

Distributed Receiver Test Facility

Sandia to Lead Solar Dish R & D

Taking form now at a site north of the control building at Sandia's Power Tower is a 45-foot-tall solar dish collector, called a test bed concentrator, being assembled here after a move from Jet Propulsion Laboratory's Parabolic Dish Test Site at Edwards AFB. It marks the first of possibly eight dish collectors that will compose the first phase of a new Distributed Receiver Test Facility (DRTF) for the Labs and the beginning of a new Sandia project for DOE's Solar Thermal Program.

Goal of the project is to develop new parabolic dish solar collector systems for the production of industrial process heat, electricity, and fuels and chemicals. Centered in Don Schueler's Solar Energy Department 6220, the project will investigate new dish and receiver design concepts, new methods of transporting and storing solar-generated energy, and new or improved industrial and utility uses for solar thermal energy.

"Ultimately, we plan to develop systems that are easily adaptable for widespread commercial use at costs competitive with those of conventional energy sources," says Bob Hunke (6227), parabolic dish project leader. "Solar thermal technologies can provide a significant contribution to this effort; their use would help alleviate need for the most used and expensive resources — oil and natural gas. In addition to producing electricity and process heat, we hope that

(Continued on Page Four)

'Synthetic Acceleration'

Jim Morel Develops Computational Shortcut

Jim Morel of Simulation Theory Division 1231 lives in the arcane world of the computational physicist. Recently, Jim devised a method called "synthetic acceleration" that is saving hours of computer time in defining highly complex systems.

Jim's job is to assign numbers and values to immense physical forces involved in complex interactions — when, say, a massive ion beam bombards a target pellet and implodes it to create fusion. The designers of the pellet need numbers — a mathematical description of the entire event, a model that can be run through the computer to simulate physical reality. With this model, then, the designers can try many designs — changing dimensions, materials, and active forces — until all the decisions and compromises are made and an ideal design emerges. Then a prototype is built for testing. This procedure is standard in a modern research and development laboratory. The key is the computational physicist.

Jim's specialty is thermal radiation transport theory. By way of introduction, he explains that all matter gives off electromagnetic radiation at an intensity and average frequency characterized by its temperature. Because of this dependence upon temperature, radiation is properly referred to as thermal radiation. Both the intensity and the average frequency of the radiation increases with increasing temperature. For instance, at room

temperature the average frequency of matter is in the infrared range. This is the radiation that is used by infrared sensors to "see" in the dark. Hot coals in a fireplace emit some of their thermal radiation at visible frequencies that we see as a red glow.

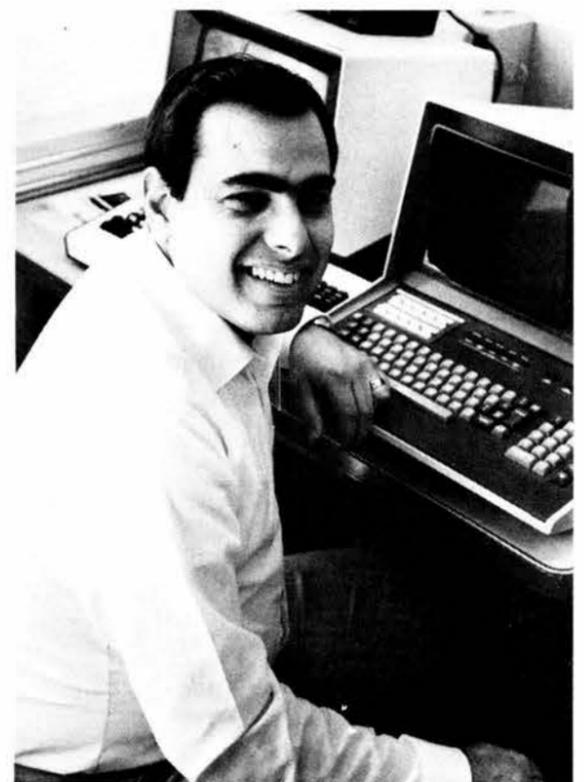
At the extreme temperatures of stars, thermal radiation is emitted as X-ray frequencies and at intensities capable of instantly vaporizing matter. In an internal confinement fusion target, temperatures equal to those of stars can be reached, and a significant fraction of the total target energy is carried by thermal radiation.

"If we are predicting the behavior of the target," Jim says, "we must follow the radiation as it is created, moves through the target, and interacts with the target material. The theory that describes this process is thermal radiation transport theory."

A complicated system of coupled equations involving thousands of unknowns defines the transport process. This system is so large that it cannot be solved directly — an algorithm cannot produce the exact solution. It must be solved iteratively: the algorithm used produces only an approximate solution. With each iteration the algorithm is repeated and the approximate solution gets closer to the exact solution, eventually reaching sufficient accuracy. However, the equations that Jim deals with require a vast amount of iteration and consume hours of computer time.

This is where synthetic acceleration comes in. "There are errors in the solution that remain after iteration," Jim says. "Obviously, if we knew what the errors were, we could construct the exact solution, but the system of equations for the errors is as

(Continued on Page Two)



JIM MOREL (1231) has developed a new computational technique (in collaboration with Ed Larsen of LANL) that is saving hours of computer time.



SHAPING UP NOW at a site adjacent to Sandia's Power Tower is the first of eight large parabolic dish reflectors that will comprise a new Distributed Receiver Test Facility. From left are Hal Baxter (6222), in charge of construction; Chris Cameron (6222), DRTF project leader; and Bob Hunke (6227), parabolic dish project leader. The dish, a test bed concentrator, will be 36 feet in diameter, mounted on a 45-foot-tall pedestal.



LAB NEWS

VOL. 36 NO. 3

SANDIA NATIONAL LABORATORIES

FEBRUARY 3, 1984

Antojitos

Your Talents Tappable?--In this issue, we'd hoped to be able to do a story on the Regional Science Fair. For one thing, it's the Fair's 25th anniversary. For another, lots of Sandians probably got their start in scientific careers by finding novel ways to demonstrate the Pythagorean theorem, or some such. And finally, the Fair needs judges. Desperately. 325 of them. And what better place to seek judges than Sandia?

Well, in spite of the best efforts of Dave Menicucci (6221) and Art Key (6426) and Joe Laval (3163), all of whom have worked with the Fair for years, we're not going to be able to produce a story for this issue that would convince you of how important good Science Fair judges are in the lives of budding young engineers and scientists. In fact, we're not going to have any story at all--this is it!

What do judges do? They give four hours of their time--the morning of March 16, a Friday. Much more important, they give 7th through 12th grade students the guidance, encouragement, and recognition they need to improve their projects. Lots of these kids don't have parents who know how to help them construct an experiment that's scientifically sound. And, sad to say, lots of the kids don't even have a science/math teacher who can help them much either.

If you're trained in a technical field, please volunteer to help--call Dave on 6-3068. We'll need those kids one of these years; they need us now. ●BH

* * *

Memories of Christmas Past--Eating a pound of fattening foods puts more weight on than not eating it takes off.

Continued from Page One

Computational Shortcut

difficult to solve as the original system of equations.

"However," Jim continues, "we realized it was conceivable to develop a simplified set of equations, easy to solve but yielding adequate approximations of the errors. Such a set of equations would allow us to leap ahead and drastically reduce the number of iterations required. This is the heart of synthetic acceleration.

"To compute the errors, we went back to the original set of equations and performed a Fourier analysis of the standard iterative procedure and obtained sufficient information to construct an effective set of equations that approximate the errors."

The new mathematical technique proved from 15 to 20 times faster than the original iterative technique. A typical problem, computed on the CDC 7600 computer in Sandia's Scientific Computing Center, might take four to six hours; with the new technique, the same problem might take 20 minutes.

"Synthetic acceleration is a technique that can be adapted to many classes of problems," Jim says. "A form of the technique has been used in computing neutron transport equations in nuclear reactor physics, and this application can be expanded. We are currently adapting the method to calculate radiation effects on weapon electronic systems and cables."

The new technique was developed in collaboration with Ed Larsen of the Applied Theoretical Division at Los Alamos. Jim has joined this group at Los Alamos National Laboratory, now chartered to continue research in synthetic acceleration for general radiation transport computations. Further developments will be incorporated into Sandia programs because Jim will maintain close working relations with the Labs.

According to Tom Wright, supervisor of Simulation Theory Division 1231, the synthetic acceleration technique developed by Jim not only provides a more efficient use of computers, but it also provides a numerical means by which to attack some types of problems for the first time.

"The technique is also being applied to coupled charged-particle/photon transport computer models," Tom says. "It will provide similar major improvements in computing time on some other types of problems. The development of this technique significantly advances the state-of-the-art in performing critical programmatic calculations faster and more accurately."

COLOSSAL BOREDOM

 There are at least twelve reasonable explanations for the death of the dinosaurs, including rickets (proposed by the Russian geologist V. Elisayev) and malaria (suggested by Donald E. Carr in *The Deadly Feast of Life*.) The theory that Noah could not fit them into the Ark is unlikely because most were the size of chickens, and the flood came 76 million years later. My favorite theory is *paleoweltschmerz*--that after 80 million years they got tired of evolving and died of boredom.

--Letter to *The Guardian* (London) quoted in *World Press Review*

Medical Corner

Let's Talk About Aging

by Arlene Price (3330)

What are the interrelationships between biology and culture? How do they affect health? Disease? Curing?

Do other societies, past or present, provide us with effective models for developing increasingly satisfactory life styles?

These are some of the issues that Anita Alvarado of UNM's Department of Anthropology will discuss in her lecture, "Cultural Perspectives on Aging," the next in Medical's series called "Let's Talk About Aging." Her biocultural expertise comes from two decades of critical care nursing with the elderly and from her training as an

anthropologist and as a registered nurse; she has studied cultural effects on life expectancy and quality of life.

Please join us on Feb. 8 from 12 to 12:30 in Bldg. 815 (outside the tech area; families are welcome) for what promises to be a provocative presentation.

Events Calendar

Feb. 4 -- SIPI Indian Club presents monthly Pow-Wow and Gourd Dances; gourd dances at 2 p.m., main dances at 7 p.m., Southwestern Indian Polytechnic Institute, 766-2443.

Feb. 4 -- Fine Arts Music Series: Vienna Boys Choir, 7:30 p.m., First United Methodist Church, 243-5646.

