees, and families. If you are interested, call Karen Shane (4-3268).

SOUTHEASTERN NEW MEXICO SCIENCE AND ENGINEERING FAIR, conducted by New Mexico Military Institute, needs judges on Saturday, March 24, in Roswell.

AMERICAN CANCER SOCIETY, Isleta Boulevard, needs both office workers and drivers to take cancer patients to treatment centers. Ability to speak Spanish is helpful, although not essential.

Congratulations

Michael (5347) and Jeannie Johnson, a daughter, Amy Michele, Feb. 3.

Terry (5357) and Nancy Ann Calloway, a daughter, Carol Ann, Feb. 16.

Mary Ann Sweeney (1265) and Edward Ricco, a daughter, Suzanna Marie, Feb. 11.

Melvin (1265) and Polly Widner, a son, William Charles, Feb. 19.

Richard (3612) and Deena Farwell, a daughter, Stacie Renee, Feb. 14.

Lanny (3742) and Dorothy Garcia, a son, March 8.

Marilynn (1531) and Joe Barr, a son, Tyler Joseph, Feb. 13, in Albuquerque.

Carolynn (1846) and Stephen (1533) Montgomery, a son, Scott Arthur, Feb. 20, in Albuquerque.

Jill and Richard McAniff (5242), a daughter, Karen Cristin, Feb. 10, in Albuquerque.

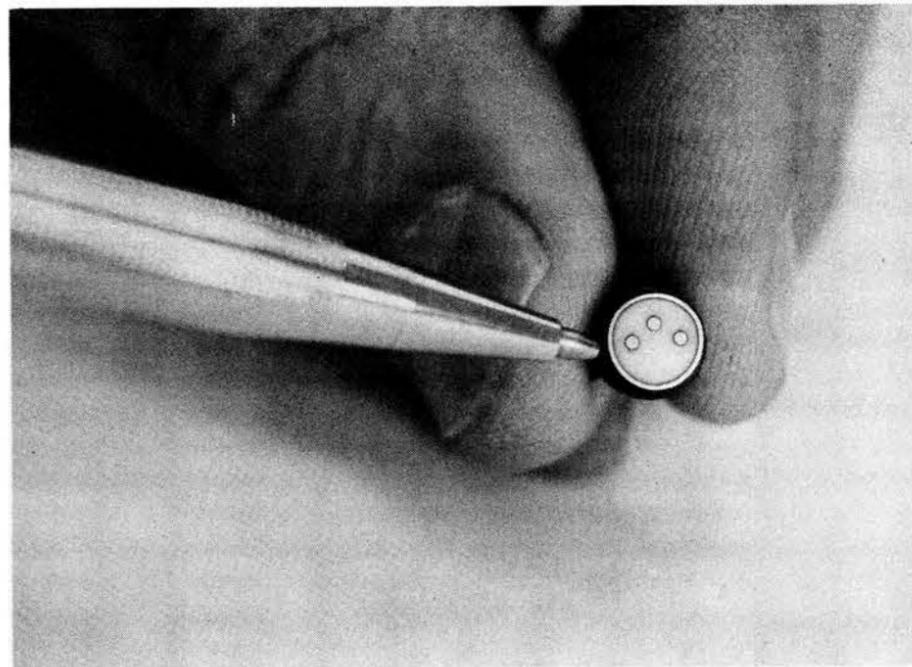
Penny and Larry Ritter (5242), a daughter, Tracy Lynn, Feb. 20, in Albuquerque.

ECP News

Two United Way agencies will participate in the March 28 ECP Agency Awareness Program from 11:15 to 1 p.m.:

American Cancer Society
Lobby of Bldg. 802

Villa Santa Maria
Cafeteria (Bldg. 861)



GLASS CERAMIC SEAL in a weapon actuator device provides a high strength bond to the Inconel shell of the actuator and to the electrical pin feed-throughs. The glass ceramic matches the coefficient of thermal expansion of the other materials. The actuators have survived explosive testing to 150,000 psi.

INVENTORS Howard McCollister and Scott Reed (both 7472) have perfected a process that seals glass ceramic to Inconel alloys. Applications include high strength seals in weapon actuators and reactor, well-logging, and high temperature testing instrumentation. Shown here are rings of glass ceramic seals surrounding the base of a large experimental neutron tube.

Patent Awarded For Glass Ceramic Seals to Inconel

The DOE has been awarded a patent for a process that produces high strength glass ceramic seals to Inconel alloys. Inventors are Howard McCollister and Scott Reed of Glass Formulation and Fabrication Section 7472-3.

Applications of the process include hermetic seals of the glass ceramic to an Inconel alloy in two Sandia-designed explosive actuators now in production. Prime requirement for these devices is high strength, and they have survived testing to 150,000 psi with explosive charges.

"In many applications of glass-to-metal sealing," Howard says, "the coefficient of thermal expansion of the materials must match. Bob Eagan (1840) and Cliff Ballard (2521) pioneered glass ceramic-to-metal seals work at Sandia. The novelty of this seal is the high strength of the glass ceramic and its high coefficient of thermal expansion. You start with the formulation of the glass and then tailor the sequence of heat treatments to give you the final product that meets requirements. It took three years to perfect this particular process."

The glass formulation contains silica, boric oxide, alumina, phosphorus pentoxide and alkali metal oxides — it's called S-glass and has been the subject of extensive basic research at Sandia (LAB NEWS, Technical Accomplishments 1983, Jan. 20, 1984).

The Inconel used in the actuators is a precipitation-hardened nickel-based alloy, much stronger than standard stainless steel (the reason it was chosen for the explosive actuator application) and extremely corrosion resistant. The glass ceramic fills the Inconel shell of the actuator header and

holds the electrical pin feed-throughs in position.

The newly-patented process involves a number of heating and cooling steps that melt the glass and crystallizes it to lithium metasilicate and cristobalite phases. It also precipitation hardens the Inconel alloy. The result is a glass ceramic with coefficient of thermal expansion matching that of har-

dened Inconel.

"The process produces high strength, corrosion-resistant seals able to withstand high temperatures — up to 700°C," Howard says. "It's finding uses in reactor instrumentation, well-logging instruments, and in experimental high temperature testing such as the work Sandia is doing with liquid sodium and reactor safety."

Favorite Old Photo



IN 1910 when this photo was taken, you didn't stop by the nearest convenience store when you needed a quart of milk. Instead, when dairyman John Pokorny stopped in front of your house (the horse knew each stop on the route; John walked beside the cart), you gave John your order and probably discussed the weather as he filled your

container with his pint dipper. The milk sold for five cents a quart.

John's dairy farm (nine cows) was located at Walden Ave. and Harlem Rd. in Buffalo, NY (the site is now a shopping mall). John was the great-grandfather of Cynthia Prior (wife of Ray Prior, 5321).



Continued from Page One

State of the Labs

course, at this point we can't know exactly how Sandia will be affected, but we do know that Sandia will be affected.

SLN: Do you see a major role for us in President Reagan's new defense initiative, the one the press generally labels the Star Wars direction?

GCD: If the nation decides to go down the road of increasing its R&D here — and the proper terminology is Strategic Defense Initiative, or SDI — then I think there will be an important role for Sandia to play. We are uniquely qualified in some areas, especially in the directed energy field. In fact, we're already beginning to develop programs.

But those won't be our first contribution to SDI. You've published in the LAB NEWS the report from Gerry Yonas [1200] and Bob Clem [1600] who served on the panels studying the issues. They acquitted themselves with great credit to the Laboratories; in fact, in my parochial opinion, they played key roles in sorting out the issues and injecting common sense into the technical discussions.

I think in terms of understanding what is possible and what isn't we are in a good position to participate. In the President's recent budget message to Congress, he proposed an SDI that could run to as much as \$25 billion over the next decade. Most of that would be spent in the DoD, but there would be a considerable amount on the DOE side as well. How much of it would come to Sandia is not clear, but we certainly would have a part.

My initial reaction to the President's speech remains intact; that is, removing the taboo against defensive systems in general is good. We certainly ought to think as broadly as possible about all kinds of ways of increasing our national security — defense and offense and negotiation. And those areas ought to be better integrated than they have been in the past; after all, defensive and offensive systems have many technical things in common, and no systems alone or military structure alone can prevail if you don't have an appropriate political negotiating posture as well. I personally applaud the president's opening up the SDI field for further research.

But it won't be easy. The summer study and other technical studies indicate that defending broad areas — cities and populations — against ballistic missiles is an enor-

mously difficult technical problem. The summer study identified a series of promising technical directions that could at some time in the future perhaps underlie a workable defensive system. But that deployment is probably not feasible in the short range. So over the next decade or so a program ought to advance the various base technologies that in turn would underlie deployment of a defensive system.

As a nation we certainly aren't ready to build, much less deploy, a big defensive system. So Sandia's kind of R&D input becomes all the more important. The whole SDI, if Congress approves it, will be a very large technology base problem, and we will have some very important things to contribute.

SLN: According to Paul Stanford [100], we are getting the funding we need to perform the many tasks we're being asked to undertake. In fact, he says the budget for FY84 looks quite good [see LAB NEWS, Dec. 16, 1983]. Do you agree?

GCD: I do. Sandia's funding is now better than it has been for some time; FY84 has brought a definite reversal of the long downward trend in the weapons budget, and FY85, on a very preliminary basis, looks even better.

For construction, the President's budget for FY85 includes a new weapon laboratory

Sandia's funding is now better than it has been for some time: FY84 has brought a definite reversal of the long downward trend in the weapons budget, and FY85, on a very preliminary basis, looks even better.

building for Livermore, repair of the buildings damaged by the earthquake there some years ago, and additional property around the Livermore site to serve as a buffer zone. We're also expecting funding for the Radiation-hardened Integrated Circuits Lab and the Simulation Technology Lab here in Albuquerque. So, in general, the indications of support in 85 for our construction program are very very good. The same thing is true of the capital equipment and the operating budget. So it looks as though, from a budgetary standpoint at any rate, we'll be able to carry out our mission fully without any problems through at least FY85.

SLN: How do we ensure that the funding goes where the need is greatest?

GCD: The allocation process for programmatic funding has been improved in the past year. We have now set up budget committees — one under Tom Cook and one under Al Narath — that attempt to look, within given funding sources, at programmatic needs broadly across the whole spectrum of the laboratory. The mechanisms for doing that are sharper than we have had in the past, and I have been very pleased with the way this new process has been working.

SLN: What new reimbursable programs are in the pipeline?

GCD: We're facing no shortage of funds or of problems and projects. The DoD has formally recognized that, from a technical standpoint, the DOE has much to offer as the nation seeks conventional deterrents for conventional threats on the parts of the Soviets and others [see related story on The World Outside Sandia]. Memos of understanding, now in preparation, may well lead to funding for the DOE to study problems related to conventional defense.

