

## Staying on the Path of Continuous Improvement Is Key to a Successful Sandia Future, Leaders Say

Continuing an annual tradition that began 20-some years ago, the LAB NEWS recently interviewed President Al Narath and Executive Vice Presidents Orval Jones and Lee Bray on the current "State of the Labs." Excerpts from the interview follow, along with related articles.

**LN:** Al, where do we stand after your being back here for a year — strengths, weaknesses, any real surprises that you found when you came back?

**Narath:** I guess I wouldn't call it a surprise, but what struck me very much is the positive reaction that I've experienced to the suggested changes in our operating style and our culture. I really feel that the Labs is well prepared for the changes that all of us know are essential to continue our record of accomplishments into the 1990s and beyond. I had thought it would take a great deal more effort to convince employees that we need to evolve to a more efficient and productive organization. In fact, it's been very different. The response to date has been most encouraging.

**LN:** Just didn't feel the resistance that you thought you might?

**Narath:** Not yet, anyway. Well, there's good reason for it. Sandians and Sandia management in the past several years have not been oblivious to what's going on around us. A number of studies were done, all arriving at pretty much the same conclusion in terms of need for change.

**LN:** Anything stand out clearly in your mind as something we have to work on?

**Narath:** Even though most Sandians see the need for cultural changes, the process of actually making changes won't be easy. I'm not suffering any illusions about this, nor do I pretend to have all the answers. It will take time and much thought and effort, and it will meet some resistance, but I'm sure we'll get there.

**Bray:** If our people understand that changes are in their best interest and will benefit them and the Labs, then the changes can be made more quickly and easily. Many of our folks see the need — they're hungry for change and genuinely enthusiastic about it.

**LN:** What kind of changes are we talking about?

**Narath:** We need to become more customer-oriented and more responsive to what our customers and sponsors want from us. We come from a culture in which we always believed we knew best. We're moving into a culture where a significant fraction of our customers can take their business elsewhere — and will — unless they believe that Sandia offers them a better deal. That means focusing on the customer and adopting operating procedures and policies that permit us to respond quickly and cost-effectively to customer requirements and needs. That's fundamental.

**LN:** An example of such procedures and policies?

**Bray:** DOE has been our primary customer throughout our 40-year history, but we don't have sufficient policies and procedures in place across the Labs to ensure that we follow all applicable DOE requirements — specifically the DOE Orders. We set up a DOE Order Task Force Study to determine which ones apply to us and found that 108 of the 245 Orders apply.

Now we're ensuring that policies and procedures are in place to see that they are followed. This is basic to our operations, and we all need to understand that. It's very important.

**Narath:** Also, it was often hard in the past for  
*(Continued on Page Four)*



RESPONDING QUICKLY and cost-effectively to customer requirements and needs will keep the Labs vital and viable in a changing world. That's the consensus of President Al Narath (center) and Executive VPs Orval Jones (left) and Lee Bray. The Labs-wide initiatives in quality, strategic planning, and project management are designed to help Sandia become more customer-oriented and more efficient.

**"Vision for the '90s Day" — See Page Two**



# LAB NEWS

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### Next Week Is Secretaries Week

## From Ditto Machines and Typewriters to the Computer Age

In the old days, if a secretary needed more than one copy of a document, she typed through multiple layers of carbon paper, or used a two-ply piece of ditto paper treated with a special ink that could be copied on a ditto machine.

In the really old days (we're talking 1950s and early 1960s here), the typewriter was usually a manual. IBM Selectrics were not yet commonplace, though they would soon become the cream of the crop.

Nowadays, things have changed, especially with the advent of computers. Today, a secretary can receive letters in the time it takes to make a phone call. She can type letters without using Liquid Paper or Correctype. Some secretaries can scan a bar code with an electronic wand to identify a classified document.

Even word processors — those miraculous machines that once all but made typewriters obsolete — are passé, replaced in the course of the past decade by the personal computer.

Although some managers still dictate letters directly to secretaries, today's secretary can edit a letter or document without erasures after an engineer or other staff member composes the first draft on a computer, eliminating the need for shorthand

or Dictaphones.

To keep up with the changes in technology, secretarial skills have changed as well.

"It's amazing. I often find myself talking about computers and I actually know what I'm talking about," says Glorianne Martinez (1550), a secre-

tary who first started at Sandia in 1961, and later returned in 1982.

"Today, we can do desktop publishing, and the old word processors couldn't begin to do that," says Mary Courtney (22-2), who works for one of

*(Continued on Page Fourteen)*



FRAN ROELLE, a secretary at Sandia since 1961, answers the phone while the boss, Herman Mauney (7200 Director) reviews a document.



# This & That

Changing Times — That name of a consumer-issues magazine might also serve as the theme for this issue's State-of-the-Labs feature and related articles. We're getting lots of info these days about changes that are under way and planned at the Labs, but I think the State-of-the-Labs feature — based on interviews with Al Narath, Orval Jones, and Lee Bray — may help put some of these changes into perspective. Combined with information from the all-employee meeting on April 25 (held yesterday for Livermore folks), I think we can all have a better understanding of what's going on and why.

Incidentally, Al hasn't confided to us the nature of his remarks for the April 25 shindig; most folks are expecting some pretty heavy stuff, but we anticipate a bit of humorous leavening from El Chefe (right).

Thanks to many Sandians for their help with the State-of-the-Labs feature — to Al, Lee, and Orval for several hours of their time in interviews and reviewing the manuscript; to Rose Ann Schultz (3533) and Renee Foster (3163) for transcribing the taped interviews; to the LAB NEWS staff who took on some of my usual duties in the past few weeks; to my boss for his alleged guidance (and because it's near merit-review time); and to the many other Sandians who provided information.

\* \* \*

How Not to Impress Your Secretary — National Secretaries Week is April 23-27 (see story this issue). Brings to mind the time several years ago during the annual observance when big spenders Roger Hill (6223), Art Morales (6311), and I — all working in Dept. 6310 at the time — decided to treat several secretaries in 6310 to a fine lunch at our favorite restaurant.

All went well until we approached the restaurant entrance and saw the sign taped on the front door: "Closed by Order of the Albuquerque Health Department."

\* \* \*

More Triplets — Gregg Giesler, a contractor who works with Division 6452, reports that he and his wife, Maryjane, also have triplets. Theirs are 16 years old — two boys and a girl. Makes me wonder whether 16-year-old triplets or the soon-to-be one-year-old triplets that Wayne Potter (152) and his wife, Petra, have (see March 23 issue) are the bigger challenge; the Gieslers also have a 17-year-old daughter at home. Something tells me Wayne and Gregg both are on a first-name basis with at least one loan officer.

\* \* \*

Banana Slugs — Recalling the unusual school nicknames and mascots mentioned in earlier columns, Paul Hlava (1822) sent me a copy of a postcard that his daughter mailed him recently when visiting the University of California, Santa Cruz, which has the Banana Slug (*Ariolimax columbianus* to you scientific types) as its official mascot.

The postcard includes a pretty color photo of a couple of Banana Slugs on a leaf. I'd reproduce it here, except for one problem: Those slugs appear to be having too good a time to show in a family newspaper like the LAB NEWS. ●LP



AL NARATH would neither confirm nor deny that part of his preparations for the April 25 all-employee meeting — Vision for the '90s Day — has included time in the kitchen. However, a LAB NEWS photographer did catch him wearing the proper apparel and counting out Thunderbird cookies that will be served after the formal program on the Kirtland AFB parade grounds, Hardin Field.

## Vision Day at Sandia: Talks, Refreshments, Entertainment

Albuquerque vocalist Linda Cotton will kick off "Vision for the '90s Day" on Wednesday, April 25, with a collection of numbers ranging from swing to modern pop and from up-tempo stylings to traditional tunes. This mini-concert will start about 10:45 a.m.

Following V-Day's hour-long program — talks by President Al Narath and four department managers — Linda Cotton will return for a second set of songs.

Also after the program, Members of Sandia Management Council [formerly Small Staff, plus Paul Stanford (100) and Gerry Yonas (400)] will help to serve refreshments — thunderbird cookies and soft drinks. The snacks are designed to complement sack lunches that employees are encouraged to bring for this meeting, which promises to be the largest gathering ever of Sandians.

Department-manager presentations will cover four of the Labs "values" discussed in the recently issued Strategic Plan. Speakers and their subjects: Jack Walker (6510), leadership; Jay Gilson (8100B), quality; Dan Arvizu (410), value of people; and Joan Woodard (1820), service to the nation. Comments by Al Narath will anchor the program.

Employees who work at remote sites south of Area I are urged to share rides to this event or to take advantage of special shuttle bus service. (To be announced: shuttle bus schedules and details about Base parking lots — other than those typically used by Sandians — that will be open for employees who must drive to the meeting.)

Sandia's Tonopah Test Range and Nevada Test Site contingent (primarily people in Orgs. 7500 and 9300) will have their own Vision Day on May 3, when they get together with Al Narath, Bob Peurifoy (7000), Roger Hagenruber (9000), and others for a dinner meeting. ●



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LINDA COTTON will provide some "mood music" at Vision Day. (Albuquerque Journal photo)

## Welcome

Albuquerque — Nancy Campanozzi (22-2), Steven Grieco (2552), Frances Grosshans (21-1), Alice Hotchkiss (6318), Barbara Lagree (22-2), Roberta Malcomb (22-2), Stephen Montague (2173), Joann Ness, (22-2), Anne Nist (22-2), Bobbie Oliver (21-1), Stuart Purvis (7842), Paula Sweet (21-1); Other New Mexico —

Cynthia Beer (5212), Adam Jimenez (3211), David Leong (2118), Lillie Peters (22-2), Stephen Reber (1841).

Elsewhere: Arizona — Ralph Wrons (7841); Colorado — Todd Sterk (1553), David Stuart (6418); Texas — Michael Mink (7825), David Paulsen (2621).



Watching the Clouds Roll By**Last of the Livermore 'Originals' Retires**

On April 3, a chapter in the history of Sandia, Livermore ended. Gayle Cain (8165), the last of the original Livermore employees, retired.

Gayle was one of 15 people who started the "Livermore branch" on March 8, 1956. His Livermore career actually predates that official starting date because he transferred from Albuquerque in October 1955. Just 10 years ago, five of Livermore's founding team were still on roll: Gayle, Bill Little, Frank Murar, Harvey Pouliot, and Jim Henderson. Now there are none.

Gayle started work in Livermore in one of the many World War II-era barracks at Lawrence Lab (Bldg. 155, west of the LLNL Recreation Assn. pool). His initial assignment was assisting an LLNL nuclear engineer who was fielding a device in the Red Wing series in the Pacific. Later, he moved to Barracks 136 — the pink one now housing the LLNL news bureau.

Once Sandia's Bldg. 912 was completed on the south side of East Avenue, Gayle moved there to continue his weapon system work as an electrical engineer. Soon he became a section head, then division supervisor.

**Work Covered Many Projects**

Over the years, his work covered many of the early projects on which Sandia and Lawrence Lab worked jointly — the Davy Crockett recoilless rifle, Little John missile, Honest John tactical Army missile, Corporal missile, and Nike B anti-aircraft missile. Other major weapon programs in which he played a role include the W48 Artillery-Fired Atomic Projectile, the W42 air-to-ground missile, the W79 eight-inch artillery shell, the W82 six-inch artillery shell, and the B83 modern strategic bomb.

For the past two years, Gayle served as lead test project engineer for an earth penetrator test at Tonopah, set up the liquid propellant gun lab in Bldg. 976, and worked on two special assignments: one with Security on insider threat assessment, and the other with the ES&H site-wide assessment team.

**Recent Patents To Sandians**

Jeff Kelber (1812): Modification of Polymeric Surface for Improved Adhesion via Electron Beam Exposure.

Dave Myers (1141): Integrated Circuit with Dissipative Layer for Photogenerated Carriers.

John Zeigler (on leave of absence): Soluble Silylated Polyacetylene Derivatives and Their Use as Precursors to Novel Polyacetylene-Type Polymers.

Joe Abbin (2542), Chuck Andraka (6217), Larry Lukens (2541), and Jim Moreno (2542): Liquid Metal Thermal Electric Converter.

Carol Ashby (1126), Dave Myers (1141), and Fred Vook (1100): Electronic-Carrier-Controlled Photochemical Etching Process in Semiconductor Device Fabrication.

David Lee (9243) and Bob Wayland (9112): Identification of Fluids and an Interface Between Fluids by Measuring Complex Impedance.

Malcolm Buttram (1253) and Jerry Ginn (2565): Linear Induction Accelerator and Pulse Forming Networks Therefor.

Thomas Brennan and Gene Hammons (1144): Wavelength-Resonant Surface-Emitting Semiconductor Laser.

George Davidson (1412) and Paul Pierce (2335): Multi-Processor Including Data Flow Accelerator Module.



GAYLE CAIN (8165), who retired April 3 after 37 years of Sandia service, was involved in many Livermore projects — starting with the Red Wing nuclear test series in the '50s and ending with the ES&H site-wide assessment in 1989-90.

In an interview with the LAB NEWS (Feb. 14, 1986) during Sandia, Livermore's 30th anniversary, Gayle recalled his many assignments through his years at the Labs and the changes he had witnessed — for example, going from tubes to transistors in weapon systems, the advent of computerization, and changing from the slide rule to the pocket calculator. His reminiscences went back even further during his recent retirement party, which capped a 37-year Sandia career stretching all the way back to December 1952.

**The Kind You Don't Forget**

One pre-Sandia memory was the kind a person never forgets. "I had a close call," Gayle says, "when I was flying out of England as a radio operator on a B-24. One of our 26 missions over enemy territory was during the Battle of the Bulge. When the B-24 lost one engine, we tried to land in Belgium, but the airfield was fogged in. Then another engine went out, and the crew parachuted out. Miraculously, we landed in friendly Belgian territory that had just been liberated from the Nazis."

"Re-tire-ment" took on a new meaning when, at Gayle's celebration, friends presented him with a giant truck tire borrowed for the occasion from a local tire dealer. Some time back, Gayle had presented other Sandians distinctive "Assistant Tire-Kicker" certificates featuring a cartoon of a man kicking a tire in a used car lot. The tire-kicker assistants were employees traveling to observe above-ground nuclear tests (checking the tires, so to speak) in Nevada.

Asked what he is going to do with all his spare time, Gayle says he'd like to restore the 1949 Chevy he and his family drove from New Mexico to California 24+ years ago (and which has since been stored in his garage). There's also that young grandchild in Omaha whom he wants to visit. The last time Gayle called there, the youngster wouldn't come to the phone to talk to his grandpa, instead saying to his mom, "I'm busy standing here looking out the window at the clouds." As a new retiree, Gayle thinks he needs that kind of "attitude adjustment." "I want to go back for a visit," he says, "and watch the clouds roll by with that two-year-old grandson." •BLS



**SANDIA  
LIVERMORE NEWS**



RECENT RETIREES at Sandia, Livermore are (from left) Roger Baroody (8280), Nancy (8535) and Harold (8513) Hunt.



*(Continued from Page One)*

## State of the Labs

a customer to identify who was in charge of specific projects at Sandia — who had “ownership” of the project he was paying for. We’re adopting a management approach in which the execution of projects — the ownership of the execution — is unambiguously assigned to the person who will be accountable and who will have the necessary authority.

**LN:** *The new project management program?*

**Narath:** Yes. What the customer wants is quality in the broadest meaning of the term. The customer wants performance on products we deliver, the lowest possible cost, and timely delivery. The need for more efficient project management [see “Project Managers: Greater Responsibility and Accountability”] and enhanced teamwork

flows from that directly, as do many other things that we’re exploring to improve our processes.

**Jones:** What Al has done since he came back is to encourage our moving forward expeditiously with a number of changes.

The first is in strategic planning. We [Sandia Management Council, formerly Small Staff] had worked together to complete — at about the time Al returned — a “Vision Statement” as the first step in developing a Sandia Strategic Plan [see “Strategic Plan 1990”]. One of the early things he did was to lay out a broader blueprint of where we were going, how we should mesh with the world, and communicating that to all employees.

The second area is quality. We had become aware in the last couple of years that we were experiencing some quality problems. Our self image has been as a quality organization, producing a quality product. But the production complex began experiencing some difficulties with our products,

which in some cases were traced back to our designs and, in other cases, all the way back to the requirements that we had not developed as fully as we should have.

The third area deals with the way we do business — re-examining and fine-tuning our business practices carefully to ensure that we spend taxpayers’ dollars as efficiently as possible. To the extent that we can make the dollars go further, we can maintain more funding in the research area and in the tech-base areas.

**LN:** *How does a successful organization like Sandia gradually get into a position where it must right itself?*

**Bray:** Successful organizations are ones that have been able to develop appropriate sets of strengths to deal effectively with the challenges at hand. As these challenges change — which they surely will over time — the organization must develop new strengths. So our recognition of the need for change is a positive statement about our

## Project Managers: Greater Responsibility and Accountability

Faced with a changing political climate and an increasingly market-oriented world, Sandia management hopes to ensure that the Labs will remain highly effective in the future by improving efficiency and cost-consciousness.

One of the strategies for achieving this is the introduction of a new, project-oriented management approach that will become the basic pattern for future research and development at the Labs. Its goal will be the completion of projects in as timely and efficient a manner as possible.

“The world is changing very fast, and it’s clear that Sandia needs to change so that it can continue its outstanding performance in the nation’s interest in these new times. And so the changes that we’re recommending are not an indictment of what’s been done in the past, but a recognition that we’re going to have to become more efficient,” says Herman Mauney, Director of Systems Evaluation 7200, who chairs the special committee appointed to oversee implementation of the project management program.

To accomplish this objective, project managers will be given both greater responsibility and greater accountability. For example, they will negotiate with the managers of line organizations to complete a particular element of a project on time, within an agreed cost. They will be encouraged to assign the work to the best organizations for the job, be it battery design, radar components, solar energy, or any other task, says Herman.

### Communicating Requirements

The purpose of the new approach is to become more customer-oriented and, in general, improve customer satisfaction by streamlining operations and making sure that all requirements are fully communicated between project manager and line manager, says Herman.

Project managers will be empowered in other ways as well. For example, in the future, a project manager who is not satisfied with the work being done on a weapon component, energy-saving device, or other product will have the option of taking the job elsewhere.

And where the project manager goes, the funding will follow, even if it means diverting money away from one line organization to another or to an outside contractor to get the job done.

Of course, says Herman, that does not mean that project managers are to be capricious. The goal will be effective communication between project managers and line managers, so that all customer requirements are efficiently met.

“I don’t expect it to get out of hand,” he notes, adding that he expects the economics of the marketplace will take care of the situation by encouraging line managers to make sure their operations are efficient enough to attract project managers to them.

A key to the success of the initiative will be a spirit of teamwork between project management and line management, says Herman.

### From Contract to Completion

To make sure there’s no confusion about the tasks to be accomplished, project managers will draw up internal contracts with line managers to be certain that requirements are understood and lead to first-time success. Private companies such as AT&T, Motorola, and Xerox are already successfully using this strategy to improve quality.

Such contracts may be in the form of detailed drawings or memos, and a few may even be “verbal handshakes,” depending on the complexity of the project, says Herman. The objective is to achieve clear, unambiguous agreement.

“Once a commitment is made between the project manager and the line manager, then that commitment is to be fulfilled,” he adds.

