

Symposium Spreads Word On Insulin Pump

"Highly successful" is the way Gary Carlson (Command and Control Division 2335) describes the Insulin Delivery System Technology Transfer Seminar held here Oct. 27.

Sandia invited representatives from the medical devices industry to learn about the insulin pump developed jointly by Sandia and UNM (LAB NEWS, March 6, 1981). The all-day seminar was well attended, with 50 engineers and executives from 30 companies in attendance.

"One of Sandia's functions is to facilitate transfer of technology to industry," explains Gary, "and the Insulin Delivery System project falls into that category. Diverse Sandia technology has gone into the development of the insulin pump—for instance, the electronic controls and the rotary solenoid-driven pump were adapted from weapons work, and the batteries were originally evaluated for other Sandia projects.

"We're well into the job of technology transfer—besides this seminar, there have been 32 articles published on the insulin pump by Sandia and UNM. We've also been awarded a three-year National

[Continued on Page Four]



PHILIP EATON, MD, of UNM Medical School addresses the Insulin Delivery System Technology Transfer Seminar. In the inset, Gary Carlson (2335), on the left, describes the display on the Sandia/UNM insulin pump project to William Swift (center) from Irvine, Calif., and Curtis Holmes from Clarence, N.Y.—two representatives from the medical devices industry.



LAB NEWS

VOL. 33, NO. 23

NOVEMBER 13, 1981

SANDIA NATIONAL LABORATORIES • ALBUQUERQUE NEW MEXICO • LIVERMORE CALIFORNIA • TONOPAH NEVADA

New Instrument Gives Unique View of Organic Molecules



JOHN PANITZ (5114) places a field emitter tip—a very small hemispherical point—in the microscope he designed. Organic molecules have been placed on the tip and three-dimensional images will be made of them.

Field-Desorption Tomography: a new kind of microscopy for imaging extremely small organic molecules.

Developed by John Panitz of Surface Physics Division 5114, field-desorption tomography (coined from the Greek *tomos*, "slice," and *graphikos*, "picture") uses a high electric field to produce contour-slice images of a molecule. From a succession of these images, a three-dimensional picture of the molecule's shape can be obtained.

John explains that only a few techniques are available to help determine the shape of an organic molecule—a problem of considerable interest to chemists and biologists. In the transmission electron microscope, an organic molecule has to be stained with a heavy metal to be made visible. Since organic molecules are made of hydrogen, carbon, and other elements with low atomic numbers, only the heavy metal shell is actually seen. X-ray crystallography is another technique for examining the shape of organic molecules, but there have to be enough molecules to

[Continued on Page Three]

Events Calendar

- Nov. 13-15—Annual Southwestern Arts & Crafts Fair, Agricultural Bldg., State Fairgrounds.
- Nov. 15—Fine Arts Music Series: "The Ragtime Years"—Max Morath, pianist, singer & comedian presents a tour of turn-of-the-century America, 4 p.m., First United Methodist Church, 4th & Lead SW.
- Nov. 18—Film, "Skiing Round the World," 7:30 p.m., Popejoy.
- Nov. 19-Dec. 20—La Compañía de Teatro de Albuquerque, "Nuevo Méjico, Sí!" Tiffany Play House, 3211 Central NE, 8 p.m.
- Nov. 19-22—Indian National Finals Rodeo & Powwow, 19, 20: 8 p.m., 21: 2 & 8 p.m., 22: 2 p.m., Tingley Coliseum, State Fairgrounds.
- Nov. 19-22*—"The Shadow Box," Vortex Theatre, 8 p.m., *2:30 p.m., 247-8600.
- Nov. 20-21—NM Symphony Orchestra, 50th Anniversary Concert, Popejoy, 8:15 p.m.
- Nov. 27-29—The Nutcracker Ballet, Oakland Ballet Co. with NM Symphony Orchestra, 27-28: 7:30 p.m., 29: 2 & 7:30 p.m., Popejoy, 842-8565.
- Late Nov.—Snowshoe Hikes in Cibola National Forest (make reservations for hikes scheduled for mid-Jan. through mid-March). Call Sandia Ranger Station, 281-3304.
- Dec. 2—UNM Orchestra & Chorus, Christmas Program, 8:15 p.m., Popejoy.
- Dec. 3-5—Christmas Craft Fair, Ballroom, Student Union Bldg., UNM, 277-2331.

Speakers

J. L. Jackson (4724), "An Assessment of the Feasibility of Widespread Photovoltaic Retrofits," UMR-DNR Conference on Energy, University of Missouri, Nov. 4, Rolla, Mo.

D. P. Miller (1223), "Human Reliability Analysis," workshop presentation, Human Factors Society annual meeting, Oct. 12, Rochester, NY.



NEW SUPERVISORS: Raye Knoff (2413-2) and Ben Johnson (1314).

Supervisory Appointments

RAYE KNOFF to supervisor of Design Definition Support Section 2431-2, effective Nov. 1.

Raye has been with the Design Definition group since coming to Sandia in July 1953 as a document clerk. She has been a senior clerk since 1963, providing services for engineers and the drafting organization. She worked for a large firm in Chicago before moving to Albuquerque.

Raye and her husband Sterling enjoy camping and fishing.

* * *

BEN JOHNSON to supervisor of Systems

Research Division 1314, effective Oct. 16.

Since joining the Labs five years ago, Ben has worked in the Systems Research Department on communications and on nuclear weapon effects and testing.

He earned a BS in EE from the University of Texas at Austin, an MS from M.I.T. in aero and astro engineering, and his PhD in aerospace engineering from the University of Michigan.

Ben served in the U.S. Air Force for 20 years before coming to Sandia. His hobbies include amateur radio operation and jogging. Ben and his wife have three sons and live in the SE heights.

Chimp Monkeys Around With Language

The facility with which Dr. Doolittle talked with our animal brethren has eluded real-life investigators seeking a similar exchange. Specifically, apes—chimpanzees and gorillas primarily—seem incapable of creating a sentence. This is the conclusion expressed at a recent colloquium by Herbert Terrace of Columbia University.

Terrace experimented for about three years with a chimpanzee, trying to teach it sign language. Taking an infant chimp and naming it "Nim Chimpsky," Terrace and his assistants raised it as a human child. "From 1974 to 1977, Nim was diapered, toilet-trained, dressed, and sent to nursery school where he looked at pretty pictures," he says.

Earlier experiments attempted to teach chimps to speak. This was the objective in Russia during the 1920s where a male chimpanzee was raised with a family. In a later effort in the United States, the trainers claimed their chimp learned to enunciate four words—"up," "down," "momma," and "poppa."

But Terrace points out that an ape's vocal track is different from a human's—

apes do not have the physical apparatus to produce human sounds. So the next step was to teach an ape to use human language in a nonverbal manner, which is what Terrace set out to do.

During a four-week period, Nim was taught 125 signs of American Sign Language. Terrace analyzed 19,000 of the chimp's utterances for syntactic and semantic patterns in two-sign combinations. Although some regularities were discerned, suggesting the ape was using grammatical rules, later videotape analyses invalidated that conclusion. The films showed that most of Nim's "speech" was prompted by his teacher's prior utterance. Terrace concludes that the occurrence of an arbitrary sequence learned by rote does not denote language.

When Nim reached adulthood and, as chimps are wont to do, grew bigger and stronger, he was returned to an Oklahoma zoo where he lives on an artificial island with other chimpanzees. He does remember some signs and presumably uses them on human visitors to entice a banana or some other treat from them.

Now, about Bonzo . . .

LAB NEWS

Published every other Friday

SANDIA NATIONAL LABORATORIES

An Equal Opportunity Employer

ALBUQUERQUE, NEW MEXICO
LIVERMORE, CALIFORNIA
TONOPA, NEVADA
Editorial offices in Albuquerque, N.M.
Area 505 844-1053

FTS 844-1053
ZIP 87185

In Livermore Area 415 422-2447
FTS 532-2447

john shunny is editor
&
don graham ass't. editor

carl mora & norma taylor write
louis erne does picture work
aided by gerse martinez

barry schrader reports livermore.

Continued from Page One

New View of Organic Molecules

form a crystal. Isolated molecule-metal interactions cannot be examined using this method.

"Our new technique—field-desorption tomography—examines isolated and unstained molecules on metal surfaces," explains John. "This capability sets it apart from all other microscopies. We begin by placing a molecule on a field-emitter tip. This is a very small hemispherical point whose surface has been prepared by chemical polishing. The tip acts as a point source of ions which are created on its surface when a voltage is applied. These ions are then projected from the surface to create a highly magnified image of the molecule."

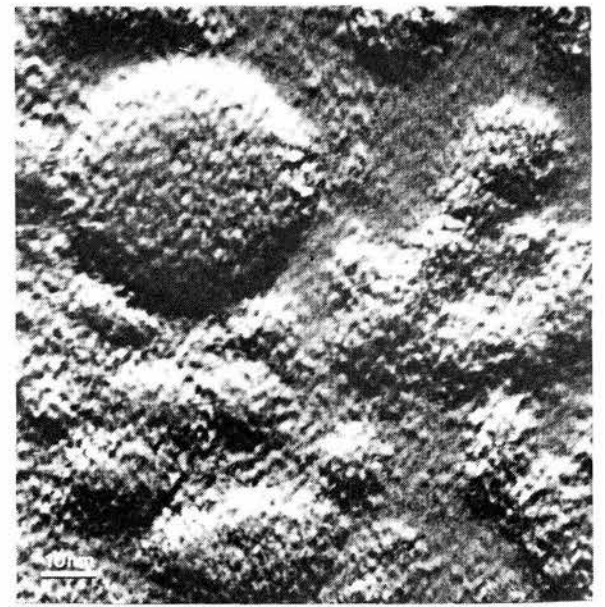
John surrounds the molecule at cryogenic temperatures within a layer of benzene which he condenses onto the tip. He calls the layer a "blanket gas" since it completely covers the much larger organic molecule he wishes to image. As the voltage on the tip is increased, the blanket gas layer is ionized and gradually removed, much like the skin of an onion is peeled away, layer by layer. This process, called "field-desorption," eventually exposes the organic molecule imbedded in the blanket gas layer.

"There's relatively little contrast in the image until a molecule is exposed," says John. "Then a dark region appears which reflects the shape of the molecule at a given height above the tip surface. As more benzene is removed, more of the molecule is observed."

By digitizing and combining a series of images, John obtains a three-dimensional picture of the molecule. The ability to obtain three-dimensional information about a molecule on a metal surface is a unique feature of John's microscope.

"We've spent a great deal of time examining one particular molecule called ferritin," says John. "Ferritin is almost spherical in shape. It's a protein found in the body, which has the important function of storing iron in the liver and spleen. Ferritin was chosen for the first test of our

microscope because it's stable, has a well-defined shape and size, and contains iron so that it's also visible in the transmission electron microscope. The ability to see ferritin in the transmission electron microscope means that we can observe its distribution on our field emitter tips." In fact, John's electron microscope pictures of



A THREE-DIMENSIONAL reconstruction of ferritin molecule clusters assembled from contour-slice images taken through the field-desorption tomographic microscope. A description of John's technique will soon appear in *The Journal of Microscopy*, and one of his images will appear on the magazine's cover.

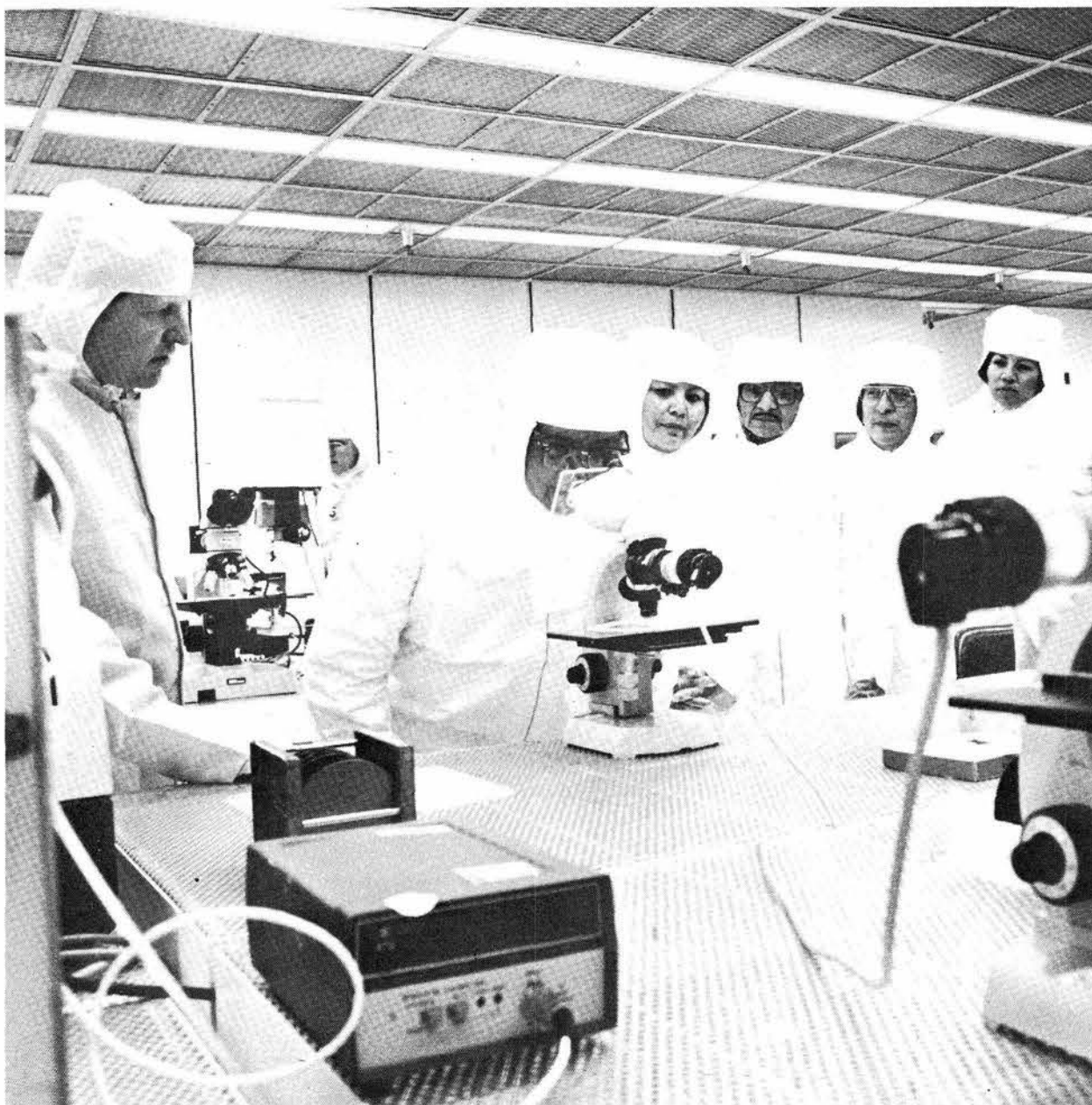
ferritin were so striking that one was selected for the cover of a recent issue of *Ultramicroscopy*.

