

EM-Field Technology Helps Locate Tunnels, Abandoned Mines

To the ordinary observer, the 6-foot piece of white PVC pipe attached to a cable doesn't look like much. But Bob Wayland (9114) says the equipment is not as ordinary as it looks. When he lowers it into a borehole, he says, the electromagnetic (EM) field it emits gives him "tunnel vision."

Bob and David Lee (7323) are among five Sandia researchers developing new tunnel detection techniques that use low-frequency EM fields to "view" what lies underground. They say the techniques are most effective for detecting tunnels that contain metal conductors such as communications wires, ore car tracks, or steel mesh.

The Sandia techniques may help verify that certain treaty-limited items are not being moved covertly, as well as detect tunnels used for drug smuggling, prison breaks, and military operations. The techniques may also be

"These methods add one more bullet to the arsenal of tunnel detection techniques."

used to detect abandoned mine shafts prior to excavations or construction projects. (See "EM Fields May Join Labs' Treaty-Verification Technologies" on page four.)

Computer-aided tomography (CAT) techniques — similar to imaging techniques used in internal medicine — are also being studied by Sandia for mapping tunnels and locating mineral deposits, says Bob, even in areas with complex geology.

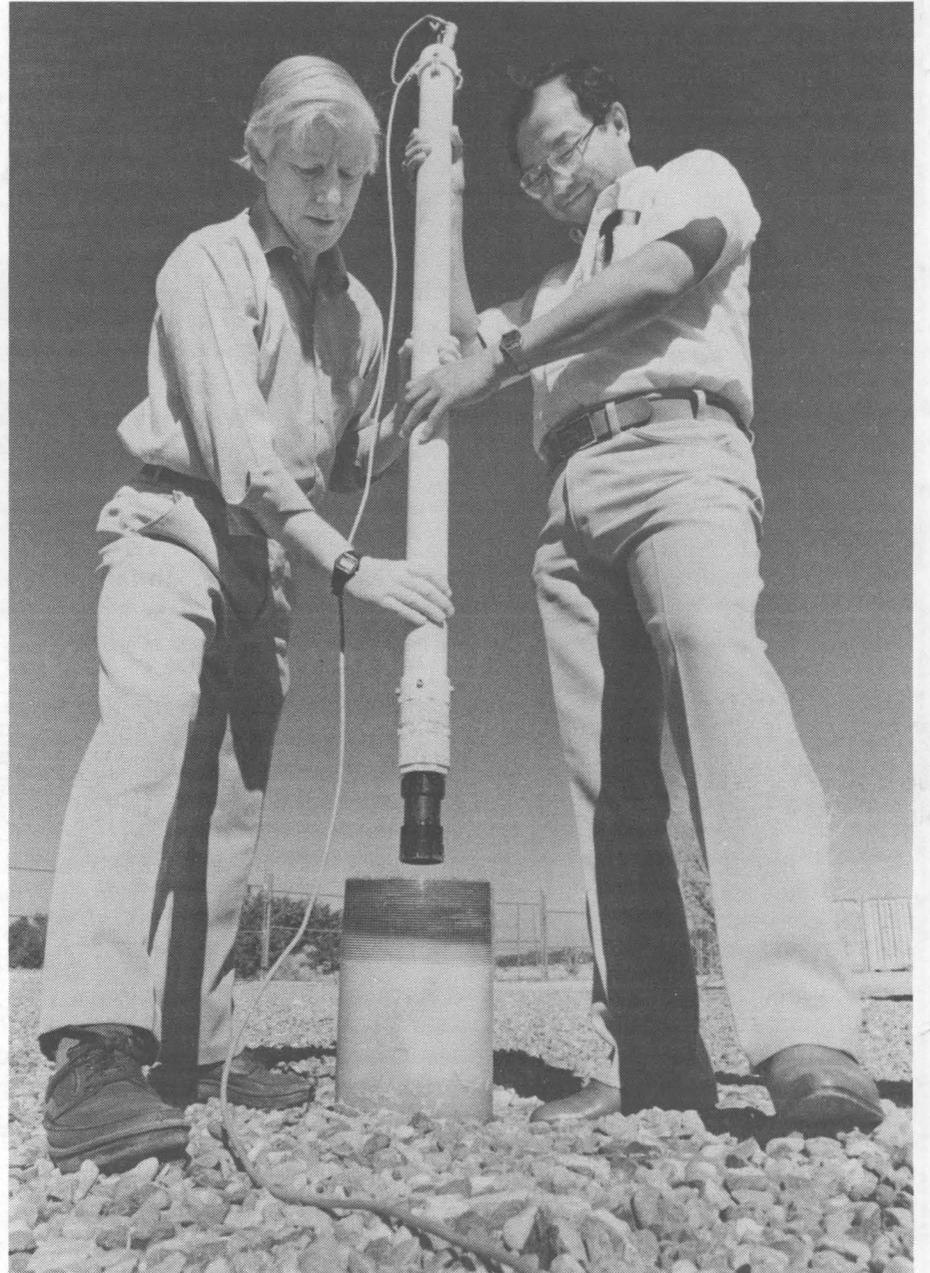
"These methods add one more bullet to the arsenal of tunnel detection techniques," Bob says. "No single technique is capable of detecting tunnels in every possible situation."

Waves Ricochet and Scatter

Conventional tunnel detection techniques are most effective in areas with uniform geological features. One conventional technique measures resistivity between electrodes placed at various locations on the surface, but the results are difficult to interpret, says David. Another technique measures the depth of the water table; localized water drawdown (suggested by dips in the depth of the water table) sometimes indicates a nearby tunnel acting as a groundwater sink (drain), he says.

Ground-penetrating radar and geophones (surface microphones that "listen" for underground mining activity) are also used, but are useful only in limited underground environments. "Most tunnel detection techniques are invasive," he continues. "You can easily confirm a suspected tunnel if you know something's down there already, but it's much more difficult to search blindly for one. A combination of the various techniques produces the best results," he says.

(Continued on Page Four)



LOWERING an electronic borehole compass into a borehole are Bob Wayland (9114, left) and David Lee (7323). The new Sandia-developed tunnel detection techniques can help locate covert tunnels and abandoned mine shafts.



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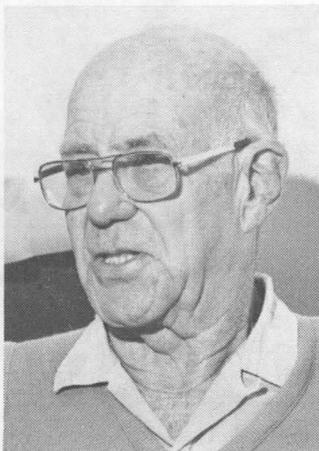
No Sick Leave for 35½ Years

Only the Healthy Can Break This Record

The last time Bill Walker (7267) took a sick day, he had a good excuse. Whether it was good or bad probably wouldn't matter at this point, though, because the day was in October 1955.

Bill also has the distinction of being the oldest Sandian — his 74th birthday was last week. He went on the Sandia payroll Jan. 3, 1949, when the Labs' operation was still managed by the University of California.

"Bill is very quiet," says his supervisor, Ron Oelsner, "and he certainly doesn't brag. But when we had our first talk after I became his supervisor last



Bill Walker (7267)

July, he did admit that he thought he had a record." And it's quite a record — look at it forward instead of backward, and it's the equivalent of taking no sick time until around the end of 2026.

"I don't believe I had any sick days before 1955," says Bill, "and I'm sure there haven't been any since then. The time I took off that October was about seven working days, for an operation."

Bill says he eats carefully (lots of fruit and vegetables, no red meat or saturated fats), avoids tobacco and alcoholic beverages, and exercises three times a week at a local gym.

Because some folks younger than Bill were already on the payroll when he joined, he can't claim the record for longest service. But he's in the top ten on that list. He's thinking about retirement, he says, but so far his plans are only as definite as staying at Sandia at least through this calendar year.

For someone who doesn't even take sick leave, it must seem more natural to think in terms of how much longer he'll work, instead of how soon he might retire. ●CS

**What Have the
Barrier Busters
Been Doing? — See
Page Seven**

15,000 Expected

Family Day Planned For October 19

Sandia, Albuquerque's seventh Family Day, an event that occurs only once every five years on average, has been scheduled for Saturday, Oct. 19, from 9 a.m. to 4 p.m.

Family Day 1991 is expected to draw some 15,000 employees, retirees, and family members, notes Joe Laval (3163), chairman of the planning committee for this year's event, which held its first meeting last week.

The popular event offers Sandians, retirees, and their families an opportunity to visit different areas of the Labs and look at special exhibits.

Employees who have questions may call Joe on 4-6531. Those with suggestions for exhibits or tours may call Paul Yourick (3429), in charge of tour planning, on 4-2630.

Details will be published in upcoming issues of the LAB NEWS.

This & That

Mark Your Calendars - Saturday, Oct. 19, is Family Day '91 at Sandia, Albuquerque (see announcement on page one). It's about a once-every-five-year opportunity for the close kin to "come inside" and see some of what we do. Might wanna tell 'em to mark their calendars, too.
* * *

Terrible Ties - If you're gonna enter a necktie in our "World's Ugliest Tie" contest, you've still got a few hours, but it's gotta be here (Bldg. 814, Rm. 1) by 4:30 today. Entry fee is a buck a tie, with all proceeds to charity. We'll announce the winner in the June 14 issue. I'll treat the winner to lunch and wear the winning tie when we go.
* * *

Going for 50, Jack? - Since G. C. Hollowwa retired April 1, Jack Suttman (9135) has been homing in on the record for being the "longest Sandian." Now he's got it. G. C. put in 44 years, 8-1/2 months before checking it in. Jack, who began his Sandia career Sept. 9, 1946, surpassed that about a week ago.
* * *

John's Jack, Jack's Not John - Speaking of "Jack" (actual name John) Suttman, I'm sure there's a logical explanation for this, but I've never heard one: why some people named John are nicknamed Jack, but guys named Jack are never called John. Sandians?
* * *

Simply Amazing - is the only way I can think of to describe Bill Walker's (7267) attendance record. Bill, the oldest Sandian on roll (age 74), hasn't used a day of sick leave since 1955 (see story on page one). Can anyone else match Bill's attendance record?
* * *

Kudos to Counterparts - When the idea of Sandians being appointed to serve as counterparts for every member of the recently departed ES&H Tiger Team was proposed, team leader Dave Spence was skeptical. But the arrangement worked well and the Tiger/counterpart relationship proved useful in various ways, says Marilyn Warrant (3600), who coordinated counterpart recruitment. In many cases, counterparts were the local technical experts in their Tiger's discipline (emergency preparedness, mixed waste, radiation, etc.). Counterparts worked closely with the Tigers to ensure that findings are stated accurately and clearly so that meaningful action plans can be produced.
* * *

More Noteworthy Typos - Retired LAB NEWS assistant editor Phyllis Wilson spotted this one in a short business article hyping a new beer. The article says the beer is packaged in specially lined cans, and taste tests show the taste "is indistinguishable from the quality bottled-beer taste which consumers prefer." I've experienced that taste a time or two, but it's usually on the morning after consuming a few.

Carter Kidd (3744) thinks a typist at a university electrical engineering department got her/his wires crossed when typing a mailing label addressed to Sandia, Albuquerque. The last line in the address was typed "Akbyqyerqyem Bew New Mexico."
* * *

No Truth to Rumor - There's no truth to the nasty rumor that lifting a copy of the new ES&H manual (goes into effect tomorrow) by yourself is an automatic safety hazard. However, my personal advice is to bend your knees, not your back, when lifting it. ●LP

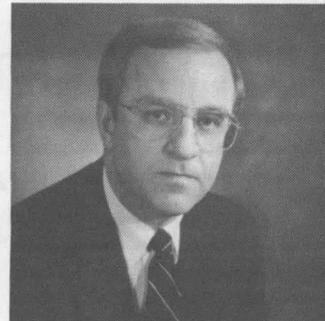
Tanenbaum Retiring

New Member on Sandia Board

Randall Tobias, vice chairman of AT&T, has replaced Morris Tanenbaum on the Sandia Corp. Board of Directors.

Tanenbaum, also an AT&T vice chairman, retires from AT&T June 30. Tobias was elected at the May 21 Sandia board meeting.

"I welcome the opportunity to have Randy



RANDALL TOBIAS

Tobias join the Sandia Board," says Al Narath, Sandia President and himself a board member "His background and experience at AT&T will make a valuable contribution to the management of Sandia. Randy also will take over from

Morry oversight responsibility for Sandia matters at AT&T.