Of course, this is an area where we have, with our reimbursable contracts, already established quite an important set of technical possibilities, especially in the 300 and 1600 groups. Conceivably, something like \$10 million worth of work would be done by the DOE in this area. Whether that would be a reimbursable or a line item isn't clear, but I think it is significant that the DoD recognizes that the DOE ought to be involved and ought to be receiving moneys of this magnitude.

We have had a large role in verification and control technology over the years, but in my opinion that role is going to be enlarged in the future. That's because, I believe, our arms negotiations in the past have been "underpinned" by too little real technical insight as to what is possible and what isn't in terms of verification. Our role would be to establish technical feasibility for various kinds of verification and control features that need to be communicated to, and made a part of, the negotiating and policy-making process at the very earliest stages.

We also expect our work in the surveillance satellite area to continue. Our non-visible infrared telescope activity, for example, could have some important spinoff for arms control in general and may prove useful for early warning purposes.

We have also initiated a new project under the sponsorship of the Defense Communications Agency that involves designing major elements of a command and control center that must be capable of operating before, during, and after a nuclear attack.

SLN: How are we doing with our current reimbursables?

GCD: Certainly the whole area of Security and Safeguards is one of our

Our policy has always been — and I think it's wise — to use reimbursables as a kind of ballast.

largest reimbursables, and it's an important one. Our technical position — in terms of being able to protect various installations, places, and sites — continues to improve. The technology has advanced to the point where we can state with fair confidence that, once the threat has been defined, we know the ways in which to counter it.

Unfortunately, there's a political prob-

lem here — not all members of Congress understand that one can *always* postulate a threat against which the existing protection does not work: protecting against a threat is a matter like insurance — how much is enough? If the potential enemy doubles his force or uses twice as big a truck or whatever, then obviously the protection is going to fail. It is a case of risk analysis. I think that Safeguards in general is an area where we've done excellent work and where we are, technically at least, in very good shape.

I think the work that Don Rigali [1650] and his folks have been doing on maneuverable reentry vehicles is another big success story. And the whole area of SITAN [Sandia inertial terrain-aided navigator] and mobile vehicles is a very successful activity; Sandia is leading the parade here.

The sensor work that Roger Hagengruber's [300] folks have been doing is tremendously appreciated and successful, and more and more people are coming to us now — including, most recently, the Marines who want to get some work done.

Many other programs deserve mention, but space doesn't permit discussing all of them.

SLN: Do you predict any change in our policy toward seeking reimbursables?

GCD: Our policy has always been — and I think it's wise — to use reimbursables as a kind of ballast. I've said many times that it takes decades to build a laboratory like this one where the skills complement one another, where complicated jobs can be done on a multidisciplinary basis, where people have learned how to work effectively together. That kind of an institution represents a national resource that deserves to be preserved; it's not easy to rebuild such a place if you dismantle it. Therefore, we ought to do everything we can when budgets fluctuate to find ways of preserving this resource for the country.

That's where the concept of ballast comes in. We've all seen big fluctuations in the energy budget — down by a factor of two over the last two or three years — and we saw some years ago a big fluctuation in the weapon budget — down by 1500 people in the early seventies. Reimbursables represent a very attractive way of taking up these fluctuations, damping out the oscillations in the other budgets.

I think we've been very successful over the years in managing our reimbursables so that we have never had a conflict between our DOE commitments and the commitments that we make in the reimbursable world. It is a matter of projecting manpower and budgets and workloads into the future and assuring that programs mature and that commitments are discharged in time to release people for whatever other things are coming along at that time. No, we don't plan to change our reimbursables policy.

SLN: Many of our reimbursable programs are done for the military. Do you see any special advantages in that interrelationship?

GCD: Work for the military has a very important spinoff in our work for the DOE. The non-nuclear weapon work we do for the DoD uses technologies and furthers contacts that are of tremendous value in our

nuclear weapon work. So we have a more rounded program of interactions with the military. As we said last year, the notion of single purpose weapons is something that technology is beginning to change.

Artillery shells are a good case in point. A cannon doesn't know whether it's shooting a conventional explosive or nuclear explosive. And yet our knowledge of how cannons are used and how the military logistically and operationally involves itself with artillery pieces is clearly of value whether we are working on nuclear or intelligent conventional artillery.

Reimbursables are not a diversion from our major mission; they are a complement to it. And if we're intelligent in the way we select reimbursable programs, we create a synergistic relationship rather than a competitive one.

SLN: The nuclear weapons labs, as you know, have been criticized in the past year for not restricting themselves solely to their nuclear weapons mission. Do the critics have a point?

GCD: I don't think that one can foresee nor that one *should* foresee any change in Sandia's fundamental mission. That is to be the nuclear ordnance engineer for the United States of America. That mission is going to continue for the foreseeable future — until very major political and technical

I don't think that one can foresee nor that one *should* foresee any change in Sandia's fundamental mission. That is to be the nuclear ordnance engineer for the United States of America.

changes occur in this world, and those are decades off. We will have to put our principal reliance on deterrence with nuclear weapons, and the modernization of the stockpile over that period of time is of crucial importance.

As we have said many times in speaking against freezes, it is important that we provide deterrence in the twenty-first century with twenty-first century technology. We must not try to deter nuclear adventures with antique, creaking, rusting weapons that no one in the next generation will know how to operate. We have to have modern weapons with which to deter over time. And therefore, I think, there is no likelihood that our present responsibility for assuring the stability and the reliability and the security of a stockpile of deterrent weapons will change. That is going to be our principal mission for a long time.

But it's not our *sole* mission. The trends we mentioned earlier mean that we must be alert as the nation moves in new directions so that we can make our maximum contribution. I believe that the comments you mention to the effect that "you folks aren't doing your job right; you're doing these other things — you should be doing more in nuclear weapons" demonstrate a misunderstanding of cause and effect. It is not a matter of priorities — we set our priorities care-



fully to fit the nature of our mission; it is a matter of funding. If the nation decides that it is not going to *fund* nuclear weapon work at Sandia, then we are not going to *do* nuclear weapon work at Sandia.

Never has the country wanted us to work on weapons and found us unable to do so because we had perniciously decided to do some other thing instead.

SLN: Our microelectronics capability seems to be a unique resource. Where do you see it leading us?

GCD: Artificial intelligence in general, and nth generation computers as the enabling technology in particular, is a trend that is going to grow over the next several years. We will be in a very good position to contribute to that growth because our future Radiation-hardened Integrated Circuits Lab will be able to make chips of another order of magnitude of complexity over what we can do today in our Center for Radiation-hardened Microelectronics.

And clearly, any practical application of artificial intelligence will depend on silicon chip technology and computer technology that's much advanced beyond what we have today. I can't imagine having a Cray going around in a tank. I *can* imagine having a miniaturized Cray going around in a tank.

At least in today's understanding of software, machines simulate human intelligence by providing immense processing power — billions of instructions per second. The human mind can accept and process

We certainly ought to think as broadly as possible about all kinds of ways of increasing our national security — defense and offense and negotiation.

only about 40 bits of information per second, but we don't understand how the mind works. So for today's machines we have to consider billions of bits per second. Given that direction, Sandia is in a good position to contribute because, in addition to the capability for ever more complex chips, we also have a number of people thinking about processing sensory information in ways



that could lead to the "intelligent" weapons of the future.

Sandia is on the threshold of real progress in integrating sensory information into an understanding of state and action to modify that state through the use of visual information, pattern recognition, motion information, positional information, and other kinds of sensory data. If we succeed, we'll have a machine able to react to its environment in ways comparable, in a small way, to what people can do. That would clearly have immense military application.

SLN: Let's shift to energy. Is funding likely to stay about the same or is it going to decrease further?

GCD: I think we have reached the bottom. I believe that if anything we'll see small increases in our energy research budget although nothing as dramatic as occurred during the seventies when there was a gasoline crisis and the DOE labs were doubling and tripling their efforts in energy.

Lately the larger increases have been on the weapons side; the energy budget has not increased. I'm disappointed that the nation does not recognize the temporary nature of the oil glut. There is no objective evidence to say that the energy crisis is over. It's true that we don't have lines at the gas pumps,

I can't imagine having a Cray going around in a tank. I can imagine having a miniaturized Cray going around in a tank.

but we have higher priced gasoline and we have smaller proven reserves in all of our energy sources. Therefore, the notion that we no longer need research into alternate energy sources is, in my view, shortsighted.

SLN: We've seen a big increase in the number of PhDs and MSs on roll. What are the implications for Sandia of this increase?

GCD: What we're seeing simply reflects the improved sophistication of engineering. A typical engineer when I graduated with a BS in electrical engineering from the University of Illinois thought "Well, that's it. I've got my degree and now I'm going out and be an engineer." The number of PhDs in engineering was very small — mostly people who were going to teach engineering in college. Today that number is up by an

enormous factor — it reflects the fact that the engineering profession has become much more sophisticated. And it's not just at Sandia but everywhere in the engineering profession that the PhD is now a more common degree.

It's also true that as the systems we design become more complex — as we see the impact of computers or the impact of microelectronics, for example — advanced training becomes much more valuable. But one should not think of a particular degree as such; rather it is that the degree represents a depth of technical effort. A person working at the forefront of the profession with a bachelor's degree received 25 years ago can be the equivalent of a PhD in terms of what he or she knows — through ex-

Some Changes In the Contract

The new contract clarifies our relationship with AT&T in the understanding of what "no profit" and "no fee" mean. No profit/no fee relates to activities having to do with the operation of Sandia; if AT&T Technologies sends auditors here or we get from them consulting or methods, for example, then those services are to be done at cost, with no profit/no fee.

This does not, however, apply to services or products that AT&T Technologies sells to others at a profit. If we buy an AT&T Technologies product, they are entitled to a profit. Similarly, a subcontract that called for Bell Laboratories to do research — not consulting about Sandia's operation — could carry a profit just as any other supplier would add.

We've also improved the area in the contract dealing with DOE responsibilities in case of contract termination; we have specifically added the employee body to the list of potential creditors covered by the termination procedure. In case of dispute about pensions or other money owed to the employees, this clause in the contract now specifically includes such claims.

In general we ought to be very pleased with the fact that we now have a new five-year contract that is better than the old contract in terms of clarifying our relationships and roles relative to the government. It, of course, represents a vote of confidence in our stewardship that DOE wants us to continue our work for the nation. It also represents a renewed commitment that AT&T is willing to continue for another five years.

