



THE DOE/SANDIA VAWT (Vertical Axis Wind Turbine) Test Bed was dedicated last week in Bushland, Tex. Here, test engineer Bill Stephenson (6225) gazes up the windmill's 10-ft.-diam. vertical axis to the top of the 165-ft.-tall structure. The VAWT's two large, bowed aluminum blades — each spanning 183 feet — swing out from the column's axis; at their widest point, they are 110 feet (34 metres) apart. More information on Page Nine.

### Downhole Stress Measured

## Sandian Wins Technology Transfer Award

Flying off to the North Sea to work on an off-shore oil platform for several days at a time isn't your everyday method of transferring Sandia technology to the private sector. But that's the way Larry Teufel (6232) does it.

This week, Larry was recognized for that unique effort, and for his development of the technology he's transferring: a new technique — just as accurate and less expensive than other methods — that increases the efficiency of oil and gas recovery from hard-to-tap reservoirs. He received a Special Award for Excellence in Technology Transfer from the Federal Laboratory Consortium (FLC) in Washington, D. C.

The FLC presents only 30 of the awards each year; winners are selected from 300 nominations submitted by the 150 laboratories that are FLC members. The awards are based on (1) demonstration of "uncommon creativity and initiative in the transfer of technology," and (2) "significant benefits to private industry" as a result of technology transfer.

### Core Sample Analysis

The development for which Larry was recognized — an Anelastic Strain Recovery (ASR) measurement technique — provides a way to determine the direction and magnitude of *in situ* stresses occurring deep beneath the earth's surface in, say, an oil-producing formation. ASR centers on the analysis of core samples taken from wellbores.

Once brought to the surface, the samples (cylindrical sections of rock — removed by a coring bit) are no longer subject to the underground pressures — stresses — they previously experienced. However,



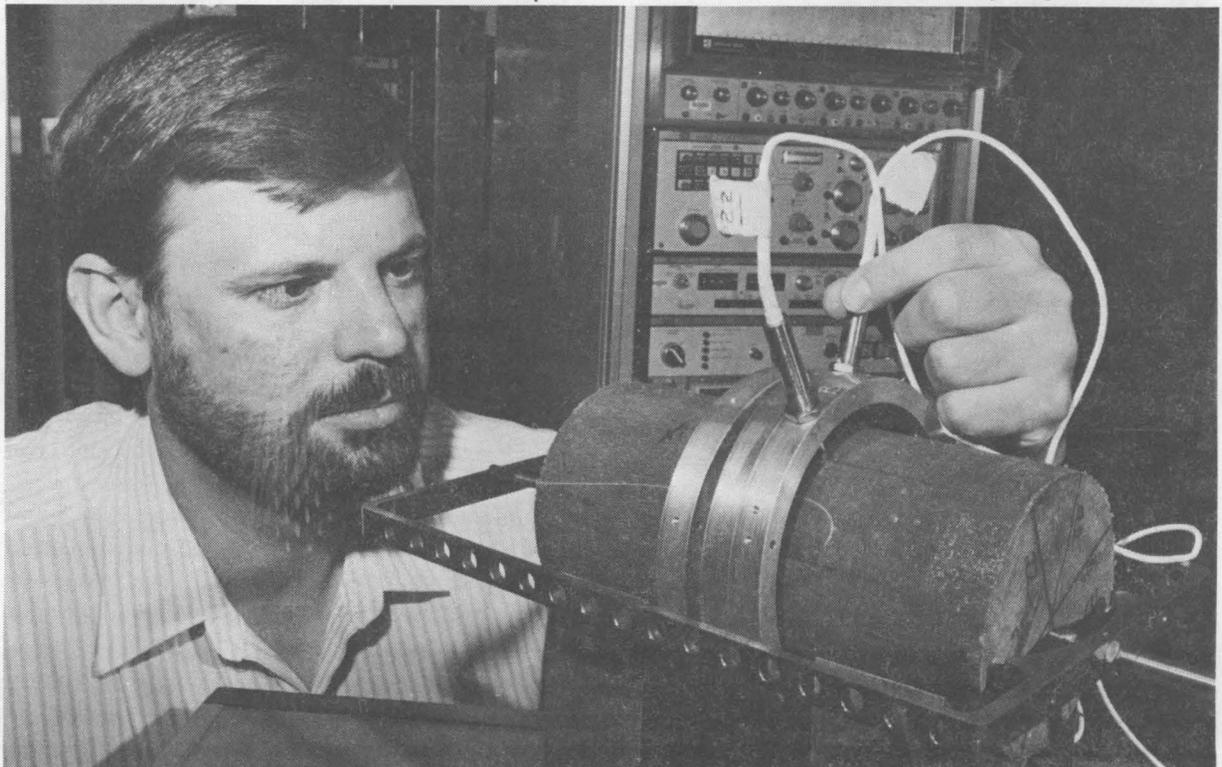
# LAB NEWS

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displacements — strains — in the sample that resulted from that underground stress don't immediately disappear; the relaxing (recovery) of this "anelastic strain" can continue for many hours.

It's during those hours that a special ASR tool is used to detect the smallest of movements — as small as one-millionth of an inch — in the sample.

The tool's support frames (displacement gauges), each of which holds a strain gauge to detect movement, are positioned on a core sample at different angles so that detailed 3-D strain readings can be obtained. (Mike McNamee and David Holcomb, both 6232, developed the displacement gauges used in the  
*(Continued on Page Eight)*)



LARRY TEUFEL (6232) adjusts a linear variable displacement transducer (LVDT) on the special ASR tool used to detect strain displacement movements in a core sample.

# Antojitos

**Texas-Sized Twister** -- The dedication of DOE's solar program's giant new vertical-axis wind turbine (VAWT) over in Bushland last week provided an opportunity for Donna Fitzpatrick, DOE's Asst. Secy. of Conservation and Renewable Energy, to focus some sunshine onto some often-clouded issues. "Solar isn't free," she pointed out. "You have to pay for the skill and the equipment needed to transform solar energy into a usable power source." She also attacked another widely held belief: "The 'small is beautiful' folk are not always correct [for example, in stating that every home should supply its solar-generated own power and heat] -- small can also be an economic pain in the neck."

\* \* \*

**Bend an Ear, Bikers Bold** -- Here's a letter to LAB NEWS you should read, and, if you detect you're its target, heed: "We ride bicycles (my husband and I). We're not fast, we're not very good, we're not very macho. We just ride to work in the spring, summer, and fall (we're fair-weather riders). We're 50 years young, and we need to stay healthy and in shape. We get intimidated by cars and trucks and anything bigger than we are.

"Should we therefore have to be intimidated by you, a fellow rider? There's enough out there that can get us without having to put up with you passing us with an inch to spare between us. Does it give you a thrill? It sure gives me one, but not a very pleasant one. Or how about when I'm riding just a few inches from the curb, no cars on the street -- and you still insist on passing on my right, between me and the curb? How exciting it must be to you! I just get plain scared. I hope it gives you the thrill you were seeking. How about passing on my left? With just a little bit of courtesy, you could call out like we do when we're passing a skier or a pedestrian or a fellow biker. Just a friendly 'On your left' (or right) would do. Even a 'get the f%&\*\$@ off the road' wouldn't upset us as much as your breathing down our necks as you go whizzing by. With us, a little courtesy and a friendly nod go a long way. We'll try to do the same for you (if we ever catch up with you)."

\* \* \*

**Strong Reprimand** Almost as bad as a nuclear physicist who can't pronounce nuclear (contrast "nu-cle-ar" and "nu-cu-lar") is a stationery company that can't spell stationery -- take a close look at the company name at the bottom of those ubiquitous (at SNLA) pink "While You Were Out" slips.

\* \* \*

**Yes, We Goof Too** -- I am now doing penance for having spelled two words wrong in our last issue by spelling them properly 10 times each: arsine phosphine (You're right, Pauline Ho, 1126.) (Boy, cut-and-paste keys make penance painless!)

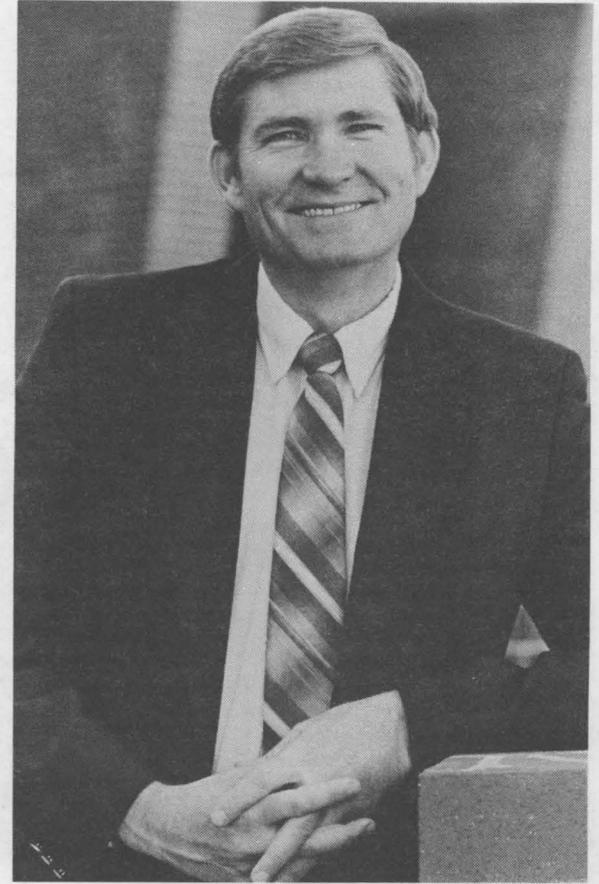
\* \* \*

**Current Favorite Sentence from SAND Report** -- "It would not be possible to obtain meaningful wind-response measurements during completely calm days." ●BH

\* \* \*

Con dinero hasta la mona baila. (With money, even the monkey dances.)

## Supervisory Appointment



THOMAS FERGUSON to supervisor of Systems Planning and Development Div. 2624, effective May 1.

Tom joined the Labs in October 1980 as a member of Div. 2624 when it was called Data Base Access Design. He's been in the same division through its various name and division number changes. His work has been in developing the Common Data Input and Retrieval System and the Administrative Network (ADNET).

He has a BBA in data processing from Eastern New Mexico University and an MA in management from New Mexico Highlands University.

Tom enjoys hunting, fishing, and other outdoor activities in his spare time. He and his wife Barbara have two children and live in the NE Heights.

## Sympathy

To Debbie Post (8431) on the death of her father in Seattle, April 9.

To Dave Stimmel (8144) on the death of his father in San Diego, April 17.

To Ray Baldonado (8446) on the death of his mother in Albuquerque, May 3.

## Take Note

Sandia retiree Martin Dieter's choral composition is one of two works by New Mexican composers to be presented during the Santa Fe Desert Chorale's Concert V, "Spanish Music and Native American Poetry." Martin's work is based on "Epitaph," a poem by Edna St. Vincent Millay. The Albuquerque performance is Aug. 19 at 8 p.m. in Keller Hall. For information on this and other Chorale season performances, call 1-988-7505.

\* \* \*

The Albuquerque Parliamentarian Unit is holding a community workshop at the Immanuel Presbyterian Church (114 Carlisle Blvd. SE) on May 21 from 9 a.m. to 3:30 p.m. for those who would like to learn how to streamline club or organization meetings, make correct motions and phrase them, conduct a meeting, plan a budget, present a financial report, take minutes, and serve as officers or on committees. Registered parliamentarians will serve as group leaders on the following topics: "The President and the Agenda," "Boards and Committees," "Bylaws and Minutes," "How to Handle Motions," and "Finances." Registration fee of \$25 includes materials approved by the National Association of Parliamentarians. For information, call 268-2820, 268-1210, or 256-7490.

