

Sandia Enters Field of Speck-Sized Parts

In the Microelectronics Development Laboratory (MDL), Sandians are building gears and cantilevers so small that several of them could fit within the space occupied by this period. Despite their size, the tiny silicon parts are twice as strong as steel and have potential applications ranging from weapons to medical devices.

The parts, whose sizes are best described in terms of human hair widths, are not made with tiny lathes and grinders. They are made using the techniques of micromachining, a spin-off of the integrated circuit industry that allows the fabrication of extremely small, three-dimensional mechanical structures. Both fields use many of the

Some researchers envision using micromachining to develop "chemical factories on a chip."

same techniques, but in the case of micromachining, the parts can actually move.

The technology is so new that only a few people at the Labs — namely Brad Smith, Jim Fleming (both 2131), Ned Godshall, and Alan Liang (both 2144) — are working in the field. All moved into the discipline from other jobs in the MDL during the past year. Terry Guilinger (1841) does some basic research on micromachining.

Much of the growing popularity of micromechanics is because micromechanical parts can be produced on wafers by the thousands, and wafers

can be produced by the hundreds. "The rapidly growing field of micromechanics is at the same evolutionary point as microelectronics was in the early '70s," says Ned.

Potential applications for micromechanical parts are vast. Immediate uses include pressure transducers, accelerometers, and temperature sensors, which are already being used in airplanes and automobiles. For example, micromachined accelerometers are now being manufactured as triggering devices for automobile airbags.

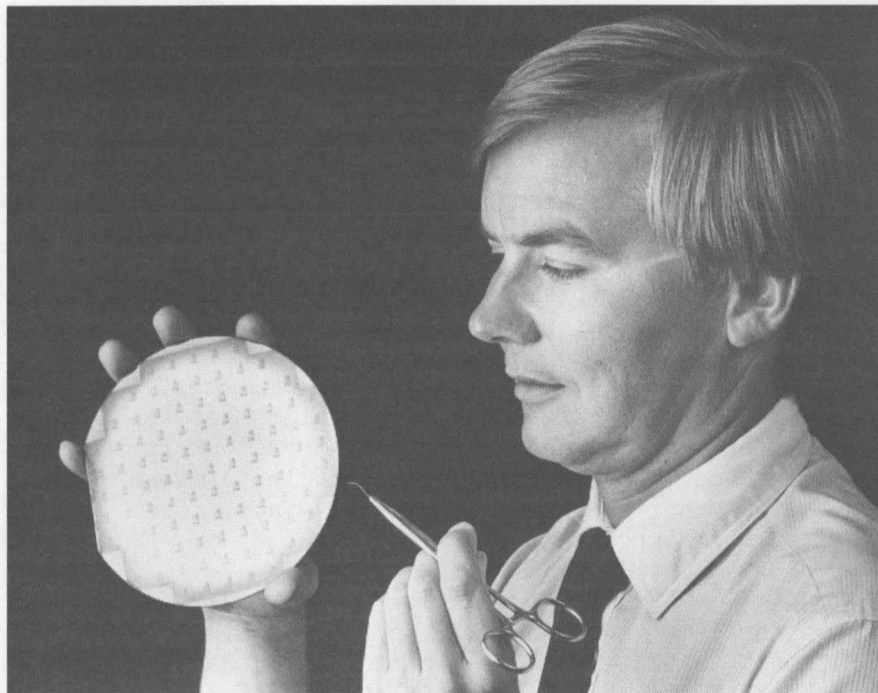
Other possibilities border on science fiction. Some researchers envision using micromachining to develop "chemical factories on a chip." Such factories could include tiny valves, pumps, and sensors for the timed release of drugs into the body — all contained in an area the size of a fingernail.

At Sandia, micromachining is being used to tackle much more fundamental problems. One of the first projects was a joint effort between Jack Houston, Terry Michalske (both 1114), and Brad Smith to develop a microscopic force sensor. The sensor, which is two hair-widths long and one hair-width wide, is an integral part of the Interfacial Force Microscope (IFM). The microscope would be used to measure interactions between surfaces and to understand, on an atomic level, why things stick together and why they come apart.

"We may understand it on a macroscopic scale, but we don't on a microscopic level," Brad says.

The sensor's sharp tip can be maneuvered in two different ways — along the surface or perpen-

(Continued on Page Five)



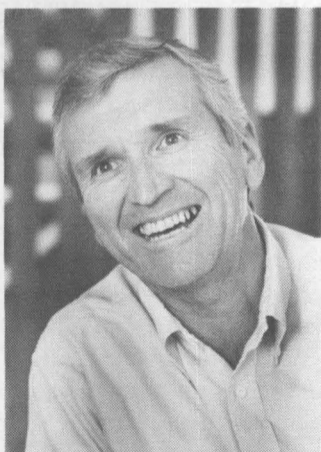
A SILICON WAFER held by Ned Godshall (2144) contains more than 4,000 microgears. To create a silicon gear, surrounding material is chemically etched away, leaving a tiny raised disk with teeth.

ECP Campaign — Make A Difference

Experimental Therapy Gives Sandian Hope

Hope is something Rollie Baack (7265) might be pretty short of without research dollars from the American Cancer Society, a United Way agency. In September 1988, Rollie was diagnosed with renal cell carcinoma, a kidney cancer that doesn't respond to traditional chemotherapy. He immediately had surgery to remove the affected kidney, but 15 months later the disease metastasized to his lungs.

Rollie's hope comes largely from a form of therapy for renal cell carcinoma, developed in late 1988. This therapy was made available to him through a pilot study being conducted by Dr. Robert Whitehead of the UNM School of Medicine's Cancer Center.



ROLLIE BAACK (7265)

Since Rollie began receiving treatments in January, the tumors in his lungs have not grown, a good sign. He's looking for shrinkage as the next step.

Receives Home Treatment

Rollie is able to receive treatment at home. To stimulate his immune system, he receives Interleukin-2 from an infusion pump through a tube (Groshong) in his chest 24 hours a day for four days a week. His wife, Karen, administers an injection of Roferon-A (interferon) two days a week.

Rollie undergoes this treatment for four weeks, then gets a two-week rest period. "It's like having the flu while I'm receiving the treatment,"

(Continued on Page Five)

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Lost and Found

Three 'Missing' DMTSs Found

Somewhere along the way, three new Distinguished Members of Technical Staff (DMTSs) were "lost" between the time they were named and the time the list arrived last month at the LAB NEWS. Unfortunately (or fortunately, if they like front-page publicity), their names and faces did not appear in the Sept. 7 issue with the 64 other new DMTSs.

The DMTS program recognizes employees for technical excellence. DMTSs are regarded as seasoned experts in their fields and, therefore, as Laboratories resources. Here are the "missing three" along with their formal DMTS citations. We hope this front-page coverage at least partially makes up for the two-week delay in their announcements.

Kathleen Gee (7234)

For her long-standing contributions to Sandia's weapon program in the areas of instrumentation and quality improvement. Her efforts to understand, apply, and teach quality concepts have contributed to the culture change at Sandia.

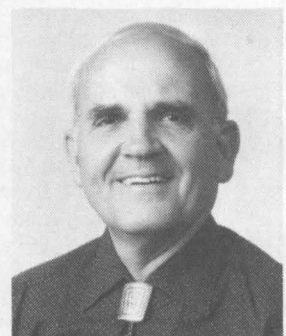


Donald Wright (7222)

For his continued contributions and technical excellence in the field of weapon component and system reliability. He provides important product improvement input to designers, is true to the product and the customer, and shows leadership and initiative in developing new tools and procedures used by the reliability organization.

Howard Gerwin (7222)

For his contributions to component and system reliability engineering as well as his technical contributions before joining Dept. 7220 in security systems, photovoltaics, thermal-solar testing, and weapon system and subsystem development. His diverse technical background and personal thoroughness have had a major impact on SNL-designed products.



This & That

Acting Up in 6000 - Like most big organizations, Sandia often places employees in temporary (acting) management slots during periods of change or while permanent managers are being sought. But the folks in Division 6321 may be experiencing a first at the Labs: acting management all the way up to the executive VP level.

Mike Vannoni, technical staff member in 6321, is acting supervisor. He's filling in for Bob Luna, who's now acting department manager of 6320. Bob's filling in for Joe Stiegler, who's on a temporary ES&H assignment. Acting director of 6300 is Tom Hunter, who normally manages department 6310. Tom's filling in for Dick Lynch, who's also on a temporary ES&H assignment. Finally, Virgil Dugan - normally director of 6200 - is acting VP of Org. 6000, filling in for Dan Hartley, who's taken the temporary assignment of VP for Corporate Change Management. Whew!

* * *

Let's Get Serious - But first, let's be honest. Some of us - yes, me too - have been hesitant to get into the full swing of the ES&H initiatives at the Labs. Some of us claim that the big push isn't necessary because the record shows that Sandia is already a safe and healthy place to work. While that's true, it misses the real point. The point is that DOE - our primary sponsor - says we must comply with all applicable ES&H rules and regulations and have the documentation to show it. And DOE - through the Tiger Teams - is scheduled to pay us Albuquerque Sandians a tough visit sometime early next year to see how well we're doing.

I've heard some convincing words recently that make me believe that we all need to get serious about ES&H and do it quickly. In plain language, our future could be at risk if we don't. The changing world political situation and serious federal budget problems could mean there will be fewer federal bucks for the DOE labs. Which labs are likely to suffer the most serious cutbacks? Maybe those that don't have their ES&H act together?

Sandia's Management Council has restructured our ES&H program to give more help and direction to the line organizations striving to meet the rules and regulations (see story on page four). I'm no expert, but it looks like a big improvement to me, and I hope we all get behind the program and do what needs to be done. It may not be the most enjoyable part of our jobs, but it just may be the most important part.

* * *

Labs and Locale Name Games - From the never-ending stream of variations that show up on Sandians' incoming mail, hotel bills, etc.: Ree Gerchow (122), Sandia National Laboratory; Joel Wendt (1141), Santa Maria in place of Sandia; Fred Vook (1100), Saudi Natural Labs; Jay Keller (8364), Soudiu Nil Labs; Jack Marron (7415), Sandial Labs; Nancy Finley (6321), Sandra Nahmel Laboratories; Will Keener (3163), Sandier National Labs in Alberquerkie; Bob Graham (1153), Landio National Labs; Jack Walker (6460), Aberkerki.

* * *

Thanks for the Help - Just because I don't always reply to you folks who send in story and column ideas, don't think I don't appreciate your help. I do, but this place often gets hectic, and I can't always find time to acknowledge that help.

I even appreciate *some* of your free advice about how to run this newspaper, but one favor, please: When you send it, include your name and organization number. I may want to discuss it with you and - time permitting - I may even want to return the favor by sending you some free advice about how to do your job. ●LP

Medical Corner

Anxiety: Least Understood, But Most Treatable Disorder

By Arlene Price (3300)
Sandia Clinical Psychologist

Oct. 7 through 13 is Mental Illness Awareness Week (MIAW), a special week to inform you about the causes and treatments of mental illnesses. The theme for this year, "A Matter of Fact," addresses the myths and misconceptions people have about mental illness.

This year, MIAW focuses on a group of the most common mental health disorders in the US - anxiety disorders - affecting almost 15 percent of Americans during their lives. Everyone is born with the capacity to develop anxiety, a normal human experience necessary for your survival. Many believe it drives most of the adjustments and accomplishments you make in your life.

Defined as the autonomic nervous system reaction pattern that occurs in situations of fear or threat, anxiety is a form of emotional pain that signals you when your health or well-being are in danger. Like physical pain, it serves as a protec-

Mental Health Roundtable Oct. 3

Sandia's Medical Directorate is sponsoring a Mental Health Roundtable on Anxiety Disorders from noon to 12:45 p.m. on Wednesday, Oct. 3 in the Technology Transfer Center (Bldg. 825). The featured guest is Dr. Eberhardt Uhlenhuth, Director of the Anxiety Disorders Clinic at the University of New Mexico.

tive symptom. When it begins to interfere routinely with your daily life, however, it becomes a problem.

Anxiety disorders include general anxiety, phobias, panic disorder, and obsessive-compulsive disorder. With general anxiety, you may experience persistent uneasiness and apprehension. Phobias may cause you to feel dread, panic, or terror when you face or expect to face a fearful object, situation, or activity. And with panic disorder, you may experience terror that has no apparent source. Many times, people experiencing these sensations think they are suffering from a heart attack or stroke. With obsessive-compulsive disorder, you may feel uncertain about things, causing you to repeat behaviors to prevent or produce a future event. These repeated behaviors are usually time-consuming and unproductive and may include repeated disturbing thoughts.

