



Charlie Brumfield Named Director of Labor Relations

On March 1, Charlie Brumfield joined the Labs as Director of Labor Relations 3800. He came to Sandia from Western Electric's Hawthorne Works in Chicago.

His WE career began in Kansas City, Mo., in 1961 following graduation from high school. He worked during the day as a sandblast operator and attended school at night. He received his BA in economics in 1967 and his doctorate of jurisprudence in 1969 from the University of Missouri. During those years he had been promoted through the first two levels of supervision in the labor relations group at Kansas City. In 1970, Charlie was transferred to Headquarters in New York City as assistant manager of Labor Relations. Four years later he moved to the Columbus Works as manager of Personnel and Labor Relations; he also served as the bargaining agent at the location. From 1978 until the present, he's held numerous managerial positions at Hawthorne.

Charlie served as a member of the Western Electric National Bargaining Team in 1971 and 1974. He is a member of the Missouri Bar Association.

Unfamiliar with the southwest, Charlie seems delighted with his move. "I like the quality of the air and the weather, and the altitude seems to agree with me." A golfer, Charlie purchased a home in Four Hills near the golf course. His other leisure time activity is reading. His children remain in Illinois to finish school. He has a 21-year-old son and a 19-year-old daughter, both attending the University of Illinois. His 17-year-old daughter is finishing her senior year in high school, and plans to join her father after graduation.

ASME Meets March 23

The New Mexico Section of ASME meets Wednesday, March 23, at 7 p.m. at the Albuquerque Federal Savings and Loan Association, 4901 Central NE. Bruce Hanche (7552) will discuss holographic interferometry.

Donald E. Procknow
President

Western Electric

222 Broadway
New York, N.Y. 10038

7 February 1983

Dear George,

I enjoyed the January 21 issue of "Lab News" which summarized & reviewed some of the technical accomplishments of 1982.

These achievements cover a wide range of activities. They are very impressive and result from the enthusiasm and dedication of Sandia employees.

Well done -

Mr. Geo. Dacey,
Pres. Sandia Labs,
Albuquerque, N.M.

Sincerely,
Don

WESTERN ELECTRIC President Donald Procknow sent this congratulatory letter to Mr. Dacey after reviewing the Technical Accomplishments 1982 issue of the LAB NEWS. Mr. Dacey asked that we share it here as a way of thanking the Sandians who worked on the write-ups as well as those responsible for the accomplishments.



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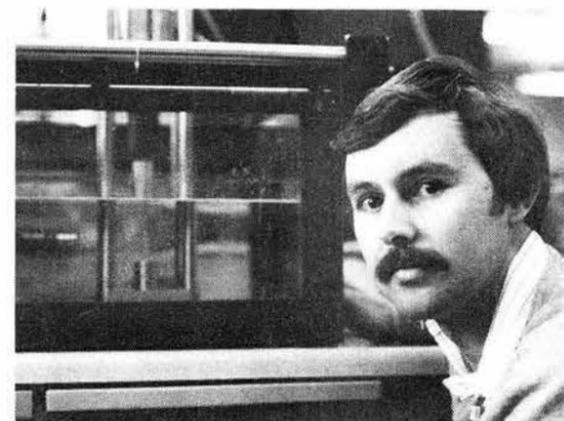
MARCH 18, 1983

Ultrasonic Research Facility

Sound Waves 'See' Defects

Ultrasonic nondestructive evaluation (NDE) is a technique in which high frequency acoustic energy is used to examine materials for defects. Similar in principle to sonar or radar, ultrasonic methods transmit sound energy through a substance and receive reflected energy when the sound impinges on a "discontinuity" or defect. From this echo, defects can be located and described. Also, information about the host material (such as modulus and grain size) can be extracted from its ultrasonic response. Ultrasonic NDE is the basis of Graham Thomas's (Acceptance Technology Division 8444) development of a Computerized Ultrasonic Research Facility.

One application of the facility has been



GRAHAM THOMAS (8444) in the Computerized Ultrasonic Research Facility he designed. In the tank behind him, high-frequency acoustic energy is transmitted through sample materials; from the response or echo, defects can be located and other information obtained about the host material.

(Continued on Page Three)

Sandian Is Quite A Judo Coach

In 1902 Theodore Roosevelt converted a section of the White House to a *dojo* (judo workout area). His instructor was one Yoshiaki Yamashita, the ablest disciple of Jigoro Kano who in 1882 had introduced a new sport in Japan called *kodokan judo*. "Kodokan" means "a school for studying the way" and judo means "the gentle way."

These intriguing facts come up during a talk with Tony Anaya (3613), who owns a local judo club. He's also the father and head coach of Darlene, 21, Gloria, 14, and Andrew, 12. He's quite a coach!

Darlene, a second-degree black belt, is the top-rated American *judoka* (judo player) in her weight class. She's a member of the world's top five in her class and has won 14 national and six international titles. She'll represent the U.S. at the Pan American Games to be held at Caracas, Venezuela, on Aug. 14-19.

Gloria is also coming along. A third-degree brown belt, she's the senior champion in her class, has won the gold medal at the Desert Judo Championship, and is now working toward the Senior Nationals.

"Women's judo isn't an Olympic event yet," says Tony, "but there's a good chance that it will be in the 1988 Olympics scheduled for Seoul, Korea. And if it is, I expect that both Darlene and Gloria will be on the U.S. team."

"My son Andrew started practicing judo when he was 3½. When Andrew's 18, I've arranged for him to go to Japan for a couple of years to study judo. We're both studying Japanese in preparation. Andrew wants to represent the U.S. in international competition, and we have to plan ahead."

Tony himself is a third degree black belt. He hopes to enter the U.S. national competition in Los Angeles in April. He is also a coach for the American team in the British Open Championship next October in London.

It's obvious that the Anayas are not only strongly committed to judo but are also outstanding practitioners of the sport.

"I started learning judo when I was 18," says Tony. "One of my first teachers was

Antojitos

Real Engineers Remembered--Being a Distinguished Member of Technical Staff is all very well, but I was distraught to note how few Real Engineers from the Good Old Days showed up on the list. What's a Real Engineer? I've kept my ears open these 15-20 years (and I'm easily inspired by pseudo-books like Real Men Don't Eat Quiche), so I can tell you.

Real Engineers:

1. Think in analog, never digital.
2. Wear gray suede safety shoes.
3. Never touch keyboards or view CRTs.
4. Don't write reports.
5. Wrap all inanimate objects in yellow tape.
6. Always use slide rules (never calculators).
7. Don't have clean fingernails.
8. Never (if male) wear ponytails.
9. Never use lead if gold will work as well.

A Nationally Known Lab, Right?--But not by everyone. Martin Nee (9761) sent us a letter he'd received addressed to "Saudia Nat Labs." But my favorite is the one received by Ed Graeber (1822) addressed to "Sandy and National Laboratories."

Sometimes the Postal Service deserves credit just for getting a letter delivered. Ex-LAB NEWS photographer Basil (Bill) Laskar got this one from a company named after the founder of the U.S. Post Office: Nasil Laskerrth, 2517 Wbonsin NE, Albuquerque, NM.

•BH

Leo Poulin, now an elementary school coach. In 1961 he started the judo club that I took over in 1973. The club dues sponsor judo sessions and trips for kids. I have about a dozen kids from 6 to 16 in the junior category, and I take them all over the country to tournaments.

"I have about 60 students in the club, many of them Sandians. Judo is a good outlet for stress — in fact we have some lawyers and doctors who say they feel good, both mentally and physically, after a vigorous workout.

"For youngsters especially, judo provides a chance for them to achieve something in a sport. Many kids are either too small or not strong enough for basketball,

football, or baseball. Judo gives kids a feel for what it's like to compete individually and as a member of a team. A sport should also teach a little more about life than simply accumulating points or winning. In judo you learn to respect the person you work out with — you learn to accept respect as well as give it. Kids learn respect for persons as well as laws through judo. Discipline is also needed to maintain yourself in good physical condition — you can't smoke or drink and expect to do judo."

By the way, it took Teddy Roosevelt three years to qualify for his brown belt. Yamashita also taught judo at West Point and is known as the "father of American judo."



THE ANAYA family judo team: (l to r) Andrew, 12, Gloria, 14, Tony (3613), and Darlene, 21, who has 14 national and 6 international titles.

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ALBUQUERQUE, NEW MEXICO
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Editorial Offices in Albuquerque, 87185
Phone 505/844-1053 FTS 844-1053
In Livermore 415/422-2447 FTS 532-2447

BRUCE HAWKINSON, Editor
DON GRAHAM, Assistant Editor
CARL MORA, NORMA TAYLOR, writers
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Supervisory Appointment



HENRY HANSER to manager of the Engineering Technology Department 8440, effective March 1.

He joined Sandia at Livermore in 1967, first working in the Advanced Development Division, then the Component Development Division. He also worked on the W75 and B77 projects. Since 1977 he has been supervisor of the Engineering Division II 8445.

Henry's education includes a bachelor's degree in mechanical engineering from California Polytechnic University at Pomona and a master's in engineering mechanics from the University of Santa Clara.

He and his wife Penny have three children, one of them married, and reside in Ripon. Henry's recreational interests include water sports and snow skiing.

Take Note

Terry Lowe of the Materials Science Division 8316 has been named a Visiting Scholar at Stanford University for a one-year term.

Terry will work with professor Alan Miller in the department of materials science and engineering. His project, sponsored by the DOE Office of Basic Energy Sciences, involves mathematical modeling of creep and fatigue in metals. The results of this work will be applicable to the solar central receiver and other Sandia programs.

His assignment begins in March on a halftime basis. Most of the work will be accomplished at Sandia where Terry will make extensive use of the SNLL computer facilities.



AN "UPSET WELDER" and its resistance welding technique was demonstrated by Annette Newman (8415; foreground) for Chabot College Valley Campus officials who recently toured Sandia's Joining Model Laboratory. From left: Chabot and Granada High welding instructor George Wilson, Chabot director of instruction Don Milanese, Valley Campus dean Barbara Mertes, counselor Alene Hamilton, and welding instructor Robert Dahl. Annette is a recent graduate of the Chabot welding program. Three Sandians, Lou Tallerico, Barry Formisano and Sam Johnson (all 8415), are on the Chabot College welding advisory committee.



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Sound Waves 'See' Defects

to study how the ultrasonic signal is changed when deformation alters the microstructure of metals and alloys. Graham and Steve Goods of materials Science Division 8316 have been examining this phenomenon in aluminum. "A large body of evidence suggests that the deformation-induced nucleation of voids or cavities within metals ultimately controls the fracture characteristics of the material," says Steve. "The presence of these voids within a material might cause ductility loss or mechanical failure in a structural component subject to either continuous or cyclic loading. For this reason, it is useful to develop a technique that will indicate the presence of cavities within a fabricated part before its use."