**“... the changes that we’re recommending are not an indictment of what’s been done in the past, but a recognition that we’re going to have to become more efficient.”**

Project managers will also be responsible for monitoring efficiency. To assist them in this task, Sandia is currently exploring various methods and commercially available management tools, such as software packages to help track the “earned value” of a project — the work accomplished for the resources budgeted.

One of the things the project management initiative is designed to do is avoid the pitfalls of the past, whether it be providing the necessary resources to complete a project or making sure someone is accountable to the customer.

Almost any member of Sandia’s technical staff could be selected to become a project manager. “With the Laboratories’ new approach on empowerment, I expect that project managers most likely will come from the ranks of staff member or division supervisor,” says Herman. “In their capacity

as project managers, they will not necessarily be responsible for other supervisory tasks.”

Some project managers have already been empowered in this way. Project managers of reimbursable programs at Sandia, who already have extensive interaction with customers and suppliers, provide a model of the new approach, says Herman.

“These changes are cultural and intertwined with other initiatives under way in the Labs, so don’t expect them to mature overnight. I’ll be happy if that happens in a year.”

To keep Sandians abreast of future changes, details will be published in special Project Management Bulletins to be distributed to all employees.

Currently, the committee Herman chairs, officially dubbed the Project Management Implementation Committee, is in the process of selecting a cross section of projects that will be monitored to see how well the new system is working. Those projects will represent a broad spectrum of activities at Sandia. The purpose is not to evaluate technical performance, but to determine if the new project management tools and efficiency-monitoring methods are working.

Along with Herman, the other members of the Project Management Implementation Committee include Paul Rosenkoetter (110), Paul Shoemaker (114), Paul Peercy (1140), Ken Prestwich (1240), Ray Bair (2110), Paul Longmire (2360), Jennie Negin (3140), Art Arenholz (3730), Gary Beeler (5130), James Kelsey (5260), Don Schueler (6220), Wil Gauster (6420), Jim Ney (7230), Tom Edrington (7260), Don Bohrer (8160), Bill Robinson (8240), Ron Andreas (9130), and Don Rigali (9140).

### Preparing for the Future

A major catalyst for the new management initiative is the fact that federal budget expenditures are expected to get leaner, and Congress is not likely to spend as much money on nuclear weapons or defense projects as it has in the past, says Herman.

“Just as the country’s going to have to learn to compete in a world market, Sandia is going to have to learn to compete in a broader market,” he notes.

By enhancing quality and cost-effectiveness, it is hoped that the Labs will improve performance and thus be in a position to attract more business. The focus will be on getting the right job done right the first time, he adds.

“And under the umbrella of the company’s new Strategic Plan [see “Strategic Plan 1990”], I believe we can accomplish these goals within an environment of integrity and trust that will serve us all well.”

•LD



HERMAN MAUNEY (7200)



preparation for the future, not a negative statement about our past performance.

**Narath:** When you have a good formula and have been as successful as Sandia has, there's no natural incentive to change. Most organizations don't change until they're facing disaster, and we certainly don't want to wait until that happens.

**LN:** *How are things really so different today?*

**Jones:** The ground is shifting under our feet. We've moved from a single-program lab in which 90 percent or more of our work was in nuclear weapons to a situation in which about 30 percent of our work is "work for others" [reimbursables], with many more customers. That kind of change strains the management fabric in many ways. Also, in some of our program areas, funding has become very tight. We just can't continue to oper-

ate the same way that we did when funding was plentiful.

**Narath:** We're coming out of a period in which we generally enjoyed excellent funding support. But the world is changing in ways that will have significant impacts on us. National priorities are shifting, chronic federal budget deficits are forcing difficult funding decisions, and the public is demanding higher performance standards in all government activities. In short, we must prepare for much tougher competition in the future. In a real sense, what is at stake is the survival of the GOCO [government-owned, contractor-operated] concept as we have known it. It is up to us to demonstrate its continued relevance in today's world through superior performance, and every Sandian needs to understand that.

I had the "advantage" of living through five years of struggle at AT&T, which almost overnight was thrown into a dynamic, competitive environment and had to make many adjustments — some pretty painful — to survive in it. Sandia's situation is somewhat different, but there are many similarities.

It's far better if you can foresee economic problems and do something about them before they hit you. That's really the reason for the urgency behind all the changes going on at the Labs today, and I'm very encouraged to observe how enthusiastically Sandians are responding.

**LN:** *Where are we in the change process? Are we changing fast enough?*

**Bray:** Change impacts everybody, and it takes  
(Continued on Page Six)

## Strategic Plan 1990: A Road Map for a Changing World

Many years from now, historians may look back at 1989 as a year of "political earthquakes," a year that saw fundamental political changes in the world.

For those of us who watched 1989 unfold, it was difficult — if not impossible — to anticipate the headline news in the paper each day: the unraveling of Eastern-bloc communism, the crumbling of the Berlin Wall, and the nomination of Soviet President Mikhail Gorbachev for the Nobel Peace Prize.

Changes such as these could mean the world will be much different from the "cold-war" world in which Sandia was founded in 1949.

"Fundamental changes in the world around us mean that Sandia must change, too — in some very basic ways," says President Al Narath. "Since last fall, the Small Staff Strategic Planning Team has spent many soul-searching, and sometimes very uncomfortable, hours of self-evaluation and thinking about how the Laboratories can continue to excel in the face of the challenges and continuing changes we expect to see in the '90s."

### Fundamental Changes Needed

"Self-evaluation is never easy," Al continues, "but we tried to be as honest as possible. It isn't easy to admit that what worked very well in the past might not work as well in the future. However, it became obvious during our discussions that, if we are to continue to contribute significantly to the well-being of the US, some fundamental changes in our way of doing business must take place."

Resulting from the team's work from November through February was the Strategic Plan 1990, a summary of which employees received last month. "Basically, the Strategic Plan is a kind of road map," says Paul Shoemaker (114), who, with John Ledwith (3523) and Elveta Bishop (3150), designed team sessions and facilitated the many hours of discussion. "It's a statement of strategic direction, rather than of rigid rules about what must be done next.

"The plan's intended to provide a strategic framework within which Sandia can move, not a strategic straitjacket," Paul continues. "It's not carved in stone; rather, it will continuously evolve and change in response to national and international events."

How does strategic planning differ from long-range planning? "The difference," explains Elveta Bishop, "is that a long-range plan assumes relatively little change in the external environment. A strategic plan, on the other hand, assumes discontinuities — unforeseen changes — in the future. It provides for flexibility in the face of changing trends, which are what we're likely to see in the next ten years and beyond."

"Probably the Strategic Plan's most direct effect on employees is the development of what's called an 'empowered culture' — an idea that reflects what Small Staff is trying to accomplish,"

says John Ledwith. "It's really a revolutionary idea, at least at Sandia and other organizations where hierarchical control — management from the top down — has been a way of life.

"Simply put, an empowered culture is one in which all employees, staff and management alike, have the opportunity — even the obligation — to share their ideas, or visions, about what can be done to create a more effective workplace. It calls for responsibility and leadership at every level. In effect, everyone 'owns' his or her actions and assumes responsibility for those actions."

### 'A Real Trade-Off'

Empowerment, according to John, also means assuming risk and being accountable for one's ideas, rather than just following orders to implement someone else's ideas — usually the boss's.

### "The future is exciting, and together we will create it."

"There's a real trade-off here," notes John. "Under a rigid hierarchy, where the marching orders come from the top down, if an idea falls flat on its face, you can always blame the 'guy up there' who was responsible for it in the first place.

"An empowered culture doesn't allow that luxury. The price we pay for assuming more responsibility for our actions and more freedom to openly voice our opinions is risk — because every decision we make or every idea we express will not always be the right one and, in some cases, may be dead wrong.

"On the other hand, in an organization operating under the patriarchal concept — 'do what you're told and be loyal, and we'll take care of you' — the price you pay is helplessness."

Changing Sandia's corporate culture — from

hierarchy to empowerment — won't be easy, nor will it happen overnight, notes Al Narath. "The Strategic Plan itself will not make changes," he says. "People make changes. We really need help from all employees to put the plan in motion."

### Some Boundaries

"Empowerment should not be translated as 'no boundaries,'" Al cautions. "Freedom without responsibility and accountability equals chaos. There are boundaries, of course; for instance, we must comply with legal and ES&H requirements, among others.

"Don't expect a new SLI on 'how to be empowered.' Instead, a starting point might be asking yourself, 'How can I contribute to a more effective Sandia?' And a second question: 'Am I getting in the way of a more effective Sandia?'"

"I encourage each Sandian to think creatively — to establish a personal vision, if you will — about better ways to do our job of 'enhancing the security, prosperity, and well-being of the nation,' as expressed in the Strategic Plan mission statement. Another part of the challenge: Exchange your ideas with others — co-workers and management. Because until ideas are expressed, they are only thoughts that do not result in actions.

"Changing the way we do things at Sandia isn't a criticism of our past practices," Al continues. "Rather, it's recognizing our changing environment and the need for continuous improvement to retain our competitiveness in a very different world.

"Maybe all this is best summed up by a statement from one member of the Strategic Planning Team. When asked to give a brief reason why we'd put in all those hours discussing the things we did, he said, 'The future is exciting, and together we will create it.' That's a good message for all Sandians, it seems to me." ●PW



DESIGNING STRATEGIC-PLANNING-TEAM sessions was the responsibility of (from left) Paul Shoemaker (114), John Ledwith (3523), and Elveta Bishop (3150).



*(Continued from Page Five)*

## State of the Labs

a lot of discussion, a lot of talking together to generate understanding. But the time is right for us to make changes because the whole world is changing rapidly. It's unclear how changes between East and West will impact this laboratory. They may bring some "downs," but they may also bring new, different opportunities for us, and we need to be well positioned for that.

**Narath:** The strength of any organization lies in its employees' abilities, motivation, and enthusiasm. There's an old-fashioned view that this strength has to be mobilized through management control. I don't think that's the way it works at all in the modern world. I believe you mobilize that strength through leadership by encouraging and supporting it, rather than controlling it. What we're trying to do is emphasize management's responsibility to encourage, motivate, and support employees. Management should establish directions, define goals and constraints, and provide more opportunities for individuals to assume "ownership" of things that they're involved in. I want to get away from a management approach in which employees expect to be told what to do in detail.

**Bray:** Sandia, like any large organization, has bureaucracy. A problem in a bureaucratic setting is that employees tend to look to the top for answers. That is one of the real challenges we face in formulating and implementing needed changes. Management can provide general guidance, but we need employees not simply to follow along, but to participate fully and actually lead the way once they understand what we're trying to accomplish.

**LN:** *Sounds easier said than done.*

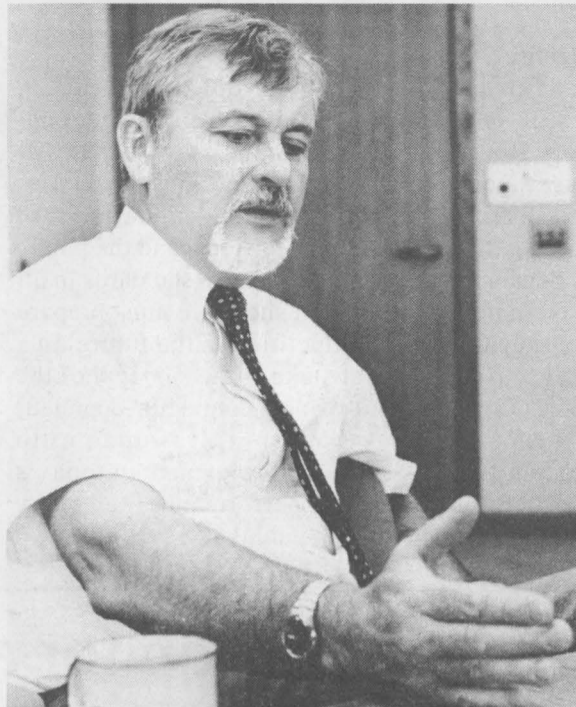
**Narath:** Correct. In fact, it sounds like we're encouraging anarchy, but that's not so. What we're offering employees isn't necessarily going to make their lives easier, but should make them more rewarding through increased job satisfaction. We're saying, "You've got to share in the responsibility for shaping the future of this laboratory and executing programs in a way that will achieve maximum customer satisfaction." All employees should understand that "ownership" for them will mean sharing both rewards and failure.

**Jones:** Many, if not most, project failures start with management, not with the employees doing the work. If we undertake a project and the managers don't understand the requirements clearly, we're on a troubled path from the very start. Unfortunately, we've had some projects like that, so our managers certainly have their work cut out for them.

**LN:** *How big a problem is this?*

**Narath:** The issue isn't that we've had a big percentage of failures. We haven't. What's important to recognize now is that to succeed in today's world, we must get continually better. It's not a question of how good or bad we are, but how rapidly we're making progress toward better results — better products. Customer expectations are rising; therefore, we need to focus on continuous improvement. That doesn't mean that we won't have some failures in the future. I certainly don't want Sandians to become so cautious that they are afraid to take any risk. On the contrary, in our business we can't succeed without some risk. But when we assume risk, it has to be a conscious decision and it has to be well understood by everyone — employees and customers — up front.

**Jones:** Risk-taking is a natural part of the type of work we do. When we research and engineer complex new systems, success is never guaranteed, and everything isn't going to work perfectly the first time. Customers and employees alike need to realize that at the outset. The point is that we need to understand this risk and to plan the project in a way that minimizes it and deals with it realistically. We often do projects in which there is high risk,



AL NARATH: "When customer needs demand it, we must be willing to take on risky work, but learn to manage it better."

but also potentially high rewards if we're successful. And we are successful many times.

**LN:** *Any particular examples?*

**Narath:** Our fuzing work for the Navy's Trident II program is a good example. We assumed some substantial risk because we set out to do something that was quite demanding — miniaturizing a very-high-performance electronic system capable of functioning in a stressful environment.

**Jones:** I asked Heinz Schmitt [5100] to document the new technologies we developed and the challenges that we undertook in the Trident II fuzing program, and I was frankly amazed. We really pressed ourselves on that project. It's been marvelously successful, but it was tough, demanding, and risky work.

**Narath:** When customer needs demand it, we must be willing to take on risky work, but learn to manage it better.

**LN:** *Political changes continue to occur in the Soviet Union and Eastern Europe. The US is still wrestling with big budget deficits. Arms-reduction treaties and continuing talks indicate our nation may reduce its nuclear arsenal significantly. How is all of this affecting Sandia?*

**Narath:** The situation worldwide is changing so rapidly that it's not clear to me — I don't think it's clear to anybody — where it's going to lead us. One thing is evident — the likelihood of global conflict between us and the Soviets has lessened. However, the world seems much less predictable. After the euphoria of their new freedom wears off, many countries will face very serious economic problems for which there are no simple answers. The problem of leading people through such difficult times in the absence of strong control will pose tremendous challenges for the world. Whether the world will really wind up being more peaceful remains to be seen.

**Jones:** The Soviets and their allies remain a very formidable military power with a substantial nuclear weapon stockpile. So our nation will certainly continue to need a strong and safe nuclear deterrent. I think we'll see increased emphasis on extremely safe weapons, extremely secure weapons, and highly reliable weapons that can remain in the stockpile for a very long time. Many of these fall in Sandia's traditional areas of responsibility.

**Narath:** The state of affairs we're witnessing in the world today is, in large measure, the result of the stabilizing influence that nuclear weapons have had on the leaders of the major powers since World War II. Now it's often said that the time has come to rid the world of nuclear weapons. I hope the day will come when that will be the right course of action. But I don't see it today because I can well imagine that — in the absence of nuclear weapons — an unstable situation could be created world-

wide not unlike that before World War II.

The consequences of a conventional-arms conflict on a scale that modern technology has made possible would be truly awesome in its destructive potential. The human suffering that would result from it is almost unthinkable. When there are political/economic instabilities such as those developing today, the potential for eventual major conflict is a very real possibility.

And despite the fact that the US has negotiated some meaningful arms-reduction treaties with the Soviets, essentially no major reductions have occurred to date. In fact, there's continued buildup in the Soviet stockpile of strategic offensive nuclear weapons. It's important to find ways to reduce the number of offensive weapons, but their total elimination simply isn't in the cards in the near term. I agree with Orval that the US will put an increasing premium on evolving a stockpile that increases nuclear weapon safety, control, and security. And our capabilities and experience fit extremely well with that need.

**LN:** *Do you see the weapon laboratories being reduced in size or maybe being amalgamated? There's been conjecture about this in the press.*

**Narath:** The future of any lab — be it Sandia, another DOE lab, or a DoD lab — will ultimately depend on how well it addresses national needs, as measured by the customers. That's why we're putting so much emphasis on meeting customer expectations. No one knows whether we'll see a consolidation of weapon-lab facilities in the future. There is a modernization study under way at DOE Headquarters that's looking at all the options. I think that's a wise thing to do.

**LN:** *What's the status of this study?*

**Jones:** The modernization study was required by the House Armed Services Committee. Secretary of Energy Watkins felt that he hadn't received all the management options that he needed, so he wanted possible alternatives studied. These are being worked up right now, and the study won't be completed until late spring at the earliest.

**LN:** *Sandia now has about 8400 employees. What are the chances that this number will shrink?*

**Bray:** That's difficult to forecast. Some people say maintaining 8400 employees isn't that important. I agree that there's nothing magic about the number in the sense that we absolutely must have 8400 people to function, but the number of employees we are able to maintain is a significant indicator of our ability to perform. If that number began to slide, I think it would be a negative indicator — that we were unable to satisfy customer needs. So I view it [employee head count] as an important barometer and think we should pay attention to it. If we can continue to attract enough work to support 8400 employees, that will indicate that our customers continue to value our contributions to the nation.

**LN:** *What kind of presence do we have at DOE Headquarters and elsewhere in Washington these days?*

**Narath:** We have about two dozen people assigned to various organizations in Washington. All are there to help with specific tasks, at the specific request of our customers.

**Jones:** Our people in Washington are there to team closely with DOE to help ensure the success of DOE programs. Right now, for example, Dennis Hayes is serving as Admiral Barr's [Deputy Assistant Secretary for Military Application] scientific advisor. We view these situations as an opportunity to have a positive impact on DOE, and we tell our folks to "take off your Sandia hat" when you go to Washington and do what makes sense for the agency you're working with. We understand that sometimes the decisions that come out may not be actually parallel to what we might desire, but we can't really serve the customer well if we take a parochial Sandia view.

**LN:** *How do we really benefit?*

**Narath:** A Washington assignment broadens an employee's experience. It can be of significant value to the individual and to the laboratory in



terms of knowledge gained, contacts made, and so on. These assignments should be career-enhancing ones.

**LN:** *One of the subjects discussed at the last Sandia Department Managers' conference was our relationship with private industry. While — as a GOCO — we're not supposed to compete with industry, how do we determine what types of projects to take on?*

**Narath:** Competition with industry is not permitted and, in fact, would be inconsistent with the values and strategic objectives that we've developed. Our relationship with industry must be viewed as one of cooperation, collaboration — helping industry. Labs like Sandia are at their best when concentrating on invention and innovation and pursuing ideas through the prototype stage. There comes a point where we need to interact with industry, transition our ideas to industry, and — at some point — let go. The measure of success is how effectively we transition our ideas to industry.