"I know all Sandians join me in thanking Morry for his service to the Labs and wishing him well in his retirement," Al continues. "We really appreciate the strong interest he has taken in Sandia and our work. We will miss the leadership and advice he brought to Sandia on behalf of AT&T."

The 49-year-old Tobias has been an AT&T vice chairman since September 1986. He is responsible for AT&T's worldwide business units that provide long-distance and other network services, telephones, and other communications products and systems.

A marketing graduate of Indiana University, Tobias began his AT&T career at Indiana Bell in 1964. ●

Take Note

The Society of Women Engineers 1991 National Convention will be held June 24-29 in San Diego. This year's convention, "Engineering Our Future — Enhancing the Quality of Life," is sponsored by SWE Region B, which includes Central New Mexico. Margie Whipple (6224) and Jan Williams (7823) helped plan the convention. Topics will include "Future Technology Projections," "Future Implications of Current Technology," "Family/Health Issues Now and in the Future," "Influences of Future Technology on Individuals," and "Managing Skills and Technologies." For information, call Debbie Brunt on 880-7909 or 294-1592.

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SIX SANDIANS recognized for outstanding volunteerism records are shown with VP John Crawford (8000, third from left), who presented award certificates. From left: Sandy Ferrario (8161) and Mary Rivenbark (8534), co-chairs for the 1991 Expanding Your Horizons (EYH) conference; John; Susan Crawford (8316), also co-chair for EYH; Gary Drummond (8300C), Livermore Heritage Guild past president, board member, and history walking-tour leader; Gloria Christensen (8300A), facilities co-chair at EYH; and Mel Lagasca (2913), a longtime leader in the Associated Filipino Organization in Stockton and board member of the Good Samaritans and Boys and Girls clubs in Tracy. The six were among more than 100 employees from companies in the Tri-Valley area honored at the annual Corporate Volunteerism Council recognition luncheon.

Reducing Oil Contamination**New Insight into Diesel Emissions Wins Consortium Award**

For more than three years, researchers at Sandia, Livermore have teamed up with scientists from Cummins Engine Co. of Columbus, Ind., to better understand how particulate (smoke) and nitrogen oxide (NOx) form in exhaust emissions from diesel engines. The researchers are using advanced laser-based diagnostics capabilities at Sandia's Combustion Research Facility.

The collaboration was under way only a short time, however, when the research took an unexpected but brief two-month detour — a detour that resulted in a Federal Laboratory Consortium (FLC) Award for Excellence in Technology Transfer. The award winners: Dennis Siebers, Acting Supervisor of Combustion Applications Div. 8362, and Axel zur Loye, a technical specialist for performance and combustion technology at Cummins.

The award, presented April 24 during the FLC annual meeting in San Diego, was for effective technology transfer of new insight into the contamination of lubrication oil by particulates, a problem that reduces engine life. (Another award for work at Sandia, Albuquerque was also made — see page five.)

"The project represents a coupling of Cummins' diesel engine production expertise for domestic and foreign markets with Sandia's engine diagnostics capabilities to look at a critical problem for US diesel manufacturers," says Dennis.

Pressing Problem

Reducing particulate and NOx emissions is the most pressing problem facing the heavy-duty diesel industry today, an industry on which the US transportation infrastructure is based, explains Dennis. But this industry has recently encountered difficult times, caught between increasingly stringent emissions regulations from the US Environmental Protection Agency (EPA) and competition from Japanese engine manufacturers.

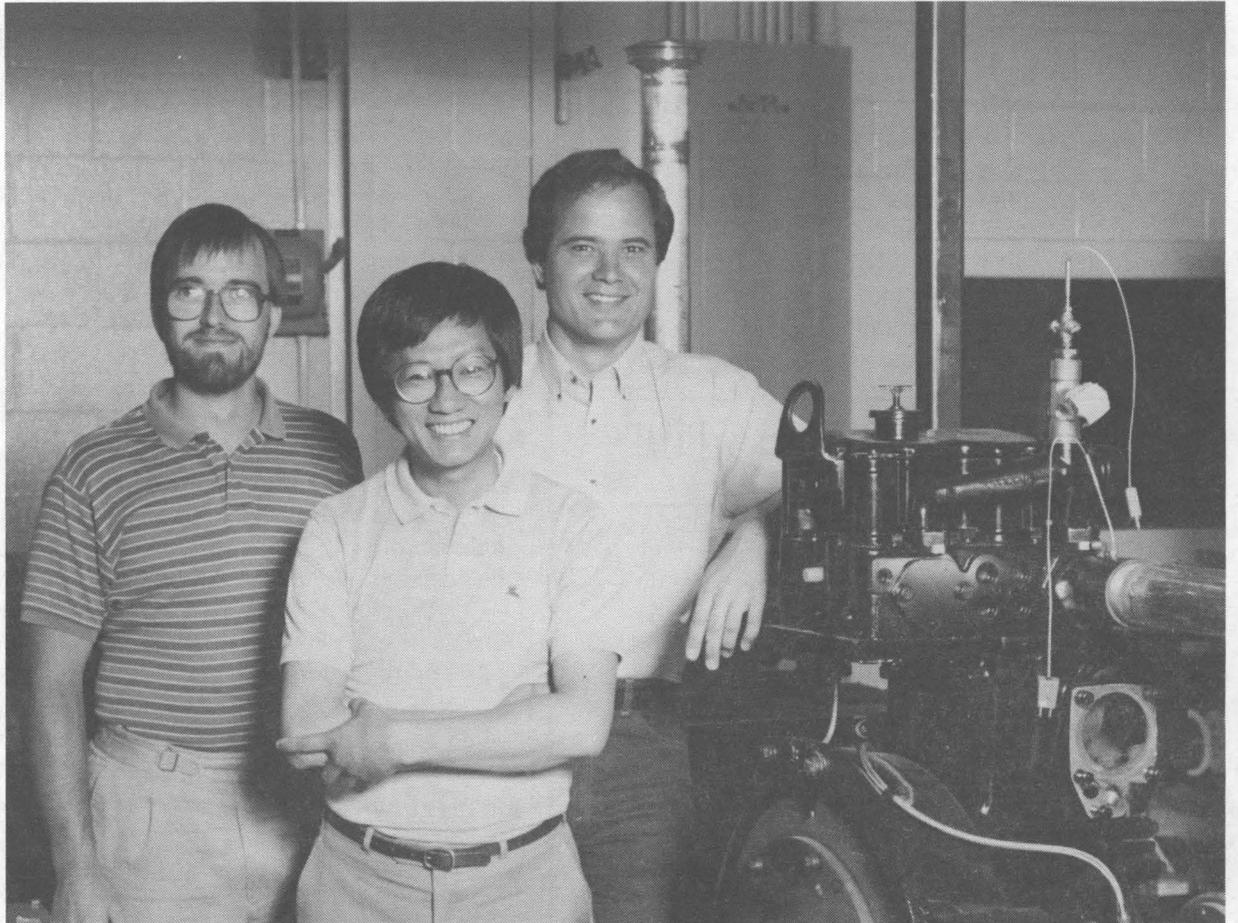
During their particulate/NOx formation investigations, the researchers became aware of another growing industry problem. Current methods used by engine designers to reduce exhaust particulate and NOx emissions (to meet EPA standards) — increased injection pressure and retarded injection timing — were believed to cause increased particulate accumulation in engine lubrication oil. The result was faster engine wear and reduced engine life. Because durability is a key competitive factor for diesel engines (500,000 miles between rebuilds is a customer expectation), the problem began receiving a great deal of industry attention.

Dennis and Axel realized that the laser-based techniques they were developing for measuring in-cylinder particulates could provide useful information about when, where, and how particulates accumulate in diesel lubrication oil. Numerous explanations had been proposed by engine designers, and industrywide research efforts were under way using conventional, but expensive and time-consuming, techniques to find the answer. The information derived from Sandia's optical diagnostics, coupled with Cummins' in-house diesel expertise, provides a clearer picture of the responsible mechanisms.

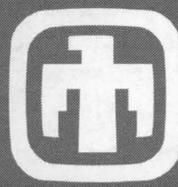
The new information had an immediate impact at Cummins. It resulted in the redirection of research on oil contamination and a new design methodology for minimizing particulate contamination of oil used in 1991 engines and advanced engine designs.

More to Come

Meanwhile, studies of in-cylinder particulate and NOx formation continue. The initial focus was on developing optical techniques for investigating particulate formation, but Dennis says these studies are also resulting in a new picture of when and where soot is formed in diesel engine cylinders —



WORKING TOGETHER on the soot emission project are (from left) Axel zur Loye, Henry Ng (both with Cummins Engine Co.), and Dennis Siebers (8362). Axel and Dennis are co-recipients of a Federal Laboratories Consortium Award for Excellence in Technology Transfer. They stand next to the single-cylinder test engine used for optical diagnostics tests.

**SANDIA
LIVERMORE NEWS**

a picture very different from what diesel engine designers had envisioned.

Research is being conducted at a diesel engine test facility that Cummins helped develop and install at Sandia. The test engine being used is a single-cylinder version of a six-cylinder Cummins production engine, modified to include windows that allow optical diagnosis of the cylinder.

Axel and Henry Ng, also of Cummins, were assigned to work on the project with Dennis, Jim Boehmke (8154), and later John Schroeder (now

Everyone benefits from improved air quality.

1275). Axel spent the first three years of the project at Sandia participating in the research, and Henry spent nearly a year helping install the facility at Sandia.

The initial three years of the project proved so successful that it will continue for another three years. The project will now focus on the effects of various engine design parameters on particulate and NOx formation. Sandians John Dec and Eldon Porter (both 8362) will continue to work with Cummins engineers. Axel, who has returned to Cummins, is now serving as a liaison for technical information with Cummins. Support for the project is provided by Cummins and DOE's Office of Conservation, Advanced Industrial Concepts Division.

Good News for Everyone

This project is beneficial to everyone, says Dennis. It will help the diesel engine industry comply with government regulations and compete in a

worldwide economy. Truckers will be rewarded with a fuel-efficient, durable engine with low maintenance costs. And everyone benefits from improved air quality.

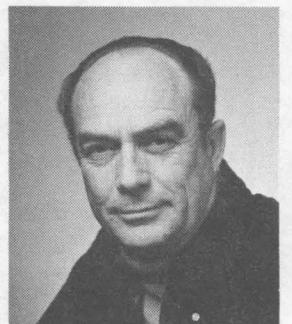
Dennis says the project was at first seen as high-risk, leading-edge research. "It was viewed as a technology-base development effort aimed at long-range needs of a critical US industry," he says. "We had no idea that it would have such an immediate impact."

The project with Cummins is only one of several ongoing collaborations between Sandia's Combustion Research Facility and automotive oil companies, including General Motors, Ford, Chrysler, John Deere, Detroit Diesel, Exxon, Texaco, and Mobil Oil. •

Congratulations

To Kim Babcock (8542) and Tim Shepodd (8311), married May 4 in Livermore.

To Denise (8526) and Mark Koker, a son, Nicholas Andrew, May 4.

Recent Retiree

Wayne Townes
8513

(Continued from Page One)

Tunnel Detection

EM technology is most often used in metal detectors to help hobbyists find "buried metallic treasures." In a commercial metal detector, an EM field remains unaffected when its source is passed over uniform grass or soil, but if a metallic object (such as a coin) is encountered, the EM waves scatter, altering the signal that reaches the device.

The much more advanced EM techniques developed at Sandia use lower-frequency EM waves to locate tunnels. Low-frequency EM waves tend to travel through the ground uniformly in areas with uniform geology — such as deep dry or sandy

"Fortunately, most tunnels contain detectable amounts of metal."

soil — which makes tunnel detection relatively easy, says Bob. In areas containing mineral deposits or complex geological structures such as fractures, faults, and sediments, however, tunnel detection can be more difficult — the waves tend to ricochet and scatter.

"Low frequency waves — between 128 hertz and 9216 hertz — travel farther through the ground than higher-frequency EM waves," says Bob. "They also don't attenuate [decrease in strength] as much in complex underground geology."

Mapping Mine Shafts

A team of Sandians and contractors recently performed a series of tests at the Colorado School of Mines Tunnel Detection Test Facility near Idaho Springs, Colo., and at the University of Arizona's San Xavier Mine Facility near Tucson. The tests confirmed the usefulness of low-frequency EM techniques in areas with complex geology. Greg Elbring, Sandy Ballard (both 6231), and Harry Hardee (6230A) also participated in the tests.