Many factors contribute to these disorders, including medical, physiological, psychological, and environmental conditions. Highly distressing anxiety can become intolerable for any length of time. The unpleasant feelings and sensations attached to the fearful situation become easily linked to the harmless aspects of the situation as well. One important consequence is the development of a characteristic feature of anxiety disorder - avoidance behavior. You learn not only to avoid the original situation where a fearful situation took place, but also situations that resemble it, even if the similarities are slight.

Most people have acquired a wide variety of fears in life, most of which can be taken in stride; when they affect your ability to carry out your daily responsibilities, however, take notice. Anxiety disorders are among the least understood and most treatable disorders. But fewer than one-fourth of the people suffering from them seek help. Medications and a broad array of behavior modification techniques have been developed to treat many forms of anxiety disorders. The challenge is for you to face up to your fears and seek professional help.



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Take Note

Sandia will host the 1990 annual meeting of the Pyrotechnics and Explosives Application Section, Ammunition Technology Division, of the American Defense Preparedness Association Oct. 2-4 in Albuquerque. Presentations will cover developments in pyrotechnics and explosives applications for both government and commercial use. For information, contact Lloyd Bonzon (2514) on 4-4709.

* * *

Nancy Freshour (7825) will receive Northern Arizona University's 1990 Alumni Association Service Award during homecoming activities at NAU in October. Service awards are given to alumni who have demonstrated continued interest in, and loyalty to, NAU. Nancy is Sandia's BS/MS recruiter at NAU.

* * *

The 12th annual conference of the Albuquerque Association for Gifted and Talented Students, "Personality and Promise: Understanding the Gifted Child," will be held Oct. 13 at the Albuquerque Academy from 8 a.m. to 4 p.m. The conference is open to the public. For information, contact Laura Goldsmith on 344-4296.

In Memory of DOE Combustion Pioneer**Mike Dyer Receives First Karl Bastress Award**

Sandia possibly wouldn't have a combustion research program today, were it not for the 1970s efforts of the late Karl Bastress, a DOE administrator who guided early combustion research activities for the national energy program. In his memory, Sandia has established an award and named the first winner.

The initial recipient of the Bastress Award is Mike Dyer (8300A), technology transfer officer for Sandia, Livermore. The award recognizes contributions that couple combustion research programs with the needs of US industry.

In the mid-1970s, when the Sandia combustion research program was just beginning, Bastress was chief of the Combustion & Fuels Technology Branch of the Division of Conservation Research and Technology, DOE Office of Conservation.

Dan Hartley (5) presented the award to Mike during the Combustion and Applied Research Directorate 8300 awards ceremony on Aug. 31. Bastress's widow, Frances, also attended the awards ceremony, as did DOE representatives Dominic Monetta, Director of the Office of New Production Reactors for DOE, and Marvin Gunn, Director of Advanced Industrial Concepts Division of DOE.

'Personal Commitment' Built Program

During the ceremony, Monetta described Bastress's dedication to the national combustion research program and his distinguished career before joining DOE in 1975. "He literally built the combustion research program around his own personal commitment," Monetta said, "assembling a small staff of dedicated people who were the early contributors, along with Dan [Hartley], to the program.

"From 1976 to 1981," Monetta continued, "Karl not only inspired the original funding but moved all the justification paperwork through the system. The program grew not only under his auspices, but under Research and Fossil Energy areas as well. It's one of the few DOE programs that has progressed from a successful concept in 1975 through all these years with an unbroken line of funding — which is no easy task."

Dan added some thoughts about Bastress: "He was a real visionary. He was technically sharp, he was committed, he was a leader, but was empowering — which is something we're just learning about 15 years later from books."

In accepting the Bastress Award, Mike said, "The measure of Karl's vision can be seen right now with the collaboration between industry, the national labs, and universities. It's the kind of thing Karl, Bill Adams, and others in this field put together some 15 years ago. It was really a valid



PRINCIPALS at the 8300 Directorate awards ceremony are (from left) Peter Mattern (8300); Mike Dyer (8300A), who received the Karl Bastress Award; Dominic Monetta, Director of the Office of New Production Reactors for DOE; Frances Bastress, widow of Karl Bastress; and Dan Hartley (5).

vision, something we can all aspire to."

Also presented at the awards program were the 1988 and 1989 O.W. "Bill" Adams Awards, initiated in 1985 in memory of DOE's original program sponsor for the Combustion Research Facility. The award is given annually to a Sandian who has made exemplary contributions to the combustion program at Livermore.

Reggie Mitchell (8361) received the 1988 award; Frank Tully (8353) was the 1989 recipient.



WINNERS of the Adams award are Reggie Mitchell (8361, left) for 1988 and Frank Tully (8353) for 1989.

"Since this is the highest award given for combustion research at Sandia, it is quite an honor to be one of the recipients," said Reggie. "I had the opportunity to meet Bill Adams several times when he came to Sandia, and I know that he really wanted to see this facility [the CRF] become a reality."

Frank was absent, but commented in a letter: "As a former faculty member at Georgia Tech before coming to Sandia, a grant from Bill Adams' office literally saved my job. Furthermore, it was at one of those early DOE Basic Energy Sciences contractor meetings where Peter [Mattern, 8300 Director] found me."

Also recognized at the meeting were the Silver Medal winners for the Best Paper presented at the 22nd International Symposium on Combustion. Winners were Bob Kee, Greg Evans (both 8245), and Jim Miller (8353), along with their co-author, Graham Dixon-Lewis of the University of Leeds in England. The title of the paper is "A Computational Model of the Structure and Extinction of Strained, Opposed Flow, Premixed Methane-Air Flames." ●BLS

Krieger Honored for Volunteer Work

Sandia retiree Harold "Blitz" Krieger has been honored by KRON-TV as one of eight Bay Area "Those Who Care" award recipients for 1990.

Blitz, who retired in 1985 after 32 years at Sandia, has devoted hundreds of hours of volunteer service to the Shepherd's Gate homeless shelter, despite a crippling arthritic condition. He has served as taxi driver for some 50 homeless people each month, driving them to medical appointments, job interviews, and other personal commitments throughout the Bay Area.

His other volunteer work includes serving as a docent at Sunol Regional Wilderness Park and as chairman of the Outreach Committee at St. Bartholomew's Episcopal Church in Livermore.

Blitz will receive his award during a Sept. 26 ceremony at GiftCenter Pavillion in San Francisco. He will be presented with two \$1,000 checks, one for himself and one for the homeless shelter. ●



**SANDIA
LIVERMORE NEWS**

Public Meeting on Site Specific Plan Is Sept. 26

DOE will conduct a public comment meeting for Sandia, Livermore's Site Specific Plan (SSP) on Wednesday, Sept. 26, at 7:30 p.m. in the Livermore City Council Chambers.

Following several short presentations, the public may offer comments or ask questions of the presenters. Patrick Higgins, Director of the DOE/AL Environmental Management Staff; Dick Rohde, Manager of Environment, Safety & Health Dept. 8540; and three of Dick's staff members are scheduled to make presentations.

The Site Specific Plan provides an overview of Sandia, Livermore and the activities required to

support ES&H compliance, environmental cleanup, and waste management programs. The plan covers near-term actions being performed now as well as activities planned through FY95. ●

Sympathy

To Charles Comroe (8454) on the death of his father in Tracy, June 5.

To Carl Pretzel (8154) on the death of his mother in Chicago, June 20.

To Karen Davis (8531) on the death of her father in Cottage Grove, Ore., Sept. 5.

'ES&H Is Sandia's Top Priority'

Restructured ES&H Program Will Help Line Organizations Comply With Requirements

A restructured program that emphasizes teamwork and more direct interaction between management and staff should help Sandia's line organizations as they strive to meet environment, safety, and health requirements, says ES&H Director Nestor Ortiz (3200).

The ES&H Improvement and Compliance Program was adopted by the Sandia Management Council on Aug. 20.

"I think folks around the Labs will be pleased about a major new element in the restructured program," says Nestor. "A Line Implementation Project has been established to work closely with ES&H coordinators and councils in the line organizations to help them determine how they can best meet requirements," he continues. "This new project will help Sandians in the line organizations and should give a big boost to our Labs-wide effort to reach and maintain full compliance."

Nestor acknowledges, however, that the restructuring isn't the total answer. "What's really needed now is the support of all Sandians. We need folks to take a direct interest in the program."

Dick Lynch (6300 Director) has been assigned to manage the Line Implementation Project and will serve as liaison between line organizations and the ES&H Directorate. (Dick's new assignment is temporary, but full-time. His temporary organization number is 20E.)

Dick believes the ES&H Improvement and Compliance Program is not only a workable one for bringing the Labs into compliance, but that it could indirectly lead to new R&D opportunities for Sandia (see "An Opportunity — Not Just an Obligation").

In addition to the Line Implementation Project, the ES&H Improvement and Compliance Program includes two other primary projects, both led by Nestor. The Definition Project drives the overall program; it identifies applicable ES&H laws, regulations, and orders and translates them into the specific policies and programs that Sandia must implement. The ES&H Support Capabilities Project provides Labs-wide implementation support, largely from ES&H Directorate specialists.

Framework for Action

All three projects work within a three-element program framework: (1) Implementation, (2) Self-Assessment, and (3) Labs-wide Integration. As shown in the diagram below, the program involves strong management support and participation. The president and all management down through every department manager are directly involved with staff in the process. A full-time ES&H coordinator is assigned to each vice presidency, and each directorate will have a coordinator assigned on an as-needed basis — if not full time, ES&H will be his or her primary job.

As the diagram also shows, each vice presidency, directorate, and department will have an ES&H self-assessment group that's responsible for continually checking how the program is going and for reporting progress and shortcomings back to the ES&H councils.

Program basics were explained in an Aug. 31 memo to Sandia supervisors from President Al Narath (ES&H Council chairman), Executive VP Lee Bray (ES&H Improvement and Compliance Committee chairman), Nestor, and Dick.

They make it clear early in that memo just how important the ES&H program is to Sandia's future: "ES&H is Sandia's top priority." They then explain, "By this we mean that whenever we have a conflict between ES&H requirements and other programmatic needs, it will be resolved to fully meet our ES&H obligations . . . we must now diligently ensure that our policies, programs, and procedures are fully compliant with

Another Angle to ES&H

An Opportunity — Not Just an Obligation

The ES&H Improvement and Compliance Program — if it works as well as Sandia management hopes it will — could not only help the Labs comply with DOE requirements, but could also lead to new R&D opportunities. That's the opinion of Dick Lynch, named last month to manage the Labs' ES&H Line Implementation Project (Org. 20E). (Dick's permanent job is Director of Nuclear Waste Management and Transportation 6300.)

"Sandians have developed a lot of technology that could be adapted to help clean up the environment and make the world safer and

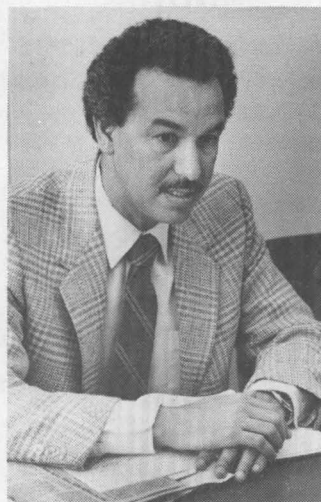
healthier for future generations," notes Dick. "There are good opportunities for the Labs to contribute practical solutions in this area, and I think getting our own house in order quickly can provide convincing evidence to DOE and other funding agencies of our competence."

Several LAB NEWS articles this year (March 9, May 4, and June 15) have featured environmental R&D projects at Albuquerque and Livermore — in robotics, solar detoxification, supercritical water oxidation, and remote chemical monitoring — and how they might be applied to clean up and protect the environment.

ES&H requirements before we conduct any proposed activity."

Tigers On Our Trail

A big impetus for restructuring the Sandia ES&H program is the DOE Tiger Team visit to Sandia, Albuquerque — expected in early 1991, but not scheduled yet. Tiger Teams — ES&H inspectors — are visiting all DOE and contractor facilities and producing detailed reports of their compliance with applicable ES&H requirements. A team visited Sandia, Livermore early this year and released its report July 31 (LAB NEWS, Aug. 10).



ES&H DIRECTOR
Nestor Ortiz (3200)

"We learned several lessons from the Sandia, Livermore report, and the ES&H Improvement and Compliance Program is partly in response to it," says Nestor. "Among other lessons, we learned that we must have formal procedures for tracking ES&H matters, keep much better records, and provide stronger management support and leadership

to help folks in the line organizations. The new program will help all Sandians put those lessons to work for the good of the Labs."

