



ELECTRIC VEHICLE — A Subaru utility van, converted to electric by Jet Industries of Austin, Tex., is getting widespread attention around Sandia as it performs daily chores for Neutron Devices and Technology Department 2350 between Areas I, II and V. Dick Bassett (2354), who has built two electric cars in his off hours, heads a DOE project to evaluate the van. He has instrumented it and is keeping complete performance and maintenance records to determine total efficiency. The van has a 50-65 mile range and a top speed of 55 mph. The van is usually parked near Gate 1 where a sign provides technical specifications.

LAB NEWS

VOL. 32, NO. 7

APRIL 4, 1980

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

First Microprocessor-Based Weapon Component Now in Nuclear Stockpile



JIM CARUTHERS (2332) points out the microprocessor (the small square) which is the heart of the MC3152 programmer. The component fills one-half the volume, is one-fourth the weight of its predecessor, and costs half as much.

After a three-year development period, the MC3152 programmer is in production, the first nuclear weapon component to use microprocessor-based memory and logic. It is a dual channel electronic programmer for the B61-3 and B61-4 weapon systems.

"The MC3152 performs the same function as its predecessor—controlling the entire arming and firing sequence," says Jim Caruthers, supervisor of Timers, Programmers and Security Applications Division 2332, "but costs one-third as much. It uses one-half the volume and only one-fourth the weight of the previous dual-component programmer.

"The MC3152 requests data from other components in the weapon in the form of binary pulses when the weapon is launched. The microprocessor performs error detection on the received data to assure system reliability and safety. Once satisfied that the data received are legitimate, the programmer uses those data for controlling the arming and firing functions."

The data received provide direction for either air or ground burst, each with options for free fall, laydown, or parachute-retarded delivery and associated safe separation timing.

"The heart of the system," Jim says, "is a commercial microprocessor that needed only minor modifications to achieve weapons-grade quality. This has helped keep production costs down, and we've had a successful, trouble-free production run at Bendix Kansas City. The cost is about one-third that of previous programmers, giving us a savings of more than \$10,000 per weapon."

The programmer design was based on the need to reduce the volume allotted to the programmer of previous systems. The MC3152 not only fits in this small space but also meets all environmental, reliability and compatibility requirements.

The same design principles are being used for other programmers for weapons systems now in development—the B61 modernization program, the B83 and the Pershing earth penetrator missile.

Afterthoughts

Which way do we go?--Perhaps this country's most pressing question for the remainder of the 20th century is that of where we will get our energy. Many at Sandia, including this writer, have a personal belief that we must follow the nuclear path. Thus, the conclusions of the National Academy of Sciences in its recently released report, "Energy in Transition 1985-2010," can be greeted with satisfaction. They may be summarized as follows:

- the only choice for the US to meet electricity demands during these years is to burn coal and build nuclear plants;
- nuclear may ultimately be the sole option because coal will be a more valuable source of synthetic liquid and gas fuels, and increased coal burning could add enough CO₂ to the atmosphere to change the climate;
- to keep the price of electricity low and to extend our supplies of uranium, the US must continue to develop the fast breeder reactor, now out of favor with the Administration;
- the US should continue solar and fusion projects but the Academy holds out little hope that these will make any significant contribution in the next 30 years;
- the most critical near-term problem in energy supply is fluid fuel, and highest priority should be given to development of a domestic synthetic fuels industry;
- despite the risk of weapons proliferation, nuclear-generated electricity represents the best option for the next 30 years, being cheapest and less sensitive to increases in fuel prices and to changes in environmental standards.

The 783-page report, five years in preparation, represents the findings of scientists who, by any rational measure, can be called expert in the field. Ironically, this very expertise will make the report suspect for that vocal group of professional activists whose hallmark would seem to be an invincible ignorance.

* * *

Definition--Of Puritanism, by H. L. Menken: "the haunting fear that someone, somewhere may be happy." *js

Congratulations

Mr. and Mrs. Mike Moulton (1766), a son, Gregory, March 20.

Carl (5132) and Lynne Seager, married in Albuquerque March 8.

Mr. and Mrs. Les Williams (Cynthia, formerly 3433), a son, Bryan Scott, March 9.

Sympathy

To Jerome Durrie (4325) on the death of his mother in Albuquerque, March 9.

LAB NEWS

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feed back

Q. I am concerned about the dishonesty of some Sandia employees. Yesterday I attended a retirement party for a friend at the cafeteria. I parked my bicycle and, when I got home, I found that a jacket and steel tape had been stolen from the handlebar bag on the bicycle.

What kind of people are we hiring?

A. While it may be that a Sandian stole your jacket and tape measure, the cafeteria is outside the tech area and essentially open to the public. The possibility does exist that someone other than a Sandia employee took your property.

Regardless, we are concerned whenever anyone is the victim of a theft at the Sandia facility. Unfortunately, there is little we can do to prevent petty thefts other than informing each employee of the consequence should he be found guilty of such an offense.

The matter of petty thefts is nothing new to Sandia. We have had them for as long as the Laboratories has been in operation. The sad fact, perhaps not realized by everyone, is that even some Q-cleared people are not above petty thievery. We urge employees to protect their personal property in their work area as they would at places away from the Laboratories.

D. S. Tarbox — 3400

Supervisory Appointment



RON FUGAZZI to supervisor of Education and Training Division 3522, effective April 16.

Since joining Sandia in 1962, Ron's work has been chiefly concerned with business systems and information systems. He has worked in business methods and budgeting, with financial systems, and, most recently, as a systems analyst in Personnel Systems Design Division 2626.

Ron earned a BS in business and his MBA from the University of Colorado. He is a member and past president of the Data Processing Management Association, Albuquerque chapter. Off the job, Ron enjoys fishing, reading and woodworking. He and his wife Carlotta have three children and live in NE Albuquerque.

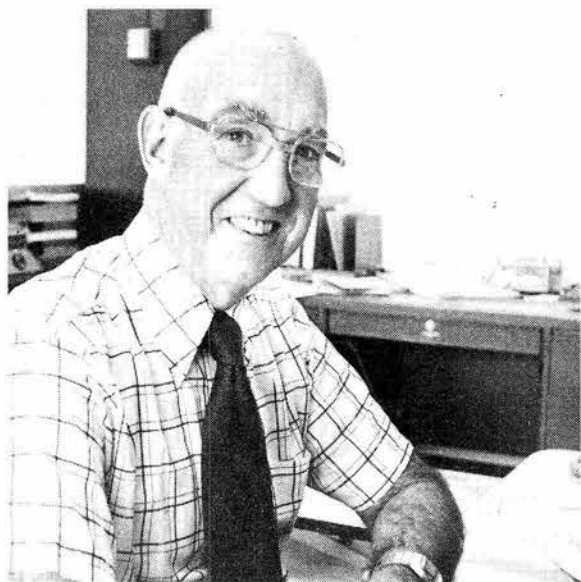
Seminar For Secretaries

Toward a higher degree of professionalism, Sandia secretaries are being invited to a one-day, in-house seminar during Secretaries Week, April 21-25. The seminar, arranged by Education and Training Department 3520, will be presented on five consecutive days to allow attendance by all secretaries who are interested. It will cover initiative and self-confidence, self-assessment and personal plans of action, interpersonal relations, stress control, time management, assertiveness and image development, and it will offer the opportunity to talk with representatives of various service organizations—the print shop, purchasing, tech art, security, mail services, records management, and word processing. Scheduling will be arranged by secretarial coordinators.

Speakers

John Holmes (4713), "The Solar Central Receiver Development Program," presented to the engineering staff of the Western Electric Cable Plant, Feb. 22, Phoenix.