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MAY RETIREES from Livermore: Louise Converse (8281) and Tom Devlin (8514).

## Bar Codes Mean Better Control of Secret Documents

Sandia Livermore's secret documents are now tracked and controlled by a centralized, on-line terminal system that uses bar-code labels to identify documents.

The system, known as the Livermore Document Accountability System (LDAS), was implemented Feb. 1. The 18-month project involved people representing information systems (IS), document control, security, and the station custodians who manage and account for secret and controlled documents, formal reports, viewgraphs, and slides.

According to IS project leader Emily Joiner (8525), LDAS users are enthusiastic about the new system. That's natural — it has not only produced better control over documents but has saved time for their custodians, a benefit not always realized by new computer systems. Emily credits much of the success of LDAS to the cooperation and commitment of all members of the project team.

"Our custodian representatives, who served as our liaison with the entire custodian community, were especially helpful," she adds. "They ensured that the system we designed would be effective and well-received."

One of the side benefits of LDAS will be that some 800,000 punch cards — the old document-control method — can be eliminated from document accountability stations during the next two years. For the past 30-plus years, SNLL has accumulated thousands of secret and controlled documents, each of which was matched with a set of punch cards used for tracking and transfers. The cards even had to be kept on file for two years after the document had been destroyed.

### Wave Wand to Read

Now all that has changed. Every action taken on each controlled document is entered into the centralized computer system by passing a light pen or "wand" over the document's bar-code label, which contains the document's identification information. Additional information on each action is keyed in. LDAS was designed so that the bar-code labels on documents transferred to Albuquerque can be read by PC/DAS, SNLA's PC-based document accountability system.

Mail Distribution Section supervisor Sharron Norris (8524-1) has the primary responsibility for document control coordination. "Creating a new document in LDAS automatically generates the appro-



LOGO/MASCOT for LDAS project — a zebra with a bar code, known affectionately as "Z.L. Das."

appropriate bar-code label," Sharron explains. "These labels greatly increase our ability to track the documents and maintain the integrity of our records."

The use of bar-code labels is not new to Livermore, but the ability to print labels on demand is. Thermal transfer technology coupled with printer programming capability provided the flexibility needed to design and format the document label. But that was only part of the task — "Getting all the bar-code readers hooked up to a variety of terminals and PCs was a real challenge, to say the least," Sharron notes.

Some special control features are part of the LDAS system. Each user is assigned to one of nine user groups with different levels of access. Document Control maintains an authorization table that identifies each user. This table also identifies stations and employees who are allowed to see special-category documents with limited access. If someone without the appropriate access authorization requests a controlled document, the request is not granted and a custodian is notified on-line.

### Complete Birth-to-Death History

"Since LDAS knows when a document has been transferred or flagged for destruction, we also have on-line notification of overdue acceptances and destructions," Emily continues. "In addition, we now keep a complete transaction history on each document from birth to death; the old system told us only who currently had the document. LDAS also cap-

tures bibliographic data — title, author, and keywords, for example — that facilitate identifying and locating any document at Livermore. The SNLA librarians will also be able to do an on-line search of SNLL documents."

LDAS is SNLL's first interactive computer system implemented for a broad-based user community.

Converting existing computer data to the new system was a significant effort. In addition, Paul Kirby (3142) extracted bibliographic information on several thousand SNLL documents from DOBIS, the corporate cataloguing computer system. These two data sources were used to create the initial database files.

A month before LDAS was implemented, Sharron conducted a formal user-training program, including hands-on practice with bar-coding and entering documents. Shortly after implementation, a task force was formed to assist custodians in entering bibliographic data on documents not contained in DOBIS and in affixing bar-code labels obtained from an outside vendor on all documents in existence before Feb. 1.

Division supervisors Peter Dean (8524) and Ron Fugazzi (8525) were actively involved during the development and implementation of the new system. Emily also credits Chuck Rudberg (8525) with coordinating the programming effort and Steve Marshall (8525) with making the bar-code portion of LDAS successful.

"I've been impressed by the attitude and willingness of so many people to make LDAS the best system possible," Emily concludes. "And that effort has paid off. From the moment LDAS was implemented, it has been very reliable. I was holding my breath for a while, but right from the start LDAS worked as planned." Already, LDAS has impressed those DOE officials and members of outside agencies to whom the system has been demonstrated.

The second phase of LDAS will include bringing Secret drawing prints into the system and developing an automated inventory system using the bar-code labels.



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## Fun & Games

**Tennis** — Winning firsts in the 9th SNLL Mixed-Doubles Tennis Tournament were John Crawford (8000) and Linda Leong (daughter of Eva Leong, 8534). Players changed partners and opponents every half hour during the fun tournament, and the winners were determined by lot at the end. Second place winners were Toney Parker and Dorothy Costa (non-Sandians). The event was held April 30 at the Amador Valley Athletic Club in Pleasanton.

### Anyone for a Plain Old Ordinary Beach?

Fancy pools, fountains, and waterfalls are gaining popularity as a design element, largely because of the work of Howard Fields, a San Francisco designer. (Mr. Fields) has dreamed up an especially exotic creation for the Grand Hyatt Wailea Hotel in Maui, Hawaii: He is planning what he calls a "labyrinth" with 3-1/2 acres of water in a course that drops 35 feet. Swimmers can paddle through a canal, shoot down a water slide, be raised in a lock, float through rapids that bubble "like champagne," drift past artificial sand beaches, and visit an island that rotates "like a rotisserie, for perfect tanning."

A Hyatt spokeswoman, who refers to Mr. Fields as "our wacky pool designer," says exotic water design is no longer an amenity. "It has become a marketing tool," she says.

Wall Street Journal



GATHERED AROUND a cart full of outmoded punch cards ready for destruction are members of the LDAS project committee (from left): Sharron Norris (8524), Emily Joiner (8525), Terry Higuera (8151), Teresa Antolak (8442), Gayle Allen (8310), and Chuck Rudberg (8525). Not shown: Steve Marshall (8525), Pat Brennan (8244), Sherry Cruz, and Renee Haynes (both 8531).



SANDIA'S NEW EXHIBIT in the National Atomic Museum offers viewers a chance to appreciate the technological difficulties of achieving controlled fusion and the potential significance of fusion as a major power source. Under a time line that traces the history of both magnetic- and inertial-confinement approaches to fusion, Sandia's current inertial-confinement fusion program is summarized in drawings, video, scale models, and a fiber-optic display that shows the basic theory of pulsed power fusion. The new exhibit, which will be formally dedicated on May 25, updates the Museum's decade-old fusion exhibit.

REPRESENTING DOZENS of other Sandians in their respective directorates who helped with the project, these four — (from left) Mike Clough (7473), Joe Laval (3163), Steve Goldstein, and Bob Johnston (both 1266) — pause at one of the new exhibit's display modules (Particle Beam Fusion Accelerator II).



#### Can We Talk #4

## Coping Skills for Grief And Bereavement

By Arlene Price (3330)

Memorial Day will soon be here. It's a special time to honor the loss of our loved ones, a special time for mourning.

Most of us think we know the right way and the wrong way to mourn, how long it should take, and when it should go away. We become indignant with those who laugh when they are supposed to be sad. We grow impatient if a friend takes too long to get over his/her sadness. We teach that "time heals all wounds." Even the professionals from whom we seek counsel may prescribe a proper way to grieve.

As a result, we come to have the same expectations for ourselves about how we should think, feel, and behave when we are in mourning. We may begin to believe that if we do not conform to the "correct" way, there may be something wrong with us — and we start to worry about ourselves.

The reason these beliefs about grief and mourning persist is that there is still so much to learn about the grieving process.

Fortunately, we're learning more. We're realizing that grief is a normal part of everyday life, not an illness to be cured. Our pain may seem to lose its

intensity over time, but our sadness over the loss of a loved one does not go away. We will not be cured of our grief, but we will be changed by it. We will always care about and miss the special people in our lives. We will have those moments of sadness every so often throughout the rest of our lives. This is how it should be. This is healthy and appropriate.

Our goal must be to learn how to face the realities of death and to realize that, however paradoxical it sounds, death is a normal part of our daily lives. Experiencing the death of a loved one provides a time for personal growth and learning new skills, a time to become more sensitive and compassionate toward ourselves as well as others.

In honor of Memorial Day and in an effort to help us learn more about effective coping skills, Medical has invited a guest speaker to join us on Wednesday, May 25, from noon to 12:45 p.m. in the Technology Transfer Center. Dr. Al Vogel, Medical Director of UNM's Mental Health Center, will speak on "Effective Coping Skills in Grief and Bereavement." Please join us for this program.



Here are a few current volunteer opportunities for employees, retirees, and family members. If you would like more information, call Karen Shane (3163) on 4-3268.

**MANZANO HIGH SCHOOL** will host the annual National Association of Student Councils Conference on June 25-29, which will include 2000 student leaders and adult advisors. Several hundred homes within 10 minutes of Manzano are needed for the students. All they need is bed and breakfast (continental breakfast is fine) — except for dinner on the first evening. All transportation is provided (except for initial pickup at Manzano). Students will leave each morning by 7 and return between 10 and 11:30 each evening. Beds, couches, cots, sleeping bags, and campers are acceptable.

**NEW MEXICO SKI TOURING CLUB** will be developing and maintaining trails in the Jemez and Sandia mountains on Monday, May 30 (Memorial Day), and Saturday, June 11. This is an opportunity to join other Sandians for an outing.

**AMERICAN CANCER SOCIETY** has opportunities for counselors at Camp Enchantment July 23-30. The camp provides children who have cancer an opportunity to experience the excitement of camping. Twenty-five children between the ages of 6 and 17 will each select a friend to accompany them to the New Mexico School for the Visually Handicapped in Alamogordo. Perhaps you have a student (must be at least 18) who will be home for the summer and would like to spend a week as a camp counselor.

**NEW MEXICO SPECIAL OLYMPICS** is a program of sports training and athletic competition for mentally retarded children and adults. The purpose of Special Olympics is to contribute to the physical, social, and psychological development of the mentally retarded. Volunteers are needed to escort entrants to their assigned events, and to help with judging, coaching, scoring, tallying, etc. Competition will be at Milne Stadium June 4 and 5.

## Earnings Factors

### Savings Plan for Salaried

Employees (SPSE)	Feb.*	March
AT&T Shares	.9837	.9306
Government Obligations	1.0100	1.0022
Equity Portfolio	1.0520	.9594
Guaranteed Interest Fund	1.0067	1.0074
South Africa		
Restricted Fund	1.0054	1.0055
Diversified Telephone		
Portfolio		
Unrealized		
Appreciation	.9914	.9324
Realized Appreciation	.0000**	.0073**

### Savings and Security Plan —

Non-Salaried		
Employees (SSP)		
AT&T Shares	.9832	.9289
Guaranteed Interest Fund	1.0068	1.0075
South Africa		
Restricted Fund	1.0048	1.0055
Diversified Telephone		
Portfolio		
Unrealized		
Appreciation	.9915	.9326
Realized Appreciation	.0001**	.0071**

\*Corrected

\*\*The 1 has been removed from the earnings factor. Current month's DTP earnings may be calculated directly: Earnings Factor x DTP Current Worth = Current Month's Earnings.

# Sandian Joins AT&T Quality Day

The highly successful team approach used by Sandia to design an improved explosive valve-actuator earned the Labs an invitation to present a paper describing the project at the AT&T R&D Community Quality Day Symposium in Holmdel, N.J.

Paul Wilcox (2515), whose division was responsible for designing the actuator — which has set records for yield, reliability, and lower cost — presented the paper. He is the first Sandian to present a paper at the annual symposium sponsored by AT&T Bell Laboratories Quality Assurance Center. The paper was one of five selected for presentation from submissions from throughout the AT&T complex.