Initial studies were conducted on a precipitate-strengthened aluminum alloy

(6061-T6). The alloy contains a well-developed precipitate or particle microstructure. These precipitates are known to be potential sites for the formation of cavities. When tensile specimens are deformed, voids result from particle fracture or separation of the precipitate matrix interface. "We send ultrasonic energy through an aluminum sample that has been highly strained," says Graham. "We can then measure changes in the alloy microstructure by observing changes in the acoustic waveform."

Two procedures for correlating ultrasonic attenuation with strain (deformation) levels in the aluminum have evolved. First, an aluminum tensile bar was mechanically deformed in a testing machine, and ultrasonic energy was passed through the sample at uniform strain intervals. These waveforms were processed and stored in a minicomputer for future data reduction. Attenuation information was then extracted from the ultrasonic data; changes in the attenuation indicated strain-induced microstructural changes. Metallographic observations of the deformed specimens revealed the presence of voids at the strain levels associated with the onset of acoustic attenuation.

A second procedure for data acquisition involved scanning a tensile bar that was deformed nearly to fracture. "By measuring the sample ultrasonically at uniform intervals along the gauge area, we acquired signals that correspond with a known strain state," says Steve. "After the ultrasonic data were analyzed in the same manner as in the previous approach, similar changes in attenuation as a function of strain level were measured."

The evidence suggests two strain regions that exhibit very different ultrasonic responses. First, for specimens elastically or plastically deformed to small strain levels, the dominant ultrasonic attenuation mechanism is one of dislocation-caused harmonic generation. After larger strain levels (approximately 10 percent), a different attenuation mechanism was noted, that of Rayleigh scattering caused by void nucleation and growth at the precipitates within the alloy.

After an ultrasonic scan of the fully deformed aluminum samples, they were annealed to reduce the dislocation density. "Then by retaking the ultrasonic data, we can separate the component of attenuation caused by dislocations from the attenuation caused by void formation," says Graham.

Eventually these ultrasonic nondestructive evaluation techniques will be applied to stainless steel and high-strength engineering alloys.

Congratulations

Donald and Cindy Jensen-Miguel (8262), a daughter, Heather Ann, born Feb. 12.

Sympathy

To Glenn Rambach (8522) on the death of his father in Boca Raton, Fla., Feb. 13.

To Dick Cook (8272) on the death of his son in Sacramento, Feb. 17.

feed_{back}

Q. Morning traffic on Eubank has gradually become slower and more backed up. It now often takes me 20 minutes to travel from Central and Eubank to the Eubank gate. Is the problem that more Sandians are now using that gate because of the new buildings in the southeast part of Area I? Is anything being done about the traffic problem?

A. Many Sandians have noticed an increase in traffic congestion at the Eubank gate during morning and evening rush hours. The city, military, and Sandia traffic engineers are reviewing this problem. The primary cause of the increase appears to be the opening of Tramway Expressway and Juan Tabo interchange, which has invited motorists formerly using Wyoming to use Eubank. Four Plant Engineering employees drove the same route on several occasions starting at the time you mentioned, and it took an average of six to eight minutes to reach the Eubank Gate from Central. It is felt the 20 minute time you quoted is an exception rather than a rule. An unpredictable number of traffic backups may occur in the morning when motorists without base stickers attempt to enter the Eubank gate. The Air Police must stop traffic to turn these motorists around and give them directions on where to enter the base.

R. W. Hunnicutt - 3600

Q. Theft from Sandia is probably as big a problem as it is with other companies. Some of this theft occurs because employees feel the item is of small value or because they cannot obtain it elsewhere. To reduce this problem and to reduce time off when it is necessary to obtain items during working hours, would it be possible to have employee accounts that could be used to buy items from Sandia (with an appropriate surcharge for handling)?

A. Since there is a strong continuing interest in reducing theft and lost working time, your suggestion is appreciated. However, Sandia's assets are all government owned. As such, their disposition is highly regulated. Only items excess to the needs of the government or considered as scrap may be sold to individuals. Therefore, it would not be possible for Sandia to establish a procedure for sales of the "more desirable" items to employees.

P. M. Stanford - 0100

Q. Most companies make available to their employees the commercial products they produce at or near cost. Is it possible that this will happen with AT&T (and its subsidiaries, such as Sandia) once AT&T enters the retail market in a greatly expanded manner because of divestiture of its operating companies?

A. We at Sandia do not know how AT&T's expansion in the retail commercial area will affect employees, so there are no plans at this time to extend employee benefits in this area. However, Sandia's management will be watching the developments closely.

P. M. Stanford - 0100



BILL SULLIVAN (1524), standing; JOHN CUMMINGS (1512), and THELMA HARRELL (0310-1)

Supervisory Appointments

BILL SULLIVAN to supervisor of Applied Mechanics Division IV 1524, effective Dec. 1, 1982.

Bill joined the Labs in 1972 as an MTS with the fluid mechanics and heat transfer group, working primarily on underwater acoustics. He has worked on weapons analysis, reactor safety and, for the past five years, on structural analyses and economic studies on wind energy.

He earned his BS in ME from the State University of NY at Buffalo, and his MS and PhD, also in ME, from the California Institute of Technology. Bill is a member of ASME. He enjoys off-road motorcycling, skiing, and restoring automobiles. Bill lives in NE Albuquerque.

JOHN CUMMINGS to supervisor of Fluid Mechanics and Heat Transfer Division 1512, effective March 1.

John joined the Fluid Mechanics and Heat Transfer Department at the labs in 1975, working in experimental fluid physics. He later joined the laser physics group and, since 1980, has been with the Reactor Safety Studies Division 9441, where he was project leader for a hydrogen combustion program.

He received a BS and an MS in engineering, and a PhD in aeronautics — all from the California Institute of Technology. He is a member of the American Physical Society.

John enjoys coaching youth soccer, church activities, skiing, fishing, and camping. He and his wife Ellen have two sons. They live in the NE heights.

THELMA HARRELL to supervisor of Systems Research Support Section 0310-1, effective Jan. 16.

She came to Sandia in December 1965 as a division secretary. She was promoted to secretary of the Systems Research Support Department and, in 1975, became an administrative assistant for the group.

Before coming to the Labs, Thelma worked for the U.S. government for 17 years. She attended business college and

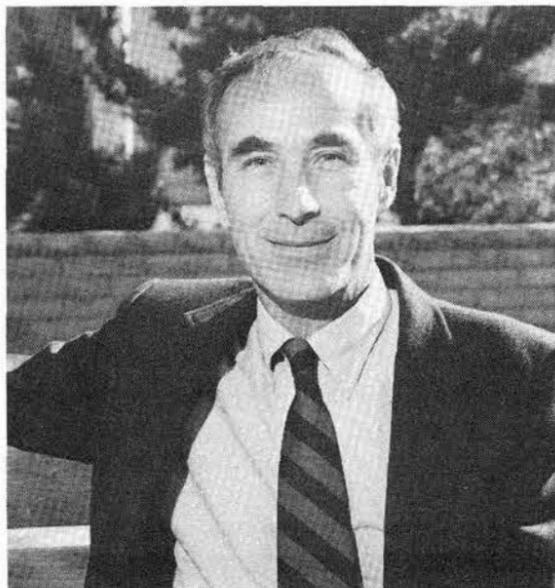
studied accounting and commercial law at Benjamin Franklin University in Washington, D.C.

Thelma enjoys oil painting, camping and fishing, and country living; she and her husband Tom live on the east side of the Sandias. They have four children and four grandchildren.

CHARLES LEE to supervisor of Systems Research Division II 0313, effective Feb. 16.

Charles has been with same group since he joined Sandia in August 1981 as an MTS. Before coming to the Labs, Charles had served 23 years in the Air Force, retiring with the rank of colonel. During the early years of his Air Force career, Charles was a navigator. For the last 15 years, he worked in R&D, primarily nuclear research.

He received a BS in metallurgical engineering from the University of Pennsylvania, an MS in metallurgical engineering, and a PhD in metallurgy, both from the University of Arizona. He is a member of the American Society for Metals. Charles enjoys long-distance running. He and his wife Glenda have three children — two still at home. They live in NE Albuquerque.



CHARLES LEE (0313)

Take Note

The Sandia Secretarial Committee, chaired by Pat Hamlet (2150), will present a Secretarial Seminar April 4-8 in the Mesa Room of the Officer's Club East, KAFB. Scheduling will allow Sandia secretaries to attend one of the day-long sessions during the week. The program includes a discussion of the Certified Professional Secretary program and the secretary's role in the automated office of the future by CPS Barbara Logan, instructor at T-VI; demonstrations of the latest word processing equipment and office supplies; a presentation by Dr. Judy Ewing (3330), "Panic Could Be Your *Second Choice*"; and tours of some Sandia facilities. Check with your secretarial coordinator for more information.

* * *

A recent addition to the LAB NEWS collection of New Mexicana is *Haunted Highways — The Ghost Towns of New Mexico* by Ralph Looney. A combination guidebook and history of more than two dozen of our state's ghost towns, it takes the reader to Loma Parda (known earlier as "Sodom on the Mora"), to Cabezon lying at the foot of the familiar volcanic neck of the same name northwest of Albuquerque, and, of course, to the many ghostly towns of North Highway 14 — Golden, Madrid, Dolores, and Cerrillos. For exploring our state, via auto or armchair, this book provides engrossing reading. It's \$8.95. Proceeds go to the South Highway 14 Village Project.

* * *

If a retirement, anniversary, or other big occasion is coming up in your office or shop, then consider as a presentation gift the latest arrival at LAB NEWS: a gold plated Sandia belt buckle. The design is the same as that of the existing silver-colored version, which has proven popular. The presentation buckle is nicely boxed, ready to present, and costs \$20. Proceeds help support the South Highway 14 Village Project. LAB NEWS is located in a trailer next to Bldg. 814.

* * *

IEEE will hold its annual conference Oct. 19-21 in Atlanta. Theme is "The Many Facets of Computer Communications." Abstracts (150 words) are due by May 1. A Call for Papers is available in the LAB NEWS office (M0125). Or call conference chairman Lois Thuss on 301/953-7100.

* * *

"Mount St. Helens: From Then to the Present" is the title of a speech by Ed Graeber (1822) to the 24th annual Northwestern New Mexico Regional Science and Engineering Fair tomorrow at UNM.