"We've got plenty to do in a pretty short time [before Tiger Team visit] to get our facilities in

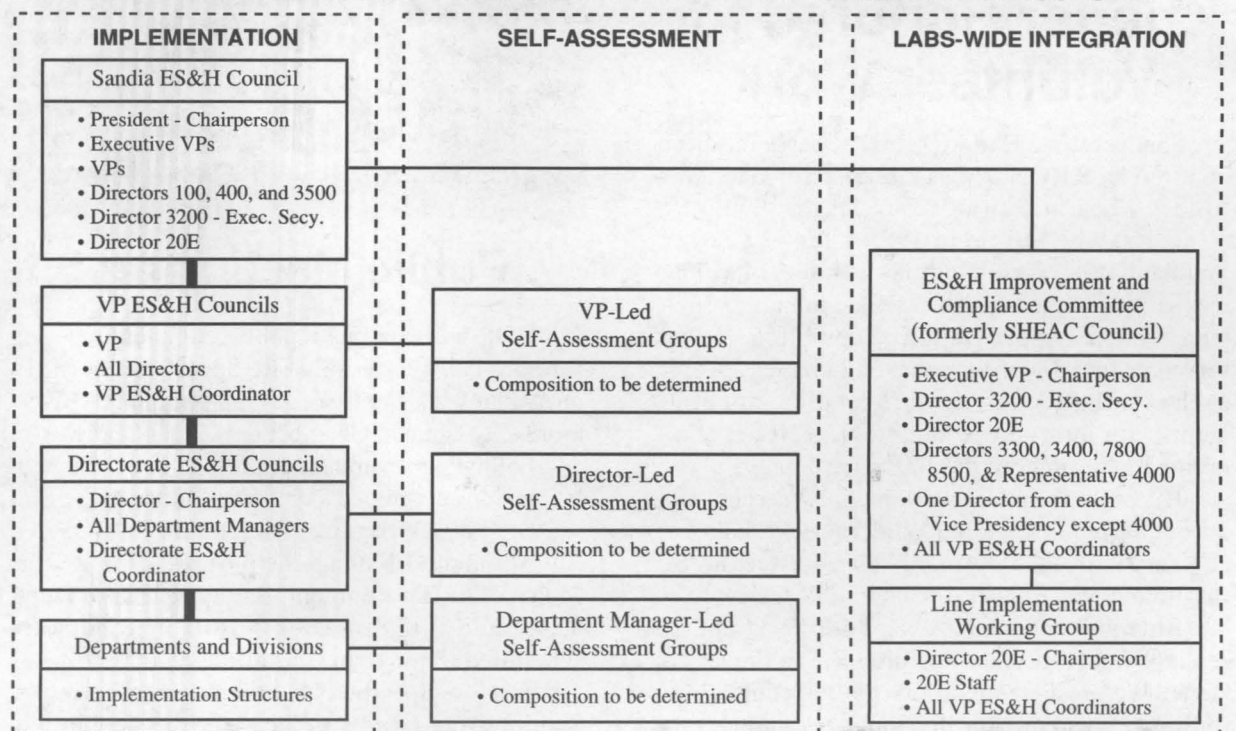
"I hope and believe that Sandians will really get behind this effort now and make it work."

compliance," says Dick. "It won't be easy, but the new program gives us some new tools and procedures for getting the job done. I hope and believe that Sandians will really get behind this effort now and make it work."

The Aug. 31 memo says the main elements of the new program are permanent, manifesting Sandia's long-term dedication to a formal ES&H structure. It also explains, however, that other elements are temporary and are designed to provide the thrust necessary to help the Labs meet all requirements: "When we reach that desired state, our program will be sized to sustain compliance and provide continuous improvement," it states.

Additional details about the new program will be provided in special meetings that begin Oct. 2 for Large Staff, department managers, and ES&H coordinators, who will then pass along necessary information to employees in their groups. (Meeting schedules and details will be announced in a special mailing to appropriate Sandians.) ●LP

ES&H IMPROVEMENT AND COMPLIANCE PROGRAM MANAGEMENT STRUCTURE



feed back

Q. Sandia is pursuing methods to maintain and improve the environment through an active ES&H program. At the same time, increasing concern is being voiced around the globe about needless use of Styrofoam products that never decompose.

Shouldn't Sandia stop procuring Styrofoam cups? Currently, very large numbers of them are used daily for single cups of coffee. All Labs employees should provide their own drinking cups at normal work locations. Guests could be served with paper cups, which will decompose.

A. Your suggestion is excellent and, through this Feedback answer, I strongly encourage all Sandians to examine their use of disposable cups and replace them with permanent cups if it's feasible.

As to an outright ban on Styrofoam cups, I considered the following before making a decision:

- Polystyrene (Styrofoam) food packaging and serving waste is a very small portion of the waste in our landfill. For example, all the polystyrene foam and paper packaging used by fast-food restaurants equals only one-fourth of 1 percent of what's in a sanitary landfill.

- Contrary to public belief, biodegradation in

landfills is an extremely slow process because of the lack of air, moisture, and microorganisms. Newspapers that are readable have been retrieved after 20 years.

- Paper mills reportedly consume more energy and produce more wastewater than do plants manufacturing polystyrene foam. The manufacture of paper cups also requires harvesting of trees for pulp.

After considering the above, I have decided — at least for the time being — not to recommend a ban on purchasing Styrofoam cups. However, Sandia will soon investigate the possibility of recycling Styrofoam products. Also, the Labs cafeteria is in the process of converting from plastic to paper for cold food and drinks. We will continue to look for ways to reduce waste in all areas.

Nestor Ortiz — 3200

Q. What can be done to improve telephone service at Sandia, Albuquerque? I am particularly distressed at the amount of time it takes to process trouble calls and moves. Here are two examples:

A few weeks ago, my supervisor's phone went dead. We called the Kirtland AFB telephone repair service, and were told it would take one to two days to repair the phone. Something is wrong

with this picture!

My other example involves a move I recently made. Our director asked several of us to swap offices. We immediately placed requests to have our telephone lines moved. Thank goodness for call forwarding; it took more than 30 days to move my extension from my old office to my new one.

I have had other problems with telephone personnel. I once asked the Sandia telephone coordinator for some special programming features and some special equipment, and was told that no options were available. However, I started looking at phones in the Facilities Directorate, and noted all sorts of programming options — the exact type of equipment I needed. I ended up spending \$100 out of my own pocket to get the proper equipment.

We need a first-class telephone system to do first-class work. It's difficult to react to changes at the Lab if the phones lag by six weeks. Why don't we hire our own telephone personnel? I wouldn't mind paying for first-class equipment and service. Can't we find a competent contractor to deliver this service for us? We are part of the AT&T family, aren't we?

A. A great amount of work must be done to improve telephone service at Sandia, Albuquerque. Orgs. 2600 and 7800 are working with DOE and the Air Force to develop a more reliable, customer-oriented telephone service. The USAF Communications Squadron (our only on-base source of telephone services) simply does not have sufficient resources to respond as we would like. Planned DoD staff reductions will further exacerbate this situation. However, Sandia is working with DOE to find a solution to more adequately address telephone service in the future.

A variety of phones are in use at Sandia today. The issues that limit the type of instrument available to the customer are system/instrument compatibility in a given building and cost-effectiveness. People in neither 7800 nor any other organization receive better phones than others unless they have just occupied a new or renovated facility containing a new telephone system.

Please call the 7800 telephone coordinator on 5-8509 or the 2600 communications consultant on 5-8666 for further assistance or clarification.

Ward Hunnicutt — 7800

(Continued from Page One)

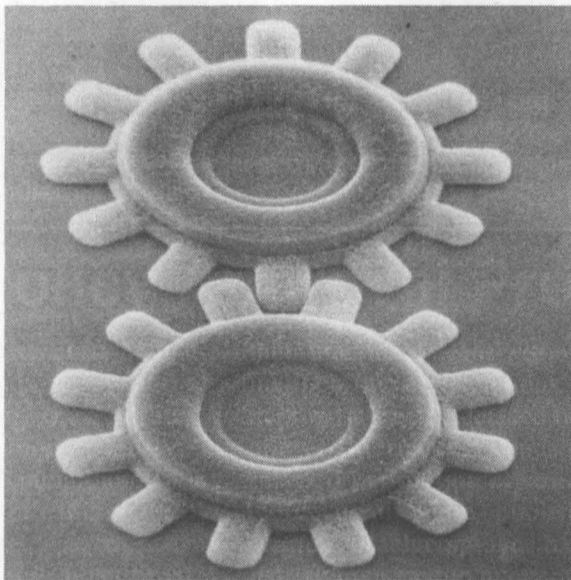
Micromachining

dicular to it — allowing researchers to obtain information on the contours of the surface and the force of interaction between the tip and the surface at any one point.

The team recently fabricated Sandia's first microgears in conjunction with other Sandians. The intermeshing gears, which are 100 micrometers in diameter and one micrometer thick, were turned using a probe and videotaped under a microscope. Each gear weighs only two one-hundredths of a microgram (one millionth of a gram).

The ability to make a freely rotating gear is the first step in a project to develop a smaller, cheaper version of an electromechanical weapon safety device called a stronglink. While microgears have been made at other institutions, the stronglink application would be the first specific use found for the microgears.

Stronglinks in nuclear weapons play a role in preventing a weapon from detonating if accidentally exposed to adverse conditions such as a lightning strike or fire. The stronglink discriminator converts an electrical signal into physical movement. The right signal moves the parts and gears in a precise sequence, allowing an electrical signal to reach critical components and starting the firing se-



MICROGEARS photographed through a scanning electron microscope at 1580X are 100 micrometers in diameter and 1 micrometer thick. Each gear weighs two one-hundredths of a microgram (one-millionth of a gram). The two intermeshing silicon gears are free to rotate on fixed hubs.

quence. The wrong signal locks up the parts.

Micromachined gears are the first step toward the possible manufacture of smaller, lighter stronglinks that might cost considerably less than current ones, Ned says. •JClausen (3161)

Microelectronics Technology Used to Make Tiny Parts

One of the basic ingredients for micromachining, as with making integrated circuits, is a shiny, 6-inch-diameter silicon wafer. The processes used in the two fields are much the same, relying largely on techniques for "growing" silicon layers on a chip and selectively etching them away.

To make a gear, an ultrathin layer of glass is deposited on a wafer. Next, a layer of polycrystalline silicon is laid down.

Photolithography — a process that uses light to make a pattern — outlines the shape of the gear. Silicon is chemically etched away so that a raised shape in the form of a flat disk

with teeth remains. After another layer of glass is deposited, photolithography is used to "drill" a hole through the glass to the silicon substrate. More polycrystalline silicon is applied, filling in the hole and forming a hub.

Finally, hydrofluoric acid is used to eat away the glass layers, leaving the gear free to rotate around its hub.

Microgears are actually simpler to make than integrated circuits, requiring 52 manufacturing steps compared to 500 to 800 steps for circuits. Another attractive feature is that hundreds of micromachined parts can be made simultaneously on one wafer.

(Continued from Page One)

Experimental Therapy Gives Sandian Hope

he says. "But when I'm in the rest period, I feel wonderful and am able to go to work."

Rollie looks forward to a full recovery and has a protocol of his own to achieve it. "It boils down to faith first, positive attitude second, and medicine third," he says about his plans to beat the disease.

"A nice thing about this treatment is that I can receive it through UNM and don't have to go out of state. I'm fortunate. I'm near family and friends." Rollie and Karen have three grown children and three grandchildren.

"An exciting thing about this is the research that's going on," says Rollie. "This experimental protocol is a recent development in cancer treatment. I feel there are going to be great events in cancer research in the near future."

Much of the money collected locally through United Way stays here to support research programs like the one Rollie participates in. The 1990 Employee Contribution Plan — Sandia's United Way program — campaign is Oct. 8-12. When deciding about your contributions, remember that friends, neighbors, and co-workers often benefit from the programs that money supports. •JW

A Sense of Community**Sandia Volunteers Lend a Helping Hand To Build Homes for Families in Need**

For a few underprivileged families in Albuquerque who have had to live with the frustrations of substandard housing, the dream of owning a home has come true through the efforts of volunteer construction workers like Margaret Chavez (5211), Chris Rautman (6315), and Lupe Arguello (1521).

These Sandians spend their Saturdays not at the amusement park, the swimming pool, or the movies, but on construction sites, laying bricks, putting up plasterboard, installing plumbing, and slapping paint on interior walls.

In the end, the homes they build have mortgage payments of \$150 to \$250 a month, interest-free. The homes are purchased by low-income families who could never afford to buy a home at market prices and interest rates, and who do not qualify for other forms of housing assistance.

Perhaps most importantly, the homes they build give the working poor a chance to begin living the American dream. No longer consigned to the fringes of society, they discover what it's like to have plumbing that works, adequate space for the whole family, and other things that are less concrete but just as essential — self-respect, a sense of accomplishment, and hope.

Those are the goals of the Greater Albuquerque Habitat for Humanity, a program that was started three years ago and is supported in part by many Albuquerque churches but requires no religious affiliation to participate.