The method developed by John to place very small molecules like ferritin on the surface of the emitter tip is quite simple. "First, the field emitter tip is placed in a beaker," explains John. "Then we add water and a solution which deposits a few molecules on all exposed surfaces including the tip. To stop the deposition, we place the tip in pure water, then in the ultra-high vacuum of our microscope."

John's microscope is also unusual in that it may be used to determine the mass of individual molecules. A voltage high enough to remove a molecule from the surface is applied to the tip. A spectrometer coupled to the microscope makes the identification. Although John originally used this technique (patented by DOE) to identify small molecules such as hydrogen on metals, he has not yet applied it to many large organic species.

A great deal of John's work depends on Gerry Fowler's (5114) unique skills. "Gerry does fantastic technical support work," he says. John also pays tribute to Dennis Ghiglia (2644), whose image-processing facility has greatly extended the capabilities of John's microscope; and to Ivar Giaever (GE's R&D Center in Schenectady, New York) who won a Nobel prize for his work in superconductivity. John's molecular imaging project began in 1976 after a colloquium Ivar gave at Sandia. "We talked about the possibility of imaging organic molecules," says John, "and have been collaborating ever since."

Sandia's field-desorption tomographic microscope appears to hold great promise for characterizing the organic molecule-metal interface and the structure of polymers (small, organic molecules that have combined to form larger structures). John's work has generated considerable interest because of its potential to observe different kinds of molecules more clearly than ever before.



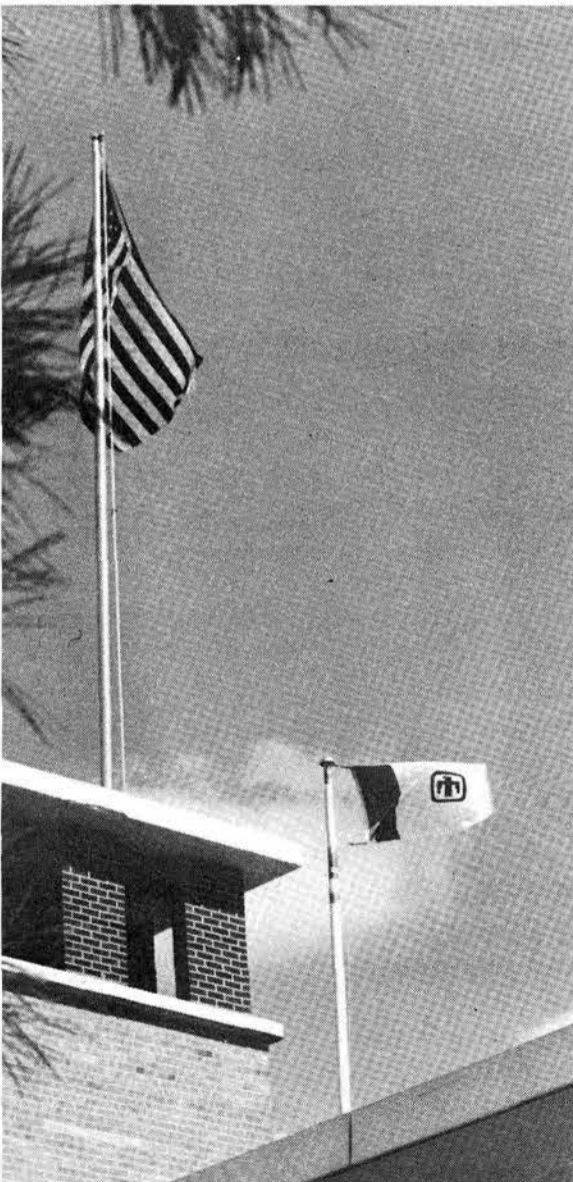
FROM ZUNI PUEBLO came tribal officials to learn of employment and training opportunities at Sandia and to see some Labs facilities. Here Charles Gibbon, manager of Semiconductor Technology Dept. 2140 (at left) explains the intricacies of wafer fabrication to the four officials. At right, accompanying the tour is Mary Tang (3521) who works with the American Indian Outreach Committee at the Labs.

Continued from Page One

Insulin Pump Symposium

Institutes of Health grant to develop an advanced system. Until recently, Sandia and UNM have been the major organizations in the business—but private industry is now becoming interested. That's why we invited potential manufacturers of the insulin pump to this seminar—to supply them with what we know in order to encourage their development programs. We'd like the implantable insulin delivery system to be available for diabetic health care as soon as possible. Our physician colleagues believe it will give a dramatic improvement over conventional insulin therapy."

Among the speakers were Dr. Philip Eaton of UNM Medical School, the principal medical investigator on the insulin pump project; Gene Reed (2000), Ed Barsis (2330), Ray Bair (2120), Gary Carlson (2335), Ruben Urenda (2542), and Jerry Love (2335). Special guests were Bill Spencer from Xerox, who began the project at Sandia six years ago; Monte Patterson, the implant recipient who's been using the insulin pump for nine months; and Dr. Sterling Edwards from UNM, the implant surgeon.



SANDIA'S CORPORATE FLAG was raised on a separate flagpole over the Bldg. 800 entrance in February 1976. The suggestion to use a flag as another means of Sandia identification came from an employee through the Feedback program. Designed by the Technical Art Division, the flag features a blue thunderbird emblem on a field of white. Flags are sent on request to remote locations by the Public Information Department 3160.



MAKERS OF GRAND PIANOS followed the market in the early 1900s by adapting their instrument to use the sophisticated reproducing player mechanism. Howard Sander (2121) has just loaded a music roll into his 1925 Kanabe-Ampico player grand and can now listen to a high fidelity performance by a concert pianist.

Howard Sander Restores Player Pianos

Ask Howard Sander (2121) what he's going to do when he retires and he'll tell you, "The same thing I've been doing for the past 20 years—restoring player pianos and antique cars."

Howard and his wife Florence are collectors of antiques—a few very small, like Florence's collection of beaded purses, vintage 1900, and of hat pins; but mostly, very large, like Howard's antique cars or any of his 18 player pianos.

"I like wood, and I like mass, and I also like intricate mechanisms," Howard says. "I guess I've been interested in restoring old things since I worked with my dad in his locksmith business."

Howard bought his first player piano in 1959. "I wanted the old rinky-tink tone and I found a 1917 version that needed complete restoration. The project soon became a family affair and one piano led to another and another. Any old player piano purchased today would be at least 50 years old and inside that box are worn parts and many hours of tedious work—88 little bellows, deteriorated rubberized fabric, embrittled leather valves, diaphragms, and corroded brass, all in need of total restoration."

Howard has restored four uprights, both electric and foot pump types, and has helped several dozen friends find and restore player pianos. In addition, he's restored two player grand pianos. Called reproducing pianos, these instruments are little known today. Their expense meant ownership only by the wealthy, and they were produced in small quantities from 1910 through 1930. The upright player piano produces its characteristic mechanical sound because all the notes are struck with the same intensity. The reproducing player grand piano, intended primarily for classical music, replays the music exactly as recorded by the artist, imparting that artist's particular interpretation, expression and nuances of performance.

So, it's possible today to insert a paper music roll into a player grand piano and listen to an exact reproduction of a renowned concert pianist such as Jan Paderewski or Edward Grieg.

"The player action in a reproducing piano is about four times as complicated as that of the uprights," Howard says, "and, of course, takes longer to restore." Howard's pianos are stored in various locations. He has two uprights in his den, a player grand in his living room, and two more player grands in the garage where he works on them from time to time.

Player pianos were the family's home entertainment center from about 1898 until 1930, when the phonograph and the radio became popular. Lyrics were printed on the music rolls and it was common for family and friends to gather around the piano and sing along. Howard asks that his guests sing along and the choice of music is a big part of the fun. His collection of music rolls exceeds 2000.

"The popularity of the player piano is on the upswing," he says. "Music rolls are available and inexpensive; producers are re-cutting old rolls as well as cutting rolls of modern music."

"A player piano is a functional antique," Howard says, "and I equate them to antique cars—some cost more to repair than they're worth but if you get a good one to start on you can end up with an absolute treasure."



A woman bootlegger in India who trained monkeys to attack police and strip off their clothes when they raided her illegal brewery was finally brought to justice. Police said the woman, Janakabai Dhangar, trained her monkeys to attack anyone wearing a khaki uniform. Every time police tried to raid her den in Nasik City, 90 miles northeast of Bombay, the monkeys attacked them. While the officers were busy trying to keep their clothes on, the woman allegedly got rid of her illicit liquor stocks. But policemen Madhavrao Arote and Chandribhan Ugle outwitted her recently by approaching the den in plainclothes and throwing peanuts in front of the monkeys. When the monkeys pounced on the nuts, the police took Mrs. Dhangar into custody and seized her illegal liquor.

—UPI

Fission Vapor Study Is Aim of New Facility

A facility to study the chemical behavior of fission products that might be released as vapors from nuclear reactor fuel during a severe accident has been built at Sandia National Laboratories.

The facility will permit laboratory simulation of fission product behavior in the high-temperature steam environment of a disrupted reactor core. It consists of a water boiler, steam superheater, fission product generator, reaction chamber, and monitoring equipment.

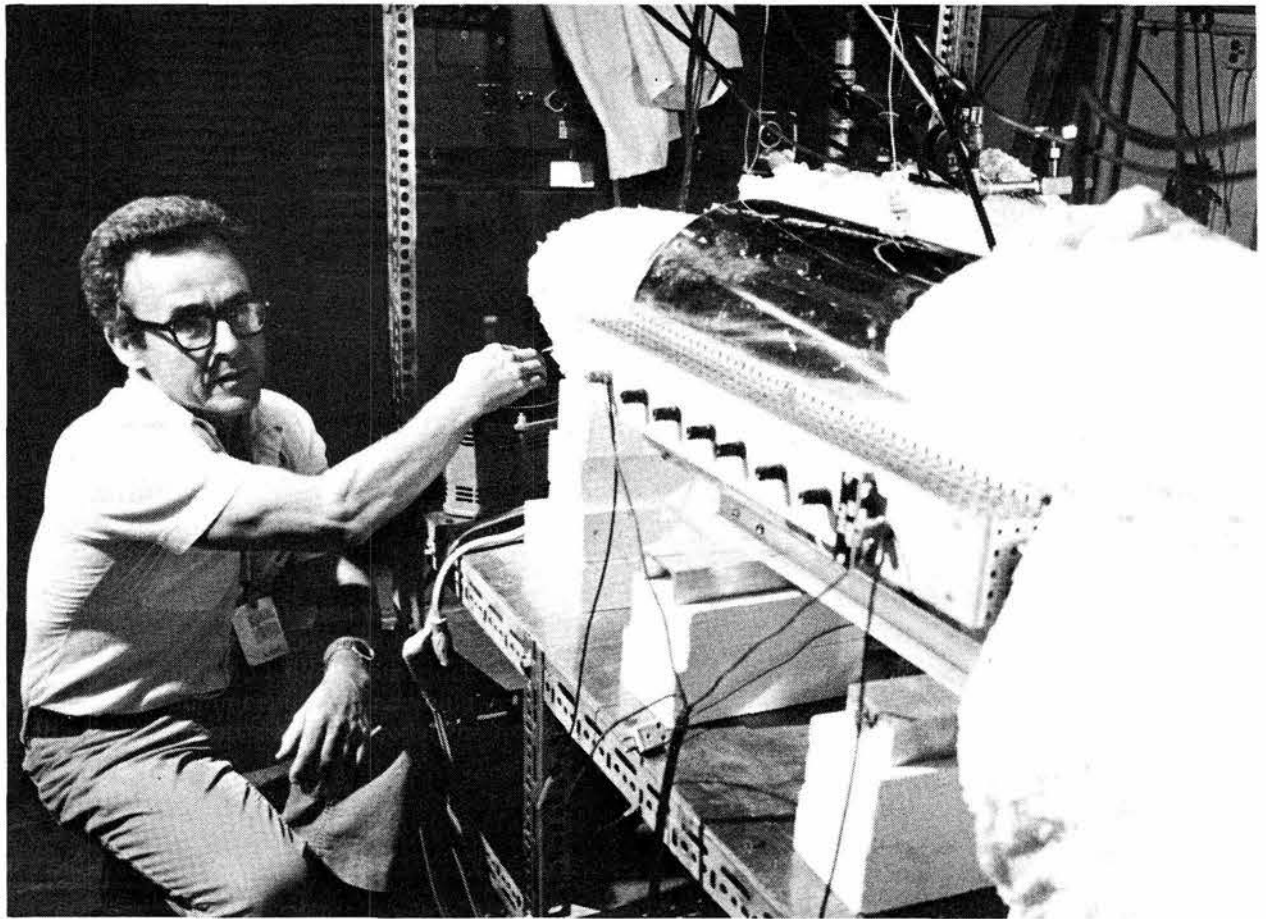
During a core-disruptive accident, coolant water in the reactor core or primary coolant loop is lost, exposing the fuel assembly. As the temperature of the assembly increases from about 300°C for normal operations to about 2200°C, it begins to melt, releasing fission product vapors which react with themselves, with reactor parts, and with steam or aerosols present in the system. Few specifics are known, however, about the chemical reactions that actually occur and how they affect escape of fission products from the reactor.

The first tests in the Fission Product Research Facility began recently and chemical vapors such as iodine, cesium iodide, and cesium hydroxide are being studied. Nonradioactive forms of the chemicals will be used in the tests.

"Radioactive iodine released into the atmosphere during a reactor accident could present serious biological hazards," says project leader Richard Elrick of Reactor Containment Safety Studies Division 4422.

"Several questions have been raised recently about the amount and form of the iodine release during severe accidents because a much smaller amount of radioiodine was released during the Three Mile Island incident than existing accident models had predicted. The new facility should help improve these models."

It is also believed that the models do not



RICHARD ELRICK (4422) checks experiment in new facility which permits study of fission products released as vapors in a nuclear reactor. Experiments are part of Labs' nuclear reactor safety program.

accurately reflect the role that cesium would play in a severe accident. Cesium could react with containment building materials such as stainless steel, Inconel, and others, binding to them and thus not be released during an accident.

Tests in the new facility begin when saturated steam, produced in a boiler and superheated to about 1000°C, flows into the fission product generator. In the generator, fission product simulants are vaporized with electric heaters and mixed with the steam at predetermined concentrations. Up to three species can be vaporized simultaneously, depending on test requirements.