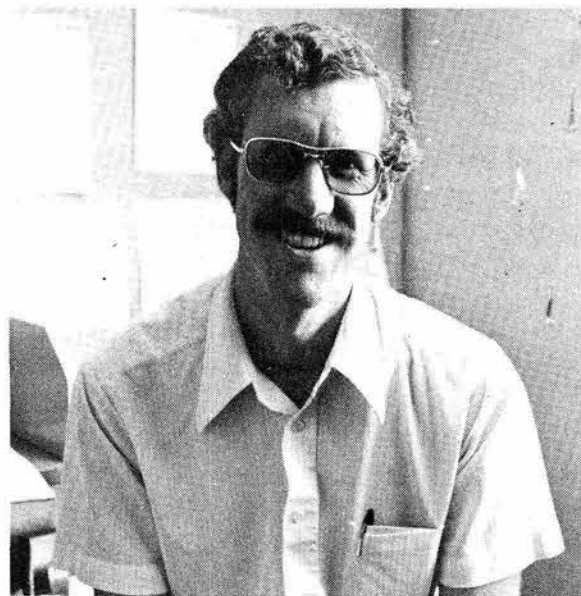
Supervisory Appointments



DAN HELD to supervisor of Material Management Division 8262, effective April 1.

After joining Sandia Albuquerque in 1951, Dan worked in the accounting and financial methods and cost accounting organizations. In 1956 he transferred to Livermore where he has been a systems analyst and assistant cashier in the Accounting, Budget and Financial Division. He is also SLL's audit and ADP data base coordinator.

Dan has a BS in accounting from the University of Tulsa. He serves as SLL's representative on the supervisory committee for the Credit Union. Off the job, Dan enjoys boating, fishing and water skiing. He has five grown children and five grandchildren and lives with his wife Jan on Juniper Street in Livermore.



CARL MELIUS to supervisor of Energy Systems Studies Division 8326, effective March 1.

After joining Sandia Albuquerque in 1972, Carl worked on gas laser development in connection with a laser fusion project. In 1975 he transferred to Sandia Livermore's Theoretical Division where he studied phenomena associated with hydrogen embrittlement and chemical reactions relating to combustion. He also worked in advanced weapons component development.

Carl earned a BS from the University of Minnesota and MS and PhD degrees from Cal Tech, all in chemistry. He is a member of the American Physical Society. Off the job, he enjoys outdoor sports, particularly sailing, swimming and running. Carl lives on Concannon Blvd. in Livermore.

LIVERMORE NEWS

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LIVERMORE LABORATORIES

APRIL 4, 1980



ROBERT LIVERMORE stands beside his great-grandfather's homesite marker located in the Lincoln Highway Park on Portola Avenue. The plaque explains that the original family homestead was located a few hundred yards northwest of this spot. The inset drawing shows our town's namesake.

Vista California

The Real Livermores: Four Generations

A popular bumper strip chiding local residents a few years ago proclaimed irreverently "Where the hell is Livermore?" Everyone working at Sandia certainly knows where it is, but many may wonder "Why is it called Livermore?"

To answer that question and find out more about our history, we did some research at the city library and interviewed a direct descendant of the town's namesake.

Livermore was founded in 1869 by William Mendenhall and named after his friend and neighbor, Robert Livermore, who was the first white settler in the eastern end of the valley. Mendenhall's newly-plotted village included land set aside for the railroad on which to build a depot, plus lots for a school and churches.

A community which adjoined his development, named Laddsville, was older and larger, but it burned to the ground a few years later and by 1876, when Livermore was officially incorporated as a city, it already had 830 residents.

Robert Livermore was born in England, had gone to sea, and when his ship landed on the shores of California in 1822 he decided to stay in this new adventuresome land.

He arrived in this valley in 1835 and established Rancho Las Positas, building his home on a site that today would be between Portola Avenue and Interstate 580, near North Livermore Avenue. Three years later he married a young widow—Josefa Higuera— and together they raised 10 children.

Throughout his lifetime, he was known for his hospitality and willingness to provide a night's lodging for the many travellers who passed through.

When he died in 1857, he left his family

with the 20,000-acre ranch, 2100 head of cattle, 230 horses and three yoke of oxen.

In a recent interview with his great-grandson, Robert Livermore, much was learned about the succeeding generations of the family. This fourth generation Livermore is now 81 years old and lives in the same house he built 53 years ago for his bride on South Livermore Avenue.

The family's original homestead had been divided up and sold by heirs when Bob Livermore was born in 1898. His first home was a ranch house near where I-580 and First Street cross, and near where his father had farmed and raised cattle. He quit high school in his freshman year to help out on the ranch. He had been going to the old high school that stood at 8th and H Streets.

Bob left ranch and farming life in 1924 to work at the old Livermore Fuse Works on Trevarno Road, later to become Coast Manufacturing and now Hexcel. He also worked at Kaiser Sand and Gravel outside Pleasanton, where he was a welder and machinist, and retired from that firm 14 years ago.

Bob recalls his participation in the first Livermore Rodeo Parade in 1915. He did some amateur bull riding in his earlier years but never went professional. He was honored along with four other oldtimers in 1976 by being named Grand Marshall of the rodeo parade for the Bicentennial. For many years he played trumpet in the Livermore Cowboy Band that led the parade.

He and his wife Nada have a daughter who is married to Douglas Baird. The family name will be carried on through at least one more generation: Bob's late brother Joseph has a son, Robert Ernest Livermore, so the name should be seen in the local telephone directory for many more years.

• bls

Magma—Still a Long Shot, Still A Hot Prospect

The Sandia Magma Energy Advisory Panel has concluded that extraction of energy directly from deep-lying bodies of molten rock (magma) continues to appear promising and that three to five more years of research are warranted to determine if the concept can eventually be put into practice.

The current concept essentially involves inserting a heat exchange system directly into the magma source—nominally a 1000°C to 1250°C body no more than 10 km (6 miles) below the surface—then using the extracted heat to generate electricity at the surface in a conventional manner. Other energy extraction schemes such as generation of synthetic natural gas from magma are also being studied.

Magma is regarded as a long-range energy source, but one of such magnitude that it must be carefully investigated even though the problems of reaching the magma and extracting its energy are extremely difficult.

The U.S. Geological Survey estimates that the energy content of molten rock deposits within 10 km of the earth's surface in the continental U.S. is 5000 times greater than the nation's total annual energy consumption in 1979. Major magma locations are found chiefly in the western U.S.

Sandia has been directing DOE studies of magma energy for several years. The National Magma Energy Advisory Panel consists of experts in volcanology, geophysics, magma petrology, tectonics, geochemistry, and materials sciences who regularly review the project research and recommend future courses of action.

At its recent meeting, the panel noted

that significant knowledge has been gained during the past several years, but recommended continued research in several areas: (1) improving geophysical techniques for locating and defining magma bodies; (2) assessing stability of boreholes drilled in magma; (3) determining physical properties of magma and materials adjacent to magma bodies; (4) establishing compatibility of engineering materials with magma; and (5) assessing novel concepts of extracting thermal energy from magma.

Much of the project's work to date has centered on locating and defining magma bodies, a prerequisite if magma is ever to become an energy source.

Various geophysical measuring techniques (seismic, resistivity, electromagnetic, and heat flow procedures), as well as drilling, have been used to characterize a known molten rock body under the Kilauea Iki lava lake on the island of Hawaii. Results are in general agreement with the lake's extent.

Geophysical measurements of the depth and thickness are continuing with the expectation that such measurement techniques can be used for defining a deep magma body in the continental U.S.

The drilling at Kilauea Iki suggests that conventional exploratory drilling techniques are satisfactory down to the molten rock margin (where rocks are still solid, but about 1000°C), but that special methods will be needed to drill through molten rock. A prototype jet-augmented drill which cools the magma ahead of the bit has been successfully tested.

Laboratory, field, and computational studies are underway to obtain information about the in situ properties of the hot, highly corrosive magma and how these

properties affect engineering materials—pipes, heat exchangers, etc.—inserted in the magma for long periods.

This magma characterization effort includes thermodynamic modeling of magmatic gases at high and low pressures, experimental measurement of the heat transfer rates in freshly erupted lava, computer modeling of magma fluid dynamics and heat transfer mechanisms, and collection and analysis of magmatic gases from eruptions.