* * *

Sandia has nominated Solar Kinetics, Inc. of Irving, Texas, for the Small Business Administration's awards program for "Small Business Subcontractor of the Year." Solar Kinetics has been selected by a panel of judges as Region VI winner for 1983. This small company will now compete



IN TUNE WITH EACH OTHER — Gene Ives (9330) and daughter Kathy Clawson.

There's An Aria About This Family

Gene Ives (9330) and his daughter Kathleen Clawson will present a benefit concert for the Albuquerque Music Club scholarship program on March 20.

Kathy won the National Federation of Music Clubs' scholarship in 1980, so she was pleased to be able to help the Albuquerque affiliated club by giving a recital in its behalf.

The Ives are a musical family. Sandians are familiar with Gene's roles in many local and regional productions. Kathy's twin brother is an accomplished guitarist, and he also composes music. "My mother sings, and my younger brother, Jeff, plays in the rock band, 'Off the Wall,'" Kathy says.

Kathy has a degree in voice from UNM. In 1981 she was an apprentice with the San Francisco Opera Company. The following year she took advanced study with the Curtis Institute of Music in Philadelphia and at the University of Southern California. She has taught voice in the graduate programs at USC and UNM.

"When Kathy was still at home," Gene says, "she kept me on my toes. Every time I rehearsed a part, she was my technical critic. She made sure that I pronounced each word correctly, among many other things. In fact, Kathy knows all the baritone

parts of every production I've appeared in. I used to worry that I was going to harm her beautiful soprano voice.

"However, in this instance, I'm supporting her — this is her recital. You know, people often tell me after they hear her sing that her voice is 'cultivated,' that they recognize the work and training that she has undertaken. That's very true, and I reply that my voice is also 'cultivated' — it's been plowed under!"

"Dad is helping me," Kathy says. "I always feel very comfortable singing with him, and that's why we're opening and closing the program with duets."

The opening duets will be from the work of Henry Purcell, followed by operatic duets from three Mozart operas. "Those are the fun ones," Gene says. Kathy will sing music of Brahms, Duparc, and Benjamin Britten.

"We're ending the program with several musical comedy duets," Kathy concludes.

Gene has no immediate musical commitments — he's busy completing a large remodeling job on their home. Kathy will be singing in "Carmen" with the Albuquerque Opera Theater the last week in April.

The recital will be held at the First Methodist Church at 4 p.m. on March 20. Tickets are \$5 each (\$4 for senior citizens). The church is located at 4th and Lead.

with nine other regional winners for the national award which will be presented in Washington, D.C. in May 1983 during Small Business Week. (Region VI consists of the states of Louisiana, Arkansas, Oklahoma, Texas, and New Mexico.) Sandia has nominated candidates for this award each of the last nine years. Eight nominees have won its regional award, and one nominee won the national award.

* * *

Jerry Esch (2631) recently participated in UNM's management training workshop

entitled "From Quality Circles to Total Quality Management." The workshop explored the cross-cultural development of quality circles and management in the U.S. and Japan and dealt with problems in integrating the two systems.

* * *

The Purdue Alumni Club will gather at the Black Angus Restaurant on Monday, April 4. All PAC men and women interested in attending can call Sydney McAhren (9412) at 296-5174 for more info and reservations.

'Tis the Season To be Wary

SLN: The recent rise in gas prices will likely result in a corresponding rise in the purveyors of solar space heating systems. Before buying one, however, the conscientious consumer may want to consider the points made in an interview with Mike Edenburn (9724). Mike not only works in the Solar Energy Department, but he also keeps up with the economics of heating a home in the Albuquerque area. We asked him to define the first step in buying a solar space heating system.

MWE: The first step is not to buy one. The first step is to reduce your heat losses. Start by putting weatherstripping around all doors and windows, sealing all cracks, and closing all unnecessary vents (electric clothes dryers, bathrooms, unused chimneys, and the like). Insulate all uninsulated attics, floors, and, if it's feasible, walls. And have your furnace checked for efficiency.

SLN: How do you do that?

MWE: Call a heating contractor or the gas company. They may be able to derate the furnace, adjust it for altitude, adjust the flame, clean filters, or check the combustion air source. You can get a booklet on the subject from the New Mexico Energy Institute at 117 Richmond NE.

SLN: Then buy a solar heating system?

MWE: No. Then add storm windows. Here's why. A really good solar collector has an average efficiency of about 40 percent. During the five heating months, November through March, 280,000 BTUs will fall on each square foot of south facing collector, and roughly 112,000 BTUs will be delivered to the house. (Some of that heat, in early November and late March, may not be needed.)

SLN: Storm windows can do better than that?

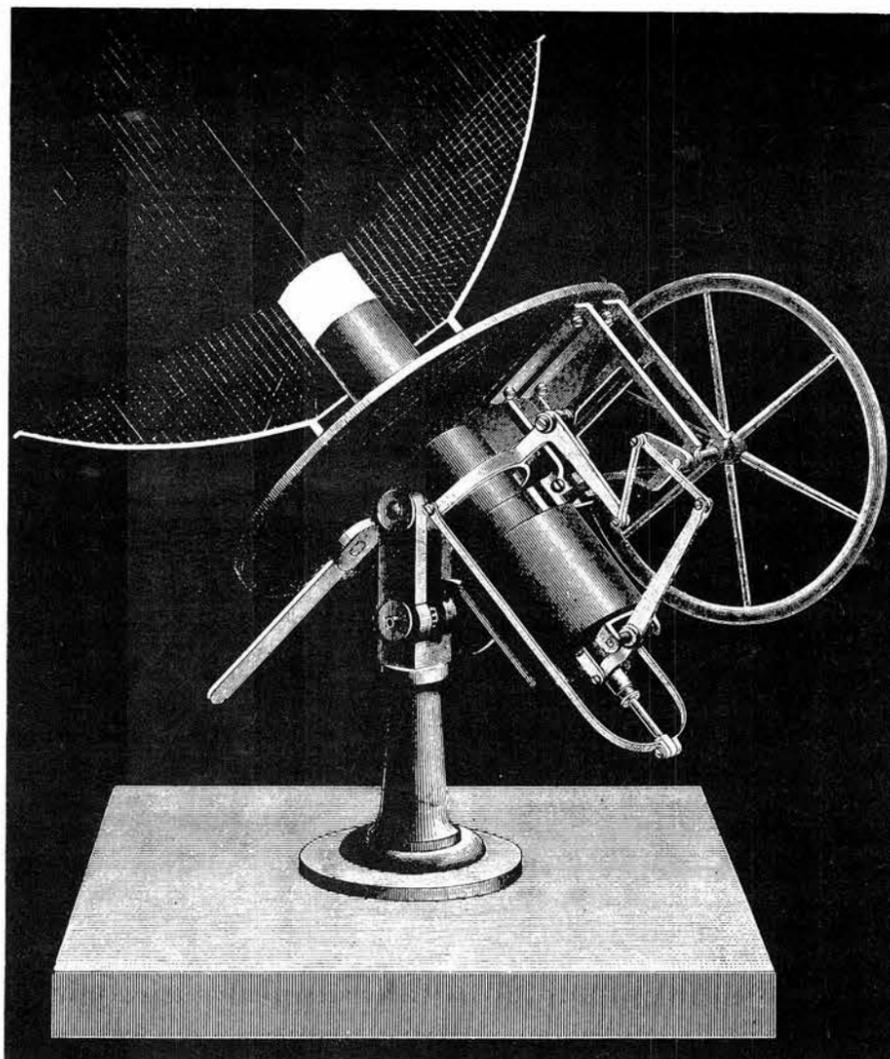
MWE: A single-glazed window has a low R value — thermal resistance, in other words. You take the window's area in square feet times the temperature differential between inside the house and outside, divide by the R value, and you get the rate of heat loss in BTUs per hour. A storm window added to a single-glazed window to make a double-glazed window loses about half as much energy as a single-glazed one, logically enough.

SLN: So, add storm windows, right?

MWE: Right. A storm window will reduce heat losses by 45,000 BTUs per square foot of window area during the heating season. A good solar system will add 2½ times as much heat to your house as a storm window saves. Nevertheless, you should double-glaze first because the collectors cost a lot more than double-glazing.

SLN: Then solar collectors?

MWE: Maybe. Installed cost for a typical solar heating system is \$40 per square foot of collector. For a storm window, it's \$4 per square foot. The federal government allows a 25 percent tax credit for solar equipment and a 15 percent tax credit for energy conservation measures such as storm windows and insulation. And



"SOLAR ENGINE activated by atmosphere air" is what this device was labeled in the 19th century. It's a reminder that not all solar energy systems are as efficient as their makers claim.

the state allows a 40 percent credit for solar heating equipment. Here's a table that shows how much it costs to install collectors that will produce one million BTUs during the heating season as well as the cost of installing storm windows that will save one million BTUs during the heating season. For comparison, the table also shows how much money would have to be set aside now (at an above-inflation, after-tax interest rate of three percent) to pay for one million BTU-worth of natural gas each year over the next 15 years, with a furnace efficiency of 75 percent. (This assumes that the present cost of gas, \$5 per million BTUs, will not change.) In other words, these three amounts of money all represent the cost of obtaining the same amount of heat.

	Cost*	
	Without Tax Credit	With Tax Credit
Collector system @ \$40/ft ²	\$357	\$125
Storm windows @ \$4/ft ²	89	76
Natural gas @ \$5/million BTU	80	80

*Cost to obtain one million BTUs per year during heating season

SLN: So storm windows are considerably more cost effective than solar, even after tax credits, and only a little better than buying gas.

MWE: Exactly. But while storm windows reduce losses, they can't add heat to your house. You'll still need a heat source of some kind.

SLN: Do you recommend solar or gas once a house is double-glazed?

MWE: Solar is more expensive than gas unless the collector system costs less than about \$25 per square foot, a cost that requires a major do-it-yourself project. And if you want solar to meet more than 30 or 40 percent of your heating needs, you also need thermal storage — an added expense.

SLN: Solar is not, then, the way to go for many people.

MWE: That's right, but I'm not talking

about solar water heating systems. The good ones may be cost-effective, especially if you're heating water with electricity. And I'm not talking about designing passive solar into a new home, which I recommend. I'm talking only about retrofit space heating.

SLN: How do you heat your home, Mike?

MWE: Solar, but I built the system myself six years ago for less than \$10 per square foot. It has worked out very well. In fact, I've bought almost no auxiliary heat in that time.

SLN: Thanks, Mike.

Congratulations

Art (2626) and Marsha Hardeman, a daughter, Jessica Erin, Feb. 24.