The steam/vapor mixture enters a 30-cm-diameter, 60-cm-long reaction

chamber where residence times can range from several minutes to several hours. The chamber can be lined with the various reactor materials that would be encountered in a reactor accident.

Chemical and physical analyses of reaction products are performed by Raman spectroscopy, by examining condensate on test specimens placed throughout the reaction chamber, and by selectively condensing chemical species as they leave the chamber.

Future tests will examine the behavior of less volatile fission products such as tellurium, strontium, and ruthenium. These studies are supported by the Nuclear Regulatory Commission as part of Sandia's nuclear reactor safety program.

My Favorite Old Photo

Grandpa Lewis Kilker (center, arms folded) came to the open prairies of South Dakota in the late 1800s from Illinois and set to work raising grain. By 1905, when this photo was taken, he was well established and here he is surrounded by helping hands—mostly relatives. This is the threshing operation, separating the wheat from the chaff—note the long power belt behind the men extending from the steam tractor to the thresher. Every now and then, one of the horses would draw near to the belt and get his tail caught in the mechanism, after which he'd be a tailless horse. The farm, still in operation, is near Britton, South Dakota. (Bob Luikens—4343)



Photovoltaics Gain Operating Experience at Eight Locations

Eight intermediate-sized, experimental solar cell systems that convert sunlight directly to electricity are now under construction or are already operating in different parts of the country under the National Photovoltaic Program. The aim: to obtain design and operating experience for such systems.

DOE's \$23-million program is being supported technically by Sandia National Laboratories. The experiments range from 20 to 225 kilowatts in peak electrical output and provide a total of about 700 kilowatts for a variety of uses.

Four of the photovoltaic systems are flat-panel designs, three are concentrator designs which are actively cooled (with thermal energy used for heating and/or cooling), and one is a passively cooled concentrator array.

The flat-panel systems are in Lovington, N.M.; El Paso, Texas; Oklahoma City, Okla.; and Beverly, Mass. The concentrator arrays are in Phoenix, Ariz.; Kauai, Hawaii; Albuquerque, N.M.; and Dallas, Texas.

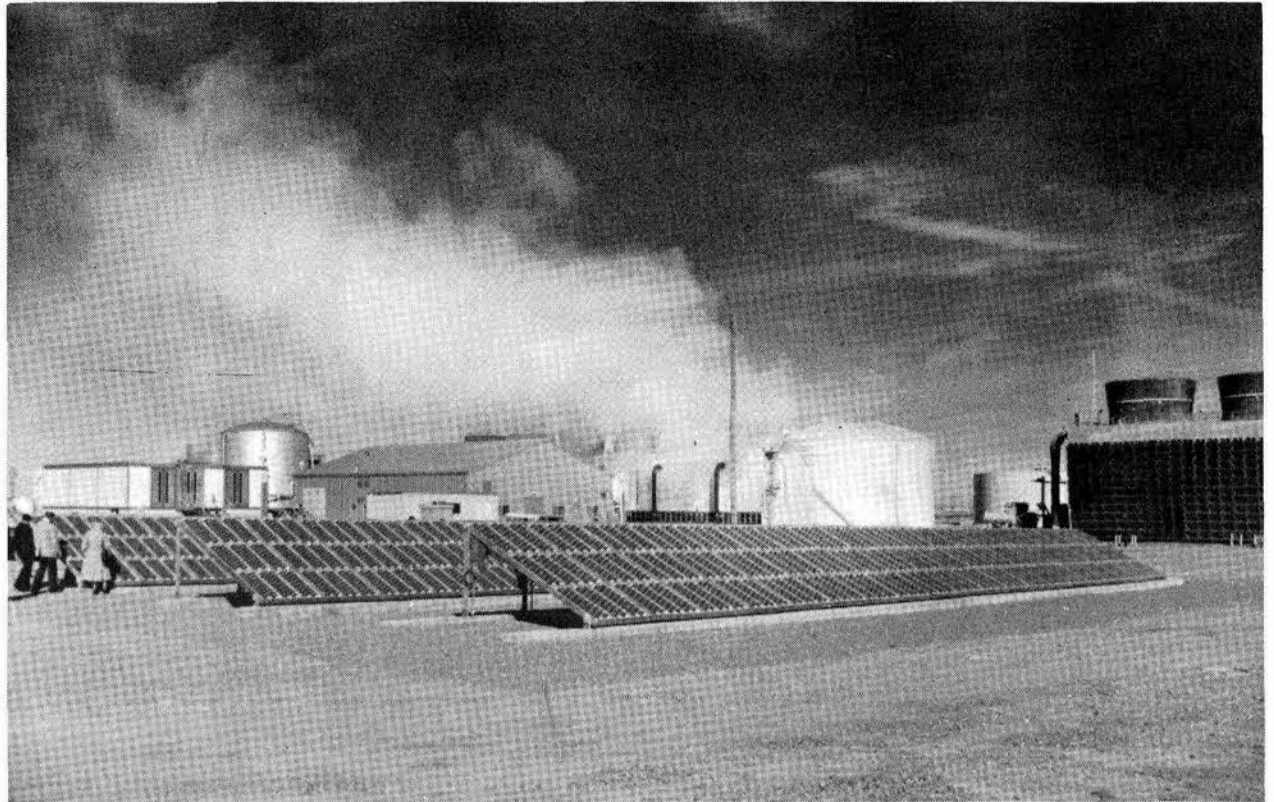
The recently completed photovoltaic facility in Lovington uses 3360 collector modules to provide 100 kilowatts of power—about 12 percent of a shopping center's electrical requirement. A 20-kilowatt photovoltaic system using 576 collector modules, installed at the El Paso Electric Company's Newman Station, provides direct current to batteries and computers that control plant operation.

In the third flat-panel design, a 135-kilowatt photovoltaic system is being constructed at the Oklahoma Center for Science and Arts in Oklahoma City. It uses 1512 photovoltaic collector modules with 10-centimeter-square polycrystalline silicon cells and companion mirror reflectors, all arrayed on the Center's roof. The fourth flat-panel system provides 100 kilowatts for two high schools in Beverly, Mass. The solar cell array, consisting of 3200 photovoltaic modules, provides about nine percent of the electricity for the schools; some power is also sold to the local utility.

A total-energy system using a photovoltaic concentrator to supply both electricity and hot water for space heating and cooling is being constructed at the Wilcox Memorial Hospital in Kauai. Designed by Acurex Corporation, this system is a parabolic trough array with a concentration ratio of 36 suns, producing a peak output of 35 kilowatts of electrical power and more than 2.5 million Btu's of heat each day. The hospital's major energy loads are air conditioning and hot water heating.

BDM has designed the 50-kilowatt, actively cooled photovoltaic concentrator system on the roof of the new BDM headquarters building in Albuquerque. The array is a linear parabolic trough, has a total of 7560 sq. ft. of collectors. These focus the equivalent of 42 suns on each of the 8964 silicon solar cells. Thermal energy produced will heat the building during the winter. On weekends and holidays, surplus power can be fed into the utility grid.

The photovoltaic concentrator under



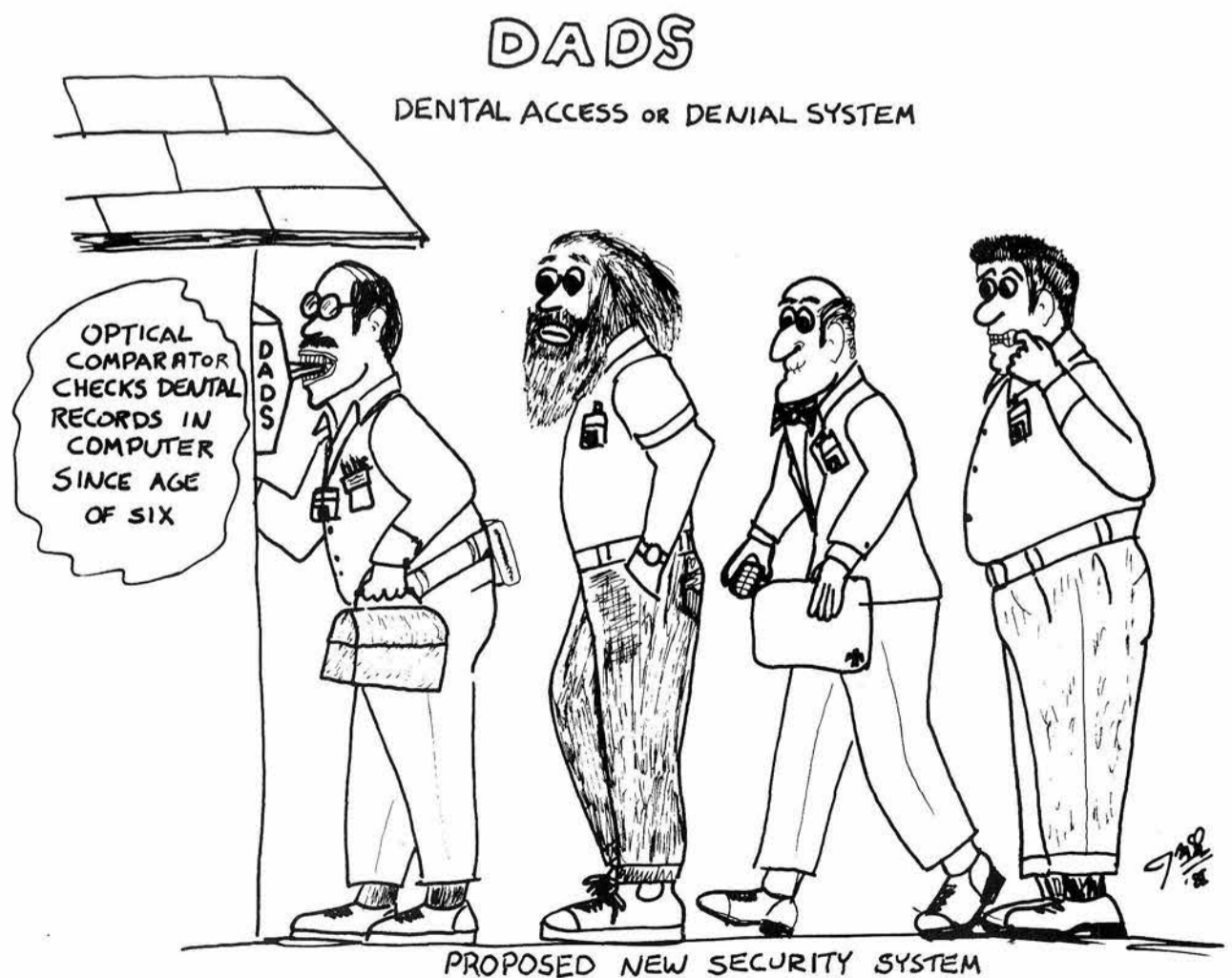
PHOTOVOLTAICS—At the El Paso Electric Company's Newman Station, this 20-kilowatt photovoltaic system provides direct current to batteries and computers that control plant operation. The facility is one of eight in different parts of the country operating under DOE's National Photovoltaic Program.

construction at the Dallas-Fort Worth Airport was developed by E-Systems, and uses that company's linear Fresnel lens concentrator to focus sunlight on silicon solar cells. It generates 27 kilowatts of electrical power and 140 kilowatts of thermal energy for the airport's power plant.

In another airport application, 80 concentrator arrays, designed and fabricated by Martin Marietta, will be installed at Sky Harbor Airport in Phoenix to provide a new terminal building with 225 kilowatts of electricity. The arrays use

Fresnel lenses to concentrate by 50X the sun's intensity on cells approximately two inches in diameter.

In DOE's photovoltaic program, Sandia's role includes technical management of field experiments, development of photovoltaic concentrator array technology, and design and definition of photovoltaic power systems. The program objective calls for the development of photovoltaic collector and power system technology suitable for various uses in residential and commercial applications.



JEFF McDOWELL, a young man who joined Sandia about four months ago as a custodian in Division 3426, brought this cartoon over and said it was inspired by some of the Safeguards systems he's seen at Sandia.

Scientist Finds Four Cantaloupe = One Hostess Cherry Pie

When Wendell Jones, a metallurgist in Org. 5835, took a look at his 210 pounds a couple of years back, he decided he didn't like what he saw and, in the next six months, proceeded to drop some 55 pounds and has since remained around 155 pounds. His "secret": a direct look at nutrition and calories, from which he learned that being slim isn't a course in martyrdom. You simply select those foods you like that offer both good nutrition and a relatively low calorie count.

Wendell likes both cantaloupe and Hostess cherry pies. So when he learned that four cantaloupe are equal to one HCP in terms of calories, he dropped the latter and became a fan of the former.

Wendell is one of two Sandians we interviewed after noting their dramatic weight losses. The other is Jeff Swegle, a physicist in 5531 who has come even farther than Wendell—he's down to 190 from 290 in six months and still losing. Both men are in their early 30s, both have carried excess weight throughout their adult lives, both enjoy eating and both have repeatedly experienced what one of them calls the "yo-yo" approach to weight control—following some heroic diet until X-pounds were lost, then returning to "normal" eating habits (the ones that put the excess weight on in the first place), only to again end up in fat city.