Some of this work is done in Sandia's Magma Simulation Facility where experiments can be conducted in molten rock at pressures up to 60,000 psi and temperatures up to 1600°C. The simulation facility is also used to evaluate material compatibilities and to identify engineering materials for possible drilling and energy extraction equipment.

Heat extraction research has included limited heat transfer studies in the lava lake, insertion of a steam boiler and heat exchange devices into vats of molten rock and insertion of a heat transfer probe in the flowing lava river during the 1977 Kilauea eruption.

Results of the work have shown that useful amounts of thermal energy in the form of high-quality steam can be extracted from magma. Possible long-term (30-year average) heat extraction rates from a magma reservoir range from 1 kW/m² for a very viscous magma reservoir to 50kW/m² for a less viscous basaltic magma reservoir.

Magma research efforts at the Labs are centered in Geothermal Research Division 4743 under Harry Hardee.

Friendship Force

Dolly Dollahon Likes Traveling

International peace, understanding, friendship—these are goals of the Friendship Force, a national program which sponsors cultural exchange between American citizens and those of other countries.

Dolly Dollahon (3711) recently returned from his second visit to a foreign country. Last October, he was part of a "goodwill ambassador" group that visited in Verona, Italy. In March, he visited Costa Rica. Next June, he will lead a delegation of Albuquerqueans to Korea.

"It's a great program," Dolly says, "started by President Carter to get international relations down to a personal level—people to people—from their homes to ours. On these trips we stay with a host family and share the events of their lives, meet their families and friends. The 'force of friendship' works. In spite of language difficulties, we become good friends, get to know and understand their country and its concerns."

Albuquerque members of the Friendship Force will host visitors from Korea this



SIGHTSEEING in Costa Rica, Dolly (3711) and Dorothy Dollahon examine the crater of an active volcano, Irizu. They were part of a group of Friendship Force ambassadors in a cultural exchange with Costa Rica. Dolly will lead a tour of another group to Korea in June.

year, Costa Rica and other countries next year. Albuquerqueans will make two other trips this year in addition to the one to Korea.

"A number of Sandians are participating in the program," Dolly says, "both as hosts and visitors. Everyone I've talked with is enthusiastic about the program."

In the recent visit to Costa Rica, Dolly and his wife Dorothy stayed with a high school teacher in the suburbs of the capitol city of San Jose. The 10 days were busy

with sightseeing trips, including visits to an active volcano and a tropical rain forest, receptions for the Albuquerqueans and their host families, concerts and other activities.

"An outstanding experience," Dolly says, "and there's opportunity for many others to share in the program. We need both hosts and travelers."

Anyone interested may call Dolly at home, 881-7952, or the Friendship Force office, 243-6916.

Gary Phipps Goes Down Under

[Have you taken an unusual vacation? Tell us about it. Call 4-1053.]

Gary Phipps (1556) and his wife Pat spent almost the entire month of November touring Australia and New Zealand.

"A great trip," Gary says. "Spectacular scenery—especially the coastal mountains of New Zealand. The mountains are very steep and rugged, rising almost 13,000 feet directly out of the sea.

"We flew Air New Zealand from Los Angeles," Gary says, "stopped for an hour in Honolulu, another hour in Auckland (New Zealand) and then on to Sydney. The trip over took 25 hours, 24 on the return trip. We stayed four days in Sydney, saw the famous Opera House and took historical tours around the city. Australia started as a British penal colony.

"Then we rented a car and drove up the coast to Newcastle through the wine-growing region, visited Canberra and then went on to Melbourne, one of the larger Australian cities. We drove inland to Ararat and visited the Grampians, a large forest reserve. Saw Koala bears and a few kangaroos. At Philip Island, a wildlife sanctuary, we saw a parade of penguins just at sunset."

The couple took a train to Woomera across 300 miles of desert. A rare rain had made the roads impassable.

"This is the edge of the Great Australian Desert—the outback—one of the most barren regions on earth, almost no vegetation," Gary says. "We returned by train to Adelaide and flew from there to Sydney and on to New Zealand, the south island, where we rented another car and drove around the island.

"Miles and miles of sheep, fantastic coastal mountains and lush green valleys.

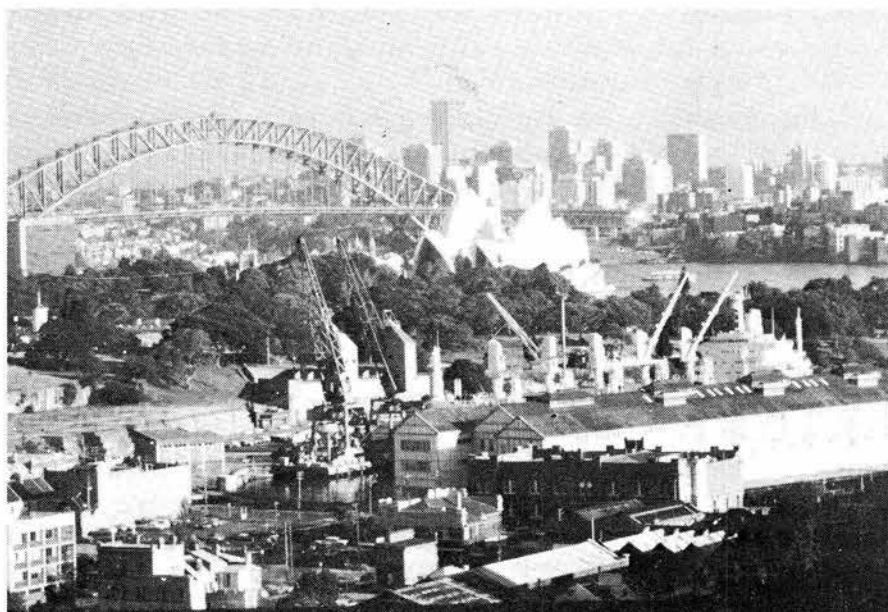
What a contrast from the Australian outback! The south island is rural—farms and small towns. They close up everything at 6 p.m. We had some early and excellent dinners of lamb and some expensive dinners of lobsters."

The couple took a ferry from Picton on the south island to Wellington on the north and completed five days of touring there by car.

"We put almost 5000 miles on rental cars," Gary says. "That's a lot of sight-seeing."

* * *

Logistics: Gary arranged air travel through an agency, booking tickets 45 days in advance and saving almost half the cost of regular fares. Round trip for two cost \$2166. Prices in both New Zealand and Australia are comparable to U.S. or slightly higher. Gary figures motels averaged \$30 a night and meals around \$25 per day for two—except when they tried fancy restaurants in larger cities.



GARY PHIPPS (1556) took this photo of Sydney's famous opera house from his hotel room window. He and his wife Pat spent 27 days last November touring Australia and New Zealand.



KOALA BEAR posed for Gary in a tree at a park reserve near Melbourne. He also saw penguins on Philip Island.

Fun & Games

Exercise for Women—On Mondays, Wednesdays and Fridays from 9 to 10 a.m., Mary Self leads an exercise class for women at the Base gym. There is no charge. A sauna and showers are available. Family members wishing to join this class should have a Labs ID card. No children, please. For additional information, call 296-4137 or 299-6642.

* * *

Biking—Can you do a hundred miles on a bike? Well, how about fifty? All it takes is staying power (and a calloused seat) . . . anyhow, you can sign up for the 8th annual Tour of the Rio Grande Valley by picking up the entry blank at the LAB NEWS office. The Century is set for April 20, starting at 6:30 a.m. Some 500 riders will likely take part.

* * *

Skiing—New officers of the Coronado Ski Club were elected last week: President, Ben Bader (4737); VP, Milo Navritil (1584); Asst. to VP, Lynn Grace (DOE); Secretary, Sadie Hesselden (6000); Treasurer, Pat Cox (3732); Membership Ch.,

Larry Lane; Equipment Ch., O'Neill Burchett (1552); Trip Ch., Bob Butler (1233); FAST Coordinator, Sharon Mackel (4550); and Area Rep., Walt Westman (ret'd.).