“Our team approach was only part of what made the project a suitable subject for the symposium,” says Paul. “Equally important was the set of quality goals we formulated right at the outset of the project and used as a touchstone throughout the design activities.”

Co-author of the paper was the project’s design engineer, Olden Burchett, now supervisor of Engineering Projects and Explosives Applications Div. 7133.

Olden also headed the design team. This was no easy task, especially when the team’s member-



PAUL WILCOX (2515, left) and OLDEN BURCHETT (7133), co-authors of a paper presented at the AT&T R&D Community Quality Day Symposium, review the symposium proceedings.

selected. The interaction also helped production people understand and share our commitment to produce a high quality product.”

## Quality Part of Design Process

Not that Sandia hasn’t always been committed to quality.

“Sandia has always maintained a high level of performance and reliability for weapon components,” notes Paul, “and production agencies have always thoroughly documented manufacturing processes and yield histories. But high performance and reliability in the final product don’t necessarily mean high yield or the lowest cost in manufacture — or that the final product was achieved by the most efficient means.

“We wanted to inject quality into the design process itself — right from the beginning of the project,” he continues. “You might say we wanted to make quality part of the journey, not just the destination.

“And it wasn’t just a vague notion of quality we were interested in,” says Paul. “What we did was to spell out exactly what quality meant in the context of designing this particular device. In this case, quality criteria were directly equatable with

good engineering practices. So, for this component, quality meant, first, that it would meet the performance requirements with good margins; second, that it would be producible with high yield; and, finally, that it could be manufactured at a reasonable cost.”

To ensure these quality features, the team emphasized producibility at every stage of the design process.

“For example,” continues Paul, “as soon as we had formulated a basic design concept that we thought would meet the performance requirements, the finite element analysis people on the team [Dept. 1520] proposed four possible designs for the header [the part of the actuator consisting of the housing, the electrical feedthroughs, and electrical insulator]. They rank-ordered the four designs according to margin of strength and producibility.

“As you might expect,” he continues, “the design engineers went for the header design that had the maximum margin of strength. But the production experts on the team argued against that choice on the grounds that it wasn’t producible.

“We then selected the third strongest design. It was ranked high for producibility — and was projected to meet the performance specifications. Unfor-

*(Continued on Next Page)*

**Affordability +  
Producibility +  
Performance =  
Quality**

Component Development VP Larry Anderson (2000) emphasizes the broadened definition of quality that was used as a touchstone during the design and development of the improved valve-actuator: “The thing that was exciting about this program to me was not so much the wholehearted commitment to quality — that’s been a hallmark of Sandia and, indeed, of the entire AT&T family for as long as I can remember — but the enthusiastic acceptance by Sandia of a broad definition of quality which included *affordability* and *producibility*, in addition to performance, as key attributes.”

ship expanded — at times — to as many as 30 people, making the team a potentially unwieldy group.

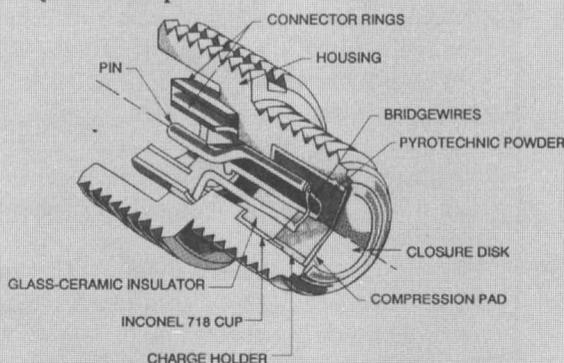
“To keep the team on track — to head off the occasional temptation to pursue interesting but unnecessary development activities — Olden had to be a prophet, a Rambo, and a Billy Graham, all rolled into one,” says Paul.

“The team really was a diverse group,” says Olden, “and many people from throughout the Labs served on the team at one time or another. But this component required the development of new technologies, new materials, and, ultimately, new manufacturing processes, so we needed people on the team from several specialty technology and materials groups.” These included Chemistry and Ceramics Dept. 1840, Process Development Laboratories Dept. 7470, Metallurgy Dept. 1830, Materials Dept. 8310, Reliability Dept. 7220, and Quality Assurance Dept. 7250. “Our customer, Engineering Technology Dept. 8440, was also represented on the team, as were many organizations from the production plant [Monsanto Research Corporation’s Mound Laboratory] that eventually manufactured the actuator,” notes Olden.

“The team approach made it possible for us designers to interact with production people right from the start of the project, so we were able to avoid several potential pitfalls,” continues Olden. “We avoided designing a component that would be difficult or impossible to manufacture, and the production agency was able to develop improved production processes to accommodate the design we finally

## How the Valve-Actuator Works

The new explosive valve-actuator (see main story) functions identically to earlier valve actuators; that is, it initiates a gas transfer within a weapon. But unlike its predecessors, the new actuator was specifically designed to withstand high internal pressures.



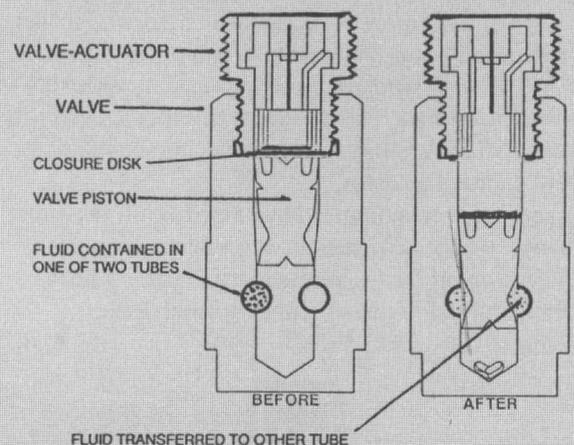
Operation of the actuator begins when an electric current flows from one of the connector rings to a pin projecting through the glass-ceramic insulator and then through a small bridgewire and back out through the center ground pin. The bridgewire, heated by the current, ignites the pyrotechnic powder (surrounding the bridgewire) and produces hot, high-pressure gas.

This high-pressure gas ruptures the actuator’s closure disk (see drawings below) and accelerates the valve piston down the barrel of the valve. As the piston descends, it cuts two tubes, allowing fluid contained in one of the tubes to

be transferred into another tube.

To enable the actuator to withstand the pressures (up to 190,000 psi) that would be generated should the piston fail to stroke, thermal processing was used to mate a high-strength Inconel 718 alloy to a special Sandia-developed glass-ceramic, providing a strong chemical and mechanical bond in the seal. An Inconel 718 cup at the base of the actuator provides a gas-tight seal even if the insulator cracks as a result of the high pressures. The pyrotechnic powder was also altered to reduce electrostatic sensitivity. The reduction allowed use of a thicker housing, which provided additional strength for containing the high pressure.

### OPERATIONAL SEQUENCE OF VALVE-ACTUATOR



### Quality Day

unately, as the testing capabilities of [Engineering Technology Dept.] 8440 were refined to produce better data, it became clear that this design really wasn't strong enough to contain the pressure actually generated by the actuator.

"We then turned to the second strongest design — it was also projected to meet requirements, but was initially ranked low for producibility.

"This is where the teamwork — and the clear quality goals — really paid off. The production experts on the team were able to refocus process development efforts to accommodate this design — and we finally had a producible design that would meet all the performance requirements. Moreover, we were assured of efficient manufacturing processes that would be compatible with the capabilities of the production facility."

#### Teamwork Solved Problems

"I don't mean to imply that there were no problems along the way," continues Paul. "We certainly had some — one, I recall, threatened to turn into a real stumbling block for the project.

"It occurred early during the processing of prototype devices. We discovered that inordinately large bubbles were appearing in the glass-ceramic insulator — we called them 'mega-bubbles.' Apparently, no bubbles had occurred in the earlier devices, and we just couldn't account for their presence.

"We knew, too, that if we couldn't get rid of them, our project was dead!

"Fortunately, we had some good people on the team from [Chemistry and Ceramics Dept.] 1840 and [Process Development Laboratories Dept.] 7470. They identified the problem — and suggested the solution.

"It turned out that during its original melting, the glass had absorbed minute amounts of water that led, eventually, to the formation of the bubbles. The solution was to prepare the glass in an ultra-dry environment. Dept. 2520's chemical-battery dry-room was perfect for the purpose. They allowed us to melt our glass there, and our problem was on the way to being solved.

"We had a few other problems that were almost as serious as that one," continues Paul, "but someone, either someone on the team, or someone in management — and, in one case, a production plant foreman — invariably came up with a solution.

"We had a group of knowledgeable people committed to working together to develop a quality product — and we had broad management support and recognition of the importance of quality."

#### Quality Pays Off

The new valve-actuator design, while meeting or exceeding performance requirements, is setting records in production.

"Yield is now running greater than 95 percent compared to 75 percent for previous devices," says Paul. "And the Quality Assurance people [Dept. 7250] tell us testing success has been so good that we're already exceeding the reliability requirement of .9998 — that is, fewer than two components in 10,000 are expected to fail."

Some of the technologies that weren't previously commercially available and were developed especially for this project — the glass-ceramic and Inconel 718/Hastelloy combinations, for example — are now being used in whole families of headers for explosive and ordnance components in other DOE programs. NASA is exploiting the technologies for its new standard actuator.

These technologies have also been transferred to more than ten commercial firms that are using them to develop products such as thermal battery headers and high-quality glass/ceramic-to-metal seals.

•DR



## Head for the High Road with US Savings Bonds

The road to financial security is paved with good intentions, but most of us know it isn't always smooth. Figuratively speaking, we usually find some orange barrels along the way.

Case in point: Many people with money in the stock market — even if those hard-earned dollars were conservatively invested — hit a big detour last October.

Since the market crash, financial publications ranging from *Money* to *Tax Hotline* to *Sylvia Porter's Personal Finance* have come up with a wealth of investment strategy. Interestingly enough, there's one bit of advice that crops up nearly every time: Investing in US savings bonds is a smart financial move — for several reasons (see "What the Experts Are Saying").

If you're not currently paving your road to financial security — at least in part — with savings bonds, your chance to avoid those orange barrels is coming up — during Sandia's 1988 US Savings Bond Drive (May 31-June 10).

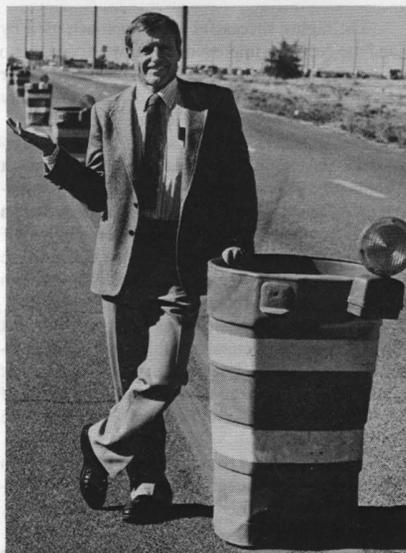
#### The 'Bond Advantage'

"It's obvious that Sandians — whether they're in Albuquerque, Livermore, Tonopah, or Pantex — are tuned in to the 'bond advantage,'" says Jack Tischhauser (2850), chairman of the 1988 Savings Bond Committee. "Last year we finished the campaign with almost 96 percent participation, which places us high on the Treasury's honor roll of US corporate leaders.

"Let's face it," continues Jack. "Twenty years ago, people bought savings bonds because it was the patriotic thing to do. The return on the investment wasn't the greatest; other savings alternatives were probably better.

"Today, though, most financial gurus advise that bonds should be a part of long-term investment portfolios. Why? For several reasons. Bonds are safe, interest rates are up and the interest is tax-deferred, there's no state or local tax on earned interest, and they're affordable and easy to buy — especially if you go the payroll-deduction route."