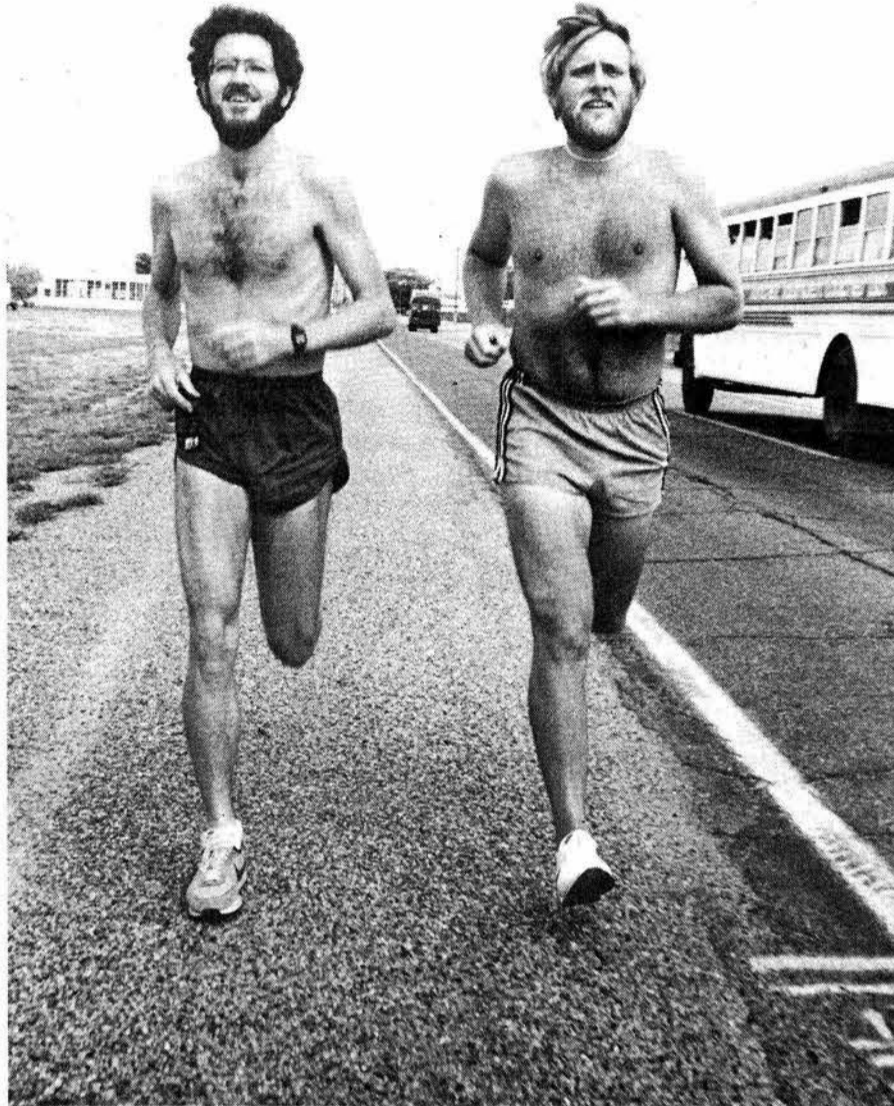
How did they do it? And could you do the same? We were struck by their common sense approach to the solution of a vexing problem. There's no mumbo-jumbo, nor exotic foods, nor heavy air of sacrifice. After due deliberation, each resolved to make a permanent change in his eating habits and, from that day onward, has eaten "sensibly" (translation: usually, not always, less than before, keeping an eye on calories and nutritional values).

Here are comments by the two on the thinning process.

Jeff—"Back in those days (at 290 lbs.), I'd get home from work and Connie and I would sit around and discuss 'What are we going to have for dinner?' in much the same way we might discuss which movie to see. Eating was entertainment. All too often, we'd end up with a monster pizza and beer or some other fast food. Fortunately, we both realized at about the same time that this way of living was destructive, and we jointly decided to change it for keeps.

"Now we eat out only occasionally, and we have simple dinners at home—like steak or chicken and a salad. And, to tell the truth, I don't feel we've cut down all that much. There's certainly been no starving or denying—we just don't eat as much. The fact is, most people realize when they're overeating . . ."

Wendell—"I found that you don't learn proper eating habits by giving up eating. Those accelerated diets just don't work over the long pull because you ultimately revert to your old ways. I think a lot of overeating is done by people who want to feel better—and eating is their way to feeling better. You have to change that view of the role of eating in your life if you



TWO well-built specimens jogging along, so what? It weren't always so. Wendell Jones (5835), left, was pushing 210 pounds not too long ago, proceeded to drop 55 pounds in six months. Jeff Swegle (5531) weighed in at 290 pounds; after six months is down to 190 and losing. Their method is simple: eat less, eat for nutrition, exercise.

want to lose weight on a permanent basis.

"My wife and I both educated ourselves on nutrition when we decided to change our eating habits. Now we minimize salt and fats and prepared foods, and we lean to vegetables that are high in protein—we're not vegetarians, though.

"I get comments now like, 'Oh, you're just one of those naturally skinny types,' and I think to myself, 'I'm about as naturally skinny as a bowling ball.'"

What about exercise and its role in weight loss? Jeff recalls coming to the gym for a couple of years at 290 lbs. and never dropping a pound. "I remained overweight but reasonably fit . . . changing the food pattern was the key." Now he runs up to three miles daily and follows a weight-lifting routine.

Wendell runs farther, 30 to 35 miles per week, and bikes to work as well. He's aiming at a marathon in '82.

Both men extol the physical and mental benefits of exercise. And between their sensible approach to eating and their exercise, their blood pressures—previously on the high side—have dropped to reassuring values: 122/76 for Jeff and 95/60 for Wendell.

Any problems with your new bods?

Jeff—"My wife keeps telling me she's afraid I'll end up skinny . . ."

• js

Retiree Publishes 13th Book

Franklin Barnett left Sandia for retirement back in 1965 and immediately went into archeology on a full-time basis. Now living in Sun City West in Arizona, Franklin and his wife, Joan, have excavated over 300 rooms in prehistoric ruins in the Southwest.

A technical writer by profession, Franklin has turned his talent to the writing and publishing of books relating to his new vocation. *Crooked Arrow*, published in 1977, is now used in the Arizona school system in teaching basic archeology and anthropology. His *Dictionary of Prehistoric Indians of the American Southwest* is in its fourth printing and is widely used as a text in universities.

Franklin's latest work is his 13th. *These Were the Prehistoric Prescott Indians* is a history based upon the research and writings of 14 archeologists in published reports over the years. It includes 45 photos of sites and of artifacts found in the Prescott area.

What's next? "No more archeology," says Franklin. "I'm giving creative writing a try."



Retiree's Dinner

SANDIA LIVERMORE'S 16th annual retirees' dinner was held Oct. 14 with 136 people attending. The buffet dinner was followed by movies of Sandia's energy and weapons projects and a brief talk by Tom Cook (8000). The oldest retiree, Helmuth Woidtke, has been to every annual dinner except one since 1969. At right, talking with Tom Cook (VP-8000, center) are Ray Shephard (left) and Mike Gregory. (Photos by Elliott Dopking, ret.)



ANN RUTLEDGE, a Wells Fargo security guard at Sandia Livermore, displays her first hardback novel, *World Without Sex*, a futuristic science fiction story. Ann writes of a world where hetero- and homosexuals are pitted in a deadly struggle and, after the holocaust, a biochemist creates an asexual race based on a microsurgical, genealogical process. The newly created race finds some devastating side effects develop from their hybrid breeding, leading to a startling conclusion. Ann has published poetry, but this is her debut as a full-length novelist. Her book, published by Carlton Press of New York City, is available in area bookstores.

\$85,400 Pledged

LEAP Leaps Up

LEAP (Livermore Employees Assistance Plan) took the largest "leap" in dollar growth in the history of the campaign, surpassing the \$77,500 goal by \$7900.

LEAP chairman Hank Witek credited much of the success to the new "donor option" plan which allows Sandians to select any charitable human service agency they wish. Fifty-four new agencies not previously reached by the charity drive will receive funds this year because employees designated them as recipients.

The \$85,400 pledged represents a 16.6 percent increase in contributions by Sandians this year, an average of just over \$92 per participant. Of the 922 employees who participated, nearly 200 pledged a "fair share."

"The theme of LEAP, 'Sharing Your Way,' obviously worked this year. Not only did some Sandians designate how they wanted their contribution to be used, but they backed their choices with generous donations," Hank said. He thanked all who

gave and especially those who served as division solicitors.

Most of the funds in excess of the 1981 goal will go to the new agencies designated by contributors, so the preselected local agencies will received about the same amounts as anticipated by the LEAP committee in setting the goals for this year.

Sympathy

To Glenn Smith (8272) on the death of his mother in Stockton, Oct. 15.

To Norm Wagner (8329) on the death of his father in Turlock, Oct. 1.

To Clyde Layne (8511) on the death of his father in El Paso, Oct. 23.

Congratulations

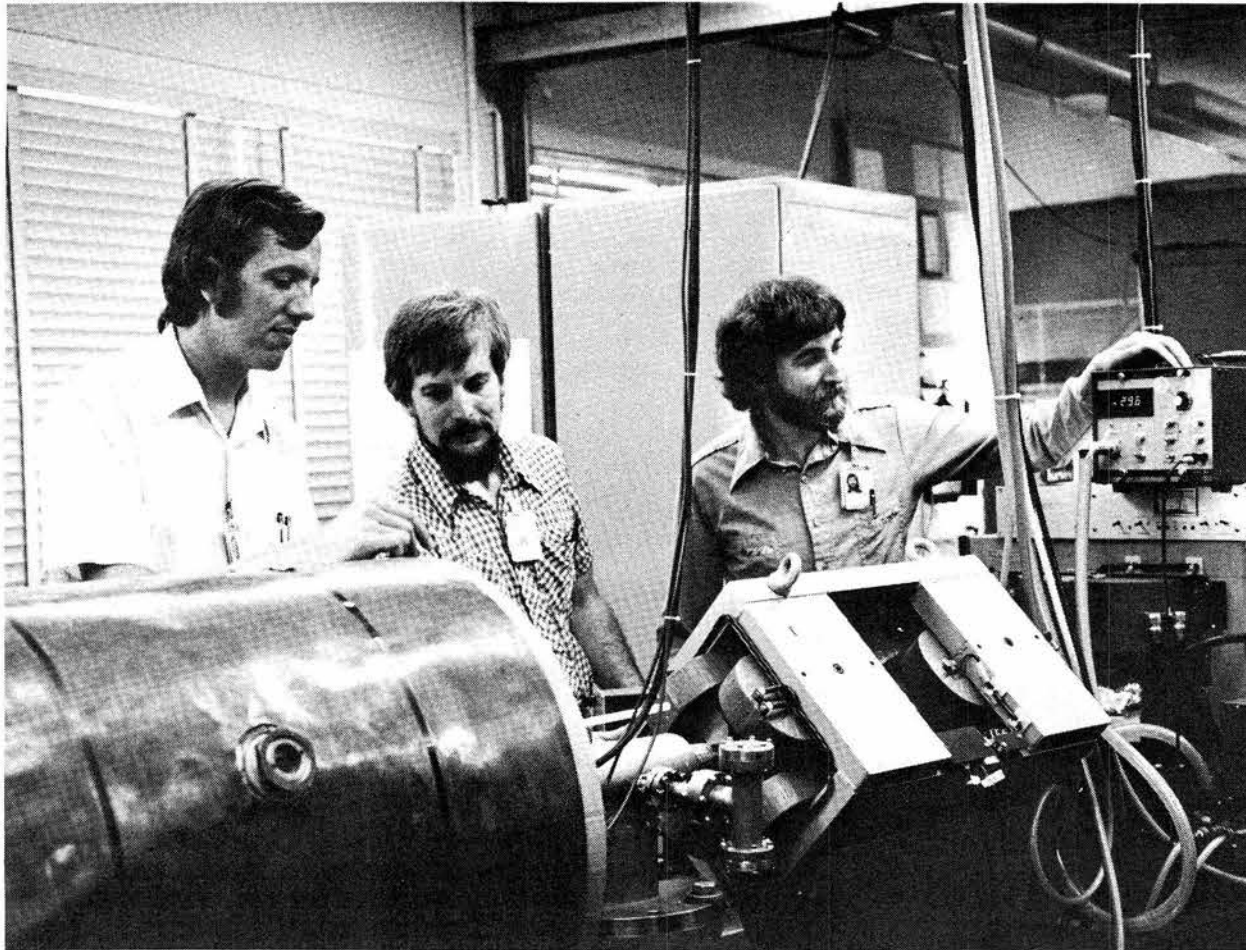
Kathy Conner (8271) and Steven Frock, married in Tracy, Aug. 22.



SANDIA LIVERMORE NEWS

VOL. 33, NO. 23

NOVEMBER 13, 1981



LIVERMORE'S Pelletron accelerator is the world's smallest one-megavolt tandem accelerator, according to Art Pontau (left) of Physical Research Division 8347. It's used to analyze carbon and silicon samples that have been exposed to plasma in Lawrence Livermore's Tandem Mirror Experiment. Plasma implants deuterium on samples which are then bombarded with helium-3 ions by the accelerator. These ions combine with deuterium to produce protons and alpha particles which are then analyzed to determine the effects of the plasma on the materials. Assisting Art are Al Ver Berkmoes (center) and Dan Morse (both 8347).

Fusion Materials Studies Under Way

Sandia is playing an important role in this country's magnetic fusion energy program through its studies of the interaction of plasma with various materials. At Sandia Livermore, physicists in Physical Science Department 8340 have been participating in the Tandem Mirror Experiment (TMX) with Lawrence Livermore National Laboratory and the University of California at Los Angeles. Groups from Departments 5110 and 8340 are also carrying out research using the Princeton and Oak Ridge tokamaks.

In both the TMX and the tokamak, the goal is to learn how to contain the plasma—a hot ionized gas of two isotopes of hydrogen—at high enough temperature and density for the hydrogen nuclei to fuse and thus generate energy. The tandem mirror machine consists of two small end-cell plasmas connected by a much larger center-cell plasma. The end-cell plasmas create an electrostatic potential well which, acting as a "mirror," reflects particles back into the center cell. In a tokamak (Russian acronym for "toroidal confinement machine") the plasma is confined in a doughnut-shaped apparatus—a torus.

Sandia's role in the magnetic fusion

program started with research on how hydrogen and helium implantation affected various materials. Now, the knowledge and techniques developed in this research are being used to measure properties of the plasma. Walter Bauer, head of Department 8340, explains, "Essentially, we expose materials such as carbon and silicon to the plasma to measure temperature and density at the plasma edge—the region where the plasma field tapers off into a vacuum. We use carbon and silicon because they are two of the most effective substances for trapping deuterium.

"The materials are exposed to the plasma at Lawrence Livermore and then analyzed here. The plasma characteristics are obtained by correlating the deuterium profiles with previous measurements using known deuterium energy and flux."

TMX work has been successfully concluded, and an upgraded TMX, in which there will be further Sandia participation, is under construction. Continuing the measurements of plasma-materials interaction is essential not only for characterizing the plasma but also for developing materials to be used in confinement device components.

feed **li**back

Q. It is evident in parking lots with concrete bumpers placed at an angle that people do a better job of parking, thereby providing several more parking spaces per row. With the lot north of 880 and west of 887 so crowded, why not change the bumpers to this orientation?

A. I agree that drivers do a better job of parking when bumpers are placed at an angle. Our standard practice is to install new bumpers this way. We will change all bumpers at the time we resurface the parking lots, or if they must be removed for any other purpose. It is a fairly expensive process and we haven't felt it necessary to change the bumpers to accommodate the relatively few people who have the most difficulty.

In case you haven't noticed, the large parking lot south of Bldgs. 821 and 823 is not full, and it may be possible to get a parking place as close to Bldgs. 880, 892, or 894 as on the perimeter of the lot north of Bldg. 880.

R. W. Hunnicutt—3600

Q. Promises, promises!

When the new stockroom was opened last year we were told that it was going to be efficiently run and that we were going to find anything we wanted in the lovely new bins provided. I have gone there several times the past few months and haven't found any of the things I was looking for. It is run as poorly as the old one in the basement of 802—empty bins and cards saying the material is on order everywhere. I have to resort to sending MR's to stores and they require several to cover an order of four or five different items. This, plus time spent walking to and from the stockroom, is a waste of time.