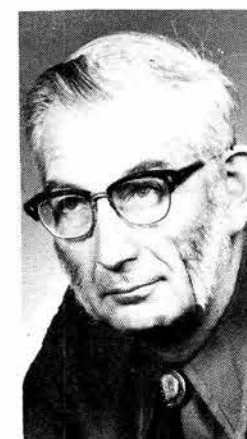
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Fishing—Most anglers are aware that the 1980 fishing season opened April 1. A change in fishing regulations also became effective on that date. Limits for brown or brook trout have been increased to 16 a day with 32 in possession. Limits for rainbow, cutthroat and salmon are unchanged at eight per day and 16 in possession.

Brown and brook trout have red spots down their sides. These self-propagating fish are present in all state trout waters. The Game and Fish Department made the change in bag limit on red-spotted trout to encourage anglers to do less fishing for the more easily caught, more expensive rainbows. The new fishing proclamation has color pictures of the fish to aid in identification.

* * *

Running—Fifty Sandians are signed up for the Duke City Corporate Cup Relays scheduled for the last weekend in May. Twelve different events are on the program, mostly team competitions at distances ranging from 110 yards to five kilometers. To organize the Sandia Labs teams, a meeting of all participants is slated for Wednesday, April 9, at 4:45 p.m. in the El Dorado room of the C-Club. If you're one of the 50 already signed up, be sure to attend. If you're not, but interested, then show up for the meeting.



Death

Arnold Draper of Physical Standards Division 2551 died March 31 after a brief illness. He was 54.

He had worked at the Labs 28 years.

Survivors include his widow, two daughters and a son.

Radiation & You—A Primer

by Sam Wenk,
Southwest Research Institute

[Ed. Note: Though Sandians work at what is often called a "nuclear installation," many of us have only a fuzzy notion of the meaning of the various units of measurement of radioactivity, especially as these may be applied to humans. Doug Ballard, 1551, has sent us this article on the subject, which is reprinted from "Technology Today," August 1979, a publication of the Southwest Research Institute in San Antonio.]

* * *

A few weeks ago, during the third week of the Three Mile Island incident, I had the rare opportunity of almost uninterrupted thinking for two days. I was in the hospital for removal of a malignant tumor resulting from exposure to nuclear radiation—Mother Nature's sun. As the result of inherited pigmentation from a red-haired father and the San Antonio smog-free skies, I contracted a basal cell (skin cancer) on the lower eyelid. This required surgery of both the family bank account and my eyelid.

Being involved in industrial radiography for over 30 years, I am familiar with the current government regulations regarding my allowable exposure to radiation. Consequently, I realized the two chest X rays and one heart X ray, which are mandatory under the hospital rules for any surgery, have used up about 60 of the 5,000 mrem a year which I am allowed by governmental regulation. Additionally, in the surgical staging area I was on the next gurney to a patient waiting for an ear operation who had not had the mandatory X rays. A portable X ray unit was brought in and the mandatory three X rays were made. My estimated exposure to this is another 10 mrem.

So here I am, 70 mrem of my allowable industrial radiation exposure for a year used up in two days in a hospital, because of manmade regulations for surgery on my eyelid caused by Mother Nature's radiation. Since I had a local anesthetic, it is obvious that the chest X rays were unnecessary in my case. This and the memories of explanations of radiation to assorted three generations of our family have led me to take a few references from my bookshelf and attempt a lay translation which should have been done by our regulators at the end of World War II.

For starters, what is an mrem? That's easy, it is a 1/1000 (milli) of an REM. The REM is a little harder to explain. It is an arbitrary unit in human tissue, which has been established by the International Committee on Radiation Protections. REM is the abbreviation of Radiation Equivalent Man, and is about the amount of absorbed radiation dose that an adult would receive for 50 chest X rays.

As a radiation worker, I am allowed 5 REM or 5,000 mrem exposure a year. Under our peculiar regulatory systems, my

medical exposure is not charged against my limit, but I do, so I now have 4,930 mrem left for the year. Or do I?

Mother Nature steps in at this point with natural radiation exposure that I share with all of you. Here is her annual box score:

• Cosmic radiation (ground level)	45 mrem
• Cosmic radiation airplane travel based on an average 10 hr/month (typical crew exposure is 500 mrem/year)	62.5 mrem
• Natural radiation from the ground we live on (U.S. average)	60 mrem
• Natural radiation from concrete, masonry, and wall board in my home	40 mrem
• Driving 10,000 miles (radiation from aggregate in pavement)	4 mrem
	<hr/> 211.5 mrem

That is equivalent of another 10 chest X rays just for a year's normal activity *without* eating or drinking. Those hard-to-break habits average another 25 mrem from Mother Nature because our food and water chain is ground dependent. All of this exposure so far is based on whole body absorption.

Here are a few common examples of localized exposure. If you wear porcelain dentures, the superficial layers of tissue in your mouth receive 60 REM of alpha radiation which fortunately has limited penetration (stopped in one layer of tissue paper). This radiation stems not only from the natural radiation present in the minerals used to make porcelain, but also the addition of uranium salts to obtain the natural color and fluorescence which has been a common practice for over 50 years.

If you wear glasses, as I do, we absorb about 4 REM of alpha radiation to our corneas. Cooking with natural gas will result in 6-9 mrem from radon which is the gaseous discharge product of naturally occurring radium in the earth's crust. Radon also shows up in our drinking water in various concentrations depending on the radium content of the rock/soil formation surrounding the water source. Due to a wide variation, there are no average figures available, but tests to date indicate possible exposures of 500 mrem. Tests have also shown that a significantly greater amount of radon is released from the water when taking a shower as opposed to a tub bath. By the way, if you have an older home with yellow ceramic tile, you are picking up a few more mrem's a year from the uranium oxide used for color.

With the OPEC price escalation for oil, coal is being touted as the substitute fuel for electrical generation; we have large reserves of low sulfur western coal, and it is non-nuclear—well, almost. Western coal contains uranium in amounts ranging up to 0.1 percent. This means that an efficient, modern 1000MW coal generating plant will expose the immediate offsite population to as much as 380 mrem per year. Oh yes, I almost forgot, a nuclear power plant is restricted to less than 10 mrem per year to the offsite (at the fence) population.

Coal plants also produce waste (fly ash) which in many cases is sold for cement construction as a substitute for sand. Assuming an average western coal, a dwelling built of this material would result in a whole body radiation exposure of 80 mrem per year. If the fly ash from the

plant burning the 0.1 percent uranium coal is used, the individual dose jumps to 400 mrem.

Remember my allowable 5000 mrem per year as a radiation worker? Did you know that there is also an unfortunate group of nonradiation workers who receive almost this much every year? They are ones living with implanted plutonium-powered pace makers. Not too bad when you consider the alternative.

In case you are wondering how an industrial radiographer can be knowledgeable in these other areas of radiation, do what I did—read the EPA report, "Radiological Quality of the Environment in the United States, 1977," EPA 520/1-77-009. It is available to the general public through the EPA Office of Radiation Programs as part of its mandate from the U.S. Congress.

Go For Health

To Smoke Or Not

Stopping smoking is easy—ask any veteran smoker. Most have "stopped" dozens of times. But stopping smoking is like waging battle—the trick is to consolidate your gains. Eventually, with enough consolidation, you win the battle.

In Medical's next Go For Health program, clinical psychologist Arlene Price and counselor Phil Cheromiah will present proven methods to help you in your battle with the cigarette . . . how to maintain and strengthen gains you have made in your new non-smoking life. Arlene and Phil have been running Medical's stop smoking clinics and they note, "Practically everyone in our classes is able to quit smoking. It's making it stick that's the big challenge. Smokers come to believe that their lives depend upon that next cigarette. In a sense, that's literally true, but not in the way they're thinking."

The program is set for Tuesday, April 8, at 12 noon in Bldg. 815. Friends and relatives of smokers who wish to help are also welcomed.

sandia PEOPLE Report



UNUSUAL PET—Gilbert Apodaca (3155), his daughter Simone and her per ferret, Crackerjack. In the past, the ferret, domesticated since Biblical times, was used as a hunter of rabbits and rodents in the British Isles and Europe. Simone compares her pet to a cat—playful, curious, quiet and clean.