And the new contract is in the national interest in this sense: our contract is unique; it enables us to operate in an industrial pattern rather than a university pattern or a Civil Service pattern. Maintaining our current degree of freedom to operate this laboratory is a major contribution to our nation.

perience and/or through continuing education. Certainly our better engineers have the equivalent of a PhD in terms of what they can do, whatever their degrees are.

SLN: Will the mix of skills that people will need for the future decade or so be different than they are today?

GCD: Yes. We're going to see more emphasis on software rather than hardware and on computer simulations rather than analog constructs. Therefore, our engineering of the future will require a different set of skills. That's not unique for us — that's going to be true for all of America's industries. And it's going to be true for everyone, not just for engineers — intelligence and information processing will play a much larger role than they did in the past.

We are responding to that change. As a matter of fact, we have recently established in the Computing Directorate a clearinghouse for personal computers. About 450 PCs have been delivered or are on order right now. If you look far enough in the future, everybody will have a computer terminal on his or her desk and will be directly involved in interacting with the computer world as part of the job. I think it will happen at a rate that will enable us to evolve into it; it's not something to worry about.

SLN: Do you predict that we will continue to hire contract employees to meet our manpower needs?

GCD: You hit a nerve there. We have, as I guess everybody knows, been looking hard

If you look far enough in the future, everybody will have a computer terminal on his or her desk and will be directly involved in interacting with the computer world as part of the job.

at how we accomplish our tasks in terms of on-roll employees versus contract employees. It's fair to say there have been some cases where we have done things with contract employees that might better have been done with fulltime, on-roll, on-site employees. And the reverse is true: we have had employees doing things that might better have been done by contractors — the latter because the tasks performed were either temporary in nature, or involved skills that we shouldn't necessarily have in-house in the long term, or demanded less training, or whatever.

In both directions, we want to take a hard look at how we get our jobs done. I can say in general that it is Sandia's policy to be an exemplary, first-rate, unparalleled engineering and scientific laboratory. To this end, we expect our employees to contribute technical work to projects for the good of the country. We do not anticipate our becoming a contracting shop, and we are not in the business of diverting money from the government to some other place where work will get done — our employees are not contract writers or work monitors or purchasing agents or whatever. Any project we undertake should have a high engineering value-added component to it.

It's equally true, of course, that some parts of our tasks might be done by contract where appropriate. But we certainly do not want to delegate to other people major pieces of work that are directly our responsibility and where a major technical contribution is to be made. Possibly we need to

How the Public Perceives the Scientific Community

For the first couple of decades of the national weapon laboratories' existence, stemming from the Manhattan Project, scientists were regarded as miracle workers. They were expected to *set* the policies as far as what we should be working on as a nation. That obviously couldn't last because scientists are *not* miracle workers — the nation can't just pour in money and expect to get miraculous results; that's been demonstrated in the fusion program, for example. "Big science" is in decline. The public, through the federal agencies, is now expecting more accountability from the science community and is expecting to set national priorities independently of what the scientists *want* to do. Partly that is because the bill is getting so high that it is becoming a significant fraction of the GNP. And partly it may be because people can't imagine a practical application for the latest elementary particle.

I think it's inevitable that, as physics and engineering get more expensive and more decoupled from the immediate goals of ordinary people, there will more feedback from the public, more concern about accountability. To some extent that's what we're seeing now. Unfortunately, a full accommodation between (on the one hand) the response of the scientific community to the priorities of the sources of funds — the public treasury — and (on the other) the injection of scientific potential into the funding process hasn't been fully worked out.

It may be that we are in a transitional period. Certainly the process of planning future budgets isn't as predictable as it ought to be. Take, for example, the field of energy research. I think you'll find general agreement in the scientific community that more work ought to be done on certain energy projects. And yet somehow those aren't the highest priority tasks emerging from the political process. The Congress, the public, and the administration have not come to a joint agreement that coincides with the scientific priorities and possibilities. Somehow we have to find a better way to set national science policy.

increase the size of the Laboratories somewhat.

The point is that we can't let personnel ceilings make us do the wrong thing technically. We have to decide to do the jobs the right way, and if it means arguing for a higher or lower "nose count," then we take that as a separate problem. The whole contracting issue is one that I'm concerned about.

SLN: The national labs in general have been criticized publicly for not efficiently transferring our technologies to the private sector. How are we doing?

GCD: The Stevenson-Wydler Act and others like the Bayh-Dole bill have focused attention on weaknesses in technology transfer. But our studies and the work that Bob Stromberg [400] has done allow us to quantify what we believed to be true all along — namely, that we have a very good and impressive record of technology transfer.

On the national level, DOE's Energy Research people are leading DOE's efforts to increase and make more visible the technology transfer from the DOE to the private sector. One of the major concerns they have is whether or not patents are being exploited to the fullest extent. Right now they are looking into ways for the labs' parent contractors to own patents directly and ease the current difficulty with exploitation.

SLN: How about our relationships with the AT&T in the future?

GCD: I believe that the post-divestiture AT&T will be more interested in a wider variety of business enterprises than was true historically. Telecommunication service to the public was the old Bell System's major, if not exclusive, mission. Because of prior antitrust experiences, it was not its style, intention, or policy to look for new commercial opportunities that were not part of telecommunications.

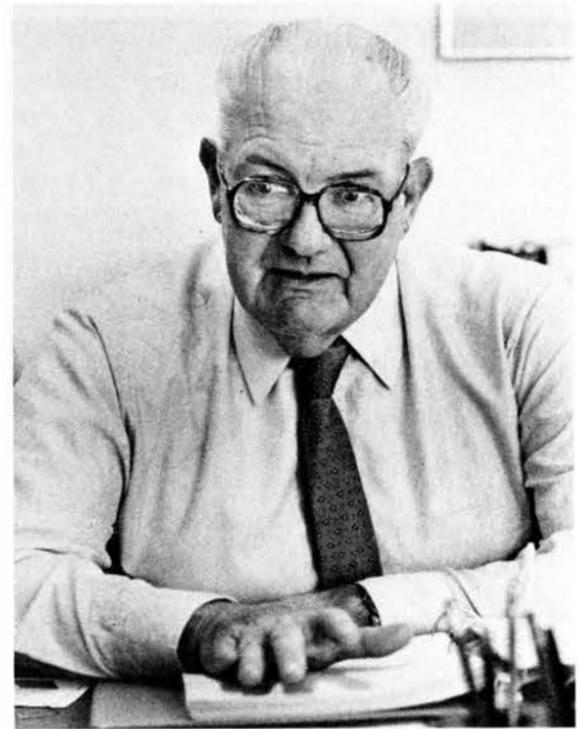
In addition, because of increasing competition in the telecommunications industry, the market share that AT&T Technologies, Inc. — the old Western Electric Company — is going to have will probably shrink. Therefore AT&T Technologies is going to be much more interested in new commercial opportunities, even if they are not directly related to telephones, in the future.

Our new contract [see related story] specifically permits the AT&T companies to compete for Sandia-related business in the same way that any other contractor does — provided that, if Sandia is involved in any way, all potential suppliers are treated with an even hand. That change may bring about a kind of synergy with AT&T that we haven't had in the past.

It may also happen, as a result of the changes in patents and licensing I mentioned a moment ago, that AT&T Technologies might turn out to be a channel by which some Sandia technology could reach the marketplace in the future.

SLN: Do you foresee a closer relationship between us and Bell Labs?

GCD: That's entirely possible. Our new contract makes it clear that we are not ruling out AT&T from areas of interest to ourselves. Of course, we would have to pay very careful attention to legality and propriety and fairness in any negotiations that we have with AT&T. But I think the prob-



ability of some joint activities in the future is higher than in the past simply because the interest *within* AT&T will be higher than in the past.

SLN: In general, then, you see Sandia as pretty healthy, our future promising?

GCD: I've said this before, but I continue to think it's true. I think Sandia from a technical standpoint is better than it has ever been. It has a broad range of capabilities and is multidisciplinary in the best sense of that word. That means that we can

Our new contract specifically permits the AT&T companies to compete for Sandia-related business . . . That change may bring about a kind of synergy with AT&T.

make very valuable contributions to our country.

I am less happy about the state of affairs in the country in general. The US is undergoing an introspective period about the role of nuclear weapons and the role of the federal government versus the private sector and several other concerns that make it very difficult to make predictions on the kind of time scale that technical programs require. We have seen our energy programs fluctuate. We have seen, from one administration to another, different emphases in our nuclear weapon program. Sandia's task is to somehow maintain our technical capability and flexibility on the one hand and, on the other, to move in directions that — and on time scales that — will enable us to make our maximum contribution.

So the only dark cloud I see in our future — or in our present, for that matter — is the lack of a really clear consensus on what the nation wants us to do. Most of the stresses that we [Sandia] have seen over the past decade or so have been a result not of our making but of shifts of national policy that were too rapid for us to fully accommodate.

I don't see that happening at the moment. In fact, I think that over the next two or three years we *can* see where the priorities lie: weapons are up, energy is sideways, and in reimbursables we have all the flexibility we need to balance the program. In a nutshell, that's the State of the Labs.

(More "State of the Labs" Next Page)

The World Outside Sandia

Let's look at the historic role of nuclear weapons: it's clear that we simply cannot go on putting our major reliance on nuclear weapons for deterring all threats, including conventional adventures. That now seems to be fairly generally recognized. There are many people now who are saying what we said some time ago — that the bloom is off the nuclear rose. A conventional (non-nuclear) defense deterrence thrust, including such things as intelligent weapons and bombs, seems to be developing the way we hoped and thought it might.

An important thrust of the President's "strategic defense initiative" speech was to try to de-emphasize the role of nuclear weapons in the world. One way of doing that would be to create an absolute defense — to make them useless so they would just vanish. Perhaps that is a little long range. Nevertheless, the perception is growing throughout the world that nuclear weapons alone are not suitable

I am more optimistic in terms of the direction technology is taking us now than I have been for quite a long time.

for ensuring world peace. They are too dangerous, too powerful, for some tasks. Alternatives must be sought.

I believe the administration wants our Strategic Defense Initiative to be, to the extent possible, a non-nuclear capability. They want to be able to defend against nuclear ballistic missiles with non-nuclear means — chemical lasers, for example.

Intelligent weapons are another possibility because if you ask "what is it about a nuclear weapon that causes it to destroy a particular target?" it is a combination of its explosive power and the accuracy with which it can be delivered to the proximity of the target. As accuracy increases, the power needed for destruction decreases. With sufficient accuracy, the explosive power required to destroy a target is below the nuclear range and into the conventional range.

In fact, one can imagine destroying a target without any explosive at all — if you have a sufficiently high *kinetic* energy, that is, a high velocity device that hits the target directly in its most vulnerable spot. The whole thrust of guidance, of acquisition, of pointing, of intelligence — in the sense of target-seeking and target discrimination — leads you to the possibility of destroying enemy targets without the use of nuclear weapons.