"When you go through some of the city planning documents, the amount of substandard housing is so overwhelming that you don't know what to do," says Chris, who is the treasurer of the Al-

buquerque group. "And most of the people who live there really don't have any hope of getting out because of high-interest loans." He says Albuquerque has an estimated 25,000 people living in poverty-level homes.

Applicants Must Meet Requirements

Applicants in the program are carefully screened to determine their actual need and their ability to repay the cost of the home over a 15- to 20-year period. Their credit records and character references are checked, and they are required to donate 500 hours of their own time toward helping to build the home or do other administrative tasks, such as office work, applicant screening, language interpreting, or publicity.

"Through their own labor, they're contributing what we call 'sweat equity.' And that's one of the qualifications of the project — we're not giving homes away. The philosophy is that we are providing capital, not charity," says Chris.

Volunteers in the program derive personal satisfaction from helping others and putting into practice their religious ideals.

"I guess it comes from inside. It's a personal motivation to help others less fortunate than we," says Margaret, who is site selection chairman. "The friendships I've made with the people we've helped are especially important to me."

"My basic reason for getting involved was the idea that, 'There but for the grace of God go I.' My parents went through the same thing when they came to this country from Mexico. Fortunately, I was lucky and got educated," says Lupe, who is on the board of directors.

Other Sandians who have volunteered their

services in the past and continue to provide financial support are Bill Larson (9224), Bob Paulsen (9011), who is the founding president of Albuquerque group, and Beverly Rainwater (9144).

Financing for the homes comes strictly from donations. Habitat for Humanity receives no federal or state funds. By so doing, the group maintains its autonomy, reduces paperwork, and avoids the high administrative costs of showing compliance with government requirements, notes Chris. Habitat is not a United Way charity, which means that Sandians wishing to donate employee contributions to the program (during the ECP campaign) must designate Habitat for Humanity as the recipient through donor option. Contributions go to the local group, which keeps all of the proceeds except for 10 percent, which is donated to the international organization.

All Work is Volunteer

All of the work done for Habitat is on a volunteer basis. Professional contractors even donate their time to work on construction sites and make sure the homes meet engineering and safety requirements before a city inspector is called to check the site. Sometimes, students from the Technical-Vocational Institute get on-the-job experience by helping out.

So far, the Albuquerque organization has built three new homes and rehabilitated two, including one that was completely gutted by a fire three years ago that took the life of a young child. The renovated home was formally dedicated in early September in Corrales, and will be occupied by a family whose members are living together again for the first time since the fire forced them to separate and move in with various relatives. Another home is under construction, and a fifth home is scheduled for construction.

Habitat is a worldwide organization that was started in 1976 in Georgia. One of its most famous supporters is former President Jimmy Carter, who together with his wife, Rosalynn, leads an annual work camp to build houses for impoverished families. This past summer, they went to Tijuana, Mexico, and San Diego, to help build a total of 107 houses. Some 2,000 volunteers from the US, Mexico, and Canada helped with the project.

"Part of the idea is that if you can give people a break, you can help them move into the mainstream. One of the families we helped here in Albuquerque were once illegal immigrants who had entered the amnesty program and now have learned English. It's just incredible how they've blossomed. We've helped them come forward through the support system that we've developed, and they're no longer sneaking around the fringes of American society," says Chris.

Or, as Lupe puts it: "Building community — that's what it's all about."

Sandians interested in participating or learning more about the group may call 243-3241. •LD



SANDIANS VOLUNTEER their time to rehabilitate old houses or build new ones for low-income families through Habitat for Humanity. Putting up chicken wire in preparation for stuccoing are (from left) Chris Rautman (6315), Margaret Chavez (5211), and Lupe Arguello (1521).

Fun & Games

Swimming — Kirtland Aquatic Club, a year-round competitive swim team for boys and girls ages 4 through high school, is holding team tryouts in the Kirtland Olympic pool Monday through Friday, Sept. 17 through Oct. 1, from 6 to 7 p.m. The two-week tryout period is free. Kirtland Aquatic Club is a member club of United States Swimming, the source of all US international and Olympic swimmers.

'A Very Significant Insight'**Sandians Unlock Mysteries of Aging
In Nuclear Power Plant Cables**

(Editor's Note: This is the third in a series of articles about nuclear power and related work by Sandia on nuclear plant safety, aging-management, and plant life improvement and approval procedures.)

The hundreds of miles of electric cables snaking through a nuclear power plant are its life-line — powering lights, monitors, and controls and triggering safety equipment in the event of an accident. Difficult to replace or repair, the cables must last the expected lifetime of a plant, currently set at 40 years.

However, with many of the nation's plants nearing the final decade of their licensed lifetimes, efforts are under way to extend nuclear power

**Many of the nation's power plants
are more than halfway through their
licensed lives.**

plant licenses an additional 20 years. A critical reactor safety feature, cables are an important factor in these rejuvenation efforts. If they degrade — which can happen in low-level radiation over time — the continued operation of the plant is at stake.

Sandia has become a leader in radiation aging studies, largely through the development of models for simulating long-term radiation exposures in greatly reduced time periods.

Holding Up for 60 Years

Through their work on polymer aging, Ken Gillen (1812) and Roger Clough, Supervisor of Chemistry of Organic Materials Div. 1811, have made important contributions to the emerging science of nuclear power plant aging. They have developed general test methods that enable researchers to predict, in as little as six months, how cable and other materials will hold up under radiation for 60 years and longer.

Electric cables are encased in plastic-like insulation and jacket materials that are susceptible to the low-level radiation environments in nuclear power plants.

The Sandians' work is based on a discovery that arose out of an earlier project for the Nuclear Regulatory Commission (NRC). They discovered that when the total doses are the same, lower dose rates of radiation over long periods of time are more harmful to polymers — strings of small molecules — than higher doses over shorter time spans.

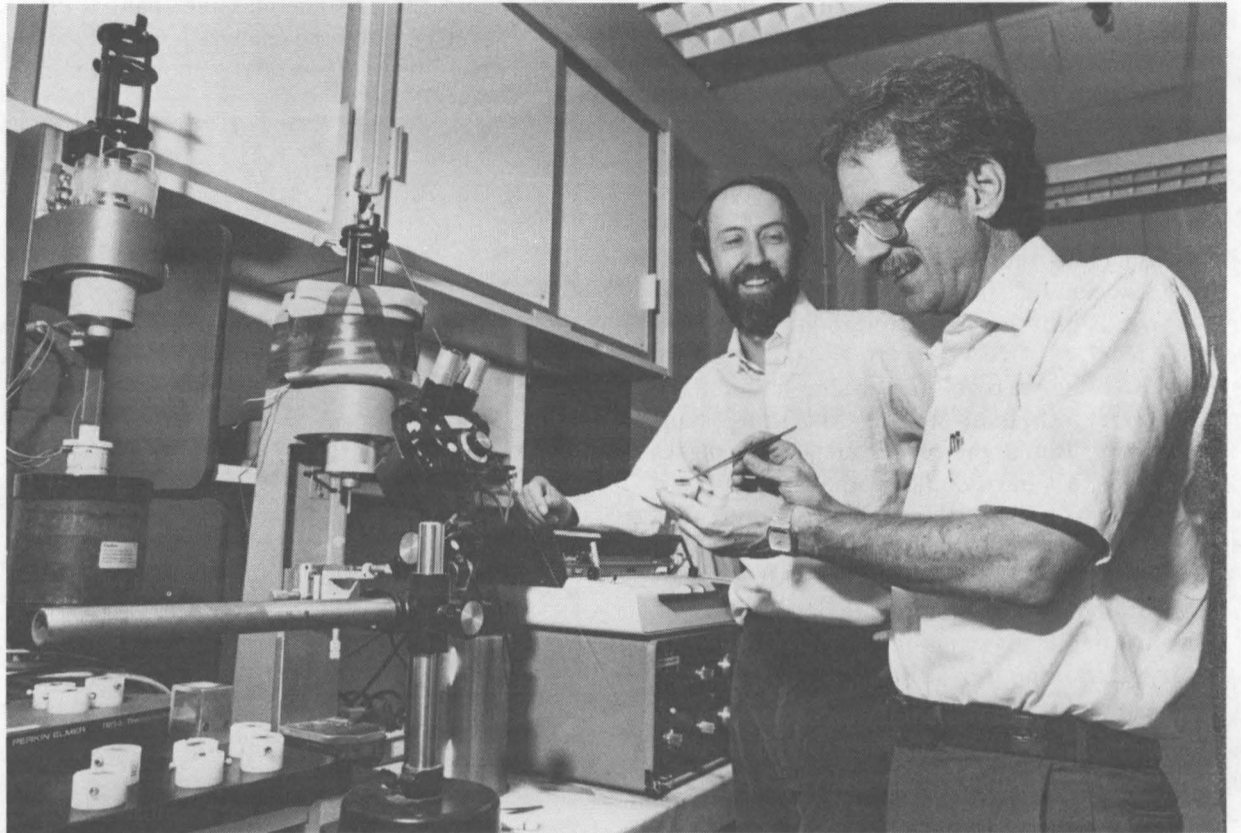
"You don't get the same effect when you accelerate the process and reduce the time," Roger says. "That was a very significant insight."

For years, the cable industry had been operating under the assumption that the total radiation dose

**Lower dose rates of radiation over
long periods of time are more harmful
to polymers than higher doses over
shorter time spans.**

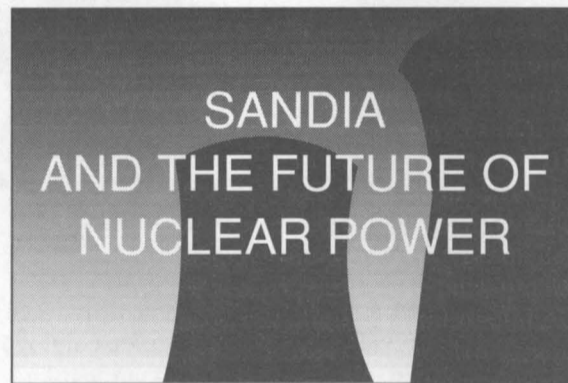
— independent of time — received by a material determines the extent of its damage. In other words, if radiation over a 40-year period equaled 40 megarads, it was assumed the same effect could be achieved by applying the same dose in a much shorter period of time (days to weeks).

Not so, say Ken and Roger. Previous test methods underestimated the long-term effects of low radiation exposure by not taking into account "dose rate effects." They found that, in most polymers, accelerated radiation exposure actually pro-



ROGER CLOUGH (1811, left) and Ken Gillen (1812) are experts in radiation effects on polymers. They've developed general test methods that enable researchers to predict how cable and other material in nuclear power plants will hold up under radiation for 60 years and longer.

duces artificially low oxidation. Oftentimes, oxidation is greatest near the material's surface but is less extensive internally, limited by the rate of oxygen diffusion into the polymer from the surrounding air. However, in the low-level radiation environments typical in nuclear power plants, oxidation occurs more evenly throughout, and



damage to the polymer is, therefore, greater. Ken and Roger have developed several unique experimental techniques for monitoring this physical dose-rate effect.

They have also discovered a number of other chemical dose-rate effects linked to enhanced polymer degradation. A particularly important one involves radiation-induced oxidation products called hydroperoxides. Under normal conditions, hydroperoxides are relatively stable, but over long periods of time, they break down and can lead to degradation of materials such as polyvinyl chloride, polyethylene, and polypropylene. These findings opened a whole new area of concerns for the nuclear industry.

Predicting Reality

Roger and Ken have verified the accuracy of their predictive aging techniques by comparing degradation projections with actual measurements on 8- to 12-year-old degraded cable materials from nuclear reactors.

Their research is carried out in a cobalt-60 test facility dedicated primarily to polymer aging research. Cobalt-60, a radioactive form of the element cobalt, placed at the bottom of a water-filled, 15-foot-deep pit irradiates samples contained in temperature-controlled aging cans. The facility al-

lows elevated temperatures and radiation to be applied independently or jointly. Atmospheric environment can also be controlled and changed — for example, from air to nitrogen.

In the past decade, the two have worked on a number of additional radiation applications and have become experts in polymer radiation effects. They have written numerous papers, review articles, and textbook chapters. Their findings are currently being incorporated into national and international radiation effects standards.

There are numerous technology transfer spin-offs from this work. An example is helping the industry that provides disposable plastic syringes to understand degradation effects occurring when these items are sterilized with radiation.

Their work will be especially important in efforts to renew licenses of the nation's existing nuclear power plants. Currently, the NRC licenses plants for 40 years. Many of the nation's power plants are more than halfway through their licensed lives, and new plants are not being constructed or even definitely planned.