**LN:** *Does this mean we'll be teaming more with US industry — perhaps on smaller projects?*

**Jones:** For many years, Sandians had the view that we shouldn't take on a multiplicity of small jobs, but try to take on large challenging national jobs — “the whole job.” We still want to do large jobs of high impact, but trying to get the entire job for ourselves is not going to be the right strategy for the future. We need to work with industry — teaming closely when appropriate — to get our concepts and ideas accepted and carried over into the private sector. It won't be easy or as tidy, and will require more “give and take,” but it's best for the nation.

**LN:** *Although we don't intend to compete with industry, and assuming some shift from guns to butter because of world events, things could get more competitive between defense-related private companies and the national labs. How do we deal with that?*

**Narath:** The specific impact of any reduction in defense spending is largely unpredictable, but huge sums of money have gone into maintaining a large standing Army and into acquisition of expensive weapon systems. In the future, the emphasis on defense-related R&D might actually increase in certain areas because — as long as the future is as uncertain as it is today — we'd be foolish as a nation to stop exploring new defense-related ideas.

**Jones:** Ted Gold [former Sandia employee] and Rich Wagner [former LLNL employee] visited recently and talked about the future concept of deterrence. They say future deterrence rests in the long shadow of the R&D that we do, as opposed to the actual production and fielding of systems. And some folks argue the West's new technology — from SDI and so forth — has had an important influence on the Russians' recent decisions to “turn this military thing down” in a procurement sense. I think labs like ours will continue to serve this R&D role in deterrence, and we're likely to see fewer of our designs actually go into production for large-scale fielding.

**Narath:** Another aspect concerns the high cost of modern weapon systems — nuclear and conventional. For some time, the US has stressed technology almost at any cost. As defense spending declines, there will be increasing emphasis on more cost-effective systems. With our experience, I think we can play a very important role not only in the nuclear weapon program, but in other defense activities as well.

**Jones:** For example, our work in teaming with the Naval Weapon Center in China Lake to develop the advanced-bomb family — involving substantial production of conventional weapons — illustrates a number of the points we've just talked about. We're applying our experience and technology developed for nuclear weapons to the advanced-bomb family, and that's resulting in a better, more cost-effective conventional weapon system.

**LN:** *However, some people will say that, com-*

*pared to our nuclear weapon work, this work for the Navy is about pennies compared to dollars. Are programs like the advanced bomb going to be big enough, and are we going to have enough of them?*

**Narath:** While the nuclear weapon program at Sandia may experience some gradual decline, it's not going away. Its fundamental importance to national security will remain unchanged, and our long-standing dedication to it will not diminish. Our basic responsibility will stay with us for a very long time, and we should be supported at significant levels. As far as other areas are concerned, we're already highly diversified with large numbers of customers. We're addressing multiple areas of national need.

I don't have any serious concern about future budgets at this time, provided we're successful in streamlining our operations and realizing the increased efficiencies that we're looking for. Also, we're mindful of shifting national priorities and, as a result, we are helping in some new areas such as environmental R&D and are also emphasizing technology transfer in a major way.

**Jones:** Our growing diversity is another strength. As projects are completed in one area or perhaps fall through in another, we have a chance to grow in others. There will certainly be new opportunities in the arms-control area. We had a very successful meeting when William Bennett [Director of National Drug Control Policy Office] was here in November, illustrating how many of our technologies could be applied in the drug-interdiction area. Other examples are recent projects in security applications at the White House and at the Baltimore-Washington International Airport [LAB NEWS, Jan. 26, 1990] to apply a complete systems approach to securing these facilities. Some extremely large programs will come along occasionally, but I see them as the exception, not the rule.

**LN:** *Does this mean we'll aggressively pursue all new opportunities?*

**Narath:** An important aspect of our strategic planning exercise has been to provide a rational basis for choosing among the many opportunities that present themselves. Simply running after every opportunity that presents itself is clearly not in our best interest — or the nation's. We want to choose projects that are nationally important and where our evolving technical strengths can make major contributions.

**LN:** *In the past year or so, we've established several new cooperative relationships with industry, including the Semiconductor Equipment Technology Center program [LAB NEWS, Aug. 25,*



ORVAL JONES: “We need to work with industry — teaming closely when appropriate — to get our concepts and ideas accepted and carried over into the private sector.”

*1989] with SEMATECH. Do you see more of this type of thing in our future?*

**Narath:** Sure. It goes back to what we discussed earlier. It's part of an evolving emphasis on teaming and cooperating with industries and industry consortia.

**LN:** *A wave — so to speak — of the future?*

**Narath:** Most definitely. This kind of teaming will help us put together a first-class technology transfer program. I think Gerry Yonas, Dan Arvizu, and their folks in Organization 400 are making significant progress toward that goal, with help from Sandians throughout the Labs. And, speaking of help, New Mexico's two US Senators, Jeff Bingaman and Pete Domenici, have made tremendous contributions with their joint technology transfer legislation [National Competitiveness Technology Transfer Act of 1989]. This legislation will really improve the efficacy of our technology transfer effort.

**LN:** *How so?*

**Narath:** First, it assigns technology transfer as one of our missions. Second, it encourages and facilitates cooperative R&D agreements with industry — agreements in which the two parties bring to the table their own funding. We support the efforts of our people, while our industrial partners cover their own costs. Before this legislation, there was no statutory basis that would have permitted us to operate that way.

**LN:** *Any other advantages?*

**Narath:** Yes. It also acknowledges for the first time the existence of intellectual property before patent disclosure. In the past, the government insisted that all information obtained with public funding be accessible under the Freedom of Information Act. Unclassified, non-sensitive information that we developed was protected as intellectual property only after a patent disclosure was filed. This made it very difficult to work jointly with an industry partner because results obtained in the early phases of a joint program could be demanded and obtained by an industrial competitor under Freedom of Information.

Under the new law, DOE can grant protection to what's called Technical Data Rights for up to five years. That's very important. This landmark legislation demonstrates a deep understanding of the technology transfer process and makes cooperative programs with us much more attractive and useful to industry.

**LN:** *How are we doing in this area in relation to the other national labs?*

**Narath:** I don't have enough specific knowledge about what the other labs are doing to give you a good answer. I'd just say that our own efforts seem to be bearing fruit and are intensifying. One significant step that we've taken is in our new Technology Maturation Program, in which we're giving special financial support to technology-development projects that have considerable promise for US industrial applications [LAB NEWS, Dec. 8, 1989].

**Jones:** Although I think we're making good progress in technology transfer and we have some new technology transfer “tools,” we remain at a critical juncture. The law is still new, and we haven't had time yet to evaluate our new initiatives. Hopefully, we will have some real success stories before long. Our work with SEMATECH, the specialty metals processing consortium, and the New Mexico Improved Oil Recovery Project all have good potential.

**LN:** *How about our current budget? What kind of shape are we in?*

**Narath:** I said at the fortieth anniversary celebration last fall that I didn't see any major problems for this fiscal year. Although there are still some uncertainties, I see no reason to change that statement. As far as next fiscal year and beyond are concerned, the budget process in the Congress could be exceedingly difficult for a number of reasons. [See “FY90 and '91 Budget Outlook.”]

Most of them are related to the rapid changes

(Continued on Page Eight)



(Continued from Page Seven)

## State of the Labs

that are taking place around the world. There's an expectation of a "peace dividend," but we can't predict how that will all work out. We have to become accustomed to living with budget uncertainties. And I must say over and over again — if we continue on the path of continuous improvement, our customers will value our participation in their programs, and we should be able to prosper in the future, despite growing pressures on the federal budget.

**Bray:** I'm sure many of our employees have some uneasiness because they don't see us taking dramatic steps, such as a hiring freeze. Rather than taking dramatic management steps at the

top, we're looking increasingly to the individual managers to do what's needed and right. Sandia managers need to stay well tuned to the needs of their customers and determine carefully what the hiring needs and so forth are. They, better than anyone else, know what their funding status is.

This gets to the basics of the "empowered manager" concept. If a project manager hires a wrong kind of person or too many people — that's going to be his or her problem. That sounds uncaring, but it's simply part of the project "ownership" idea. Sandia project managers will have more authority and more responsibility.

**LN:** Any further comment on the empowered manager, empowered culture concept?

**Bray:** One of the exciting things is the interaction with people at all levels. I'm currently leading a quality action team on a Sandia self-assessment and performance-improvement process, and we've

got a good mix of folks — VPs, directors, division supervisors, and an MLS staff member. It's great to be able to work with this kind of group and get input from the different levels. It's good for all of us, and I think we'll see more of this interaction of Sandians at different levels in the empowered culture.

**LN:** Back to the budget. Any specific parts look better than what we originally thought?

**Jones:** I think our SDI budget is holding up a little better than we expected. We decided a few years ago to emphasize technology development in the SDI area instead of getting into huge demonstration projects. That's proved to be a wise decision, and I think we've made some significant progress in the area.

**Narath:** We're learning to go after work that addresses real needs rather than just racing with the pack to chase what might turn out to be a mechanical rabbit. What might be popular today — currently in vogue — can go away quickly. We're doing our best to pursue opportunities that address real needs that are likely to be sustainable in the long run. Prudent selection of projects will become increasingly important.

**LN:** How about our energy program?

**Jones:** The excitement in energy is that Congress and DOE are taking energy seriously again. In fact, more than 20 Sandia staff members have provided input — on renewable energy and global climate change — for DOE's National Energy Strategy. We will continue to help identify critical national issues for DOE as an objective of Sandia's Strategic Plan. For the first time since 1980, we are seeing promising growth in a number of energy areas, and the new activities have an exciting twist — they involve industry in an intimate way. We have staff on leave, working to transfer our energy technologies.

**LN:** Any parts of the budget that are particularly difficult?



BUDGET BUSINESS is attended to by Roger Thorp (left), Supervisor of Non-weapons Budget Div. 143 and Bill Hollis, Manager of Budget Dept. 140. Bill is hopeful that the total FY91 operating budget will be about \$1.23 billion. That would be about the same as this year plus inflation.

### The Beat Remains Steady

## FY90 and '91 Budget Outlook

It's often said that people are the "lifeblood" of an organization. But something's required to pump that lifeblood, and that's money. Bill Hollis, Manager of Budget Dept. 140, keeps his finger on the Sandia pulse and says the beat remains steady this fiscal year and the prognosis is currently good for FY91.

"Our current [FY90] budget is in good shape," says Bill. "Although some 'reprogramming action' could be taken by Congress to shift money among some DOE programs, we've taken that into account, and our internal budget is pretty firm [see table]. So, basically, we're set for this year. Our construction program, our programmatic efforts, and our hiring program to replace attrition [projected 430 employees this year] are all continuing pretty much like we planned. And we don't foresee that any hiring freezes or major programmatic cutbacks will be needed this year."

"We've had to accommodate some special needs this year," says Roger Thorp, Supervisor of Nonweapons Budget Div. 143, "but special needs aren't that unusual — we have them every year."

However, the special needs are larger than usual this year, Roger says, primarily because of the large amount of activity in the Environment, Safety, and Health (ES&H) area.

Bill acknowledges that it's risky — especially these days — to forecast budgets too far into the future. He points out that actions under way in Congress and DOE and world events are causes for uncertainty. However, he's cautiously optimistic about FY91.

"We've worked closely with DOE to put our '91 plans together, and nothing in the President's budget request surprises us. The President has proposed about a 2.1 percent increase in 'our' portion of the DOE budget for operating activities. Now that amount wouldn't cover inflation — which we're estimating at about 5 percent.

"But we're hopeful," Bill continues, "that if things go our way in Congress and the rest of the government and when the budget is final, our total operating budget — DOE and other programs — will allow an FY91 budget of about \$1.23 billion, which compares to the FY90 budget of \$1.16 billion. That should cover inflation." (The operating budget does not include capital equipment or major construction items.)

"In short," says Bill, "if the FY91 budget shapes up like we think it will, we'll come out OK — no increases, but no major cutbacks either. The challenge for the Labs is to continue excellent technical performance and to deliver 'value' to our customers. That should provide us with the basis for maintaining some stability in our funding."

The Budget Department currently anticipates that about \$48.6 million in capital equipment funds and \$56.8 in major construction funds will be available in FY91. The FY90 totals are \$44.9 million and \$36.8 million, respectively. (Note: these two amounts are FY90 appropriations and do not match the FY90 capital equipment and major construction expenditures in the table, which include carry-over funds.)

The trend of modest growth in federal agency reimbursables could continue into FY91,

according to Bill. Reimbursable projects have been funded primarily by the Department of Defense, but also include other federal agencies. As the table shows, FY90 reimbursables are expected to total about \$366 million — approaching 30 percent of the total Sandia budget.

"As our upper management is emphasizing," Bill says, "Sandia should do well in the future if we continue to perform well and make progress in some of our new initiatives. Our new emphasis on strategic planning, quality enhancement, and project management should improve our efficiency and make our services and products even more attractive to customers in the future. Our 'pulse' can get stronger as Sandians get behind these initiatives." ●LP

### Anticipated Sandia Expenditures FY90 (\$ rounded to millions)

Defense Programs	\$638
Conservation and Renewable Energy	33
Fossil Energy/Strategic Petroleum Reserve	9
Nuclear Energy	4
Energy Research	26
Civilian Radioactive Waste Management	33
New Production Reactors	5
Total — Department of Energy	793
Reimbursables	366
Total Operating	1159
Capital Equipment	50
Major Construction	73
TOTAL	\$1282



**Jones:** An area of concern is in our MA [Military Application] budget. I think there's some question about whether DOE may feel that it's necessary to sacrifice its long-term RD&T [Research, Development, and Testing] budget to solve short-term environmental remediation problems. We see some evidence of that in the FY90 budget; if that's a one-time thing and the base is later restored, it shouldn't be too big a problem — but I do have some uneasiness about the long term. Pressures to tap the long-range "bank account" to solve the immediate problem can be almost irresistible. If Congress doesn't support DOE in solving environmental problems that have developed over the past 40 years and DOE is forced to solve those problems out of its regular operating budget, it could cause some problems.

**LN:** How much of our total budget does MA provide now?

**Jones:** Defense Programs [DP] provides about 60 percent of our total budget; MA provides most of that — around 50 percent. Energy Programs provides about 10 percent, and the remaining 30 percent is work for others [reimbursables].

**LN:** Any specific areas around the Labs where budget problems are really being felt?

**Jones:** We're concerned about the exploratory development and advanced development areas — at the components level and system level. The competition for resources from our committed-weapon program [weapons scheduled for production and stockpiling], along with the general tightness of the budget, has impacted exploratory development's work in prototyping new concepts. This has been a problem for several years running because of our heavy commitments in Phase 3 weapon work.

**LN:** What's going to happen? Does that stop somewhere?

**Jones:** We're going to have to carefully re-think how we maintain the proper balance. As part of our strategic planning process, we need to determine how we can most effectively make our dollars go as far as possible in the special capabilities and functional support areas.

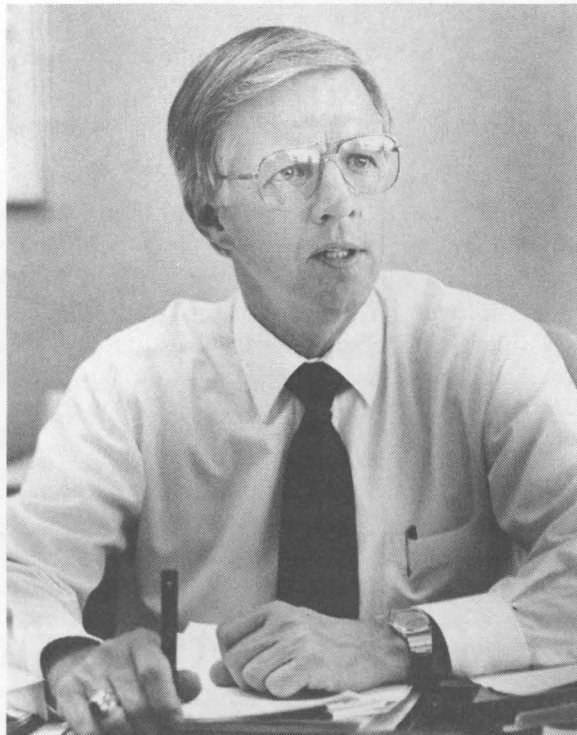
**Narath:** I don't expect the Phase 3 activity to stay at its current very high level. When it begins to decline, we need to ensure that more funds then flow into exploratory development. That's essential for the future of the program. As our quality initiative [see "Quality Is Part of Strategic Plan," page ten] makes progress, I also expect the costs of our committed-weapon programs to decrease. I think that will be a natural consequence of improving our processes. If it doesn't happen, I'll be surprised — and disappointed.

**Jones:** The hope here is that by doing things right the first time, we'll save the costs of going out and fixing them later. That's always disruptive and costly. It's the same basic point we make in our Environment, Safety, and Health [ES&H] activities: If we can get ourselves on a steady keel and get away from these bursts of activity where we have to drop everything else to fix problems, we'll be much better off. We've got to get away from that; there are savings to be realized, but we'll have to work for them.

**LN:** ES&H matters have taken a lot of effort during the past year. How are we doing with that?

**Bray:** A month or two ago, I would have said we were doing very well. The initial response to our ES&H initiative that began last year was very positive. We identified and corrected thousands of deficiencies. However, recent experiences at PBFA II and at the Tritium Research Lab have demonstrated that, in some cases, we've been treating symptoms rather than identifying and treating root causes. We must redouble our efforts to identify and correct the root causes and make sure that we develop appropriate ES&H attitudes and practices and make them an integral part of the way we do our work. Nothing short of that will be satisfactory.

**LN:** How can we keep from getting careless?



LEE BRAY: "The better we get at achieving cost-effective ES&H compliance, the more money we'll have left for our primary work."

**Bray:** By a fundamental change in our attitude and in some of our practices. This will require ongoing effort, but it will certainly be less costly to maintain good ES&H practices than to create problems and have to spend large sums later to fix them. We need to develop the same kind of mentality of routine, continuous vigilance that we exercise for classification and security. This is clearly in our best interest because ES&H remediation money will come right off the top. There is no incremental funding, and the better we get at achieving cost-effective ES&H compliance, the more money we'll have left for our primary work.

**LN:** Sandia has a very good safety record, so why do we need this big push now?

**Narath:** We've always taken great pride in the fact that we offer employees a safe working environment. We've always preached safety. What is different today is that it's not good enough just to be safe. We have to follow procedures that are defined by law, regulation, and directive. When we checked our performance — compared our performance against the letter of the law — we found a large number of deficiencies. Our sponsors today expect us to comply with the regulations literally. That's our "price of admission" to the future. In the past we judged what was safe and what wasn't safe by applying our own experience and common sense.

**LN:** That's not good enough today?

**Narath:** That's not good enough today, and there's no point in arguing about it. We simply have no choice. Furthermore, in the process we will become a better-managed and better-performing R&D laboratory. I am convinced of that. The disciplined approach that DOE is enforcing makes a lot of sense and need not create conflicts with the empowered culture our new Strategic Plan calls for.

**Jones:** One particular area of concern is when a project ends. Often projects don't end with a flourish, but just taper off. Nobody's quite sure whether funding will return or whether it's going to stop. You may have a cabinet full of chemicals that apply to that project, so you just keep them there. Then maybe the folks that were working on the project gradually drift off to other jobs; pretty soon nobody even remembers those chemicals. So here's an example of how easy it is to mess up. We need particular vigilance from staff and supervision in such cases.