There are elements of artificial intelligence in weapons that I think will become increasingly important. In my opinion, the course of arms negotiations in the future must move away from the assumed inevitability of escalation and toward agreements that are stabilizing and de-escalatory. In other words, if a

conflagration of some sort breaks out and if it becomes nuclear on even a small scale, then all of the forces — those of weapon design, and of negotiation, and of communications, command, and control — must be directed toward de-escalation before the conflagration becomes a holocaust. In my perception at least, we have been insufficiently attentive to that problem.

Now, the solution to that problem does require precise intelligence. We must be able to respond to unpredictable situations with speed and with surgical precision in order to avoid inadvertently triggering the holocaust we seek to avoid.

There are some things that would be useful in this connection. One is the Crisis Control Center that Senator Sam Nunn talks about. This would be a center manned by Warsaw Pact and NATO people that would have state-of-the-art information systems monitoring what was going on in order to respond instantly in case of crisis.

Crisis management is in part an intelligence problem, an information processing problem. But also, to manage a crisis in a flexibly responsive way and avoid escalation, we need weapon systems that can respond. New weapon systems that respond to changed targeting or changed direction or perhaps are even capable of recall after launch are the kinds of things that we have to think about in terms of de-escalatory scenarios.

I am more optimistic in terms of the direction technology is taking us now than I have been for quite a long time. In particular, it seems to me I see a number of strains coming together that I have felt for a long time were needed: one is emphasis on conventional deterrence and *defensive* nuclear weapons; another is emphasis on defensive instead of purely offensive strategies; and a third, yet to be adequately implemented in my view, is arms control negotiation *intermixed* with

It would be wrong to freeze our exploration of new systems capabilities at the very time when there is some hope that the technical direction that these systems will take is more amenable to control and thus more likely to lead to stability in the world.

technical capability in such a way as to lead to stability.

An uncapped nuclear arms race with none of these features clearly is dangerous; that's what the world's populations perceive and are trying to protest against. However, it would be wrong to freeze our exploration of new systems capabilities at the very time when there is some hope that the technical direction that these systems will take is more amenable to control and thus more likely

to lead to stability in the world.

All in all, however, I think that, if anything, the nuclear freeze movement and the general state of public alarm are subsiding somewhat. Perhaps the fate of the freeze resolution in Congress tended to defuse it. Perhaps the series of events that focused attention on Soviet motives once again — the KAL 007 incident, the latest evidence out of Afghanistan — caused people to question whether or not freezing our defense capabilities is all that smart.

At any rate, it seems to me that there is less of a frenzy now than there was a year or so ago. Perhaps you can only sustain a panic for so long. After a year or two, if you haven't gotten killed and the world hasn't changed much, the panic subsides and you begin to say "Well, I guess I can live for another year."

It's also true that the state of the world is disturbing enough without nuclear events. In Grenada, in El Salvador, in Lebanon, and in Afghanistan — all over the world — people are killing each other. And not a single "nuke" is involved. So if people really want to worry about the state of the world, they can do so without reference to nuclear war. The lukewarm public reaction to the "nuclear winter" discussion is another evidence of that. So my perception is that, if anything, the anti-nuclear movement is calming down a bit and perhaps is becoming more rational, mature.

On the international scene, I wish I could better understand what is currently motivating the Soviets. Clearly it is not in their interest any more than in ours to allow an arms race to continue. Their economy is even less able than ours to stand another round of a high-tech nuclear arms race.

The Soviets seem to view military power as a political weapon more than as an actual weapon. They do have adventures here and there — Afghanistan and various places — but they seem at the same time to avoid a major confrontation with the West.

If that is the case — if they are really building their military machine primarily for saber-rattling purposes in hopes of getting political advantage of some kind — the events of the last several years have gone against them: look at the attitude of France today compared with the attitude of five or six years ago and look at what has happened in the West German elections and the English elections. The Soviets' saber-rattling has not done what they hoped it would do — namely, to scare the West into some kind of political submission.

So it seems to me they ought to contemplate a change in their almost total reliance on military might to make them a superpower. It seems to me the best chance for the Soviets to stay a major force in the world over the long range is through economic reform — they are going to have to become a decent, rich country like other major powers. That's wishful thinking, I know. What will happen, who can say?

Indian Trade Fair Planned

Sandia recently brought together two Indian tribal leaders and the heads of two other Indian organizations to plan a National Indian Industrial Trade Fair. Such a Fair has never before been held on the annual basis planned.

Peterson Zah, the chairman of the Navajo Tribal Council, and Ivan Sidney, the Hopi Tribal chairman, as well as representatives of the All-Indian Pueblo Council and the NM Indian Business Association agreed that such a fair will promote Indian business development. Equally important, it will help the tribes and pueblos in the Southwest — and across the nation — improve their ability to market the increasingly sophisticated industrial products and services now coming out of Indian businesses. The fair will be sponsored by those four groups plus the U.S. Department of Commerce, the U.S. Small Business Administration, and the Bureau of Indian Affairs.

“We are inviting several hundred Indian companies to participate,” says Dick Fairbanks (3511), chairman of Sandia’s American Indian Outreach Committee. “We plan to fill all 300 booths available at the Convention Center.”

“And we’re getting fantastic response from both government and private procurement departments around the country,” adds Lewis Sisneros of Small Disadvantaged Business Relations Division 3731. “Many of these people haven’t known how many Indian businesses are producing high-tech and computer-related equipment and services, as well as standard commer-



AMERICA'S FIRST National Indian Industrial Trade Fair was planned recently at the Coronado Club. Among the planners, which include representatives from across the country, were: Ivan Sidney, chairman of the Hopi Tribe; Peterson Zah, chairman of the Navajo Tribal Council; and Bob Johnson, director of the Business Development Office, All-Indian Pueblo Council. Lewie Sisneros (3731; standing) represented Sandia's support for the fair, set for June 11-13.

cial products. Others haven't known how to contact Indian suppliers.”

“And many Indian suppliers haven't known how to contact the buyers,” points out Dick. “The ones that haven't been successful will be able to learn from those that are doing well. The fair will help everybody involved.”

Sandia's goal is to assist Indian enterprise in entering the mainstream of American business. So both Dick and Lewie

are helping the fair planning committee, headed by Vivian Tapahe of the Navajo Nation, in formulating activities for the fair and in ensuring that the event gets nationwide attention.

“The fair committee is really going after it — it's going to be a good fair,” says Lewie.

It's set for June 11-13 at the Convention Center in Albuquerque.



John Hoice (2341), Walt Troy (3436)



Ralph Davies (3733), Chet Chestor (7262)

Retiring



Clarence Sandy (7211)



Fred Magee (3663)



Bob Roberts (2313)



Helen Gaither (153), Paul Gaither (5120)

Take Note

Dennis Berry (6447) and Leo Klamerus (2154) are co-authors of an invited paper that Leo presented last week in Paris at the International Conference on Polymer Insulated Power Cables. "Cable Fire Testing to Meet Realistic Design Criteria" was the single invited paper for the conference. The paper describes the need for supplementary fire protection testing for power cables, an important topic among conference attendees from reactor installations, hospitals, and other industries.

The Jicable 84 conference was held in the Versailles Congress Center from March 5 to 10.

* * *

Two new outdoor sculptures in the 1% for Art Program are in place at the Albuquerque Museum and will be dedicated at a reception on March 30 from 5-7 p.m.

"Walk in Beauty," a sculpture in limestone and marble of a Navajo woman, by Doug Hyde, can be viewed by visitors to the museum through the glass windows that face onto the interior courtyard.

"Floating Mesa," the work of Jesus Moroles, is a fountain in the sculpture garden outside the museum's south entrance. The sculpture features pink granite slabs supported by three stainless steel poles that form a teepee frame; the water will emerge from between the two granite slabs placed near the top of the 22-foot sculpture.

Updating and reevaluating the 1% for Art Program is the topic of two upcoming meetings sponsored by the Albuquerque Arts Board. The first meeting, for the arts community, will be held March 28; the second meeting on April 11 is for all others interested in the program. Both meetings will be held at the KiMo Theatre at 7 p.m.

* * *

The South 14 Bookstand — If you'd like a clear-eyed view of the real cowboy life, read "Land & Cattle, Conversations with Joe Pankey, a New Mexico Rancher." Joe was in his 80s, still cowboying, when these conversations took place. Here's a sample: "I went to work at twelve . . . The kind of a boy who never went to school much in his life goes to work, the first thing he has to learn is to take care of himself, take care of his bed and take care of his horse and do a daily work . . . He learns to cook, saw meat, make a bed, and then he goes out in the morning, looks over his ranch, whatever he might find that needs attention — cows, water lines, windmills. Then he comes back and takes care of his evening work. It's the same. Gets his supper, goes to bed. He hasn't had no degree for that. And when he's ready to go on a roundup, like the early days, he has to have seven horses, have 'em all shod, that's his business. Have his bedroll to take with him, have his saddle and all of his equipment and go and be responsible for the man he's working for, his cattle and calves." Joe's kind of cowboy doesn't wear sequins and lacks glamour, but he's an impressive figure. Published by the UNM Press, and containing many excellent photos of Joe, his ranch and cattle, this book sells for \$15 and is available at the LAB NEWS office, Bldg. 814.

* * *

Two shows opened this month in the Albuquerque Museum's West Gallery. The Lovelace Foundation Collection features paintings produced by the Taos and Santa Fe artists groups from the early 20th Century. The exhibit, only a part of the entire Lovelace collection, includes paintings by Oscar Berninghaus, Joseph Sharp, Irving Couse, Freemont Ellis, Joseph Imhof, and Willard Nash. The other exhibit, the Frederick Weisman Foundation Collection, is contemporary American art and includes works by Andy Warhol, Jasper Johns, Robert Rauschenberg, Paul Sarkisian, Max Ernst, Robert Motherwell, Josef Albers, Vasa, and others. The exhibition will be in place until May 6.

The Museum, located on the corner of Mountain Road and 19th Street, is open Tuesday-Friday, 10 a.m. to 5 p.m., and Saturday and Sunday from 1 to 5 p.m. It is closed on Mondays and holidays.

* * *

"Southwestern Lives" is a reading discussion series starting tomorrow at the Albuquerque Public Library. The series includes reading, presentations by humanities scholars, and group discussions on the lives, experiences and culture of southwesterners. Books to be read and discussed are: *Nambe — Year One* by Orlando Romero, *Desert Solitaire* by Edward Abbey, *No Life for a Lady* by Agnes Morley Cleaveland, *Portrait of an Artist: A Biography of Georgia O'Keeffe* by Laurie Lisle, and *Ceremony* by Leslie Marmon Silko.