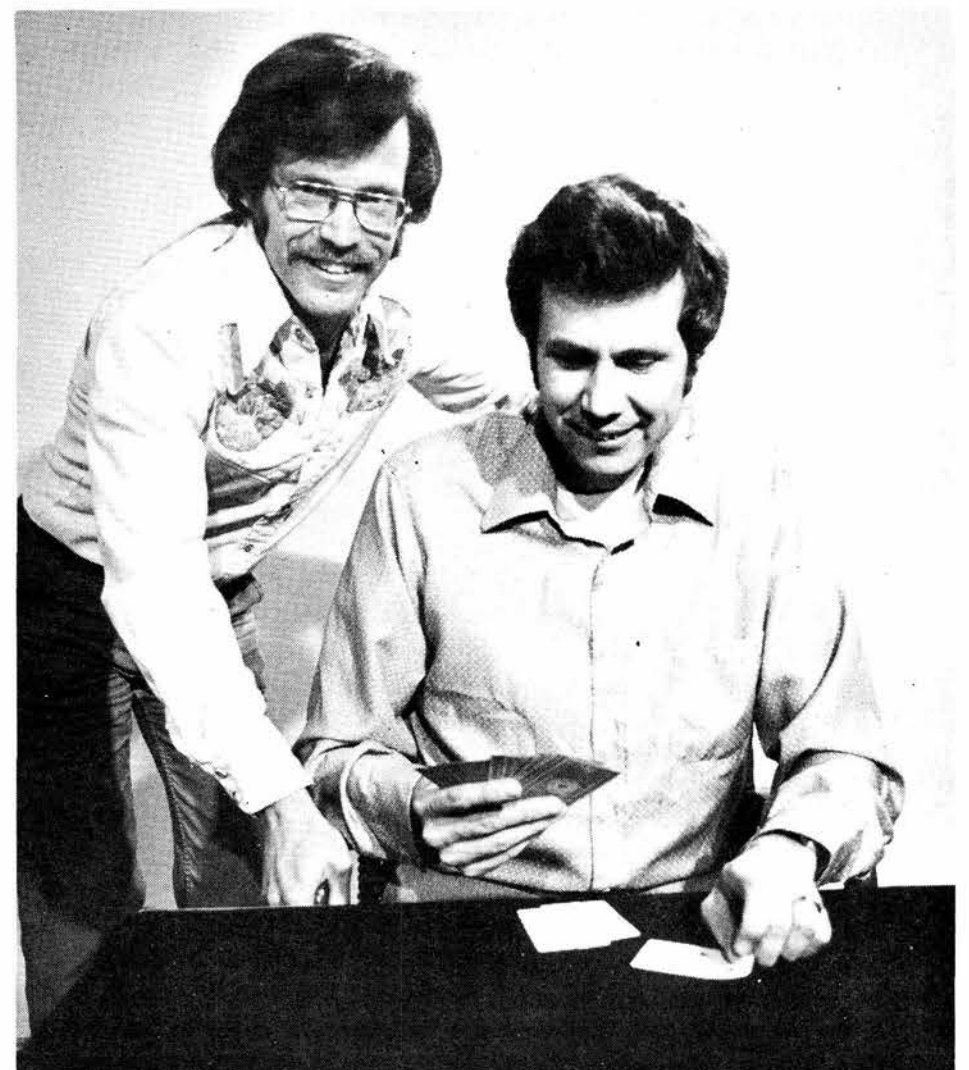
DAVE SANDERS (5154) demonstrates his winning judo technique on Jim Wolcott (5821). Dave took two third-place trophies (in the 132-lb. and 143-lb. weight categories) during the recent State Judo Tournament in Las Cruces. It was his first competition. More than 100 entered the tourney. Both Sandians are members of the Haiku Judo Club which meets at UNM three times each week. New members are invited. Call Dave on 4-8157 for details. Women are welcome.



BILL DAWES (center), supervisor of IC Technology Division 2144, was honored last week with the Meritorious Paper Award of GOMAC (Government Microcircuit Applications Conference). As Gene Reed (left), VP-2000, looked on, Larry Sumney, Undersecretary of Defense, Research and Engineering, made the presentation. Title of Bill's paper is "A Radiation Hardened Field Oxide."



BOB STROMBERG, supervisor of Solar Technical Liaison Division 4714, displays his article in the current issue of *Popular Science* which describes his homebuilt trough-type solar collector that provides hot water for his residence. (LAB NEWS, May 26, 1978.) So far, he's had dozens of requests for plans.



BRIDGE CHAMPS—Rich Schmidt (4732) and Larry Bertholf (5531) took top honors in a recent regional open pairs duplicate bridge tournament sponsored by the American Contract Bridge League in Colorado Springs. Competing for Master Points, the Sandians won 37 each, placing Larry in the Life Master category and Rich very close. A player needs 300 points won in local, regional and national competition to achieve Life Master rank.

Getting to Know You — En Español

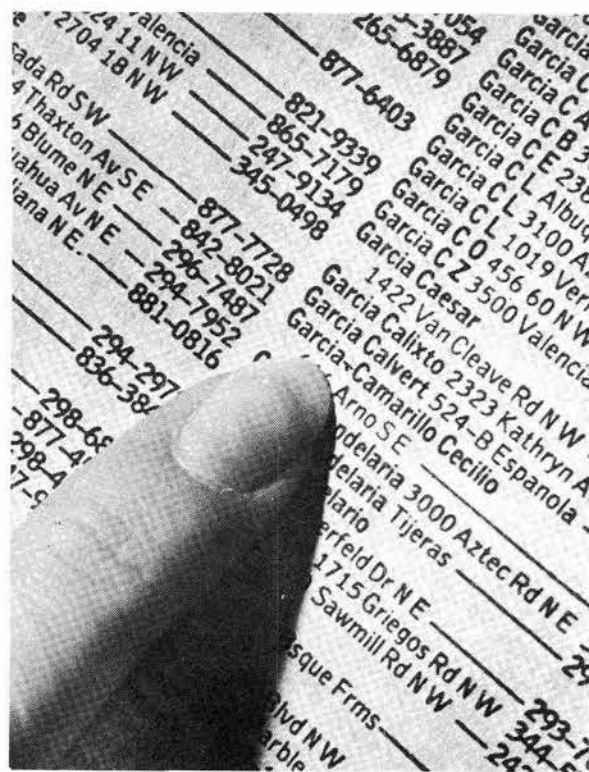
On TV the other night, the announcer was going smoothly through the roster of players until he came to García. "Gah-kee-ya" was what came out; we winced, and he continued on, unmindful of his *faux pas*.

Spanish names are rich in their variety and frequently have a musical quality—Porfirio, Boleslo, Celestina, Joaquín, Crucita. Like other eastern migrants, I've committed my share of stumbling pronunciations but now, after two decades here and several years of Spanish language study, I think I've got the hang of it—in theory anyway.

If you're having problems with pronunciation of Spanish names, here are a few simple guidelines. (And note that I don't call these "rules" because there are always exceptions.)

•If you've got the accent right, you're nearly home. Spanish names that end in a vowel or n or s receive the stress on the next to last syllable—Bo-LES-lo, Cel-es-TIN-a, Cle-O-fas. But names that end in a consonant other than n or s receive the stress on the last syllable—Is-ma-EL, Jav-i-ER. And if the stress departs from these guidelines, then the name will usually be written with an accent mark—Lá-za-ro.

•As for pronunciation, I'll touch on only those letters which, in Spanish, may create problems. C is like the s in see before e and i, but otherwise like the c in cake. G before a, o, and u and consonants is like the g in go. But before e and i it comes out like the h in house—the name Gerardo would be pronounced Herardo. H is silent in Spanish; thus Hilario would be ee-lah-re-o. And j comes out much like our h—Juan is hoo-ahn. The doublet ll is usually



given a y pronunciation—Guillermo would be ghee-yer-mo. Ñ (that's called a tilde) has the value of ny, as in canyon. Finally, b and v. These two more often than not come out closer to a v than b sound, but authorities differ.