A. In checking out the self-service stockroom (SSS), we have a couple of situations that are unavoidable: (1) We don't and cannot carry every line item that is stocked in general stores; and (2) It is difficult to maintain stock when users wipe us out on a daily basis. We feel that the new SSS is a definite improvement over the one in the basement of Bldg. 802. In the new SSS everything is visible; we can see what stock is missing, and immediate action can be taken to restock the bins. In Bldg. 802 we had to pull drawers and look inside to determine empty stock, which was time consuming. We are sorry you feel the store is run poorly, but we find this is a far better system and a big improvement over the old store.

Regarding the cards stating material is on order, or back order, this procedure flags everyone that some action is being taken on those empty bins. In checking just the 351 stationery items on Sept. 16, we were out of 21 line items. This represents a six percent outage. It is impossible to avoid back orders in the SSS because of deliveries from suppliers to our main warehouse.

If you have any items you see are needed in the SSS, please do not hesitate to call Bob Durand at 4-3851.

J. C. Strassel—3700

What's a Btu?

(Ed. Note: Reproduced from *the Pipeliner*, house organ of the El Paso Co., this article gives a down-to-earth description of a unit that has come to prominence with the onset of the energy crunch. Under the metric system, the Btu is replaced by the joule (J); one KJ is about equal to one Btu. Use of the calorie (heat to raise the temperature of one g of water 1°C) is being discouraged. Roughly speaking, four J are equal to one calorie.)

Fuel is any substance that produces useful heat or power when burned.

America's high standard of living has resulted from this nation's abundance of

"A Btu is the amount of heat needed to raise the temperature of one pound of water one degree Fahrenheit under stated conditions of pressure and temperature."

fuel that allows us to heat and cool our homes, cook our food, power our automobiles and planes, and keep our factories operating.

Nature produces the common fuels such as wood, coal, oil and natural gas, and, although these fuels have a common origin, they differ greatly in heating value. Initially, fuels were sold on a volume or weight basis (cubic foot, barrel or ton). Recent trends have been to sell fuel, particularly natural gas, on a total heating value basis. The heating value usually is measured in British thermal units (Btu).

A Btu is the amount of heat needed to raise the temperature of one pound of water one degree Fahrenheit under stated conditions of pressure and temperature.

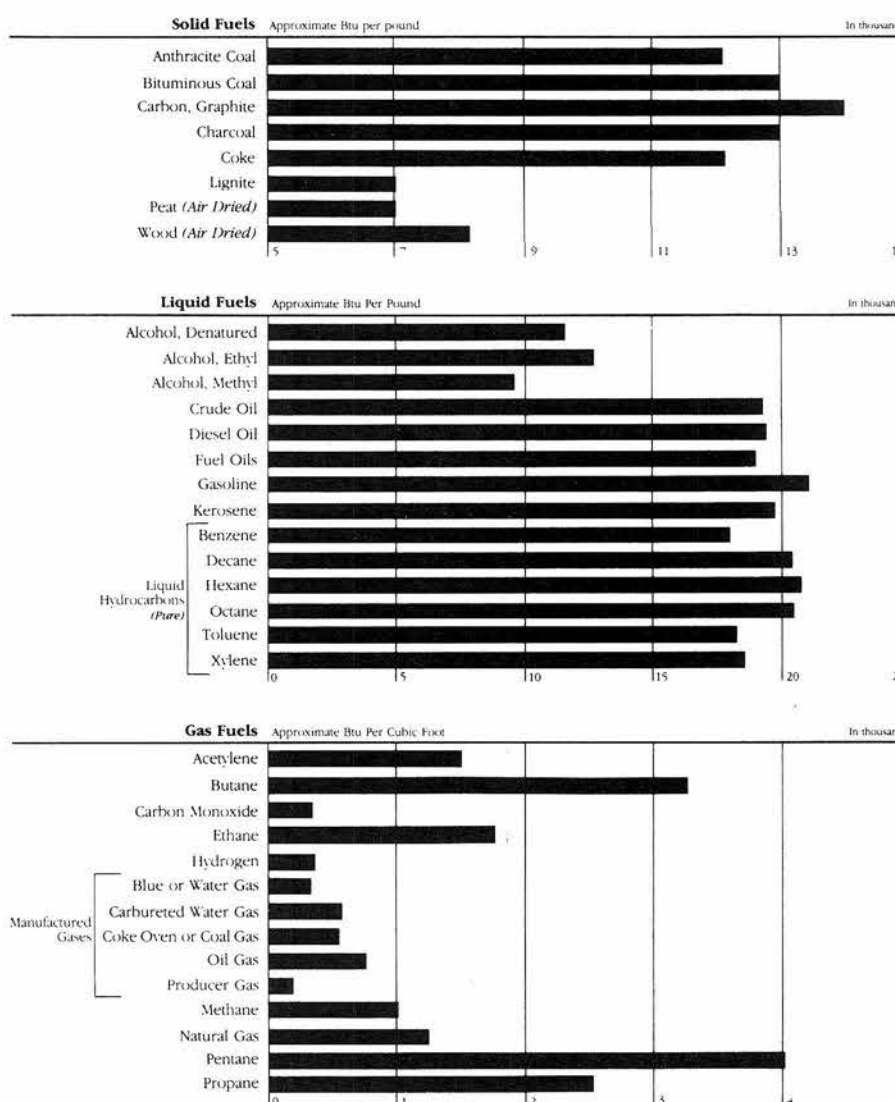
The reason for utilizing Btu measurement is apparent when you consider the variance in heat value that burning fuels release. For example, a cubic foot of natural gas (chiefly methane) sold by El Paso Natural averages between 1040 and 1080 Btus, while a cubic foot of manufactured gas normally has only about half as many Btus. (See chart for other values.)

Measurement of energy in the form of heat is a science called calorimetry. Calorimetric measurements are widely employed in many fields of science and industry.

But determining Btu content is not a simple matter. At large natural gas purchase points along the El Paso system, Btu content is determined by installation at the site of a recording calorimeter. The principle of a gas calorimeter is to burn a metered amount of fuel, which heats a stream of air. The instrument measures the temperature of the air before and after heating, and converts temperature difference to Btu per cubic foot. The Btu is then recorded on the calorimeter chart.

Many different types of calorimeters have been devised for measuring amounts of heat by observing quantitatively the effects produced or comparing the effects

APPROXIMATE HEATING VALUES OF FUELS



produced when energy in other forms is transformed into heat.

One of the earliest calorimeters, devised about 1760 by Joseph Black, consisted of a block of ice hollowed out in the center and covered with a slab of ice. A substance was heated, dropped into the ice calorimeter and the cover put on. Sufficient time was given for the substance to cool to the ice temperature. Then, the water formed by the heat given up to the ice was removed and measured.

This rather crude form of measurement was replaced by other forms of calor-

imetry, including the method of mixtures (dropping a heated substance into a known amount of water at a known temperature and measuring the rise in temperature), and transforming heat from fuel to drive paddles, which stirred a liquid and raised its temperature.

As with any science, the advances in technology and equipment have resulted in an exact measurement of heating values becoming more precise, and the precision of modern calorimeters has helped establish this measurement device as the standard for the natural gas industry.

Take Note

Que Pasa Rec Center is sponsoring a charter bus to Sunland Park on Saturday, Nov. 21. The bus leaves at 7 a.m., returns that evening. Cost is \$15. Call 4-5420.

* * *

The New Mexico Section of ASME tours solar facilities of the BDM Corporation on Tuesday, Nov. 17. Speakers are Joe Baxter and Albert Fong, BDM project design engineers. The tour group meets at 6:30 p.m. at 1801 Randolph Road SE. For more information, call Dorrie Miller (1542), 4-6543.

* * *

The Sanado Woman's Club Christmas dance, "Gingham Christmas Ball," is set for Saturday, Dec. 5, at the NCO Club East. The buffet dinner will be followed by dancing to the music of Crosswinds. Reservations by Nov. 27: Carolyn Hermanson, 266-9927, or Maurine Romme, 299-8765.

* * *

The Albuquerque Philharmonic Orchestra is presenting a free concert on Monday, Nov. 23, at 8:15 p.m. at the U of A, Stage II. Willy Sucre will conduct works by Beethoven, Gluck and Prokofieff. The public is welcome.

* * *

A paper, "A Remotely Programmable and Implantable Insulin Delivery System," co-authored by J. T. Love (2335) and R. E. Bair (2120) won the best paper award of the poster session at the 1980 Government Microcircuit Applications Conference held recently in Houston.

* * *

If your organization is planning a Christmas charity project, give the LAB NEWS a call on 4-7841. Also, LAB NEWS is looking for interesting Christmas stories — offbeat, a Christmas observed in a foreign land under trying circumstances, Christmas during the Depression, favorite old Christmas photo, etc. Give us a call.

Fun & Games

Triathlon—There's still time to register for this event which starts Sunday, Nov. 15, at 8 a.m. sharp here on Base at the intersection of F and Pennsylvania Streets. Contestants run five miles, bike ten miles and swim one-quarter mile, all back-to-back. LAB NEWS has entry forms or call Tom Lenz, C-Club recreation manager, on 4-8486. Or show up to compete no later than 7:45 a.m. Sunday.

* * *

Skiing—Klaus Weber, UNM cross country ski coach, will again conduct a series of ski clinics for Sandians starting Dec. 15. In addition to cross country ski clinics, Klaus is offering sessions on winter camping, moonlight treks in the Sandias, and cross country ski racing techniques. Cost for an indoor session, a full day in the snow and equipment rental is \$10—\$8 if you have your own equipment. Contact: Tom Lenz, 4-8486. On the downhill scene, Blake of Taos is featured speaker at the Coronado Ski Club's next meeting, Tuesday, Nov. 17, at 7:30 p.m. Ski movies and freebies are also on the menu.

* * *

Running—Bill Hendrick (3643) was a winner in the recent Oklahoma City Marathon, taking a third overall. Bill was aiming to qualify for the Boston Marathon, which takes a prior marathon time of 2:50. He cut it a bit close: 2:49.43.

* * *

East Gym—The basketball and racquetball courts and the women's locker room are closed for floor refinishing through Nov. 23.

* * *

Basketball—A meeting for basketball coaches will be held at 4:45 p.m. on Tuesday, Nov. 24, in the Eldorado Room of the C-Club. League rules, player fees, liability release forms, and schedules will be discussed. A representative from each team should be present in order to continue to participate in league play.

* * *

Arts & Crafts—A one-evening nativity ceramics workshop will be held Nov. 19 from 5:30 to 7:30 p.m. at the A&C Ctr. Cost: \$1.50 plus materials. Contact: Tom Lenz, 4-8486.

* * *

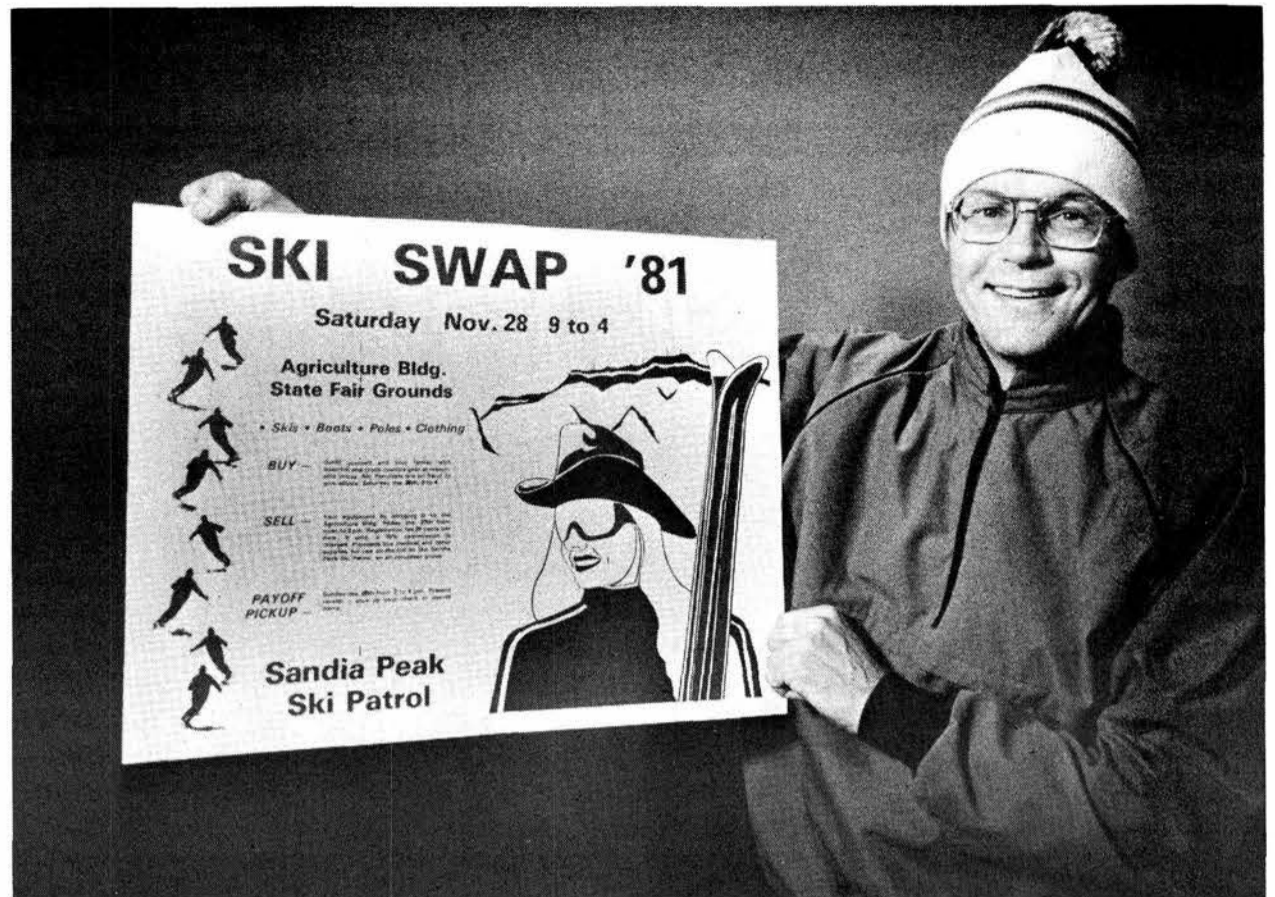
Swimming—The Kirtland Aquatic Club is seeking new members for its competitive swim teams—from beginning youngsters to masters level. The group swims nightly at 7:15 at the Base Olympic pool. Fees are \$5 per month per swimmer. Sandians and families are eligible for membership.