License renewal will require a systematic evaluation of the plants' components — including cables — for continued effectiveness and safe operation. ●JClausen(3161)

Welcome

Albuquerque — Cynthia Acosta (21-1), Michael Allred (7810), Steven Becker (7825), Betty Brooks (21-1), Eric Burns (7810), Elizabeth Cowper (22-2), Roger Hartman (7213), Sherrie Langlois (7824), Frank Loudermilk (3210), Della Pacheco (22-2), Charles Roma (3221), Ronald Rymarz (7810), Victor Sandoval (7814), Gail Simon (22-2), Darla Tyree (21-1), Virginia Wing (3340), Kirt Wilson (7810); *Other New Mexico*: Anna Baca (22-2), Gary Kishi (3153).

Elsewhere: *California* — Thomas Nash (1272); *Colorado* — Christine White (1810); *Massachusetts* — Ira Weinstock (1846); *Michigan* — Christopher Young (6231); *New Jersey* — Jerry Simmons (1152); *Pennsylvania* — William Warren (1815); *Utah* — Michael Hobbs (1512); *Virginia* — Rudolph Buchheit (1834).

Sending a Message**Bonner Named to Sandia Management Council**

Ralph Bonner, Director of Human Resources 3500, is the first "four-digit org." director named to the Sandia Management Council (SMC).

As of Sept. 4, he joined the group that administers the Labs. Formerly known as Small Staff — President, Executive VPs, and VPs — the SMC now includes Directors Gerry Yonas (400), Paul Stanford (100), and Ralph.

"We intend to send a message here," says Dan Hartley, VP for Corporate Change Management 5. "Adding the Director of Human Resources to the SMC is a deliberate step toward recognizing that people are Sandia's most important asset, and that their needs must be represented at the highest policy level.

"Too often we dwell on our unique facilities — high-tech this and world-class that," continues Dan. "But, as the new Strategic Plan makes quite clear, it's our people that can — and will — provide us with the edge we're going to need in the '90s.

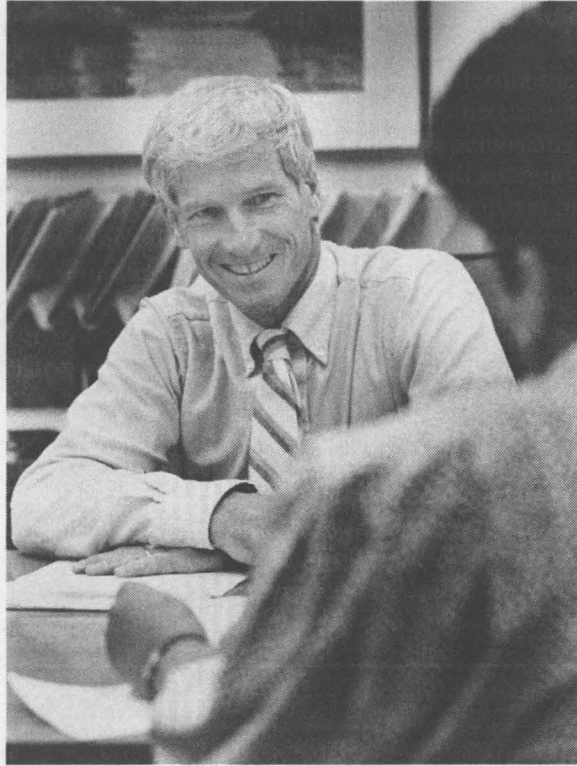
"Ralph's becoming part of the SMC is overt recognition of 3500's key role in developing and implementing the systems and processes involved in hiring, training, rewarding, and retaining the many kinds of people we need."

Our Only Renewable Resource

"I'm most pleased that SMC has asked me to join the group," says Ralph. "As Dan notes, it drives home the point that people truly are our most important asset, our only renewable resource. Just as Paul Stanford is the keeper of Sandia's financial resource processes, I'm keeper of Sandia's human resource processes. Both of us can play a

significant role in helping the SMC lead us into the future.

"And the future's exciting," Ralph continues. "We're undergoing some massive changes in our business today, and these changes invariably affect our people directly. How we go about making the



THE FIRST "four-digit org." Director named to the SMC, Ralph Bonner (3500), discusses his new role as SMC representative for Sandia's Human Resources Directorate.

changes is critical. As a member of SMC, I'll be able to help the SMC members concentrate on how the changes impact Sandia employees.

"Looking at human resources from the Quality point of view, I'll use my SMC position to focus on 3500's customers — Sandia employees and management."

Flexible SMC, Flexible Staffers

"We're using the SMC to model the kind of flexibility we want all of Sandia to exemplify," says Executive VP Lee Bray (30). "It's a rapidly reconfigurable body, able to respond quickly to many kinds of policy-making.

"For example, by excusing the director-level people from the group, it becomes the SCC [Sandia Compensation Council], which handles official Sandia Corporation business, sets director's salaries, and so forth. By adding Nestor Ortiz [3200] and Dick Lynch [20A], the SMC becomes the SEC, or Sandia Environmental Council. And by adding Larry Bertholf [7300], the SMC becomes the SQC, the Sandia Quality Council.

"And these are not *ad hoc* groups," Lee continues. "Each one meets formally and regularly at least one hour per month, keeps minutes of its meetings, and reviews our progress toward stated goals."

"In other words, the SMC allocates a fraction of its time to pressing initiatives, such as Quality and ES&H, every month," adds Dan. "We are asking individual members of Sandia staff to allocate their time, talent, and energy to those same issues; we are 'walking our talk' at SMC in an organized, time-managed way." ●BHawkinson(5)

Policy Approval Process Streamlined

Sandians can now play a more active role in revising or suggesting new Labs policies, and policy changes will take less time than in the past. Sandia's Management Council recently sanctioned an approval board for Sandia Laboratories Instructions (SLIs) that will streamline the approval process.

SLIs are written statements of Labs policy that spell out general objectives for Sandia operations and reflect external requirements placed on the Labs by DOE, AT&T, and federal, state, and local regulations.

"This is the first time the approval process has undergone such a significant change since the Labs' inception," says Shirley Wallace, supervisor of Corporate Policies Div. 113. "It's a reaction to the Labs' current focus on quality."

Employee Participation

Under the old approval process, employees proposed changes to the policies division based on

their individual needs without necessarily consulting their line organizations. This practice resulted in proposals being delayed because they often were not well-defined and because no agreement was reached within line organizations.

"We call it the 'buckshot' approach," says Shirley. "Each employee had his or her own wish list. There were too many proposed changes coming from too many different directions, and the policies division couldn't respond to everyone's requests. It was a hit-and-miss situation."

Now the SLI Approval Board will oversee Labs-wide policy development and guide employees interested in suggesting policy changes. This new process provides Sandians with a distinct channel for initiating changes.

Employees interested in suggesting policy changes will propose them through board representatives appointed from each vice presidency. These representatives will relay change proposals to the approval board and help employees

propose changes that meet internal and external Labs requirements.

"Now organizations can approach the approval board with a single voice through their representatives," says Shirley. "Once the approval board reaches a consensus on the change and Sandia's executive vice-president signs it, it becomes policy. It's that simple."

Paul Rosenkoetter (110), chairman of the approval board, says board representatives throughout the Labs will provide a communication vehicle between the board and employees.

"The policy board should make things convenient and effective for all Sandians," says Paul. "Board members will be like apostles. The representatives can spread the word and, I hope, the rationale behind policy changes. I think this will lead to a general support of policy changes."

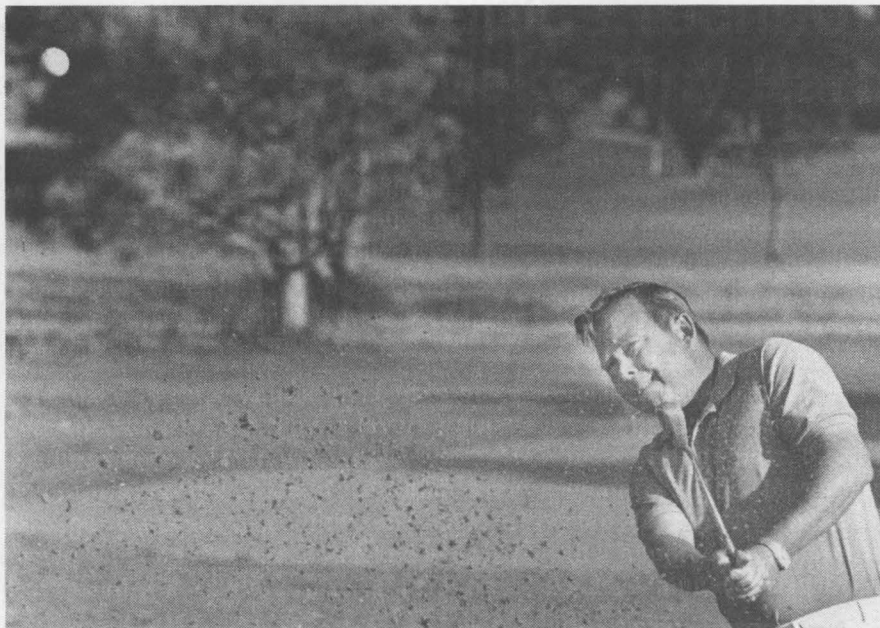
Board members include Chairman Paul Rosenkoetter, Randy Maydew (420), Lee Davison (1520), Doug Weaver (2130), Bob Gaeddert (3410), Joe Lawhon (4010), Hank Witek (5230), Don Schueler (6220), Mike Nielson (7810), Paul Brewer (8500), and John Keizur (9014).

The approval board will see action immediately — a half-day orientation for board members took place Sept. 18, and the board's first meeting is planned for Oct. 1. Also, an orientation for Primary Responsible Organizations is being held Sept. 27.

Soon many Sandians will have access to up-to-date versions of Sandia policies right at their desks. Starting Oct. 1, at least 85 percent of existing SLIs will be accessible to Sandians on two VAX systems — one inside the area and the other outside the area.

Among those who helped develop the VAX listing were Dal Jensen (2534), Anna Nusbaum (113-1), Jerry Hanks (7824), Mary Courtney, Diane Sanchez (both 22-2), and Digital Corp. "It really was a cooperative effort," says Anna. ●JG

HOW SWEET IT IS — Veteran golfer Mike Gray (9121) made his first hole-in-one Aug. 11 after playing the game for 30 years. He did it at the Tijeras Arroyo Golf Course's 210-yard (par-3) 17th hole using a 3-wood off the blue tees. Mike is seen here practicing a sand-wedge shot.



Supervisory Appointments

DANIEL FINNEGAN to Supervisor of TTR Administrative Support Div. 7516.

Dan joined the Labs in 1978 as an engineering and science assistant in the Nondestructive Testing



DANIEL FINNEGAN

Technology Division. He entered the MLS trainee program in 1981, and was assigned to the Systems and Appraisal Division. In 1982, he joined the Systems Analysis and Computer Applications Division and, in 1983, was reclassified to

MLS. He transferred in 1985 to the Material Systems Division, where he served as Sandia's nuclear material manager. He returned to the Systems and Appraisal Division in 1987.

He has a BS in business administration from the University of Albuquerque and an MA in public administration from UNM. Before joining Sandia, he was a member of the Air Force.

Dan enjoys camping, hunting, and motorcycle riding. He and his wife Marilyn have two children.

ALAN HURD to Supervisor of Interfacial Chemistry and Coating Research Div. 1841.

Until his promotion, Al had been a member of Sandia's Structural Physics and Shock



ALAN HURD

Chemistry Division since joining the Labs in 1984. His work has been studying the physics of complex fluids, including the sol-gel film formation process and aggregation of flame- and plasma-generated particles.

He has a BS in engineering physics from the Colorado School of Mines and an MS and PhD in physics from the University of Colorado. Before joining the Labs, he was a member of the Physics faculty at Brandeis University.

Al is a member of the American Physical Society, the Materials Research Society, and the American Association of Aerosol Research. In 1986, he shared the Basic Energy Sciences Award for outstanding, sustained research in metallurgy and ceramics.

He enjoys music and camping. He's a referee and coach for the American Youth Soccer Organization and board member and coach of East Mountain Little League. Al and his wife Joan have four children and live in the East Mountain area.

ROBERT WORKHOVEN to Supervisor of Electronic Security Systems Div. 3433.

In 1959, Bob joined Sandia's Environmental Testing Division, where he was project engineer on



ROBERT WORKHOVEN

mechanical shock and vibrational testing in Area III. Since then, he's been project leader for climatic environmental testing, mechanical shock test lab, solar-thermal energy research, barrier technology/safeguards and security, and interior

intrusion detection systems. He was a project leader in the Advanced Technology Division from 1987 until his promotion.

Bob has a BS in mechanical engineering from the University of Iowa and an MS in the same field from UNM. He's a member of the International Association of Bomb Technicians and Investigators.

He enjoys sports, old cars, auto racing, and outdoor activities. He's also involved in environmental concerns and is a member of the Sandia Mountain Wildlife and Conservation Association. Bob and his wife Germaine live in the East Mountain area.

RONALD OELSNER to Supervisor of Systems Test Equipment Design Div. II 7267.