Most Spanish names can be readily translated into their English equivalents: Alfredo, Nataniel, Felisa, Ricardo, Teresa, Patricio, Rafael, Francisca, Elena, Bernardo. But can you guess these? Diego (James), Carlos (Charles), Timoteo (Timothy), Pablo (Paul), Noé (Noah), Guillermo (William), Enrique (Henry).

I noted earlier the richness and variety of Spanish names. Consider this sampling (taken from the Albuquerque phone book under "García"): Telesfor, Tasho, Zenoa, Shauna, Reynel, Arsenio, Auduro, José,

Esequiel, Premetivo, Gumisundo, Cor-sinio, Marcelino, Brancilio, Berlinda, Serafín, Olimpio, Epifanio, Donaciano, Ciriaco, Pilar, Calixto. And many, many more whose very number would seem to indicate that Spanish parents look at every new offspring as a brand new ballgame, an opportunity to range afield.

As in English, nicknames and diminutives abound in Spanish. The ending -ito or -ita is frequently seen, as in Juanito (Johnny) or Evita. María has many diminutives: Marica, Mariquita, Maruca, Marucha. Sometimes the transition from proper name to nickname follows an unpredictable course: Catarina (Catherine) to Catana, Catuca, or Catujita. Or Francisco (Francis) to Paco, Pancho, Frasco. Jesús is a fairly common proper name, with diminutives of Chucho and Chuchito. Pepe, Pepito, and Chepe derive from José. And young Pedro (Peter) may end up Perico.

In many parts of the Spanish-speaking world (though not common here), people use the surnames of both parents, much as the English upper class uses hyphenated names. The father's surname precedes that of the mother, and the two surnames are occasionally joined by the conjunction "y" (and). For example, José López Gonzales might also appear as José López y Gonzales. A Spanish female in this system retains her maiden name after marriage but generally drops her mother's surname, adding her husband's name by the preposition "de" (of). Thus, Elena López y Gonzales marries Porfirio García y Sánchez and becomes known as Elena López de García. I'm sure the telephone company in Madrid has a lot of fun putting out a directory. •js

Take Note

In the last issue of LAB NEWS we carried a full page reproduction of an aerial view of the Tech Area, and many readers called to express their pleasure with the picture. Quite a few also called to ask that LAB NEWS make available a photographic print suitable for framing of the same picture. After checking with several commercial photo development houses, we can offer to readers an 11" x 14" photographic print in color for \$3.50; all profits will go to the South Highway 14 Village Project, a charitable venture. Before we place our order, we need to have an estimate of quantity, so if you're interested, please send your name, organization and phone number to Tech Area Print, LAB NEWS. We'll contact you after the order is received.

* * *

Bob Gorsline, a third-year EE student at UNM under the Labs Work-Study Program, is the recipient of two honors, having been named to Tau Beta Pi (engineering honorary) and Eta Kappa Nu (EE honorary). In addition, Bob was elected president of the former. Son of Don Gorsline (1242), the younger Gorsline will

work at the Labs this summer in Micro-electronics Technology Dept. 2140.

* * *

Pianist Vladimir Ashkenazy plays a benefit concert with the New Mexico Symphony on Sunday, April 13, at 4 p.m. in Popejoy Hall. The concert proceeds are for the benefit of the orchestra itself. Russian born, Ashkenazy now resides in Switzerland. He'll play works by Brahms, Rossini and Britten. Call 842-8565 for tickets—they're tax deductible.

* * *

Retirees take note: the 15th annual retiree picnic is scheduled this year for Thursday, May. 29. Invitations will be mailed to all Sandia retirees in late April.

* * *

Larry Lopez of Technical Writing Division 3151 has published an article in the current issue of *New Mexico Historical Review*. Title of the article is "The Founding of San Francisco on the Rio Puerco: A Document." The scholarly work describes early Hispanic colonization efforts on land grants along the Rio Puerco watershed in north central New Mexico.

Retiree Deaths

Jan.—March 1980

James McAchran (78)	Jan. 2
Silverio Armijo (73)	Jan. 3
Alfred Brady (80)	Jan. 8
Dorcas Crosby Close (81)	Jan. 22
Dorothy Harrington (75)	Jan. 24
Walter Halpin (56)	Jan. 25
James O'Connor (72)	Feb. 2
John Findlay (76)	Feb. 7
Mack Milner II (69)	Feb. 19
Paul Krogdahl (57)	Feb. 29
William Huffman (65)	Feb. 29
William Meador (64)	March 11
Ramon Bernal (75)	March 26



National Geographic recently noted that a beam of infrared light at its highest frequency oscillates nearly 100 trillion times a second—and that visible light vibrates faster still. Their conclusion: modulated light has immense potential for transmitting information—a potential so immense, in fact, that "every word in the 30-volume *Encyclopaedia Britannica* could be transmitted in a tenth of a second." It's a little difficult to grasp the significance of this information, but one thing seems sure: it's long past time for us to sign up for a speed reading course.

Overeaters Anonymous: Offering Hope

It's no fun being overweight in a society that equates attractiveness with the lean look. But worse than that, being overweight simply isn't healthy. We're reminded of that day after day in magazines and newspapers and even in government reports like the one we read recently that told us that one out of five Americans under 40 and nearly two out of five over 40 are "overweight to a degree that can interfere with optimal health and longevity."

So why don't we all lose weight?

A lot of us try. Some even successfully. In many cases, it's just about as simple as picking a diet, counting the calories, exercising a little will power. But for some, it doesn't work like that. In fact, for some, nothing seems to work.

A friend at Sandia talked with us the other day about the problems of overeating and obesity. After trying every known diet and weight loss plan with limited and short-term success, our friend was in a state of despair. Nothing had worked—not shots, hypnotism, behavioral modification or aversion therapy. Yet one meeting a week with Overeaters Anonymous is working for our friend, and we decided to find out why.

Overeaters Anonymous is listed in the yellow pages under Reducing and Weight Control Services. Their number, 243-3538, is an answering service and the operator there, before we revealed our identity, moved quickly to protect our anonymity: "Just your first name and a number where you can be reached, that's all we want."