Feb. 4-April 1 -- American Lithographers 1900-1960, an exhibition of lithographs, University Art Museum, UNM, 277-4001.

Feb. 5 -- Audubon film, "Okavongo," (Botswana), 7:30 p.m., Popejoy.

Feb. 7 -- NM Folk Music Society presents Bryan Bowers and Trapezoid, 7:30 p.m. SUB Ballroom, UNM.

Feb. 10-11 -- NM Symphony Orchestra, guest artist Steven De Groote, pianist; 8:15 p.m., Popejoy.

Feb. 12 -- Albuquerque Youth Symphony, 3 p.m., Popejoy.

Feb. 12 -- Music at the Museum, Alfredo Lopez, clarinet, and Darby Fegan, piano, 3 p.m., Albuquerque Museum.

Feb. 17 -- The Best of Broadway and International Theater, Hungarian Folk Ballet, 8:15 p.m., Popejoy.

LAB NEWS

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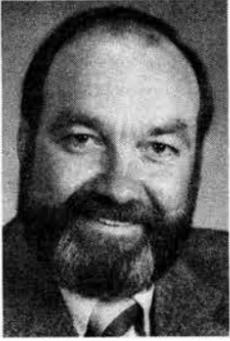
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Supervisory Appointment



JERRY WACKERLY to supervisor of Financial Division 8423, effective Feb. 1.

He joined Sandia at Livermore 25 years ago this March, first working in the documents control division. He later worked in the financial division and materials management, then in Purchasing as a small value buyer. He next transferred to the systems control group as an integrated contractor buyer. In 1969 he moved back to the financial division to the budget analyst position he held until his promotion.

Jerry earned a bachelor's degree in management and business administration at San Jose State University while working at Sandia.

He and his wife Judy (8273) have two children; they live in Manteca. Their hobbies include camping, boating, and other water sports. Jerry is a youth soccer coach and also plays in the adult soccer league.

Take Note

Lutz Dahlke (8444) was chosen to deliver the Mehl Honor Lecture at the 1983 American Society for Nondestructive Testing fall conference in Dallas. The 24th person to receive the honor, he spoke on "Non-destructive Testing at the Livermore National Laboratories" — both Sandia and LLNL.

* * *

Marlin Pound (8424) has again been named chairman of the Livermore Area Recreation and Park District board of directors. He has served on the elected board since 1968 and has been its chairman four times over the years.

Congratulations

Kellie and Jon Noring (8453), a son, Benjamin Bjorn, Dec. 17.

Yancey Lutz (8443) and Christal Kyle, married in Pleasanton, Dec. 17.

Norman Calderon (8265) and Philip Zablocki (8465), married in Pleasanton Dec. 17.

Sympathy

To John Becker (8465) on the death of his father in Wisconsin, Nov. 15.

To John Didlake (8163) on the death of his mother in Mississippi, Nov. 2.

To Bob Marmon (8116) on the death of his father in Garnett, Kans., in October.

To Barbara Carter (8273) on the death of her father in Superior, Wisc., Jan. 1.

NOBLE EFFORT

I was interested to read in this morning's *Times* that Mr. Richard Noble had "pushed his jet-powered Thrust 2 car to 633.6 miles per hour to capture the world land speed record." I have been speculating what speed this remarkable man might have achieved if not pushing a car.

—Letter to *The Times* (London) quoted in *World Press Review*



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RETIRING — From left, Fred Eichert (8271), Ken Foster (8262), Don Baumann (8271), Bob Hauff (8271), John Jesse (8257), Jim Henderson (8426), and Dan Pegan (8162).



MAKING PREPARATIONS for the 33rd annual American Society of Mechanical Engineers technical divisions conference slated Feb. 24 at San Mateo are these four Sandians who head various committees: (from left) Mark Mintz (8443), Carolyn Pura (8113), Larry Weingarten (8122), and Roger Baroody (8410). This year's theme is "Computer-Aided Engineering: Challenges, Benefits and the Future." The conference will be held at the Dunfey Hotel.



RECENT SEMINAR on purchasing and shop procurement attracted nearly 100 local machine and electrical shop businesspeople to Sandia. The event was held to better acquaint prospective suppliers with Sandia's operation and needs. Hardware displays were set up in the foyer of Building 904, and technical exchanges were presented through talks and a panel discussion. Looking over some of the machine tool parts on display are from left Marv Glaze (8250), Earl Powell of Caral, Inc.; Don Holt of Diamond Tool & Die; and Adana Dean (8264), SNLL's new Small and Disadvantaged Business Coordinator.

Hydrogen Getter Awarded Patent

The DOE has been awarded a patent for a combination moisture and hydrogen getter. Inventors are Larry Harrah and Keith Mead of Chemistry and Organic Materials Division 1811, and Mike Smith of the materials staff of Bendix Kansas City.

Resembling a thick Alka-Seltzer tablet, a moisture and hydrogen getter performs about the same function inside a small, sealed weapon component. The "getter" removes unwanted moisture and hydrogen from inside the component much as the antacid pill removes excess acid from your tummy.

Larry Harrah explains: "When you have plastic parts or organic material inside a sealed container, then over a period of time you are going to have a release of hydrogen and moisture. If there's a circuit inside that container using, say, an evaporated thin film of aluminum as a conductor, then eventually you are going to get an oxide film on the aluminum or hydrogen embrittlement

Continued from Page One



INVENTORS Keith Mead and Larry Harrah (both 1811) display a pellet of their recently patented hydrogen and moisture getter.

of other metals. That could lead to a malfunction. Our little getter pellet absorbs the hydrogen and moisture first and prevents damage to the components."

The pellet is composed of two formulations. The hydrogen getter portion consists of 75 percent diphenyl butadiyne and 25 percent palladium on carbon. The moisture getter is zinc dust, particle size ranging from one to ten micrometers. The pellet is a combination of about 70 percent hydrogen

getter with 30 percent metal powder.

"The approach taken with the metal powder," Larry says, "is to provide a large surface area, an area that competes with the other metal inside the container for absorption of water. The zinc will do the job, but the problem is one of preparation. By the time we get the zinc in powder form, an oxide layer has partially formed. We are experimenting in this area looking for an inexpensive way to prepare the zinc."

Sandia To Lead Solar Dish R & D

solar thermal energy can be used to produce meaningful amounts of valuable gases like hydrogen."

"Dwindling supplies of nonrenewable energy sources — and the potential economic and political instability caused by U.S. dependence on these sources as well as environmental issues such as pollution, acid rain, and the greenhouse effect — require the development and deployment of alternate energy technologies," adds Jim Leonard, 6227 supervisor.

A parabolic dish — typically on the order of 20 to 50 feet across — has the highest energy collection capability of any solar concentrator because of its high efficiency and two-axis tracking capability. A dish system also is extremely versatile because it can use almost any number and arrangement of collectors.

Dishes track the sun and concentrate reflected solar energy onto a receiver, or absorber, usually located in front of the dish and at its focal point. In a dish-thermal system the energy accumulates as heat in a thermal transport medium (typically a liquid or gas) that circulates through the receiver and then travels through insulated pipelines to the point of use. A dish-electric system uses the sun's energy at the focal point to heat a working fluid that drives an engine that is incorporated into the system. This engine, in turn, drives an alternator that produces electricity for transport to an electrical grid.

The current generation of dish-thermal systems produces transport fluids with temperatures up to 400°C. Researchers expect the new generation of dish-thermal systems will provide temperatures up to 1200°C and eventually higher.

Approximately 40 percent of this country's industrial process heat needs require temperatures greater than 500°C. With the higher temperatures achievable in thermal-dish receivers, they could be used in, for example, fuels and chemicals production, processes that currently consume considerable

amounts of fossil fuels to produce the operational temperatures necessary. Relatively inexpensive but efficient thermal transport systems are needed for dish-thermal systems in these high-temperature applications.

Success of the dish-electric approach depends on development of a low-cost dish concentrator and receiver plus an efficient, reliable power conversion unit in the 20 to 30 kW_e size range that can be mounted near the focal point. To this end, three engine cycles are being considered for incorporation into dish-electric systems. These are:

- 1) Organic Rankine cycle in which a fluid (toluene, for example) is vaporized under pressure, expanded through a turbine to drive a turboelectric generator, and condensed in a closed cycle.

- 2) Brayton cycle in which a gas (typically air) is compressed, heated, and expanded through a turbine, and exhausted or recuperated.

- 3) Stirling engine in which a gas (helium or hydrogen) is alternately heated (expanded) and cooled (contracted) to drive a multiple-cylinder engine.

First-generation models of these systems typically are capable of converting sunlight to electricity at 20 percent efficiency. Introduction of ceramic materials and advanced systems should bring performance improvements leading to solar-to-electric efficiencies of 30-40 percent and high reliability for both the Brayton and Stirling cycles.

Another major part of the Sandia-led project will be to design, develop, and test novel concentrator and receiver concepts. An example is the double reflector — also called a Cassegrainian dish — that has a secondary reflector that reflects light back to the center of the primary reflector and thus concentrates the light. The same principle is commonly used in receivers for radio signals, such as those coming from satellites or from microwave transmissions. Other highly accurate concentrators

that will permit an increased percentage of solar energy to be usefully reflected to a receiver will also be developed.

Additionally, the project calls for evaluation of high-performance, highly reliable parabolic dish cogeneration systems. Formerly called the solar total energy concept, these systems make more effective use of collected solar energy by supplying electrical and thermal energy that can be used simultaneously for space heating and cooling and for industrial process heat.

"Energy cascading is the key advantage of cogeneration over other systems that separately produce thermal or electrical energy," Bob says. "Simply put, thermal energy rejected during electricity generation is used to meet somewhat lower-grade energy needs instead of being exhausted."

The DRTF is expected to be fully operational in 1985. It will be used to evaluate not only prototype dishes but engine modules, control strategies, thermal transport systems, storage tanks and the system-level interactions among these components. In addition, it will provide a realistic way of individually testing components of new systems and then integrating them into a complete solar dish thermal or electric operation.

Fiscal year 1984 funding for the project is \$12 million, half of which is allotted to Sandia for internal and contracted research and development and for technical management responsibilities. The remaining funds are earmarked for industrial and academic solar energy organizations that will perform a variety of supporting research and development activities.