Anyone interested can join the group at no charge. Copies of the books will be loaned to participants through the public library. Register and receive your first book at either the Main Albuquerque Public Library or at the Wyoming Regional Branch. The group will meet on five alternate Saturdays, beginning tomorrow, at 10:30 a.m. at the Main Library.

* * *

The *Que Pasa* Recreation Center (Bldg. 20155, 844-5420) announces the following activities: March 24 — Barbeque under the stars and a George Russell concert at the Center. A no-host bar begins at 6 p.m., barbeque at 6:30, showtime at 8 p.m. Cost is \$3.50 per person; make reservations before March 20 by calling the Center.

March 26-30 — Spring Break Computer Classes for kids 5 and up at the Center. "Introduction to Computer Operations" for ages 10 and up will be held from 1 to 4 p.m., Monday through Friday (cost is \$20). A four-day workshop for kids 5-9 will be held March 27-30 from 10 to 12 noon (cost is \$7). For more information or to register your child, call the Center.

* * *

A conference on "High Technology and the Quality of Life" will be held at the U of A on March 29 and 30, 9 a.m. to 5 p.m. The conference, co-sponsored by the U of A and the NM Humanities Council, will present the following speakers: Ray Powell (3000), "The Contribution of Science and Technology to the Quality of Life"; Father Alfred McBride, President, U of A, "The Relation of a Liberal Arts Education to High Technology"; Amitai Etzioni, Director, Center

of Policy Research, Washington, D.C., "High Technology and the Quality of Life"; Harrison Schmitt, former astronaut and U.S. Senator, "The Importance of High Technology: Its National and Local Advantages"; and Lee Zink, Director, Institute for Applied Research Services, UNM, "High Technology and Industrial Development in New Mexico." A seminar/workshop follows each presentation.

For registration (\$10) or more information, call Yvonne Jehenson, Director, University Scholars Program, U of A, 831-1111.

* * *

Have any furnished housing you'd be willing to rent out for the summer? Liz Schuman of Staff Recruiting and Employment Division 3531 is looking for housing for college professors and graduate students who will begin arriving at Sandia in May or June and will be leaving in August or early September. If you have such rental property — houses or apartments — please call Liz on 4-7774 by March 30.

* * *

The YMCA Blue Triangle Day Camp in the Manzano Mountains, for children in grades one through seven, will be open during spring break, March 26-30. The camp provides outdoor fun — singing, games, arts and crafts, swimming. Early and late hour care is available at the Northeast YWCA; transportation is provided from the city. For more information and registration (\$45), call 247-8841.

* * *

A Workshop in Technical Communication tomorrow covers a variety of topics — proofreading, computer graphics, technical report writing, manuals, interviewing, listening, copy editing, personal computers for camera-ready copy, resumes, and more. Sponsored by the NM Kachina Chapter of the Society for Technical Communication and T-VI (and including workshops led by Sandians Lee Garner and Tony Trennel), the event costs \$30 and runs from 8:30 to 4 at T-VI's building (room S-10) on the main campus. Register from 7:45 to 8:30. More info from Elizabeth Schitoskey on 298-0273 weekdays.

* * *

The U.S. Coast Guard Auxiliary, Flotilla 2-4, is offering free courtesy marine examinations to recreational boaters from 9 a.m. to 3 p.m. on the weekends at these locations:

Albuquerque: March 17, 18, 24, 25, 31, April 1; State Fair Grounds, Lomas at Louisiana entrance.

For more info, contact Ben Gardiner (7481).

* * *

The Counseling Department of Presbyterian Hospital is offering bereavement group counseling — learning about grief and sharing the experience. Each session includes a short education presentation followed by the opportunity to participate in small support groups. Interested persons may attend any or all of the sessions held on Monday — March 19, 26, April 2, 16, 23, and 30 — at the Kaseman Presbyterian Hospital, Manzano Conference room from 5 to 6:15 p.m. Cost for six sessions is \$20. Register by calling 841-1634.



DAYTIME & NIGHTTIME on the Juárez to Mexico City train. The author enjoys the view during the day; later, the two seats facing each other are



converted into a lower berth (with the addition of a mattress). Upper berth pulls down from above. Train porter performs conversion.

Unusual Vacation

To Mexico City by Train

by John Shunny, Ret.

North of Zacatecas, at kilometer 750, our train picks up speed as we descend from the mountains to the *altiplano* — the high plains of central Mexico. A boy herding goats waves to us. We're standing on the open platform at the end of our *dormitorio*, the American-made Pullman car that returns us to Juárez. It's a brilliant morning in October, sunny and cloudless, and the breeze is on the cool side. We — Jack Jackson (9764), Carl Mora (400) and I comment that this closeness to the countryside is not exactly a feature of travel by jet. We're having fun, that lost element in "modern" modes of travel.

A week earlier we had boarded the same train in Juárez at 6:30 in the evening, destination Mexico City. Earlier still, we had driven in from Albuquerque and parked the car at El Paso's Civic Center. A taxi took us to the Juárez railroad station.

Dinner was served shortly after our train departed Juárez, and we settled in for the 36-hour journey. The dining car is half diner, half lounge; Mexican beer remains superior to our brews. I had the veal for dinner and judged it OK, which is my reaction to most restaurant food, i.e. it mostly falls somewhere between distinguished and revolting. In fact, all meals aboard both trains were OK — entirely adequate and well served. As for prices, more on that later.

Your bed is made up early — around 8:30 — and if you're so young as never to have known Pullman travel, let me briefly describe sleeping arrangements, of which there are three. In the basic mode, a berth (*cama*), you occupy two facing seats during the day; this space is then converted by the porter in the evening to a lower and upper berth, shielded from the outside world by curtains. By all means get a lower berth; you then have the pleasure of alternately snoozing and enjoying the view out the window.

Next is a roomette (*camerín*), a tiny room with a door and its own sink and toilet. A bedroom (*alcoba*) is a slightly larger private room with an upper and lower berth by night, two chairs by day. It also has its own sink/toilet. If you occupy a basic berth, you use a washroom at the end of the car.

Prices (detailed later) for roomettes and bedrooms are only slightly higher, but before you choose one of them consider that you will be largely isolated and, if your object is to be close to the people as well as

the countryside, then the double seat/berth arrangement is certainly more congenial. Further, if the air conditioner goes out, as ours did, those tiny rooms become very stuffy.

By rail you're traveling 1223 miles to Mexico City and with your calculator (which you'll need in currency exchanges), you'll determine that your average speed is some 35 mph. But the number is without meaning. The Mexican railroad is nationalized and, if a *campesino* wishes to get off at his dusty village, the conductor obliges. In any case, the stops are interesting; the train's arrival is an event and young and old turn out. Have a supply of one-peso coins handy for the kids.

The train's actual speed is in the 45-60 mph range when not in mountainous terrain. This you can determine with watch and calculator as you observe the interval between kilometer posts.

Mexicans are friendly. En route to Mexico City, Sergio stopped by for a bilingual chat. A waiter in Juárez, he not only spoke good English but French as well. Talks with Mexicans inevitably turn to the economy and the devaluation of the peso. Sergio would like to vacation in the United States and Europe; he has been to the US several times, but the present exchange rate (155 pesos to the dollar) that makes Mexico a super sale for Americans makes our own country formidably expensive for Mexicans. Still, the many Mexicans with whom we talked seemed more philosophical than bitter about the downturn in their economic fortunes.

At the principal stops along the route — Chihuahua, Torreón, Zacatecas, and Aguascalientes — passengers have 15-20 minutes to walk around and to note the action at the station: vendors selling food to the passengers in *segunda clase* through the open windows of the coaches, other vendors selling shawls, soft drinks, newspapers, trinkets, etc. The scene is lively.

The Mexican countryside is varied and similar to parts of New Mexico, Arizona, and Nevada. High desert, rugged and barren mountains, long stretches of chaparral, farm and ranch land — pleasant vistas to contemplate from your comfortable and mobile vantage point.

Your one full day (between two nights) on the train goes by rapidly. Besides sight-seeing, you can walk around, read, nap, drink beer or cokes, and practice your Spanish with the other passengers (most of whom know more English than you do Spanish). And, of course, breakfast, lunch,



FIRST CLASS cars are usually at the end of the train, and rear platform affords good views. Town in background is Zacatecas. Journey to Mexico City lasts 36 hours, but with stops and other diversions the trip passes quickly.

and supper break up the day. That evening you'll turn in and be awakened by the porter early — around six. That's because your destination is just an hour away. Our train arrived on time, 7 a.m. That's a good hour to arrive in Mexico City. We were able to make a leisurely survey of hotels in the downtown area, near the Zócalo, checking out the rooms in each. The three of us settled on a two-bedroom suite with bath, 2100 pesos/day for all three. Sound like a lot? That's \$14/day American ... think about that on your next trip to San Francisco.

* * *

Logistics & Money — Prices in Mexico are so low that you tend to use the currency like Monopoly money. The train ride is \$36 each way, and meals on board run from \$1.50 (breakfast) to \$3 or \$4 (dinner). It's customary to tip your porter when you arrive at your destination; two or three hundred pesos is about right.

All is not bliss on the train. If you're a light sleeper, take ear plugs. It's noisy and the roadbed makes the ride bouncy. I wouldn't think of going in the summer because of the uncertain air conditioning. The major hassle associated with the train is the purchase of tickets. You can't do it by mail, and I'm not sure a travel agent can or would purchase them for you. An El Paso friend got ours by crossing over to Juárez and buying them at the station ticket office. One way only — you buy the return ticket when you get to Mexico City. An outfit in El Paso called Mexican Rail Travel is said to purchase tickets for a commission — 30 percent. They're at 2030 E. Paisano; phone 915-542-0098.

And when you get your tickets, check them carefully. The important information, dates and car/berth assignments, is handwritten, and ours were garbled both going and returning.

If you'd like to railroad it on just a one-way basis, you can always go by train from Juárez to Mexico City, then take Aeroméxico, the Mexican airline, back to Juárez — it runs about \$75.