The names are familiar — GE, GM, Sunbeam, Hughes, RCA, Baldwin — all firms from the Fortune 500 list of successful US enterprises. But this isn't the US, it's Mexico, and the towns carry such names as Matamoros, Nuevo Laredo, Tijuana, Nogales, Ciudad Juárez. The workers, too, are young Mexicans, even though the plants they work in are US companies. The phenomenon is called *maquiladora* or in-bond or drawback industries in English. It provides US companies with a valuable new edge in competing with lower-priced foreign imports. And it offers jobs and new skills for Mexican workers in areas which, in the past, have suffered from heavy underemployment. Today, 650 in-bond plants operate along Mexico's northern border zone, a tract some 20 kilometers wide that stretches roughly 2500 kilometers from coast to coast. The industries employ more than 130,000 Mexicans — mostly young women — in basic assembly jobs.

— Laurie Kassman Garcia in *R&D Mexico*



A man in Moscow was arrested by the KGB after running through the streets shouting, "The whole world is suffering because of one man!" Asked by the interrogator who he had in mind, he replied, "Hitler, naturally," and was set free. On the way to the door he paused and then asked, "Excuse me, but whom did you have in mind?"

Collected by Zhanna Dolgoplova in *Russia Dies Laughing*

I've Got (Circadian) Rhythm

"Jet lag," says Nigel Hey (3161), "is a marvelous invention for making you appreciate *mal de mer*." He should know. Just before he returned to Sandia recently, he left his home in England, flew to Japan, flew back to England, then flew to Albuquerque, arriving on Sunday evening. At work in his new job (supervisor of Public Information 3161) on Monday, he experienced all of jet lag's traditional discomforts — irritability, insomnia, indigestion, and general disorientation — plus, in Nigel's case, exhaustion.

Ah, if he had only known of the research conducted by Charles Ehret of Argonne National Lab! Ehret has developed a diet used by thousands of travelers who face jet lag — generally, those who fly across more than two time zones.

The diet grew out of studies of circadian rhythms, natural body cycles controlled by molecular "clocks" in every cell of the body. When the body's inner clock is out of synchronization with time cues from the environment, you get jet lag. Normally, the body needs one day to adjust for each time zone crossed.

But the diet uses some of those same cues — meal times, day and night, rest and activity — to speed up a traveler's adjustment to a new schedule.

The diet calls for a planned rescheduling of mealtimes and meal contents to help reset the body's clock. The trick is to prepare for the adjustment a few days ahead of time by carefully choosing the amounts and types of food eaten at mealtimes. On the day of arrival, the body's clock is reset by assuming the schedule of meals and activities appropriate for the new time zone.

For example, if you plan a Sunday flight from New York to Paris, you face a nine-hour flight across six time zones. You will arrive, say, on Monday at 10 a.m. Paris time. Therefore, your body's clock must be advanced so that it is not still set at 4 a.m. (New York time) upon arrival.

You begin the diet on Thursday with a feast day, then follow it with a fast day on Friday, a feast day again on Saturday, and a fast day on Sunday. The day of the flight is always a fast day. (See the cut-out card.)

On feast days, you eat three full meals. Breakfast and lunch are high in protein, perhaps steak and eggs for breakfast, meat and green beans for lunch. Dinner is high in carbohydrates to help the body produce chemicals that bring on sleep. Pasta is good, but no meatballs — too much protein.

On fast days, you eat three small meals, all low in carbohydrates and calories to help deplete the liver's store of carbohydrates. "We do not fully understand the reasons," says Ehret, "but this seems to speed the shift to a new time zone." Meals on fast days contain 700 calories or less — skimpy salads, thin soups, and half-slices of bread.

Whether feasting or fasting, you drink coffee (or any other drink containing caffeine) only in the afternoon, the one time of day when caffeine seems to have no effect on the body's rhythms.

On Sunday evening you board the plane



GENERAL DISEQUILIBRIUM is a major factor in jet lag, as experienced privately by Nigel Hey. "Worse than corporal punishment," he reports — and there's a colonel of truth in that.

and begin the first phase of speeding up your body's internal clock to Paris time — drink a few cups of coffee, turn off the overhead light, get a pillow from a flight attendant with a smile that says you're serious about not being awakened (good cue for seatmates too), and go to sleep.

Wake up about 1:30 or 2 (New York time) — the coffee will help you — and take the final steps that reset the body's clock to Paris time. First, eat a high protein breakfast without coffee — perhaps last night's dinner saved for the occasion. (Most airlines will agree to such a request.) The meal helps the body wake up and synchronize itself with the Parisians, who are eating breakfast about the same time.

After breakfast, you stay active to keep your body working on Paris time. The other passengers may be sleeping, but you are walking the aisles, talking to the flight attendants, or keeping busy with work from home.

After landing in Paris, you have a high-protein lunch — steak, say. That evening, you again have a high carbohydrate dinner — crepes, for example, but with no meat filling — and go to bed early.

By Tuesday morning, you should have little or no jet lag.

Reverse the procedure when you return home, but with one change. Going from east to west, you want to turn your body clock back six hours so that upon arrival at, say, 10 p.m. New York time, your clock is not still set at 4 a.m. Paris time.

Follow the same feast-fast-feast-fast

procedure as before, but drink plenty of coffee the morning before the flight and the morning of the flight; avoid it in the afternoon and evening of both days.

After you board the plane, coordinate your schedule with that of your destination. Break your fast with a large, high-protein breakfast about the same time New Yorkers are eating theirs.

Ehret points out that the diet can be flexible: "if you don't have time to alternate feasting and fasting for three days, just fast on the day you leave. Follow the rest of the plan accordingly. It may not prevent jet lag entirely, but it will speed up the adjustment."

(Ed. Note: This article was adapted, with permission, from the August 1982 *Argonne News*.)

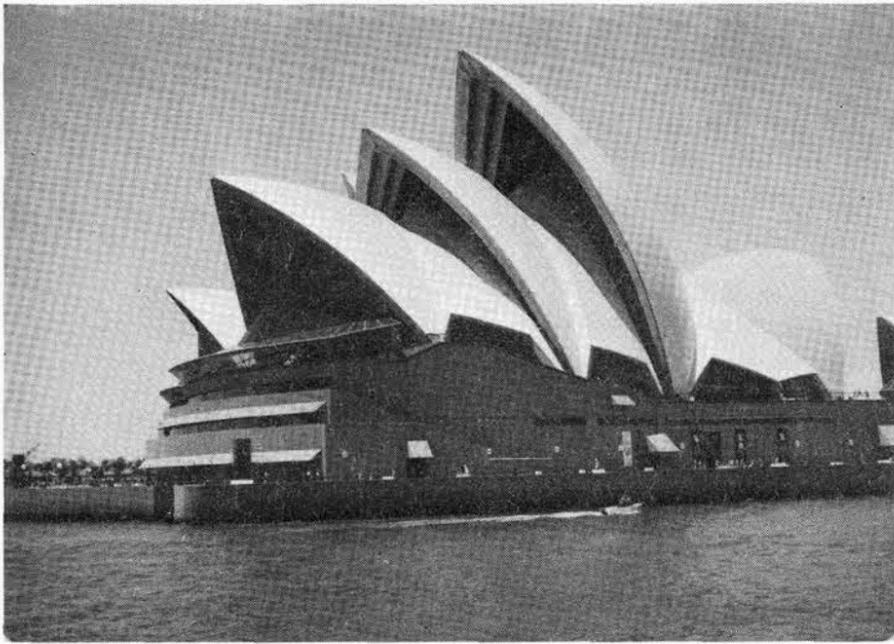
Clip, fold, carry in wallet when traveling.

ARGONNE'S ANTI-JET LAG DIET

How to avoid jet lag:

1. **DETERMINE BREAKFAST TIME** at destination on day of arrival.
2. **FEAST-FAST-FEAST-FAST** — Start four days before breakfast time in step 1. On day one, FEAST; eat heartily with high-protein breakfast and lunch and a high-carbohydrate dinner. No coffee except between 3 and 5 p.m. On day two, FAST on light meals of salads, light soups, fruits and juices. Again, no coffee except between 3 and 5 p.m. On day three, FEAST again. On day four, FAST; if you drink caffeinated beverages, take them in morning when traveling west, or between 6 and 11 p.m. when traveling east.
3. **BREAK THE FINAL FAST** at destination breakfast time. No alcohol on the plane. If the flight is long enough, sleep until normal breakfast time at destination, but no later. Wake up and FEAST on a high-protein breakfast. Stay awake and active. Continue the day's meals according to mealtimes at the destination.

FAST days help deplete the liver's store of carbohydrates and prepare the body's clock for resetting. Suitable foods include fruit, light soups, broths, skimpy salads, unbuttered toast, half pieces of bread. Keep calories and carbohydrates to a minimum.
(over)



THE SYDNEY Opera House.



STROLLERS on Sydney's waterfront.

Unusual Vacation

Sandian Visits 'Land Down Under'

When your daughter and son-in-law live in Sydney, you often discover a hitherto unknown yearning to see Australia. That's just what happened to Don (7426) and Betty Markwell when their daughter Patricia and her husband Derek accepted a nine-month job with Mazda Corporation in that city.

The Markwells left Dec. 26 and stayed at Patricia and Derek's rented house in a Sydney suburb called Cornulla. "It was just like any U.S. suburb," says Don. "In fact, it reminded me a lot of Livermore. The houses looked California-style, except for the many double-walled brick homes with tile roofs. I saw very few wood houses, probably because of the scarcity of forests in Australia and the expense of importing lumber."

Don and Betty spent two weeks in and around the Sydney area. There are many recreational areas, such as beaches and national parks, near the city. Sydneyites are very water sports oriented and it seems that almost everyone owns a pleasure boat.

"Our daughter and son-in-law took us on an outing to Katoomba in the Blue Mountains — a national park about 50 miles inland," says Don. "It's a beautiful area with completely tree-covered mountains — something that most non-Australians probably wouldn't expect. And at one spot where a large group of tourists were enjoying the view, I met — quite coincidentally — Bob

Nelson, a recent Sandia retiree who's in the same golfing association I'm in. The proverbial small world!"