DOE recently transferred technical management duties for the dish-electric portion of the project from Jet Propulsion Laboratory (JPL) in Pasadena, Calif., to Sandia. In addition to the test bed concentrator, much of the other equipment at JPL's Parabolic Dish Test Site in the Mojave Desert will be moved to Sandia.

CHIEF SCHWYZER (2000), JACE NUNZIATO (1510) and, seated, GEORGE NOVOTNY (5164)



DON MCGINNIS (2631-4)



LLOYD BONZON (6446) and MABE FOSTER (2631-3)

Supervisory Appointments

CHIEF SCHWYZER to Assistant to Vice President 2000, effective Feb. 1.

Chief joined the Labs in January 1976 as a staff member in the property accounting organization; he transferred to the auditing department in June 1977. He became the CRM (Center for Radiation-hardened Microelectronics) Financial Specialist for the Microelectronics Directorate 2100 in October 1981 and, since last April, has also served as the administrative assistant to the 2100 director, Bob Gregory.

Chief received his BBA, with emphasis on finance, and his MBA, with emphasis on accounting, from UNM in 1972 and 1975 respectively. He enjoys skiing and tennis. He and his wife Barbara have two children and live in Sandia Heights.

GEORGE NOVOTNY to supervisor of Advanced Electrical Systems Division 5164, effective Dec. 2.

George joined the Labs in July 1967 as a member of the Technical Development Program. He's worked with a firing set development group, the Phase I and Phase II systems division, the nuclear safety organization, and, most recently, the ASW/SOW (Anti-Submarine Warfare/Stand-Off Weapon) Division 5162.

George received a BS in EE from the University of Nebraska and an MS in EE from UNM. He is a member of IEEE. He enjoys skiing and sailing. George, his wife Mary, and their daughter live in the NE heights.

JACE NUNZIATO to manager of Fluid and Thermal Sciences Department 1510, effective Dec. 16.

When Jace joined the Labs as a staff member in 1969, he was assigned to a research group that conducted shock wave studies of polymers. Two years later, he transferred to what is currently Shock Wave and Explosives Physics Division 1131. This was also a research position where he studied initiation and detonation processes

for both porous and granular explosives. Jace was promoted to supervisor of Fluid Mechanics and Heat Transfer Division I 1151 in 1980. His division's responsibility has been to support the nuclear waste disposal project and the weapons program.

Jace received his BS in aeronautical engineering from Rensselaer Polytechnic Institute and his MS and PhD, both in applied mechanics, from West Virginia University. He is a member of ASME, the American Physical Society, and the society of Rheology.

He enjoys fishing, cross-country skiing, backpacking, and racquetball. Jace has two children; he lives in the NE heights.

DONALD MCGINNIS to supervisor of Computer Operations Section H 2631-4, effective Jan. 6.

Before joining Sandia in September 1966, Don served 10 years in the Air Force as a cryptographer and completed the Air Force's teletype school and cryptographic school. At the Labs, Don worked in the teletype section for three years and then moved into the computer area. Since 1971, he has been a senior computer facilities operator.

Don enjoys hunting, fishing, and trap shooting. He was the state class C singles trap shooting champion for 1983. He and his wife Joan have two sons; they live in NE Albuquerque.

LLOYD BONZON to supervisor of Qualification Assessment Division 6446, effective Jan. 15.

Joining Sandia as a member of the technical staff in September 1968, Lloyd spent several years with the organization involved in the development and use of pulsed reactors. In 1974 he transferred to a group with NRC and DOE reimbursable projects definition and development responsibilities. Since 1977 he has been with the group he now supervises, which is concerned with investigations of reactor safety-related equipment.

Lloyd received a BS in EE and an MS in nuclear engineering from the University of Illinois. He is a member of the American Nuclear Society, and serves on IEEE and International Electrotechnical Commission standards groups concerned with equipment qualification and environments testing.

He and his wife Jessica have two children. He enjoys family oriented activities — youth soccer, Indian Guides, skiing, and traveling. The Bonzons live in NE Albuquerque.

MABE FOSTER to supervisor of Computer Operations Section C 2631-3, effective Jan. 6.

Joining Sandia in September 1977 as a graded computer facilities operator, Mabe was promoted to senior computer operator and to lead operator, the position he's held until his current promotion to supervisor.

Before coming to the Labs, Mabe served 22 years in the Air Force. While an Intelligence Operations Specialist, he acquired 10 years of on-the-job computer experience. He was stationed in the Far East, Europe, and the U.S.

Mabe enjoys golfing and fishing. He and his wife Evelin have two children and live in NE Albuquerque.

Take Note

The New Mexico Arts and Crafts Fair will be held June 22-24 at the State Fairgrounds. Entries for jurying will be accepted Feb. 16 from 1 to 7 p.m. and Feb. 17 from 1 to 8 p.m. at the Flower Building on the fairgrounds. Application forms may be obtained from the NM Arts and Crafts Fair office at 2745 San Mateo NE, Suite G, Albuquerque, 87110 or by calling 884-9043 (9 to noon, Mondays or Thursdays).

* * *

The South 14 Bookstand — When Cherry Lou Burns left the LAB NEWS and Sandia about 10 years ago, she resolved to travel ... and travel she did. Not for her the quickie visit to the headwaters of the Amazon; Cherry went down the whole thing to the Atlantic. And she has made similar long-duration trips to just about everywhere: the remainder of South America, Africa, China, the Philippines and other Asian countries and, of course, Europe. In all, Cherry estimates she has been on the road for five of the last 10 years. Now she has written a booklet: *More Time than Money — A Travel Kit for Leisurely, Reasonable Travel Abroad*. It's a sort of distillation of her experience with the logistics of travel, with sections on overall costs (Cherry actually travels for less than it costs for her to reside in Albuquerque), housing, shopping for transportation, clothes, currency matters, sending letters/parcels home, luggage, and how to have fun in a place that's a loser (of which she's endured a few). And more. You can get a copy, \$5 at the LAB NEWS, Bldg. 814.

* * *

Bumblebees Toastmasters Club is looking for new members, says Yolanda Padilla-Vigil (3511). "Over 2,000,000 people have enjoyed the benefits of Toastmaster membership," she reports. "Although they come from all walks of life, they share an awareness of the need to improve their listening, thinking, and speaking skills." The Bumblebees meet on Mondays from noon to 1 at the Enlisted Men's Club on KAFB-East. Yolanda, the club's educational vice-president, has more information; she's on 821-8059.

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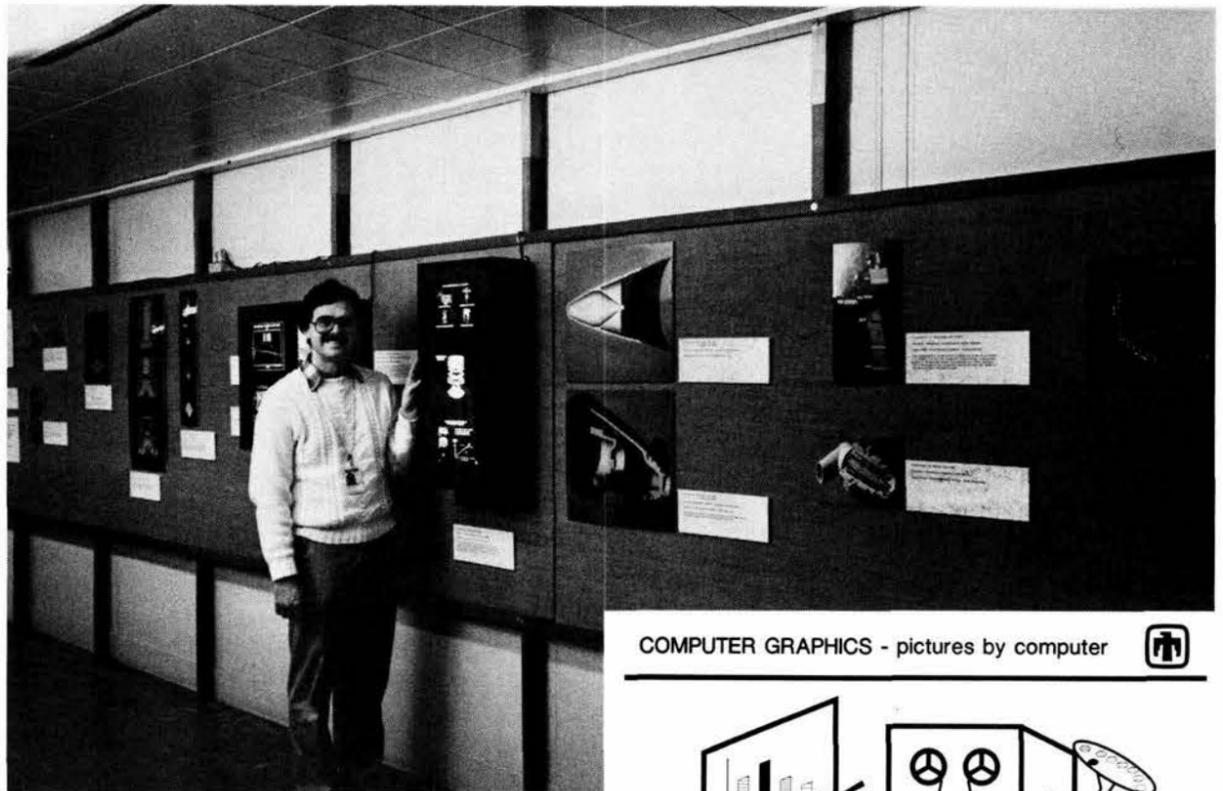
Wildlife Rescue, Inc., a volunteer organization operating under state and federal permits, provides care for orphaned, injured, and sick wild creatures. The group needs a desk, a couple of metal filing cabinets, and a table for its office at 11200 Menaul NE.

The organization receives animals and cares for them until they can survive on their own, then releases them to the wild again. The group has saved an orphaned owl and two sparrowhawks taken from Sandia's Power Tower. The birds were cared for and then released back at the Tower. A Wildlife volunteer may be reached anytime by calling 298-0473.

If you can help with donations or if you would like more information, call Madeline Edgar (wife of Robert, 6222), at 884-8567.