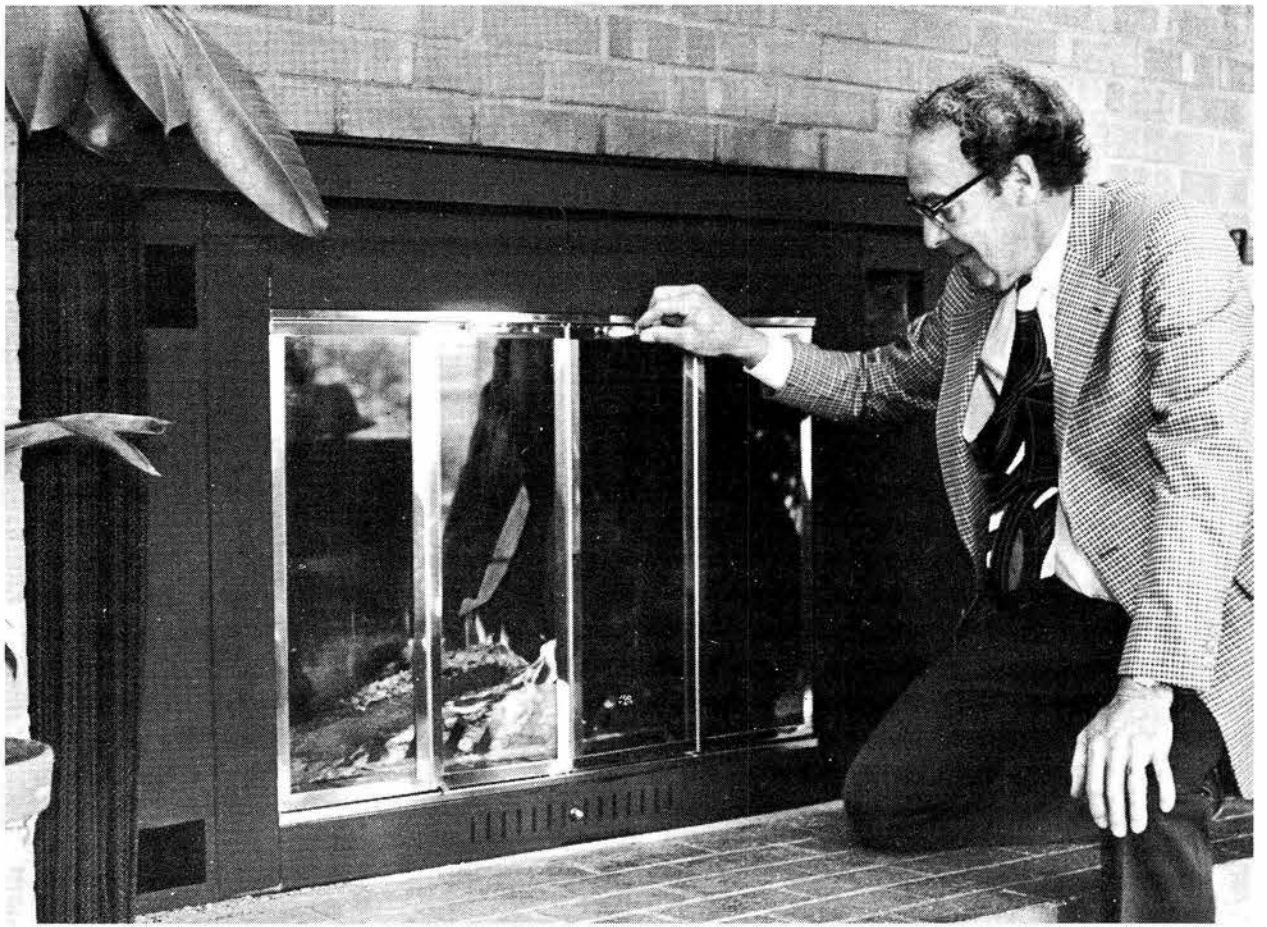
The calls are answered in the evening by a member of one of Albuquerque's six chapters of OA, so it's best to leave your home phone number. Our call was answered by a woman named Cynthia, who listened politely as we explained we were seeking information for this article.

She told us that Overeaters Anonymous (with chapters in every state and 22 foreign countries) is patterned on the principles of Alcoholics Anonymous, that it's a self-help, non-profit organization.

"We believe you have to approach compulsive overeating at the physical, emotional and spiritual levels," Cynthia says, "and that before people can control their eating, they have to learn *why* and *when* and under *what* stresses the problem occurs.

"The important thing about Overeaters anonymous is the support it provides. We have six groups in Albuquerque and six meetings a week. Members attend one or all, depending on their need for support. And each member has a phone partner, someone to call when the impulse to overeat gets too strong to control alone."

Of the six meetings held each week, two are at St. Luke's Lutheran Church, two at Anna Kaseman Hospital, one each in the community room at Coronado Shopping Center and the Albuquerque Federal Bank Building in the North Valley. Three meetings a week are held in the daytime, two at night and one on Saturday morning.



MORE EFFICIENT fireplace is admired by its developer, Corry McDonald (2426). Besides glass doors, unit features air compartments on either end; cool air enters at bottom, is heated and flows out top opening. Five-inch pipe brings air from outside to hearth to support combustion.

Conservation at Home

Fireplace Fix Looks Good, Heats Too

When the price of natural gas began to take off, Corry McDonald (2436) looked fondly at the open hearth of his five-foot-wide fireplace and had to concede that something else was going up the chimney

They follow a format, with individuals reporting successes and failures and group leaders moderating open discussions on how problems might better be approached and how pitfalls might better be avoided. Group members lead on a rotating basis, but there's no pressure to do so.

"You can participate for years and never lead," Cynthia says. "But when you're ready, the opportunity is there."

Coupled with meetings, there's a food program—not a rigid, one-system-for-all approach, but eight different programs (including ethnic and vegetarian) that give members what Overeaters Anonymous refers to as "dignity of choice."

We asked Cynthia to sum up those factors she felt most important about the organization—the factors that made it work for people who found no help elsewhere. She thought a moment.

"First, we're a support group. We provide lots of sympathy and lots of empathy. We don't offer any panaceas and no overnight cures, and we don't pretend that losing weight is easy. But we do emphasize that it's possible and that learning to control your weight is part of a lifetime learning process.

"Lots of people come to us as a last resort, in desperation. We tell them we know our program works and that they can make it work if they want to." She paused a moment, then concluded: "I guess you could say our greatest asset is that we offer hope—to people who often have none—that overeating can actually be controlled."

• cec

besides heat from the house, namely money. The alternative—not to have fires—was unappealing, so Corry set out to achieve an operating fireplace that offered both a rosy glow and additional heat.

His initial solution was simply to have made-to-order glass doors installed, but when the price tag—\$500—was announced, Corry backed off and came up with a fix that looks good and does contribute to the heating of the house.

From a department store in town, he purchased an off-the-shelf set of glass fireplace doors, the biggest in stock, some four feet wide. This left a gap of six inches on either side of the door which Corry could have simply filled by extending the doors with sheet metal. Instead, he designed a sheet metal compartment (one for each side) that extends to the rear of the fireplace, forming a kind of manifold on either side of the hearth. Cool air enters the sealed compartments through a cut-out at the bottom (see photo), is heated, rises and exits from the top into the living room.

Because the glass doors are closed in operation, an outside source of air for combustion is needed. "This was the hard part," says Corry. "I had to chip my way through 28 inches of concrete in the fireplace foundation so that I could run a five-inch air pipe into the firebox under the grate. The pipe also goes through an outside wall of the house, but making that opening was not unduly difficult." Corry regulates air flow through this pipe into the fireplace with a damper.

Cost of the fireplace fix was nominal—\$75 for the glass doors, another \$35 to have the sheet metal work done at a shop, plus a few bucks for the five-inch pipe. And it works. "Heat still goes up the stack," notes Corry. "But the house doesn't lose any and, in fact, we gain some."

MILEPOSTS

LAB NEWS

APRIL 1980



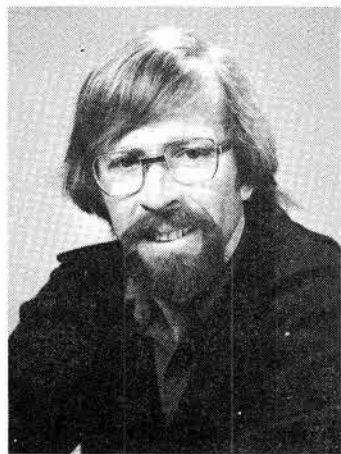
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Lee Garner - 3151 15



Jim Pennington - 3155 25



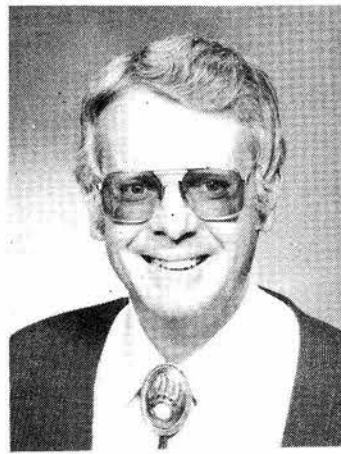
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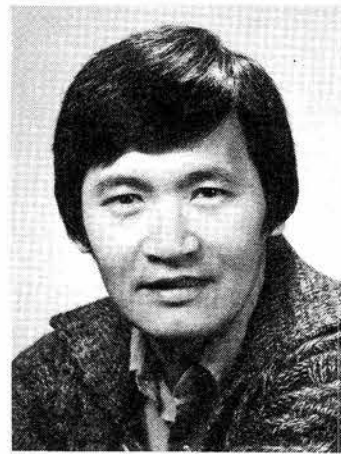
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Don Cox - 4422 25