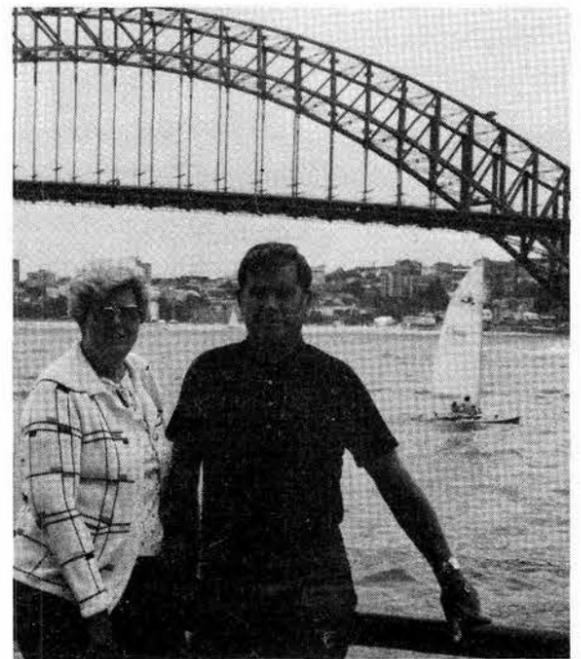
Sydney has a population of about 3 million. The Opera House and Harbour Bridge are its two most distinctive landmarks. "I was kind of disappointed when I went inside the Opera House, and not just because no performances were scheduled. The interior is very modern but not elegant like the Vienna opera house. Its acoustics, though, are supposed to be excellent. An area called 'The Rocks' is like our Old Town — the original part of Sydney that has been restored to its early 19th century appearance. The section has restaurants, shops, museums, wharfs, street performers — all reminiscent of San Francisco.

"I had no trouble understanding Australian speech," he continues, "but many times I had to listen carefully, especially with slang. Australians are very friendly and like to talk about the U.S. I noticed a strong national pride — slogans everywhere such as 'Be Proud to be Australian' and 'Buy Australian.' However, there's a high percentage of Japanese cars on Sydney's streets even though Ford, Chrysler, and GM have assembly plants in the country. No Japanese plants as far as I knew. And cars are expensive. My son-in-law told me that the lowest line Mazda sells for around \$9000."

From Australia, Don and Betty flew to Christchurch, New Zealand, where they spent two days — "Prettiest town I saw," says Don. "Very serene, architecture very English. The Botanical Gardens were outstanding, as was the Canterbury Museum with its restoration of an 1890s street. Interesting exhibits on the Maori culture and Antarctica too."

After two days in Christchurch, the Markwells visited Wellington ("a lot of hustle and bustle") and Auckland for one day each before flying on to Honolulu and then home.

Logistics: Round-trip air fare on Air New Zealand from Los Angeles was \$1750, which included 3 days in Honolulu (hotel not included) and stopovers in three New Zealand cities. Accommodations in Australia are cheap if you stay with relatives.



BETTY AND DON (7426) Markwell with a prominent Sydney landmark.

Trip Reservations For Sandians To Be Handled by SATO

In a move that will save Sandia \$250,000 annually, Dick Russell, Director of Purchasing 3700, announces that the function of Reservations Division 3744 will be assumed by SATO (Scheduled Airlines Traffic Office).

From the Sandia traveler's viewpoint, the move will be "transparent" — making reservations for airlines, rental cars, and hotels will continue to be made by calling 4-9201 or by stopping by the SATO counter in Bldg. 800. SATO reservations people will provide the needed services, and Sandians will continue to pick up their tickets at the Financial Division 6021 as they sign for trip cash advances.

SATO assumed responsibility for DOE/AL travel last summer.

The five Sandia employees who are not reservations specialists will transfer to other organizations as vacancies occur. It is anticipated that the transfer of functions will be completed by mid-summer. Sandy Borgrink, Division 3744 supervisor, will oversee the transfer of responsibilities to SATO.

Argonne's Anti-Jet Lag Diet
(See Preceding Page)

COUNTDOWN					
1	2	3	4		
FEAST	FAST	FEAST	FAST	BREAK FINAL FAST	
B					<i>Westbound:</i> if you drink caffeinated beverages, take them morning before departure. <i>Eastbound:</i> take them between 6 and 11 p.m. If flight is long enough, sleep until destination breakfast time. Wake up and FEAST, beginning with a high-protein breakfast. Lights on. Stay active.
L					
D					

Coffee, tea, cola, other caffeinated beverages allowed only between 3 and 5 p.m. these 3 days.

FEAST on high protein breakfasts and lunches to stimulate the body's active cycle. Suitable meals include steak, eggs, hamburgers, high-protein cereals, green beans.
FEAST on high-carbohydrate dinners to stimulate sleep. They include spaghetti and other pastas (but no meatballs), crepes (but no meat filling), potatoes, other starchy vegetables, and sweet desserts.

Fun & Games

Running — The second annual "Feel Nutrific" fun run sponsored by the Albuquerque District Dietetic Assoc. will be at 9 a.m. on March 26. The four-mile run will start at the Southwest Health and Fitness Center. Entry fee is \$5 (pre-registration) or \$6 (at the race). Inedible T-shirts go to the first 150 entrants. Forms are available from the Center (345-2683) or from Susan Harris (3330) on 4-0713.

Kayaking — A whitewater kayaking class for beginners will start April 4. The class consists of four indoor sessions and a full weekend on the Rio Grande near Pilar on April 16-17. Call SERP director Tom Lenz on 4-8486 for more info.

Exercise — Benefit your body by attending a free exercise class, sponsored by a local fitness center, at 5:30 on April 8. It's for both men and women. Tom Lenz has more info on 4-8486. Deadline for signup is April 1.

Corporate Cup — All persons great and small who wish to participate in this year's Corporate Cup Relays are invited to a meeting at noon on March 22 in Bldg. 815. The Corporate Cup is a track and field competition that pits companies of like size in New Mexico against each other. The

meeting will be geared to first-timers, and it's important that they attend because jerseys have to be ordered immediately. (Veterans should have received an information packet by now). Don't be modest — men and women of all ages and skill levels are needed (especially over-40 women and field events people). Again, call Tom Lenz for more info.

Aerobic Dance — Donna Ness will lead her legion of ladies through another 12-week session of aerobic dance starting April 4. Classes are held twice a week at the Coronado Club: Mondays and Wednesdays from 9:30 to 10:30 or from 5:30 to 6:30. Call Aerobic Dance, Inc., at 293-0316 or Donna at 255-6314 for signup and further info.

Cold Camping — A few spots are still open for the winter camping class offered through SERP. Indoor sessions in shiver cessation are set for March 22 and 24 from 7 to 9. The climactic event is March 26-27. \$20 per person. More info from Tom Lenz.

Moonlight Trek — Ski the moonlit snow on March 25 in the Jemez. Meet at the Los Ojos bar in Jemez Springs at 6 p.m. If you remember your X-C skis, it will be an evening of romance, adventure, and beauty (if it's a clear evening). \$5 per person will get you an invigorating two-hour tour, camp-

fire, wine, and cheese. Tom Lenz has more data.

Horse Lovers — Anyone with equine-oriented information is asked to call Tom Lenz (on 4-8486). SERP is contemplating the preparation of an information packet on horse show schedules, stables (locations and rates), vendors for supplies and equipment, classes, etc.

Female Fitness — Former Sandian Samia Doro is leading a group, sponsored by KAFB's Que Pasa center, interested in toning, firming, and all-round total fitness via full-cycle resistance training. Classes, at \$10.50 a month, run on Monday, Wednesday, and Friday from 5 to 6 p.m. and on Tuesday and Thursday from 9 to 10 a.m. at the East Gym. Another class, this one coed, begins soon too. More info from 4-5420, 4-1818, or from Samia on 299-6505.

Photography — A class in landscape photography will be held at the Rio Grande Nature Center State Park on March 20 from 1:30 to 4:30. The course is designed for those with a basic knowledge of 35mm single lens reflex cameras who want to improve skills in color landscape work. Instructor is Irene Hinke-Sacilotto. Cost is \$15. More info from the Center on 344-7240.

Retiring



Gladys Olguin (2632)



Willard Benson (9323)



Emma Dale Daniel (2140), Mary Snodgrass (3440). Standing are Irvin Moulton (2631), Phil Dailey (7135), Royce Bewley (7481).



Gabriel Maestas (3613), Jim Grier (3413). Standing are Jerry Pierce (3741), Art Troum (3143), Henry Moculesski (9372).

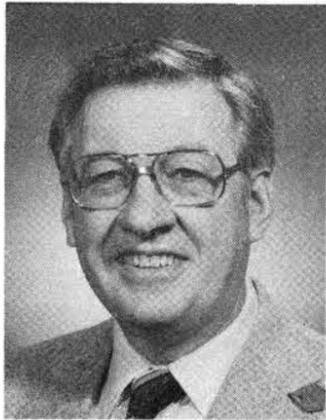


Bill Schuessler (2551), Bill Stolpun (2457). Standing are Rusty Puccini (9316), Ralph McRae (2457).

MILEPOSTS

LAB NEWS

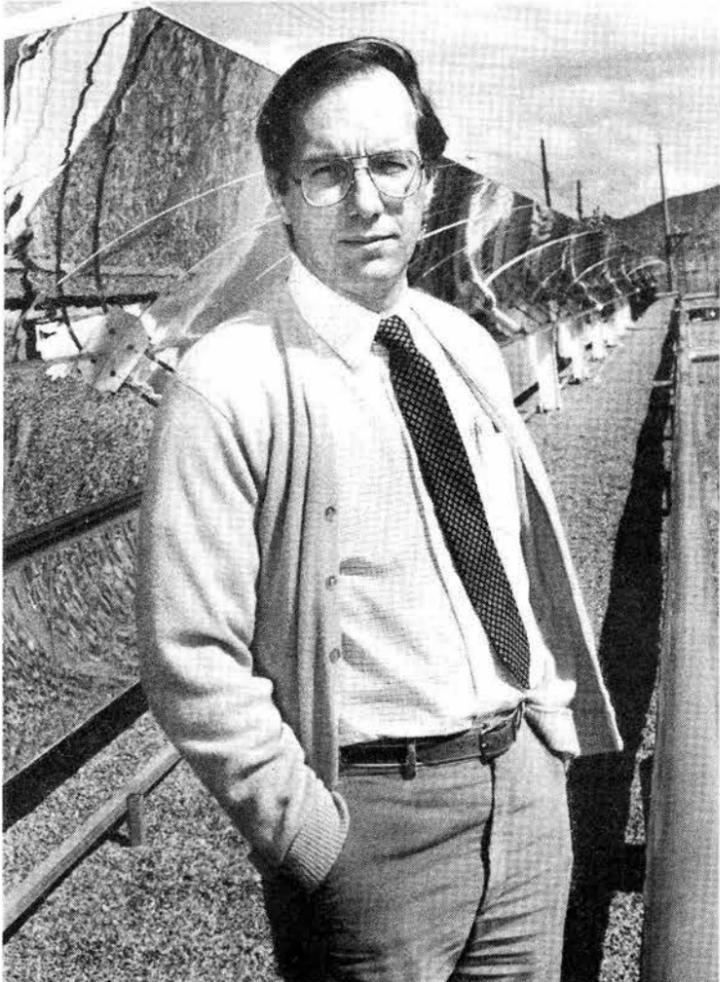
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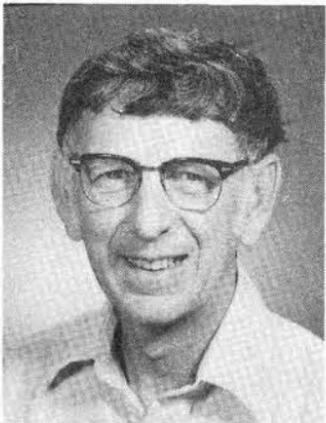
Dick Andes - 0110 25