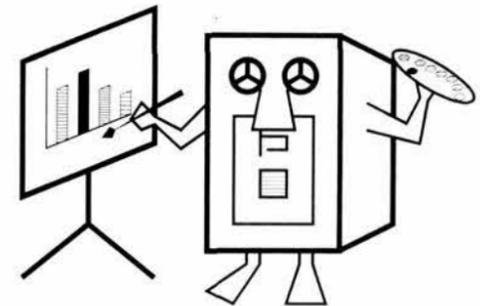
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Teddie Bruce (3543) who handles the Labs' Lost and Found reports that she is accumulating quite a collection of keys, eye-



DINO PAVLAKOS (2644) put together this computer graphics display in Bldg. 802 to give Sandians an idea of what computer graphics can do. His own entry (inset) represents the "fun" aspect of the work. This little fellow has become the mascot for the graphics group in Division 2644.

COMPUTER GRAPHICS - pictures by computer



Computer Graphics/Image Processing Display Attractive, Informative

Some of the examples of Sandia's rapidly escalating computer graphics technology, currently on display in the foyer of Bldg. 802, may be interesting both aesthetically and pragmatically.

Conceived by Dino Pavlakos (2644), the display includes contributions from throughout the Laboratory. Its intent is three-fold — to show that computer graphics is a useful and productive tool for portraying information, to illustrate the use of graphics at the Labs, and to inform Sandians about the availability and adaptability of this technology.

"This display is representative of various applications in computer graphics and in the related field of image processing," explains Dino. Computer graphics uses the computer to generate a synthetic picture, whereas image processing generally deals with the computer analysis of real images. Computer graphics applications include data plots for both administrative and technical use, presentation and publications illustrations, computer-aided

design, solids modeling, and animation.

"Computer graphics is being recognized as an important tool for transferring and portraying information," says Dino. "In the past, designers and engineers worked with pages of computer-generated numbers; today those numbers can be represented pictorially, making them much easier to understand. The rapid advancement in graphics technology is providing such capabilities at lower and lower costs."

The graphics group in Distributed Processing Systems Division 2644 supports computer graphics for the Central Computing Facility and distributed computers. Dennis Ghiglia and Gary Mastin (also 2644) provide the image-processing expertise. Dennis, Gary, and Bruce Hansche (7551) put together the image processing part of the display. Joe Laval (3163) coordinated the exhibit. Anyone wanting information on using computer graphics or image processing in his or her work can contact Division 2644, supervised by David Darsey.

glasses, miscellaneous clothing, and jewelry. Anyone who has lost anything recently should check it out in Bldg. 832, east end. Or call Teddie on 4-5677.

* * *

Retiring this month and not shown in LAB NEWS photos are Onesimo Martinez (7485), Dave Tafoya (3155), Clyde Dunlap (5213), and John Garcia (3661).

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The AIAA student branch at UNM along with the UNM Tau Beta Pi Honorary will sponsor a Personal Computer Symposium on Feb. 17 and 18 on the UNM campus. Local dealers will display a variety of personal computer hardware, software, and

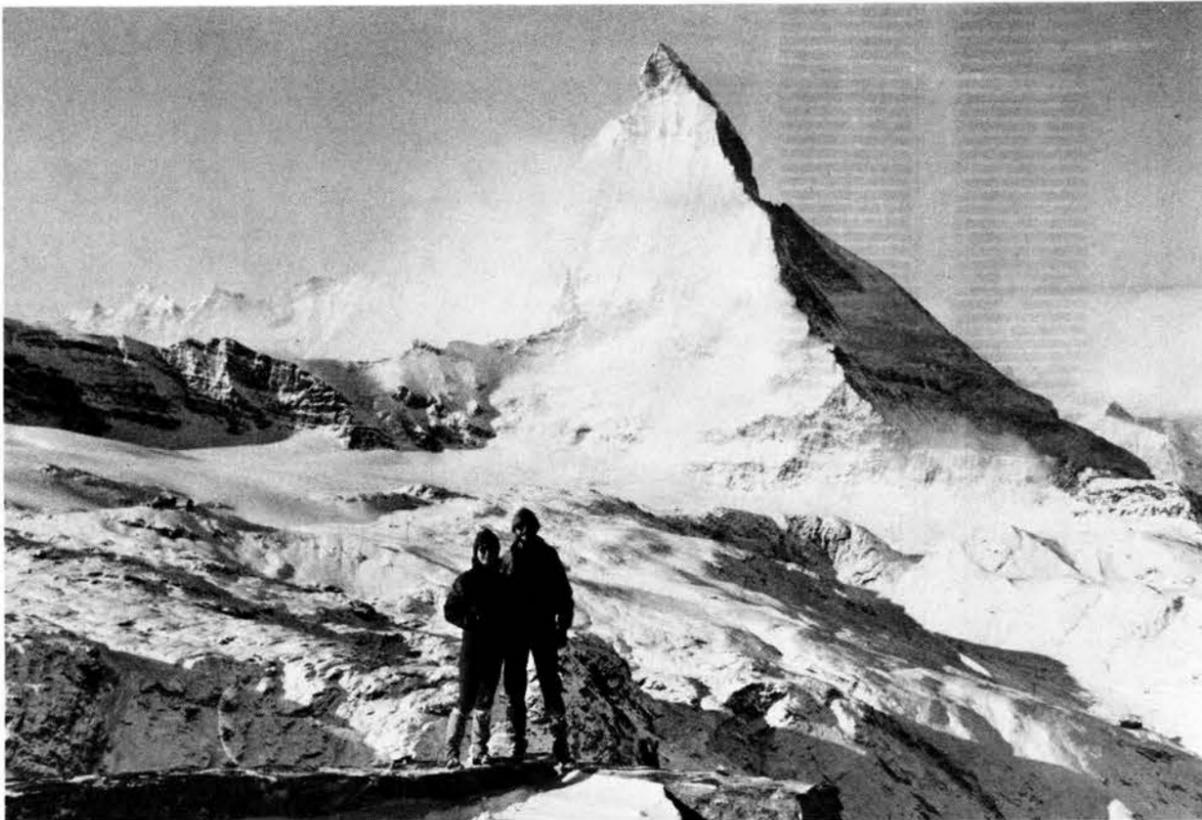
services. Lectures and panel discussions will cover home, student, and professional applications on PCs. Computer clubs are invited to participate. The exhibition will be open in the UNM Union ballroom from 9 a.m. to 9 p.m. Feb. 17 and from 9 a.m. to 2 p.m. Feb. 18. For more information call Walter Rutledge (1635) on 4-0119.

EXPERTISE REVISITED



Truman, 1945)

"That is the biggest fool thing we have ever done . . . the atomic bomb will never go off, and I speak as an expert in explosives." (Adm. William Leahy to President



Dodds Ski Europe

A free trip to anywhere in the world that TWA flies. That's the grand prize won by Kathie Hiebert-Dodd (315) and Henry Dodd (6252) at the Sperry-United Way Fun Run last summer. Avid cross-country skiers both, they picked Europe.

After flying to Frankfurt, they took a train to Stuttgart where they bought a Porsche and headed for Austria and Switzerland and the X-C trails. A minor fender-bender on a snowy mountain road didn't upset them nearly as much as tire chains (at \$250) would have.

"It was luxury skiing," reports Henry. "And excellent snow during two of our three weeks."

"Over there they set track everywhere anyone wants to ski, so everyone has racing skis," says Kathie. "The locals couldn't imagine that two apparently sane Americans would want to follow a trail that hadn't yet been groomed."

They stayed in small hotels in small villages — and enjoyed large helpings of excellent food, "especially the desserts," adds Henry. They found the Europeans very polite, very friendly, and they learned to communicate well enough to go where they wanted to go and do what they wanted to do without speaking German. "Most Swiss, in fact, speak English," says Kathie. "It was a great vacation!"



THE DODDS in Europe. Above, they visit the Matterhorn. Left, Kathie trails Olympians. She's on a 25k loop used by cross-country ski racers in the 1964 and 76 Winter Olympics near Innsbruck, Austria.

Retiring



Larry Williams (7471), Smitty Schmedeman (5216)



Joe Cowham (7474), Ruth Cowham (3610)

feed back

Q. I understand that there has been a Sandia amateur radio club. Some of the fixtures are still in place. There is some radio gear in reclamation.

In my department there are several amateur radio operators who are interested in starting another club. I know that in the past the Labs did provide equipment.

What would it take to get a club station on the air again? This would be a means for families to communicate with personnel overseas.

A. The Sandia Base Radio Club is still active, according to Robert Adams, present trustee. The club's call is WSMPZ, and the current FCC license is valid up to April 24, 1986. All SNL amateur radio operators may contact him (5236) on 4-3401 for further information.

C.L. Brumfield - 3400

Friendship Force To Invade Orient

The New Mexico Friendship Force plans a trip to the Orient next summer. The group leaves June 22 for Hong Kong and returns July 3 after spending three days in Hong Kong and six days in China. On the agenda are the Great Wall, Forbidden City, Temple of Heaven, Shanghai, and Beijing (Peking). An optional six-day tour of Japan follows with a return date of July 9.

The tour group is limited to 80 people, and applications are being accepted now. Cost is \$2295 for the China portion, \$695 for the Japan portion, and approximately \$130 for roundtrip air fare to Los Angeles. All foreign-country transportation, lodging, and most meals are included.

For additional information, call the Friendship Force office, 298-6916, or Wally Cramond (6414), 298-2660.



Here are two volunteer opportunities for employees, retirees, and their families. If you are interested, call Karen Shane (4-3268).

ST. MARY'S MID-SCHOOL is looking for judges for its science fair, Feb. 15, 3:30 until 6:30. Volunteers with backgrounds in physics, chemistry, engineering, and computers are needed.

MOTHER who was injured in an auto accident needs a babysitter (fee paid) for her 10-month old baby. Hours are 8 to 5 weekdays until mother is mobile (2 weeks to 2 months).

Fun & Games

Swimming — The Coronado Club sponsors a summer swim team program, and it's none too early to start thinking about getting your family involved. We participate in the Sundance Aquatic Association; the season runs from May 30 to Aug. 5. Sundance is an alternative to the year-round AAU program. We're interested in children of *all* skill levels.

Goals of the swim team coaching staff are to teach the proper fundamentals of competitive swim strokes to all, to give each child an opportunity to experience healthy competition, and to make the swim team an experience that's fun for everyone. Recreation Director Tom Lenz says, "We're very big on parent participation, so plan on helping out. We had a great time with the program last year — just ask any family that was involved — and with the help of everyone involved, we'll be bigger and better this year."