Congratulations

Gary (1473) and Gloria Gallegos, a daughter, Bernadette Marie, Oct. 20.

Robert (1485) and Bunty Gunter, a son, Brad Anthony, Sept. 17.

Ruth Hawley (3531) and Ken Varga (5822) on the occasion of their marriage, Oct. 3.

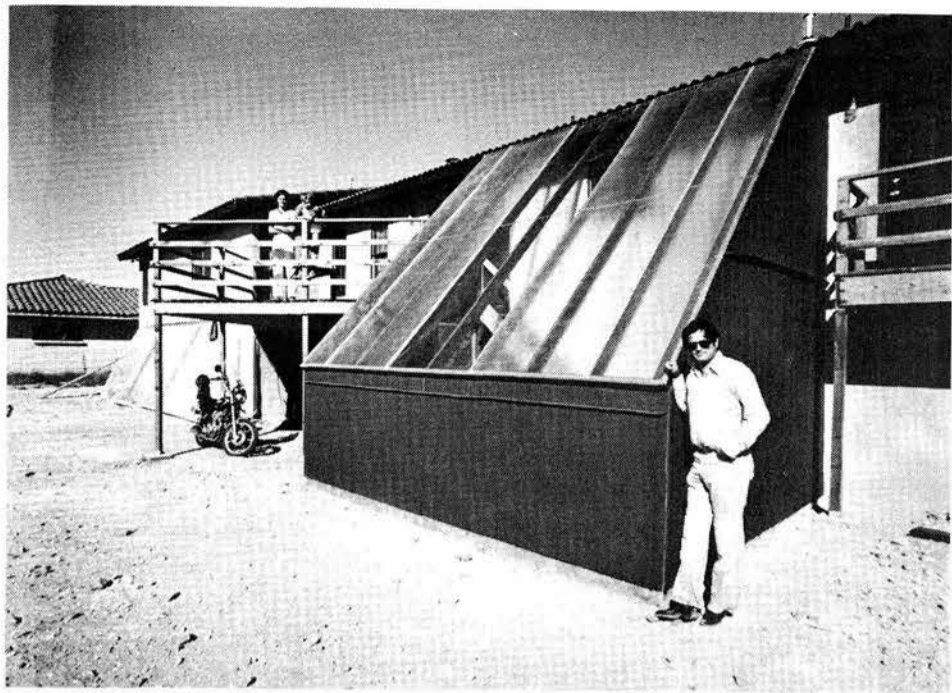


SKI PATROLLER Pete Stirbis (5524), one of the honchos for the annual Ski Swap, reminds skiers and would-be skiers that it's later this year—Nov. 27 to 29 (Thanksgiving weekend). Bring equipment to be sold on Friday, Nov. 27, between noon and 8 p.m., the sale itself runs Saturday the 28th from 9 to 4, and you pick up your check or unsold items on Sunday from 2 to 4 p.m. Anticipated number of skis, boots, poles, clothing items, and other ski gear is 8000. Patrol uses proceeds to purchase medical supplies and equipment for first-aid use at Sandia Peak Ski Area.



Retiring

Above, from left are Harold Meidel (1485), George Johnson (2553), Arthur Becker (1473) and Paul Sanchez (3417). At left are Virginia (3253) and Ray Glass (1123) and Andrea Breckenridge (3734).



COLLECTOR on the south side of the house encloses a greenhouse. Another collector, on the far side of the redwood deck, is positioned below floor level. The large crawl space under the floor, filled with stacked containers of water, is a heat storage area. In summer, doors and vents in the system are opened, cooling off the thermal mass and, indirectly, the house itself.



LIVING ROOM of John Aragon's passive solar house is a pit surrounded by diagonally laid adobes. The pit drops below the house floor level into the heat storage area. Warm air circulating under the house heats the adobe mass which, in turn, heats the living room. From left, young John, John, Mary Beth and Jarred.

Energy Do-It-Yourself

John Aragon Builds Solar House

The house sits on the edge of an arroyo and, from the redwood deck on the south of the house, the view extends over the Four Hills area and across the South Valley. Mt. Taylor is usually visible and so is Ladron Peak near Socorro.

On either side of the redwood deck are slanted walls with a vast expanse of translucent plastic. They are solar collectors for space heating and hot water, and it was 170° in there last weekend. The house is an efficient passive solar machine for living.

John Aragon, a graduate of Sandia's electronics apprentice program, now an ESA in Systems Safety Information Division 4445, spent nine months designing the four-bedroom, three-bath house. It incorporates a number of passive solar features—

- The crawl space under the house, ranging from four to six feet in depth, is a heat storage area. He is in the process of filling the area with plastic containers of all types containing water.

- All of the outside walls are faced with one-inch styrofoam. The foundation footing and the stem wall from beneath ground surface to floor level are insulated with two-inch insulating styrofoam.

- The ceiling has eight inches of insulation.

- Almost all of the north wall of the house—67 feet—is used for closet spaces, providing additional air-space insulation.

- The windows are double glazed, double

- The most striking feature of the house is a sunken living room area outlined by 13-ft.-high diagonally laid adobe brick. The adobes extend down to ground level and are warmed by the hot air from the collectors circulating under the house. The adobes thus constitute another thermal mass to heat the house.

- A wood-burning fireplace which has glass doors and draws outside air for combustion is located within the adobe-walled area.

- A 44,000-lb. Mouray tile roof helps keep the house cool in summer.

John has many other attractive design features that give the house its custom look:

There are four skylights. His two sons share a large bedroom with built-in desks and storage areas plus an adjoining bath. The master bedroom measures 16 by 22 feet, includes a study area and a dressing nook. It adjoins a large bathroom with a 200-gallon sunken Jacuzzi tub and a walk-in closet. (John laid the attractive interior tile himself.) The kitchen is compact but has a large counter-top workspace and breakfast bar.

All of the lighting inside the house (John installed the wiring) features three separate switches so that lights may be turned off behind you or on ahead of you as you walk through the house. The crawl space under the house contains lights and there are several outside floodlights.

John contracted about 60 percent of the construction. He and his two sons—John, 14, and Jarred, 10—completed the rest.

"I'm proud of the boys," he says. "They spent long hours this summer working on the foundation, deck, insulation, front porch, painting and cleaning. They gave up their whole summer of activities. I'd lay out the work in the evenings and they'd finish it the next day."

Construction on the house started last May; the family moved in last month.

The work is not finished. John plans a separate double garage and workshop. The greenhouse behind one of the large collectors needs plants and plantings. The 55-gallon steel drums filled with water must be installed in the collector areas and the water containers in the crawl space need to be filled and stacked.

"The important thing," John says, "is that the design works—we've checked the air flow from the collector areas to the heat storage area under the house through the interior rooms and then back into the

collector areas. It is a natural flow, and insulated doors will automatically close on cold nights when the collector areas cool. This will trap the heat under the house. The insulated doors will remain closed in summer and the collectors used to heat water only. There is no floor insulation. Heat will radiate up through the entire floor.

"In the summer," John continues, "the system works in reverse. The collector areas are vented to prevent heat build-up. Cool nights will cool the thermal mass, and this should keep the house comfortable throughout the day. I didn't put in any kind of air conditioning system and, with any luck, I'll be able to shut off the gas."

Writer Writes & Wins

One might say that Chuck Cockelreas (400) talked himself into writing. True, as a science editor he's been writing for a number of years—technical manuals, film scripts, science articles—but he also dreamed of doing creative writing. He also talked about it for years—at writing workshops, on social occasions, to his wife, his cat. But few manuscripts issued forth from all this apostrophizing.

One day Chuck finally said to himself: "I've decided to stop talking about writing and start doing it!"

Not long after, his poem "Upon Indifferent Earth" won second place in the 1981 National Writers Club Poetry contest. One of the judges said of it: "It narrowly missed first place . . . It has a rhythm and thrust that is very refreshing."

But this was not all. In September Chuck was notified that his short story, "The Pups are Free," had won third place in the NWC Short Story contest. On this occasion, one of the judges, Michael Shaaras (Pulitzer Prize for fiction, 1975), opined, "All in all, the most professional story I read."

Chuck isn't talking much these days.

MILEPOSTS
LAB NEWS
NOVEMBER 1981



Jim Young - 3435 10



Horace Lucero - 5632 20



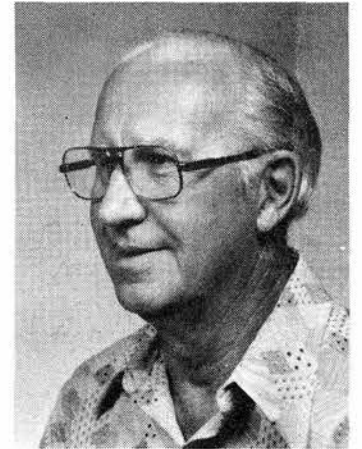
Doc Pasko (1710) 30 Mary Pasko (2426) 30