**LN:** Another — but more positive — facet of ES&H for Sandia is the matter of our involvement in developing new technologies to use in environmental remediation efforts. Is this a programmatic opportunity for us?

**Narath:** Yes. The problem of environmental cleanup and restoration is staggering, and we're

not talking about just the cleanup of DOE facilities or sites in this nation alone. This is a very serious worldwide problem. As Secretary of Energy Watkins mentioned when he spoke to Sandians in February, our nation is one of the cleanest in the world. Some Eastern-bloc nations have truly devastated their environment. Unless research and development provides improved remediation methods in the future, the problems are going to get completely out of hand.

**LN:** Do we have a better idea or ideas? Have you seen any?

**Narath:** We're not offering any miracles, but we can make some significant contributions. Examples are detoxification of aqueous waste streams using photocatalytic conversion and super-critical combustion. We have some exciting proposals in the robotics area, and I believe many of these ideas will be supported. We're also getting involved in organizing a DOE-wide initiative to begin developing specific plans to help ES&H regulators. In the long run, we need to establish standards on the basis of sensible risk-assessment methodologies, which is currently not always done. If regulatory standards continue to follow the evolution in our ability to detect very low concentrations of toxic substances, then the job of complying with future standards could become impossible.

**LN:** How are we involved in this initiative?

**Narath:** The subject arose at a DOE lab directors meeting in which it was suggested that we need to get on with R&D efforts in the environmental area because future standards will probably just get tougher. It was deemed important to ensure that future standards are guided by technically sound risk assessments.

I was asked to organize an effort involving all the DOE labs to think about this issue, and I've asked Dick Lynch [6300] to spearhead this activity. He's attempting to organize a workshop in cooperation with the New Mexico Institute for Public Policy. This workshop will bring together laboratories, industry, regulators, and universities to develop a plan of action to coordinate a lot of activity that's already under way in ES&H risk assessment. One thing we definitely need is to gain better ways of communicating accurate risk-assessment information to the public.

**LN:** Any suggestions?

**Narath:** The public, in general, doesn't view risk in the way engineers and scientists understand it, but it's essential that the public become better informed about the nature of risk and the relative magnitudes of various risks. Public opinion drives the political process in our country, and a well-informed public can help our politicians make decisions based on reason, not emotion.

**Jones:** The concept of risk involves both the probability of something adverse happening and the consequences if it happens. That's not generally fully appreciated; we often get focused on either one part or the other. The consequences of something like a major nuclear power plant accident could be very serious, but the likelihood of it happening is extremely low. To make intelligent decisions, both factors must be considered. We must understand this as a society, or we may shut ourselves down so that we literally can't do anything economically. Every Sandian needs to understand this and be prepared to explain it.

**LN:** Don't we also need to understand the public better?

**Narath:** Yes. It isn't just a matter of developing the technical data base and communicating it to the public in a way the public can understand, but we also need to listen to the public and be sensitive to their fears and concerns. In responsible groups like the Sierra Club, people often have points of view that many of us don't always agree with. But it's important to really listen to them and to try to understand what motivates their views and positions. We can't communicate effectively unless we have that understanding.

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## State of the Labs

**Jones:** And they're often not wrong.

**Bray:** Certainly not. And there's a real parallel here to our own need for some cultural changes at Sandia — the need to communicate effectively in all directions. We — as managers — need to do a better job of listening to our employees, communicating information to them, and recognizing their contributions. Our shortcomings aren't necessarily intentional; we don't often take the time to do it, but we're going to get better. [See: "I Don't Hear

60 a Week," page twelve.]

**Jones:** The results from the latest employee communication survey [LAB NEWS, Oct. 20, 1989] clearly show our need to improve in this area.

**Narath:** Part of our effort to improve vertical communication will be to implement an upward evaluation program in which all managers [supervisors and up] will be provided with feedback from their employees. This isn't upward performance assessment *per se*, but rather feedback intended to provide managers with suggestions as to how they can become more effective leaders and manage people and projects better.

**LN:** When and how will this be implemented?

**Narath:** We will begin implementing the upward evaluation process in June at the director level up through my position. After we fine-tune the process, we'll extend it to all levels, and I expect it to become an annual affair.

**LN:** At the last Department Managers' conference and in other meetings with supervisors, you've emphasized that Sandia and Sandians need to be more "visible" and to take a more active role in professional societies, with customers, etc. What's your reasoning?

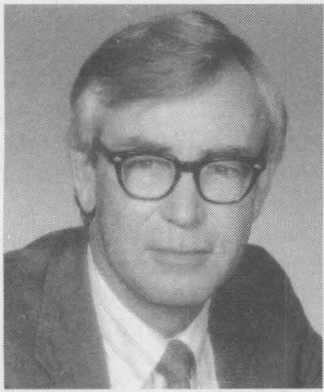
**Narath:** We're not alone in this world. Individually — and as a laboratory — we're imbedded in a global technical community. We can't participate or contribute fully unless we're knowledge-

### Update on Quality Initiative

## Quality Is Part of Strategic Plan

Sandia's quality initiative is a key element of the corporate Strategic Plan, which is setting the company's course through years of transition (see "Strategic Plan 1990: A Road Map for a Changing World"). Quality is embedded in the Plan's mission statement: "Our quality standard is meeting customer requirements every time; our performance standard is continuous improvement." Quality is a corporate value, along with integrity, leadership, teamwork, and respect for the individual. Quality is one of five major objectives: "Become a national leader in quality and quality progress."

That's an ambitious program. But it means much more than idealistic generalities or some vague idea of "goodness," says Charles Tapp, Director of Development Testing 7500



CHARLES TAPP (7500)

and chairman of the Sandia Quality Improvement Team: "Everybody carries out the Strategic Plan. We're defining quality in terms of customer requirements, and all Sandians have a hand in meeting those requirements — performance, cost, and schedule. That applies, whether the customer is external or internal."

Sandia's management has created several groups responsible for promoting quality. At the top is the Sandia Quality Steering Council (SQSC). Consisting of vice-presidents and above, plus a few others, SQSC meets for a half day each month to consider quality issues. The members developed the structure of the quality program that's being put into place.

To carry out the Council's directions, there's the Sandia Quality Improvement Team (SQIT). It includes a director from each vice-presidency, plus department managers from Legal, Accounting, and Quality, with other support as needed. Organizations such as directorates and departments may choose to establish their own quality improvement teams — and some have already done so.

"Besides having a structure," says Charles, "we have to encourage action in support of quality. So, as one way of doing this, we established the process of quality action requests — QARs. These are memos that anyone in the company can send to the SQIT or to any quality improvement team. Anyone with a quality problem that can't be resolved in his or her own organization — for instance, the problem may be broader than one organization — can send a QAR to a department or directorate quality improvement team, or to the SQIT."

The team receiving the request creates a Quality Action Team, an ad hoc group of people best suited to solve the problem. Once the problem is solved, the team is disbanded.

"Because the terms can start to sound like alphabet soup," Charles says, "we all need to recall what's really going on, what we're working to accomplish. We're trying to change our culture to be more quality-oriented. It's a new focus on the customer's importance in defining whether we've done our job satisfactorily. It's certainly not a way of identifying people to blame for problems. When you look for defectiveness, you look for it in the process, not the people."

The SQIT will, however, nominate people (as teams or individuals) for recognition by SQSC for quality-related achievements.

Training in quality will help Sandians improve work processes. Nearly all managers at the level of director or above, and a majority of department managers, have recently taken courses on the fundamentals of quality. All Sandians will be offered AT&T's Process Quality Management and Improvement program, which adapts well to R&D projects. (Details of time, place, etc., are still being worked out.) Quality training will continue in future years, partly through the In-Hours Technical Education Courses (INTEC) program.

### Increasing Cost of Correction

Another purpose of the quality program is to find ways of measuring quality and to determine the "price of nonconformance." "Quality analysts tell us," says Charles, "that in a typical organization, 20 to 30 percent of resources are wasted because the right thing isn't done the right way the first time. Do we know how much of our time and money is spent correcting errors? The quality program will help organizations focus on their own price of nonconformance — and then find the root

causes and eliminate them."

Charles emphasizes that quality cannot be "inspected in" at the end of a project. In fact, the later in the project a basic flaw is discovered, the more it costs to correct — and the cost of correction can increase a hundredfold or more from the concept stage to the manufacturing stage. So the emphasis is on preventing problems from the outset of each project.

Another goal of quality is "zero defects." "We need to make clear what we mean when we use the term 'zero defects,'" Charles continues. "People say, 'We're human — how can you expect perfection?' The answer is that none of us comes to work in the morning planning to make 10 percent mistakes during the day. We want to have a perfect day — and that is the sense of the zero-defects goal. Remember, a defect is much broader than a botched part; rather, it's a failure to meet one of the customer's requirements. And every one of us has customers — some inside Sandia and some outside."

The definition of quality, then, begins and ends with the customer. "It's always necessary to sit down with the customer and work out the requirements," says Charles. "When you do that, you find that sometimes the customer doesn't understand your process well enough to establish clear requirements. That's when you have a chance to educate that customer — and head off a lot of problems. Larry Bertholf [2600] likes to say that customer development is a contact sport — and he's right. We've all got to be smart enough to negotiate the requirements with each customer before starting the job, and then to meet those requirements." ●CS



SANDIA QUALITY STEERING COUNCIL — vice-presidents plus a few other Sandia managers — meets monthly to discuss the Laboratories' quality program.



able about what others are doing, and, of course, we need to make the world more aware of what we're doing. Becoming more involved in professional societies and on national panels, attending appropriate meetings, and otherwise sharing information with customers and colleagues outside the Labs is vital. Not everything of value is created at Sandia, and if we're going to be truly competitive in our specialty areas, we need to know at all times what's going on elsewhere.

**Jones:** Another aspect of this is leadership. Sandia has some of the finest technical people and capabilities in the world, and we really should be exercising more leadership in science and engineering. As we do that, it will further enhance our individual and organizational reputations and could open new doors for us — giving us more opportunities, more customers. But it's really more than that; we have experience and capabilities that could truly make the world a better place if we used them to full advantage.

**LN:** Higher visibility certainly is not without risk — in the sense that you have to take stands on occasion. In the past, Sandia has been careful to stay out of controversy. Can we take the heat if we change our way of doing things?

**Narath:** Your question assumes that as people reach out and interact more, that naturally leads to controversy. That's not always true, but it can happen. However, I don't think we have any choice in the matter. We can't hide from the world, and I trust our employees to be sensible and to take responsible public positions. We're talking about Sandians interacting with the rest of the world in areas in which they have expertise. We need to distinguish between technical positions that an individual may take versus public policy recommendations. There's a big difference. I expect Sandians to concentrate on technical issues in their public interactions.

**LN:** How about a hypothetical example? Let's say that Bill Snyder [Director of Exploratory Nuclear Energy Systems 6500] became convinced of the efficacy of certain new technology or directions for the nuclear power industry — always a controversial area. How visible — how aggressive — should he be in advocating his ideas?

**Narath:** The kind of interactions we're talking about here are likely more technical than they are policy-related. I would have no problem with Bill Snyder discussing publicly his views of what technical approaches might be superior.

**Jones:** Bill Snyder, in fact, can serve as an outstanding real example of what we're talking about. A few years ago, he felt that someone in this country needed to be thinking about ways to extend the life of our nuclear power plants because we're not building any new ones. The US is generating about 20 percent of its electricity from nuclear power plants. If we don't extend the life of those plants, we're going to start losing that source if plant licenses aren't extended. Bill was so concerned that he asked to be moved out of some other assignments so he could develop viable license-extension concepts. He went to the utility industry, to Congress, to DOE Headquarters — to anybody who would listen to his ideas and concepts.

**Narath:** In this case, he had laboratory support because his ideas were based on sound technical reasoning.

**Jones:** Yes, and Bill's efforts have resulted in a program that may extend the useful life of some nuclear power reactors and keep them safely on-line for many more years. Bill didn't attempt to make policy, and you don't see his name in the paper every morning below controversial headlines, but he made a real difference — a real contribution. He's a member of professional organizations, gives freely of his time in connection with state and national committees, etc. That's the kind of increased visibility and participation we're talking about.

**Narath:** I was really shaken not long ago when a Sandian told me that he'd been offered Fel-

lowship status in his society and had refused it because it would require some additional meeting attendance and he felt that his supervisor wouldn't approve because it wasn't directly job related. I expressed my views about that very forcefully.

**LN:** Sandians are just naturally shy?

**Narath:** For reasons that have historical roots, we haven't spent much time as a laboratory seeking recognition for individuals. We have not in any systematic way promoted our people for prizes, advancement in their societies, or other forms of public recognition. There has always been this feeling that we don't want to single anyone out. It's very different in other organizations, for example, at Bell Labs. They take great pride in having on their staff individuals who have achieved such recognition. It's not just the individual who gets recognized; the laboratory also gains recognition and stature, and that's equally important.

**LN:** Speaking of outside activities, how about our increasing emphasis on education outreach programs? What are we trying to accomplish?

**Bray:** We're stepping up our efforts in education outreach. Secretary Watkins is personally committed to expanding DOE's efforts in this area, and we support it strongly. Getting and keeping US students interested in science, engineering, and math and encouraging them to pursue careers in these areas is vital if we're going to remain a world leader. This gets at the very heart of our future — our ability to stay economically competitive and to lead the free world. In the long run, our education outreach program may be just as important as our technology transfer efforts.

**LN:** Are we beefing up existing programs or doing some new things?

**Bray:** Both. Traditionally, we've worked closely with colleges, universities, tech schools, and predominantly minority schools — particularly those near our New Mexico and California

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**"I think the [AT&T/Sandia] relationship is good. . . . There's still a strong sense that AT&T operates Sandia as a public service."**

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facilities. That will continue and expand. A good example is our new partnership with the University of New Mexico and Los Alamos National Lab to create three-year faculty appointments for top Sandia and LANL scientists to teach part-time at UNM [LAB NEWS, Jan. 12, 1990]. But we are recognizing more and more that we need to help interest young students in science and engineering careers.

**LN:** How are we going about that?

**Bray:** Our program isn't completely structured yet, but we're working to expand our education outreach programs in Albuquerque and in Livermore.

In Livermore, several Sandians serve with some LLNL staffers on a Science Advisory Council that works with the Livermore schools. The Council works with teachers and administrators at all levels in the public school system to determine needs in science education.

A major new thrust came with the realization that student interest in science can be influenced especially effectively in grades K through 8. To affect large numbers of these students, we are working in Albuquerque to place Sandians as science advisors in all of the public schools at that level. These advisors would spend up to a day each week helping teachers to devise means of involving students in scientific experiments and demonstrations. They will also serve as links to the laboratories and collect data so that we at Sandia can better understand student and teacher needs. This will serve as a base on which to further expand our programs. We're still working out the details, but I'm really excited about the concept. Mike Wartell [9001], who chairs our education outreach steering committee, and other Sandians

who have been involved in earlier work with the schools [LAB NEWS, Feb. 9, 1990] are bringing it together.

**LN:** This program is limited to the public schools?

**Bray:** Initially, yes. We may extend it to some outlying schools and some Native American schools. We'll be discussing that soon with the Bureau of Indian Affairs, but we need to get it rolling locally first and see how it works.

**LN:** How's the new three-level MTS [Member of Technical Staff] system working?

**Jones:** It's still young, but is working well so far. When we announced it last fall [LAB NEWS, Oct. 20, 1989], we hoped it would accomplish several things. One was to give on-roll employees a unified and visible career path, and I think it's doing that. Another was to give the Labs more flexibility in hiring new technical staff, particularly in hiring bachelor's degree people at the MTS level. Since then, we've hired a couple of dozen bachelor-level engineers, so I think we're off to a good start. As I said last fall, we will always value advanced degrees, but not every job that we do requires an MS or PhD engineer or scientist. The new system helps us match employee capabilities to job needs and requirements. It is a more cost-effective way of doing business.

**LN:** Any plans to follow suit in the MLS [Member of Laboratory Staff] ranks?

**Bray:** We're taking a hard look at that and may change entry-level requirements for some of our MLS slots. You can make the same argument as you can for the MTS ranks — some jobs can be done very well by folks with bachelor's degrees. If that's the case, it doesn't make economic sense for us to require advanced degrees for those positions.

**LN:** Assuming we make this change, will we alter our educational program to encourage these employees to get advanced degrees?

**Bray:** I don't think we would really gain anything by instituting any new programs to encourage employees to get advanced degrees. As Orval said, we value advanced degrees, but that doesn't mean that all employees need advanced degrees to do their jobs well. The important point, I believe, is that everyone should continue to learn and sharpen his or her skills. If a person really wants an advanced degree and the capabilities it provides, he or she should go for it.

**LN:** How's our relationship with AT&T?

**Narath:** I think the relationship is good — it's very warm and supportive. There's still a strong sense that AT&T operates Sandia as a public service. I don't see that changing. With Tom Thomson's retirement late last year, I now report to Morris Tanenbaum, Vice-Chairman of the AT&T Board. He's very supportive. He visited us recently for two days and seemed enthusiastic about Sandia. I expect he'll visit us frequently. I see the relationship between Sandia and our parent company becoming more solid as time goes on, and I expect this will not only benefit us, but AT&T as well.

**LN:** What's in it for AT&T?

**Jones:** Patriotism *isn't* dead! I think AT&T's willingness to operate this laboratory exhibits it. I think the company's willingness to operate Sandia for no profit and no fee reflects the company's pride in, and concern for, the nation.

**Narath:** Although the character of AT&T has changed from a regulated monopoly to a competitive enterprise since divestiture, it remains a company that we can take great pride in. The values guiding AT&T are very much like our own. It's a highly ethical organization, and I'm personally very proud of our relationship.

**LN:** Does DOE still see AT&T's management of Sandia as a good thing?

**Bray:** I believe so. It seems to me that the Sandia/AT&T relationship is better for DOE than it's ever been. AT&T and Bell Labs have really had to scramble for the last five or six years since divestiture. They've made a lot of changes to im-

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## State of the Labs

prove efficiency and their competitive position, and we're tracking along with many of them when it seems appropriate. I think DOE should see that as a very positive statement about the Sandia/AT&T relationship.

**LN:** *But we don't necessarily adopt every AT&T policy or follow every new change.*

**Bray:** No. We examine them carefully to see if they make sense for us. We try to understand the impact and the value that they would have, not only on Sandia, but on the federal government as well. As our contract suggests, we pattern ourselves after Bell Labs and AT&T, but we don't just follow their policies mindlessly.

**LN:** *Switching gears a bit, how is our research program doing? Has funding been hurt by the need to pump funds into other needs — ES&H activities, for example?*

**Narath:** I'm delighted by the quality of our research program and the contributions it has made over the years. It continues to be an essential part

**“Our researchers have demonstrated a remarkable ability to do outstanding fundamental work in areas that are directly relevant to our applied programs.”**

of our operation and will continue to be well supported by Sandia. I don't anticipate our research activity being threatened by any overhead burden that we might face in the future.

What's exemplary about Sandia's research is that over the years it has not only made fundamental contributions, but has always managed to focus on those topics and problems that are relevant to our mission. It has never lost sight of the purpose of the Labs. Our researchers have demonstrated a remarkable ability to do outstanding fundamental work in areas that are directly relevant to our applied programs.