Practices run from 7:45 to 9 a.m. Monday through Friday, and most meets are held on Saturdays. Cost is \$20 per child. An organizational meeting will be held in late February — call 4-8486 to get on the mailing list.

* * *

Table Tennis — A singles and doubles team tournament is set for Feb. 11 at Monroe Jr. High School (Louisiana & Indian School) at 12:30 p.m. All Sandia employees, especially newcomers, and their dependents are invited to play. Entry fee is \$3 per person in advance; contact Dave O'Brien (4-5517), Dave Sealey (4-4475), Dale Breeding (4-9084), or Jim Sanchez (4-1908).

* * *

X-C Skiing — The Redondo Round-Up Cross-Country Ski Race, sponsored by the NM Ski Touring Club and High Country, is set for Feb. 5 at 11 a.m. at the Redondo Campground in the Jemez. Arrive early to sign up. Race is approximately 10 km; entry is \$5 (\$4 for NMSTC members) or \$2 for juniors; ribbons will go to the first three finishers in each of six age classes for males and females. In addition, prizes from High Country will be awarded by drawing. And all entrants get a free long-sleeved shirt. Entry forms at the LAB NEWS office. Further info from Larry Costin (1542) on 292-2396 or Stewart Kohler (2334) on 294-7150.

* * *

Mountain Climbing — The NM Mountain Club's annual course in technical climbing techniques is set for spring. The course includes three lecture sessions (Apr. 3 & 4, May 8) and six weekend field sessions (Apr. 8, 14, 29; May 6, 12, 19). Enrollment is limited to 30. And you must be 16 or older, pay a \$25 registration fee, have an interest in climbing (not rapelling), own a hard hat and hiking boots, and be willing to invest about \$40 in climbing gear. Sign up on Feb. 15 at 7:10 p.m. at St. Timothy's Lutheran Church (Jefferson & Copper). More info from the co-chairmen of the technical climbing course, Doug Drumheller (1534) on 281-2127 or Jim Linn (6257) on 296-3176.

* * *

Biking — The 12th Annual Tour of the Rio Grande Valley, a 100-mile bike ride from Albuquerque to Belen and back, is set



POWER IN SPACE — Sandia was recently honored by NASA with a citation and a framed photo for its support of the Radioisotope Thermoelectric Generator (RTG) program. The device has provided NASA's Voyager spacecraft with reliable electrical power for more than six years as it journeyed to the outer planets Jupiter and Saturn. Mound Lab and Los Alamos were also honored for their roles in the program. Here, President Dacey and Bob Hannigan (7254) hold the photograph, a view of Jupiter and its moon Io taken by the spacecraft; DOE/AL Manager Ray Romatowski made the presentation. Bob Harnar (also 7254), who played a key role in Sandia's quality assurance and reliability support for the RTG, was unable to attend the ceremony.

for May 6 at 6:30 a.m. It's a popular event, and registration is limited to 1000 people, so sign up early (people have been turned away the last few years). LAB NEWS has a fat flyer full of information, tips, and inspiring exhortations as well as an entry form (it costs \$6). Oh, yes, there's a 50-mile loop too. LAB NEWS office is in Bldg. 814, Rm. 1.

* * *

Square Dancing — S.E.R.P. is attempting to form a Square Dancing Association; the chief honcho is Ed Ehrman (2154) on 4-2816. Sub-honchos are John Lewin (6446) on 6-7881 and Marv Plugge (5211) on 4-5549. They're looking for all kinds of basic info — best day of the week to meet, whether lessons are desired, mainstream dancing (as opposed to dancing in the eddies), etc. Call any one of them if you're interested.

A BIGGER & BETTER MILKY WAY GALAXY

 Due to new research techniques, our picture of the Milky Way Galaxy has changed dramatically during the past few years. In 1973, the maximum radius of the Galaxy was about 20 kiloparsecs. The new radius is at least three times — and possibly five times — the earlier value. Whereas the mass of our 1973 Galaxy was 100 to 200 billion solar masses, newer evidence from the large rotational motions of galactic gas clouds and the motions of a dozen or so outlying globular clusters indicate a total mass of at least 600 billion solar masses, possibly even 1 to 2 trillion solar masses. We now recognize four major parts of our Galaxy: the *central bulge*, a flattened and spheroidal nucleus perhaps centered upon a black hole; the thin *disk* component, which contains stars, interstellar dust and gas, and the Sun and the Earth; the *spheroidal component*, formerly called the halo, which extends 25 kiloparsecs from the center and contains old stars; and the tenuous but very large (hence very massive), newly discovered *corona*, apparently *not* populated by stars, but the home of the "missing mass" of our Galaxy; its minimum radius is 60 kiloparsecs.

Bart Bok in *Astronomy*



RETIREE MAXINE STEPHENSON is among the first recipients of the Louise B. Olguin Award. Named after an outstanding New Mexico female labor leader, the award went to Maxine for her nearly 10 years as president of Local 251 of the Office of Professional Employees International Union. Maxine, who retired in January 1983 after 24 years of Sandia service, was chosen during a statewide competition.

Congratulations

Chris (6222) and Kris Cameron, a daughter, Joy Elizabeth, Jan. 23.

Liz Scott-Patterson (3153) and Paul Patterson, a daughter, Laurel Teresé, Jan. 22.

Mike (152) and Katherine McFadden, a son, Daniel Joseph, Jan. 6.

MILEPOSTS
LAB NEWS
FEBRUARY, 1984

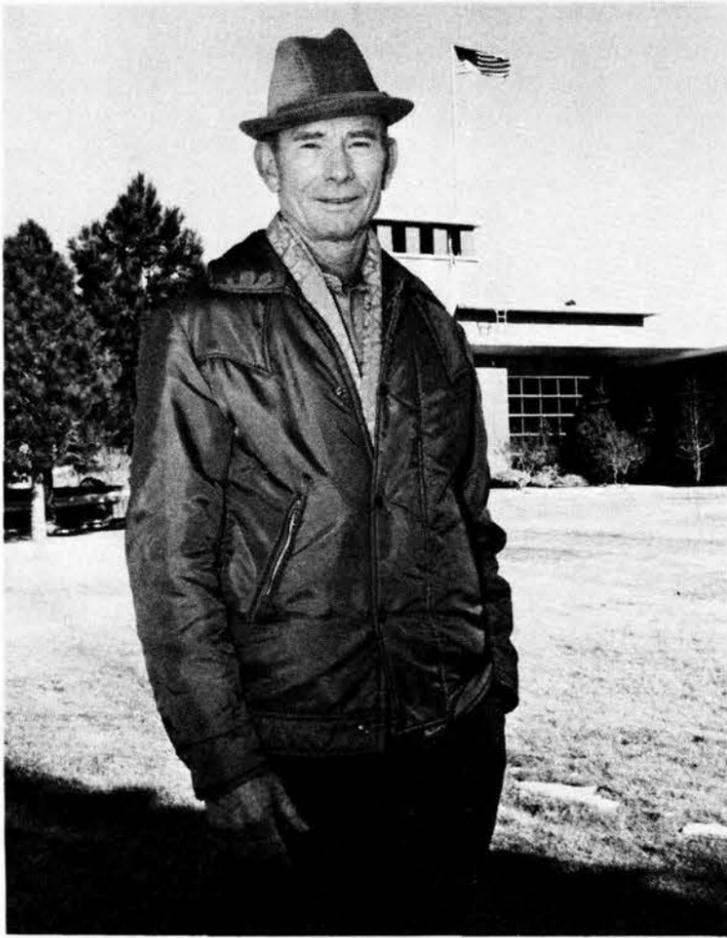


Rosalie Gallegos (3741) 35



Evelyn Pafford (2617)

20



Elwin Chestor (7262)

35



Mike Pendley (8335) 10



John Milloy (5219) 20



Lloyd Nelson (6427) 20



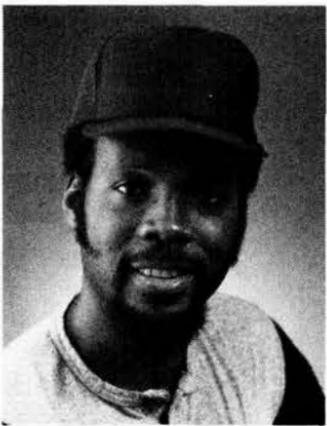
Leonard Morris (8413) 10



Claire Smith (7482) 15



Syl Grisby (8411) 25



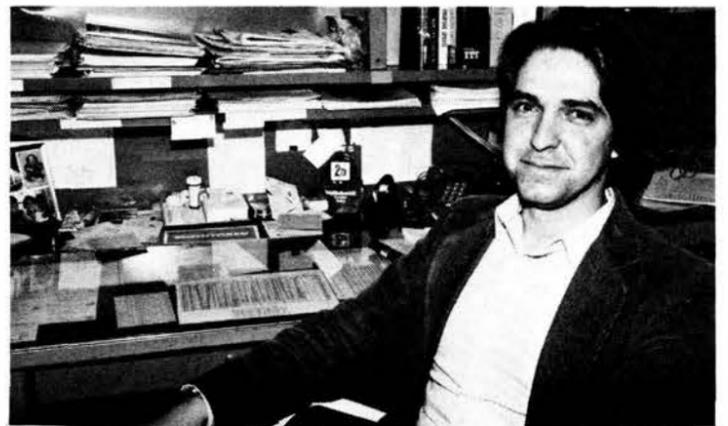
Fred Johnson (8414) 15



Frank Petrini (8414) 25

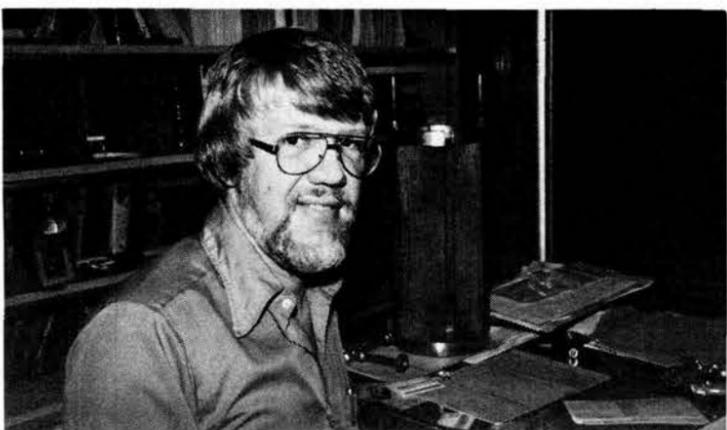


Henry Schoeppe (8461) 25



Robert Sanchez (2153)