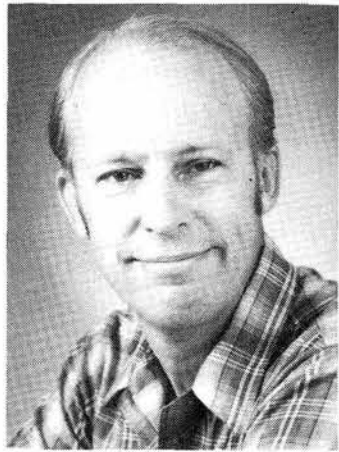
Dick Jones - 8442 15



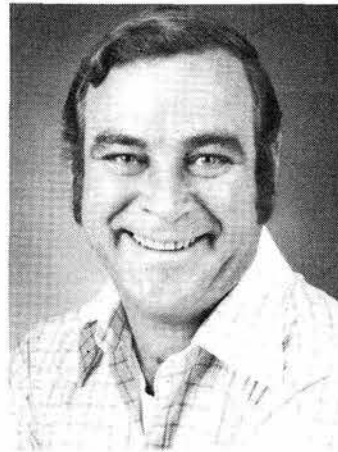
Bob Velasquez - 3541 25



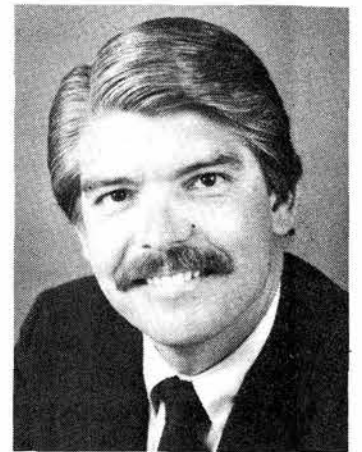
Earl Sherwood - 2543 30



Tom Devlin - 8275 20



Dennis Sparger - 8352 20



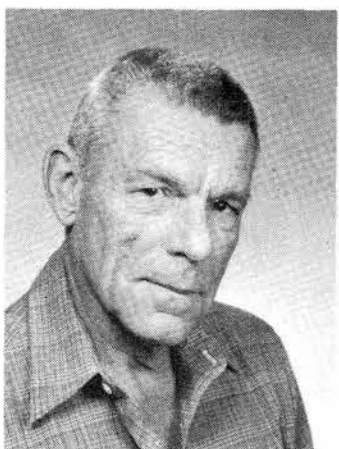
Dave Havlik - 8441 15



Ernesto Griego - 1482 25



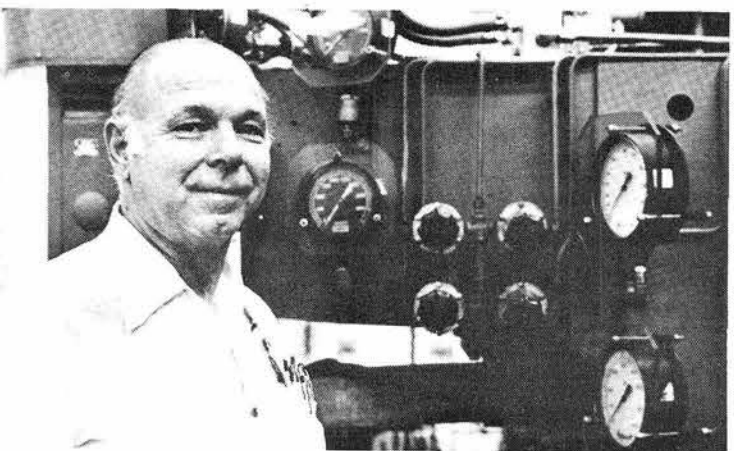
Tom Chiado - 3436 30



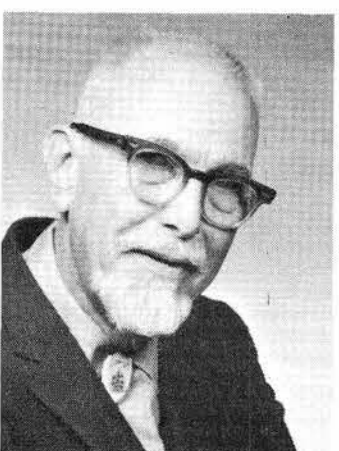
Bob Jones - 1541 35



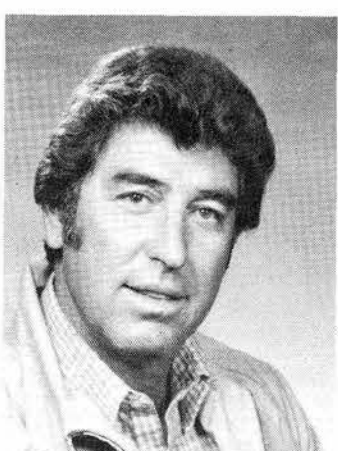
Jay Hughes - 3731 30



Daryl Orth - 1473 30



Mark Gens - 5523 25



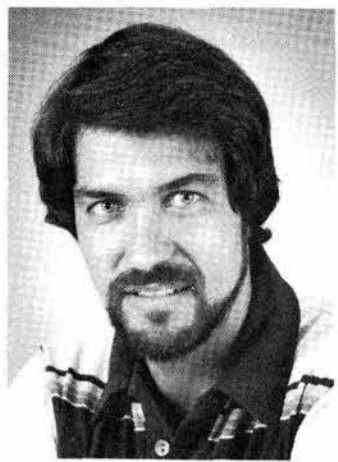
Abel Lucero - 3423 30



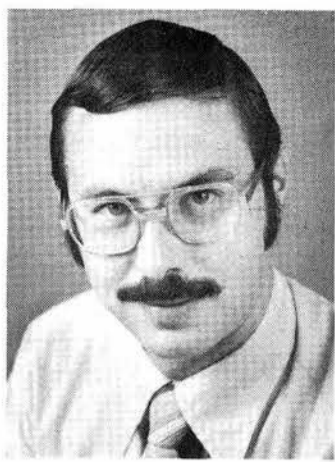
Dorothy Schroeffer - 8255 15



Diane Atwood - 8452 10



Joe Barbera - 8423 10



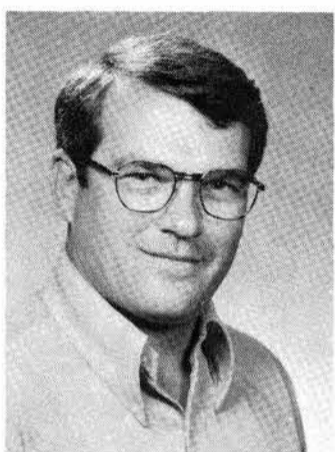
Al West - 8315 10



Mac Weaver - 4321 25



Florenio Baldonado - 3423 30



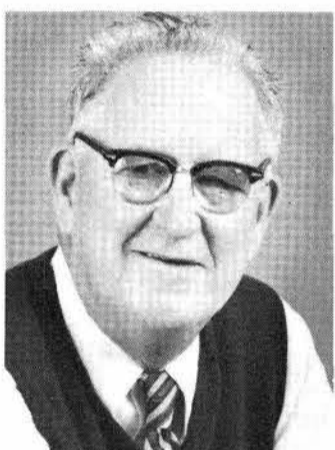
Gary Reif - 2522 15



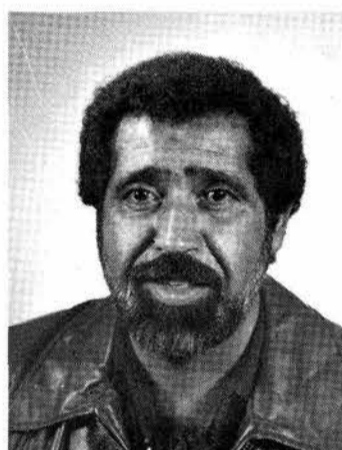
Roger McKenzie - 2340 30



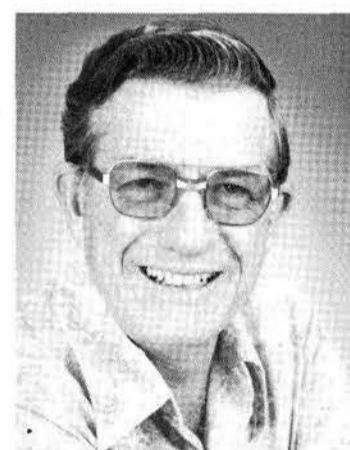
Ike Davis - 8262 15



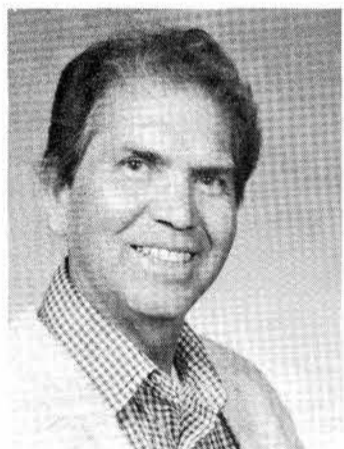
Bob Hauff - 8271 25



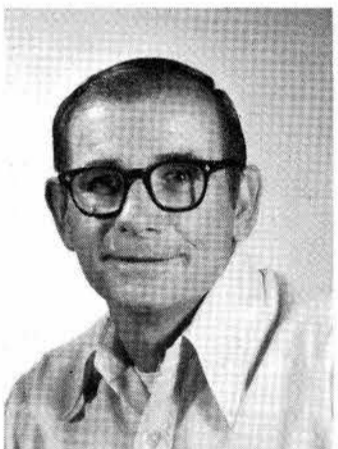
Joe Gonzales - 2632 10



Gene Lopp - 8271 30



Jose Garcia - 2631 25



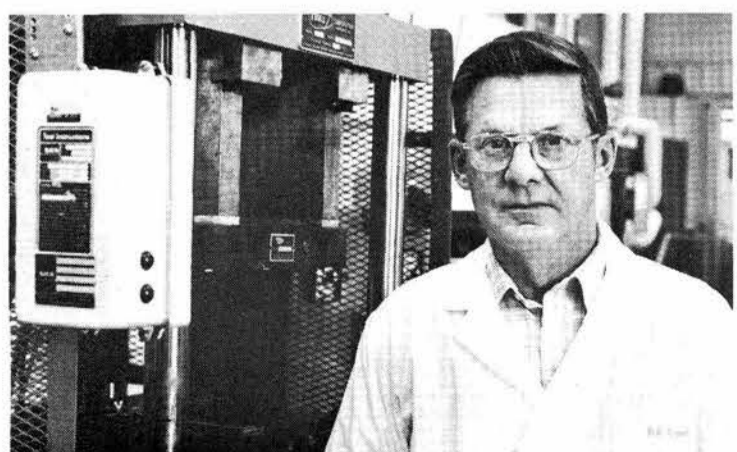
Jack Burt - 2456 25



Dave McCloskey - 4410 15



Paul Gallegos - 3154 15



Bob Knight - 1472 25



Daniel Alvino - 2457 30



Ralph Fox - 4311 30



Herman Stein - 5112 25

My Favorite Old Photo



Once upon a time, there was something called the Austro-Hungarian Empire. It had an army, some of whose soldiers are shown in this photo taken about 1907. The man above the "X" is my uncle Paul Nagy, my mother's oldest brother, and the locale is the town of Rogatica, in Bosnia, now part of Yugoslavia, only 25 miles from Sarajevo, the site of the incident that triggered World War I. During WWI, the Empire and its army were destroyed in Russia, Rumania and Italy. Uncle Paul, by then a major, managed to survive and today, at age 97, he's still going strong and lives in Hungary. Mother died a few years back at age 71. (Gene Aronson—2646)

JUNK • GOODIES • TRASH • ANTIQUES • KLUNKERS • CREAM PUFFS • HOUSES • HOVELS • LOST • FOUND • WANTED • & THINGS

CLASSIFIED ADVERTISING

Deadline: Friday noon prior to week of publication unless changed by holiday. Mail to: Div. 3162 (M0125).

RULES

1. Limit 20 words.
2. One ad per issue per category.
3. Submit in writing. No phone-ins.
4. Use home telephone numbers.
5. For active and retired Sandians and DOE employees.
6. No commercial ads, please.
7. No more than two insertions of same ad.
8. Include name & organization.
9. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

COPPERTONE refrigerator, Frigidaire, \$400; Nissan gymnastic mini-trampoline, \$50; pine desk, stained walnut, \$50. Pate, 293-5393.

ANTIQUA CHAIRS; needlepoint; glasses; plates; vases. Strance, 298-0258 after 5.

RANGE, Corning, glass top, slide-in, self-cleaning oven, needs some repair. Miller, 268-5992.

FIVE 165x15 Michelin radial tires, \$75; 10-spd. bike, \$25; Soloman 444 bindings, \$40; new 914 Porsche ski rack, \$45. Mason, 281-3052.

LADIES' Nordica ski boots, size 7 1/2, \$75; Ehrbacher skis, 165cm w/Gezee bindings, poles, \$65. Noack, 268-4806 after 5.

UPRIGHT FREEZER, 15 cu. ft., \$175. Patterson, 299-1062.

AIR COMPRESSOR, 1/2 HP, 110/220, Wards, w/paint gun & hose, 10 gal. tank, \$125. Baxter, 344-7601.

KITCHEN TABLE, 48" round, Formica top, 4 high back chairs, \$100; men's, ladies' bowling balls & bags, \$20 ea. Haid, 292-0159.

QUEEN SLEEPER sofa, matching chair, Herculon fabric, beige w/ brown weave, \$300; square end table, large lamp, \$50 ea. McAl-laster, 298-8371.

WALL (or door) 18-pr. shoe rack, \$6; girls' AMF 26" bicycle, needs 1 tube & brake wire, \$15; Eiger hiking boots, size 7, worn once, \$25. Treadwell, 884-4221.

BEEES, one colony consists of 2 brood chambers, 3 med. supers top & bottom, \$150. Dobias, 256-7476.

WINDJAMMER mounting bracket & wiring harness for Kawasaki KZ650; luggage rack, \$25 for either. Barnard, 831-4114.

L. L. BEAN Maine hunting boots (11); Bean pullover parka (M); both almost new; Coleman lantern; sheath hunting knife. Bailey, 294-4218.

SLIDE-IN camper shell for LWB, sell or trade; need tires & rims for '60 Jeep. Knight, 836-7149.

200CM Kneissel touring skis w/Rot-tetoffg bindings, \$50. Brice, 344-4855.

18" diameter wrought iron light fixture; Wards humidifier; children's phonograph; games, 8-track, AM-FM car stereo; basketball backboard & hoop. Prevender, 299-5253.

ELEC. floor polisher w/buffing brushes & pads. O'Bryant, 268-9049.

PIANO, Acrosonic spinet, tuned, no scratches, \$1000. Esterly, 881-1973.

RABBITS (bunnies). Hesch, 294-3298.

WHISKEY barrel dining room set/ 4 chairs; full size headboard/frame; chrome/brown corduroy couch/ chair; Craftsman 9-dwr. toolbox. Gleason, 836-5612.

DOUBLE PANE sliding glass door, 80" x 72", dark gray alum. w/screen, \$80. Hannum, 296-2095.

ELEC. ORGAN, \$15; 2 metal open house signs, \$15; 32" panel door, \$5; 36" screen door, \$5. Denish, 256-1559.

GARAGE SALE, Nov. 14, including: cherry wood dining room set, 6 chairs, buffet; 2-piece sectional. 11708 Palm Springs NE, Hodges.

WHITE living room type chair, \$50. Schroeder, 344-1011.

PUPPIES, Half miniature dachshund, 4 weeks old, \$10. Puccini, 255-0568.

SKI RACK, Peter Kennedy, \$35; woman's ski boots, Dolomite leather lined Flo, 7 1/2 narrow, \$75. Anderson, 884-5163.

ANTIQUA 42" round oak table w/leaf, lion's head & foot legs, \$649. Schmale, 293-0784.

COMBINATION bumper pool & poker table. Chavez, 831-5517.

GARAGE SALE, Sandians Club, 9 to 1 only, Sat., Nov. 14: children's clothes, toys, household items, etc., 9 families, 12100 St. Marys NE. Molecke, 296-5850.

30- & 10-gal. aquariums; wrought iron stand, all accessories, \$125; Sears twin mattress, \$50; set both \$90. Gabaldon, 266-0028.

ECKERT'S 110" sofa, \$250; chrome recliner, \$150; chrome & glass table, \$125. Dippold, 821-5750.

GE lg. capacity dryer, white, approx. 7 yrs. old, \$65. Lawson, 296-5759.

ODYSSEY video game, \$45; coffee table & end table, \$10 ea.; mags for Datsun Z-car, best offer. Mercer, 821-6449.

GIFT BAZAAR Sat., Nov. 14, 9-5, 5316 Revi Don NE, follow signs at Juan Tabo & Eubank. Self, 296-4137.

RATTAN dining room table w/48" round glass top, 2 captain's chairs & 2 side chairs w/burgundy seat cushions, \$1500 or best offer. Dyer, 884-3687.

BUTCHER GOATS, \$40; refrigerator, \$100; power mower, \$25; etageres, uncrated, \$20, 3 for \$50; metal yard chairs, \$10. Nielson, 873-2615.

GARAGE SALE: 616 Arizona SE, Nov. 14-15, furniture, clothes, books, records, lawnmower, etc. Olson, 268-2227.

COUCH, Spanish traditional, custom built, 8'; Signature gas dryer, \$150. Dominguez, 821-8826.

TWO 8'x7' garage doors, \$25 ea.; boys' 24" 10-spd. bicycle, \$50; boys' 20" 2-spd. bicycle, \$20. Abbin, 296-7678, 883-8665.

PING PONG table, \$25. Kozlowski, 298-4869.

JANSPORT D3 backpack, fits over 5'8", \$60; Realistic turntable, model LAB 100 w/ADC cartridge, \$35. Southwick, 281-3782.

CROSS COUNTRY Jarvinen Plastone skis, pole, shoes (size 5), \$60; sell separately, used 3 times; glass, 35x62, reg. \$36, sell \$24. Chen, 298-2422.

BEARCAT 220 scanner, programmable 20-channel, \$150. Kish, 298-7090.

NEED loving home w/ample running area for big, lovable St. Bernard; female, 3 yrs., craves affection. Bell, 821-7148.

FURNITURE: maple wing chair w/ matching ottoman, coffee table & corner table, colonial brass floor lamp. Randall, 821-0388.

YOUNG albino Cockateel, semi-tamed, needs lots of attention, small cage included, \$75. Peterson, 299-9106.

QUEEN SIZE box springs, Sealy Posturepedic, never used, \$100; Hanson ski boots, men's size 8, used 3 seasons, \$45. Brinker, 293-0225.

BOZAK large cabinet speakers, \$300. Stephenson, 821-2088.

FOUR 195/70 HR14 steel blackwall radials, Bridgestone RD106, 2000 miles, fit Datsun Z, Mercedes, BMW, others, \$160. Christensen, 292-1491.

ANTIQUA OAK PIANO, \$600 or best offer. Tricoglou, 869-3265.

RIFLE reloading equip.: press, 30/06, 30/30, 25/06 dies, powder measure, scale, reloading handbook, some powder & rifle primers. Conrad, 299-5316.

**Next LAB NEWS
Issue Date Is
Dec. 4, 1981**

**Deadline Is Noon
Wednesday, Nov. 25**

BABY combination automatic cradle, swing & travel bed, Swingomatic brand, \$20. McBride, 299-4347.

FREE for parts, portable dishwasher; Hotpoint 30" elec. range, best offer; fireplace screen, mounts inside fp, \$11. McConahy, 884-5071.

RUGER .22 auto. pistol, 6" barrel, target sights & trigger, w/holster, \$155. Drury, 293-1929.

ALBUQUERQUE Sunset Mausoleum niche for urn, eye level, well below current price. C. H. Maak, 2734 South Oak, Wichita KS 67217.

PHOEBUS camp stove for back-packing, 4 1/2" x 5 1/2", \$25. Benton, 877-2473.

2 PLANT POLES w/hooks, \$4 ea.; Colorburst 50 instant camera, \$15. Simons, 821-9340.

ANTIQUA brass glass screen, new, 30" to 37"W, 28" to 31"H; 40"W, 30" H wrought iron fp screen; 32" exterior pre-hung door; 36" wood screen door. Mantelli, 298-2603.

MATTRESS, full size, extra firm. Ingram, 298-0390.

TWO outboard motors, Scott Atwater 40 HP, elec. start, repair manuals, one runs—other partially dis-assembled. Clark, 869-2569.

TRANSPORTATION

SCHWINN 3-spd. girls' bicycle, \$60. Pate, 293-5393.