MILEPOSTS

LAB NEWS

MARCH 1984



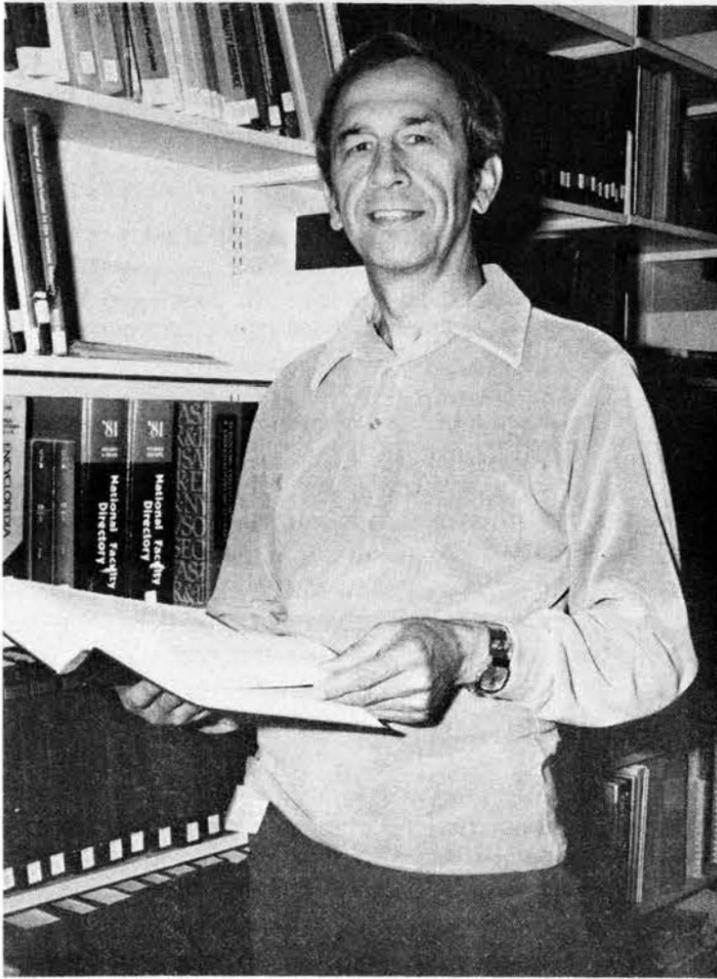
Art Jones (3154) 35



Al Heckes (6252) 25



Parris Holmes (7555) 10



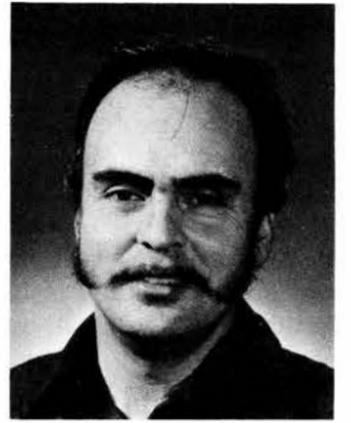
Gil Cano (6454) 20



Tom Bozone (7263) 30



Alan Stemm (5266) 20



Louis Sanchez (3417) 10



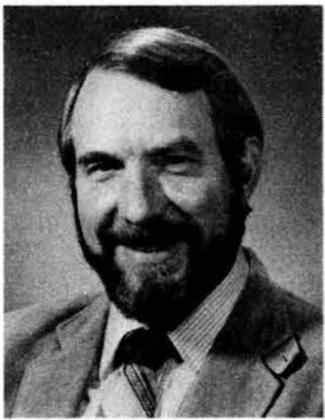
Herman Yazza (3425) 10



Don McCoy (5111) 15



Leroy Paulson (7556) 35



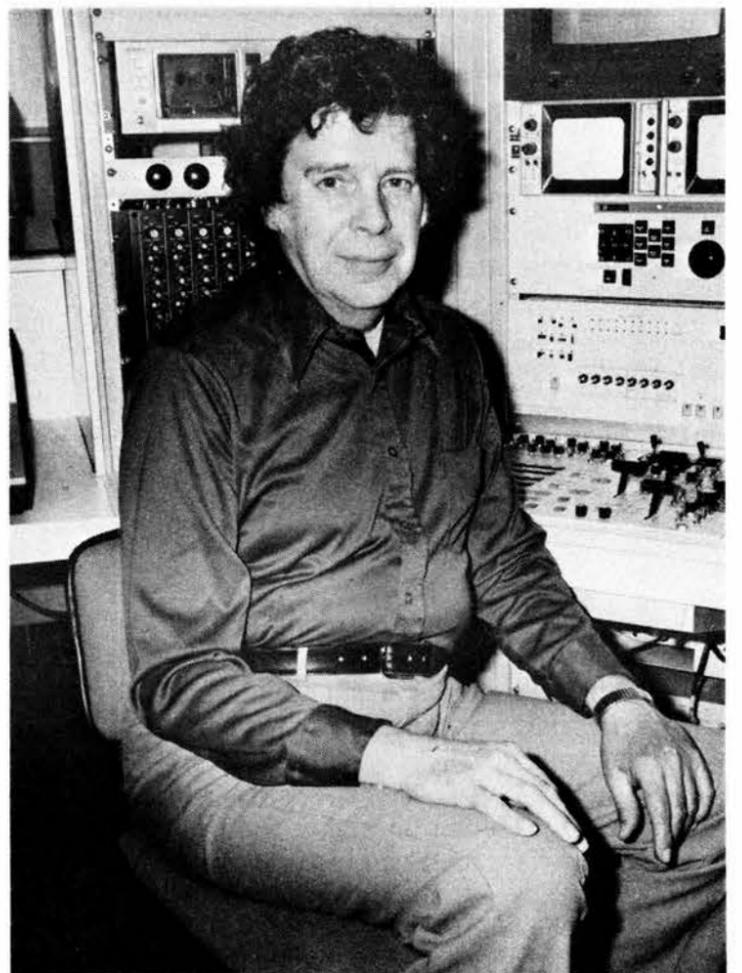
Frank Thome (6446) 15



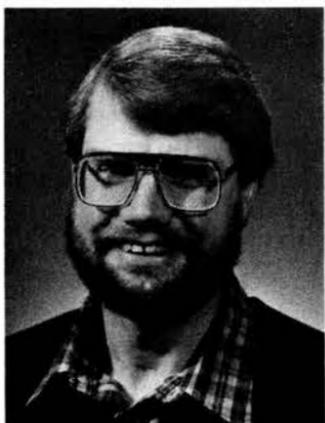
Dave Heinze (6253) 10



Gary Holmes (2634) 10



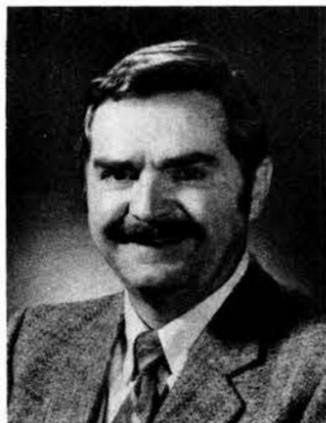
Bob Colgan (3153) 25



Kevin Babb (7535) 10



Clarence Carter (5116) 30



Gary West (5251) 25

Take Note

Patricia Newman (3142) was recently elected President-Elect of the American Translators Association. Pat will be in charge of conventions for the next two years and then serve as president for two years. The Association celebrates its 25th anniversary at the 1984 convention in New York City in September. Pat will be responsible for publication of the proceedings of the convention. She is also ATA's representative to the Science and Technology Commission of

the Federation Internationale des Traducteurs, the international translators' association. The NM Translators and Interpreters Association will host ATA's Board of Directors meeting in Albuquerque next month. Pat would like to introduce board members to hot-air ballooning; if any balloonists will be flying sometime during the weekend of April 27-28, contact Pat. She would like to take her visitors to watch the balloons.

* * *

Clay Harris (husband of Dolly, retired) would like to assist a friend and needs help. He's looking for B/W or color photos of WWII aircraft that were parked on KAFB during 1946-47. And he would really be delighted to find photos of planes with nose art. If you have photos that you want to share, write to Clay's friend: Clarence Simonsen, Box 78, Acme, Alberta, Canada, TOM OAO. Simonsen is the Nose Art Researcher for the 8th Air Force Historical Society.

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

Deadline: Friday noon before week of publication unless changed by holiday. Mail to: Div. 3162.

RULES

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

NEW SHIPMENT: Sandia Labs caps & T-shirts (\$6 ea.), belt buckles (\$8); new Southwest books from UNM Press; paperbacks & hardbacks. South Highway 14 Project, LAB NEWS, Bldg. 814.

SCHNAUZER puppies, 3 females, 1 male, pure-bred, no papers, born 2/3, \$125 ea. Heimick, 292-3718.

PIANO, Simpson spinet w/bench, lt. cherry custom made, orig. owner, \$700; dbl. kitchen sink, 22x33, cast iron, white, w/single lever faucet & disposal, \$45. Rainhart, 821-7138 after 6.

MAHOAGANY bedroom set. James, 294-6837.

RADIO SHACK TRS-80 Model III, 16K RAM, cassette, covers, some software, \$400. Olson, 299-8678.

WILSON Staff, pitching wedge, 1958 model, Dyna-Powered, Black Dot. O'Bryant, 268-9049.

NEW 5'x7' royal blue carpet remnant, \$15; 3/4 roll-away bed, \$35; trade or sell: heavy dark maple coffee table (trade for shelves or chest-of-drawers). Onell, 892-6754.

FISHER "Mama Bear" wood stove; 20" Homelite chain saw, Super XL. Parker, 821-5999.

CRIB, "Jenny Lind," \$95; child's wardrobe, 5-dwrs, & hanging area, \$75; console; phono, 8-track, AM-FM, \$75. Blackledge, 294-6030.

RUGER 77V, .22-250, Hvy. bbl., Leupold Vari X II, 3x9, DOT, ammo, brass, sling, used once, \$450. Kureczko, 298-1577.

1923 REMINGTON port. typewriter, orig. case w/instruction booklet, \$50; railroad crewman's tin suitcase, \$20. Gregory, 268-2022.

COLEMAN tent trailer, stove, ice chest, Porta-Potti, spare tire, sleeps 5. Vandt, 255-0685.

PIANO, Cable-Nelson console, walnut finish; 20.3 cu. ft. chest type freezer, \$175. Cronin, 265-5229.

BABY swing, wind-up type, \$12; diaper pail, \$2; traverse rod, cafe style, 80-140", \$20. Borgman, 299-6010.

STORAGE shed, new, never uncrated, 10x7, gambrel roof, \$150. Myers, 294-7316.

COMMODORE C2N Datasette unit, 4 mos. old, \$45. Walter, 298-0471.

CLOSET doors, 1 set 2' wide, std. hts., \$10; 2 sets 3' wide, \$12 set; wrought iron decorations, lamp, etc., best offer. Shaw, 299-8524.

D-41 Martin guitar w/hard case, left handed, \$1400. Perryman, 281-3020.

LEATHER motorcycle jacket, zip in liner,

size 42; queen size mattress (Lady Englander), box springs; platform bed or chrome pedestal bed. Gasser, 299-2199.

KROEHLER couch, tawny olive green velvet, long, straight contemporary style, \$150. Kinney, 298-5281.