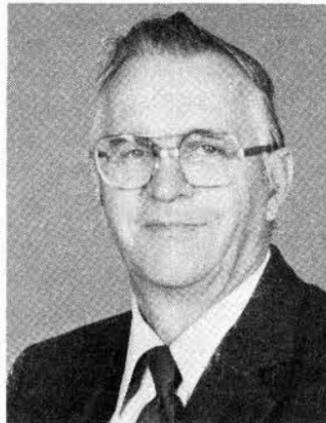
Bill Gardner - 2629 25



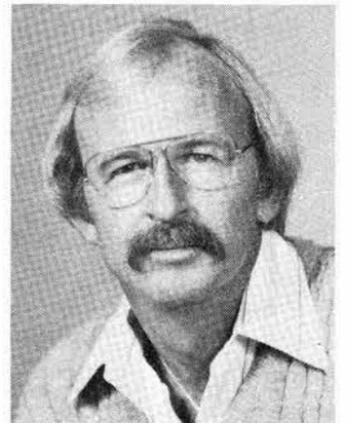
Jim Banas - 9721 15



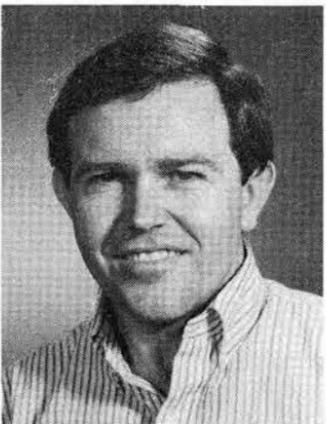
Gene Daniels - 2452 30



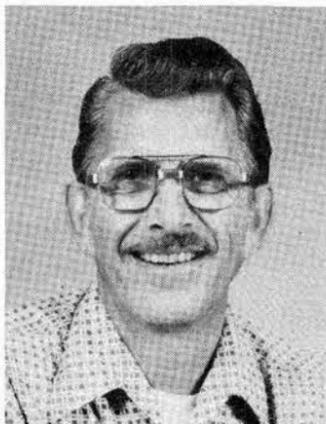
Perry Lovell - 8275 20



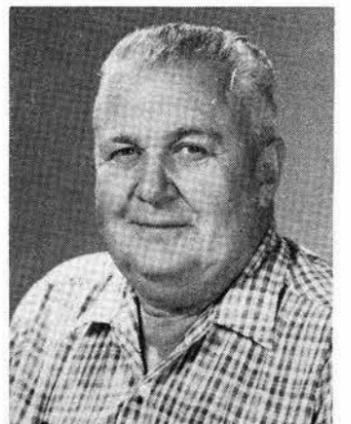
Conrad Stayner - 8465 20



Chuck Looney - 7311 20



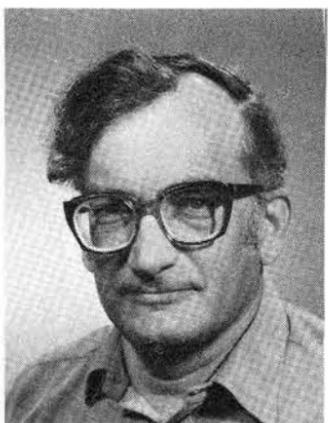
Billy Pontsler - 8162 30



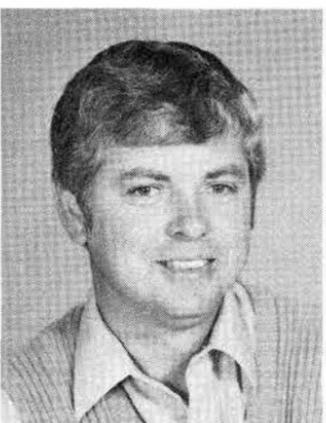
Ray Gott - 8315 25



Max Littleton - 7262 30



George Schnetzer - 9231 20



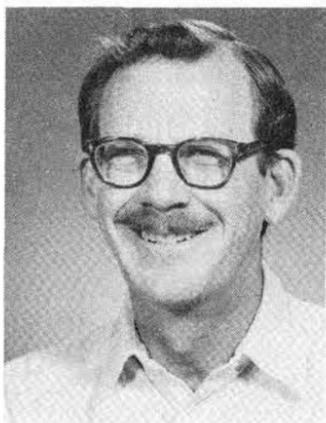
Ken Dolan - 8322 15



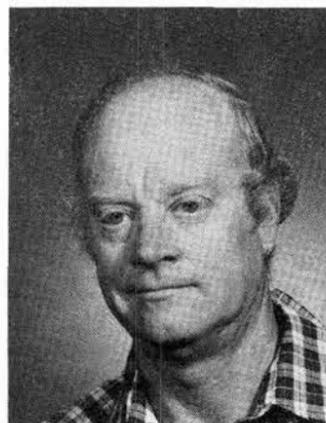
Joe Abbott - 2124 25



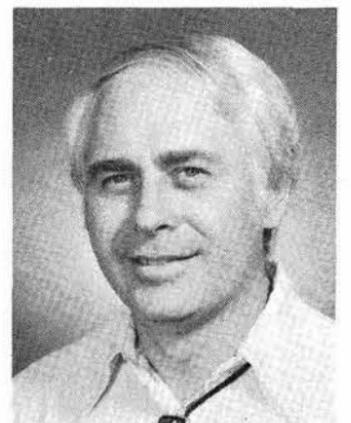
Charles Arning - 2451 25



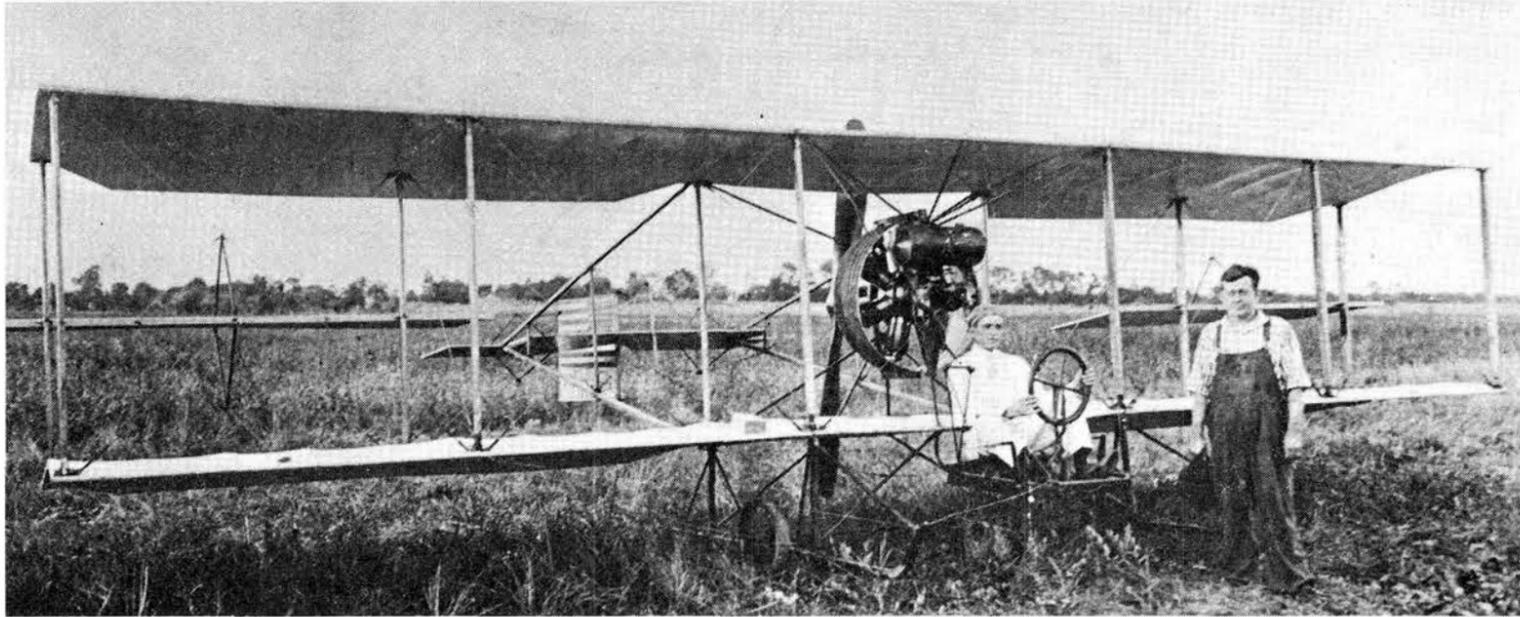
John Cawfield - 7541 15



Vernon Marsh - 2433 20



Winn Erdman - 7535 25



Favorite Old Photo

The first decade of aviation was unique in its excitement, color, romantic episodes, and sense of adventure. This 1912 photo shows my dad, Byron Lopp, seated in a modified Curtiss. The other man is probably the owner of the "airfield" in Missouri. Dad started flying in 1910, seven years after Kitty Hawk, and was a Navy ferry pilot in WWI. He died two years ago at the age of 90. (Gene Lopp, 8271)

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 and organization.
9. Housing listed here for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

SANDIA BELT BUCKLES — silver color, \$8; gold-plated & boxed, \$20; T-shirts & caps, \$6 ea.; new books; used books; bike maps. S. Hwy. 14 Village Project. LAB NEWS.

QUEEN size waterbed, \$90. Kolb, 293-2044.

NEW Yamaha PS-20, elec. keyboard, w/case, 10 orchestra tones, auto. rhythm control, built-in amp., \$475. Reynolds, 265-0383.

USED 40-gal. hot water heater, gas, \$35. Wright, 296-3850.

WASHER & DRYER, Kenmore apt. size, stacking, upright, white, 18 mos. old, \$475. Beeson, 881-8185, 266-6534.