Ron joined Sandia in 1960 as a member of the Product Tester Design Division, where he



RONALD OELSNER

designed product testers for weapon components and electrical systems. In 1973, he moved to the Radar Product Evaluation and Control Division, where he designed radar field-test equipment and provided support for radar exploratory

development programs for Mk4 and Mk500 radars. He was project leader for the Mk4 radar sup-

plemental overland operation, reentry error compensator, and numerous reentry body exploratory development programs. In 1982, Ron went on special assignment to Livermore for the SDI-related high-power microwave vulnerability studies. In 1983, he was project leader for the Mk5 radar test equipment and evaluation team. Recently, he was project leader for the Mk5 radar design and B90 radar evaluation and product tester teams.

Ron has an AAS in electrical engineering from the State University of New York College of Technology at Alfred, N.Y. He's a member of the IEEE Automatic RF Technologies Group.

He enjoys landscape gardening and woodworking. He and his wife Margaret have two children and live in Corrales.

GLORIA CHAVEZ to Supervisor of Radioactive and Mixed Waste Div. 3222.

Gloria joined Sandia in 1979 as a member of the Health Instrumentation Division, where she



GLORIA CHAVEZ

was responsible for Albuquerque personnel and environmental radiation dosimetry, the environmental monitoring program, and radiation-effects consultation. In 1984, she transferred to the Environmental Protection and Hazardous

Waste Management Division, where she was responsible for radioactive waste management, PCBs, and air pollution and environmental monitoring. In 1989, she became project manager, in the Environmental Programs Division, for radioactive/mixed waste, environmental monitoring, and waste minimization. She was responsible for design and construction of a radioactive/mixed waste storage facility, Sandia's waste minimization program, and radioactive/mixed waste operations.

She has a BS in biology/chemistry from UNM and an MS and PhD in radiation health physics from Colorado State University. She's a member of the Health Physics Society, the American Nuclear Society, the American Association for Advancement of Science, the Mexican-American Engineering Society, the New Mexico Network for Women in Science & Engineering, and the New Mexico Hazardous Waste Management Society.

Gloria enjoys hiking, reading, and snorkeling. She's a docent at the Rio Grande Nature Center and the New Mexico Museum of Natural History. She lives in the North Valley.

Earnings Factors for Savings Plans

April 1990

Savings Plan for Salaried Employees (SPSE)	Earnings Factors
AT&T Shares	.9560
Government Obligations	.9982
Equity Portfolio	.9755
Guaranteed Interest Fund	1.0073
South Africa Restricted Fund	.9747

Savings and Security Plan — Non-Salaried Employees (SSP)

AT&T Shares	.9543
Guaranteed Interest Fund	1.0072
South Africa Restricted Fund	.9748
Equity Portfolio	.9929

May 1990

Savings Plan for Salaried Employees (SPSE)	Earnings Factors
AT&T Shares	1.0750
Government Obligations	1.0170
Equity Portfolio	1.0918
Guaranteed Interest Fund	1.0072
South Africa Restricted Fund	1.1078

Savings and Security Plan — Non-Salaried Employees (SSP)

AT&T Shares	1.0750
Guaranteed Interest Fund	1.0072
South Africa Restricted Fund	1.1055
Equity Portfolio	1.0753

June 1990

Savings Plan for Salaried Employees (SPSE)	Earnings Factors
AT&T Shares	.8998
Government Obligations	1.0109
Equity Portfolio	.9894
Guaranteed Interest Fund	1.0071
South Africa Restricted Fund	1.0103

Savings and Security Plan — Non-Salaried Employees (SSP)

AT&T Shares	.8998
Guaranteed Interest Fund	1.0070
South Africa Restricted Fund	1.0104
Equity Portfolio	.9930



Cooperation With Industry**News Bulletins Feature Technology Transfer Opportunities**

Robots that perform precise manufacturing procedures and tiny mechanical gears (the diameter of a human hair) that operate on a silicon microchip are just a few items featured in the first issue of *Manufacturing Technology*, the first of three new quarterly bulletins from Sandia that will highlight research and production activities at the Labs.

The three bulletins are intended to stimulate cooperation among industry, national laboratories, and universities to seek and develop technologies

“These bulletins address many of our objectives in Sandia’s Strategic Plan 1990.”

that increase product quality or improve manufacturing processes, one of Sandia’s new missions under the National Competitiveness Technology Transfer Act of 1989.

This act responds to growing pressures on the national labs to bolster US economic competitiveness in the face of an unfavorable balance of trade, a result, some say, of inefficient and outdated manufacturing processes and inferior product quality. The Technology Transfer Act has stimulated procedures for sharing information and for initiating collaborative arrangements with industry.

“The US simply must learn to compete in the international marketplace,” says Randy Maydew

“The US simply must learn to compete in the international marketplace.”

(420), managing editor for all three bulletins. “These bulletins address many of our objectives in Sandia’s Strategic Plan 1990, which will help us compete.”

The bulletins are written for audiences outside the Labs who might see potential uses for



MICHAEL MCDONALD (7484, left) and Bill Alzheimer (7400) examine parts made on the computer-controlled CL805 capacitor winding machine. The CL805 is featured in the first issue of *Manufacturing Technology*, the first of three quarterly bulletins published by Sandia to stimulate industrial interest in technology transfer activities at the Labs. Bill is technical consultant for *Manufacturing Technology*.

Sandia technology or capabilities. Each issue will contain several short articles and a collection of news briefs.

The *Manufacturing Technology* bulletin emphasizes new Sandia processes that may save manufacturers time and money or improve product safety and reliability. The first issue appeared in August.

Facilities Testing will highlight the Labs’ state-of-the-art testing and development activities. The aim is to stimulate industry and government agencies to use such Sandia facilities as the Solar Thermal Test Facility and rocket sled tracks to improve designs and gain the greatest benefit from

the R&D dollar. Each issue will feature tests in four or five Sandia facilities. The first issue will be published in December.

Energy and Environment will explore Sandia energy programs and ES&H developments that provide opportunities for industry or support US objectives. The first issue is scheduled for January 1991.

Randy says he will keep track of responses to the first issues of the bulletins to see if they are effective. “Sandia is willing to work with industry to provide leadership in solving national problems. Taking leadership also means getting out word to potential partners,” he says. ●JG



BRYAN PLETTA (5267, far right) discusses a robotic system with NATO representatives (the Joint Theater Surety Management Group) who toured Sandia recently. Part of the Remote Security Station (RSS), the robot is a modified all-terrain vehicle equipped with a video motion detection system, microwave and infrared sensors, an infrared spotlight, acoustic sensing devices, a pneumatic mast for raising the sensor suite 10 feet, and computer smarts to recognize purposeful movement of objects in its environment. Other components of the system, which Sandia is developing for the Defense Nuclear Agency, include stationary sensors that can be placed around the periphery of an area and a central control console where a human operator can assess alarms and manipulate system components.

Fun & Games

Golf — Sandia Women’s Golf Association completed a 36-hole, two-day Championship Tournament on Aug. 25 at the Ladera Golf Course. Awards were presented to the following winners: Flight A — Deborah Reichman, low gross; Delores Worley, first low net; Marlene Shields (7542), second low net; Shirley Kendall, low putts; Deborah Reichman, second low putts; Marlene Shields, best front nine; Delores Worley, best back nine; Shirley Kendall, closest to the pin; Flight B — Teri Carpenter (3731), low gross; Maria Feliz (3726), first low net; Peggy Burrell (6000), second low net; Janice Montoya (153), low putts; Betty Worley (ret.), second low putts; Maria Feliz, best front nine; and Teri Carpenter, best back nine and closest to the pin. Tournament director was Maria Feliz.

The final Par-3 Tournament was held at Belen Country Club and Golf Course on Aug. 25. Prizes were awarded to Ann Wilkey (9321), first low net; Archie Stannish (3712), second low net; Dorthe Bame (9241), first low putts; Georgianne Huff (7842), second low putts; Berta Rodriguez (4000), third low putts; and Beverly Quinlan, long drive. Tournament directors were Georgianne Huff and Beverly Quinlan.

Something Like Doughnut Holes?

Ever wonder what happens to the holes in the middle of Life Savers candy? You may be able to buy them soon. Nabisco plans to test-market Life Savers Holes in limited areas.

Thomas King, *Wall Street Journal*

feed **back**

Q. There is a method of recognizing "technical excellence" by Members of the Technical Staff (DMTS designation). These seasoned experts are given a new title that sets them apart from SMTs. Since "not all highly paid, highly ranked STAs should become MTs," wouldn't it be appropriate to recognize some select group of STAs in a manner similar to DMTS?

A new title for this position might be Leading Senior Technical Aide or Leading Technical Aide, since people in this category could — or probably should — be leading projects. Valuing diversity

can apply to job classifications, too.

A. Thanks for your idea about a possible method of recognizing individuals in the technician (STA) classification. In April, a Recognition/Reward Project Team was formed to assess our current system and to suggest changes where appropriate. Your idea has been submitted to this group for consideration.

Ralph Bonner — 3500



Retiree Deaths

- Lee Denton (79)Aug. 4
- Lillian Bowers (70)Aug. 8
- James Harry Kelly (70)Aug. 14
- Marrian (Salomon) Johnson (62)Aug. 15
- Fred Krauss (78)Aug. 21
- George Lester (75)Aug. 28

Sympathy

To Carla Honeyestewa (3723) on the death of her father in Shawnee, Okla., Aug. 30.

To Jim Tichenor (2565) on the death of his father-in-law in Albuquerque, Sept. 6.

To Sharon Mahkee (22-2) on the death of her sister-in-law in Zuni, Sept. 9.

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

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

Ad Rules

1. Limit 20 words, including last name and home phone.
2. Include organization and full name with each ad submission.
3. Submit each ad in writing. No phone-ins.
4. Use 8 1/2 by 11-inch paper.
5. Use separate sheet for each ad category.
6. Type or print ads legibly; use only accepted abbreviations.
7. One ad per category per issue.
8. No more than two insertions of same "for sale" or "wanted" item.
9. No "For Rent" ads except for employees on temporary assignment.
10. No commercial ads.
11. For active and retired Sandians and DOE employees.
12. Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

- PERSIAN KITTENS, 8 weeks old, black & white, \$150. Montano, 867-5402.
- ANTIQUE CEILING FAN, \$55; automobile battery charger, \$15. Grafe, 897-0776.
- LANE TABLE, \$100; smoked mirrors, \$50; rocker, \$30; chandeliers, \$30 to \$100; desk/bookcase set, \$800. Bonzon, 828-1066.
- BESTOS STOVE PIPE, metal, 6", three 3-ft. sections. Bender, 281-1989.
- MORGAN HORSE, registered 9-year-old, chestnut gelding, trained English & western, \$2000. Olman, 884-4663.
- FULL-SIZE BED, w/waterproof mattress, \$80; infant car seat w/cloth liner, \$15; school desk & blackboard, \$25. Kwak, 294-2524.
- GITAR, Yamaha FG 250, 12-string w/case, \$150. Lynch, 292-8523.
- MICROWAVE OVEN, Amana, full-size, \$75; Pioneer PD-5010 compact disc player w/remote control, needs work, \$25. Simons, 821-9343.
- TOW DOLLY, Demco KK-260, '87 model, new departure hubs, 2 sets straps, \$850; Scout II parts. Brooks, 299-1884.
- GLASS PATIO DOORS OR WINDOWS, heavy-duty, 78" x 48", \$15/ea. Nelson, 881-0148.
- QUEEN-SIZE SOFA SLEEPER, grey/beige stripes, oak trim, \$200. Luikens, 881-1382.
- AKITA DOGS, 2 female, AKC-registered, 5 & 7 yrs. old, keep pair together, free. Rael, 884-4778.
- VIOLIN, full-size, Scherl & Roth w/case, \$200. Magnuson, 268-5955.
- EVAPORATIVE AIR COOLER, window-mounted, for auto. Weydert, 299-6211.
- SOFA, 3-cushion, plaid; green carpet, 93 sq. yds. Serna, 292-2564.
- GIRL'S BEDROOM SET, French Provincial, includes bed, mattress, box spring, dresser w/mirror, desk, chair, \$300. Clements, 822-1003.
- SOFA SLEEPER, blue velvet w/pillows, full-size Simmons mattress, \$280. Bennett, 889-0929 after 5:30 p.m.
- JUNIPER, 6 yrs. old, you dig & haul, free. Greer, 831-0019.