PEUGEOT 10-spd. bike, 24" wheels (child's size), \$75. Magnani, 299-8693.

76 DODGE Maxivan 8300, 360 cu. in. engine, 2BBL, PS, PB, AC, 48,000 miles, custom interior, new tires. Perryman, 294-6113.

77 Malibu Classic 4-dr., 38,600 miles, \$4200. Varoz, 293-4943.

'65 EL CAMINO 2-spd. auto., extra wheels & radio, needs work, \$500 or best offer. Potter, 831-0155.

'66 TOYOTA Landcruiser, 4-wd, engine needs work, \$600. Patterson, 299-1062.

JAWA CZ motorcycle, \$250. Montoya, 243-5868 evenings.

70 OLDS Cutlass 2-dr., PS, PB, AT, AC, 350 V8, one owner, 87,000 miles, \$1200. Haid, 292-0159.

74 TOYOTA Celica 5-spd., AC, \$1300. Moody, 294-0482.

79 KAWASAKI KX80 motocrosser, 6 hrs. riding time, never raced, \$575 or make offer. Barnard, 831-4114 evenings.

76 HONDA Civic, CVCC, hatchback, 5-spd., 54,000 miles, \$2600. Bryant, 299-1292.

74 VW BEETLE, white/sunroof, \$1950. Evans, 268-7039.

79 TOYOTA Corolla liftback, wine w/beige interior, 5-spd. trans., 35,000 miles, AM/FM cassette, hitch, \$4600, single owner. McKinney, 842-5158 before 2 p.m.

'80 YAMAHA Endore, low mileage. Durand, 821-3064.

79 CHEVETTE, 30 mpg, 14K miles, AT, AC, PS, PB, tilt wheel, deluxe int./ext./2-dr. hatchback. Lawson, 296-5759.

75 BRICKLIN, air system doors, new carpet, 26,000 miles. Perkinson, 821-5206.

73 WINNEBAGO motorhome, class A, 21', 26,000 miles, always garaged, fully equipped, w/extras, \$13,500. Fry, 884-4459.

450 HONDA MC, DoHc w/fairing & luggage rack, \$550; 80cc go-cart, \$175; 3 coffee tables, 30x32", \$35 ea. or all for \$90. Powell, 877-4939 after 5.

70 GREMLIN, runs ok but needs work, \$400. Volk, 299-1702.

70 CHEVROLET Impala, 4-dr. HT, 350 eng. which is seized, AC, auto, new starter, brakes, \$400. Smatana, 299-6278.

'66 MUSTANG 289 V8, mech. decent, needs upholstery & some body work, make non-insulting offer. Bell, 821-7148.

BICYCLE, Nishiki Marina Mixte (women's frame), new (less than 20 miles) \$225, asking \$150; 79 Husqvarna 390WR dirt bike, low mileage, NADA book \$1350, asking \$1100. Bailey, 299-0184.

'77 FORD VAN, Econoline 150, 34,000 miles, captain's chairs, \$3950. Dalphin, 265-4029.

BICYCLE, 10-spd., 26" wheel, 20" frame, \$50; Pinto bucket seats, \$25 for pr. Roberts, 881-2815.

BICYCLE, 26" 3-spd. Sears, \$35. Bertman, 294-8350.

'77 HONDA 750 four, new tires, new chain, \$1250 or best offer. Atkins, 298-5762, 11609 Bellamah.

'77 CADILLAC Fleetwood Brougham D'Elegance, fully loaded, asking \$6495. DeVenzeio, 822-0356 after 4.

'77 MONTE CARLO, AC, PS, PB,

stereo, asking \$3600. Garner, 298-2352.

'75 NOVA coupe 350, 2 Barrel std., AM-FM-Tape, AC, new radials, NADA \$1975, \$1700 takes. Clark, 869-2569.

REAL ESTATE

HOUSE TRAILER, 1977, 14x65, 2-bdr., 1 bath, AC, W-D, carpeted. Dow, 821-3974 Sun.-Fri., 9-4.

FOR LEASE: Sandia Heights town-house, 3-bdr., 2 bath, completely furnished, 6 mos. lease, \$750/mo. plus elec. Jones, 299-1658.

LEASE w/wo buy option, 4-bdr. house near Tramway & Montgomery (option allows use of 9% money). Szenasi, 299-1495.

4-HILLS, 3-yr.-old custom 5 bdr. & study, 3345 sq. ft., swimming pool, view, appraisal \$177,000, 10% w/substantial down, 12% w/25% down. Chen, 298-2422.

CHOICE Corrales eastside acre with apple trees, terms. Ellingson, 299-4056.

WANTED

CAR SEAT: Strolee-We-Care/Bobby Mac; tire chains, radials 185:14. Shephard, 298-4879.

CRAFTSMAN lathe & other wood-working tools, machine or hand. Long, 296-2590.

CAMERA 4-spd. 6, 5 or more yrs. old. Baxter, 344-7601.

FIBERGLASS or insulated shell for '79 Datsun short bed pickup. Valdez, 822-1870.

ANY information or possible source for: Japanese effort to develop nuclear weapons during WWII. Dalby, 268-3598.

WOMAN babysitter in my home, Thursday afternoons 12:30-5:20 for children ages 5 & 9. Schroeder, 344-1011.

TWO FEMALE ROOMMATES: 3-bdr. house, quiet NW neighborhood, no pets, big yard, \$120/mo., 1/2 utilities. McKinney, 842-5158 before 2 p.m.

BATHTUB, porcelain on cast iron, not antique, good condition. Johnstone, 898-5165.

BLACK SUIT that approx. fits man who wears medium shirts w/33" waist. Swenson, 821-8363.

BABYSITTING in my home, Lomas & Morris area, experienced, references. Roeschke, 298-0365.

LEAF shredder driven by gas or elec. motor. Erickson, 298-4416.

BEDSIDE tray/table for hospital bed. Finning, 298-0743.

250 C.I.D. Chevrolet engine, rebuild-able, w/truck 4 spd. trans., bell-housing clutch, etc. Bailey, 299-0184.

WOMEN wanted to play on city league basketball team, fee \$20, season starts Dec. 1. Roeschke, 298-0365.

LOST & FOUND

FOUND: In Bldg. 887, Oct. 30, men's wire frame glasses, silver color, black case. Harrington, 4-7885.

Casino Night Set Nov. 21

HAPPY HOUR TONIGHT gets rolling right after work and barrels along until midnight or so with special prices in effect all evening. Youngblood holds the bandstand while Gary Waters entertains in the main lounge. The dining room is open from 5:30 until 9 with *a la carte* selections of steaks, seafood and a chef's special.

Next Friday, Nov. 20, a new group called Wildflower has been booked for the ballroom and the thing about Wildflower is this: They play contemporary tunes for the first half of the evening and then after intermission, they change costumes, slick their hair back with a little Wildroot cream oil, produce a swinging '50s sound and call themselves Frankie and the Corvettes. There are four musicians and a female vocalist.

ON MONDAYS watch the NFL action on the tube and enjoy a little action in the Club lounge. Starting at 6:30, a selection of super sandwiches is available with a couple of beers or well drinks included for a special price of \$2.75. Last week, a good group gathered and much enthusiasm was exhibited all around.

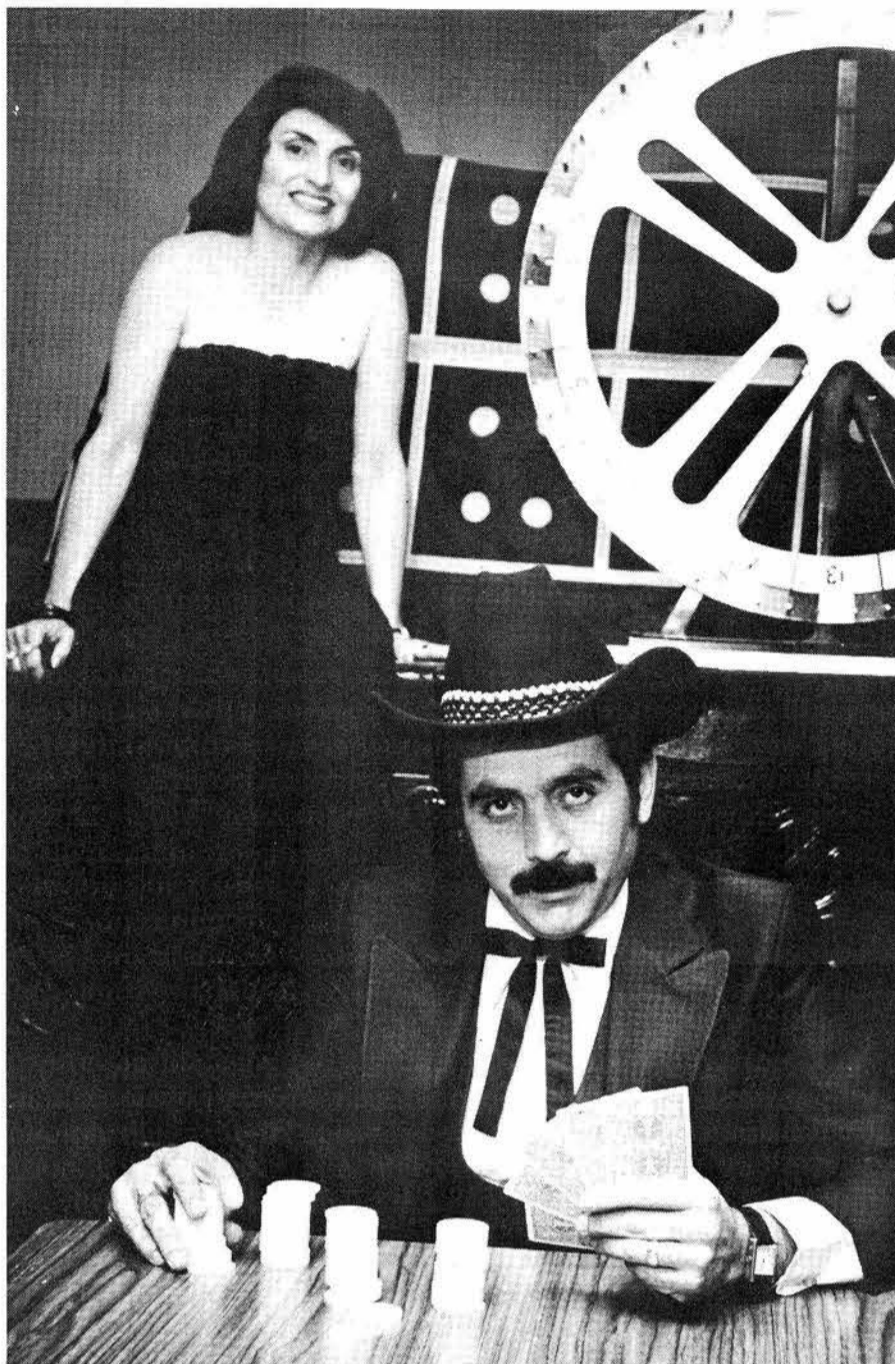
MIDWEEK HAPPY HOURS include the Tuesday night goodie and munchie spread and the Wednesday three-for-one specials.

ON THURSDAYS, try the Beef 'n Burgundy buffet. The steamship round of beef is generously served, the salad bar is spectacular and a variety of desserts is offered. A carafe of wine is included in the \$6.75 tab.

CASINO NIGHT, Saturday, Nov. 21, is shaping up as a spectacular. In addition to the Las Vegas-type casino action with blackjack, craps, chuckaluck and like that,



"Thanks for a wonderful evening, John, and I'll always cherish what you told me about field-desorption tomographic microscopy."



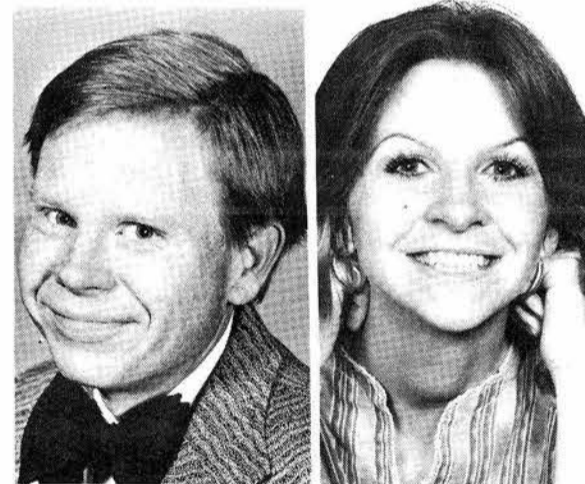
CASINO NIGHT Saturday, Nov. 21, turns the old C-Club into Las Vegas on the Rio Grande where a dollar in real money buys a bundle of play money for wagering. Virginia (3163) and Pro Padilla (3743) will be among the 50 volunteer dealers inviting you to try to beat the house.

Elton Travis and the Westernaires will play for dancing with time out for a comedy act floor show. Richard and Karen Breeding are talented performers good for lots of laughs. A super supper will be available and door prizes will be awarded. You trade \$1 admission (real money) for a bundle of play money and try to beat the odds. The action starts at 7 p.m.

TRAVEL—"The recently completed Canyon de Chelly trip was so popular that we plan another one next year," says Travel Director Frank Biggs (4231). "There will be a post-trip meeting at the Club (7 p.m., Nov. 19) for this trip and the recent Cumbres-Toltec tour. Everyone is invited to share the photographs taken by Club members during these trips."

A few seats are available on the Dallas Cowboys-Six Flags Over Texas trip (Nov. 25-29, \$226), Las Vegas (Dec. 27-30, \$137), Disneyland-Rosebowl Parade (Dec. 26-Jan. 2, \$368) and the Washington, D.C., package (April 3-10, \$300 plus airfare). Check with the Club office about availability of space on the Caribbean cruise (Dec. 13-20, \$1031).

"We are now organizing travel plans for next year," Frank says, "and we welcome suggestions on this tentative schedule—Chaco Canyon, April 24; Las Vegas, March 14-17, May 30, June 2, Sept. 19-23, and Dec. 26-29; Mexico, May; Cumbres Toltec, June 26, Sept. 25, Sept. 25-26 and Oct. 3; Durango-Silverton train, July 10-11; Grand Canyon, July 31-Aug. 1; Gallup Indian Ceremonial, August; Can-



COMEDY ACT—Richard and Karen Breeding perform at Casino Night.

yon de Chelly, Oct. 30-31; Dallas Cowboys, Nov. 25-27; Mazatlan, Nov.; Hawaii, Oct.; and a cruise in December. Stop by the Club lobby tonight between 5 and 7 and talk about travel."

Death

Harry Holmes of Mechanical Design Division 1545 died Oct. 27 after an illness. He was 60.

He had worked at the Labs since April 1951.

Survivors include his widow and two daughters.