Since the Treasury spruced up the bond program in 1982 to make it more competitive, bonds pay a floating interest rate set every May and November at 85 percent of the average market rates on five-year Treasury securities. Most significant, perhaps,



AVOID AN ORANGE BARREL or two on your road to financial security by investing in US savings bonds, suggests Jack Tischhauser (2850), chairman of the 1988 Savings Bond Committee.

is the 6 percent interest-rate floor on bonds held at least five years. (Bonds are guaranteed to provide an annual return of 6 percent or 85 percent of the T-note rate, whichever is greater.)

"That 6 percent minimum compares favorably with current money-market rates and payouts from savings accounts," Jack points out. "You might be able to take a bigger gain in the stock market if your timing is right; but, as many people found out last October, the associated risks may not be worth the occasional rewards.

"In comparison, bonds are both safe and secure," he continues. "There's free replacement if they're lost, stolen, or destroyed; and they're fully backed by the US government. And they're liquid once you've held them six months; of course, cashing them in after a short period of time means a lower rate of interest."

The market-based rate for bonds was 7.17 per-

cent for the period from November 1, 1987, through April 30. Rate for the six months that began May 1 is 6.9 percent.

#### Retirement, College Expenses

Jack reminds us that stockpiling bonds for retirement or for kids' college expenses is advantageous too. "Since the interest isn't taxable until you cash bonds in," he says, "people who buy bonds before they retire can cash them in afterwards at what will probably be a lower tax rate."

College expenses are increasing every year — a trend not likely to turn around. Setting aside bonds (for school expenses) when a child is relatively young could well determine (1) which school he or she can attend when the time comes, and (2) whether lengthier courses of study — such as medical school — are within reach.

Another definite bond plus for retirees — and anyone else looking for current income from investments — is the ability to convert Series EE bonds to Series HH bonds, for which holders receive a semi-annual interest check. (Series HH bonds are larger, with a minimum investment of \$500; they're bought at face value, and pay the same interest rate as Series EE bonds. They can be purchased with cash or a rollover of EE or E bonds.)

#### VP Coordinators

The 1988 bond drive, as in other years, will be conducted by VP coordinators with the help of directorate coordinators and canvassers. As usual, each employee will receive a payroll deduction card.

"All of us on the Bond Committee encourage Sandians to continue their high rate of participation in the program," says Jack. "And we hope everyone will take a close look at his or her level of support. Increasing the amount saved each paycheck translates to receiving bonds sooner — and a faster interest buildup."

The opportunity to avoid some of those orange-barrel detours on your road to financial security is right around the corner. Go for it. •PW



## Denomination? It Depends . . .

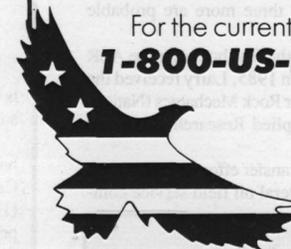
Bonds are available in eight denominations ranging from \$50 to \$10,000 (you pay half the bond's face value). However, there's a slightly different denomination picture for people enrolling for the first time in a payroll-savings plan after Jan. 31 of this year. As of Feb. 1, the Treasury Department — in a move to reduce administrative costs — set the minimum denomination available for new enrollees at \$100 (at a cost of \$50).

Treasury officials emphasize that the \$50 and \$75 denominations still can be purchased by people who began buying those denominations through payroll deduction before Feb. 1. Additionally, those who participate in the Bond-a-Year Plan (one deduction in July) may purchase the smaller denominations, which are, of course, also available at banks.

So if you're going the payroll-deduction route for the first time, it will take a while longer to buy a bond. The program is still affordable, though; deductions may be as little as \$1 a week (for weekly paid) and \$2 each pay check for semimonthly paid.

## BUY UNITED STATES SAVINGS BONDS

For the current rate call... 1-800-US-BONDS



TODAY'S THE DAY! Noon's the time. And Hardin Field's the place. It's Sandia's Eighth Annual Fitness Day, and kite-flyers are a part of it. Come out to join the 3-mile bike ride or the 1.5-mile walk/jog (prizes for those who best predict their finish times) or the TLC aerobics demo. Or come out to hear the Bob Banks Trio. Or come out to see a stunt-kite demo or this full-size (five-foot wingspan) replica of the flying reptile Rhamphorhynchus, which took first place in the professional category of the NM Museum of Natural History's Pterosaur Ptournament. The latter will be flown by its developers: (from left), Brian Landrum, Terry Jordan, Ron Greene (all 1555), Dave Salguero (9144), and David Keese (1555).

#### Money, Sylvia Porter, & Others

### What the Experts Are Saying

In recent months — probably as a result of the market shock last fall — investment gurus strike a distinctly conservative tone in their advice on financial planning. No matter what the source of the advice, there seems to be a common thread: Buy US savings bonds for part of your investment portfolio. Bonds, overlooked by financial advisors in the "good old days" — 20, or even 10, years ago — because of relatively low interest rates, now appear to be a star (or at least a co-star) of the show. Here's what the experts are saying.

- *Tax Hotline* (January 1988) — The newsletter, in "13 Absolutely Safe Tax-Planning Loopholes," said: "With Series EE savings bonds you can put off paying tax on the interest. You don't have to pay tax until you cash the bonds in. You can continue to defer tax on the EE bonds' interest by converting them at maturity to Series HH bonds . . . [To avoid the kiddie tax] purchase EE bonds for younger children and hold them until the kids reach 14."
- *Sylvia Porter's Personal Finance* (February 1988) — In an article on how to protect what you have in 1988, "Smart Money," the magazine said of bonds: "[EE bonds], more than any of the US

Treasury's other offerings, are designed with the individual investor in mind. They are safe, simple, and inexpensive . . . After five years, bonds earn 85 percent of the average return on five-year Treasuries, or 6 percent, whichever is higher. At the 6 percent rate, bonds mature in 12 years, actually doubling your investment . . . Plan to invest in EE bonds as a way to defer taxes as well as build an ultrasafe portfolio. Although you can redeem them after six months at no charge, it is to your advantage to hold the bonds until maturity. That way you'll double your money without risk."

• *Money* (March 1988) — In an article on "Where to Stash Your Cash," the magazine mentioned bonds: "The darling of payroll-savings plans, Series EE savings bonds currently yield 7.17 percent. Not only is the interest tax-free at the state and local level, but it is also tax-deferred at the federal level unless you choose to pay the tax every year . . . To calculate the EE bond return, every six months the Treasury adjusts the rate to equal 85 percent of the [five-year Treasury] note's rate. At the end of five years you get the

average of those semiannual rates." • *Wall Street Journal* (April 14, 1988) — "Trends in Industry and Finance" column: "IRA accounts take a turn toward safety, boosting some sellers' business . . . The top sellers: US Treasury bills and bonds." • *Tax Hotline* (May 1988) — Item on "Tax-Advantaged Investing": "Interest on [Series EE] bonds can be taxed in one of four ways — You can (1) pay tax on the interest as it's earned every year even though you haven't received any of it yet; (2) defer paying tax on all the interest earned throughout the years until you cash in the bond at maturity; (3) wait beyond maturity and pay tax on all the accumulated interest when you cash in the bond; or (4) convert the EE bond at maturity in a Series HH bond. (The interest earned on the EE bond remains tax-deferred until you cash in the HH bond. However, HH bonds pay out interest annually to the owner; you must pay tax on this interest each year.) Investor strategy: Purchase savings bonds that will mature after you retire, when you are in a lower tax bracket due to a lower income."

## ASR Award

ASR tool, and subsequently were awarded a patent on the devices.)

Strain directions are determined directly from the strain measurements, but stress magnitudes must be calculated from a model of the strain-recovery process. Norm Warpinski (6253) had the lead role in developing this model.

As the sample — oriented as it was underground — “relaxes,” the ASR tool helps researchers pinpoint where the downhole stresses are, allowing them to determine the distance and direction that man-made fractures can be expected to travel from the wellbore.

(The fractures, typically created by injecting high-pressure fluid into oil- or gas-bearing rock, provide passageways for the product to flow from the formation to recovery wells. The ability to predict the fracture pattern results in more efficient positioning of the wells.)

Field demonstrations and cooperative experiments with the oil industry have proved ASR downhole-stress determination is as accurate as more expensive methods involving surface and downhole geophysical techniques and long-term analysis and modeling.

### ‘North Sea Connection’

A couple of years after he developed the ASR technique, Larry established his “North Sea connection.” In the spring of 1984, he took ASR measurements on core samples for Amoco while based on oil platforms off the Shetland Islands. Between 1985 and 1987 he worked with British Petroleum off the coasts of England and Holland; the core analysis work involved four trips to the area.

Since 1986, he’s been working on a cooperative effort with Phillips Petroleum at the Ekofisk Field, located 200 miles off the Norwegian coast — a “long helicopter ride,” says Larry. “The Ekofisk Field, an older oil recovery area, was the one of the

## In Situ Stress: A Primer

Stress — the force or load applied over a given area — in rock formations *in situ* (in place) arises both from actively applied (external) forces and from stored residual-strain (internal) energy.

The causes of external *in situ* stresses in rock are varied. There’s gravitational stress, produced by the weight of the overlying rock or soil material (overburden). A deep formation, then, will suffer more overburden stress than a shallow formation.

Tectonic stresses, resulting from movement of the earth’s crust, also load anything beneath the earth’s surface. Thermal stresses — heating and cooling of a confined rock mass — can result from seasonal temperature changes, from deep-seated natural sources such as magmatic intru-

sions, or from human activities such as nuclear-waste disposal.

Residual stresses are caused by deformations “locked into” individual grains of a rock at some time (or times) during its geological history. These internal stresses are distinct from stresses imposed on the rock mass by some outside influence.

*In situ* stresses vary, depending on the thermomechanical properties of the rock formation and its location within surrounding geological structures. Stress magnitudes and directions often change within a given formation, across formation boundaries, and in the vicinity of structural features such as large fracture zones (for example, the San Andreas fault).

first major oil fields discovered in the North Sea. Phillips was experiencing subsidence problems; its oil platforms were, literally, sinking — albeit, very gradually.

“Over the long haul, that could create a hazardous situation for workers stationed on a platform and could spell the end of oil recovery operations,” Larry continues. “So we’re working on core sample measurements to determine what’s happening under the seafloor. We need to predict how much more change — subsidence — is likely to occur.”

Larry’s become something of a “regular” at the Ekofisk Field; his work with Phillips took him there five times in 1986 and five more in 1987. He’s made two trips to the area this year (he’s on the second one right now), and three more are probable before 1989 rolls around.

The FLC award isn’t the first honor for the ASR measurement technique. In 1985, Larry received the US National Committee for Rock Mechanics (National Research Council) Applied Research Award for his ASR work.

Larry’s technology transfer efforts have paid off in other ways as well. Several oil field service com-

panies — including Terra Tek, Rock Mechanics A/S, Halliburton, and Litton Core Lab — are currently planning to offer the ASR method as a routine, commercial service for mapping potential fracture patterns in oil and gas formations.

It’s projected that the ASR technique could result in savings of millions of dollars — and perhaps billions — by pinpointing the most productive locations for recovery wells. ●PW

## Other FLC Award Nominees

Each of the 150 Federal Laboratory Consortium members is permitted to nominate two candidates for FLC tech transfer awards. “It was difficult to narrow the 20 nominations we received from line organizations down to just two,” says Bob Stromberg, supervisor of Technology Transfer Division 4031. “All the nominations are good examples of Sandia-developed processes or devices that subsequently found their way to the private sector through outstanding tech-transfer efforts.”

Along with Larry Teufel’s ASR technique (see main story), the other Sandia nomination submitted to FLC was a pulse combustor model developed at Sandia Livermore by Pamela Barr (8363), Tazwell Bramlette, and Jay Keller (both 8362). The model is being used by industry to develop more efficient pulse combustion furnaces through design improvements (LAB NEWS, Jan. 29, 1988).