- FULL-SIZE WASHER, Speed Queen, heavy-duty, \$200; full-size automatic electric dryer, Speed Queen, \$150. Pompeo, 291-0291, leave message.
- CRIB, Bassett, dark pine, double-drop side, mattress, sheets, pads, \$125. Mastin, 292-2086.
- UNITED AIRLINES TICKET, round trip from Alb. to Des Moines, leaving Oct. 4, returning Oct. 9, \$198. West, 296-1235.
- ANTIQUE ICEBOX, oak, White Mountain Grand, \$500; Toshiba microwave, \$75. Petersen, 275-7467.
- MODULAR SOFA, 6-piece, \$125; wooden table lamp, \$20. Hudson, 821-8988.
- TOM YOUNG'S MEMBERSHIP, 3-month, cost \$130, sell for \$75 OBO. Shamamian, 293-7655.
- MOUNTAIN-BIKE RACK, Blackburn, new, \$20; K4 mountain-bike slicks, 2, Specialized, Kevlar-belted w/tubes, \$30. Harris, 291-8956.
- ENCYCLOPAEDIA BRITANNICA, leather-bound, w/yearbooks, purchased new in 1987, \$700. Hammond, 281-9354.
- MATCH PISTOL, .22-cal., Smith & Wesson Model 41, 5-1/2" barrel, extras. Rasmussen, 266-1097.
- DINING ROOM TABLE, wood, w/6 chairs. Moore, 831-4959.
- DINING ROOM SET, Victorcraft, authentic dark rattan, glass top table, 6 chairs w/cushions, cost \$2572, sell for \$865. Schkade, 292-5126.
- LAWN & GARDEN TRACTOR, John Deere Model 70, 36" mower deck, snow blade, tire chains, new battery, \$300 OBO. Garrison, 869-6979.
- WESTERN WOOD STOVE, w/all parts, stacks, flue, \$250 OBO; Kirby vacuum cleaner, w/attachments, \$75. Newman, 266-6928.
- CONDO SHARE, 7 days, at the Sweetwater in Palm Springs, 1 bdr., Jan. 25 through Feb. 1, 1991, \$300. Ater, 822-9697.
- TELEPHONE ANSWERING SYSTEM, Duofone II, w/instruction manual, \$30. Tippy, 298-3758.
- VIOLA, Roth, 15-1/2", w/case, \$450. Rentzsch, 281-5017.
- LA-Z-BOY RECLINER, rust-colored, \$125. Dunlap, 884-0232.
- RATTAN BOOKSHELF, 70" x 26" x 11", \$60. Lockwood, 821-6331.
- FRONT BUMPER, for '84-88 Toyota Pickup/4-Runner, black, complete w/end caps & mounting brackets, \$90. Gerwin, 881-0028.
- VIOLA, 16-1/2", w/case, \$400. Finley, 822-8457.
- TIRES, used, 2 General Radial P225 75R14, white sidewall, 4-ply tread, 2-ply steel, \$10/ea. Stamm, 255-2640.
- SKATEBOARDS & RECTORS; Legos; rockets; canopy bedding & curtains; stuffed animals. Skogmo, 292-9773 after 5.
- TWO REAR CAB WINDOWS, safety plate glass, trapezoidal, 52" bottom, 43" top, 15" wide, fits Datsun, \$25/ea. OBO. Stang, 256-7793.
- TWO 55-GAL. DRUMS, \$10/ea. Prior, 281-5532.
- 35MM CAMERA, Pentax K1000, lenses, case, \$350; Kenmore electric dryer, \$50; Subaru rear window louver, \$30; writing desk, \$25. Salgado, 291-9460.
- SIDE-BY-SIDE CRYPTS, pair, original indoor crypts adjacent to chapel in Sunset Mausoleum. Schneider, 299-6243.

- KIRSCH MINIS, 9' x 4', off-white, cost \$240, sell for \$150; exterior door, 36", finished, \$75. Marshall, 298-1699.
- AIRCO HELIWELDER, 150-amp, AC/DC, w/full Argon bottle, \$1150. Kurowski, 881-1859.
- HICKORY WOOD CHIPS, 4 lbs., \$2; radial tires, \$5; wire book/magazine racks; birdhouse; file folders. Foster, 299-6240.
- CAMPER, Mitchell fishing hut, furnace, 12V H₂O, TV antenna, extras, \$1050 OBO. Cook, 865-6391.
- MOVING SALE: furniture, clothing, fish tank, misc., Sept. 22-23, 8 a.m.-5 p.m., Hwy. 344 & West Church St., Edgewood. Kulawinski, 281-8694.
- DOORS, hollow-core, new, slab, nine 1-3/8" x 30", \$10/ea.; two 1-3/4" x 32", \$15/ea.; AT&T keyboard, \$50. Falacy, 293-2517.
- TIFFANY-STYLE LIGHT FIXTURES, \$25 & \$35; rocking recliner, \$75; rectangular coffee table, \$60; 2 wood & brass lamps, \$40. McMillen, 292-5126.
- REFRIGERATOR FREEZER, Kenmore, harvest gold, frost-free, automatic ice maker, \$200. Rader, 292-6241, leave message.
- STEREO, turntable w/cover, 2 speakers, \$20; B&W 12" TV, \$20. Rosul, 281-4114.
- LANDSCAPE MATERIALS, 8" L-shaped border bricks, gray, approximately 200 bricks, 25¢/ea. Sikora, 891-7862.
- POP-UP TENT CAMPER, sleeps 6, stove, heater, wired for lights, \$1100. Ledbetter, 296-2138.
- ANTIQUE DRAFTING TABLE, w/arm, \$350; Kitchen Aid dishwasher, custom convertible, portable, used 6 months, \$300. Hayes, 298-9396.
- SKIS, K2 710, 207cm, w/Salomon S727 bindings, \$50; ski boots, woman's Salomon Sx60, size 310, \$35 OBO. Davis, 298-3342.
- SYLVANIA VCR, 3-spd., \$35; Pre Team 800 skis, new, 170cm, \$50. Norwood, 292-0072.
- CAROUSEL HORSE, hand-carved jumper, full-size, from actual carousel, 50 yrs. old, restored by museum curator, \$1900. Wood, 293-5501.
- IBM PC/AT CLONE, 65 Meg. hard drive, w/extras, \$750; 2400-baud modem, \$100; IBM VGA color monitor, \$300; 80287 math chip, \$100. Snyder, 293-3611.
- SOFA, Flexsteel, 3-piece sectional, channel-back, off-white, \$150; Flexsteel club chair, \$50 OBO. Mills, 299-4752.
- CRIB, w/mattress, \$100; rocking chair, \$25; wall hanging; assorted children's items. Kraynik, 294-1043.
- ESCORT/LYNX OIL FILTERS, \$1.50; air filters, \$2; set of 8 new R46SZ spark plugs, \$3. Berg, 296-2695.
- KENMORE REFRIGERATOR, 19 cu. ft., white, \$75; Frigidaire oven, 30", electric, drop-in, white, \$25; wood kitchen cabinets, make offer. Trelue, 292-7369.
- MOVING SALE: exercise bicycle, furniture, dishes, antiques, books, Sept. 22 & 23, 2727 Kathryn SE, 1 block west of Girard at Princeton. Arris, 266-3414.
- FREE FILL DIRT, 2-3 yds., loose, you haul. Brooks, 275-0056.
- GAS RANGE, double oven, harvest gold, w/vent hood, \$100. Teague, 293-8736.

- VARI-KENNEL DOG CRATE, new, medium-size, \$25. Odinek, 892-5822.
- CAMCORDER, JVC GR60U, used 4 times, cost \$1060, sell for \$750; Escort radar detector, \$100. Christoffersen, 897-9180.
- SKI EQUIPMENT: Pre-SX Electra skis, 175cm, w/Salomon 647 bindings, \$100; 2 jackets; 3 children's bibs. Plummer, 296-4327.
- GE COOKING CENTER, w/microwave, range, self-cleaning oven, almond, \$200 OBO. Schmidt, 821-2917.
- AMIGO MOTORIZED WHEELCHAIR, 100 lbs., 2 batteries, rear-wheel drive, w/short-ramp access wheels, extras, \$2475 value, sell for \$1800. VanDeVelde, 255-8174.
- HITACHI 19" TV, \$125; Mitsubishi 4-head VCR, \$165; Pentax IQ-zoom, \$115; Brother electric typewriter, \$65; cassette rewinder, \$15. Martel, 293-1892.

TRANSPORTATION

- WOMAN'S 12-SPD. BICYCLE, \$50. Bonzon, 828-1066.
- '85 OLDS. FIRENZA, 4-dr., AC, 5-spd., PS, PB, cruise, AM/FM, one owner, \$3400. Roybal, 867-6643.
- '67 VOLKSWAGEN BUG, classic, 15K miles on motor. Miller, 292-5634.
- '83 CHEV. VAN, custom Roman Wheels, blue interior & exterior, w/4 captain's chairs. Gover, 296-3928.
- '83 CHEV. VAN, brown, loaded, 51K miles, front/rear AC, new tires, CB, bay windows, kept in garage, \$10,500. Trump, 299-5162.
- '86 FORD CONVERSION VAN, super-deluxe, fully equipped, \$1000 below book. Chavez, 294-2650.
- '77 FORD BRONCO, 302 V-8, AT, PS, PB, for sale or trade for equal value pickup. Cumiford, 877-6498.
- '85 OLDS. TORONADO; '85 Cadillac Fleetwood Coupe. Beck, 299-4786.
- '82 DODGE RAM PICKUP, rebuilt engine, \$2225. Garrison, 869-6979.
- '83 FORD CUSTOM VAN, AC, PS, PB, tilt, cruise, AM/FM cassette. Harrison, 897-2023.
- '86 CHEV. PICKUP, custom-deluxe, one owner. Neil, 291-9760 after 5.
- '80 928S PORSCHE, 300-hp, V-8, 5-spd., leather, \$10,500 firm; '74 Jensen-Healey convertible, 2.0L, DOHC, 4-spd., tops, \$4500 firm. Mantelli, 298-2603.
- '82 MERCURY ZEPHYR, 6-cyl., 4-dr., AT, PS, PB, AC, AM/FM, 76K miles. Walker, 821-0708.
- '79 HONDA CIVIC, 80K miles, body has rust, \$300 OBO. Shamamian, 293-7655.
- '88 TOYOTA TERCEL, 2-dr. coupe, 5-spd., AM/FM cassette, rear defrost, tilt, 38K miles, \$4995. Eldredge, 298-3905.
- '80 FORD FAIRMONT SW, 6-cyl., 62K miles, \$1100. Joseph, 299-6989.
- REPO: '79 Ford F-150 pickup, 133K miles, needs repairs, bids accepted through Sept. 26, we reserve the right to refuse all bids. Sandia Lab FCU, 293-0500.
- '85 NISSAN 4x4 PICKUP, 47K miles, 5-spd., AC, PB, AM/FM cassette, \$5000 OBO. Montague, 291-0976 after 5.
- GIRL'S 10-SPD. BICYCLE. Skogmo, 292-9773 after 5.
- BOYS BMX BICYCLE, 20", \$50. Moore, 831-4959.

- '86 FORD F-150 PICKUP, 29K miles, LWB, white, 300 CID, 6-cyl., AT, AC, Leer fiberglass cap, \$7000. Funkhouser, 296-0036.
- ROAD BICYCLE, Ross Signature, 22" Tange frame, 12-spd., Campagnolo components, Specialized Turbo R tires, sleek black, \$250. West, 821-5420.
- '89 KAWASAKI BAYOU 4-WHEELER ATV, red, single/dual traction. \$3200 OBO. Chavez, 899-8695.
- '65 FORD F-250, 3/4-ton, rebuilt engine, new front end & tires, \$1500. Christoffersen, 897-9180.
- ULTRALIGHT AIRCRAFT, Quicksilver MX, all updates, gauges, recent Rotax engine, \$2850. Stephenson, 299-3914.
- '84 PACE ARROW MOTORHOME, 34', generator, microwave, food center, more, 17K miles. Courtin, 291-0544.
- '82 PLYMOUTH VOYAGER VAN, PS, PB, AT, AC, 5 seats, hitch receiver, trans. oil cooler, \$2600. Jensen, 821-6178.
- '87 OLDS. TORONADO, Brougham coupe, 23K miles, fully equipped. Chapman, 292-1198.
- TWO MATCHING '73 MARK IVs, tan w/brown landau tops, sold as pair only, \$2200 OBO. Arris, 842-8709 or 266-3414.
- 10-SPD. BICYCLES, Raleigh & Peugeot, \$75/ea. Kraynik, 294-1043.

REAL ESTATE

- 2-BDR. HOME, 1 bath, North Valley near 2nd & Griegos, 4510 Carlton NW, garage/workshop, 1/4 acre, \$54,000. Bedeaux, 291-0836.
- 3-BDR. TOWNHOUSE, NE heights, 2 baths. Loubriel, 268-1341.
- 4-BDR. HOME, spa, pool. Beasley, 298-3398.
- 2-BDR. PATIO HOME, Wood Brothers, 2 baths, 2-car garage, off Spain between Morris & Juan Tabo, \$79,900. Biringer, 821-8741.