In the first set of experiments, an EM source (a vertical dipole) and receiver (either a magnetometer or an electric field sensor) were lowered into boreholes located on opposite sides of a metal-containing mine shaft. Once underground, the devices are capable of "seeing" what lies between them based on the behavior of the EM field. Measurements were taken every three feet as the source and receiver were lowered into the boreholes simultaneously (at equal depths).

Another set of measurements placed the receiver three meters below the source while both

Applications Abound

EM Fields May Join Labs' Treaty-Verification Technologies

Bob Wayland (9114), a member of the Sandia team studying low-frequency electromagnetic (EM) field technology, says new Sandia-developed tunnel detection techniques may have important security and treaty verification applications. In particular, he says, the techniques may be useful for preventing drug smuggling and prison breaks.

Drug smugglers sometimes use underground tunnels to ship drugs across international borders, safe from governmental controls such as drug-sniffing dogs. The Sandia techniques could help drug enforcement officers locate such tunnels. Prison security could also be enhanced if the EM techniques were used to detect covert tunnels under prison perimeters.

David Lee (7323) says the techniques may also be useful for preventing illegal movement of treaty-limited items. The Intermediate-Range Nuclear Forces (INF) treaty enacted in June 1988 permits the US and the Soviet Union to inspect cargo shipped out of certain weapon production sites in both countries. The new detection techniques could be used to verify that tunnels do not exist at the sites that would

allow covert movement of cargo underneath site perimeters.

The techniques may also be useful for detecting military tunnels used to move supplies, weapons, and troops underneath militarily strategic zones, says David. The South Korean government now spends millions of dollars searching for covert North Korean tunnels underneath the DMZ (de-militarized zone) between the two nations.

In some areas of the country during the 1800s, says Bob, especially in the old mining districts in Colorado and New Jersey, mines were never surveyed accurately and many remain uncharted today. The techniques may be useful for locating abandoned mines.

"In some places, abandoned mines are a serious safety consideration," he says. "Low-frequency EM waves are particularly effective for detecting and mapping abandoned mines because most contain a certain amount of conducting metal. The new techniques could help planners ensure the suitability of building sites by alerting them to areas where cave-ins or subsidence could be a problem."

source and receiver were lowered simultaneously. Both tests showed dramatic changes in the EM field when the tunnel was located directly between the two devices.

In the second set of tests, an EM field source (a surface line) was placed on the ground 85 meters away from the boreholes. Measurements were taken using electric field sensors and magnetometers located at varying depths in the boreholes.

'Slicing' and Scanning

A third set of experiments used low-frequency tomography, a mathematical method for creating an image of what lies underground by scanning a region — in this case the area between two boreholes — a "slice" at a time. This method is similar to much higher-frequency CAT-scans used to create an image of a human organ in internal medicine.

In the underground tomographic experiments, a large number of EM signal transmissions (at 10 different frequencies) were made at different

depths. The signal's attenuation caused by the varying configurations of the test equipment was measured, and the resulting data were converted to horizontal and vertical components. A set of these two-dimensional coordinates can be used to create a mathematical image of the underground geology between the two boreholes.

The researchers found that tomography was effective for locating tunnels containing metal. In particular, they found that the vertical components of the tomographic measurements were affected most dramatically by metallic conductors such as steel mesh, cables, and rails. However, in one set of tests, a "bare" tunnel (containing no metal) and a tunnel containing only a 14-gauge copper wire were also detected.

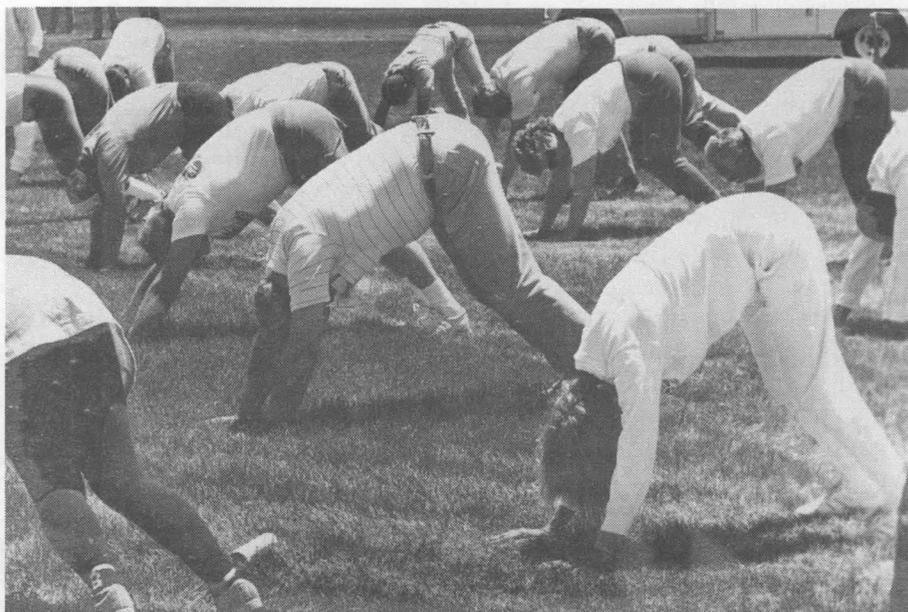
"We found that the detection techniques were most effective for locating tunnels containing metal of some kind," says Bob. "Fortunately, most tunnels do contain detectable amounts of metal. It's much more difficult to detect 'bare' tunnels."

•JG/JClausen (3161)

Nice Weather for Fitness Day '91 Attracts Hundreds



LUNCHTIME WORKOUT — Hundreds of Sandians exercised in the fresh air on Hardin Field May 15 during Fitness Day activities. Some folks limbered up (and showed their best sides) in a stretching class (right), while others kept time to music in a low-impact aerobics class (above). Event organizer Michaeli Portman



(3330) says more than 1,300 people participated in fitness sessions, about 400 more than last year. She attributes the higher turnout to better publicity, better organization, and one heck of a nice day.

Technology and Trust**Role in Specialty Metals Consortium Brings Award to Zanner**

Frank Zanner (1830A) has received a Federal Laboratory Consortium Award for Excellence in Technology Transfer, recognizing his "unusual dedication and effort in the creation of a consortium of specialty metal manufacturers, and cooperative R&D with a federal laboratory."

(Another award, for work at Sandia, Livermore, was also made — see page three.)

Frank was the central figure in establishing the Specialty Metals Processing Consortium (SMPC), formed last year to strengthen members' R&D capability (LAB NEWS, July 27, 1990). During the previous decade, many specialty metal producers had lost part of their R&D strength during a difficult economic period of foreign competition and tight profit margins.

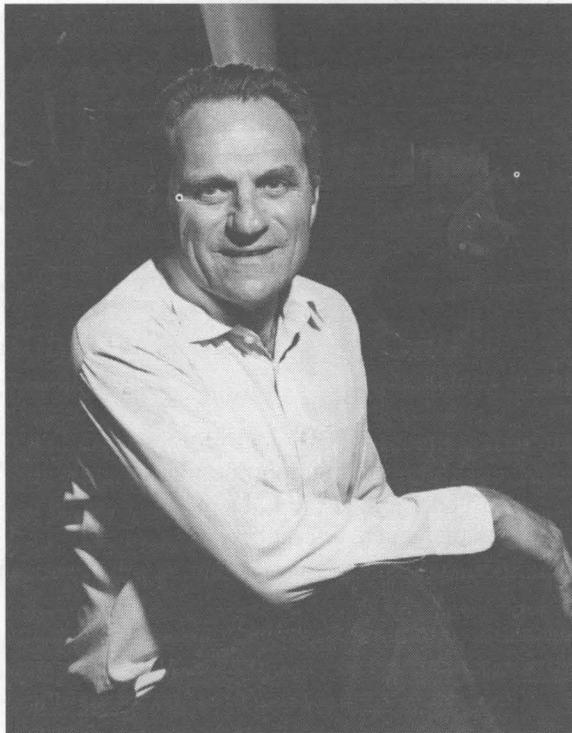
Specialty metals are used in jet engines, chemical plants, nuclear reactors, and other difficult environments that require high strength at elevated temperatures, and often resistance to corrosive chemicals as well. Because these materials are critical to US competitiveness in world industry, a strong, long-range R&D capability is important to the nation.

"It's a highly competitive industry," says Frank, "and companies in it were reluctant to work together. They were accustomed to seeing each other strictly as the opposition. But the approach that made the most sense economically was for them to support research together and to share the results."

Trust Was Vital

Because he had worked with several companies to transfer Sandia-developed production control technology, Frank had a unique overview of the industry and the problems that the companies

had in common. He also had their trust, and was thus in a position to help them trust each other. For about two years, Frank worked with specialty metals companies, singly and in meetings with several



FRANK ZANNER

companies' representatives, to encourage them to form a group that could take advantage of unique facilities such as Sandia's to the benefit of the entire US specialty metals industry.

Last July, an agreement was signed between SMPC and DOE, providing for generic specialty-metals research supported jointly by SMPC and DOE. The research is being done at Sandia facili-

ties, with participation by industrial interns from companies in SMPC. The results are shared among all the consortium members, now including 14 companies.

Breaking New Ground

Frank was promoting the idea of a consortium and its cooperation with a government lab before the National Competitiveness Technology Transfer Act of 1989 was passed to simplify such arrangements.

"Because we were trying to do something new, it took the help and cooperation of many people at Sandia and elsewhere," says Frank. "For instance, Sandia Legal and the Tech Transfer organization were invaluable. The management of Org. 1000 supported the effort, especially Jim Jellison [1833], who was my supervisor during that period. The technical contributions of the staff in the Liquid Metal Processing Lab made all of the interactions possible. And there were many others who contributed, at DOE and in the companies that formed SMPC."

Dan Arvizu, Manager of Technology Transfer and Industrial Relations Dept. 410, says, "I agree with Frank that creating the SMPC took the cooperation of many people. But Frank outdid us all in persistence and perseverance, during some frustrating times when we were facing an uphill effort in getting SMPC formed. This award recognizes that."

The Federal Laboratory Consortium (FLC) develops and tests tech transfer methods and addresses barriers to tech transfer. The national FLC consists of representatives from more than 500 federal R&D labs representing 16 government agencies. ●CS

feed  back

Q: Why is there a fence across the wheelchair ramp in front of the Mardix booth northeast of Bldg. 823? Both sides of the fence are outside the Tech Area. This causes unnecessary delay when coming out of Bldg. 823. Please remove it if it's not required.

A: The fence was installed to place the new Primary Standards Lab out of the area and to designate the driveway east of Bldg. 823 as the path for large earth-moving and materials handling equipment. It has been proposed to have one flagman control vehicle and pedestrian traffic at the southeast corner of Bldg. 823. The Mardix booth will remain in service during the 18- to 24-month period of construction. However, the routes for gaining access to Tech Area I from Bldg. 823 should be as follows:

• South from the west doors of 823, then west to 822.

• South from the west doors of 823, then east on the sidewalk across the previously mentioned driveway and north to the Mardix booth.

Ward Hunnicutt (7800)

Q: Regarding the December holiday shutdown — How refreshing to see in print (LAB NEWS, April 5) a complaint that I have been voicing privately for years! Except for winter sports fans, I cannot believe that the majority of Sandians would not prefer to have their holiday break at a "normal" time of year, such as President's Day in February, Columbus Day in October, or Veterans Day in November.

In the interest of empowerment, why doesn't management actually ask employees what their preferences are, rather than assume that an obso-

lete policy instituted 20 years ago is still popular? The 80 percent non-union people (and perhaps some of the other 20 percent) might be a silent majority.

Where are the results of management's survey on this matter?

A: In response to your question regarding Christmas break, Org. 5 plans to conduct a general survey of employees' perceptions and opinions this summer. We have asked them to include a question about employees' preferences regarding the December shutdown.

Ralph Bonner (3500)

Q: In support of Sandia's TLC program, the 5000 Employee Council would like to request that more showers be installed for use by employees who exercise during the day. Some buildings, particularly older ones, have no showers at all. Bldg. 821 has no showers; Bldgs. 823 and 820, adjacent to Bldg. 821, have two women's showers and four men's showers. This is not enough to encourage exercise for the people in these buildings.