VACUUM cleaners; utility table; small rocker; Descoware; pressure cooker; misc. household items. Young, 256-9158.

RADIO SHACK color computer w/printer & disk drive, \$450 OBO. Jennings, 294-5287.

WURLITZER organ, orig. cost \$5K, sell for \$1500; Sharp stereo system w/linear tracking, \$300. McDaniel, 299-6189.

CRAFTSMAN 8" table saw & 4 3/8" jointer-planer, 1/2 HP motor, stand, dado, 4 blades, \$219. Becktell, 884-5237.

1971 ROVER travel trailer, 17', self contained, 30-gal. water tank, \$2000, will negotiate. Wilsey, 1-864-3125.

LUGGAGE POD for camper top mount, fiberglass, 20 cu. ft., \$150. Ruttle, 883-5547.

TWO Sony Betamax video recorders, model SLO-323, \$300 ea., never used, \$1500 ea. new. Garcia, 881-9069 after 6.

TIRES w/rims, 5-hole, radials, fit Ford pickup, car or Bronco, \$170. Ramirez, 821-3790.

SPANISH style furniture: sofa, \$150; matching chair, \$125; cocktail table, \$75; hexagonal & square commode end tables, \$50 ea. Chorley, 296-1454.

KROEHLER sofa, 82", earthtones, \$90. Clough, 897-1539.

MINOLTA SRT101 camera body, \$80; stainless steel 35mm developing tank, \$13; fp screen, 36 1/2 x 21 1/2, \$35. Bennett, 298-1142.

ROLL-A-WAY bed, heavy frame, coil springs, mattress, cover, \$30. Ronan, 268-0726.

X-COUNTRY skiing equip: 3 pr. skis, sizes 180, 195, & 200 cm; 1 pr. boots, size 40. Conley, 298-7862, 6-7 p.m.

FIBERGLASS camper shell for LWB, \$300; 12-string guitar, \$50. Luna, 293-4674.

MATTRESS & box springs, full size, \$30. Eldon, 836-5415.

RACECRAFTERS Futura motorcycle fairing, built-in signals & mirrors, universal mount, \$285 retail, sell for \$175. Barnard, 831-4114.

SKYLIGHT, 24x48, for flat roof, \$80 OBO. Sanchez, 897-0743.

CANON AE-1 program camera, 2.0 28mm wide angle lens, A2 power winder, action case, \$525, never used. Sharp, 293-1824.

LAWN mower, reel type, McClane, front throw, heavy duty, \$95. Siska, 884-4713.

TELEVISION, Zenith 25" color, wood cabinet model. Shoemaker, 255-8820.

CHARCOAL grill w/hood & stand, elec. spit, \$25; 60-gal. pickup gas tank, \$125. Harrison, 255-7978.

BASSINET, complete w/hood, skirt, sheets, mattress & pads, \$50. Whelan, 294-6016.

DRUM set, 5-piece Apollo, blue sparkle, 2 cymbals, Tama hi-hat, \$300. Burgess, 296-4254.

LAWN mower, Craftsman 22" rotary, 4 hp, 2-spd., self-propelled chain driven, side grass catcher, 2 sharp blades, \$110. Brammer, 266-5158.

CARPET, gold shag, lt. green shag, gold plush, total 190 yds., some

padding, \$2.50/yd., all or part. Berg, 296-2695.

GARAGE sale: toys, Fisher-Price, Mattel, wooden puzzles, riding toys, Wonder horse; for infants to 5-yrs. old. Goekler, 296-4162.

GAS barbeque, complete, portable, \$75. Stang, 256-7793.

ANTIQU SINGLE BED w/matching vanity, \$135; butcher block, \$100; 45 rpm records, 75 cents each, elec. wok, \$10. Blackledge, 294-6030.

COMPLETE DARKROOM, 2 Durst enlargers, tanks, trays, timers, and lights, all or part, make offer. Bailey, 268-8079.

HEATHKIT 4550 dual trace, 10 MHz oscilloscope, \$150. Turner, 293-8938.

TRANSPORTATION

'81 850 SUZUKI, windjammer, backrest, full cover, 15K miles, \$2300 OBO. Schuler, 299-2968.

'80 OLDS Cutlass Brougham, V6, AT, AC, AM-FM/tape, PS, PW, other options, low mileage, \$7500. Hezlep, 296-2962.

'71 FORD pickup; '76 Honda 360CJ; Sony 6" big screen TV; '77 Jeep CJ7; '77 BMW 320i. Moss, 299-6573.

'64 FORD Ranchero pickup, '74 engine, new glass, trans., batt., starter, more, \$800 firm; '59 Jaguar XK-150 coupe. Hanks, 884-9196.

RALEIGH Grand Prix 10-spd., SunTour VX derailleurs, Alpine gearing, quick release hubs, thorn-proof tubes. Roesch, 296-8248.

'81 FORD, 1/2 ton F-100, 6-cyl., 4-spd., stereo, \$4500. Smid, 344-8174.

'80 KDX175, \$650; LW crossbed truck tool box, \$100. Wilkins, 281-1152.

'75 DODGE Journey motor home, 67K miles, fully self-contained, generator, rooftop air, 3 new tires, \$11K. Fink, 836-3206.

'78 FORD Fairmont stn. wgn., red, make offer. Onell, 892-6754.

'64 CHEVY Impala, 2-dr., AT, PS, PB, AC, 327 eng., \$2500 OBO. Gendreau, 268-3436.

'80 MAZDA RX-7 GS, Tornado Silver, 5-spd., AC, sunroof, AM-FM cass., rear window louvers. Odinek, 892-5822.

'79 TRIUMPH Spitfire 1500, 4-spd. OD, 3500 miles, new radials, mag wheels, \$5500. Sanchez, 877-5231.

'78 DATSUN 200SX, 5-spd., AC, AM-FM, stereo, reg. gas, white w/brown striping, \$2500. Nakamura, 256-1039.

'73 CADILLAC Sedan De Ville, low mileage, maintenance record, \$1500. Garcia, 298-7340.

'77 CHEVY 4x4, SWB, 350ci, 2-bbl, 4" body lift & 4" suspension lift, 40" Gumbo mudder tires, AM-FM cass, PS, PB, AT, lt. bar w/lts., \$6500. Longfellow, 299-7062.

'82 MAZDA B2000 pickup, LWB, 5-spd., AM-FM cass, \$4900 OBO. Lucero, 293-2678.

'74 CHEVY pickup, LWB, 1/2 ton, 4-spd. trans., dual tanks, 350, 55K miles, \$2300 OBO; '69 American MH, 12x50', furnished, 2-bdr., 1 bath, \$6K. Garcia, 888-4735.

SEKAI 10-spd. 27" bicycle, 21" dbl. butted frame, quick release wheels/brakes, accessories included, \$225. Kim, 898-7546.

'72 MUSTANG, AT, AC, PS, PB, V8-302, new tires, mags, AM-FM cass., Jensen speakers, \$2200.

Snyder, 296-5771.

YAMAHA XT250G motorcycle, 1870 miles, adult ridden, shop manual, \$900. Braithwaite, 822-1998.

'83 HONDA 650 custom, waranteed, 2500 miles, loaded, new cost \$3200, sell \$2500. Johnson, 266-0513 8-4 p.m.

'78 HONDA Goldwing, 21K miles, Vetter fairing & bags, \$2700. Perryman, 281-3020.

'79 MAZDA RX7/GS, AC, 5-spd., Targa top spoiler alum. wheels, AM-FM-cass, sun roof, new Bridgestones, louver nose protector, \$7200. Bassett, 898-1840.

'70 VW, rebuilt engine, new heater, new clutch, new tires, new interior, new paint. Baker, 299-5072.

'70 CAMARO, one owner, complete maintenance records, \$900. Renken, 296-9713.

'81 HONDA Silverwing, water cooled, drive shaft, 4700 miles, windshield, \$1500, will negotiate. Wilsey, 1-864-3125.

'80 MOTO Guzzi 1000SP, tank bag, new rear tire, 7300 miles, \$2700. Weatherbee, 869-2849.

'77 DATSUN 280Z 2+2, 4-spd., new brakes; AM-FM cass, many extras, AC. Ramirez, 821-3790.

'81 VESPA P200 motor scooter, helmet, rain gear, metric tools, wind screen, make offer. Sharp, 293-1824.

'81 SUZUKI 550L, less than 1K miles, \$1600 OBO. Fellerhoff, 883-3628.

'83 HONDA Silverwing, 650cc, V-twin, water cooled, shaft driven, engine guards, fairing, 2200 miles, \$2800. Barnard, 831-4114.

'78 CUTLASS Supreme, 2-dr., lt. blue, \$3795. Neal, 294-3088.

'80 HONDA Civic, 4-spd., 26K miles, stereo, AC, new front tires, one owner, \$3500. Lane, 299-7925.

'75 PINTO, reasonable offer near \$1200. Pullen, 892-7850.

BOAT 14' aluminum w/car-top carrier/loader, \$575; 4hp Evinrude motor w/tank, \$425; Sears push-type lawn mower, \$25. Landrum, 884-4739.

'76 ALFETTA GT, 45K miles, alloy wheels, AM-FM cass., dark blue exterior, lt. tan interior, \$4000 OBO. La Farge, 299-0929.

'74 DATSUN pickup, shell, wide radials, many extras, \$1950. Van Deusen, 881-4493.

'80 RENAULT Le Car, 36K miles, radio, AC, \$2500. Wickett, 268-7804.

'67 COUGAR restored to near new condition, new tires, paint & engine overhaul, std. shift on floor, \$3000. Burgess, 296-4254.

'72 MUSTANG Mach I, AT, PS, AC; '69 Honda trail 90, \$180. Yingst, 884-3812.

'77 BMW 1000cc motorcycle, Luftmeister fairing, Krauser bags, new Koni shocks, low miles. Weaver, 344-0122.

HONDA NC 50 motor bike, low miles, less than yr. old, helmet, baskets, lock & shop manual, \$250. Meikle, 299-4640.

'80 KZ1000, 16K miles by owner, equip. for hot-cold weather, loaded, \$3200. Yip, 294-8124 after 6.

'80 DATSUN 210, 2-dr. sedan, 5-spd., AC, FM, 27K miles, best offer. Kelly, 299-7190.

'77 CAMARO LT, 350 V8, loaded, \$2900. Stang, 299-8688.

'64 VW BUG, low mileage on rebuilt engine, replaced shocks, brakes, tires, \$1200. Doyle, 844-5238.

'73 VW SQUAREBACK, radial tires plus

2 radial snow tires on extra rims, stereo cassette, \$2200. Peterson, 298-1235.

'80 CITATION COUPE, AC, PS, AM-FM, 4-sp., 42K miles, \$2900. Boles, 299-1697.