WANTED

- CHILD'S INDOOR PLAY GYM, prefer Little Tykes; trampoline. Grafe, 897-0776.
- MICROFILM READER, portable 35mm, reel-to-reel. Lopez, 265-3296.
- CAB-OVER POP-UP CAMPER, for full-size pickup. Thunborg, 898-0863.
- TENNIS PLAYERS, couple for mixed doubles. Falacy, 293-2517.
- APPLE IIe or similar Apple computer. Torres, 293-4385.

LOST & FOUND

- LOST: woman's black suit jacket, Jack Winter, size 10. Dunkel, 268-9991.

SHARE-A-RIDE

- PART-TIME AND FULL-TIME VAN-POOL SEATS AVAILABLE, along N-14, Frost Rd., Tijeras. Yelton (281-2893) or Burns (281-3922).



Coronado Club Activities**Make Tracks to the C-Club
For More Poor Boys**

TOE-TAPPING TUNES from the Isleta Poor Boys return tonight, Sept. 21, to the C-Club, where you're sure to track down some great eats. There will be c/w dancing all night, and from 6 to 9 p.m. choose from the evening's selection—prime rib, poached halibut, salmon steak (all \$7.95), and filet mignon (\$8.95). Also, the Club's "special sauce" will be strawberry daiquiris, at the sweet price of \$2.50. Don't forget dinner reservations (265-6791).

FEED THE KIDS this Sunday, Sept. 23, at a very special brunch dedicated to kids. Children under 12 eat for \$1.50 and parents eat for the usual price of \$5.95 (kids under 3 always eat free). Serving times are 10 a.m. to 1 p.m.

HOME-GROWN DANCING MUSIC comes your way Sept. 28. Sandia's own Bob Banks (3531) and his band, the Bob Banks Trio, make a

variety of music including oldies, Latin, c/w, and polkas. Also, sink your teeth into stuffed cod (\$6.95), prime rib (\$7.95), filet mignon (\$8.95), or lobster (\$13.95), served between 6 and 9 p.m. Make reservations early because there's a special treat that night—ladies enjoy a free strawberry margarita with dinner.

BINGO BUFFS TAKE HEART: There's one Tuesday night left of budget-bingo, Sept. 25. Try the Fortune Wheel Game or win one of the \$250 Jackpot Specials. Card sales begin at 5:30 p.m., and the session begins at 7. Regular bingo for you bingo regulars still takes place every Thursday night. Card sales begin and buffet opens at 5:30. The early-bird game begins at 6:45.

PUT ON A POKER FACE for the T-Bird card players' next meeting, Thursday, Oct. 4. Session starts at 10 a.m.

Events Calendar

Events Calendar items are gathered from various sources. Readers should confirm times and dates of interest whenever possible.

Sept. 21-22 — "Amadeus," provocative play revolves around a confrontation between genius and mediocrity in the eighteenth-century world of Antonio Salieri and Wolfgang Amadeus Mozart; 8 p.m. Fri.-Sat., 2 p.m. Sat.; Albuquerque Little Theatre, 242-4750.

Sept. 21-22 — Classical Concert Series: New Mexico Symphony Orchestra, conducted by Neal Stulberg, featuring pianist Jeffrey Biegel, program includes William Wood's "Celebrations: A Concert Overture"; Prokofiev's "Piano Concerto No. 3 in C Major, Op. 26"; and Beethoven's "Symphony No. 5 in C Minor, Op. 67"; 8:15 p.m., Popejoy Hall, 842-8565.

Sept. 21-Oct. 14 — "Georgia O'Keeffe and the Stieglitz Circle," exhibition examining the group of artists (including O'Keeffe) who were affiliated with Alfred Stieglitz, the photographer, gallery owner, and champion of early twentieth century avant-garde art; 9 a.m.-4 p.m. Tues.-Fri. (5-9 p.m. Tues. evening), 1-4 p.m. Sun.; Upper Gallery, UNM Art Museum, 277-4001.

Sept. 21-Oct. 16 — "Birds/Portraits," exhibit of 40 oil portraits of birds seen in the Southwest by Austin, Tex. artist Benita Giller; 9 a.m.-5 p.m. daily, New Mexico Museum of Natural History, 841-8837.

Sept. 23 — "Studio Safari," four prominent Albuquerque visual and performing artists open their studios, entertainment, refreshments, and trolley ride from studio to studio provided, homecoming event sponsored by the UNM College of Fine Arts Alumni Chapter; 2 p.m., 277-4402.

Sept. 23 — Sunday Jazz at the Zoo, music by Jazz Culture and Linda Cotton and Street Life; call for time, Rio Grande Zoo, 843-7413.

Sept. 23 — "The Late Great Ladies of Blues and Jazz," Sandra Reeves Phillips and her combo cover 70 years of musical history with her impressions of seven singers including Ma Rainey, Ethel Waters, Billie Holiday, and Mahalia Jackson; call for time, Popejoy Hall, 277-3121.

Sept. 25 — "The Art of Bonsai," class presented by the Bonsai Society, sponsored by the Council of Albuquerque Garden Clubs; 7 p.m., Albuquerque Garden Center (10120 Lomas NE), 296-6020.

Sept. 25 — Contemporary Chinese Printmaking, artist talk by Zhang Bai Bo, printmaker from the People's Republic of China; 5:30 p.m., free, UNM Art Museum Fine Arts Center (Cornell & Central NE), 277-4001.

Sept. 27 — Charles Carrillo, noted santero, presents a lecture and demonstration of the art of the santero; 1-3 p.m., free, Albuquerque Museum, 243-7255.

Sept. 28-30 — Oktoberfest: Enzian Schuhplattler Dancers, Edelweiss Folk Dancers, the Polka Dots, the Polka Schlingels Oktoberfest Band, Austrian & German foods; 4-midnight Fri., noon-midnight Sat., noon-9 p.m. Sun.; Haynes Park, Rio Rancho, 892-1700.

Sept. 28-Oct. 15 — "An Evening of Coarse The-

atre" by Michael Greene, an opera without music, upside down scenery, Shakespeare without Shakespeare, presented by Theatre-in-the-Making; 8 p.m. Fri.-Sat., CenterStage, 260-0331.

Sept. 30 — Fine Arts Series: Preservation Hall Jazz Band, traditional New Orleans music; 4 p.m., First United Methodist Church (4th & Lead SW), 243-5646.

Sept. 30 — "Vivat Rex!," performances by Musica Antigua de Albuquerque, featuring ceremonial music from the Middle Ages and renaissance, with voices and authentic period instruments; call for time, Central United Methodist Church (1615 Copper NE), 842-9613.

Sept. 30 — "Symphony in the Sunshine," New Mexico Symphony Orchestra Chamber Players Series, conducted by Neal Stulberg, program features Tchaikovsky's "Serenade for Strings," Berlioz's "Les Nuits d'Été," and Mendelssohn's "Symphony No. 1 in C Minor, Op. 11"; 3 p.m., Sunshine Theatre, 842-8565.

Oct. 2 — "Museum Transformations/A Symposium," presented by Joseph Traugott, Jonson Gallery curator, and J. J. Brody, Professor Emeritus, UNM Dept. of Art and Art History; 5:30 p.m., free, UNM's Jonson Gallery (1909 Las Lomas NE), 277-5967.

Fun & Games

Tennis — Sixty-six players (many entering more than one event) participated in a tennis tournament Sept. 7-9 at the Coronado Club. Winners included: Men's A Singles — Tim Draelos (9244) defeated Kevin Maloney (6418) 6-1, 5-7, 6-3; Men's B Singles — Elmer Klavetter (6212) defeated Fred Zutavern (1248) 7-5, 6-1; Women's Singles — Jill Sanchez defeated Denise Waye, 6-2, 6-0; Men's A Doubles — Tim Draelos and Kevin Maloney defeated Jeff Tsao (1141) and Tom Brennan (1144) 7-6, 6-1; Men's B Doubles — Roy Palmer (2635) and Pat Fleming defeated David Sealey (3152) and Mike Torneby (7412) 7-5, 3-6, 6-2; Women's Doubles — Judy Hansen (3730) and Evangeline Sanchez defeated Denise Swanson and Terry Martinez (9119), 7-6, 7-5; Mixed Doubles — Joe Martinez (7851) and Leslie Kelly defeated Tim Mooney and Terry Martinez, 7-6, 6-3.

Congratulations

To Roberta and Jeff (7413) Rinehart, a son, Sean Christopher, July 21.

To Pamela and Stephen (2173) Montague, a daughter, Rebecca Ann, July 24.

To Mary (1556) and Larry (9222) Walker, a son, Scott Michael, Aug. 3.

To Kathy and Bill (7532) Pregent, a daughter, Alexandra Dyan, Aug. 5.

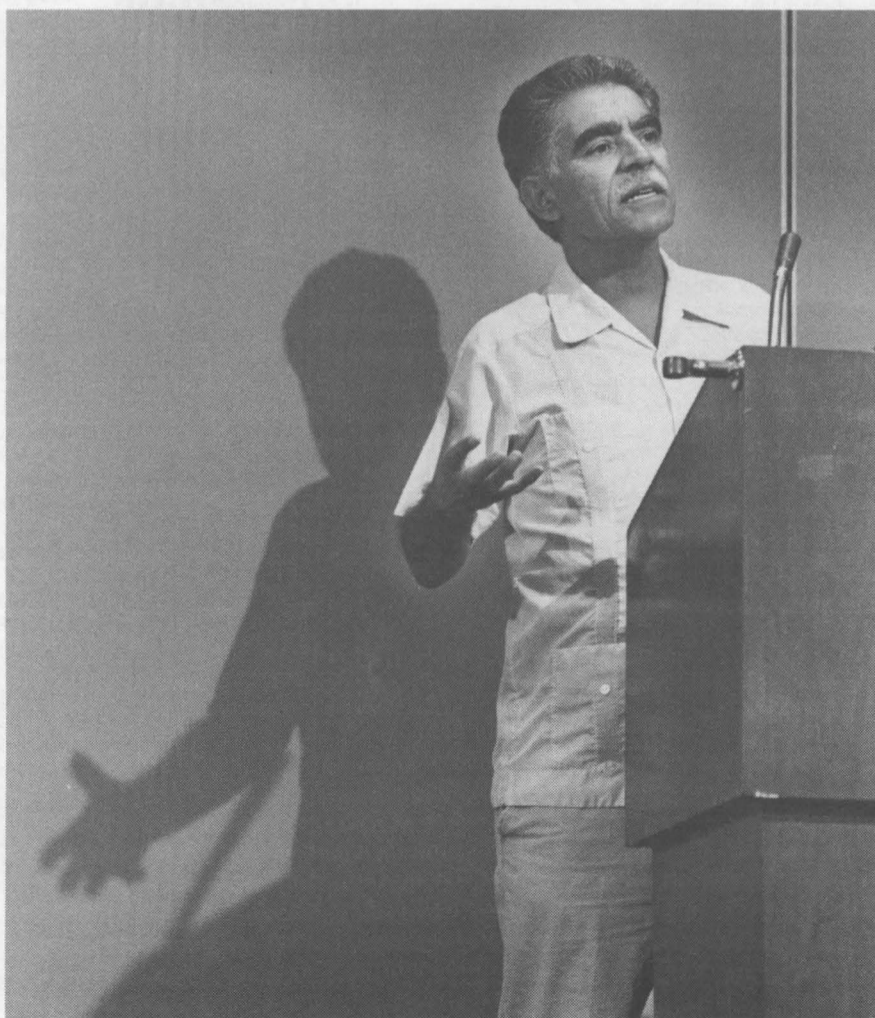
To Debi and Steve (5221) Scott, a daughter, Erin Leeann, Aug. 23.

To Karla (3714) and Garry Causey, twin sons, Jason and Jeremy, Aug. 24.

To Trish and Jim (7413) Arzigian, a daughter, Amanda Faith, Aug. 26.

Got a Question or Suggestion?

Employees who have suggestions for improvements at Sandia or who need quick answers to Feedback questions are encouraged to telefax their suggestions/questions to the Employee Communications Div. 3162 at 844-0645. For additional information about how the system works, call Janet Walerow (3162) on 844-7841. She can also provide printed Feedback forms if you cannot locate one where they are stocked in common areas throughout the Labs.



RUDOLFO ANAYA, author and chairman of the Chicano Literature Department at the University of New Mexico, speaks to Sandians earlier this month as part of Hispanic Heritage Month Lecture Series '90. The author of "Bless Me Ultima" and the winner of the Premio Quinto Sol literary award, Anaya discussed "A New Mexican Perspective," focusing on native New Mexican literature. Other speakers in the series have included Theresa McBride, President and CEO of McBride and Associates Inc.; Chris Garcia, head of the UNM Political Science Department; and Nelson Martinez, anchor and reporter for KOAT-TV.