**LN:** *How's our building program going? What's the outlook?*

**Bray:** We've added some important facilities during the late '70s and '80s — about 1.2 million gross square feet of space in Albuquerque and

nearly 300,000 gross square feet in Livermore — and we continue to have an active construction program. We're currently in the occupancy phase for the Process Development Lab for Org. 7400, the Systems Development Lab for Org. 9000, and the Strategic Defense Lab for Orgs. 1200 and 9300. And we recently completed Building 859, and it was occupied by Computer Aided Design Dept. 2810 and by the Rocket Systems divisions of Dept. 7520.

**LN:** *How about new starts? What's in the works?*

**Bray:** In Livermore, construction is under way on the Defense Engineering Lab and on the Combustion Research Facility addition. In Albuquerque, design is complete for the Integrated Materials Research Lab, which will be located near the southeast corner of Area I, and design is nearing completion for the Primary Standards Lab, which will be located north of Building 823. Construction on these labs should start this fall. Design is about half finished for the Explosives Components Facility, which will be located northeast of Area II, and construction should start early next spring. And we're ready to start designing the Center for National Security and Arms Control, on which construction could start in late 1991.

The new buildings that we're getting into now and the ones that are being designed will add about 520,000 gross square feet of space [400,000 Albuquerque; 120,000 Livermore] and will allow us to remove some temporary and substandard buildings and mobile offices.

**LN:** *We're actually going to tear down some clunkers?*

**Bray:** Yes. We don't plan to just expand into more and more space. We need to get rid of some of the older structures that are in sad shape and expensive to maintain. The Buildings and Facilities Committee has a “hit list” of substandard buildings — including some mobile offices and temporary buildings — to be removed during the next two to three years in Albuquerque and in Livermore. We've already removed many mobile offices at Livermore as new facilities have come on line.

**LN:** *I understand we continue to have a backlog of uncleared employees. Do we still have plans to move fences to take some buildings outside the tech area to accommodate some of these folks?*

**Narath:** Building 823 will go outside the fence in June. And we'll consider locating certain future facilities outside the fence. The intent is twofold — to afford easier access by outsiders for programs where security isn't an issue and to pro-

vide more space to accommodate people waiting for clearances. We must find a way to use new people effectively while they're waiting. I don't hold much hope that the time required to process clearances for new hires can be shortened significantly. I think we're going to have to live with that, so it makes sense to put more facilities outside the fence where new employees can work more effectively.

**Jones:** Facilities outside the fence also will help facilitate technology transfer. Moving fences can present some sticky problems, though. Obviously, folks outside the fence can't access the secure-computing network. But we've largely solved that, thanks to some innovative approaches by the Computer Committee and the Computing Directors in Albuquerque [Larry Bertholf, 2600] and Livermore [Ron Detry, 8200]. Open-partition, but restricted-access, computing will be provided from Livermore, and secure [closed-partition] computing will be provided from Albuquerque.

**Narath:** Both Computing organizations deserve a lot of credit. The arrangement is wonderful.

**LN:** *What's the general status of our work on major weapon systems?*

**Jones:** Our committed-weapon work is very active now. In Livermore, we have a major program under way on the SRAM-II [Short Range Attack Missile II, W89], and we're completing development work on the W82, the 155 mm nuclear artillery shell.

In Albuquerque, we're winding up work on the Trident II [W88] submarine-launched missile. And we're very busy with the B90 Nuclear Depth Strike Bomb. We've got ongoing work on

**“We remain a ‘can-do’ lab, and that's recognized throughout the free world. I take a lot of pride in that.”**

the MX W87 rail garrison, and we're doing a number of different B61 stockpile improvement modifications. These are all Phase 3s.

At the same time, we're anticipating Phase 3 work on the SRAM-T [Short Range Attack Missile, Tactical] or the TASM [Tactical Air-To-Surface Missile], which are synonymous names. We have the W61 weapon system, for which we're anticipating engineering development work. Depending on what happens in treaty negotiations, we may be doing additional work on the FOTL [Follow-On-To-Lance].

Altogether, we've got a large plateful of weapon development.

**LN:** *What makes your chest swell out these days when you think about being at Sandia and representing Sandia — when you go to Washington and meet people? What are you proudest of?*

**Jones:** Our record of delivered accomplishment as opposed to promises — in the long haul, that's been at the heart of our success. We remain a “can-do” lab, and that's recognized throughout the free world. I take a lot of pride in that.

**Narath:** I'm very proud of Sandia's response to the challenges and opportunities of the 1990s. It's exhilarating to observe the enthusiasm with which Sandians are contributing to the creation of a more productive work environment. The past has left us a remarkable record of contributions in the national interest. I'm confident that future generations will declare our current efforts equally successful.

**Bray:** My response is similar to Al's. I love working with Sandians because, no matter what the challenge is, they tackle it with enthusiasm and an expectation that they can create superior solutions — and they usually do. I'm glad to be part of such a team. ●LP

### Communication and Recognition Go Together

## ‘I Don't Hear 60 a Week’

“We've done a lot of things well at Sandia, but vertical communication isn't one of them,” says Executive VP Lee Bray (30). “Our latest employee communication survey [LAB NEWS, Oct. 20, 1989] showed that we haven't really improved at this in the past five years or so. We need to get better at it, and we're going to.”

“If staff members have problems that don't get communicated upward to management or if management has concerns that don't get communicated downward, it can translate into inefficiency, mistakes, and improper decisions,” he continues.

Lee says another negative aspect of inadequate vertical communication is that employees don't get enough credit for their accomplishments.

“More than 3000 staff members in Sandia organizations report to me. If each person completed just one significant accomplishment a year that was reported to me, I'd get 3000 reports a year — about 60 a week. I don't hear 60 a week. Actually, I hear very

few,” he notes.

“Does that mean these folks aren't doing anything significant, or just that no one is talking about it? I think it's the latter, and that isn't good. I should be hearing about their accomplishments. And we should be celebrating their success.”

Lee attributes this in part to the Sandia culture of employees quietly going about doing their jobs without feeling a need to tell everyone else what they've done.

“There's nothing inherently bad about that, but I'm concerned that we miss opportunities to recognize people and give them proper credit for some outstanding work,” says Lee. “People need to be appreciated. Hard work and dedication shouldn't go unnoticed or unthanked. We should be doing a much better job of recognizing good work, for entire organizations and for individuals. We plan to set up some new ways — formal and informal — to encourage better communication and recognition.”

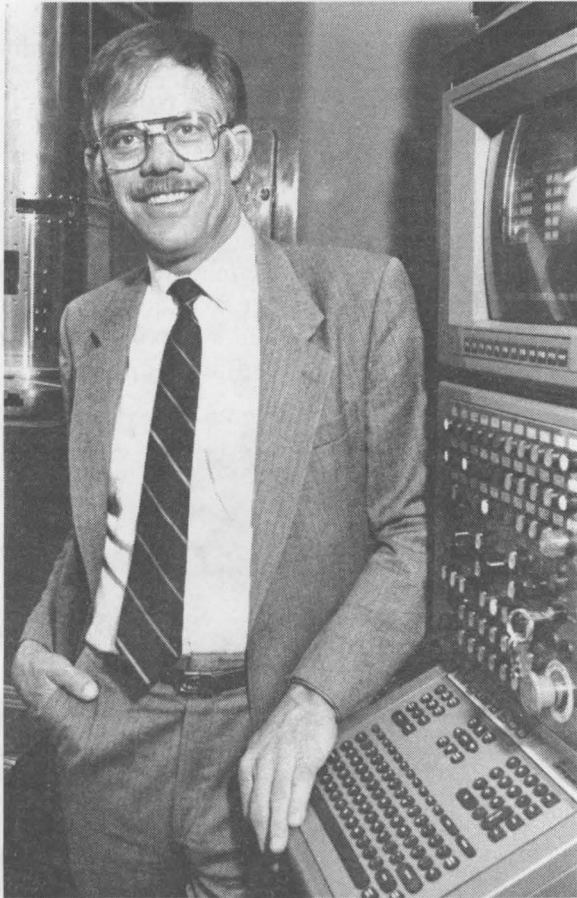




Sandia's Eighth and Ninth**Bill Alzheimer and Dan Reda Named ASME Fellows**

Two Sandians have been named Fellows in the American Society of Mechanical Engineers (ASME). The election of Bill Alzheimer (7400) and Dan Reda (6225) puts them among the slightly more than one percent of ASME members who have received that distinction.

Bill is Director of Materials Process Engineering and Fabrication 7400. ASME's citation of his accomplishments credits him with having "consis-



**BILL ALZHEIMER (7400)** is in the heavy-machining area, standing beside a five-axis numerically controlled machine tool. The tool can be controlled from the panel at right. In the upper left, a part being machined for the B90 program is visible.

tently demonstrated leadership in the development and design of weapon and energy systems," as well as being recently "active in developing computer applications for engineering design."

When he joined Sandia as an MTS in 1966, Bill was assigned to the Applied Mechanics Division. He worked on techniques for solving problems related to structurally hardening weapon structures against x-ray effects. After three years, he became supervisor of a division of structural analysts.

In four divisions between 1969 and 1976, Bill directed the adoption of innovative techniques. For example, as a new supervisor when computers were being increasingly used to solve structural-mechanics problems, he led the growing use of numerical-analysis techniques for Sandia problems. Bill also supervised a weapon division that demonstrated the concept of ballistic-matching artillery shells: Shells with different shapes and weights could be designed so that their ballistic behavior would be the same when they were fired.

#### Diversity for Engineer-Manager

"One of the good things about Sandia for an engineer or a technical manager," he says, "is the Labs' diversity. As a supervisor and department manager, I went back and forth between weapon groups and groups involved in more analytical, even theoretical, problems. The weapon work was some of the most challenging I've ever been in — ranging from basic materials research to production drawings to qualifying the products."

From 1976 to 1986, Bill managed departments in both Livermore and Albuquerque: Applied Mechanics, Engineering Technology, Weapons Devel-

opment, and Weapon Engineering. He became Director of Design Engineering 2800 in 1986, a position he held until last year.

"Much of my time at Sandia," he says, "I've been involved in project management and weapon systems. That's a segment of the company that doesn't typically participate in professional activities; the feeling is that research- and publication-oriented staff do that. But people in those areas — managers and staff members both — have as much to contribute and to gain from professional activities as researchers do. Every engineer should be active in at least one professional society."

Bill has been an officer in both the New Mexico and Mt. Diablo (Calif.) ASME sections and was national chairman of ASME Membership Development. He holds BS and MS degrees in civil engineering from Montana State University and a PhD in engineering mechanics from Virginia Tech. He's a Registered Professional Engineer in the State of New Mexico.

#### Fluid Mechanics for Weapons, Energy

Dan is cited for his "experimental fluid mechanics research in support of national programs in civilian space exploration, military systems, and energy-related problems. . . . Principal research contributions have been in the fields of supersonic and hypersonic boundary layer flows (primarily transition to turbulence), single and multiphase flows in porous media, and incompressible, unsteady boundary layer flows on airfoils."

Dan has focused on energy-related work since coming to Sandia in 1978. Several Sandia activities involve the behavior of fluids in geological structures — for example, nuclear-waste isolation and underground oil storage in salt caverns (for the Strategic Petroleum Reserve — SPR). In both instances, it's important to know how fluid moves and how it interacts with its surroundings. Dan did laboratory experiments to provide basic knowledge, including data crucial to the development of reliable computer codes for designing geologic repositories and — in the case of the SPR — procedures for removing oil from storage.

Recently, Dan has done research for the wind-energy program. In this case, the emphasis is on unsteady flows of the sort that occur around wind

**According to recent figures, ASME has 125,500 members, of whom only 1385 (1.1 percent) are Fellows. At Sandia, however, there are now nine ASME Fellows out of 230 members — nearly four percent.**

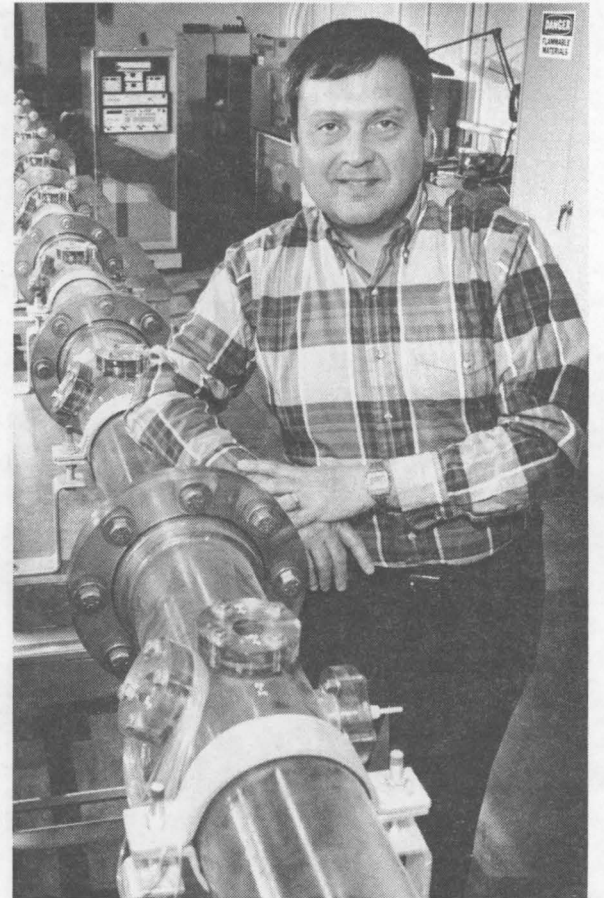
turbines. The work involves using 10-micron-thick, liquid-crystal coatings sprayed on the surfaces of airfoils to "visualize" — by color changes — regions of high shear stress (friction) between the air flow and the blade. "The technique has proved to be a valuable diagnostic tool for both lab and field experiments," says Dan. "In fact, with the help of Dan Aeschliman [1554] and others in his Experimental Aerodynamics Division, we have now successfully applied it to reentry body models at Mach 5 velocities."

In work on military systems, one of Dan's most important contributions was an improved way to investigate the transition of flow around reentry vehicles from laminar (smooth) to turbulent flow. Because nose-tip materials begin to wear away (ablate) during their early encounter with the atmosphere at high altitudes, their surfaces become microscopically rough. This roughness is subsequently responsible for the onset of turbulent flow at lower altitudes. Turbulence causes drastically increased ablation, threatening the accuracy and even the survival of an RV.

Dan replaced conventional experimental methods — such as wind tunnels — with a technique of

realistically roughening an RV nose-tip, then launching it into the well-defined environment of a ballistics range. That procedure closely simulated reentry conditions while allowing the acquisition of reliable data — though acquiring and processing the data also took some innovations.

Dan holds a PhD in mechanical engineering from Rutgers University. He began his career at the Convair Division of General Dynamics in San



**DAN REDA (6225)** stands at the Unsteady Flow Facility, where research is done on shear-stress sensors used to measure the friction between an airflow and a body or airfoil. The facility can create known levels of friction for calibrating and testing sensors mounted on the inside of the tube.

Diego, and then spent two years as a post-doctoral fellow at the NASA-Ames Research Center in California. Before joining Sandia, he worked for six years at the US Naval Ordnance Laboratory in Silver Spring, Md.

He has been a session chairman for many professional conferences, a reviewer for several journals, and associate technical editor of the *ASME Journal of Fluids Engineering*. ●CS

## feed iiback

*Q. If internal memoranda bore the sender's telephone number after his/her organization, the recipient who chooses to respond by phone would be spared the need to consult the directory. Collectively, the time saved could be significant.*

A. Following the procedure you suggest would undoubtedly save the recipient time in tracking down a phone number for the author. However, the responsibility for including the sender's phone number (and any other communication aid, such as electronic mail addressee information) should be the author's, and not that of the person preparing the internal memo.

Placing the communication aids on the "From" line would clutter up the appearance of the memo. Therefore, it's suggested that a "Communications" line be added at the end of the text, listing any relevant communications information there.

It would be up to each directorate to implement this suggestion on its own.

Paul Stanford — 100



(Continued from Page One)

## Sandia Secretaries

the two supervisors who oversee Sandia's 300 division secretaries. Altogether, Sandia has 475 secretaries, and they're not all women — three are men.

"I found I had to learn more about the personal computer — the basic operating system, the hardware and software, how to manipulate programs to get the output I wanted," notes Rose Mary Gurule (5100), who joined Sandia in 1984.

This week, in honor of Secretaries Week (April 23-28), several of Sandia's secretaries share their reminiscences of how things have changed.

### The Advent of Computers

The biggest change, of course, is the advent of computers.

In the two or three decades since they were introduced in offices, computers have improved dramatically. Today's personal computers at Sandia automatically generate documents according to a certain format, explains Glorianne. For example, if



ROSE MARY GURULE (5100)

one director prefers letters with extra-wide margins, a simple keyboard command instructs the computer to type the letter the way the director wants it. Built-in grammar and spelling packages have automated the task of checking for errors. Even equipment and supplies can be ordered by computer, says Rose Mary.

In contrast, early computers were run with keypunch cards like those used in data processors,



TONNI NUNLEY (8522-1)



CATHY CASPER (6211)

notes Cathy Casper (6211). People carried boxes of such cards from one place to another — a cumbersome and time-consuming task. Today, programming information is stored on small disks that fit into a slot beneath the computer screen.

"When I came to Sandia in 1979," says Judy Jewell (2500), "one of the parts of my training was how to make a clean erasure. But within six months, I was on a Wang word processor."

In the 1960s, equations were typed with the help of Typits — small plastic blocks embossed with Greek characters that were placed over a sheet of paper and tapped with a typewriter key.

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**"It's amazing. I often find myself talking about computers and I actually know what I'm talking about."**

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Today, such characters are part of the extended keyboard of a personal computer.

But even though they are faster than the typewriters of the past, computers have not necessarily lightened the secretary's work load. In days gone by, the boss hesitated to ask for a correction unless it was essential. Today, Judy and other secretaries agree, managers, engineers, and researchers tend to make more editing changes because they know they are easier to make.

This has created more paperwork, says Fran Roelle, secretary to Director Herman Mauney (7200), not just to make the corrections, but to reprint and redistribute edited copies. Today's secretary is an editor as well as a typist.

"I have more work than I had back in the 1960s," says Fran, "much more. It's more difficult to keep up with."

Fran has been at Sandia since 1961. "I remember a time before the advent of the ballpoint pen, when one of my duties was to fill the boss's fountain pen with ink each morning," she says.

With the help of computers, some secretaries have also become more involved in other areas with quite different challenges, such as computer graphics, budgeting, and manipulating data bases, says Judy. A big part of the job is handling classified documents, adds Mary.

In fact, today's secretary is a combination of office manager, editor, and typist: "The secretary is more of an administrator today and less of a workhorse," says Cathy.

### Other Kinds of Office Automation

Computers are not the only things that have changed.

Telephone switchboards can handle more lines, and copy machines, which once had to be filled with black ink, now use a black powder that is easier to use.

FAX machines have eliminated the need to

wait for important letters or documents to arrive in the mail. A phone call transmits a facsimile of a document within seconds — a vast improvement over FAX machines of the early 1970s, which took at least four minutes to transmit one page, says Cathy.

The chief drawback to FAX machines is that the paper is so thin, it curls, and it's difficult to

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**"I remember a time when one of my duties was to fill the boss's fountain pen with ink each morning."**

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write on, says Val Cowan, who started at Sandia Livermore in 1959 and now is secretary to VP John Crawford (8000). But even FAX machines are changing, with the introduction of state-of-the-art models that use normal copy paper.