Newer buildings, such as 890, 891, and 858, have two showers for women and two or three showers for men. Older buildings with enough people to warrant showers should be retrofitted. We believe TLC has shown itself to be cost-effective in terms of the reduced number of sick days taken by employees who participate in the program. We believe that adding showers will likewise be cost-effective.

A: There are several showers in and around Tech Area I and we continue to include showers in new buildings such as 890 and 891. Your

Feedback is the first indication I have received that two to four showers in these buildings are inadequate. The next version of Bldg. 890 has already been bid, so we probably won't add more showers there, but maybe we will be able to in the CNSAC, which is scheduled for completion in about three years. I'm not optimistic about installing showers in older buildings; space and money are both in short supply.

Ward Hunnicutt (7800)

**Earnings Factors
March 1991**

Long-Term Savings Plan for Management Employees (LTSPME)	Earnings Factors
AT&T Shares	1.0359
Government Obligations	1.0049
Equity Portfolio	1.0166
Guaranteed Interest Fund	1.0073
South Africa Restricted Fund	1.0274

Long-Term Savings and Security Plan (LTSSP)

AT&T Shares	1.0364
Guaranteed Interest Fund	1.0073
South Africa Restricted Fund	1.0275
Equity Portfolio	1.0158
Employer Stock Fund	1.0363



Supervisory Appointments

GORDON GRAHAM to Supervisor of Partnership Agreements and Information Services Div. 413.

Gordon joined Sandia's Purchasing Organization in 1985. He negotiated and administered contracts for



GORDON GRAHAM

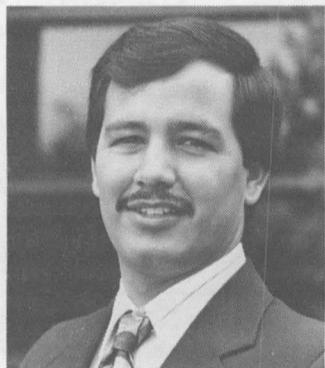
the Pulsed Power and Monitoring Systems directorates. In 1989, he transferred to the Technology Transfer Procedures and Agreements Division. He worked with the DOE's Technology Transfer Field Task Force from February to November 1990.

He has a BS in business administration and an MBA from Rockhurst College (Kansas City, Mo.). He is a Certified Purchasing Manager. Before joining Sandia, Gordon worked for Allied Signal in Kansas City.

He enjoys visiting national parks and archaeological sites, walking, reading, and yoga. Gordon and his wife Susan have one child and live in the NE Heights.

ANTHONY MEDINA to Supervisor of Satellite Sensors Div. 9222.

Anthony joined Sandia in 1983 as a member of the Advanced Firing Sets Division. He was project leader for conventional weapon safing and arming device projects, and was co-developer of the modern, in-line electronic safe, arm, and fire (ESAF) design concept. He was also project leader on FOG-M, AMRAAM, and Patriot conventional



ANTHONY MEDINA

weapon ESAF designs and design engineer on a major nuclear weapon firing set.

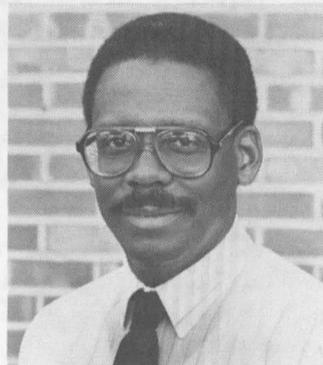
Anthony transferred to Digital Subsystems Division I in 1990 and worked on a Drug Enforcement Administration surveillance project. Before his promotion, he was on loan to Advanced Systems Development Division V, working on a lightweight telemetry program.

He has a BS in electrical engineering from New Mexico State University and an MS in electrical engineering from Stanford University through Sandia's One-Year-On-Campus program. He taught a Sandia Out-of-Hours course about linear circuits.

Anthony enjoys playing sports, especially basketball and tennis. He coaches several children's soccer and basketball teams. He and his wife Leslie have two children and live in the NE Heights.

MICHAEL CARSON to Supervisor of Material, Custodial, and Support Services Sec. 7818-5.

Michael joined the Labs in 1975 as a member of the mechanical apprentice training program. He rotated through various Facilities Operations and Maintenance divisions while in the program. In 1980, he became a journeyman mechanical technician and worked in Facilities Operations Div. I. In 1984, he became a planner analyst in the Maintenance Operations Planning Division. In his new position, he supervises laborers, material handlers, and custodians in Facilities Operations, Area 3.



MICHAEL CARSON

Michael attended TVI and the University of Albuquerque. He worked for Safeway before joining Sandia.

Michael enjoys bowling and basketball. He and his wife Theresa (3726) have one child and live in the NE Heights.

Steve joined Sandia's Computational Physics and Mechanics Division I in 1985, where he worked on developing radiation-hydrodynamics codes and associated graphics software. In 1989, he joined Computational Physics and Mechanics Division II, where he did computational analysis and project development/management. He also performed underground test simulations and participated in the Advanced-Bomb-Family project.

STEPHEN ROTTLER to Supervisor of Computational Fluid Dynamics Div. 1511.

Steve joined Sandia's Computational Physics and Mechanics Division I in 1985, where he worked on developing radiation-hydrodynamics codes and associated graphics software. In 1989, he joined Computational Physics and Mechanics Division II, where he did computational analysis and project development/management. He also performed underground test simulations and participated in the Advanced-Bomb-Family project.



STEVE ROTTLER

From 1986 to 1990, he was part of a joint Los Alamos/Sandia special project on the Nuclear-Directed Energy Weapon concept development program and was co-designer of an underground test experiment. In 1990, Steve became project manager of the CTH Development Project (CTH is a multidimensional code used to simulate events characterized by strong shocks and large deformations).

Steve has BS, MS, and PhD degrees in nuclear engineering from Texas A&M University. Before joining Sandia, he was a member of A&M's engineering faculty. He's a member of the American Nuclear Society, the American Physical Society, and the Hypervelocity Impact Society. He received a Sandia Award for Excellence in 1990 for contributions to the design of underground test add-on experiments.

He enjoys astronomy and stamp collecting. Steve and his wife Lee have two children and live in the NE Heights.

Sense of Support

Sandia's Reservist Policies Ease Stress of Call-ups

For a reservist in one of the military services, it's stressful — to say the least — when your unit is activated and you have to leave your home, family, and job, often on short notice and for an unknown duration.

But knowing there's something solid to come back to — such as your accustomed job — can help ease the stress. Sandia's policies are designed to ensure that reservists called to active duty aren't penalized by lower pay or uncertainty about whether they'll have a job when they return.

Eleven Sandians were in units activated for duty associated with Desert Shield and Desert Storm. Nine of them are now back at work.

One Sandia reservist whose unit was activated during the Persian Gulf war was affected in an unusual way by Sandia's policy. Debbie Mulligan (3524), a first lieutenant in the Air Force Reserve, expressed her own appreciation by requesting an official Employer Certificate of Appreciation for her supervisor, Belinda Holley. (The certificates are issued by state subunits of the National Committee on Employer Support for the Guard and Reserves.)

Formerly a nurse in Medical Directorate 3300, Debbie was in the process of transferring to ES&H Training Div. 3524 when her unit was activated during Desert Storm. (She had previously been called for a month's active duty while still assigned to Medical, in anticipation of the deployment.) What was unusual about the timing was that Debbie had not yet been formally offered a position in Belinda's division when



RESERVIST Debbie Mulligan (left, 3524) was just starting a transfer to ES&H Training Div. 3524, supervised by Belinda Holley (right), when her unit was activated. Belinda held the job open for Debbie until her return and received a certificate of appreciation initiated by Debbie.

her unit was called up. She was interviewed by Belinda for the new position on Jan. 22; two days later, the unit was activated — "for the duration," which, Debbie was told at the time, might be as much as a year or two.

Debbie says in her memo requesting the certificate for Belinda, "As there had not been an official job offer, Belinda did not technically need to save the job for me. However, she did! I was able to begin my new job upon being deactivated and returning to the civilian sector."

Ralph Bonner, Director of Human Resources 3500, says, "Though this situation was unusual in one way, it's typical of the Labs' attitude toward reservists' obligations to their unit and to the nation. I believe all of our reservists who were called up for Desert Storm felt the same sense of support from Sandia." ●CS

Employee Death



Glenn Haycock of Facilities Operations and Maintenance Dept. 7810 died May 14 after a long illness.

He was 58 years old.

Glenn had been at the Labs since 1959. He was the coordinator for the Facilities mechanical and electrical apprenticeship programs.

He is survived by his wife, son, and daughter.

Barrier Buster Update**Sandia Team Works to Simplify Labs Procedures**

Last spring, the Sandia Management Council established the Barrier Busters Quality Action Team to look at various processes at the Labs that might need improving — and to recommend and take action to eliminate or modify unnecessary and inefficient policies, procedures, and rules. Barrier Buster leader Tom Cannon (2850) provides this activity report; names following the items are Sandians (Barrier Busters and others) who worked together on these actions.

- Employees no longer need supervisor signature on Delivery to Reclamation forms for sending non-controlled excess property to Property Application. Dick Shaw (9213), Don Wagner (8532), and Dan Poole (3422).

- A pilot program was initiated for rapid procurement of low-value, time-critical software and other commercial items. On a trial basis, off-the-shelf items costing \$250 or less per reimbursement voucher may be procured using corporate credit cards or cash. The program quickly proved successful, and Purchasing will likely make it permanent, according to Paul Rosenkoetter (110). Paul and Bob Zaeh (3700).

- Because of a change in procedures, estimated construction time for office remodeling has been reduced. Sandia's office furniture contractor, New Mexico Office Furniture, is now permitted to rely on its own count of wall panels (versus Facilities' count) in quoting jobs. In addition, Sandia will now stock common items and store incoming furniture until remodeling is complete. Lewis Sissneros (3718), Harry Chaney (3745), and David Humble (7821).

- Supervisory signature requirement was eliminated on forms requesting drafting support. Tom Cannon and Ron Williams (2853).

- The requirement that vice presidents issue notices encouraging new hires to attend the "Intro-

duction to Sandia" seminars was eliminated. Now, such letters are sent directly from Personnel. Rochelle Lari (2000), Harry Saxton (2100), and Phyllis Owens (3521).

- The running track near Bldg. 956 was opened to all employees. This new track was previously available only to members of the Security organization. Tom Cannon, Jackie Kerby (5240), Peter Green (1845), Jim Martin (3400), and members of Sandia's Security Force.

- Voice-messaging adapters were distributed to Sandia Voice Messaging System users. Because the adapters are pieces of hardware, they cannot be distributed through Sandia's mail system. The problem was solved by having the adapters delivered through Just-In-Time. Rochelle Lari.

- Design Information Management Dept. 2830 supports drafters by releasing drawings, retaining records, maintaining film banks, and providing other design services. A new process has been established that provides drafters with two separate

The running track near Bldg. 956 was opened to all employees.

opportunities to provide input about changes in Dept. 2830 services before the changes are implemented. In the past, changes were made in those services without all drafters being aware of them. Tom Cannon and Terry Lovato (2831).

Other Barrier Buster Actions

In addition to these actions, Barrier Busters have helped clear up some misunderstood or miscommunicated information:

- Some individuals say that time could be saved if Sandia had a centrally controlled document system. There is, in fact, such a system in use at Livermore, and it is under consideration for the rest of Sandia.

- Some people perceive a barrier to getting information into the Sandia Directory. There is no barrier. Employees should submit information and changes to their department secretaries.

- Many Sandians still believe that proof of insurance and registration must be presented to receive a base decal for vehicles. The only requirement is the employee signature on a form verifying ownership and insurance responsibility.

- An employee suggested to Barrier Busters that capital money left over from the previous year be put into a companywide pool. This is, in fact, Sandia policy.

- Some employees believe they must attach a proof-of-completion certificate to expense vouchers in order to be reimbursed for classes and workshops. Actually, either proof of completion or a receipt may be submitted.

- A department manager suggested raising department manager signature authority on reimbursement vouchers to \$500. Department managers can sign for some \$500 purchases. For other approvals, such as petty cash, Sandia is constrained by AT&T policies, which require director approval. Refer to SLI 1053 for approval levels.

- Some individuals believe their pay frequency cannot be changed from weekly to semimonthly or vice versa. There have been opportunities in the past to make these changes, and employees will be given opportunities to do so in the future. However, changes can be done only when the weekly and semimonthly systems "line up," which occurs only rarely. Employees will be notified through the *Weekly Bulletin* or other means when such opportunities occur.