10



Floyd Braaten (7473)

15



Al Bastion (8257) 25



Peter Johnson (1264) 10



Don Greenwoll (5249) 25

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Shirley Carson (8336) 15



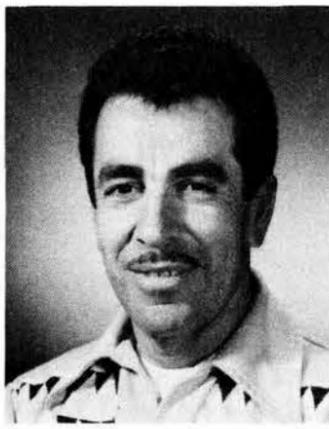
Walt Maupin (8255) 35



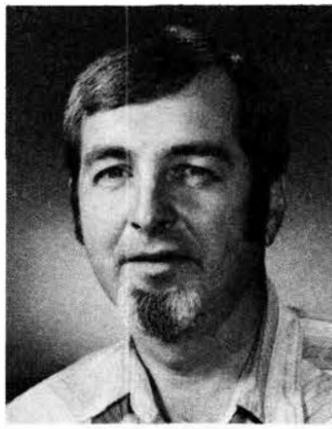
Dennis Arizumi (8441) 15



Marcie Samuelson (3417) 35



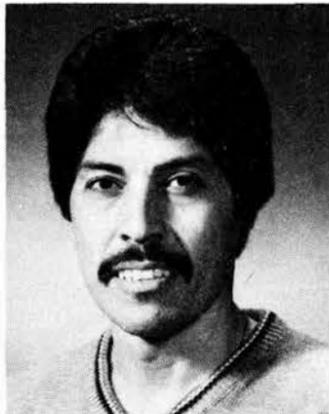
Ernie Vigil (3425) 20



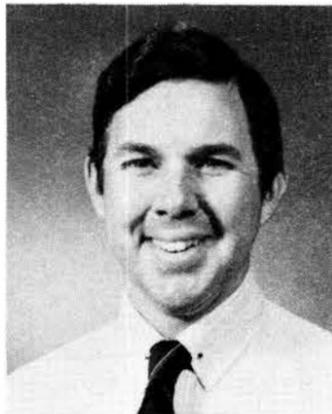
Bob Prew (2313) 20



Marshall Berman (6441) 15



Joe Santana (7651) 15



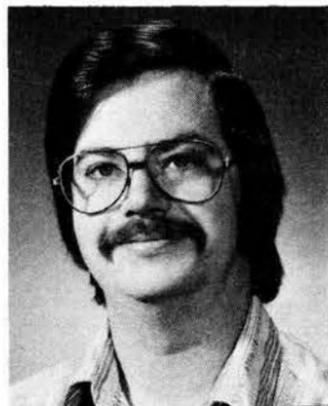
Charlie Field (2334) 15



Bill Wilson (8341) 15



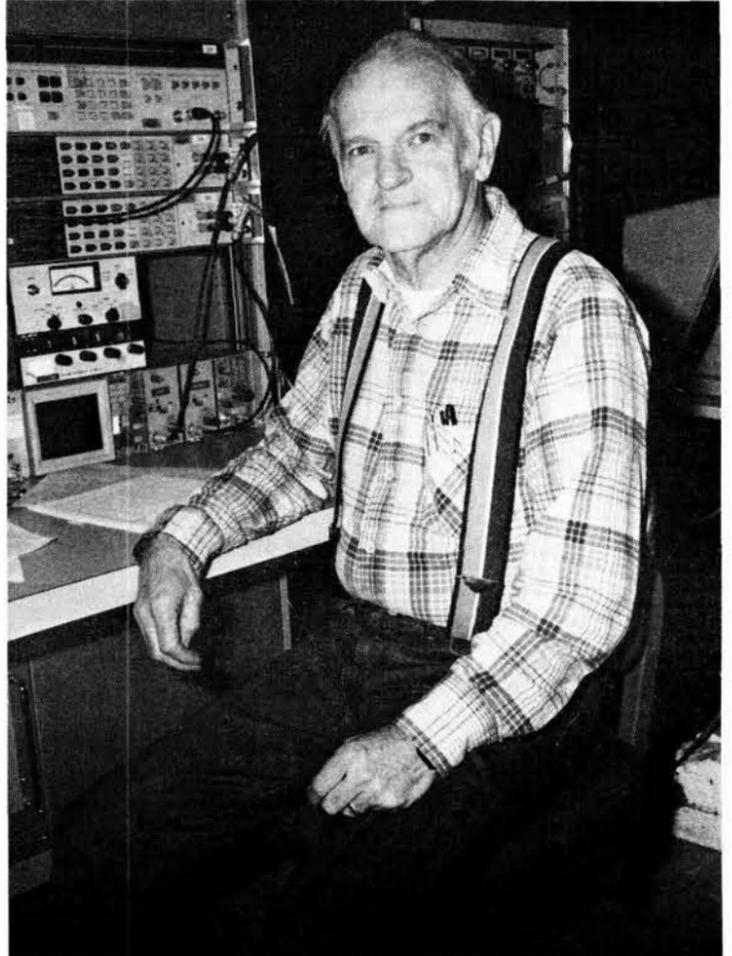
Jim Rego (8315) 25



Larry Dishman (1126) 10



Tom Barger (7234) 15



Ed Newman (7546) 35



Ruth Dillon (3615) 20



Hermenes Baca (3618) 20



Dave Waymire (7112) 10

Surgery Gets on the Nerves

In a recent talk entitled "A Biological Rubik's Cube," Dr. Luis de Medinaceli described his pioneering work in peripheral nerve repair or "cellular surgery." From Paris, France, de Medinaceli is currently a researcher at the National Institute of Mental Health and St. Elizabeth's Hospital in Washington, D.C.

De Medinaceli discussed the problems involved in reconnecting severed peripheral nerves. These nerves emanate from the central nervous system and lead to the various parts of the body; unlike the nerves in the central nervous system, peripheral nerves are repairable in the event of injury — if the severed ends can be reattached.

"A nerve is a bit like a telephone cable," says de Medinaceli. "It contains fascicles that in turn are filled with axons — a very long, single nerve cell that conducts impulses away from the cell body. A fascicle may contain from 3000 axons (in a rat nerve) up to 175,000 in the most complex human nerve."

Nerve cells are very small and extremely fragile, both physically and chemically. The problem is how to join the nerve stumps so that a good connection is made between the thousands of separated axons.

"To the naked eye, nerve endings that are sutured together may have a nice external appearance," explains de Medinaceli. "But the fascicles might still be misplaced. Even though we operate with a surgical optical microscope and use thread that's only 10 micrometers thick, it's still something like performing standard surgery with a saber."

The damaged or dead sections of a nerve have to be cut away before the severed axons and fascicles can be reconnected. De Medinaceli compared cutting a nerve to cutting spaghetti wrapped in paper with a garden shear — the spaghetti ends are crushed. Similarly, the nerve suffers crush damage when it is cut, even with a microscopic vibrating blade.

"To avoid this, I briefly freeze the nerve

with dry ice to minus 1.5°C before cutting," says de Medinaceli. "Then I can cut the nerve without crushing the ends."

He has also found a way to prevent chemical damage to the nerves, caused by the different chemical component of the medium outside the nerve. By soaking the nerves in PVA (polyvinylalcohol), swelling — the most common symptom of chemical burn of the nerve ends — can be prevented.

And when will these surgical techniques be available to reconnect severed limbs or perform other delicate operations?

"Not for a while yet," says de Medinaceli. "All experimentation so far has been done on rats. We cannot experiment on humans at this point — first these techniques must be tried on monkeys."

"Reconnection works on rats, but will it work on a higher species? I don't know, but believe me, I'm going to try."

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6. No commercial ads, please.
7. No more than two insertions of same ad.
8. Include name and organization.
9. Housing listed here for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

- BARRECRFTER Car top ski carrier, \$45; Fischer Europa 99 skis w/bindings, new, \$105; waxes & Klisters. Klett, 884-8354.
- DRESSER w/mirror, white provincial, 9-dwr.; 5-dwr. chest; twin headboards w/railings, \$350. Cleery, 898-2721 after 6.
- REG. 6-yr.-old Appy gelding; 6-yr.-old qtr. horse mare; 18-mo.-old qtr. horse gelding. Baker, 294-3334.
- TWO Advance automatic floor scrubbing machines, 26". Lovato, 247-3815.
- HEATILATOR fp w/10' of stove pipe, rain drip cover, other misc. items, never used, \$225 OBO. Kolb, 822-1918.
- FIREPLACE Grate w/thermostat-controlled blower; trim, glass doors, used 2 seasons. \$50. Hufnagel, 294-5949.
- TELEPHOTO lens, Canon FD 200mm, 1:4 S.S.C., \$80 Gray, 265-1883.
- DISHWASHER, Sears 3-cycle Power Miser, copper-tone, all functions work, model 587771203, \$50. Rainhart, 821-3690.
- PIMENTEL guitar & case, \$150; Virtuoso accordion, full 120 bass, two shifts, \$100. Smith, 299-6873.
- BASSETT bookcase, avocado, 30" w X 72" h X 14" d w/dbl. doors & shelf on bottom, adjustable shelves; Deacon bench, avocado, 42" l X 17" h X 16" d, w/back to 29" from floor, Michele, 298-8576.
- X-C skis, "Bonna" w/mica bottoms, no bindings, 215 cm, \$30. Baxter, 344-7601.
- S/W, M686.6", red ramp, white outline, \$275; M19.6", target trigger, target hammer, \$245, both new. Kureczko, 298-1577.

LIZARD/TURTLE cage w/light, timer, heating pad, rocks, water tank; 40" X 18" X 28", glass front, \$35. Nimick, 296-0196.

ANTIQUA Duncan Phyfe sofa, newly covered in velvet; velvet covered chair, wood refinished, make offer. Rex, 822-0450.

SQUARE dancing pettipants & pettislip, white, worn 4 times, \$25 for both. Mangan, 255-0197 after 5.

CAMPER Shell for short wide pickup, sliding front window, boat racks, \$250. Zamora, 294-3737.