Val has worked on a variety of word processors and personal computers, shifting gears to learn how to operate a new machine every couple of years or so. She once worked on a prototype word processor called a Flexowriter that wrote form letters by reading a tape made of



GLORIANNE MARTINEZ (1550)

heavy pink paper with holes punched in it in a certain pattern.

She later worked on an early word processor called a Vydec, along with her friend and colleague, Tonni Nunley (8522-1), who started at Livermore in 1963 and is section supervisor in charge of Secretarial Development. The Vydec had about 30 pages of memory and took up a

(Continued on Next Page)



MARY COURTNEY (22-2)





JUDY JEWELL (2500)

**(Continued from Preceding Page)**

whole office, along with a printer and a table. Other early word processors at Sandia were the Lexitron and Micom.

In some ways, new-fangled inventions have made the secretary's job more impersonal by reducing the need for human contact.

"I don't like to use the answering machines, because they're less personal. To me, it adds a lot to the job to still have some human interaction. It gets too cold just worrying about getting the job done," says Cathy.

**The Secretary of the Future**

Most of the secretaries interviewed agreed that future changes will include even more sophisticated machines than those in use today.

"I think there will be a continuing evolution

toward more office automation," says Rose Mary, "particularly in terms of generating new forms and acquiring approvals via computer. Additional training will be needed to prepare secretaries to handle these responsibilities."

Fran predicts that facsimiles of the future will be transmitted directly from a secretary's desk: "I think the facsimile of the future will be right at the secretary's computer terminal." Secretaries also

**"Today, we can do desktop publishing, and the old word processors couldn't begin to do that."**

will be able to send mail to each other electronically over a computer network. Currently, some secretaries can already send messages via computer, but not everyone is hooked up to an electronic mail system.

Fran also thinks secretaries will eventually need to be able to do some of their own computer programming. And along with the increased requirements and expertise, she thinks they will eventually get more recognition.

Future training requirements for secretaries will probably reflect an increased emphasis on computer programming, says Mary, who serves on the Office Automation Subcommittee, a group of employees that is responsible for standardizing software and making sure all secretaries are trained to work on the same software standards. "I see our role in the future as continuing to evaluate what software package will best serve the majority of the secretaries and the staff," she says.

Although shorthand skills are not used as much as in the past, Rose Mary says these will probably continue to be required, because research at Sandia has shown that secretaries who are proficient in shorthand are more proficient in editing as well.

Dawn Calek, secretary to Executive VP Lee Bray (30), notes that the basic responsibilities of her job have remained essentially the same since



VAL COWAN (8000)

she started at Sandia in 1953 and in many ways are not likely to change.

"The tools I use have indeed changed and increased the scope and quality of functions I perform (though the equipment still breaks down, I might add). Different bosses bring different management styles. Changes in leadership bring changes in company culture. But my focus is on assisting my boss, and that hasn't changed.

"I am basically someone," Dawn continues, "who takes care of things, who assumes responsibility for seeing that things get done, who helps create a congenial environment, who provides continuity in the office for the boss who is attending meetings or traveling."

Judy sees a need for secretaries to be flexible: "Eleven years ago when I hired in, I couldn't have envisioned my job today, and 11 years from now, who knows what I'll be doing as a Sandia secretary?" ●LD

**Take Note**

When spring cleaning, consider that many of the cans and bottles you have stored in closets, garages, and basements may contain hazardous waste. The City of Albuquerque will be collecting these potential pollutants Saturday, April 21, at the Rinchem Company, Inc. (6133 Edith Blvd. NE) from 9 a.m. to 6 p.m. Commonly used household materials that are considered hazardous include garden pesticides, household chemicals, oil-based paints, thinners, paint removers, solvents, wood preservatives, brake fluid, antifreeze, pool chemicals, muriatic acid, used automobile oil, and automobile batteries. There is no charge for disposal. Gather up the bottles and cans you want to dispose of, label them, and take them to the collection center. If you have questions, call the Albuquerque Environmental Health Department on 768-2600.

**Retirement Workshop**

Dean Witter Reynolds is sponsoring a "Portfolio Planning for a Secure Retirement" workshop Wednesday, April 25, at the Dean Witter Reynolds office, main conference room, (6400 Uptown Blvd. NE) at 5 p.m. Call Natalie Ostby on 889-2860 to make a reservation.

For a full day of family fun, check out Camp Fire's Kidfest '90 on April 28 from 10 a.m. to 8 p.m. at Tiguex Park (near Old Town). The festival features entertainment, hands-on art activities, games, an arts and crafts fair, drawings for tethered hot-air balloon rides, storytelling, face painting, an ice-cream-eating contest, a pie-eating

contest, and more. Across the street from Kidfest, Safety Square (sponsored by the Junior League of Albuquerque) presents hands-on safety demonstrations and exhibits. And, in the parking lot of the Albuquerque Museum, the City Environmental Health Dept. features an Earth Day Celebration with environmental exhibits and events.

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While observing Earth Day activities, you can be sensitive to the environment and help Public TV at the same time. Take your aluminum cans to any Reynolds Aluminum Recycling location — or to the KNME-TV studios (1130 University NE) — and request that the weight value (dollar value) of your cans be donated to KNME-TV.

The New Mexico Vine & Wine Society invites amateur wine makers to join in a free wine-making class for beginners on April 28 at the Holiday Inn Pyramid at 3:30 p.m. The instructor is Charles McKinney (Texas A&M). To reserve a place in the class, call 294-6217.

**Congratulations**

To Georgia and Tony (1163) Ricco, a son, Charles Nicolas, March 14.

To Barbara and Rodney (6425) Schmidt, a son, Benjamin Knudsen, March 23.

To Linda and Chris (5212) Robertson, a son, Chad Eric, April 4.



TOP MANAGEMENT from DOE's Albuquerque Operations Office and from Field Command/DNA were invited to take a first-hand look at the new weapon training center in Bldg. 892 (LAB NEWS, March 9, 1990) on April 10. Here, VP Bob Peurifoy (7000, left) discusses some of the advanced video equipment used to tape training sessions with Bruce Twining, Manager of DOE/AL. DOE provided funding for the remodeled facility, which will be used to train some 2000 people a year — a majority from the military services.



# Supervisory Appointments

KENNETH GLIBERT (DMTS) to supervisor of Test Planning and Diagnostics Div. 9312.

Ken joined Sandia's Radiation Phenomenon Division in July 1966. His work has been with radiation diagnostics measurements on DNA-sponsored underground nuclear weapon effects tests at the Nevada Test Site and on Sandia's above-ground simulators. He has also participated in x-ray production efficiency measurements of laser-induced plasmas, in situ oil shale rubblization experiments at Rock Springs (Wyo.), trace-element analyses of thin films, and mammalian tissue composition studies for Detroit's Ford Institute for Medical Research.

He has a BS in mathematics and physics from the University of Puget Sound (Tacoma, Wash.) and a PhD in physics from Oregon State University. He is a member of Sigma Xi.

Ken enjoys classical music, hiking, and flying. He holds a commercial pilot's license. He also enjoys restoring aircraft and old automobiles. He and his wife LaDonna have two grown daughters and live in the NE Heights.

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PROFESO PADILLA to supervisor of Traffic, Travel, and Stores Management Div. 3743.

Pro joined Sandia in December 1966 as a clerk in the Mail Services Section. In 1967, he transferred to Purchasing as a property clerk, where he worked in the Document Production and Administrative Services Division. In February 1968, he joined the division he now heads. He was promoted to supervisor of the Traffic Management Section in November 1987.

He has a diploma in traffic and transportation management from La Salle University. He's a member of the Albuquerque Traffic Club and Contractor Traffic Managers Association.

Pro enjoys gardening and golf. He and his wife Virginia (7220) live in the NW Valley.

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JOHN EICHELBERGER (DMTS) to supervisor of Geochemistry Div. 6233.

John joined Sandia's Geophysics Division in December 1979. He's done research on volatiles in magmas; participated in Hawaiian lava lake drilling; monitored Mt. St. Helens' eruption; and selected and characterized sites for Sandia's earth-penetrator tests at White Sands, Tonopah, and Ft. Riley, Kans.

He developed and led the Inyo Project that drilled through and sampled the feeder dike beneath a 600-year-old volcano in California. John is currently leading the Katmai Project, which will drill into a vent near Mt. Katmai (a result of the largest volcanic eruption on earth in this century) at the head of the Valley of Ten Thousand Smokes

in the Aleutian Range to discover how explosive eruptions occur.

John has a BS and MS in geology from MIT and a PhD in the same field from Stanford. He's a member of the American Geophysical Union and the Geological Society of America. Before joining Sandia, he worked at LANL.

He enjoys winter mountaineering, photography, running, and mountain activities with his family. John and his wife Alice have two children and live in the University area.

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FREDERICK HARPER to supervisor of Reactor Modeling and Regulatory Applications Div. 6413.

Fred joined the Labs in January 1980 as a member of the Nuclear Fuel Cycle Systems Safety Division, where he worked on NRC-sponsored probabilistic system analyses and accident-progression analyses for commercial nuclear power plants. He was project manager for the accident-frequency analysis program supporting the NRC's Reactor Risk Reference Document. In 1987, he transferred to the division he now heads.

He was project leader for the accident-progression analysis supporting NRC's Severe Accident Risks: An Assessment for Five US Nuclear Power Plants. Fred is a US delegate to the Organization for Economic Cooperation and Development, and is a member of the Principal Working Group on Probabilistic Risk Assessment for that organization's Committee on the Safety of Nuclear Installations.

He has a BA in physics from Yale University and an MS in nuclear engineering from the University of Virginia and is currently working on a doctoral dissertation at UNM. He's a member of the American Physical Society.

Fred enjoys rugby, triathlons, and scuba diving. He and his wife Donna have three children and live in the NE Heights.

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HARRIET MORGAN to supervisor of Personnel and General Employment Div. 3533.

Harriet joined Sandia in August 1984 as a member of the Staff Recruiting and Employment Division, where she coordinated the Technical Institute Recruiting and Employment (STA and TA employees), One-Year-On-Campus, and Specialized Engineering Development programs. She was project leader for developing the New Employee Orientation program.

In March 1987, she became Personnel Representative for Orgs. 100, 400, and 3000. In January 1990, she joined the Equal Employment Opportunity and Affirmative Action Department as an Educational Outreach Specialist, a new position designed to support Sandia's new educational outreach initiatives.

Harriet has a BA in English and secondary education, an MA in guidance and counseling, and an Education Specialist Certificate in educational administration, all from UNM. Before joining Sandia, she was an administrator in the Albuquerque School System and taught courses at UNM. She

has trained Loaned Executives for United Way and has served on several community agency boards.

She enjoys skiing and boating. Harriet and her husband Alan have two children and live in NE Albuquerque

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DONALD TIPTON (DMTS) to supervisor of Trident II Arming, Fuzing, and Firing Div. 5151.

Since joining Sandia in February 1960, Don has worked in weapon development. Assignments included projects for the B36 and B39 strategic bombs and designing arming and fuzing systems for test devices for the Dominic atmospheric test series and for an anti-satellite system using the Thor missile at Johnston Island. He also worked on Sandia's test readiness program, including development of test vehicles.

He was electrical project leader for developing an arming, fuzing, and firing (AF&F) assembly for the Navy Mk4 reentry body. Don also worked on advanced fuzing projects, including Phase 2 and 2A design studies of warhead and fuzing system for a Navy Mk500, fuzing studies for the MX missile, and Phase 1 and 2 studies of a warhead and integrated AF&F assembly for the Navy Mk5. He was electrical project leader for developing an AF&F for the W88/Mk5 and for the Phase 2A design study of a warhead for the Army's Follow-On-To-Lance program.

Don has an AA in science from NE Oklahoma A&M Junior College and a BS and MS in electrical engineering from Oklahoma State University. He is a Registered Professional Engineer and retired Naval Reserve commander.

He enjoys woodworking, fishing, and hiking. Don and his wife Mary Lou live in the NE Heights. They have four children.

## Take Note

Ken Frazier (3161) was recently selected for membership in Sigma Xi, the Scientific Research Society of America. Initiation will be held on April 28 at UNM. Ken's the author of several science books, including *Solar System*, *Our Turbulent Sun*, and *The Violent Force of Nature*.

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A paper by Beth Richards (6223), Jay Chamberlin, and Eldon Boes (both 6221), "Recent Progress in Photovoltaic Concentrator Module Technology," was named best technical paper at the 19th Annual Conference of the American Solar Energy Society on March 19-22 in Austin, Tex. Beth presented the paper.

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Richard Rays, President and Chief Executive Officer of Sandia Laboratory Federal Credit Union, was recently named one of the nation's 100 best credit union CEOs by the Cardwell Group. The Westlake, Ohio, human resource consulting firm that specializes in the credit union industry announced the award after surveying top credit union CEOs nationwide.

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Jack Jackson (9241) will be the guest speaker at an Armed Forces Communications and Electronics Assn. luncheon April 25 at the Kirtland Officers Club East at 11:30 a.m. The luncheon topic is INF Treaty Verification. Jack will make a color-picture presentation about the Soviet way of life. For more information, contact Lt. Col. Alan Jost on 4-9421.



# Feed Back

*Q. It seems to me that it would be much cheaper and more efficient to reprint the entire Sandia telephone directory once a month than to send out change pages. Paper and in-house printing must surely be less expensive than the time it takes each employee to put inserts into the telephone directory.*

A. Reprinting the entire Sandia telephone directory on a monthly basis — instead of sending change pages — is currently being considered, along with other improvements such as different page formats and a corporate data base. While the positive aspects of a monthly issue of the telephone book are apparent, directory page divisions would require one FTE as compared to the current process, which requires a half FTE. Additionally, printing 10,500 complete copies each month would increase costs dramatically.

Herb Pitts — 3100

*Q. Why do we dispose of the "banker's boxes" used during personnel moves, rather than attempting to use them several times over? At \$1.90 each, it seems that a central collection/issue point would be a more businesslike approach.*

A. As a matter of fact, what you're suggesting is the way we do business. Employees anticipating a move may obtain the "banker's boxes" in one of two ways. They may order new boxes through Just-in-Time, or they can call Transportation Services on 4-8048 for used ones. After they move and unpack, they should call Transportation Services to have the used boxes picked up for re-issue.

Jim Martin — 3400

*Q. Sandia appears to be heading for "corporate gridlock" because of the amount of time consumed by meetings at all staff levels. While the majority are necessary, there are many meetings with inadequately defined agendas, too many attendees, and other problems that lead to excessive time being spent. Perhaps a form to be filled out ahead of time when a conference room is reserved would help. Such a form could include a listing of*

*the meeting purpose, agenda, attendees, and predicted total meeting time. Because nobody loves paperwork, this might force more thought to be given to organizing the event ahead of time.*

A. Meetings with poorly defined agendas and prolonged discussions are frustrating for everyone. Ideally, meetings should be planned far enough in advance for the organizer to provide all attendees with background information, a copy of the agenda, and an estimated time frame for the meeting. Unfortunately, some meetings must be called on short notice; under those circumstances, a scheduling form would not increase meeting efficiency.

Requiring the use of a form to reserve conference rooms might encourage some organizers to give more thought to planning meetings; however, this requirement would place an additional burden on those persons who already organize meetings well, as well as the persons responsible for scheduling conference rooms. Also, the use of a form would probably increase the time necessary to schedule conference rooms because forms would have to be routed — and resubmitted when the requested room is already booked.

Attendees can encourage better organization of meetings by making the organizer aware of their needs. If an agenda or time frame is not provided, a call to the organizer would serve as a reminder of the need to make efficient use of other employees' time.

Paul Stanford — 100

*Q. I almost had my car door removed this morning by a "helpful" type as he cut a corner hard in order to angle into the parking slot next to me — after driving the wrong way down the lanes in the lot south of Bldg. 823. A couple of years ago, I was asked to shoulder some of the responsibility in such a situation by pointing out the other person's erroneous ways. This solution doesn't work*

*well; people get positively belligerent if they're told about driving the wrong way in one-way traffic lanes. All it would take is a guard in uniform who's walking in the lot and handing out a few tickets to end this unsafe practice.*

A. We do not routinely patrol parking lots because of manpower limitations and higher-priority security duties. That doesn't mean we're not interested, however. When there are situations such as you describe involving actions considered to be unsafe, hazardous, and/or illegal within the parking lots or on Sandia property, you should avoid confrontations with the offender and report the incident (time, location, and offender's license number) to the Traffic Enforcement Section on 4-6410 or 4-8902. The Section will then contact the individual(s) and correct the situation as appropriate without identifying the complainant.

Jim Martin — 3400

*Q. The Feedback response about rodent control published in the LAB NEWS several months ago mentioned that glue boards are available to trap rodents. I'm asking that Sandia not use glue boards to trap an animal. It's not too difficult to imagine the struggle, fear, panic, and frustration of an animal caught on a glue board. If what the writer calls vermin need to be eliminated, I'm asking that it be done as humanely as possible.*

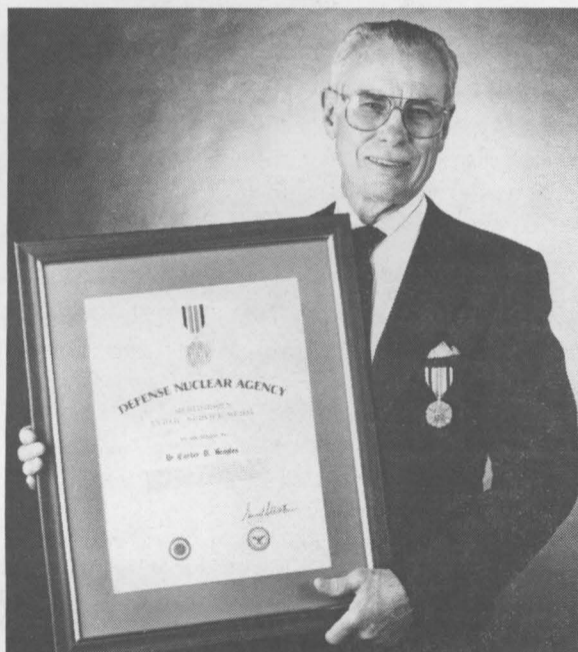
A. Glue boards are used only as a last resort for mice control, and only upon specific request to Telecon or to Marty Peterson (7816). Please direct your concerns to Marty on 4-2491.

Nestor Ortiz — 3200

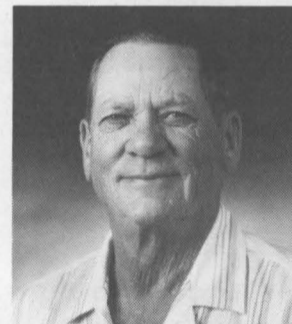
## Sympathy

To George Tucker (3212) on the death of his mother in Winter Haven, Fla., April 1.