- Many employees believe department manager approval is required on Library Requests (acquisitions). The approval level was lowered



several months ago to MTS/MLS or above.

- There has been confusion about how ownership is determined when controlled property is purchased. Property is assigned to the person and division listed in the "Deliver To" block on the purchase order.

- It is generally believed that every Move Order requires supervisor approval. When moving "controlled" property to or from Property Reapplication, a supervisor must sign the Move Order. Most other moves don't require supervisory approval.

Process Management Teams

As Process Management Teams (PMTs) develop, many problem areas and questions formerly handled by Barrier Busters can now be handled directly by process owners.

For example, Barrier Busters received many requests to ease the shipping process, including lowering signature level requirements. While discussing these with the Shipping and Receiving Sections, it was learned that employees there also recognize areas for improvement within their operations. A Quality Action Team led by Suzanne Moya (3428) is addressing these concerns.

Barrier Busters also received many complaints about Sandia's time card system as a barrier. Barrier Busters reviewed this issue with Employee Accounting Div. 152, Business Information Systems Dept. 2920, and senior management. A new

Electronic time card application is expected to be available in late 1992.

system will be implemented in conjunction with Phase II of the Human Resource Information System Payroll Development Project. This project is moving some human resource programs (Payroll, Personnel, and Benefits) to a new IBM model 3090 computer. Electronic time card application is expected to be available in late 1992.

People have complained about the organization, accuracy, and availability of the Sandia Directory. Gerald Esch (3150) has assembled a PMT to study the problems and make improvements.

A number of suggestions have been made about how Sandia might improve the approval process for Travel Authorizations, Reimbursement Vouchers, Expense Vouchers, and general approval levels. Changes have either recently been made or are under investigation in all of these areas.

General approval levels were studied extensively last summer by Controller Org. 100, and many new approval levels were established effective Oct. 1, 1990. Since many changes are extensive, SLIs have not been completed. More opportunities to lower approval levels are being investigated. The Corporate Policies Division is working with process owners at Sandia to identify these areas.

Details about changes to other approval processes will be published in the *Weekly Bulletin* or special bulletins when appropriate. ●

Favorite Old Photo

DURING THE COLD WAR, Radio Free Europe (RFE), operating at studios in New York and Munich, Germany, broadcast news and feature programs across the Iron Curtain into Eastern Europe. I was one of the child broadcasters in special holiday programs to Poland in the 1950s. We were photographed in our festive ethnic costumes for portraits that were printed on RFE Christmas cards and publicity brochures. Many years later, I helped Solidarity organize its press liaison offices in Brussels and Paris in the early 1980s. Polish immigrants told me then that the uncensored news programs of those early days were an immense help to them in bearing the early years of Communist terror. However, not all of the programs got through; the Soviet and Polish governments regularly jammed the air waves.— Irene Dubicka (7212)

News Briefs

Sandia Has Role in Space Exploration Initiative

Sandia has been designated as lead lab in a major area of DOE's support of the Space Exploration Initiative (SEI) and has been given responsibility for a subtask in another area. John Vitko (8300A) is lead lab chairman for Environmental Assessment and Monitoring. Phil Stanton (1543) is directing the Debris Shield portion of the Manufacturing and Construction Technologies segment of the program. Programs Development Dept. 430 serves as coordinator for Sandia's work in the SEI. Working groups involving several DOE labs were set up by the DOE Office of Energy Research to coordinate ideas from DOE labs that would be technologically useful to NASA in achieving SEI objectives.

Sandian to Lead ASQC Chapter

Members of Quality Support Div. 7311 are among both the outgoing and incoming officers of the Albuquerque Chapter of the American Society for Quality Control (ASQC). Dave Bushmire (7311 Supervisor) is outgoing president. Patricia Wormington is the new president, following a term as chapter secretary. Allison Kane is the incoming secretary. Other Sandians are new or outgoing heads of chapter support committees for arrangements, education, certification, membership, and publicity. Persons interested in joining the chapter can contact Patricia on 5-8745. The next meeting will be in the fall.

Sensor Detects Humidity in Integrated Circuits

A new type of moisture sensor improves on current methods for evaluating electronic packaging, report Michael Kelly (1824), Terry Guilinger (1841), Dave Peterson, Melanie Tuck, and Jim Sweet (all 2134). The sensors are made of silicon, the same basic material used to manufacture integrated circuits (ICs). Accurate humidity measurements inside IC packages are critical in assessing long-term performance and reliability.

The new sensors are essentially capacitors that use oxidized porous silicon as a moisture-adsorbing dielectric between two electrodes. They are highly sensitive and respond rapidly to either increasing or decreasing humidity. The sensors can be manufactured by methods compatible with standard IC fabrication techniques.

Besides evaluating electronic packaging, the sensors might be used to monitor industrial drying applications, resulting in energy savings and increased productivity. Another possible application is in a "smart sensor" for advanced heating, ventilation, and air-conditioning systems.

Sandian Is DOE Liaison for Iraqi Cease Fire Resolution

In response to a request from DOE's Office of Arms Control, John Taylor (9241) is serving as the DOE liaison to the State Department for implementation of the Iraqi cease-fire resolution. While assigned to the Bureau of Politico-Military Affairs for about two months beginning in early May, John is developing plans and resource estimates for the inspections and demilitarization activities covered by the United Nations Cease Fire Resolution 687.

New Solar Plant Technology Ready to Be Commercialized

Sandia solar engineers Greg Kolb (6217), Dan Alpert (6216), and Jim Chavez (6217) have launched a campaign in the Sunbelt states to promote the next generation of solar electric power plants. Using molten salt rather than steam to transfer heat, such plants could, according to Sandia's analyses, produce electricity at a cost competitive with power from a fossil fuel plant.

The Sandians are promoting the technology to utilities, regulatory agencies, and environmental groups in the hope of interesting a utility or consortium of companies in building a molten salt central receiver power plant capable of producing 100 megawatts or more of electricity. Experiments at Sandia have proved the feasibility of such a plant, which would be the first utility-scale facility of its kind in the country.

In recent years, molten salt has emerged as an attractive alternative to steam for heat transfer and energy storage because of its lower cost, safety, and high heat-transfer capabilities. Other advantages of molten salt central receiver systems are that they improve efficiency, can store energy cheaply, and can deliver electricity on demand, even at night.

Take Note

Studios of weaver Nancy Kozikowski, print-maker and painter Russell Hamilton, sculptor Charles Mattox, dancer Lorin Saint, and ceramist Joan Weissman will be open to the public during the second annual "Studio Safari!" sponsored by the UNM College of Fine Arts Alumni Chapter. The tour, scheduled for Sunday, June 9, from 11 a.m. to 3 p.m., is a fund-raiser for the UNM College of Fine Arts Scholarship Fund. Tickets are \$25. For reservations, call the UNM Fine Arts Box Office on 277-4402 or Katy Ely on 247-3406.

The KNME-TV Wine & Jazz Festival '91 will be held tonight, May 31, from 7 to 10 at the New Mexico State Fairgrounds, Exhibit Hall A. At least 38 wineries are participating, providing a minimum of 90 wines for sampling. Jazz groups include Laney McDonald, Dan Dowling Quartet, Lewine/Brown Xtet, Caribe, Real Time Quartet, and Phil Lenk & Friends. Cost is \$15 at the door. Food will be provided courtesy of the American Culinary Federation, Rio Grande Chapter.

Joe Lawhon (4010), Vickie Rodgers (3511), and Rebecca Spires (400) recently joined the board of Family and Children's Services, Inc. Shirley Wallace (113) is vice president of this United Way agency.

Retiree Picnic — Food and Fun On June 27

The 21st Annual Retiree Picnic (and the 28th annual get-together) will be Thursday, June 27, from 4 to 7 p.m. at the Coronado Club.

Entertainment will be provided by the Bob Weiler Band, and members of Sandia's Large Staff will join retirees and their spouses.

Parking is available at the Coronado Club, the chapel, the Que Pasa Recreation Center, the base hospital, and the Sandia Base School east of the Club. A shuttle bus will operate from parking lots on B Street to and from the Club's patio entrance by the swimming pool.

Guests are asked to use the patio entrance, except for handicapped people, who may use the main entrance next to the handicapped parking area.

Sandia retirees and their survivors now number more than 4,200.

Congratulations

To Shannon and Kimball (7553) Merewether, a daughter, Lauren Kelly, May 19.

Containing Costs

Budget Drafting Can Handle Extra Workloads

Sandia now has a contract drafting service to handle extra workloads at a reasonable price. Called Budget Drafting, the project offers basic drafting services for approximately \$25 per hour, compared to usual rates of about \$60 per hour. The service is particularly aimed at handling modest design work, notes Tom Cannon, Manager of Design Dept. 2850.

Work is performed by on-site contract drafters who handle assignments ranging from entry-level detail to senior-level design. All drafting is CAD-generated using software that is compatible with most personal computer systems.

In addition, Budget Drafting will soon have the capability to provide on-site support using laptop work stations.

Budget Drafting was created by Dept. 2850, says Tom, to help engineering groups that currently either generate their own drawings or go off-site for such services. Budget Drafting produces drawings that are suitable for entry into Sandia's Records Management System and that conform to existing standards, thus ensuring unambiguous part description.

Customers requesting services get up-front cost estimates, he adds, and to date, no jobs have overrun the original estimate. Customers also receive biweekly cost reports.

Budget Drafting currently employs five full-time workers. Jobs may be submitted by contacting Jack Smith (2858) on 6-9770. ●

Fun & Games

Golf — Winners of the Sandia Golf Association two-man-scramble tournament held at Cochiti Lake Golf Course on May 11 were: A Flight — DuWayne Branscombe (2114) and Mark Platzbecker (2858), first; David Salas (ret.) and Bill Lutgen (2852), second; Dick Fairbanks (3521) and Florencio Aragon (5113), third; Thomas Welch (9223) and Roy Tucker, fourth; B Flight — Jose Llamas (7556) and Tony Lopez (ret.), first; Mark Smith (1832) and Frank Arellano (6422), second; Gary Beeler (5100) and Don McCoy (7210), third; Ed Rivera and David Trujillo (5144), fourth.

Winners of the two-man best-ball tournament held in Socorro on May 18 were: A Flight — Bob Platt and Daryle Dew, first; Charles Salazar (7485) and Pres Herrington (9244), second; Jose Torres (1273) and John Garcia (6423); tied for third with Mark Calvin (141) and Howard Cilke (7483); B Flight — Larry Wilhelm (2941) and Pro Padilla (3743), first; Bob Barton (3741) and Ronald Van Theemsche (3851); tied for second with Don McCoy and Ray Reynolds (5120).

Volleyball — A Sandia Volleyball Association meeting will be held Thursday, June 13, at the Coronado Club Conquistador Room at 5 p.m. Topics will include election of officers, association rules and bylaws, and fall 1991 season play. All team captains and interested persons are invited. For information, contact Bob Patton (2515) on 898-3524.

Welcome

Albuquerque — Warren Cox (3223), Susan Longley (3222), Daniel Urenda (5141). **Other New Mexico** — Rita Gonzales (9216).

Elsewhere: Massachusetts — Robert O'Neill (7853).

feed **back**

Q: New culture, change management, empowerment. Sandia has devoted an enormous amount of time, money, and resources on change to improve our workplace 100 percent. We even have a set of values that I've posted on my wall to stay up-to-date. But I don't see these values being followed. In fact, the opposite seems to be occurring. Our change experts are in such a hurry to bring about this "change" that they issue last-minute notices of meetings, not requesting, but stating, "We will meet with you this week."

Respect for the individual? No consideration is given to previously scheduled meetings, let alone respect. Managers should have the opportunity to prioritize their own schedules. Teamwork? Yes, but the message is, "We're the coaches, we say when and how." I interpret this as arrogance. I'd like to see these values displayed more and hear less about them. I believe in the old adage, "Actions speak louder than words."

Please don't accuse me of being hostile and resistant to change because my opinion of your methods is less than complimentary. I am, after all, empowered! Change is necessary and accepted by most people. Like all good things, I believe good planning and adequate time for completion are necessary for success. Employees do resent being called hostile simply because of a difference of opinion.

A: You're right! Good planning and adequate time are conditions that ensure a greater likelihood of success. I also agree that we may not consistently live out our desired values, but we are committed to moving in that direction. Providing feedback to others, both when we see the values being lived out and not being lived out, will help move us all toward a more desirable future.