'76 VW RABBIT, \$1950. Barker, 294 0254.

'81 RX-7 GS Mazda, ATR, Auto., alloy wheel blue metallic paint, \$8500 firm. Bailey, 268-8079.

'81 SUZUKI PE250, less than 750 miles, never raced, \$800. Turner, 293-8938.

REAL ESTATE

NORTH VALLEY, 2 3/4 acres, slump block house, over 4000 sq. ft. w/solar room & porch, \$200K. Lackey, 898-6638.

NEW, custom-built, passive solar, 3-bdr., 2 baths, on 2.9 acre, restricted lot, 5 miles due east of Los Lunas. Syme, 296-2447 after 6.

ACADEMY ACRES: 3-bdr., 1 3/4 bath, 2-car garage, fenced back yard, \$68K, assumable low-interest loans. Douglas, 821-8551.

20 ACRES northeast of Edgewood, 660' frontage on 472, 2.5 miles east of 344, view, \$30K. Kureczko, 298-1577.

3-BDR. brick, near KAFB, assumable loan, 1750 sq. ft., 2-car garage, 1 3/4 bath, landscaped, \$84K. Gonzales, 294-8482.

'78 SKYLINE Homette MH, 3-bdr., 1 1/2 bath, 14'x70', skirted, set up, w/water cooler, located 4-Hills MHP, available about 7/1/84. Booth, 296-3955.

FOREST LAKES lot near Durango, Colo. Lake, 888-4581 after 6:30.

'79 MH, 14x80, 3-bdr., 2 bath, carpeted, set up, skirted, in family park NE, assumable 12.33% loan. Shaw, 299-3202.

3-BDR., 2 bath, great rm. w/cathedral ceiling & corner brick fp. foothills east of Tramway, \$82,900. Kelly, 299-7190.

TOWNHOUSE, 2-bdr., 2 baths, solarium, dbl. garage, custom interior and landscape. Open house Sunday, 1-5, \$86,500. Neiman, 884-6727.

WANTED

MEN'S softball team, new Sandians seeking SERP or city team to play on, any position. Yourick, 256-7338.

HOUSING for faculty summer hires: 1. single male, May only; 2. family of four, July-Aug. Easterling, 298-7083.

FOR Museum of Natural History exhibit, bicycle crank & gear for 5/8" shaft, used bicycle chains. Mattox, 255-8327.

USED trumpet, or cornet over 75% conical, prefer 1st/3rd valve slides. Yio, 265-2205.

CHILD'S swing & slide gym set for backyard use, must be in good condition. Noack, 821-4494.

ELECTRIC powered wheat grinder for making flour from whole grain wheat. Rogers, 256-0066.

WORLDBOOK encyclopedia set. Falacy, 293-2517.

NEED issue of *Family Safety* with article on finger rings, how to stress relieve & keep fingers. Souther, 842-8762.

METAL-chromed rally sport mirrors, two each. Greer, 296-7310.

ROOMMATE for 3-bdr., 2 1/2 bath townhouse, plenty of storage, pool, tennis, Morris & Indian School, \$230/mo., utilities included. Dreike, 299-6670.

Western Flyer Tonight; St. Pat's Party Tomorrow; Brunch Sunday

The CORONADO CLUB is where it's happening. Tonight, for instance, the Club presents Western Flyer, one of the better country western groups around, playing for dancing from 8:30 until 12:30. The buffet tonight is steamship round of roast beef or you can order dinner from the Club's standard menu featuring fine steaks and seafood. Paul Vuchetich, guitarist/singer, provides dining room background music and Karen Edwards instructs free western dance lessons from 7:30 to 8:30.

TOMORROW'S ST. PATRICK'S DAY PARTY is shaping up as a monumental memorial to Old St. Pat, the patron saint of engineers and the Irish. Starting with Happy Hour at 2 p.m. with special prices and free hors d'oeuvres (until 6 p.m.), the party plans include an appearance by Bob Banks and Tommy Kelly who will sing the old songs starting at 4. Tommy is the Original Irishman. He sings Irish songs that will break your heart, even if you're not Irish. You can join in and sing along. At 6 p.m., Chef Henry will present a fine corned beef and cabbage dinner. At 8:30, Together will wind it up with more singing and dancing. It will be a fine party for engineers, the Irish, and everyone else. The corned beef and cabbage dinner (including soup and salad bar) is \$7.25. For reservations, call 265-6791. No reservations needed for the afternoon festivities and sing-along.

ON SUNDAY, enjoy the Club's champagne brunch served from 11 a.m. until 3 p.m. The menu includes relishes, salads, fresh fruit, Swedish meatballs, sliced roast turkey, steamship round of beef, vegetable du jour, rolls and butter. Cost is \$6.95 for adults, \$4.95 for children under 12. For reservations, call 265-6791.

CORONADO SKI CLUB meets Tuesday, March 20, at 7 p.m. to elect a slate of officers to serve the 1984-85 season. Every member who attends will be presented one of the new CSC logo patches. A much-prized Flightmaster ski case is one of the door prizes to be given away. A ski movie is also scheduled.

A FRESH SEAFOOD "Buffet Extravaganza" is set for Thursday, March 22, when Club Manager Mitch Griffin goes all out to please followers of his special Fresh Seafood Thursdays who have been requesting a buffet. "This will be a super spread," Mitch says, "at the regular price of \$8.95 for adults, \$4.24 for children under 12." For reservations, call 265-6791.

ON FRIDAY, March 23, Spinning Wheel returns to the Coronado Club for another night of great swinging variety and show tunes. Mitch will wheel out a "Smorgasbord Buffet" — the works. This will have beef and seafood entrees supported by a spectacular spread of accompanying goodies. The Isleta Poor Boys are booked for Friday, March 30, when barbecued beef ribs will top the buffet.

TAX SHELTER SEMINAR — The first of a series of Coronado Club-sponsored financial seminars is scheduled Tuesday, March 27, from 7 to 8:45 p.m. in the ballroom. Charles Justus III and Sandra Corless of American First Financial will discuss tax shelters. The financial planning and consulting firm has conducted seminars on a variety of topics both for public audiences and for employees of companies such as Mountain Bell, Los Alamos National Laboratories, and Gas Company of New Mexico. There is no admission charge.

RESERVATIONS are in order now for Dinner Theatre Night set Saturday, March 31, when a production of "The Owl and the Pussycat" appears on the Coronado Club stage. Starring Gary Bearly and Karen Byers (best known locally for their outstanding work with ACLOA), the play is a modern comedy about how tough it is these days to find somebody to love. Audiences love it. The evening starts with cocktails at 6, dinner at 6:30 and the show at 8. A steamboat round of roast beef is the buffet feature. Cost is \$13 per person, and the number to call is 265-6791.

Fun & Games

Running — "Jog Your Mind, Run to Your Library" is an invitation to local runners. Walkers too. And you don't have to be especially cerebral to participate. The event is a 5K Fun Run on April 7 from the UNM Law School Library (1117 Stanford NE) to the Albuquerque Public Library (501 Copper NW); it begins at 9 a.m. Proceeds from race fees (\$5 through April 6; \$7 on race day) benefit the state's Special Libraries Association (including those of Sandia, Los Alamos, and UNM's law and medical schools). Specifics: "Jog Your Mind" T-shirts to the first 300 entrants; prizes in each age/sex category; refreshments for all entrants; entry forms in LAB NEWS office.

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Bowling — The last Sandia Bowling Association tournament of the season is set for March 31-April 1 at Fiesta Lanes. It's a no-tap affair, and the fee is \$4.75 for members and \$5.50 for guests. Deadline for entries is March 29 (entry forms will be mailed to members). More info from Terry Holovka on 281-5518 or Dee Schumpert on 243-3380.

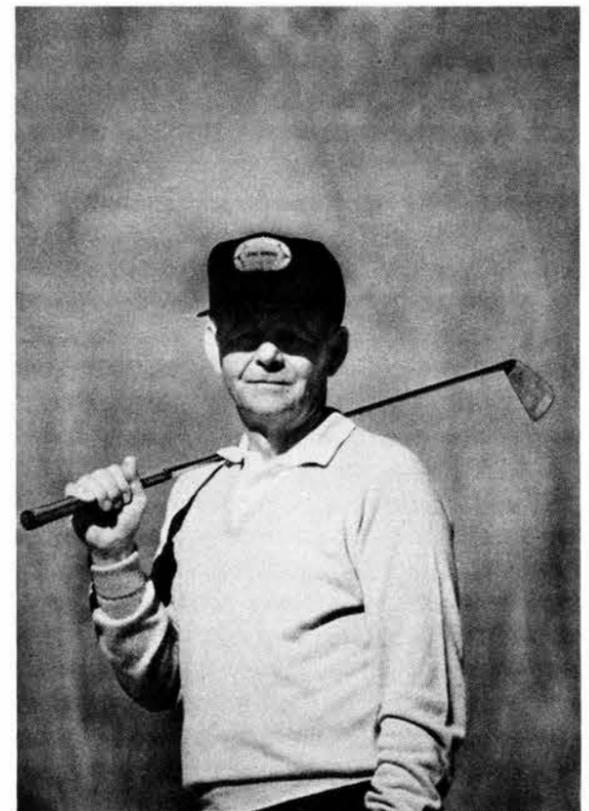
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Soccer — The Sandia Summer Soccer League starts its season of fun and recreation June 1. For its weekly after-work games, the group is seeking new players — men and women. Sandia, DOE, contractor employees and their adult dependents are eligible. There will be a registration form in the April SERP Newsletter. For more information call John Biffle (1521), 4-6764. Incidentally, the Albuquerque Women's Soccer



GUITARIST/SINGER Paul James Vuchetich is appearing regularly at the Coronado Club these days, providing background entertainment for the dining room crowd on Thursday and Friday evenings. On Friday, March 23, pianist Jim Trost from Santa Fe will fill in during Happy Hour dining.

VARIETY NIGHT on Saturday, April 7, is a repeat of another classic Walt Disney animated film. This time it's *The Sword in the Stone*, a retelling of the King Arthur legend with the emphasis on the young king's education with Merlin the magician. Super sandwiches, cokes, and popcorn are available at 5. The movie starts at 6. Free admission to members and their families.



HAROLD LINKER (5213) shot a hole-in-one recently during a Sunday afternoon game at Tijeras Arroyo. The shot was on the 157-yard number 13 hole. It was his third hole-in-one in 20 years of golfing. His second one was about a year and a half ago at Paradise Hills on the 175-yard number 12 hole during a tournament. The first one was about 12 years ago at Los Altos. A normal 15 handicapper, Harold plays about twice a week, depending on weather, in a group that usually includes his wife Marilyn and son Kevin (6227).