Other nominees from Sandia line organizations were:

- Vacuum arc remelt gap controller — Frank Zanner (DMTS, 1833), Gene Aronson (DMTS, 2542), and Lee Bertram (2643);
- Embedded atom materials property prediction method — Michael Baskes, Murray Daw, and Stephen Foiles (all 8341);
- Injection locking laser and development of Faraday isolator technology — Larry Rahn (DMTS, 8354);
- Hydrogen catalytic igniter — Larry Thorne (8357);
- Multi-stage gas switch — Johann Seamen (1236), Ken Prestwich (1240), Juan Ramirez, Dave Johnson (both 1245), Tom

Martin (1250), Bobby Turman, Douglas Bloomquist, Steven Babcock, Russell Humphreys (all 1252), and Roy Hamil (1275);

- Wind turbine dynamic analysis — Bob Reuter (1522);
- Air pollution and visibility analysis — Bernie Zak (6321);
- Gas leak calibration service — Frank Garcia, Steven Thornberg, Timothy Moss, and Mark Benner (all 7243);
- Radiation-tolerant photodiode — Gordon Osbourn (1145), James Wiczer (1411), Ralph Dawson (1141), and Benny Rose (2531);
- RAPRENOx process — Dennis Siebers, James Boehmke (both 8362), and Bob Perry (ex-Sandian);
- Integrated circuit layout software — John Wisniewski (2111);
- Tungsten technology — Bob Blewer (DMTS, 2147);
- Radiation-hardened complementary metal oxide semiconductor (CMOS) technology — Rich Anderson (2142);
- Antireflective photoresist process — Clifford Renschler (1811);
- Security alarm communication system — Gil Herrera (2159);
- Sensor layout expert-system code — Jayne Ward (5268);
- Solar central receiver design handbook — Pat Falcone (8435); and
- Solar central receiver plant design — Al Baker (8151).

## Labs Winners In the Past

Larry Teufel’s FLC award (see main story) is the fourth garnered by Sandians since the Consortium established its awards program in 1984.

In 1985, two Labs programs received the honor. David Ginley (1144), Janda Panitz (1834), Carleton Seager (1143), and Donald Sharp (1841) accepted an award for development of a process (later used by manufacturers of solar devices) to increase the efficiency of solar cells using ion-beam hydrogenation.

The other FLC award in 1985 went to Peter Rand (1813) for development of a stabilized aqueous foam material and its subsequent transfer to the security-system and fire-fighting industries.

Last year, Dale Boehme and Monte Nichols (both 8313) received an FLC award for development of an X-ray microanalyzer and transfer of the technology to Kevex Corp. for commercial production.

## Sympathy

To Paul Demmie (9141) on the death of his mother in Pittsburgh, Pa., April 23.

To Mac Weaver (9141) on the death of his mother in Albuquerque, May 2.

To Tony Chen (1523) on the death of his father in Taiwan, May 4.

To Vicente Garcia (7818) on the death of his sister in Los Angeles, Calif., May 6.

To Lewis Reif (5142) on the death of his grandfather in Kouts, Ind., May 9.

To Renee Foster (3163) on the death of her father in Albuquerque, May 12.

### Junior Nobelists on Agenda



A new program to award \$50,000 American Nobel Fellowships to graduate students in physics, chemistry, medicine, and economics was announced by the Westport, Conn.-based American Nobel Anniversary Committee. The non-profit organization was set up in 1941 by Albert Einstein and French emigré Jacques Ferrand to honor Alfred Nobel and U.S. winners of the award named for him. . . The first awards are scheduled to be made on Dec. 9, 1988.

# 'New Generation' of Wind-Turbine Technology Dedicated

Appropriately enough, it was sunny and slightly breezy when the DOE/Sandia Vertical Axis Wind Turbine (VAWT) Test Bed was dedicated May 10 in Bushland, Tex., a short distance from Amarillo.

Virgil Dugan (6200), one of the dedication speakers, described the 165-ft.-tall, 110-ft.-diam. VAWT and its associated monitoring equipment as a "new generation of wind-turbine technology." (Its 165-ft. height makes the Bushland VAWT just 23 feet shorter than the First National Bank building at Central and San Mateo.)

Donna Fitzpatrick, DOE Assistant Secretary for Conservation and Renewable Energy, said the test bed is a "monument to many people whose steady work and continuing dedication made it possible." Fitzpatrick, who described Sandia as the "lead center for VAWT research," noted that the test bed was built on time and within budget.

## Major Goal

Members of Henry Dodd's Wind Energy Research Div. 6225 designed and developed the VAWT Test Bed, which is located at the USDA's Agricultural Research Service in Bushland. "It's the first variable-speed research VAWT in the world," Henry says, "and is designed to operate at rotor speeds between 25 and 40 rpm. That capability will allow us to explore further ways to improve VAWT design and effectiveness — in areas such as airfoil design and structural dynamics.

"Lengthening VAWT fatigue life is another of our goals," Henry continues. "The ability to vary the rotor speed during tests at Bushland will, we hope, give us insights on fatigue problems that have



THE VAWT WAS SPINNING, and the spectators' applause showed their enthusiasm. From left: Virgil Dugan (6200), Earle Gavett (USDA Office of Energy), Donna Fitzpatrick (DOE Assistant Secretary for Conservation and Renewable Energy), and Norma Grover (wife of Bob Grover, in whose memory the VAWT was dedicated).

cropped up on some commercial VAWTs."

Most wind turbines generating electricity today turn at a constant rotor speed. The variable-speed capability at Bushland, Henry explains, leads to a more efficient operation. "It's rather like changing speeds when you're driving your car," he says. "Out on the open highway, you're traveling along at 65 mph. But if weather conditions are bad, or there's a safety hazard ahead, you can always cut back on the speed at which you're traveling.

"More energy from the wind is available if you can 'match' — or follow — its speed," Henry continues. "If winds are fairly brisk, for example, you'd elect a higher rotor speed. On less windy days, you'd cut back on rpm speed."

There's another benefit for the Bushland area: The VAWT Test Bed, rated to produce 500 kilowatts of power while rotating at 37.5 rpm in a 28-mph wind, will provide electricity to the local utility grid. With Bushland's annual average wind speed of 14 mph, the test bed could supply more than 100 households with their yearly electrical needs.

Other dedication speakers were Bobby Stewart and Nolan Clark (both USDA-ARS), Henry Dodd,

James Bickel (assistant manager, DOE/AL Office of Projects and Energy Programs), and Earle Gavett (director of the USDA's Office of Energy).

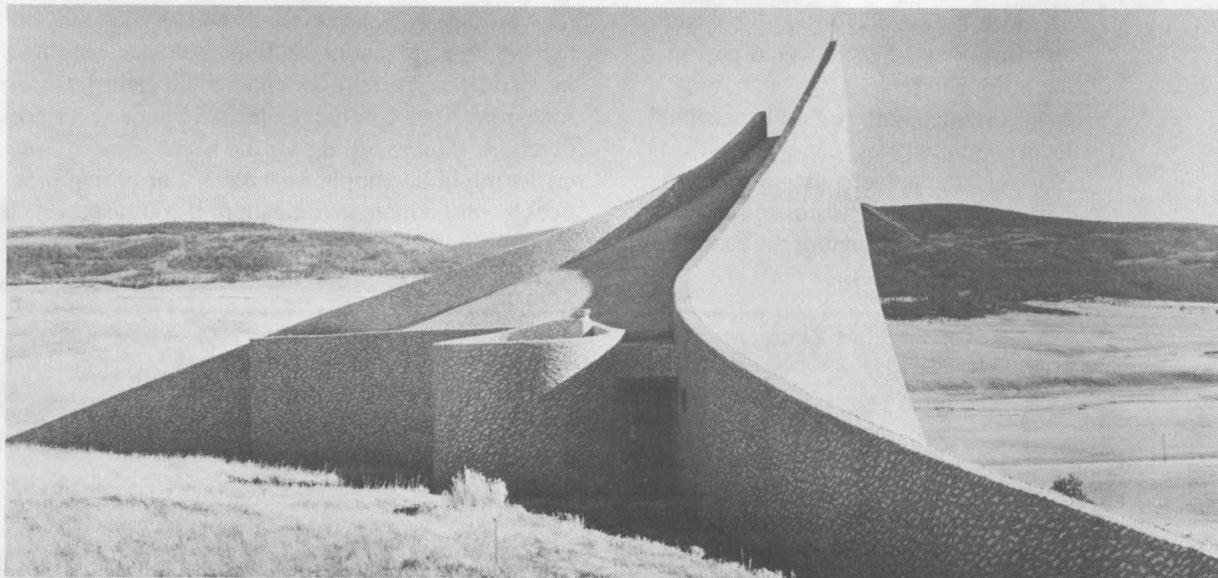
Paul Klimas (DMTS, 6225) dedicated the facility as a memorial to Bob Grover (ret., now deceased). Bob's mechanical design work on VAWT systems during his more-than-10 years in Sandia's wind-energy organization, Paul commented, was invaluable in designing the Bushland wind turbine. Paul presented a copy of the plaque that's permanently installed at the test-bed site in Bob's memory to Norma Grover, Bob's wife.

USDA will have the day-to-day responsibility for operation and maintenance of the Bushland VAWT; no Sandians will be permanently stationed there, though members of Div. 6225 will travel to the site for certain tests. Test data (on hard disks and tapes) will be sent to SNLA for review and analysis.

Planning for the test bed began in 1983. The \$3.5 million facility is the latest experimental project in Sandia's 15-year involvement with wind energy and is part of DOE's and the Labs' long-term commitment to energy research and to technology transfer to private industry. ●PW



DONNA FITZPATRICK, DOE Assistant Secretary for Conservation and Renewable Energy, is interviewed by one of the Amarillo TV stations before the dedication ceremony.



A TIME, AND PLACE, TO REMEMBER — "Last Memorial Day weekend, I visited the Vietnam Veterans Memorial Chapel, located in a beautiful valley near Angel Fire. There is something about this place — you feel different, you feel like crying, it grows on you. The nearby visitor center tells why the chapel was built, and why all the Vietnam veterans call this place their memorial, their home, a place to think, a place to be alone with the friends they have lost. Anybody who knew someone who was part of the Vietnam War should visit this place. I know. My father's name and picture are inside the visitor center along with the names and pictures of other men who fought and died for their country." —Michael Benavidez (3434) Photo by John Shunny (ret.)

"I Cannot Tell A Lie..."

...Bonds Are Better Than Ever"

**U.S. SAVINGS BONDS**  
THE GREAT AMERICAN INVESTMENT

## Take Note

James Ortega (3741) was recently appointed by Mayor Ken Schultz to the Airport Advisory Board.

\* \* \*

The annual Endangered Species Fair is scheduled for May 21 from 9 a.m. to 5 p.m. at the New Mexico Museum of Natural History. It's designed to promote public awareness of New Mexico's endangered animals and plants and their needs. Emphasis this year will be on the Mexican gray wolf; there are only 32 left, all in captivity.

The Fair is planned as a family event with live animals, plants, speakers, films, music, food, displays, exhibits, and wildlife-related activities for children. Special speaker is Warren Parker, manager of the red wolf reintroduction project in North Carolina.

Sponsors of the Fair are the Sierra Club, the New Mexico Museum of Natural History, and the New Mexico Dept. of Game and Fish. Admission to the Museum will be half-price, and all regular exhibits will be open. For more information, contact Sierra Club member Jiunn Yu (9115) on 268-5355.

\* \* \*

Finished your spring housecleaning yet? No? Good. Turns out that some stuff you might throw away can be given away instead — and to a Worthy Cause.

First, children's books. The Albuquerque Public Library is helping the South Broadway Cultural Center start a summer reading program. The two groups are looking for good-condition paperbacks suitable for toddlers through teenagers. If you have any paperback books that you're willing to donate, tie them together, add a tag with Elaine Shannon's name, and take them to any branch library in town. More info from Elaine on 768-5154.