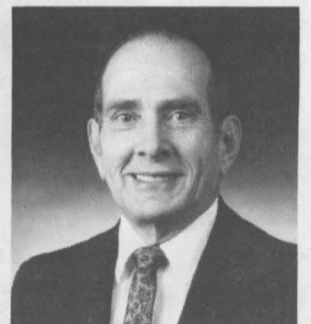
## Recent Retirees



CARTER BROYLES, who retired last fall as Director of Field Engineering, received the Defense Nuclear Agency's Meritorious Public Service Medal last month for "his exceptionally meritorious service over a long and prominent career in research, management and direct support to the nuclear weapon effects testing program" of the DNA. The citation, signed by Maj. Gen. Gerald Watson, USA, Director of DNA, further noted that Carter was directly responsible for the start of the program for analysis of the vulnerability of DoD weapon system components to nuclear effects. Carter retired after 37 years at Sandia — all in the testing program.



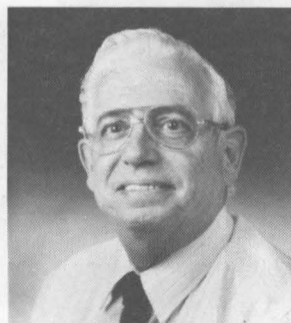
B. D. McConnell  
(7812) 41



Alfred Winblad  
(5211) 37



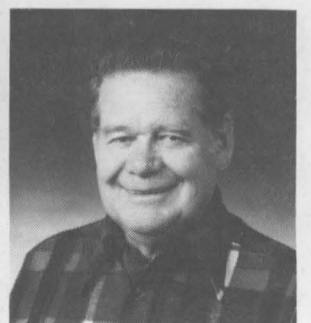
James Clark  
(6215) 30



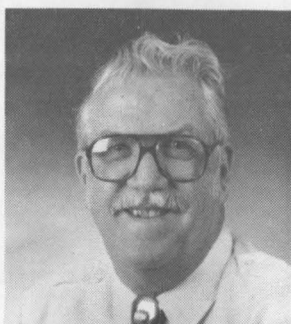
B. S. Gardiner  
(7411) 36



Sally Dyer  
(152) 32



Orval Talley  
(7414) 32



Harold Myers  
(7243) 37



Albert Tucker  
(5213) 37



Dale Buchanan  
(5222) 32



James Lang  
(5153) 38



# MILEPOSTS

## LAB NEWS

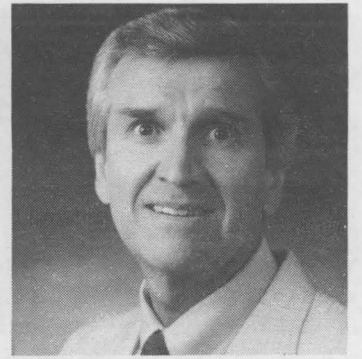
April 1990



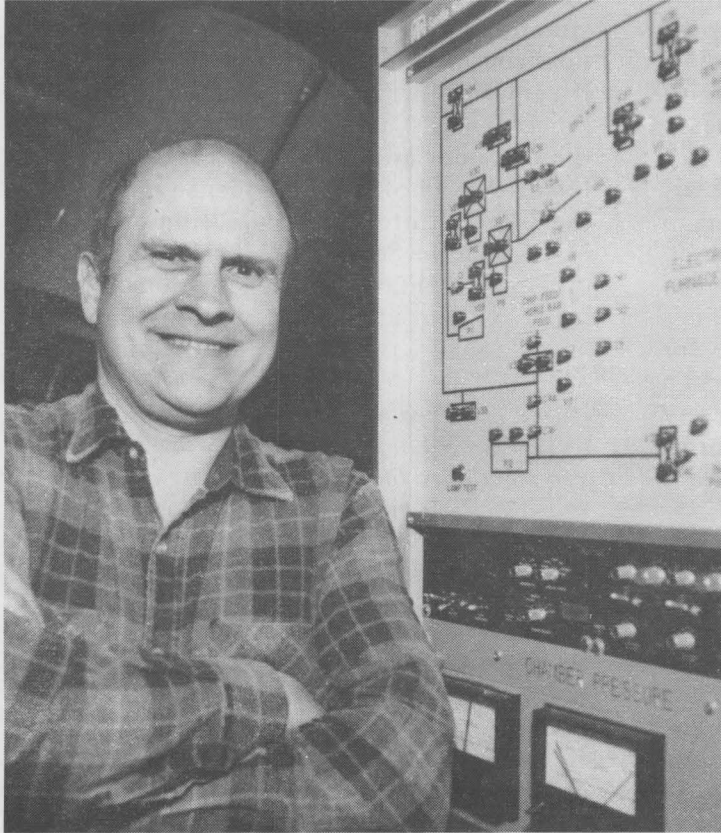
Lee Garner  
3151 25



Robert O'Nan  
2346 35



Rolyn Baack  
7265 30



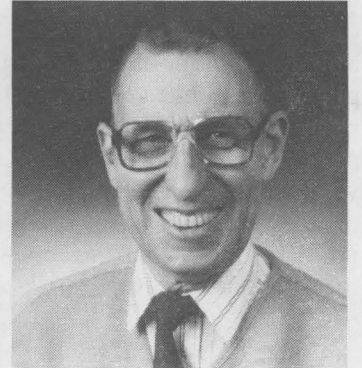
Bob Fisher (1833) 25



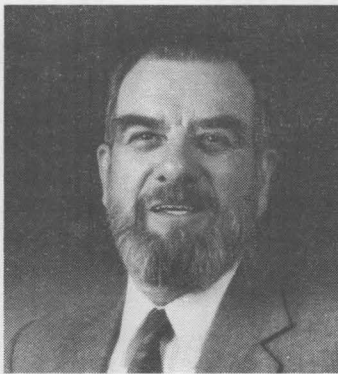
William Burnett  
3210 30



James Hanlon  
2552 25



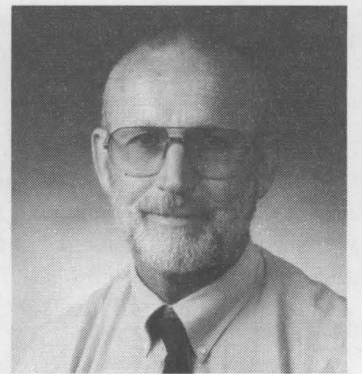
Leonard Flesner  
5113 35



Marvin Taylor  
7213 20



Donald Cox  
6516 35



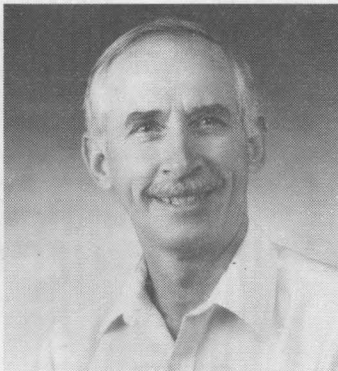
Eric Jones  
1143 25



Bob Leslie  
7265 35



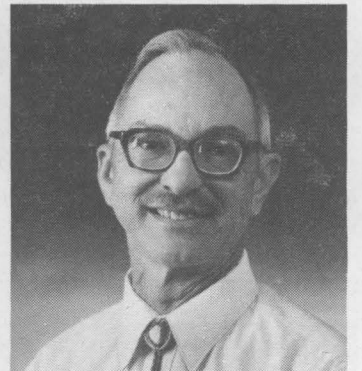
Bonnie Vigil  
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Charles McCarty  
2171 30



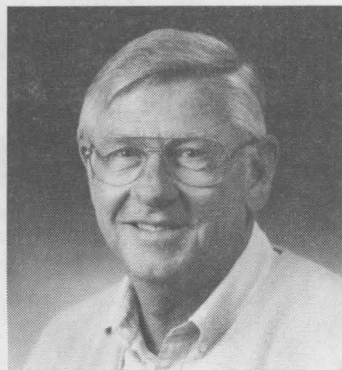
Raymond Bland  
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Charles Daniel  
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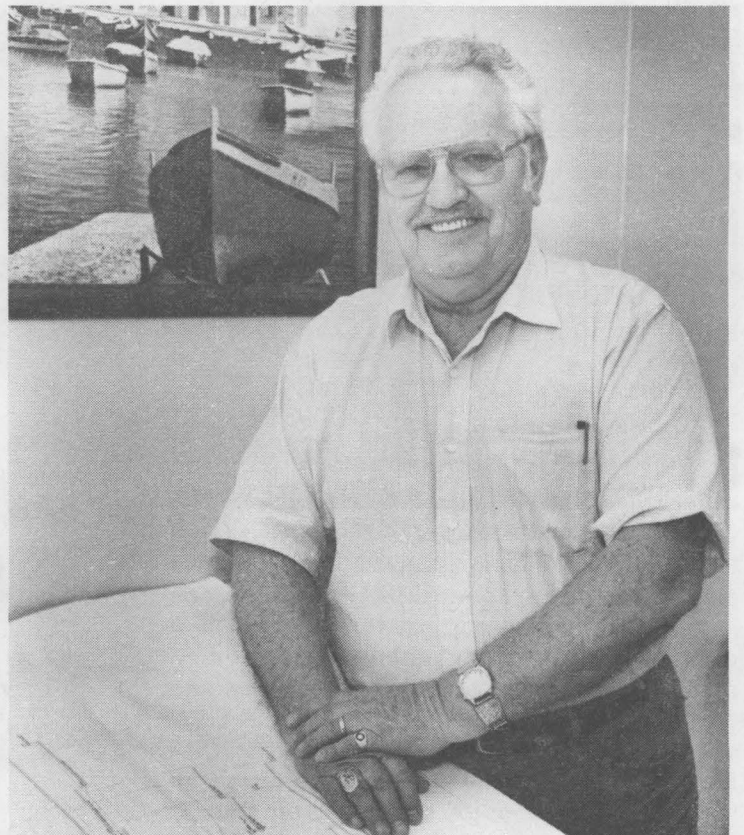
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Paul Seward  
9334 35



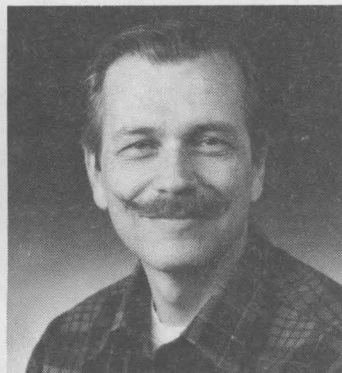
Howard Stuart  
7212 35



James Hann (6318) 40



Marlin Aker  
7842 30



David Straub  
7234 20



Glenn Kuswa  
1272 20



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**

CRAFTSMAN 10" TABLE SAW, w/accessories, \$350; 6" jointer, \$300; 12" band saw, \$175; 5-gal. Jerry can, \$10. Klafke, 292-5349.

DP OCTAGYM, \$80; Vetta bike trainer, \$100; Technics component stereo, w/cabinet, \$250. Johnson, 899-8410.

PRINCESS HOUSE CRYSTAL (never used): luncheon dishes, 4-place setting, \$20/setting; chip and dip set, \$30; salad bowl, \$20. Apodaca, 247-8101 leave message.

APPLE IIc, additional 5.25 drive, color monitor, mouse, joystick, \$600. Josephson, 299-9495 after 5.

PLASTIC BED LINER for LWB pickup, \$60 OBO. Liguori, 256-3613.

SUPER-SINGLE WATER BED, w/all accessories, will trade for regular single bed. Baca, 881-4184.

GIFT CERTIFICATE, for \$500 at Scandinavian Interiors Furniture. Palmquist, 281-5951.

WATER CONDITIONER, Culligan 3200-grain unit, \$250. Schmidt, 867-5989.

TWO ALUMINUM SCREEN DOORS, less frames, 32" x 80" and 30" x 80", \$5/ea. Denish, 256-1559.

DOUBLE-SIZE MATTRESS and box spring, \$100; full-size sofa sleeper, \$100; Kirby vacuum cleaner, \$100. Chavez, 298-1649.

FLY-FISHING REEL, Hardy Prince, 5/6 w/extra spool, S.A. Supreme WF-5-F and Cortland 444 Nymph-Tip WF-5-F lines included, \$175. Adams, 821-9079.

UTILITY TRAILER (long/wide truck bed), w/radial tires mounted on 8" x 15" rims, spare tire, wired, primed, best offer. Snelling, 294-5751.

WELLER SOLDERING GUN, \$10; thermal-type wire stripper, \$10. Davie, 296-3950.

RIFLE, Savage Springfield 30-06, \$190. Adams, 821-9079.

LAPTOP COMPUTER, Toshiba T1000, w/Targus carrying case, \$575; WordPerfect Executive program, \$50. Flesner, 265-2136.

CRAFTSMAN PUSH LAWN MOWER, \$5; Hyden software for SAT score improvement, \$5. Hall, 298-8617.

GATE CHAIN-LINK, spans approx. 12', each piece 45" H x 69" long. Hole, 255-1444.

ELECTRIC TYPEWRITER, Olivetti Lexicon 83 Deluxe portable, w/interchangeable typing element, ribbon cartridge, \$99. Behar, 831-5621.

CLOTHES DRYER, electric, \$35; digitizer tablet, new, \$200; Xerox LQ printer, \$180. Ginn, 883-0004.

IBM COMPUTER, 640K, two 360K floppies, Herc board, mono-green monitor, keyboard, \$550. Pace, 299-5036.

SOFA SLEEPER, queen-size, brown tweed, bed never used, \$275 OBO. Strascina, 299-2285.

STEREO CABINET, Scandinavian-style, teak veneer, 46" L x 19" D x 28" H, never used, \$160. Sedlacek, 256-3119.

ROLAND DIGITAL RECORDER, for Roland Juno-60 or Jupiter-8 keyboard; dual gas wall heater, w/thermostat and blower. Gonzales, 344-4933.

LAWN MOWER, Sears Craftsman, electric start, 5.0-reserve power, 22" cut, 4-spd. front drive, used 1 summer, \$350. Maldonado, 821-5041.

THREE DRAPERY RODS, copper, 42" long. Wagner, 823-9323.

AMIGA 5.25" DISK DRIVE, can be used with Transformer software for IBM compatibility or as additional AmigaDOS drive, \$75. Zoss, 822-0816.

ULTRASONIC HUMIDIFIER, w/separate humidistat and output controls, \$20. Hansche, 281-5623.

SOHMER STUDIO PIANO. Chapel, 828-0622.

HOLTON COLLEGIATE TRUMPET, locking case, cleaning supplies, \$280 OBO. Spangler, 293-5091.

SABLE FERRET, female, 3 months old, de-scented, has all shots, \$100 OBO. Brooks, 884-5958.

SOFA SLEEPER, double-size, earth tones; king-size water bed, waveless mattress, \$125; queen-size water bed, regular mattress, \$90. Portman, 266-7648.

FREE RIVER ROCK, approx. 6", will help you load, you haul. Wright, 836-6729.

ZEFAL BICYCLE PUMP, fits large-frame bicycles, high-pressure model, \$10. Montoya, 296-4268.

VCR CAMERA, RCA CC011, zoom lens, Newvicon tube, w/case, \$700. Winokur, 821-6866.

QUEEN-SIZE FUTON MATTRESS, used 2 months, cost \$200, sell for \$150. Tapia, 299-1941.

QUICKEN SOFTWARE, Version 3, new, never used, 3.5" disk, \$25. Schroeder, 296-1011.

COMPAQ PORTABLE II PC, 2 floppies, 40-meg. hard drive, wide-carriage Epson LQ 1000 printer, \$1900. Chou, 294-4213.

CAMCORDER, Zenith VM 6180, soft case, cleaning kit, in box, used 3 times, \$700 OBO. Golightly, 293-5987.

DINING ROOM SET, 6 chairs, dark wood, \$150; microwave cart, white, light-colored wood trim, \$130; TV cart, \$15. Hietala, 296-3287.

SONY BETAMAX SL2710, in original carton, used one month, \$300 OBO. Click, 883-6649 after 6.

NORDICTRACK SKI MACHINE, \$325. Gropper, 293-0586 after 5.

CEMENT MIXER, 6 cu. ft., electric motor, used twice, \$250. Spatz, 299-0410.

PARAGON AA99B KILN, 3 heated collars, 5 blank collars, kiln sitter timer, \$1400. Lewandowski, 892-7311.

SHOP MANUAL, parts, for '77 Datsun pickup, free; bumper- and roof-style bicycle racks, \$20 and \$40; garden spreader, 20", \$15. Joseph, 299-6989.

TWO MINIATURE DACHSHUNDS, AKC-registered, black & tan, 1 yr. old, \$200 ea. OBO. Dubois, 881-3026.

CRAFTSMAN RADIAL ARM SAW, 10", \$225 firm. Caton, 281-9420.

FOLD-DOWN CAMPER, '88 Jayco 1206, sleeps 6, queen-size bed, carry-out stove, brakes, awning, \$4200. Whitley, 865-4390.

TRAMPOLINE, 6 x 12 heavy frame, new mat & springs, \$250; bathtub, steel/enamel, tan, w/faucet, \$50. Lachenmeyer, 268-7818.

'65 AIRSTREAM TRAVEL TRAILER, 17', self-contained, w/AC, \$2750. Carter, 821-6383.

ALTO SAXOPHONE, Vito, \$250. Gallejos, 867-6284.

FRONT BUMPER, for '84-'88 Toyota 4-Runner or pickup, complete w/end caps & mounting brackets, \$90. Gerwin, 881-0028.

RIFLE, Browning "T-bolt" T2, .22-cal., 24" barrel, figured walnut stock, w/Redfield 2-3/4 scope, \$250. Parks, 884-7475.

SOFA & LOVE SEAT, golden brown, \$150; chest freezer, \$200; bar refrigerator, \$50; 2 matching bar stools, \$40/ea. Stevenson, 299-3510.

FORD 5-LUG WHITE SPOKE-WHEEL SET, mounted, balanced 235-75R-15 tires, \$150 OBO; 4 M/S 235-R-

75-15 tires, \$24/ea. OBO. Gorman, 291-0009.

KIMBALL BABY GRAND PIANO; console television; percussion equipment (drum heads, etc.); Wurlitzer organ; piano and organ music. Purdue, 256-0802.

WORD-PROCESSING TYPEWRITER, Brother AX-28, \$150; Smith-Corona electric typewriter, \$20; yogurt maker, \$10; Weed Eater trimmer, 8", \$20. Clark, 281-1243.

TWO TANDY TRS80 COMPUTERS, models 4 & 4P, \$200/ea.; free software; walnut computer center, w/hutch 49" W x 70" H, \$75. Burstein, 821-6688.

UPRIGHT PIANO, w/bench, recently tuned. Vancil, 299-7211.

TEAK TWIN-SIZE BED, w/drawers, mattress, \$90. Rejent, 299-1518.

SPERRY XT-COMPATIBLE COMPUTER, 640K RAM, 20-meg. hard drive, 360K floppy, monochrome monitor, printer, software, manuals, \$700. Smith, 293-8928.

TWO FIRESTONE RADIAL TIRES, 155xR13, \$10/ea.; 2 mahogany end tables, table lamps, wine table, La-Z-Boy swivel rocker, Early American sofa. Tremi, 292-9219.

GLASS-TOP TABLE w/4 chairs, \$75; woven woods, 72" x 40", \$25; Madame Alexander dolls, in boxes. Morris, 292-5112.

CENTURY PLANTS, locally grown, from 7" to 20" diameter, \$5-\$25. Bando, 292-2452.

BEDROOM FURNITURE: queen-size mattresses, frame, headboard, dresser, 2 mirrors, 2 nightstands, lamp, 2 pictures, chair, \$500. Dipold, 821-5750.

LANDSCAPING PLANTS: fruitless mulberry trees, \$10; juniper, privet, other shrubs, \$2; you dig, you take. Baldwin, 822-1860.