COUCH & loveseat, herculon & wood, earthtones, \$150; black chrome chair, \$50; black vinyl chair, \$35. Hubbard, 842-9431.

DINETTE w/4 chairs; 2 5-dwr. chests; nightstand; queen size headboard; glass/chrome coffee table & etagere. Sanchez, 299-0443.

OFFICE DESK, 3'x6', wood, 5-dwrs. including file dwr., \$150. Stackpole, 821-5348 after 6:30.

COUCH, hand made, mahogany wood, \$250. Bell, 345-9440.

GLASS door firescreen, antique brass, \$30; cast iron fp grate, 22"x15", \$5. Rody, 299-6084.

LOVESEAT & tables, \$100; IBM typewriter, \$150; 8-trak stereo, 6" speakers, \$65; copper bottom pans, \$10. Norman, 898-5072.

STUDIO bed frame, twin box springs & mattress, firm, almost new, \$55. Leatherman, 877-8173.

FOUR 16" 8-hold tire rims (split type) w/tires, \$65. Tapia, 294-4139 after 5.

PLAY HOUSE, you haul, best offer. Negin, 266-1983.

SIMMONS sofa sleeper, Danish sleeper arm chair, coffee table, end tables, stereo, FM record player, elec. lawn mower. Stokes, 255-4788.

WOODEN garage door w/accessories, \$30. Waibel, 298-0067.

FRENCH HORN, Holton Farkas model H-179, sells new for over \$1500, asking \$975. Davie, 296-3950.

SLIM GYM exerciser, an all body system, make offer; motocross racing bike, all accessories, \$300 investment, sell for \$150. Arana, 299-1214.

FOUR GR70-15 Goodyear GT radials, raised white outline letters, mounted on Pontiac factory mags. De Reu, 821-6063.

LADIES suede coat, med. size, tan; heavy metal box for small truck (24x18x15); barrels, fiber, 10-gal. Harris, 255-6577.

TWO screen doors: alum. 32"x81" including frame, \$30; wood 30"x78", \$20; girls' single headboard, \$50. Pendall, 265-3008.

LAWN MOWER, Sears 24" reel type, gas powered, self propelled, catcher, \$50. Yoder, 265-9276.

SECRETARIAL DESK, \$150; bar fridge, \$80; apt. washer, \$125; end table, \$5. Trussell, 865-6595.

JACKMAN white spoke rims, 10x15 w/General tires, fit Jeep, Ford truck, Bronco, w/5-lug pattern, \$225. Martinez, 293-2301.

SHIPPING CRATE for lg. dog, alum., collapsible, 24"x42"x36" high, \$150 or best offer. Hunter, 294-2877.

SEARS 5hp shredder-bagger, cost \$166, asking \$75; Sears saw table, makes circular saw into table saw, \$25. Warden, 1-465-2436, Cochiti Lake.

STEREO speakers, Hartley mid range, Electrovoice tweeter, custom cabinets, \$300. Sutherland, 345-1183.

ULTRALITE, Easyriser, MAC 101 w/48" prop, landing gear, \$1750; pool table, 6' w/access., \$125. Hayward, 294-7278.

MALE Pomeranian puppies, AKC reg., 6 wks. old, \$300. Duimstra, 293-8235.

AUTO. roaster oven, holds 25-lb. turkey, removable pan & rack, \$22; food processor w/access. & instructions, \$10. Rauch, 821-6992.

CABINET sewing machine, Riccar, \$120; dining table & chairs, \$135; lg. upright deep freezer, \$250; year-old Sears dryer, \$250; dbl. wide dresser & mirror, \$140. Gifford, 293-9793.

ARROWCRAFT adapters & fiberglass fenders to convert '73-'77 F250 to dual rear wheels, \$100. Bosworth, 869-6736.

GM toddler's love seat, \$20; Whirlpool compactor, new, \$250; Sears 2-sp. reversible window fan, \$15; Gerry umbrella stroller, \$15. Butler, 292-8823.

FOOSBALL table, million dollar game, \$275 or best offer. Tapia, 298-0398 after 5.

RUGER std. semi-auto. pistol, 22 cal., \$100. Olsson, 821-8348.

BICYCLES: 2 men's 3-sp., 26" & 2 girls' 20"; Yamaha trumpet, case & mutes. Conrad, 298-2691.

SOFT LEATHER modular seating, 6 pieces, 15' total, earthtone brick color, \$600; near new oak built-in desk & shelves, \$185. Errett, 292-4885.

REFRIGERATOR, Westinghouse frost-free, \$100; 2 bicycles, man's 23" 10-sp. CCM, \$100; Bianchi folding, \$100; free — used bricks, concrete paving bricks, kitchen cabinets. Loehman, 265-3179.

CAMPER SHELL, 80" L, 74"w, 24"h, insulated, paneled, outlet for AC, alum, \$250. Dourte, 881-2494.

DINING FURNITURE: trestle table, harvest bench, 2 chairs, hutch/buffet, baked highgloss yellow enamel finish, laminated surfaces, \$300. Mitchell, 293-8746 after 4.

2 WOODEN bats, \$5 ea.; 2 alum. bats, \$10 ea.; 8 fast pitch softballs, \$3 ea. Pickle, 884-5323.

BABYLINE CRIB & mattress, yellow, \$75. Reed, 897-1086 after 6.

FREE to good home, female chihuahua, beige, needs shots. Chavez, 345-5471.

POWER HAMMER, charges, \$25; Jeep hauling trailer w/folding ramps, \$900; Phone-Mate, \$60. Falacy, 293-2517.

HORSE, 1/2 Arabian, 1/2 Quarter horse, 16 hands, reg. w/leather saddle & tack, \$750. Brainard, P.O. Box 14397, City, 87191.

SUITCASE, ladies 29", tan, Samsonite w/wheels, used once, \$55 or trade for soft cover suitcase. Schubeck, 294-7088.

CAMPER TRAILER, 13.5', stove, sink, pump, heater, sleeps 4-6, \$1000. Lopez, 265-3296.

FISHER stereo cabinet, glass front & top, new, \$80. Goddard, 299-8370.

TRANSPORTATION

'81 VW Jetta diesel, 2-dr., AC, AM-FM-Cass., sun roof, 42/52 mpg, \$7200; '80 PUCH moped, 100+ mpg., \$350. Pope, 293-1072.

GIRL'S/BOY'S bicycle, 20" AMF w/training wheels, \$25. Wowak, 298-9398.

'70 MGB hardtop convert., 5-sp. w/OD, \$2900. Johnson, 298-1011.

'74 DATSUN 260Z, 77K miles, AM-FM, white w/sunshade, \$3750. Bell, 345-9440.

'77 VW campmobile, \$4800/offer. Flynn, 299-4929.

'74 FORD F-250, V8, 360, LWB, 4x4, new tires, \$2000 or trade for small car w/AT. Saxton, 299-8547.

'71 DODGE Coronet, PS, PB, AC, 48K miles, \$1200; Bennilli trail bike, \$250. Tucker, 256-7850.

'67 FORD Ranger pickup, F-100, 352 engine; 2 hitches; bar; manual typewriter. Padilla, 296-5048 after 5.

'79 HONDA CB 650, luggage rack, back rest, windshield, less than 3000 miles, \$1600. Menschel, 892-6475.

'73 BUICK LeSabre Custom, fully equipped, 84K miles, passed emissions test, AM-FM, tilt SW, blue-white, \$1395. Beard, 821-0309.

'79 DODGE Omni 4-dr. H-back, sun roof, stick, one owner, 27K miles, \$3375. Rainhart, 821-3690.

'78 KAWASAKI AIR1000, many extras, low miles. Baca, 299-2036.

'81 YAMAHA 650 Special II, burgundy, sissy bar, luggage rack, 7 K miles, \$1750 or best offer. Kolb, 293-2044.

'77 TOYOTA Celica GT, 5-sp., AM-FM radio, AC, lift back, louver windows, \$3000, orig. owner. Bitsu, 897-1235.

'79 SCIROCCO, 5-sp., AC, AM-FM, PS, PB. Chavez, 242-2126.

'79 MAZDA RX-7GS, 5-sp., sun roof, louvers, back spoiler, stereo, \$6700. Platzbecker, 292-6866.

WILDERNESS 25' 5th wheel travel trailer, lg. refrig., range w/oven, sleeps 5. Warden, 1-465-2436, Cochiti Lake.

'79 CHEV. Malibu classic, 20K miles, \$4100. Delnick, 294-4670.

'67 ALJO trailer, single axle, self contained, \$2750; '77 Coachman van conversion, refrig., stove, water, porta-potti, \$8500. Gray, 265-1883.

'60 VW convert., completely rebuilt inside & out. Braasch, 268-8416.

'81 GS650E SUZUKI, tinted plexifairing, best offer over \$1900. Prevender, 299-5253.

'81 MONTE CARLO Landau, AT, PS, PB, AC, AM-FM, tilt, cruise, all power acces., 36K miles, \$5900. Hepner, 296-3185, 293-2044.

'69 HONDA 125, \$250; '73 Chev. Caprice, \$625. Marquez, 344-8455.

'78 PLYMOUTH Sapporo, AT, premium pkg., P/W, power mirrors, AM-FM-tape, sell at wholesale. French, 293-3451.

'75 DODGE Colt, yellow 2-dr., 4-sp., AC, 57K miles, service manual, service records, \$1300. Kaestner, 265-0283 after 5:15.

'81 EL CAMINO supersport V8, 2-tone, AM-FM-tape-CB, PS, PB, AC, AT, \$6300. Shipe, 822-0924 after 5.

'76 TRIUMPH TR7, low mileage, AM-FM-cass., new tires & wheels. Gangel, 898-4176 after 6.

CHRYSLER 14' boat, 1970 model, 25 HP Johnson motor, remote steering, sun & boat cover, \$2000. Walker, 821-5938.

'79 AMC Spirit, 43K miles, AT, PS, PB, AC, AM-FM stereo. Drayer, 821-4017 after 3/19.

'73 SUPER Beetle, AC, AM-FM-cass., radials, reg. gas, \$2000. Lewin, 898-2303.

'79 HONDA CX 500 custom, shaft driven, water cooled, 6K miles, many extras. Marlman, 883-8660.

'79 AUDI 5000S w/51K miles, sun roof, loaded, \$7100. Harrison, 883-5411 after 5.

SAILBOAT, 15' catamaran by Venture, main & jib sails w/new trailer plus car top carrier, \$1000. Harstad, 298-6551.

21' REINELL Boat, convert., galley, head, sleeps 6, E-Z loader trailer, \$11,500. Falacy, 293-2517.