Next, musical instruments — horns, strings, drums, guitars, even pianos. If you've finally given up on resuming that "promising musical career" of 20 years ago, donate your old or new, playable or broken (good for parts) instrument to the Albuquerque Chapter of the American GI Forum. An AGIF member will restore it to playable shape and pass it along to the "loan instrument pool" of an Albuquerque Public Schools Music Department. And you'll help out one of the many kids who'd like to learn music but can't afford an instrument. Either take your instrument to the AGIF clubhouse (621 Gabaldon Rd. NW; entrance on Mountain Rd.) or call Isabelle Tellez on 242-5440 to arrange for pick-up.

Finally, home computers. If you and/or your kids have outgrown yours (system, monitor, printer, software, books, supplies, etc., of any type or make), donate it/them to the St. Bonaventure Academy on the Navajo Reservation in Thoreau. The Academy will pick up your donation (call the school on 505/862-7465) and use it in a new microcomputer class designed to teach a marketable skill to the school's poverty-stricken students. (Your donation to the non-profit school is tax-deductible at fair market value.) More info from John Garrity at the phone number above.

\* \* \*

Retiring and not shown in LAB NEWS photos: Charles Gulick (7133), Kelly Montoya (2690), Louis Ulibarri (3423), Clory Valdez (4021), Domi Casares (2825), Jack Kidd (2613), Edward Salazar (9142), R. L. Ledgerwood (5213), Walter Drake (7533), and David Werme (3434).

## Retiring

# How — and Why — to Be a Skilled Health Care Consumer

By B.J. Jones (3545)



My earlier LAB NEWS columns on this subject have addressed the problem of increasing health care costs across the nation (1/29/88) and the actions being taken by industry to address the problem (3/25/88). As I stated in those articles, Sandia continues to investigate alternatives for managing health care costs while maintaining health care coverage that allows you to receive quality care.

In this article, I'm asking you and your family to work with us to achieve two important goals: (1) Better management of health care costs, and (2) Continued access to quality health care for you and your family; that means getting the right treatment, in the most appropriate setting, at the least risk to your health.

To meet these goals, one of the things we can do is to help you become a skilled health care consumer — that is, to take a more active role in your own health care.

The best way to protect your health is to adopt or maintain healthful living habits and to have periodic checkups. You should plan and budget for your wellness and your preventive medical care costs because these expenses are your responsibility; they are not covered by Sandia's Medical Care Plan (MCP).

We hope, of course, that you never require the services covered by the MCP. But — no matter how healthy you are now — chances are that someday you will need health care services. That is where the MCP steps in. The primary purpose of the MCP is to protect you and your family from the financial hardship associated with catastrophic medical problems.

That's why the MCP covers only "reasonable and customary" expenses for "medically necessary" treatment. Your MCP booklet contains the following definitions:

"REASONABLE AND CUSTOMARY refers to the range of usual fees charged by medical care providers in a defined locality for a specific procedure, supply, or service."

"MEDICALLY NECESSARY services or supplies are those provided by a hospital, physician, or other provider which the claim administrator [Provident] determines are:

1. Appropriate for the symptoms, diagnosis, and treatment of the covered person's condition; and
2. Provided for the diagnosis, direct care, and treatment of the covered person's condition; and
3. In accordance with generally accepted local community and national standards of medical practice; and
4. Not primarily for the convenience of the covered person and/or the provider; and

5. The most appropriate supply or level of service that can be safely provided to the covered person.

THE FACT THAT A PHYSICIAN MAY PROVIDE, PRESCRIBE, ORDER, RECOMMEND, OR APPROVE A SERVICE OR SUPPLY DOES NOT, OF ITSELF, MAKE THE SERVICE OR SUPPLY MEDICALLY NECESSARY OR MAKE THE CHARGE FOR IT COVERED. . . ."

In other words, Sandia does not consider all treatments to be medically necessary. For example, the MCP recently denied payment of charges billed for treatment received at pain control treatment centers because some of the therapy or services delivered — suntanning, orthopedic pillows, non-specified "evaluations," for example — were not consistent with the MCP's definition of "medically necessary supplies and services." The MCP is *not* intended to pay for every kind of service you receive, so plan accordingly.

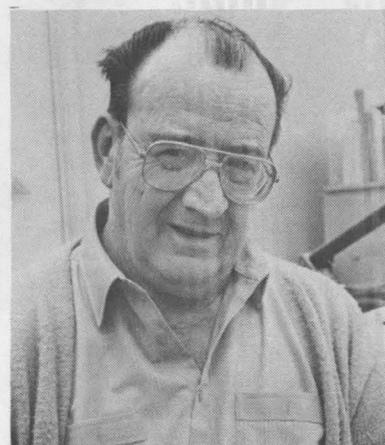
### Your Health — Your Responsibility

You must participate in your own health care choices. Your health is your responsibility. Therefore, it is important that you make wise decisions to get appropriate care — and getting appropriate health care does not necessarily mean getting the most expensive care.

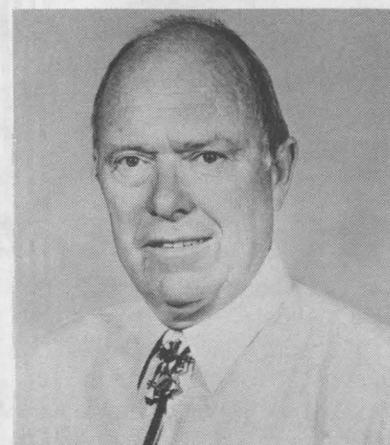
How can you make wise decisions? Talk with your doctor to make sure you understand recommended treatments, alternatives, and risks. For example:

- If your doctor recommends elective (non-emergency) surgery, you should ask how you will benefit from the surgery, what the surgery risks are, what would happen if you did not have the surgery, and what alternative treatments are available. Also, because the decision to have surgery is up to you, it is wise to get as much information as possible by getting a second opinion; see another doctor.
- Before going into the hospital, you should determine why hospitalization is required, whether routine pre-admission tests can be done before you are admitted as an inpatient, whether any surgery recommended could be done on the same day as admission (or on an outpatient basis), and an estimate of how much the total charges will be.

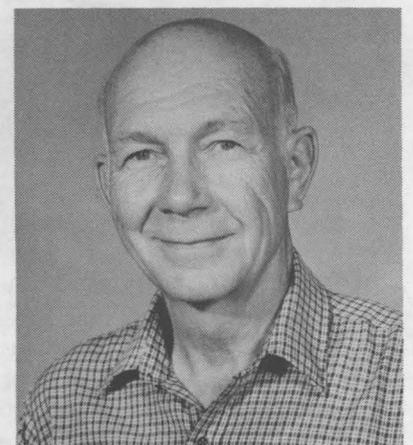
When you file a claim (or one is filed for you), it is very important that you carefully inspect every charge on the bill. (Even if someone files a claim for you and you never see the bill, you will still receive an Explanation of Benefits describing how much the MCP is reimbursing for that claim). Check for errors, such as charges for treatment never rendered, or double billing for the same service. Such errors might be simple mistakes — or billing practices that need more investigation. If you suspect such an error, you should immediately contact the claim administrator or the Sandia Benefits Office.



Duke Pawley (3155)



41 yrs. Bill Rogers (9222)



32 yrs. Bill Walker (DMTS, 7526) 34 yrs.



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

- '77 AVONDALE TRAVEL TRAILER, 8' x 35', sale or trade, make reasonable offer. Martinez, 255-6919.
- DOG BASKET, brown wicker, new, 33" x 25" x 10", and new cushion, cost \$48, \$20/both. Stamm, 255-2640.
- DIGITAL STEREO RECEIVER, JVC RX-111, 25 watts per channel, 6 months old, \$100. Probst, 268-1461.
- WINCHESTER model 94 .32-cal., made in 1965, \$165; Winchester model 1300 featherweight, \$250. Greene, 299-4163.
- LAPIDARY ARBOR, grinding wheel, polishing drum, face plate, bench-mounted, w/6" diamond saw and water pump, \$180. Rainhart, 821-3690.
- QUEEN-SIZE WATER BED, Aqua-Firm II, solid wood, mirrored headboard, padded sides, heater, \$300. Lucero, 831-0125.
- BLACK TUXEDO: coat, 40R; pants, waist 34; shirt, 16x33; cummerbund and tie; \$35. Collins, 292-0495.
- ELECTRIC PLANE, w/extra cutter for doors; other wood tools and mechanical tools. Kross, 836-3860.
- NAVAJO KACHINAS, 18- to 20-in. (Longhorn, Spotted Corn, Antelope), \$100/ea. Kinney, 298-5281 after 4.
- OWNER'S MANUALS: '74 Ford Maverick, '76 AMC Pacer, \$3/ea.; service manual for '74 GMC light-duty trucks, \$5; Chev. & Ford truck rims. Padilla, 877-2116.
- WASHER, Sears Kenmore, brown, \$75. Carmel, 889-8826.
- FEDERAL "STREETHAWK" LIGHT-BAR, 47" long, 4 rotating halogen lights, 2 strobes front, two alley lights, red/blue, \$350. Bruce, 897-7416.
- PIONEER SA7100 STEREO AMP, 35 watts/channel, walnut case, Acoustic Research AR2ax 10" 3-way speakers (pair), \$75/all. Brooks, 883-1485.
- FOUR TIRES & WHEELS, P215-75R-15, 1/2 tread, includes wheel covers from '71 Bronco, \$50/all. Snyder, 296-5771.
- FOUR TIRES, P155-80R13, steel-belted radials, \$10/ea. OBO. Davidson, 294-4571.
- TWO CHILD-CRAFT CRIBS, honey oak wood, Simmons Super Maxipedic mattress, 2 yrs. old, \$125/ea. Barr, 821-5870.
- GOLF CLUBS: irons, 3-PW, Spalding Executive XE, \$115. Loukota, 294-7353.
- BABY GRAND PIANO, full-size, w/bench, Winter (Aeolian), 7 yrs. old, walnut, \$5500. Saxman, 299-8274.
- APACHE RAMADA FOLD-DOWN CAMPER, solid sides, stove, icebox, sleeps 8, \$2950. Strasburg, 821-7104.
- KING-SIZE WATER BED, Big Sur, new, complete, w/heater, mirrored headboard, \$275. Falacy, 293-2517.
- GOLF CLUBS: Ping 3-P, Walter Hagen Ultradyne II woods (1, 3, 4, & 5),