GARAGE SALE: 20 families, April 28 & 29, 8 a.m.-4 p.m., cash only, 13106 Bear Dancer NE (SE of Tramway & Menaul). Hendrick, 296-2163.

KITCHEN TABLE, w/leaf, 4 chairs, \$100; ceiling-mount kitchen light, 3 glass globes, oak base, \$40. Shrouf, 821-0765.

QUEEN-SIZE MATTRESS and box spring, \$50; 155 skis and size 6-1/2 boots, \$50. Trellue, 292-7369.

CHEST OF DRAWERS, king-size sheets, wooden patio tables, rocking chair, "Big Wheel," crib, utility shelving, toaster, kids' clothes. Levan, 293-0079.

BARBECUE GRILL, \$25; GMC rim set, 6-hole, 15", w/caps, \$30/four. Zirzow, 281-9896.

VACUUM, as is, needs belt, \$15. Doran, 299-2635.

**TRANSPORTATION**

'86 GMC S-15 JIMMY, 4x4, V-6, AC, 48K miles, stereo cassette, more, \$7500 OBO. Johnson, 899-8410.

'76 CHEV. PICKUP, 1/2-ton, 79.9K miles, new paint, 4-spd., PS, 2 tanks, \$3200. Lackey, 869-9333.

'83 PONTIAC 6000LE, 4-dr., 51K miles, \$4175 NADA, sell for \$3975. Mirabal, 296-5222.

'75 MGB, 46.5K miles, \$2900. Merillat, 294-8546 or 821-3699.

ALUMINUM BOAT, 15', closed bow, 35-hp Johnson, w/trailer, \$1200. Gibson, 344-8056.

'85 CHEV. CAVALIER CS, 4-cyl., 4-dr., AT, PS, PB, AC, tilt, tape, \$3400. Paul, 299-6387.

'87 CHEV. S-10 PICKUP, Tahoe package, V-6, AT, PS, PB, tilt, cruise, two-tone, \$6300. Forster, 897-2436.

'73 NOVA, 2-dr., 46K miles, AC, PS, AM/FM cassette, \$2500. Klafke, 292-5349.

'83 CHEV. CONVERSION VAN (by Roman Wheels), AC front & back, PW, PL, CB, new tires, \$8000 OBO. Jaramillo, 898-3168.

'81 TOYOTA CELICA HATCHBACK, loaded, original owner, 31/28 mpg, \$2300. Tebo, 296-4964 leave message.

HOBIE CATAMARAN, 16', w/trailer, sails, trapeze, \$1345. Burchard, 884-5424.

MAN'S NISHIKI BICYCLE, 23", maroon, Oly. 12-spd., 27" wheel, toe clips, brake levers, thorn-proof

tires. Beasley, 298-3398.

MOTORCYCLES: '83 Yamaha XJ900, 13K miles; '87 Yamaha YZ490, adult-owned and maintained. Wright, 296-3850.

'87 PONTIAC GRAND AM LE, 2-dr., V-6, AT, all power options, 42K miles, \$8000. Spangler, 293-5091.

'88 BMW K100 LT MOTORCYCLE, 4K miles, fully equipped, \$7600. Oatley, 821-6801.

SCHWINN BOY'S BICYCLE, 16", red Pixie, w/training wheels, \$75 OBO. Winokur, 821-6866.

'79 AUDI 5000, 5-spd., one owner, \$1700. Shepard, 898-9217.

'79 CAMARO Z28, 350, new paint & tires, rebuilt engine, \$2400; '68 Chev. El Camino, \$4200 OBO. Dubois, 869-3447.

'84 CORVETTE, Delco Bose stereo system, \$13,000; '85 Mallard MMH, 26', AC, awning, \$20,500. Pullen, 291-0666.

'86 MAZDA RX7, loaded, 33K miles, \$9500 OBO. Mulryan, 296-3628.

'82 MAZDA GLC, 4-dr. sedan, new tires, 80K miles, one owner, below book. Shortencarier, 293-8053.

'72 DODGE DART SWINGER, 318 V-8, AC, PS, AT, 107K miles, original owner. Werling, 298-5842.

'84 HONDA PRELUDE, 5-spd., AC, 83K miles, one owner, \$6000. Granoff, 345-0711 after 6.

'89 JEEP COMANCHE, long bed, AC, red, bought new Jan. '90, extended 7-yr. warranty, 1.9K miles, \$8900. Convissor, 828-2137.

'84 PONTIAC FIERO, 2-dr., 4-spd., 58K miles, white, AM/FM, PB, PW, tinted windows, AC, 4-cyl., sunroof, \$3375 NADA, sell for \$2800. Hernandez, 268-5000.

'82 CHEV. CITATION, hatchback, one owner, AT, PS, PB, AC, AM/FM radio, tilt, 68K miles, \$1200. Bryant, 298-6353.

'79 PORSCHE 911 SC TARGA, \$15,500 or make offer. Roberts, 299-5671.

'89 PONTIAC SUNBIRD LE, 4-cyl., 5-spd., 5.6K miles, \$8500. Weatherbee, 869-2849.

'77 RAMCHARGER, AM/FM cassette, new carpet, PS, PB, AT, burgundy/white, \$3200 OBO. Schaub, 345-2862.

'80 PLYMOUTH ARROW, hatchback, 2.6L, 5-spd., sunroof, stereo, PB, original owner, 78K miles, \$1350 OBO. Swahlan, 292-3598.

'89 JEEP WRANGLER, 6-cyl., White Islander package, 9K miles, \$1400 below blue book, \$10,500 or \$5000 and assume loan. Goodwin, 294-6702.

'81 TRUCK & CAMPER, 305, 1/2-ton, 82K miles, 8' camper sleeps 4, extras, \$4950. Padilla, 831-3500.

'90 FORD RANGER XLT, AM/FM cassette, bed liner, custom interior, extras, \$9800 firm. Tessler, 293-5628 leave message.

'75 CHEV. BLAZER, 4x4, rebuilt engine & transmission, AT, needs work, \$1700 OBO. Gorman, 292-7119.

'87 FORD CROWN VICTORIA SW, 62K miles, 5.0L, AC, cruise, PS, AM/FM cassette, \$5600. Coleman, 883-7498.

PEUGEOT 10-SPD. TOURING CYCLE, toe clips, new tires, rear rack, \$150. Clark, 281-1243.

'83 CHEV. SILVERADO PICKUP, 3/4-ton diesel, 47K miles, w/22-1/2" 5th-wheel camper, '79 NU-WA. King, 255-6683.

'57 WILLYS UTILITY WAGON, 4-WD, 12V electrical, reclining bucket seats, new Ford 302 V-8, Saginaw 4-spd., and 23-gal. tank, \$5700. Grafe, 271-0136.

REPO: '85 Chrysler 5th Ave. sedan, vinyl top, AT, 68.3K miles, bids accepted through April 30, we reserve the right to refuse all bids, subject to prior sale. Sandia Lab FCU, 293-0500.

TWO BICYCLES: 19" Centurion 10-spd.; Nishiki 23" 12-spd.; w/extras, \$150/ea. Zurzolo, 898-1175.

'89 MERCURY GRAND MARQUIS GS, 4K miles, all options, \$14,500. Garrison, 881-1851.

'73 PORSCHE 911T TARGA, black, 2.4E engine, \$9900. Kehli, 897-7964.

'85 RALLYE MOTOR HOME, 26', 21K

miles, extras, \$22,000. Hansche, 255-2878.

'89 CHEV. 4x4, 21K miles, AM/FM cassette, \$12,500. Portman, 293-3524.

'85 PRELUDE, 55K miles, alloy wheels, fog lamps, AC, timing belt, water pump, master cylinder, tires, \$6900. Kunz, 296-1023.

BICYCLES: boy's Nishiki, 10-spd., 20" frame, blue, \$70 OBO; Mongoose BMX, 20" wheels, silver, \$80 OBO. Schroeder, 296-1011.

'82 FORD EXPLORER, yellow, PS, PB, 4-spd., 55K miles, bra, \$1895. Zirzow, 281-9896.

'85 TOYOTA LANDCRUISER, 4-WD, AC, cruise, stereo, \$9300. Spires, 275-3655.

**REAL ESTATE**

3-BDR. CUSTOM PUEBLO, Corrales, 2 baths, 2174 sq. ft., mountain & city views, 1 acre. Hays, 897-1335.

3-BDR. MOBILE HOME, 2 baths, in Four Hills park, \$16,800. Huff, 296-3349.

FOUR MOUNTAIN BUILDING LOTS: 3 acres, roads, power, 10 miles east of Tramway. Souder, 281-3121.

2-BDR. MOBILE HOME, double-wide, 2-car garage, on 2-1/2 acres near Moriarty, 1 mile from schools on paved road. Powell, 281-9570.

5-BDR. HOME, rec room, 2-3/4 baths, 2280 sq. ft., 2-car garage, UNM area, \$118,000. Arthur, 256-7359.

TOWNHOME, 13208 Executive Ridge NE, 9.5% FHA, no qualifying, no points, open Sat./Sun., 1-5 p.m. Roberts, 299-5671.

3-BDR. HOME, Belen, 2 baths, room for RV, 1795 sq. ft., vanpool available to Sandia, \$99,900. Jortner, 821-9684.

3-BDR. HOME, Towne Park, 2 baths, double garage, 1300 sq. ft., assumable 9% FHA, \$83,000. Depoy, 291-0576.

3-BDR. HOUSE, NE, 1-3/4 baths, 1 block from Hawthorne Elementary School, 2 blocks from Los Altos Golf Course. Cochrell, 298-2068.

3-BDR. HOME, 1-3/4 baths, great room, custom cabinets, solar heat, landscaped, 9.5% FHA assumable, Lomas/Tramway area, \$86,900. Akau, 293-7085.

2 ACRES+, S-14, open meadow area, covenants, power, water, \$22,000. Witkowski, 299-6402.

**WANTED**

LOGO SOFTWARE PACKAGE, for Apple IIe computer. Stevens, 293-5704.

BOXES AND PACKING MATERIALS, will buy large-size boxes and foam, bubble wrap, "peanuts," etc., needed on continuing basis. Davie, 296-3950.

TO BUY OR BORROW: *The Specialist* (humorous essay) by Charles (Chick) Sales. Lambert, 293-8825.

TWIN-SIZE BED, w/mattress, box spring, frame w/casters. Lewin, 898-2303.

POP-UP TRAVEL TRAILER, in good condition. Palmquist, 281-5951.

FISHER-PRICE CAR SEAT, in good condition. Coleman, 883-7498.

**LOST AND FOUND**

LOST: Public Library book, *Weatherhawk*, left by CU-Anytime ATM at Bldg. 861. Clough, 897-1539.

**SHARE-A-RIDE**

VANPOOL SEATS AVAILABLE, full- and part-time, from Santa Fe to Albuquerque and Sandia. Hawthorne, 1-471-0448.

CARPPOOL DESIRED, from N-217 and old 66 area, nonsmokers only. Zirzow, 281-9896.





**Coronado Club Activities**

# Head for El Rancho Coronado For a Good Ol' Country/Western Hoedown

"BACK AT THE RANCH" is back at the C-Club tonight to provide four hours of c/w music for your dancing pleasure — 8 p.m. to midnight. Beforehand, enjoy some choice chow-line specials: prime rib or fried shrimp (both \$7.95). Dinner reservations recommended (265-6791).

IF YOU LOVE TO FLY and never want to grow up, the Family Matinee April 22 (this Sunday) should suit you to a tee. The Walt Disney classic, "Peter Pan," lights up the big screen at 2 p.m.; as usual, movie admission is free. Ahead of time, enjoy reasonably priced people-pleasin' food for lunch, served from 1 on.

CATCHING THE STAGE FROM DOWN SOUTH next Friday night, April 27, are the well-known Isleta Poor Boys, who are booked to play their sagebrush-shuffle specialties from 8 p.m. to

midnight. The ranch hands in the kitchen are serving some pretty fancy trail fare — prime rib or poached halibut (both \$7.95). The Poor Boys always draw a crowd, so make that reservation early.

SUNDAY BRUNCH on April 29 from 10 a.m. to 2 p.m. features an added attraction — the C-Club's first annual Arts & Crafts Fair. If you'd like to exhibit your creative handiwork at the fair, call the Publicity Department on 265-6791. Brunch prices: \$5.95/adults, \$3.50/children 3 through 11, and free/kids under 3.

A WORD TO THE WISE — Pool/tennis season passes for this summer are available at 1989 prices (\$20/individual, \$40/couple, \$55/family of three, \$5/each additional dependent family member) if they're purchased on or before April 30. Starting May 1, this year's prices go into effect:

\$30, \$50, \$70, and \$10 for each of the above categories, respectively.

SPEAKING OF SWIMMING AND TENNIS, registration for lessons in both sports is scheduled Saturday, April 28, from 9 to 11 a.m. at the Club. Swimming-lesson categories (\$18) range from toddlers and preschool to competitive swimming. Tennis-lesson categories (\$25): beginner, advanced beginner, and intermediate. C-Club membership and pool passes — also available that day — are required before the purchase of swimming and tennis lessons.

T-BIRD CARD SHARKS (no connection with the UNLV coach) get together again for fun and games on April 26, starting at 10 a.m. Come on out for a great combination: convivial conversation, gratis goodies, and captivating card games.

## Events Calendar

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

April 20-21 — Albuquerque Founder's Day Celebration: Friday evening fund-raiser, auction, entertainment, and hors d'oeuvres; Saturday procession, live entertainment, more; Old Town Plaza, call for times, 243-3696.

April 20-21 — Gathering of the Nations Pow-Wow: dance competitions, arts and crafts, 5K run, 10K walk, Miss Indian World Contest, more; University Arena, call for times, 836-2810.

April 20-21 & 26-28 — "The Threepenny Opera," operetta in three acts by Bertolt Brecht, music by Kurt Weill, presented by the UNM Theatre Arts Dept.; 8 p.m., Rodey Theatre, 277-4401.

April 20-29 — "Phaedra," Jean Racine classic that tells the tale of a Greek goddess who comes to life, directed by Grubb Graebner; 8 p.m. Fri.-Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.

April 20-May 24 — Exhibit: "Sun Drawings," a 3-D architectural model of Washington, D.C.-based artist Janet Saad-Cook's Sun Drawing Project at the Very Large Array west of Magdalena, plus 25 Cibachrome photographs of sun observation sites in New Mexico and India; 9 a.m.-5 p.m. daily, New Mexico Museum of Natural History, 841-8837.

April 20-June 17 — Exhibit, "Twelve Artists From the German Democratic Republic," traveling exhibit of art from East Germany (lecture by Peter Selz, Professor Emeritus of Art History, University of California, and co-curator of exhibit, April 29, 2 p.m.); 9 a.m.-5 p.m. Tues.-Sun.; East Gallery, Albuquerque Museum, 242-4600.

April 21-25 — Exhibit: "Art of Albuquerque," contemporary art by 73 Albuquerque artists; 9 a.m.-5 p.m. Tues.-Sun.; West Gallery, Albuquerque Museum, 242-4600.

April 21 — 13th Annual Guest Artist Series: jazz, featuring piano/bass duet of Carla Bley and Steve Swallow and soprano saxophonist Steve Lacey, presented by the New Mexico Jazz Workshop; 8 p.m., KiMo Theatre, 255-9798.

April 21 — Earth Day Seminars: population control, resource use and consumption, growth-based economics, recycling and waste reduction, the greenhouse effect, ozone depletion, and acid rain; 10 a.m.-4 p.m., Rodey Theatre, free, 277-1714.

April 22 — Exhibit Opening: "Focus on Youth," Albuquerque Public Schools juried photography exhibition (3 p.m. awards ceremony in auditorium); 9 a.m.-5 p.m. Tues.-Sun.; Albuquerque Museum, 242-4600.

April 22 — Les Ballets Trockadero De Monte Carlo: playful, entertaining view of traditional, classical ballet in parody form; 8:15 p.m., Popejoy Hall, 277-3121.

April 22 — Earth Day 1990: sunrise observance at Elena Gallegos Picnic Area and Boca Negra Horse Complex starting at 6 a.m., followed by hikes in the surrounding areas, free, 873-6200; Earth Day Teach-In and Display, 2-4 p.m., San Gabriel Park, free, 277-3422; Earth Day Candlelight Ceremonies, 6:30 p.m., Old Town Plaza, 265-6346.

April 22 — Fine Arts Series: UNM Chamber Singers, conducted by John Clark; 3 p.m., First United Methodist Church (4th & Lead SW), 277-4402.

April 22 — Earth Day 1990: sunrise observance at Elena Gallegos Picnic Area and Boca Negra Horse Complex starting at 6 a.m., followed by hikes in the surrounding areas, free, 873-6200; Earth Day Teach-In and Display, 2-4 p.m., San Gabriel Park, free, 277-3422; Earth Day Candlelight Ceremonies, 6:30 p.m., Old Town Plaza, 265-6346.

April 24 — "Trees and Evergreens," class sponsored by the Council of Albuquerque Garden Clubs; 7 p.m., Albuquerque Garden Center (10120 Lomas NE), 296-6020.

April 27-28 — Big Band Salsa Extravaganza: Latin music in a big-band format featuring local band Caribe; 8 p.m., UNM Conference Center (1634 University NE), 277-6945.

April 27-29 — Spring Arts and Crafts Expo:

April 28-29 — A Celebration of Musical Theatre, tour of Broadway's greatest composers, featuring the Albuquerque Civic Light Opera and singers and dancers; 8:15 p.m., Popejoy Hall, 345-6577.

April 29 — Concert, Albuquerque Youth Symphony; 3 p.m., Popejoy Hall, 277-3121.

## Retiree Deaths

Jose Jojola (67) .....	March 2
Edward Rightley (68) .....	March 3
Dan Wood (80) .....	March 10
Stanley Krell (91) .....	March 13
Charles O'Keefe (77) .....	March 17



WORK EXPERIENCE TRAINEES Lucille Pedroncelli (3533, left) and Amy Lawhorn (3560) head for Minneapolis next week to attend the national Business Professionals of America conference April 28-30. They placed in the top five in statewide office skills competition (both in the administrative specialist category) last month and will represent New Mexico in national competition at the Minneapolis conference. Sandia's 12 work experience trainees — all high-school seniors — attend classes in the morning and work afternoons at the Labs, says Soila Brewer (3533), program coordinator. Lucille and Amy are seniors at Valley and Rio Grande high schools, respectively.

## feed liback

Q. Are there plans to put a Mardix booth by Gate 4? If yes, when? If no, why not?

A. Locating a Mardix booth at Gate 4 has been considered several times in the past. The number of Mardix booths that can be added to the Access Control System each year is limited, both by configuration of the system and the high cost of each installation. Therefore, priority locations must be determined on the basis of projected volume of use and type of traffic (pedestrian, bicycle, or motorized vehicle). To date, Gate 4 has not ranked high enough to be selected. It will again be evaluated as a potential location at our next review.

Jim Martin — 3400

## Fun & Games

Triathlon — The 14th Annual Triathlon of Albuquerque, which began under Coronado Club sponsorship back in the '70s, is scheduled for Sunday, April 29, on KAFB. Called the Jay Benson Memorial (Jay was a Sandia physicist), the Triathlon was the first of its kind in New Mexico and, probably, the Southwest. Entry forms are available at the LAB NEWS office in Bldg. 814.