While it is difficult to reply to your specific situation without knowing the details, I would like to apologize for any inconvenience we may have caused. When a meeting is scheduled on short notice, we are generally responding to the requirements negotiated with our internal Sandia customers. Our rapidly changing environment has required us to often be flexible and responsive to critical and changing customer needs. We may need to be more mindful of the impact on others as we negotiate those requirements.

The process of change is one of continual learning and improvement, of examining both our successes and failures. In addition, respect for the individual is one of our values and requires us to value each other's differences. I do not consider your opinion to be hostile or resistant. You obviously care enough about the Labs' future to write. I encourage feedback like yours to provide different perspectives and to help us continually review and improve our approaches. In fact, we have established an informal communications network, the Ambassador Program, to foster timelier and more open dialogue. Your local Ambassador has direct access to me every other week, in addition to written correspondence. Please use these avenues to provide input to me on how we can improve. The more specific you can be, the more we can learn from the feedback. If you are not sure who your local Ambassador is, ask your supervisor or manager.

Dan Hartley (5)

Q: One of the developments in the Middle East has been the millions of gallons of oil gushing into the Persian Gulf, creating a major environmental catastrophe. It seems that Sandia's scientists, engineers, and designers could provide technical expertise to a cleanup campaign.

Has Sandia's management ever approached the powers that be about providing technical assistance in the development of equipment, chemicals, and processes to clean up oil spills? If so, what was the outcome, and if not, would it be

worth investigating? This surely won't be the last oil spill, and a high-tech effort would have a positive and lasting effect. It would also relate to ES&H and give Sandia a positive image, much like the USS Iowa investigation. Perhaps this could be a new work frontier at the Labs.

A: In June of 1990, Sandia received a request from DOE asking us to examine what capabilities we had that might be useful in oil spill cleanup. A team was pulled together that included represen-

Got a Question or Suggestion?

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

tatives from organizations 1000, 6000, 8000, and 9000 to consult with experts and to examine our capabilities in light of actual technical needs. After many discussions with private companies, including Exxon Corp., as well as the Coast Guard, the Department of the Interior, and other organizations involved in oil spill cleanup, we formulated a response to DOE. The response highlighted a number of technical areas we thought would be appropriate, such as the development of robotics to inspect tanker hulls, the use of Synthetic Aperture Radar to track spills, and probabilistic risk assessment.

Unfortunately, despite considerable press coverage of recent spills, such as those in Prince William Sound and the Persian Gulf, there is very little funding for oil spill research in either the public or private sectors in the US. Thus, even though a number of our ideas have been acknowledged as useful, we have been unable to obtain support to carry them further. The Oil Pollution Act of 1990, which created the Marine Spill Response Corp., may change that situation. This organization is expected to start funding research in 1992. We have opened dialog with this group and continue to seek opportunities to familiarize them with Sandia's capabilities. I am hopeful that sometime in the future, we will be able to point to the contributions that Sandia has made to the problem of oil spill cleanup.

Paul Hommert (6250)

Q: Although I try to be understanding about the plight of my smoker colleagues, I must complain about their "butt disposal policy." I have observed (and I challenge others to confirm this) that I cannot walk more than 10 feet in Area I without encountering one or more cigarette butts on the road, sidewalk, landscape, fence lines, etc. They are a ubiquitous part of the scenery; in one short walk from Bldg. 823 to Bldg. T22, I counted 210 cigarette butts without walking particularly slowly or searching for high-concentration areas.

Aside from the fact that these butts are a concentration of various demonstrated carcinogens (nicotine and tar) being released into the environment, they are unsightly and suggest, at least to me, a lack of concern for cleanliness in our work environment.

I propose that we prohibit smoking except in designated areas with appropriate cigarette butt disposal receptacles. I also propose a complete ban on smoking in vehicles and while walking across the areas.

A: Sandia's current smoking policy has generally required employees who smoke to do so

outside of company facilities. This creates a problem in terms of disposal of cigarette debris. Increasing sensitivity to the problem is reflected in housekeeping measures through Sandia's ES&H Initiative. Line organizations can assist in this effort with the following actions:

1. An "oily rag disposal container" with a flip-top lid can be ordered through Sandia's Just-In-Time catalog by line organizations.

2. Once purchased, this container should be sent to the paint shop for painting and labeling indicating its use is for "cigarette butts only."

3. These containers may then be placed in areas used by smokers and will substantially alleviate the problem of randomly discarded butts.

Please note that the responsibility for cleaning these cans remains with the line organization rather than Facilities custodians.

Of course, though these measures are designed to help, the fundamental responsibility resides with smokers themselves, and it is well to ask their support in using appropriate repositories for cigarette disposal.

Dr. Larry Clevenger (3300)

Q: Recently, I have been trying to get rid of extra copies of controlled-access SAND reports. I have checked with several people about the proper way to dispose of them, and no one could help me. The reports could be shredded, but the secretaries in my department are overloaded and don't have time to do the shredding.

Since I have been told that the penalties for disclosing "Official Use Only" information are more severe than for disclosing classified information, I don't want to put them in the trash. How should these reports be destroyed? Why doesn't Sandia include the method of destruction on the report like other agencies?

A: Instructions on how to destroy any Unclassified Controlled Access Information (UCAI), including Official Use Only (OUO), can be found at the end of SLI 1008-4, "Unclassified Controlled Access Information — Special Categories." The SLI lists several options, only one of which is shredding.

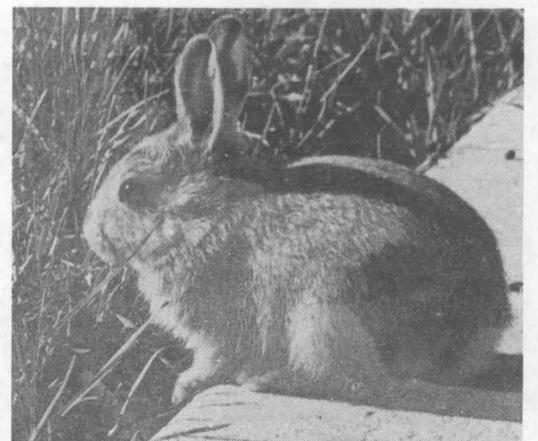
Your suggestion to include the destruction method with the information itself bears investigation, and a copy of your Feedback query has been forwarded to Div. 3151 for consideration.

Paul Stanford (100)

Q: What happened to the bunnies that used to hang out in front of Bldg. 800? It seemed like they just sort of disappeared about last August.

A: I don't know what happened to the bunnies in front of Bldg. 800, but we didn't do anything to make them disappear. It may be they found a more attractive place to go or they left when the weather got cold. Warm weather may bring them back.

Ward Hunnicutt (7800)

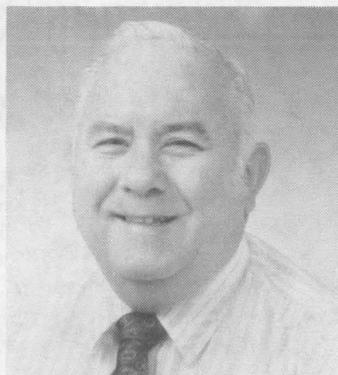


BUNNIES ARE BACK — LAB NEWS photographer Mark Poulsen spied this baby cottontail playing with its kin May 23 in front of Bldg. 800.

MILEPOSTS

LAB NEWS

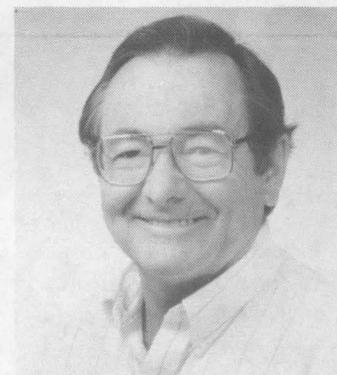
May 1991



Herschel Rogers
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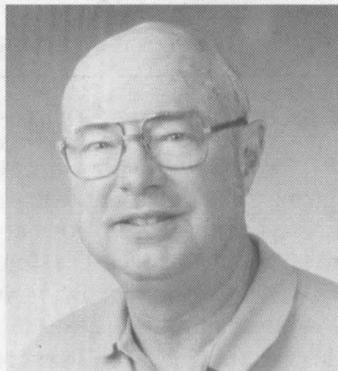
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Gene Aronson
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Dick Bassett
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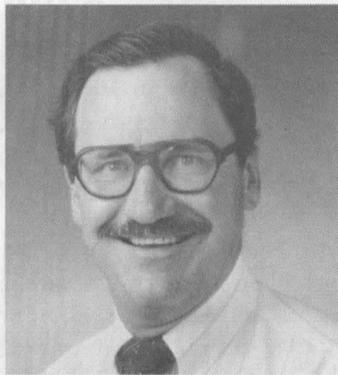
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Roy Rentzsch
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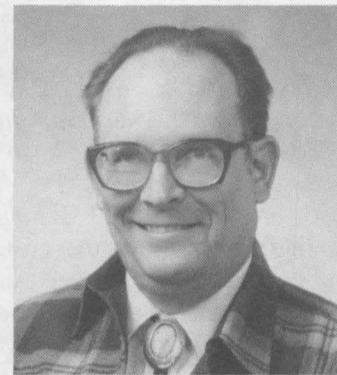
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Gerald Hochrein
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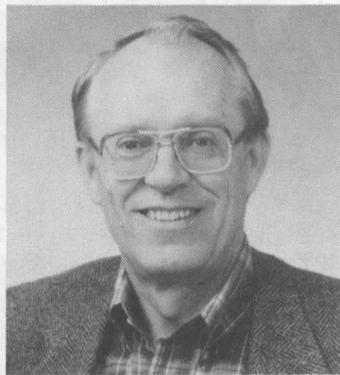
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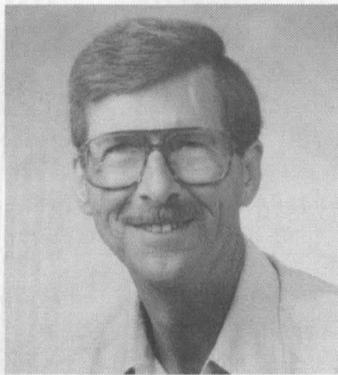
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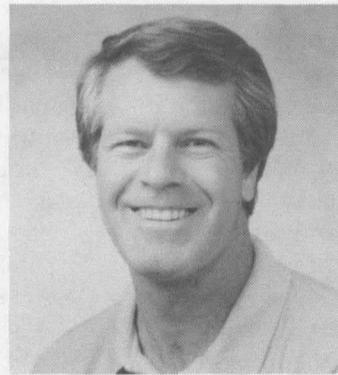
Martin Molecke
6345 15



Orval Jones
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David Huskisson
6454 20



Alan Smith
2855 15



Fred Blottner
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Bob Reese
7542 25



Ernest Niper
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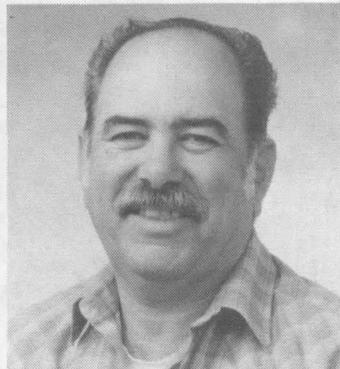
John Cronin
7473 25



Edward Gonzales
7813 35



Arthur Sena
9122 25



Fidel Gabaldon
3423 25



Florencio Aragon
5113 20

Issues and Tradeoffs

Recycling Program Kicks Off Expansion on Monday

Want to find out more about recycling at Sandia and maybe get personally involved? Come to the Sandia Recycling Team's informational program on Monday, June 3, at 10 a.m. in the Technology Transfer Center (Bldg. 825).

The program will include a videotape narrated by actor Tom Selleck that will test your recycling knowledge, and several speakers will be featured.

There will be a question-and-answer session at the end.

Cecil Gates, an account executive with Recycle America and Sandia's recycling contractor, will discuss recycling issues and tradeoffs and what can be recycled now in Albuquerque. Madeline Dunn, coordinator of the Keep Albuquerque Beautiful program, will talk about how

institutions such as Sandia can help create markets for materials not currently being recycled.

The program will also help kick off the expansion of Sandia's wastepaper recycling program that began last fall as a pilot program in selected buildings. Other buildings are being added to the program gradually. ●

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.
13. "Work Wanted" ads limited to student-aged children of employees.