- Titleist bag, \$250; slalom water ski, Western, wood, tunnel, concave, \$10. Harris, 268-4432.
- GAS RANGE, brown, \$50; double mattress and box spring, \$40; TV video game, \$20. McCrory, 292-7516.
- FULL-SIZE MATTRESS and box spring, \$50. Sims, 299-4418.
- BLACK & DECKER 8" TABLE SAW, w/stand, \$50; 6' aluminum step ladder, \$8; 16' aluminum extension ladder, \$17; electric drill stand, \$8. Travis, 255-9295.
- WOVEN WOOD BLINDS, 3 panels, w/hardware, earth tones, fits up to 9' patio door, \$50. Dunlap, 884-0232.
- PRECIOUS MOMENTS FIGURINES, includes club, retired, and suspended pieces, dolls, musicals, and one Anri wood carving. Ishmael, 242-4050.
- ANTIQUA ICEBOX, oak, \$399; brass 5-prong light fixture, \$50. Kallio, 884-3923.
- FIVE TIRES (2 are new): 10x15, 6-ply, \$225/all OBO. Hamilton, 869-2718.
- UNUSED VACUUM TUBES, old sewing patterns and license plates. Williams, 294-4742 leave message.
- '73 COACHMAN OVERHEAD CAMPER, 9-1/2', shower, self-contained, heater, hot-water tank, battery charger, swamp cooler, \$1800. Weatherbee, 869-2849.
- EVAPORATIVE COOLER, Champion 4800DD, complete, includes 2-spd. motor, all new, \$295. Griffie, 296-8129.
- COMMODORE 64, 1702 monitor, 1541 disk drive, recently overhauled by Omega, misc. software, price negotiable. Gottlieb, 298-9859.
- EQUALIZER HITCH RECEIVER, for '77 Jeep Cherokee, \$50. Schnetzer, 292-0733.
- SHOES (casual): size 6, tan, wedge sole; size 5-1/2, white; brown, size 6, new. Gonzales, 243-1434.
- LAWN MOWER, 3.5-hp Briggs & Stratton, 22", w/side bagger, bag needs work or replacement, \$25. Cocain, 275-9505.
- ELECTRONICS; king-size water-bed mattress, liner, heater; toys; bike parts; HO trains, train board (grid), garage sale 8 a.m.-6 p.m. May 21, call for location. Mayer, 294-3368.
- SPEAKERS, Magneplanar MG-2-B, new, cost \$1250, \$650/pr. Babcock, 892-7199.
- SEARS CEMENT MIXER, 2-1/4 cu. ft., \$200. Chapman, 299-8080.
- PRECOR 710 ROWING MACHINE, \$200. Webb, 828-2271.
- ROOM DIVIDER, dark wood, 4 panels, \$85. Marchi, 291-9681.
- FLAGSTONE, 300 sq. ft., \$250 if you haul, \$300 if I haul. Greer, 831-0019.
- IRIS RHIZOMES: common varieties, 25¢; named varieties, \$3-\$8. Mozley, 884-3453 leave message.
- WROUGHT-IRON CHANDELIER, \$20; new boat seat, \$20; Atari 2600 w/games, \$30; porta-potty, \$20. Garcia, 293-3937.
- EVAPORATIVE COOLER, 4000-cfm, 1/3-hp 2-spd. motor, pump and steel side panels for winter, \$75; roof elbow, \$10. Brion, 298-1761.
- CHINA CABINET/BUFFET, walnut, \$100. Schuster, 299-1072.
- QUEEN-SIZE HIDE-A-BED COUCH, solid wood frame, \$100; 4 bar stools, padded seats, 29" high, \$25. Hovorka, 299-0224.
- CONN ORGAN, Caprice, new. Spatz, 299-0410.
- SOFA BED, 2 yrs. old, \$300; outdoor clothesline, \$10. Meeks, 828-9825.
- TELEVIDEO TS803 PERSONAL MICROCROCOMPUTER, CP/M, software, dual floppy drives; Bell & Howell Super 8 movie outfit; best offers. Hansen, 296-0610.
- IBM EXECUTIVE ELECTRIC TYPEWRITER, red case, solid touch, print-like letters, \$50 OBO. Fjelseth, 296-2257.
- SHOWER ENCLOSURE, includes all hardware, \$20. Spiers, 275-3655.
- TIRE CHAINS for light truck, 7.00x15, unused, 1/2 price, \$25; sand-blasting cabinet, homemade, \$20. Olsen, 294-2333.

- GOLF CLUBS: MacGregor Tourney Master 3-4-7 woods, (3-10) irons, sand iron, putter, right-handed, bag, and cart, \$200. Rodriguez, 296-3277.
- AQHA-REGISTERED 1987 BAY FILLY, w/star and snip, halter prospect, \$950. Reynolds, 1-864-6224.
- SOLID-CORE DOOR, 30" x 6'8", never used, \$25; various landscaping rocks, free. Zirzow, 294-7296.
- ANTIQUA TWIN-SIZE HEADBOARDS, brass, \$25/ea. OBO. Pfeiffer, 299-3951.
- GE REFRIGERATOR, 16.6 cu. ft., top freezer, avocado, \$125. Bisbee, 293-0356.

### Early Deadline

Because of the Memorial Day holiday, the deadline for all ads and other LAB NEWS submissions is noon on May 26.

### TRANSPORTATION

- '72 ELDORADO 20' MMH, fully self-contained, 34K miles, dual AC, second owner, \$5500 OBO. Renwick, 299-8090.
- '84 COUGAR, V-6, new tires, sound system, extras, \$6995. Terry, 293-5440.
- '85 WINDJAMMER CLASS A MOTOR HOME, 27', 7K miles, twin beds, microwave, swivel chairs. Lombard, 294-5754.
- '76 DATSUN 280Z, recently restored, new engine, tires, rear end, and seats, \$2600. Chavez, 881-2782.
- '81 SUZUKI GS1100, adult-ridden, garaged, \$1600. Prevender, 296-8586.
- '71 KARMANN GHIA CONVERTIBLE, second owner, new windshield, rebuilt engine, Blaupunkt radio, radial tires, \$5000. Sandoval, 293-6003.
- '67 CORVETTE, 427; '66 Mustang, 6-cyl. Gutierrez, 821-4852 or 242-7660 after 5.
- '65 DODGE DART, 2-dr., 6-cyl., \$500. Barry, 275-3875.
- '69 FORD F-250 RANGER, loaded, 37K miles, 390 engine, AT, AC, w/camper, \$4800. Kross, 836-3860.
- '77 MOTOR HOME, 17', 20K miles, self-contained, sleeps 4, refrigerated AC, \$7995. Stephenson, 836-4260.
- '81 BLUE SEASPRAY CATAMARAN SAILBOAT, w/sail, lifejackets, etc., includes '83 EZ-Loader cat trailer, \$1200. Cernosek, 299-2252.
- '86 BRONCO II, V-6, fuel injection, AC, 24K miles, 50/50,000 warranty, \$9000 OBO. Machin, 822-8125.
- '74 CORVETTE COUPE, 350, loaded, silver & burgundy, recently restored to original, records available. Bukaty, 345-4691.
- '86 CHEV. K-5 BLAZER, 305 V-8, brown, AC, tilt, 45K miles, \$10,500, trade considered. Todd, 344-9015.
- '57 WILLYS 6-226 UTILITY WAGON, 4x4, rebuilt throughout, \$2400 OBO. Carrick, 266-0191.
- '86 NISSAN 200 SX-XE, 21K miles, blue, 2-dr. hatchback, 5-spd., sunroof, digital dash & entry, AM/FM cassette, cruise, more. Hassig, 292-3350.
- '87 VOLVO DL, loaded, metallic blue, \$15,000 OBO. Boal, 897-4216.
- '83 VW QUANTUM, 4-dr., brown, light tan interior, 5-spd., AC, AM/FM cassette, cruise, 63K miles, \$3900. Keeling, 296-9729.
- '82 BUICK SKYLARK, 47K miles, fully equipped, silver, \$3300. Wagner, 823-9323.
- 10-SPD. RALEIGH GRAND PRIX BICYCLE, used 4 times, rear carrier, mirror, locks, originally \$350, sell for \$200. Shurtleff, 296-7870.
- '46 DODGE TRUCK, \$1395; '80 Suzuki GS1100L motorcycle, \$1295. McCrory, 296-1321.
- '78 HONDAMATIC CB400T, blue, w/white Windjammer and saddlebags, chrome bag rack and crash bars, \$700. Martinez, 821-6096.
- '76 VW BEETLE, new clutch, brakes, and upholstery, 2-yr.-old paint, tow equipment, \$1875 OBO. Hamilton,

- 869-2718.
- '85 MAZDA RX-7 GS, adult-driven, louvres, air dam, blue. Clark, 821-6323.
- '85 GOLD WING LIMITED EDITION, cruise, radar detector, custom pin-striping, oversize windshield, remote burglar alarm. Hufnagel, 294-5949.
- '72 VW SUPERBEETLE CONVERTIBLE, white, serious inquiries only, \$4000 firm. Jones, 881-8341.
- FISHING BOAT AND TRAILER, 12', fiberglass, 2 swivel seats, V-hull, \$550. Doughty, 296-4142.
- '66 MERCURY PARK LANE, 2-dr. hardtop, 410-4V, AT, PS, PB, AC, all original, \$1150. Griffie, 296-8129.
- BICYCLE, \$15. Heames, 293-6550.
- BMX BIKE, Roger Decoster, mag wheels, \$85. Mayer, 294-3368.
- '82 FORD THUNDERBIRD LANDAU, 67.5K miles, 3.8 V-6, all power options, garaged, one owner, \$4200. Spence, 266-3002.
- '72 FORD MUSTANG CLASSIC, 351, \$2000 OBO. Pacheco, 836-5305 after 5.
- '87 FORD BRONCO XLT+, 14K miles, fully loaded, 5.8-litre, trailer-towing and handling package. Smith, 298-4100.
- '77 HONDA-MATIC 750 MOTORCYCLE, 19K miles, \$2500; 20" dirt bike, heavy-duty rims, tires, and Schwinn sting-ray frame, tang forks, \$75 OBO. Coleman, 299-8321.
- '84 FORD BRONCO II XLT, 4x4, 44K miles, AC, PS, PB, cruise, tilt. Stinnett, 298-8613.
- 14' BOAT w/trailer, \$1250 cash. Weber, 293-8196.
- 17' O'DAY DAYSAILER w/trailer and travel cover, \$2600; 7-1/2-hp Honda outboard motor, 4-stroke, \$950. Melvin, 298-6402.
- '87 DODGE OMNI, 5-spd., AC, AM/FM stereo, cruise, rear defrost and wiper, \$5300. Herr, 892-3024.
- '81 CHEV. CITATION, 58K miles, PS, PB, AC, AT, 4-dr. hatchback, \$1950. Fjelseth, 296-2257.
- BOY'S BICYCLE, Huffy, 16" knobby tires, pads on handlebar and top tube, training wheels, used one year, \$25. Lagasse, 293-0385.
- '87 NISSAN SENTRA, 5-spd., AM/FM cassette stereo, 2-dr., red on gray, cloth seats, 19.8K miles. Woodrum, 892-7947.
- '88 FORD RANGER XLT, 5K miles, make offer, assume notes \$238/mo. Welch, 268-9545.
- '81 MAZDA GLC, 4-dr., 4-cyl., 5-spd., AM/FM, FWD, 66K miles, one owner, \$1850. Plomp, 296-2647.
- '75 OSSA OFF-ROAD MOTORCYCLE, 350 MAR, rear spokes need tightening, \$150. Kiekel, 294-6547.
- '78 MONTE CARLO, PS, PB, PW, PL, AC, tilt, AT, cruise, new paint and seat covers, \$1350. Jackson, 836-1013.
- '81 KAWASAKI KZ750, 1/4-fairing, tank bag, cover, \$1200, offers considered. Brusseau, 892-6840.
- '84 BUICK CENTURY CUSTOM SEDAN, 60K miles, new brakes, silver, vinyl roof, loaded, \$5800 OBO. Trudell, 898-8049.
- '79 FORD FIESTA, 4-spd., new master cylinder, \$800 firm. Monson, 268-0150.
- 3-BDR. HOME, NE, 1-3/4 baths, den w/wood stove, remodeled kitchen and baths, assumable FHA, \$2500 down plus closing, \$77,500. Mitchell, 275-1527.
- 3-BDR. RESORT HOUSE, Rio Grande, north of Truth or Consequences, 110' river frontage, 2 baths, boat storage, garden, \$49,500. Carson, 281-5115.
- 3-BDR. HOME, Rio Rancho, 1-3/4 baths, 2-car garage, FP, cathedral ceiling, landscaped front yard w/sprinklers, cul-de-sac. Bailey, 255-7437.
- 3-BDR. DOUBLE-WIDE MOBILE HOME, on 2-1/2 fenced acres, east mountain area, 1150 sq. ft., 1 bath, separate workshop/garage w/loft, all utilities installed, assumable loan,

- small down, \$55,000. Graf, 265-4624.
- 2-BDR. MOBILE HOME, '85 Schult, 14' x 60', landscaped, storage shed, \$15,000. Sweenhart, 291-0747.
- 3-BDR. TOWNHOUSE, Shores condo, 2-level, 1700 sq. ft., FP, double garage w/opener, 2-1/2 baths, clubhouse, pool, tennis courts. Williams, 294-4742.
- 2-BDR. MOBILE HOME, '79 Redman, 14' x 60', Four Hills, appliances, carpet, covered patio, workshop, mini-blinds, bar, bookshelves, \$14,000. Phillips, 293-2738.
- 2-BDR. TOWNHOUSE, NE, 1-1/2 baths, upgraded carpet, fenced yard, less than \$4000 down, \$245/mo. payments. Morris, 292-5112.
- REBONITO CORNER LOT, adjacent to foothills, views, \$56,000 w/assessments (\$45,000 without). Eisler, 823-2080.
- MOBILE HOME, 12' x 65', adult park, covered porch, carport, garden, new AC, \$9000. Rosenberg, 299-9628.
- DOUBLE-WIDE MOBILE HOME and land in Los Lunas, fully landscaped, city utilities, more. Martin, 865-4017.
- 2-BDR. HOME, 1650 sq. ft., open house 1-5 p.m. May 21-22, west on Rover off Tramway, then north to 1953 Chandel. Pike, 292-5080.
- 3-BDR. HOME, NE, cul-de-sac, 1-3/4 baths, pitched roof, attached garage, workshop, solarium, landscaped, auto sprinklers, \$86,900. Fleming, 255-4513 or 293-0414.
- 3-BDR. HOME, NE, 1212 sq. ft., FP, sprinkler system, 1-3/4 baths, landscaped, \$71,000. Opichka, 294-4985.
- 13 ACRES with home and apt., outside Tucumcari city limits, irrigation well, more. Rodriguez, 296-3277.