2 GE HELP CBs: 40 channel CB radios, including antenna & papers, used 1 week, \$50 ea. Spletzer, 294-4601.

SOFA & matching loveseat; lamps, 2 end tables; matching coffee table; kitchen set; less than one yr. old. Mackey, 294-3837.

CHANDELIER, modern, wood, glass & brass, for dining room, best offer. Rabinowitz, 266-2957.

TI 59 programmable calculator & PC-100A printer, complete w/manuals, thermal tape & unused magnetic cards. Hernandez, 883-8498.

TREADMILL, Sears, has speedometer & timer, \$55. Russell, 292-3279 after 7.

CLARINET, Yamaha student model w/case, \$250. Ewing, 268-6920.

10" Star diamond vibrating lap, polish flat surface on cut rocks, \$35. Henry, 266-6467.

CAMPER, 9 1/2' Mitchell, monomatic toilet, furnace, range, oven, Mitchell loader, \$2695. Stronach, 294-5271.

LARGE desk, 7 drawers include 2 file drawers w/dividers, all wood w/glass top. Shortencarier, 292-3575.

TRAVERSE RODS: 3 pr. w/undercurtain & valance, 66"-108", \$15 ea.; 3 pr. w/undercurtain, 60"-84", \$12 ea.; 3 pr. pleated sheer curtains, 72" X 84"L, natural color, \$12 pr. Armstrong, 296-7808.

TWO bunk bed mattress sets, \$95; Hermez manual adding machine, \$75. Ripi, 293-6067.

GAS unit heater w/thermostat/fan, 40K BTU, suitable for garage, \$175. Lipkin, 881-6038.

MOUNTAINEERING boots, men's 9 1/2 Meindl's, leather, nearly new vibram soles, \$65. Drumheller, 281-3127.

CRAFTSMAN router, 1 hp, \$25. Hall, 298-8617.

STEREO tape deck, 10 1/2" reel-to-reel, Pioneer RT1011L w/l new Maxell UD tape, \$285. Turner, 292-6819.

GAS furnace, Bryant, 116,000 BTU, updraft, all controls, new blower motor, all duct work, \$60. Stamm, 255-2640.

COLONIAL buffet, 33" high X 43" long X 18" deep, \$130; 4 matching mates chairs, \$15 ea. Purcell,

296-4986.

TWO captain's beds w/built-in drawers & end desk w/accordion fold-down top; Sears gas dryer; GE port. dishwasher, yellow w/cutting board top. Miles, 293-4386.

GE 13" B & W TV, \$40; rocking chair, canvas & chrome, w/headrest, \$30; 1980 Oldsmobile body & chassis service manuals, set \$15. Paul, 299-6387.

DINETTE set, formica top, bright yellow seats, \$300; trundle bed, wooden headboard, \$100. Sons, 294-3953.

KENMORE port. dishwasher, \$50 OBO; lg. GE color console TV, needs tubes, \$35. Shaw, 299-8524.

45-PC. antique gold edge Noritaki china, dishwasher proof, \$200; 52-pc. Franciscan ware, rose pattern, \$150. Shively, 867-5439.

POWERMATIC 14" table saw, 3 HP single phase, \$2300 OBO; 2-spd. 14" band saw, \$350. Davie, 296-3950.

SKI PANTS, women's size 8, blue fabric overalls, never worn, \$30. Van-Thorre, 883-3066 after 5.

4 GLASS Belted tires, P225-75R15, used 100 miles, \$150; 2 chairs, \$40; bar stools, \$5 ea.; coffee table, \$50. Chavez, 268-2598.

ENGLISH Setters, male, pup 8 wks, \$125; field-proven 4-yr.-old, \$200; papers. Maciolek, 877-6858.

GUNS: S & W .357 Mag. Mod. 27, \$450; S & W K-22 Mod. 17, \$300; Colt .22 cal., Diamondback, \$325. Luther, 293-4462.

TRANSPORTATION

'78 SUZUKI RM100, \$550. Warren, 256-1334 between 11 a.m. & 3 p.m.

'72 OLDS Cutlass: rebuilt engine, distributor, carb.; Diehard battery, sb radials, recently painted, \$1900 negotiable. Heschke, 294-3298.

'77 TRIUMPH Spitfire convertible, low mileage, FM stereo cassette, red, \$3300. Zurawski, 268-9511, 884-3862.

SCHWINN 10-spd. 1976 LeTour, 27", \$130 OBO. Georg, 266-3203.

'79 VW Rabbit, 2-dr. hatchback, 35-40 mpg, front-wheel drive, \$2650. Ward, 821-1383.

'81 FORD pickup, F-100, V8-302, AM-FM cassette, custom wheels, new snow tires, w/camper shell, \$5500. Beazley, 255-5652.

'81 CUTLASS Supreme, AM/FM, AC, cruise control, vinyl roof, tilt steering wheel, V8, 260 engine, \$5200 OBO. Thomas, 242-8532.

'76 CHEVY Luv pickup, 4-cyl., 4-spd., Sony AM-FM-cassette, \$2500. Logue, 292-1933.

'77 KAWASAKI KZ750, custom seat, low mileage, \$1400. Rich, 344-2354 8-5, 897-0491 after 5.

'83 HONDA GL650 Silverwing, 2100 miles, Vetter Windstar fairing, engine guards, lg. travel trunk, warranty, \$2800. Barnard, 831-4114.

'79 KAWASAKI KZ750 Twin, 12K miles, \$1000 or trade for truck or car. Roeschke, 298-0365.

'81 280ZX, fully loaded, new tires, extras, \$5300 equity & take over payments. Jaramillo, 1-864-8039 or 864-8491.

GOLDWING Interstate, fully equipped, AM-FM, CB, cassette, intercom, instrument panel, new tires, 4-yr. warranty, \$3800. Savage, 299-7130.

'78 YAMAHA YZ-250, dirt bike, accessories, \$595. Dourte, 881-2494.

TWO BMX bicycles, Schwinn Phantom Scramblers: 1 w/mag wheels, \$80; 1 w/spoke wheels, \$70. Wright, 296-3850.

'78 CHEVROLET Monza stn. wgn., std. shift, \$2000 book, sell for \$1500 OBO. Purcell, 296-4986.

'31 FORD Tudor Model A, restored, many accessories, all original steel, drives at 50 mph, \$10K. Boehmke, Livermore (415) 447-6670.

'72 TRIUMPH 650 Bonneville motorcycle, completely rebuilt & customized, \$1900 OBO; '65 Dream Honda 250cc, \$100. Gonzales, 344-4933.

'77 CUTLASS SUPREME, 2-dr., 63K miles, \$3000. Younge, 298-8079 after 5.

'74 MUSTANG II fastback 2+2, new paint, complete new interior, V6 4-spd., PS, PB, sport wheels, \$2450. Banach, 836-6477.

'70 PLYMOUTH Duster, 6-cyl., 3-spd., \$1000. Gonzales, 265-9031.

'73 FORD pickup, F-250 Camper Special, V8, 4-spd., AC, PS, PB, \$2200 OBO. Workhoven, 281-3246.

'77 FORD 1-ton pickup, AT, PS, PB, King cab, long bed, Reese hitch, HD radiator, \$3900. Smith, 255-5662.

'68 FORD pickup, \$950. Gardner, Moriarty 1-832-6181.

'68 CUTLASS Supreme, 2-dr., AT, AC, AM-FM, new trans., rebuilt carburetor, 2 new tires. Eldredge, 881-4528.

REAL ESTATE

3-BDR, 1 1/2 bath, LR, 20 x 20 den w/fp, on fenced 1/2 acre, near Los Lunas, 25 mins. from Albuquerque, mid 70s. Richards, 865-7158.

9 ACRES w/telephone & electricity, near Estancia, \$15K at 10% interest & 10% down payment. Thomas, 256-1921.

ASSUMABLE loan, NE, 3-bdr., 1 1/2 bath, atrium, sunken den w/fp,

garage, \$65,900. Sorroche, 299-3075.

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

ASSUMABLE 7 3/4% loan, NW, 3-bdr., 1 1/2 bath, 1200 sq. ft., oversize garage, energy pkg., almost new, low 50s. Summers, 867-2752.

10 ACRES, 7 miles south of Belen, electricity & telephone, trade/sell, terms. Ripi, 293-6067.

SW near Rio Grande HS, 3-bdr. house, 1500 sq. ft., oversized lot, carport & storage bldg., \$55,900. Reich, 877-2846.

WANTED

WAR TIME VETS to join D.A.V. Chapter 33. Hernandez, 766-3469, 766-3485 or Garcia, 266-6596.

ROOMMATE to share 2-bdr., 2-bath apt., Adams & Candelaria, \$225/mo. + 1/2 utilities. Burns, 881-4159.

CARPET rake; fireset tools, antique brass-finished poker, brush, shovel, log tongs & stand; white sheer curtains, 50" wide X 84" long. Hitchcock, 294-4591.

National Geographic Nov. 1942 and Dec. 1975, buy or borrow. Baxter, 344-7601.

COMPUTERS, VCRs, video games, need old or broken items for parts & repair. McConnell, 268-3109 (leave message).

GOOD quality and good condition exercise bike; over-the-table hanging lamp; large table lamp. Hymer, 293-6029.

CAPTAIN'S BED w/4 drawers. Farnsworth, 865-6160.

INNERTUBES for winter fun; tire chains to fit P195/75R14 tires. McKay, 821-1950.

ROOMMATE to share 3 bdr. house near Juan Tabo & Lomas, fp, garage, fenced yard, non-smoker. Anderson, 292-5676.

NICE brass-finished fireplace screen & fp tool set. Shaw, 299-8524.

RECORDING of the Black Mountain Rag record — 45 rpm or album. O'Neil, 892-6754.

SHARE-A-RIDE

ONE or two car pool members from vicinity 4th & Chavez to East side Area I. Folkins, 345-2801.

WORK WANTED

TUTOR/teach, can upgrade reading levels of low achievers; English grammar, reading, writing & speech. Also edit theses. Allison, 883-1382.