MISCELLANEOUS

- AQUARIUM, 20-gal., glass, w/stand, light, heater, gravel, accessories, paid \$90, sell for \$30 OBO. Kissel, 281-2729.
- POWER MOWER, 21-in., \$75; antique oak drop-leaf table, \$150; patio table umbrella, \$25; electric weed eater, \$15. Thornberg, 897-3785.
- WHITE PERSIAN CAT, male, w/copper eyes, 2 yrs. old, champion lines, good for show, \$600; kitten, black female, free to good home. Perea, 275-3683.
- FREE-ARM SEWING MACHINE TABLE, \$85; captain's bed, w/4 drawers & mattress, \$150. Mayes, 821-0698.
- GARRISON WOOD STOVE, heat shield, some stove pipe included, cost \$700, sell for \$325. DeWitt, 294-6514.
- BRAHMA CAMPER SHELL, fits long wide bed. Lovato, 255-6634.
- BARBEQUE GRILL, \$7.50; 2 children's flotation devices, \$2.50/ea.; coffee table, \$12.50; 2 bathroom sinks, \$5/ea. Mozley, 884-3453.
- WATERBED, queen, w/maple bookcase headboard, 6-drawer pedestal, new semi-waveless mattress & heater, \$150 OBO. Letz, 293-4525.
- CAMERA, Vivitar Aim & Shoot, PS35 autofocus, \$45. Spears, 266-9782.
- POP-UP CAB-OVER CAMPER, Sun-Lite, 3-way refrigerator, electric water pump, 3-burner stove, \$2,750 OBO. Tenorio, 821-8967.
- WEDDING BANDS, man's size 9, woman's size 5-1/2, never worn, cost \$725, sell for \$600 OBO. Cunningham, 821-4224.
- VACUUM CLEANER, Hoover Concept Two, power drive, \$40. Newman, 292-7351.
- BEDS: double-size, w/headboard, \$50; king-size waterbed, w/headboard, nightstands, pedestal w/drawers, oak, \$150. Patterson, 822-1196.
- LAWN MOWER, Black & Decker, 18-in., electric, w/grass catcher, \$20. Stirbis, 299-8442.
- LABRADOR/CROSS, female, black & tan, 5 mos. old, all shots, negative heartworm test, free to good home. Rex, 344-6552.
- EXERCYCLE, w/speedometer, odometer, & timer. Miller, 268-5992.

LINDSAY WATER CONDITIONING and purification system, 3 yrs. old, \$350. Salazar, 877-9579.

ELECTRIC ORGAN, Lowrey Holiday spinet, recently serviced, \$200. Walker, 821-5938.

TRAVEL TRAILER, 24-ft., self-contained, sleeps 4, \$3,500 OBO. Sisneros, 281-9266.

WATER SKI, H.O. Mach 1, w/medium boot & horizontal skeg stabilizer, 1 yr. old. Schaub, 865-8807.

BUMPER POOL TABLE, w/pool light fixture, \$125. Tafoya, 298-6208.

KING-SIZE CALIFORNIA WATERBED, padded rails & headboard, medium wave mattress, heater, pine frame, \$100. Trever, 823-9418.

ANTIQUA HALL TREE (coat rack), \$125; antique Victrola, \$100. Coalson, 298-0061.

GARAGE SALE: June 8, 8 a.m.-noon, Gerry backpack, high chair, toddler clothing, electric boat motor, 9000 Haines NE. Nicholas, 294-2651.

BASKET CHROME RIMS (4), w/locks, size 14-in., removed from '86 Mustang, w/tires. Chavez, 842-6374.

YARD SALE: European yarn handmade sweaters, blue plaid king-size bedset, 4208 Douglas MacArthur NE, Saturday, June 1. Jones, 881-1918.

DAISY-WHEEL PRINTER, Silver-Reed EXP500, letter-quality, \$75; CGA/HERC color graphics adapter, w/TTL & video outputs, \$30. Hale, 298-1545.

SOFA/SLEEPER, love seat, chair, coffee table, 2 end tables, lamp, cream/blue-gray, \$650 OBO. O'Toole, 828-9260.

CHILD'S SWING SET, 2 swings, seesaw, slide, climbing bar, 4 anchors, free, you disassemble and move. Kirson, 293-5284.

FLEX-STEEL SOFA, \$100 OBO; entertainment center, \$125 OBO; hanging lamp, \$15 OBO. Kilgo, 881-0182.

IBM 286 AT, 8-Mhz computer, 1.2-Meg. floppy, 20-Meg. hard drive, mono monitor, serial, parallel, 101KB, 2-Meg RAM, \$650. Roody, 299-6084.

SQUARE COCKTAIL TABLE, oak, w/4-pane beveled-glass top, \$75. Simmons, 891-2475.

.22-CAL. RIFLES: Gevarn carbine, Browning bolt-action w/scope; .22-cal. pistols: Hi-Standard Model 1031, Colt Officer Special. Harris, 865-0140.

TIRES AND RIMS for Ford 3/4-ton truck, 16-in., 8-hole, \$100/all 4. Lucero, 294-2546.

SEARS ELECTRIC DRYER, \$125; Sears portable dishwasher, \$125; large birdcage, \$60; Sears washer, \$75. Pullen, 291-0666.

CAMPER SHELL, for long wide truck, white, \$250. Hesch, 268-6122.

CAMPER SHELL for small pickup, needs some work, \$100. Montoya, 842-0929.

WIDE-MOUTH PINT KERR JARS, 2 doz., never used, \$4.50/doz.; 6 doz. jars, used 2 seasons, \$3.50/doz. Dingman, 881-9632.

GARAGE SALE: Saturday, June 1, baby items, couch, misc., 6209 Avenida La Costa NE, 9 a.m.-4 p.m. Caldwell, 821-7110.

ZENITH TELEVISION, 19-in., color, solid-state, \$85; dress, size 12, May D&F (Garden Wedding), voile-floral, short, \$45; pearl rosary, \$5.75. Montoya, 883-9115.

DEPRESSION-ERA BUFFET & matching hutch, w/glass door & key, mahogany, \$250/ea.; double-lamp ceiling fixture, w/genuine brass, \$250. Gerwig, 822-1620.

RECEIVER, Technics, AM/FM/TV sound, "New Class A" amp, 47 W/channel, \$95; vacuum cleaner, Hoover upright, 2-spd., w/tools & bags, \$35. Ricco, 828-1997.

MINOLTA 35mm CAMERA, Maxxum 3000, 35-80mm lense, case, new, \$325. Torres, 265-6516.

GARAGE SALE: June 1, toddler clothes/toys, bar stools, exercise bike, stroller, Nugget St. (north of Spain, east of Juan Tabo). Schofield, 292-7220.

MULTI-FAMILY SALE: June 1, 9 a.m.-2 p.m., 4608 Danube NE, couch, chair, draperies, toys, miscellaneous household items. Malcomb, 292-4533.

STEREO SPEAKERS, B&W model DM10, \$150; Peavey amplifier, 150 watts, \$225. Crenshaw, 296-8948.

COLEMAN CATALYTIC HEATER, \$20; Yamaha guitar, \$120; Paragon electric kiln, \$250; spring rocking horse, \$50; assorted engineering texts. Mills, 299-2130.

SALE: tapestry wool, needlepoint canvas, counted-cross-stitch supplies, Aida accessories, June 2, 10 a.m.-4 p.m., 1600 Cornell SE. Hall, 243-3672.

PRINTER, Diablo 630, letter-quality, wide-carriage, complete w/print-wheels, carbon ribbons, paper, manuals, \$250 OBO. Barker, 294-0254.

PENTAX K1000 35mm CAMERA, 50mm lens, \$150. Harris, 299-4559.

COMPUTER EQUIPMENT: 8-bit CPM computer w/10M hard drive, Tele-Video 925 terminal, Qume printer. Olman, 884-4664.

CARPETING: neutral beige color, w/upgraded padding, approx. 190 sq. yds., \$3/sq. yd. OBO. Rogers, 292-4396.

FAX MACHINE, OmniFax, commercial quality, \$250. Carson, 281-5115.

TRANSPORTATION

'87 WINNEBAGO, 21-ft., dash/roof AC, cargo carrier, microwave, CB, sleeps 6, 21K miles, under warranty, \$17,500. Lovato, 891-1998.

'86 FORD ESCORT "L", white, 4-dr. hatchback, AC, AM/FM stereo, cruise, 35K miles, \$2,950. Kurowski, 881-1859.

'90 KAWASAKI TENGAI, 650cc, 700 miles, electric start, \$2,900. Brooks, 296-6870.

TRACTOR, B-N, 4-spd., new paint, w/blade, Gutierrez, 877-8298 after 6 p.m.

'90 MAZDA MX-6, blue w/blue interior, AT, AC, AM/FM stereo cassette. Cloer, 296-5244.

'74 VW SUPER BEETLE, w/sunroof, new brakes, shocks, battery, 5 new tires, AM/FM cassette, rebuilt seats, extras, \$2,000. Letz, 293-4525.

'82 HONDA ACCORD, PS, AC, 5-spd., silver, 4-dr., 105K miles, \$2,500. Dunn, 822-1873.

FISH/SKI BOAT, 18-ft., tri-hull, open bow, inboard/outboard 120-hp 4-cyl. Chev. engine, \$3,200 OBO. Tenorio, 821-8967.

'72 T-CRAFT BOAT, cruise, fish, ski, 21-ft., 165 Mercruiser, tandem trailer, new tires/cover, extras, \$6,500. Hansen, 897-0765 or 898-3173.

'85 GMC S-15 PICKUP, white, AM/FM cassette. Karr, 823-2473.

'81 PLYMOUTH RELIANT STATION WAGON, AM/FM, AC, cruise. Dillon, 891-9559.

FISHING BOAT, 16-ft.; 3/4-ton Ford pickup; Mitchell camper. Kindschi, 256-0531.

'79 FORD FUTURA, 91K miles, original owner, AC, AT, AM/FM cassette, records, 6-cyl., cruise, \$1,000 OBO. Kureczko, 281-8206.

MEN'S BICYCLES: blue 27-in. 12-spd. Pinnacle FS; burgundy 26-in. 10-spd. Sunbird Free Spirit; \$80/ea. or \$150/both. Sisneros, 281-9266.

BMX REDLINE FREESTYLE BICYCLE, paid \$300, make offer. Schaub, 865-8807.

'80 MERCURY CAPRI, 4.2L V-8, fully equipped, 104K miles. Crumley, 299-5293.

'86 BIANCHE RACING BIKE, 50cm, light mint color, cost \$500, sell for \$300. Silva, 898-1722.

'78 MERCURY ZEPHYR Z7, V-6, AT, PS, PB, AC, 82K miles, \$800 OBO. Harris, 299-4559.

'81 DATSUN 280-Z, 2+2, T-tops, \$5,300. Dubes, 275-0191.

FISHING BOAT, Sears Super Gamefisher, 14-1/2-ft., suntop, cover, seats, Mercury 110 outboard, Shoreland'r trailer, w/spare, accessories, \$3,100. Hughes, 299-6674.

'71 INTERNATIONAL SCOUT II, 4x4, 4-spd. standard, CB, one-family owned, \$1,350. Beasley, 298-3398.

'81 SUBARU GL WAGON, 178K miles, \$1,495. O'Toole, 828-9260.

'85 CHRYSLER LASER TURBO, AT, fully loaded, \$2,500. Mowrer, 281-5595.

'73 MERCEDES 280, 4-dr., AT, gasoline engine, value \$4,500, will consider any reasonable offer. Levy, 821-2294.

'67 MFG RUNABOUT BOAT, 17-1/2-ft., deep-vee hull, w/trailer & 80-hp Mercury engine, needs restoration, \$500. Cotter, 897-1470.

'78 DATSUN 280Z, 5-spd., AC, extras, 119K miles, maintenance records, \$2,600. Nygren, 344-3332.

GIRL'S BICYCLE, 26-in., \$50. Pullen, 291-0666.

MOUNTAIN BIKE, Diamondback, \$100 OBO; Sunfish sail boat, 14-ft., \$350 OBO. Hughes, 265-1698.

'90 CRX, AM/FM cassette, AC, tinted windows, 7K miles, below book, \$9,800. Finley, 294-3910.

'73 DODGE PICKUP, 1/2-ton, PS, PB, AC, sliding window, AM/FM cassette, 400 motor, \$1,500. Townsend, 275-8913.

'70 GTO, rebuilt 400 engine under 2K miles, extras, consider pickup or 4x4 in full/partial trade, \$4,900. Cooper, 881-1329.