### WANTED

- HOUSEMATE, nonsmoker, share 3-bdr. home, NE, 1-3/4 baths, \$200/mo. plus 1/2 utilities. Mitchell, 275-1527.
- CEMENT MIXER. Prevender, 296-8586.
- '74 OR LATER FORD 150 PICKUP, in good condition; '74 or later Dodge pickup, in good condition. Thomen, 281-4194.
- BABYSITTER: responsible teenager to babysit 3 children (including infant) on occasional evenings in Ridgcrest area, must have references. Paus-tian, 255-5127.
- TO VIEW: videotape of PBS documentary on Robert Oppenheimer. Pruett, 293-6244.
- DINNER PLATES: Franciscan Madeira pattern, will buy or swap some extra pieces for plates. Carrick, 266-0191.
- HOUSEMATE, female, over 65, share 3-bdr. furnished home in Kingsland, Tex., retirement area on Lake LBJ. Starz, 915-388-4887.
- SMALL GASOLINE-POWERED MOWER, good condition, prefer one w/catcher. Underhill, 294-5774 after 6.
- COLORADO RIVER BUFFS: Grand Canyon by commercial boat, 280 miles, Lee's Ferry to Lake Mead, Aug. 8-17, group rate of \$895, includes all meals. Shunny, 265-1620.
- JUICE EXTRACTOR. Maxwell, 294-9073.
- '83, '84, '85 HONDA 650 NIGHTHAWK, wrecked or bad engine, wanted for parts. Wright, 296-3850.
- POTTER'S WHEEL and kiln. Garcia, 293-3937.
- HONDA ODYSSEY 350 in good condition, or a 250 in any condition. Hine, 299-9062.
- CARTOP LUGGAGE BOX for small car. Zirzow, 294-7296.

### WORK WANTED

- PAINTING, by college student, interior and exterior, in NE/SE Heights, large and small jobs, experienced, reasonable rates. Perrine, 265-7340.
- EVAPORATIVE COOLER PREPARATION, pad replacement, by college student. Coulter, 275-2183.

## Get In the Swim At a Memorable Memorial Day

**SPLISH SPLASH** — and we're all at the bash, as those lazy-hazy-crazy days of summer fun get started officially on Memorial Day (May 30). Celebrating starts at 11:30 a.m. and continues until 6 p.m. Enjoy an outstanding outdoor menu: BBQ beef and ribs, hot dogs, hamburgers, potato salad, cole slaw, baked beans, 50-cent beer, and much more. A DJ's on hand to play your favorite music, and plenty of games (and prizes) are in store for the kids. It's free if you're a member; guest cost is \$2.50.

**LAWYERS, GUNS, & MONEY** — a rootin'-tootin' outfit if we ever saw one — belts out the shuffle tunes tonight from 8 p.m. to midnight. Beforehand, line up for some very special two-for-one chow: filet mignon or scallops. Bring along your membership card; it gets you a discount on dinner. Reservations requested (265-6791).

**GLOOMY SUNDAY?** Not if you come out for Sunday brunch this weekend (May 22). Anytime between 10 a.m. and 2 p.m., enjoy a bountiful buffet, courtesy of Manager Sal and that ever-efficient

kitchen staff. It's a treat for the whole family, and the membership discount applies (maximum of \$2/family). Reserve your space with a call to the office.

**RETIREES REHASH** old times next Thursday, May 26, at their annual picnic. For the rest of us, that means no lunch service at the Club that day. But don't let it get you down; someday — sooner or later — we too can join the party . . .

**DUST OFF THE TEN-GALLON**, because wearing it next Friday night (May 27) will get you a free drink while you're enjoying Western Hat Night. Isleta's most famous citizens, the Poor Boys, are back in town to provide c/w dance music from 8 p.m. to midnight. Two-for-one choices that night are prime rib or poached halibut.

**IF YOU'RE UNDECIDED** about where to throw that really big party this summer, consider the Club's pool/patio area — a great gathering place for any number of people. Cost can be as low as \$2/person, and meal catering is available: everything from

hot dogs and burgers to full dinners. Catering manager Maggie Pappas can help plan the festivities down to the very last detail; give her a call at the office (265-6791).

**T-BIRD CARD SHARKS** are *not* double-dealers, but they *do* call a spade a spade; come out and see for yourself. Three (count 'em) wheel/deal sessions are on tap next month: June 2, 16, and 30. Start time is 10 a.m. Where else can you find convivial conversation, cliff-hanger card games, and relishable refreshments — gratis?

**SWINGTIME IN THE ROCKIES** is what's in store for folks who sign up for a not-to-be-missed trip to Canada late this summer (Aug. 27-Sept. 4). Enjoy nine days of splendid scenery as you travel through the rugged Rockies in our neighbor to the north. The \$876/person tab covers RT air fare to Calgary, motor coach ground transportation, boat cruises and a snow coach tour, eight nights' lodging, some meals, and more. Reserve space with a \$300 deposit; balance isn't due until July 27.

## Events Calendar

**May 20-22** — "Bus Stop," classic American drama by William Inge, presented by New Mexico Repertory Theatre; 8 p.m. Tues.-Sat., 2 p.m. Sat. & Sun. (no matinee May 21); KiMo Theatre, 243-4500.

**May 20-22** — Demonstration, "fancy" baskets from ash splint, by Clara Keezer of the Passamaquoddy Indian Tribe of Pleasant Point, Maine; special event for Lost and Found Traditions exhibit; 10 a.m.-2 p.m. Fri., 1-5 p.m. Sat.-Sun.; Albuquerque Museum, 243-7255.

**May 20-June 6** — "Dinosaurs in Action": exhibit of 7 near-life-size mechanical dinosaurs including stegosaurus, parasaurolophus, ankylosaurus, dimetrodon, and pteranodon; 10 a.m.-5 p.m., New Mexico Museum of Natural History, 841-1374.

**May 20-June 12** — "Leonardo da Vinci: The Inventions," hands-on exhibit sponsored by IBM; 10 a.m.-5 p.m. Tues.-Fri., 1-5 p.m. weekends; Albuquerque Museum, 243-7255.

**May 20-June 12** — "Lost and Found Traditions, Native American Art 1965-1985," national traveling exhibit organized by the American Federation of the Arts; 10 a.m.-5 p.m. Tues.-Fri., 1-5 p.m. weekends; Albuquerque Museum, 243-7255.

**May 20-July 30** — "Viva Mexico! Serapes from the Andrew Nagen Collection," exhibit of Mexican serapes woven between 1830 and 1920; regular museum hours, Maxwell Museum of Anthropology, 277-4404.

**May 21** — Music Under the Stars: "A Night in Romantic Vienna," New Mexico Symphony Pops Concert V; conducted by Roger Melone, music includes Viennese waltzes, polkas, and overtures; 8:15 p.m., First Plaza, 842-8565.

**May 21** — "Tito," La Compania de Teatro de Albuquerque presents one-man show by Jose Garcia based on work by Taos poet Romolo Arellano; 7:30 p.m., South Broadway Cultural Center, 848-1320.

**May 21-22** — Collectors Showcase, antiques and collectibles; 10 a.m.-6 p.m. Sat., 10 a.m.-5 p.m. Sun.; Exhibit Hall, New Mexico State Fairgrounds, 883-6986.

**May 21-22** — Spring Flower Show, sponsored by the Council of Albuquerque Garden Clubs; 2-6 p.m. Sat., 10 a.m.-4 p.m. Sun.; Albuquerque Garden Center (10120 Lomas NE), free, 296-6020.

**May 25** — Danzahoy Dance Theatre of Venezuela, modern dance in a Latino idiom inspired by the tango, the jungle, and magic; 8 p.m., KiMo Theatre, 848-1374.

**May 27-29** — Demonstration of beadwork moccasins and leather clothing, by Assiniboine Sioux artists Joyce Growing Thunder Fogarty and Juanita Fogarty; special event for Lost and Found Traditions exhibit; 10 a.m.-2 p.m. Fri., 1-5 p.m. Sat.-Sun.; Albuquerque Museum, 243-7255.

**May 28** — Taste of Summerfest: different ethnic groups selling variety of foods, free entertainment, Children's Theatre performance; 5-10 p.m., Civic Plaza, 764-3490.

**May 29** — Concert, Albuquerque Municipal Band performing marches, Broadway-show medleys, and classics; 2 p.m., Rio Grande Zoo, 843-7413.

**May 29** — Blessing of the Fields, Corn Dance; Tesuque Pueblo, call for time, free, 843-7270.

**June 3-5** — Wood-carving demonstration by Richard Hunt of the Kwagiutls of Fort Rupert, Vancouver Island, British Columbia; special event for Lost and Found Traditions exhibit; 10 a.m.-2 p.m. Fri., 1-5 p.m. Sat.-Sun.; Albuquerque Museum, 243-7255.

## Congratulations

To Barbara and Ed (2858) Young, a son, Joshua Michael, April 23.

To Debbie and Brian (2857) Schwaner, a daughter, Jenna Kaylene, April 25.

To Lydia and Brett (7818) Dalton, a son, Dakota James, May 3.

To Regina (3426) and Patrick Jaramillo, a son, Eric Patrick, May 5.

To Terri and Glenn (2113) Machin, a son, Christopher Paul, May 11.

To Linda Stackpole and Phil Rivera (both 3437), married in Albuquerque, May 14.

## Welcome

### Albuquerque

Patricia Shorty (3426)

### Arizona

Brian Stallard (2131)

### Indiana

Michael McEwan (2531)



**FIRST-TIME VISITOR** to Sandia — Ray Massie (right), Director of DOE's Office of Minority Economic Impact, recently toured some of Sandia's pulsed power fusion facilities (here, PBFA II); Ed Kozlowski (1200 staff, left) was the tour guide. Massie's visit, hosted by Maureen Baca (3510), was designed to help him learn how Sandia could most effectively participate with three high-minority-enrollment universities in a new, multi-lab Science and Technology Alliance, the first of its kind (LAB NEWS, Dec. 18, 1987). He also talked with VP Dan Hartley (6000), Sandia's signatory to the alliance.