'82 BMW R100RS, white, 2 seats, many extras, 9K miles, Bailey, 268-8079.

'76 VW Scirocco, AC, AM-FM, alloy wheels, all-season radials, low miles, 35/25 mpg, \$2950. Aeschliman, 281-1227.

REAL ESTATE

1/3 ACRE corner lot in Siesta Hills on Ridgecrest, Mt./city views, utilities installed, \$40,000, terms. Harvey, 265-3055.

FIVE woody acres on S-14 13 miles from I-40, good access, utilities, \$35,000 cash to \$11,000 loan. Davis, 281-1248.

5-BDR. BRICK, Sandia High, den w/fp, 3 baths, B-I appliances, DW, carpeting, 2 1/2 car garage, no qualifying 9.5%. Browne, 884-1343, 881-3772.

3-BDR. house, completely remodeled, assumable loan, mid 50s, 5 min. from Base. Barnes, 293-4574.

3-BDR., 2 bath, huge den, fp, ElDorado district, thermal pane windows, extra insulation, assumable, low down, \$60s. Bradley, 293-9586.

CONCHAS LAKE: 1/3 acre w/12x52 Kirkwood furnished trailer, covered concrete patio & boat storage, 8TK-AM-FM stereo, storage shed, 100 gal. butane tank, \$11K. Kubiak, 265-6525.

12x65 MH, 2-bdr., 1 1/2 bath, new plumbing & wiring, see after 5, space 12A behind Sizzler on Menaul NE. Brockway, 344-1901.

9.2 ACRES Juan Tomas Valley, tree-covered, 3 miles east of S 14, \$2250/acre. Baack, 296-2312.

WANTED

5-7 HP boat outboard engine. Horton, 883-7504 after 5.

NEED 220VAC elec. dryer in reasonable condition, will buy or trade gas dryer. Klarer, 344-0612.

KNIFE MAKING GRINDER, square wheel Burking or Bader type. Baca, 299-2036.

'74-'77 HONDA Civic, engine need not be running, all other parts should be in good condition. Zirzow, 294-6142.

VISITING professor will be working at Sandia this summer; would like to house-sit or rent small house for June-Aug. Olman, 884-4663.

TOOL BOX for wide bed pickup. Vonderheide, 842-9568 after 5.

ROOMMATE wanted: \$200/mo + 1/2 utilities, own room & bath, near work. Levin, 299-0891.

MIT8800 A/B disk boards, 8" 32-hole/hs disk, memory/CPU/IO boards, any information appreciated. Moore, 294-5646.

FASTPITCH softball catcher for championship caliber team. If interested, contact Tom Lenz, 4-8486.

CHAIN SAW: Sthil, Poulan, Homelite, 16" bar; larger engine, 2" or 3" surface type well pump. Gunter, 892-0652.

FOUND

PAIR of brown plastic Rx bifocals in case, on Los Altos pedestrian overpass on 3/11. Leeman, 4-7949.

WORK WANTED

STUDENT wants hauling jobs during Spring break. Paul Prew, 296-3815.

SHARE-A-RIDE

CAR POOL: Taylor Ranch to Area I, 8-4:30. Van Berkel, 897-2541.

EDGEWOOD S.E.C.A. VAN seeking riders, \$2.25/day alternate. Jones, 281-1186.

Lobster Tonight

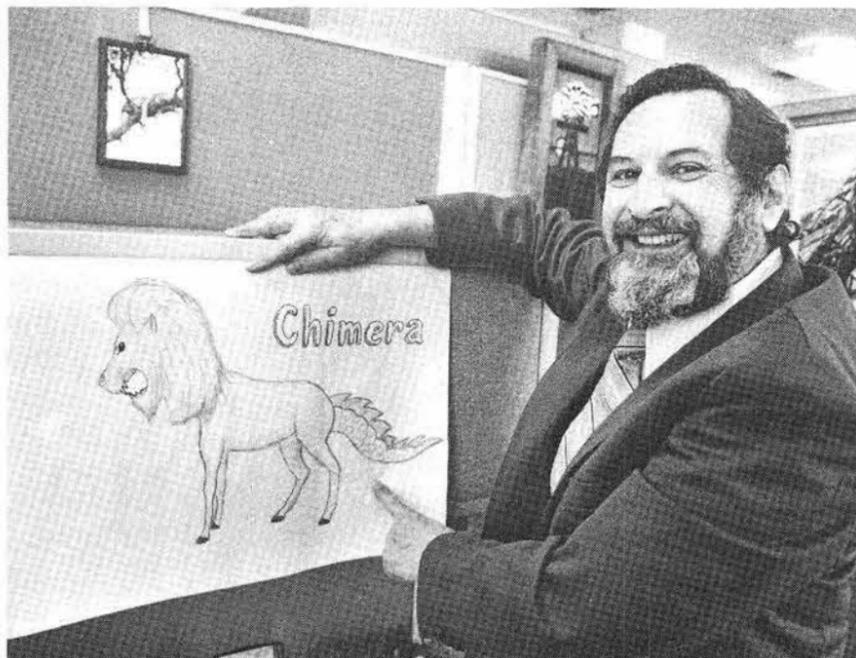
TONIGHT, a couple of very good things happen — first, the menu at the (served) dinner features an eight-oz. lobster tail, baked potato, vegetable du jour, and salad for the very good price of \$9. Second, Chisum, a favorite country and western group, is on the bandstand playing a very danceable selection. Happy Hour prices are in effect from 4:30 until the music starts. Dinner is served from 6 until 8:30. Call 265-6791 *right now* to let the office know you're stopping by.

NEXT FRIDAY, March 25, another favorite country and western group — the Apple Mountain Band — is on the bandstand while the buffet features a seafood platter. Mark it on your "things to do" list now.

SUCCESS is what you have to call the new Tuesday two-for-one dining specials offered by the Club. On a recent Tuesday, more than 100 patrons enjoyed the excellent dinner, the candlelit atmosphere, the service, Alex Montoya playing piano, and the fantastic price. See for yourself on Tuesday, March 29. Surf 'n turf is the two-for-one special at \$11.50. The dining room will serve from 6 until 8:30. Call 265-6791 for reservations.

CORONADO SKI CLUB has two ski trips coming up with fantastic discounts. Ski Crested Butte April 7-10 for \$115. You go by bus, stay six in a three-bedroom condo and buy lift tickets for \$5. Call Bob Butler (7233), 4-4920, for more info.

Or ski Purgatory March 26-27 for \$110 double, \$132 single. Stay at Mountain Shadows in Durango. Sign up with Lisa Mondy (1512), 4-0284, or Joel Miller (1523), 4-1775, by March 21.



CHIMERA: a fire-breathing monster consisting of a lion's head, a goat's body, and a reptile's tail — a mythological beast, needless to say. But George Cosden (3732) revived it in order to clarify to an audience of Rio Grande Electronic Representatives the sometimes perplexing relationship among three other disparate elements — the DOE, Western Electric, and Sandia. Dave Barton (0132) did the artwork.

GAMES NIGHT is returning to the Coronado Club with games, prizes, and drawings. Grand opening will be Thursday, April 7, starting at 7 p.m. Details will be announced later.

CHINA is the destination of a new Coronado Club travel package announced this week by Shirley McKenzie (2432), travel director. The 21-day tour leaves in mid-September. Cost is \$2810 per person and includes airfare, lodging, and meals (everywhere but Hong Kong). Cities in China to be visited include Shanghai, Beijing, Suzhou, Wapi, Nanjing, and Lianjin. Two lake cruises and a visit to the Great Wall are included.

Another new trip is Las Vegas by bus May 29-June 1 for \$122 or by air May 29-31 for \$146 (includes transfers and baggage handling). Either way, stay at the luxurious Maxim Hotel.

Puerto Vallarta May 19-26 for \$384 is another travel package coming up. See Shirley in the lobby tonight between 5 and 6 p.m. for details on this and other Club trips — Hawaii April 16-24, and a Caribbean cruise Oct. 28-Nov. 5.

A special one-day bus trip to Chaco Canyon on May 14 for \$24 is also planned. The trip includes a Continental breakfast and a guided hike at the Monument. See Shirley tonight for details.

Events Calendar

March 19 — Annual St. Joseph Feast Day, harvest dance, Laguna Pueblo. Contact pueblo.

Through March 27 — Albuquerque Little Theater presents "Mr. Roberts," 8 p.m. Tues.-Fri., 6 & 9 p.m. Sat., 2 p.m. Sun., 242-4315.

March 19-20 — 14th Annual Gem & Mineral Show, 10-7 Sat., 10-6 Sun., Agriculture Bldg., State Fairgrounds, 293-6215.

March 20 — Albuquerque Jr. Orchestra and Jr. Symphony concert, 2 p.m., KiMo.

March 20 — "Alive" concert, female jazz quintet blending jazz, gospel, blues, swing, R&B, be-bop, and Afro-Cuban rhythms, 8:15 p.m., KiMo.

March 23 — Latin American Feast of Film, "Tree of Life" and "Tree of Knowledge," 7 p.m., auditorium, Albuquerque Museum.

March 25-26 — Johnny Mann's Great American Choral Festival; amateur choral groups compete for cash prizes and national finalist status. Concerts, demonstrations, community sings, Music Fair; 8 p.m. Fri., 9 a.m. - 10:30 p.m. Sat., Convention Center, 277-4301.

March 25-27 — "La Pasión de Jesús Chávez," a modern commentary on the Gospels in dramatic form, bilingual, La Compañía, 8 p.m., 3 p.m. Sun., KiMo, 256-7164.

March 25-27, 29-31 — Albuquerque Civic Light Opera, "Hello Dolly!" 8:15 p.m., 2:15 on Sun., Popejoy, 277-3121.

March 26 — UNM Jazz Festival concert, 8:15 p.m., Keller Hall, UNM.

March 27 — Chamber Music concert, 2 p.m., Albuquerque Museum Auditorium.

March 27 — Ensemble Pro Musica and members of the NMSO perform Handel's Messiah (Lenten and Easter portions), free, 3:30 p.m., First United Methodist Church.

March 28 — Chamber Orchestra of Albuquerque concert, Albuquerque Little Theatre, 8:15 p.m.

March 29 — Harmony Sisters and Rosalee Sorrels, folk music, 8 p.m., KiMo.

March 31-April 2 — Indian Artisans Exhibition, free, Winrock Shopping Center.

March 31, April 1-2, 7-9 — "The House of Bernardo Alba," modern Spanish tragedy by Federico García Lorca, Experimental Theater, UNM, 277-4402.



"And if the sun should ever go nova, our collector is guaranteed to work by the light of Sirius."