'84 VW RABBIT, 5-spd., 2-dr., AC, fuel injection. Schmitt, 291-0878.

'47 DODGE CLUB COUPE, complete original, restoration started, builder or parts car, \$900 firm; '70 VW Bug, parting out. Smith, 256-0861.

'83 YAMAHA XV750 VIRAGO, red, ready to ride, make offer. Boruff, 294-8324.

'78 PONTIAC Grand LeMans, 4-dr., PS, PB, AT, AC, power locks/windows/seat, runs reliably, needs misc. repairs, \$700 OBO. Shirley, 821-0480.

REAL ESTATE

5 ACRES, on national forest, wooded, 16 miles from Albuquerque, power, telephone, \$500 down, \$250/month, no qualifying. Savage, 281-4651.

3-BDR. HOUSE, Westview area, 2,100 sq. ft., 2-3/4 baths, den, sun-room, hot tub room, 2-car garage, fully landscaped, \$78,000. Padilla, 836-6956.

2-BDR. HOME, 6 miles south of Tijeras, 2 baths, .7 acre, woodstove, brick floors, security system, \$84,900. Dubbert, 281-9269.

2-BDR. LOG HOME, in Jemez Springs, 2-car garage, greenhouse, on 1 acre, surrounded by 6-ft. chain-link fence, \$58,000. Beasley, 298-3398.

2-BDR. CUSTOM BRICK HOME, in Netherwood park, 1,756 sq. ft., large rooms, corner lot, RV access, \$104,000. Vandetti, 299-2318.

1/2 ACRE in Bosque Farms, w/2-bdr., 1-bath, '79 mobile home, 14' x 54', completely fenced, some landscaping, city water & well, \$42,500. Montoya, 842-0929.

HOME, 2 master bedrooms, 2-1/2 baths, fireplace, foothills, fans, skylights, sprinklers, views, finished garage, oak throughout, thermopane, \$70,500. Hovorka, 294-6981.

3-BDR. HOUSE, open house June 1 & 2 (1-5 p.m.), 1,700 sq. ft., carpet, deck, views, assumable \$803/mo., 2437 Sandler NE. Outka, 298-5707.

HOUSE IN CEDAR CREST, on 2 wooded acres, detached 2-car garage, guest quarters, \$110,000. Carson, 281-5115.

WANTED

ALUMINUM BOAT, 10- or 12-ft., to be used as car topper, must be in good condition. Kureczko, 281-8206.

BOOKS: "The Summer Tree" and "The Wandering Fire" by Guy Gavriel Kay, hardcover preferred, price commensurate with condition. Novak, 268-8258.

HALL OR SOFA TABLE, oak/pine, 48-in. long maximum, for use with Western decor, prefer old. Rounds, 345-1976.

RV TOW BAR, w/hardware, for small car, must be in good condition. Garcia, 888-4735.

WHITEWATER RAFT, 12-ft. to 14-ft., in good condition. Normann, 291-9909.

LONG BED for '80-'86 Ford pickup equipped for dual tanks. Romero, 281-9423.

SANDIANS with prior Bell System service for get-together. Schubeck, 821-3133.

JEWELRY ARMOIRE and lingerie chest, oak; someone to do yardwork for elderly lady, yard cleanup and mowing, reasonable. Hovorka, 294-6981.

WORK WANTED

EXPERIENCED PAINTER, college student, uses brushes, thorough prep work, quality exterior and interior work, free estimates, references. Dickey, 275-0890.

BEGINNING STRING LESSONS, bass and cello, high-school junior wants to teach elementary and middle school students, \$5/per half hour, must supply own instrument. Graham, 293-7302.

LOST AND FOUND

FOUND: wristwatch in Water Tower parking lot during week of May 13, identify and it's yours. Ritson, 6-7377.

SHARE-A-RIDE

CEDAR CREST VANPOOL, has openings, Frost Rd., N-14, Tijeras. Yelton (281-2893) or Burns (281-3922).

Coronado Club Activities**Splash into Summer Tonight at 'Dollar Daze'**

IT'S THAT TIME OF YEAR AGAIN — Friday "Dollar Daze" begin tonight at the C-Club and last all summer, featuring the pool and patio, lots of green grass, shade trees, a playground for the kids, horseshoe, sand volleyball, basketball, tennis, table tennis, shuffleboard, and badminton. The pool and patio are open from 5 to 10 p.m., and a low-cost patio buffet (open from 5 to 7 p.m.) includes such favorites as hamburgers, hot dogs, steak, baked fish, tacos, low-calorie plates, and sandwiches. Members with pool & patio passes get in free, Club members without passes pay \$1, and non-member guests pay only \$2.

BRUNCH BONANZA — Three Champagne Sunday Brunches take place in June (all served from 10 a.m. to 1 p.m.). The first, June 2, is "Family Day," so bring the kinfolks over for a family

feast they won't soon forget. On Sunday, June 23, Bob Weiler and Los Gatos play from 1 to 4 p.m. following the brunch. The third brunch is June 30. As always, adults get a free glass of champagne with their meals. Cost is \$6.95 for adults, \$1 for children 4 to 12 years old, and free for toddlers. Make reservations, please (265-6791).

WEDNESDAY WAVES — Wednesday Family Pool Days begin June 5 and continue through the summer. The pool is open from 11:45 a.m. to 8 p.m. each Wednesday, and a patio buffet is available from 5 to 7 p.m. Regular admission rates apply: free for pool & patio pass holders and \$3 for C-Club members and non-member guests.

THANK GOODNESS it's Friday, because Friday, June 7, the Isleta Poor Boys play their

best toe-tapping dance music from 7 to 11 p.m. Menu items include filet mignon or fried shrimp (two-for-one priced \$16.95), prime rib (\$9.95), chicken teriyaki (\$7.95), and poached halibut (\$9.95). Dinner is served from 6 to 9. Reservations recommended.

KIDS, JUST YELL "BINGO" and win a bike at kid's bingo Sunday, June 9, starting at 1 p.m. New bikes will be given away to one lucky boy and one lucky girl. Low-cost buffet is served starting at noon. Cost to play is \$2.50.

THEY'RE SUCH CARDS — The T-Bird Card Sharks meet the first and third Thursday of each month. June's meetings are Thursday, June 6, and Thursday, June 20, from 10 a.m. to 3 p.m. New members are always welcome.

Events Calendar

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

May 31 — "The Birthday Present," musical about a group of pre-teens who create a village for homeless children; 7:30 p.m. Fri., 2 p.m. Sat.; South Broadway Cultural Center, 766-9026.

May 31 — June Music Festival: Guarneri String Quartet, music includes Beethoven's "Quartet in B-Flat Major, Opus 18, No. 6," Dohnanyi's "Serenade for Violin, Viola, and Cello in C Major, Opus 10," and Ravel's "Quartet in F Major"; 8:15 p.m., Simms Fine Arts Center, Albuquerque Academy, 881-0844.

May 31 — Exhibit opening: "Late Style," recent works by Charles Mattox, Enrique Montenegro, Lucy Lewis, Clinton Adams, Garo Antreasian, Beaumont Newhall, Anne Noggle, and Joe Herrera; reception 6-8 p.m., exhibit continues through July 28, 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

May 31 — Exhibit opening: "Figure It In: The Human Figure in American Art Since 1945," drawings, paintings, photographs, prints, and sculptures featuring the face and human body; reception 6-8 p.m., exhibit continues through July 28, 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

May 31-June 1 — "Frida, a Dance Drama," one-woman performance by Alicia Perea portraying the life and work of the late Mexican artist Frida Kahlo; 8 p.m., KiMo Theatre, 764-1700.

May 31-June 16 — "School for Drugs," comedy by Grubb Graebner about Santa Fe politics, power, and strange bedfellows; 8 p.m. Fri.-Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.

May 31-Aug. 18 — Exhibit, "Treasures of the Tar Pits," ice-age fossils from the Rancho La Brea Tar Pits in Los Angeles, produced by the Natural History Museum of Los Angeles County, features complete skeletons of dire wolves, a coyote, a giant ground sloth, and a cast from the skeleton of a 9,000-year-old La Brea woman; 9 a.m.-5 p.m. daily, New Mexico Museum of Natural History, 841-8836.

June 1 — Subscription Concert VI, the Chamber Orchestra of Albuquerque, featuring guest pianist Leon Bates, music includes "Prelude and Sarabande" by Arcangelo Corelli, "Piano Concerto No. 1 in C Major, Op. 15" by Beethoven, and "Symphony No. 6 in C Major, D. 589" by Franz Schubert; 8:15 p.m., St. John's United Methodist Church (2626 Arizona NE), 881-0844.

June 2 — June Music Festival: Guarneri String Quartet, music includes Beethoven's "Quartet in C Minor, Opus 18, No. 4," Mozart's "Duet for Violin and Viola in G Major, K.423," and Dvorak's "Quartet in F Major, Opus 96, No. 6" ("American"); 4 p.m., Woodward Hall (UNM), 881-0844.

June 2 — "Three Graces," an evening of contemporary dance by Marta Lichlyter, Molly Prewitt, and Amy Schactman; 8 p.m., KiMo Theatre, 764-1700.

June 2 — Bluegrass Concert, featuring Country Gazette; 2 p.m., Oscar Huber Memorial Ballpark, Madrid, N.M., 298-3080.

June 3 — Monday Lecture Series: "Continuance in Native American Music, Past, Present, and Future," lecture and performance by Anthony Zuni (disk jockey,

KUNM Singing Wire Program); 10 a.m., Indian Pueblo Cultural Center theatre, 843-7270.

June 5 — June Music Festival: Guarneri String Quartet, all-Mozart concert in recognition of the 200th anniversary of Mozart's death, with guest flutist Joshua Smith, music includes "Quartet for Flute and Strings in A Major, K. 298," "Quartet No. 8 in F Major, K. 168," and "Divertimento for String Trio in E-flat, K. 563"; 8:15 p.m., Woodward Hall (UNM), 881-0844.

June 7 — Svirka, Women's Balkan Chorus; 7:30 p.m., Living Batch Bookstore (106 Cornell SE), 262-1619.

June 7 — June Music Festival: Guarneri String Quartet, music features Mozart's "Quartet in D Major, K. 575," Beethoven's "Trio for Violin, Viola, and Cello in G Major, Opus 9, No. 1," and Dvorak's "Quartet for Piano and Strings, No. 2, in E-Flat Major, Opus 87"; 8:15 p.m., Woodward Hall (UNM), 881-0844.

June 8 — Second Saturday Storytelling: Storyteller Linda Piper, featuring African tales; 1 p.m., West Gallery, New Mexico Museum of Natural History, 841-8838.

June 9 — June Music Festival: Guarneri String Quartet, music includes "Mozart's "Piano Quartet in E-Flat Major, K. 493," the world premiere of Ned Rorem's "3rd String Quartet," and Schumann's "Quintet for Piano and Strings in E-Flat, Opus 44"; 4 p.m., Woodward Hall (UNM), 881-0844.

June 10 — Monday Lecture Series: "Preview of Bus Trip to El Morro (Inscription Rock), Zuni Pueblo, and tour of Zuni Churches, Hawikuh," by historian Joe Sando; 7:30 p.m., Indian Pueblo Cultural Center Theatre, 843-7270.

June 13-16 — Festival Flamenco '91: UNM College of Fine Arts Theatre and Dance Department, concert of Flamenco dance, music, and song; 8 p.m. Thurs.-Sat., 2 p.m. Sun.; Rodey Theatre (UNM), 277-4402.

Take Note

The UNM College of Engineering is offering Total Quality Management Workshops, June 25-27 and July 9-11. To register or for more information, call Katherine Love at UNM on 277-6061.

Albuquerque-area high schools holding reunions this summer include Highland High Classes of '50, '51, '52, '53, '66, '71, and '81; Sandia High Class of '81; Valley High Class of '71; Del Norte High Class of '81; Rio Grande High Class of '71; and West Mesa High Class of '81. For specific dates and other information, call Alice Smit or Janice Bonfantine on 821-0038.

Favorite Old Photo

ICE CREAM PARLOR, 1957 — This is a photo of my father, Roy G. Fitzgerald (5238), while he was still working with my grandfather at one of two ice cream parlors the family owned on Central Ave. My grandfather, a native Albuquerquean, opened the shops in the 1940s, and my dad worked there until 1962, when Grandfather died and the family sold the business to Creamland. This parlor was at the northwest corner of Central and San Mateo; the other was nearer the university.
Roy L. Fitzgerald (122)