Poor Boys Tonight, 'Dumbo' Tomorrow

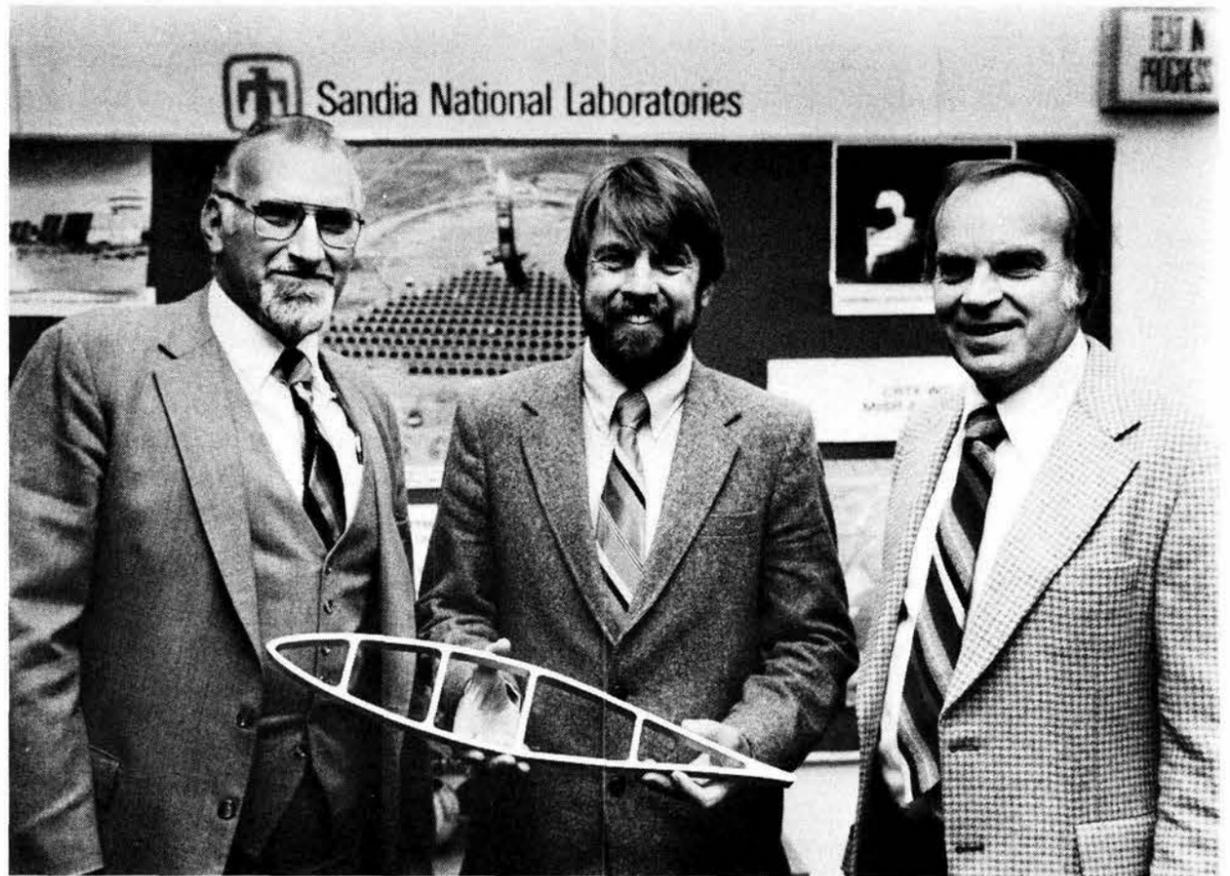
TONIGHT at Happy Hour, the Isleta Poor Boys return (by popular request) to the Club bandstand to play country and western music in a style everyone enjoys. The dining room is serving a buffet tonight or you can order from the Club's standard menu. Dining hours are from 6 to 8:30. Happy Hour prices are in effect from 4:30 until 8:30 when the music starts. Karen Edwards instructs free western dance lessons from 7:30 until 8:30. Next Friday, Feb. 10, Happy Hour features the swinging variety music of Red Wine.

TOMORROW is Variety Night for families and kids, and kids should enjoy the magic show of Don Marchi (2512) — he mystifies adults, too. The movie is Walt Disney's classic animated film, *Dumbo*, a flying elephant. Admission is free to members and families. Food service is available at 5 p.m.; the entertainment starts at 6.



Don Marchi

IN HONOR of St. Valentine's Day, the Club has scheduled a champagne brunch on Sunday, Feb. 12, from 11 a.m. to 3 p.m. The menu features whole salmon, carved roast beef, carved Virginia ham, spaghetti with clam sauce, scalloped potatoes, assorted pastries, and assorted fresh fruit. Guitarist Paul James Vuchetich will play back-



SOME 50 RESEARCHERS in vertical axis wind turbines attended the fourth annual Sandia-sponsored VAWT Aerodynamics Seminar recently. Here are Louis Divone (left), director of DOE's Solar Electric Technologies, Conservation and Renewable Energy Division; Paul Klimas (center), seminar chairman; and Emil Kadlec (both 6225), Sandia VAWT project leader, with a cross-section of a new aerodynamic VAWT blade design.

ground music. The price is \$5.95 for adults, \$3.95 for children under 12. For reservations call 265-6791.

ON THURSDAYS, try manager Mitch Griffin's fantastic fresh seafood flown in special for the occasion. Mitch calls his hometown contacts back in New England early in the week and finds out how the catch is going and what the best buys are and proceeds from there. He gets the best and brings it to you on Thursdays. Dinner tab is \$7.25 for adults, \$4.25 for kids under 12, and it's the best deal in town. Don't take our word for it, ask someone who was there last night. By the way, Visa and Mastercard are accepted for dining room tabs of \$10 or more.

KIDDIE KARNIVAL, an annual event at the Club, is scheduled this year on Saturday, Feb. 18. Ronald McDonald presents a magic show, door prizes will be awarded, and the ballroom will be set up with game booths offering fun and challenges. Eight game tickets sell for \$1.25 (and a portion is donated to the Ronald McDonald House). Included are a coke and popcorn. Doors open at 10 a.m., the magic show is set for 1:30, and super sandwiches will be available throughout the event.

CORONADO SKI CLUB meets Thursday, Feb. 21 for "Ski New Mexico" night. Speaker is Carol Hill of the Ski New Mexico organization. As usual, there will be door prizes and low-cost refreshments. The Ski Club has four trips scheduled in February. The Telluride and Crested Butte trips are full, but the one-day Taos trip on Saturday, Feb. 25, and the weekend Monarch trip on Feb. 25-26 still have openings.

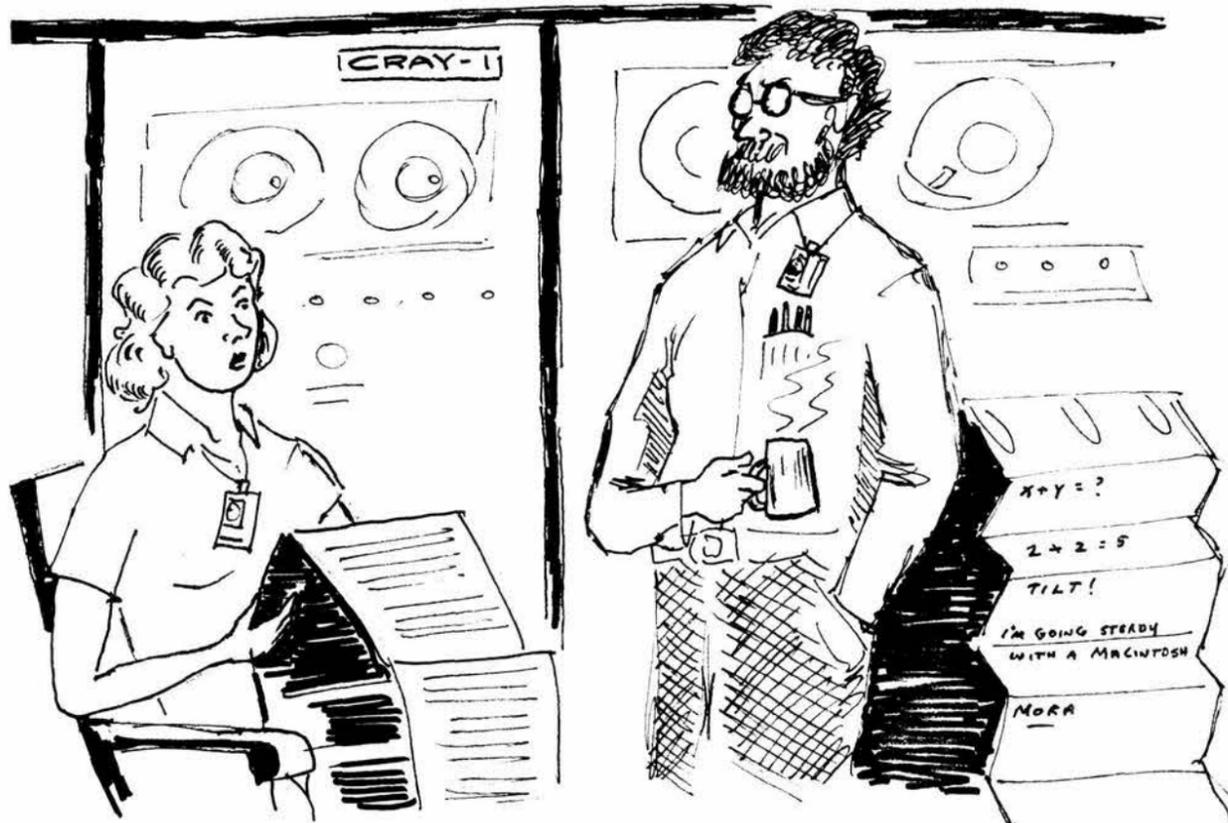
TRAVEL — Reserve your spot now for the Louisiana Exposition in New Orleans May 25-29. The package includes airfare, four nights at the New Orleans Marriott, two days admission to the fair, a sightseeing tour of New Orleans, dinner at the Andrew Jackson restaurant, and a riverboat ride. The price is \$562 per person. See Charlie Clendenin (2611) in the lobby tonight at the travel desk.

CONFUSED SILENCE



I vividly recall driving three remarkably quiet children through the Sussex countryside some years ago. They had been shocked into silence by a notice at the side of the road that read: "Oven-ready chickens and Shetland ponies."

— Letter to *The Times* (London), quoted in *World Press Review*



"Y'know, I don't like this 'synthetic acceleration' stuff. I think we should go for the real thing."