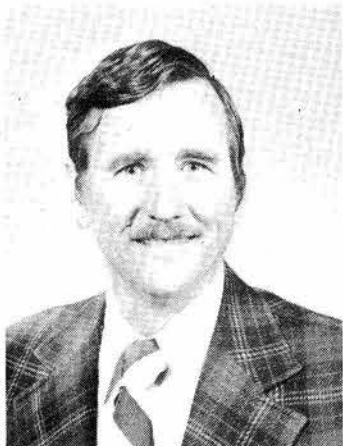
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Ray Marr - 8313 10



Don Loehle - 3424 30



Robert O'Nan - 2341 25



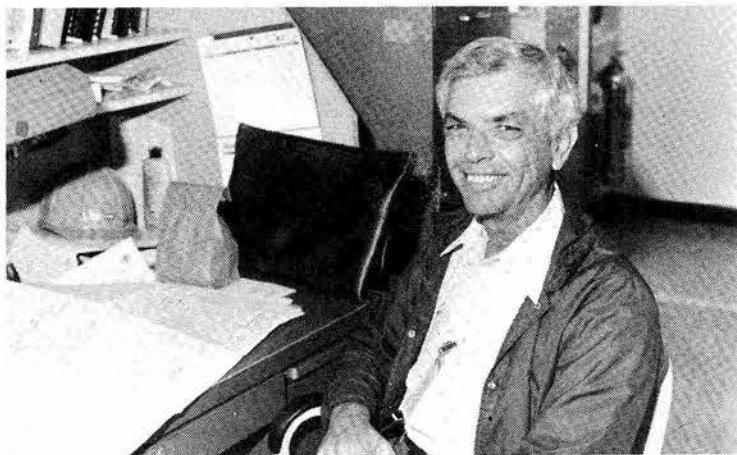
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Richard Corn - 1727 20



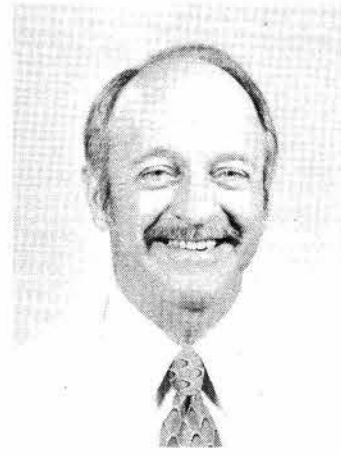
Richard Williams - 1172 10



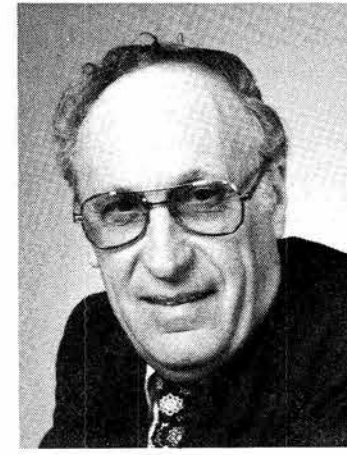
Bill Roper - 1172 25



Simeon Teisher - 1767 25



Robert Leslie - 1426 25



Ollie Olivotti - 8412 20

Retiring



Abelio Garcia (3423)



Cliff Shaw (1481)



Jack Westbrook (2637)



Marian Weiss (3733)

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4. Use home telephone numbers.
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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

DRAPERIES, 2 full panels, ceiling to floor, flowered woodtones, orange & brown, fully lined. Kubiak, 265-6525.

MAYTAG washer & dryer, washer needs some work, \$75/pair, may separate. Fuller, 294-3089.

SWING SET, substantial, homemade w/1.5" galvanized pipe, will deliver & assist w/set-up, \$50. Durkee, 255-4211.

LARGE chandelier, wood & ceramic, Kachina design, \$130 or trade for sofa-bed, belt sander or small freezer. Clark, 281-5934.

STOVE, 30" gas countertop, \$50; elec. wall oven, \$50; ping pong table, \$30; wheelbarrow, 4 cu. ft., \$30. Pilat, 292-4727.

NORITAKE service for 8 plus serving dishes; stemware; tricycle; creative playthings slide; rocking horse; GM loveseat; Ford totguard. Carson, 898-8847.

LANDSCAPING STONES, for more info. after 5. Webb, 294-8341.

'77 17' Komfort travel trailer, fully self-contained, \$4500. Baca, 298-1505.

QUEEN SIZE MATTRESS only, new, \$50. Nunez, 884-3623.

GEESE: 1 drake & 2 hens, \$12.50 ea. or \$30 for all 3. Dees, 869-6949.

'77 25' Wilderness 5th wheel trailer, self-contained, air, TV antenna, carpeted bdr., dbl. door refrig. furnace, etc. Warden, 266-8452.

AKC German Shepherd dog, female, 1 1/2 yrs., \$125; chain link dog kennel w/gate, 6'x6'x12', \$175. Martinez, 821-8692.

SWIMMING POOL, 20' dia. x 4' deep, metal frame, plastic liner, cover, free to good home. Latta, 822-0912.

TRAVEL QUEEN cabover camper, stove, heater, gas/elec. refrig., monomatic toilet, carpet, jacks, boot, plus extension bumper, \$1100. Hamlet, 299-5124.

DRESSER, dbl. bed, night stand, needs refinishing, \$50 or best offer. Corradini, 266-4307.

DOG-PROOF deluxe drop-thru rabbit hutch, 4'x4' heavy dbl. screened, \$10, includes some food. Lewis, 299-7217.

BAR, white naugahyde w/4 black swivel wrought iron bar stools, \$350. Nogales, 247-1178.

WOVEN WOOD for 6'x3' window, avodaco & white, \$80; bedroom set: dresser, mirror, headboard frame, antique blue. \$25. Kaiser, 296-5215.

WURLITZER organ console w/bench, 2 full keyboards, 32 pedals (for the electronic organ builder). Bircher, 268-0726.

TIRE, HR70-15 sb radial, whitewall, mounted on rim, never used, \$18; car jack & tire iron, \$5. Headley, 293-4930.

FREE goat manure & alfalfa mulch, you haul. Davis, 877-0839.

LONG wide bed camper shell, cab high removable back door, panel, curtains, wired, lights, \$125; tent, 12x10, \$75. Prokash, 296-6775.

ASSORTED APPLIANCES, most are klunkers, some are antique, others unusual. Massis, 299-5584 daytime.

HOOVER floor and rug scrubber w/ attachments, \$35; Regina Elektric-broom, \$10. Russell, 292-3279.

WASHER, Frigidaire auto., model WC-7B, purchased in Nov. '78, still under parts warranty, \$250. Alvarez, 821-6817.

SEARS glass fireplace enclosure, used less than 1 yr., \$75. Patterson, 299-1062.

GOLF CLUBS, men's LH, 2-PW & #2 & #3 woods, \$70; girl's 20" Spyder bicycle, \$35. Poole, 298-6025.

WASHER/gas dryer, full size Kenmore matched set, a little over 1 yr. old, almond color, \$400. Vosburg, 298-6025.

.38 SPECIAL reloads by 3-D, 100 grain wadcutters at 800 F/S, ideal plinking load, \$5/box. Svensson, 898-3078.

EASY LIFT adjustable trailer hitch, 750 pound, leveling bars, used 1 yr., \$35. Irwin, 881-3985.

GITAR, 3/4 size, new, w/case, \$40. Donaldson, 255-4024.

ROPER microwave oven, \$300; Sears dishwasher, \$125; Kroehler hide-a-bed, \$75. Caster, 299-4308.

CABRITOS, born Feb. 28, will wean April 15, 1 male, 1 female, Toggenburg-Alpine cross, \$30 ea. Morrison, 877-7425.

FREE, doghouse for medium to large dog, carpeted inside. Keltner, 298-7888.

HOTPOINT electric cook top & 23" wall oven; kitchenette formica 42" round table w/6 chairs, all mid '60s vintage. Hanna, 299-1126.

HI-LIFT JACK, 4', new, \$30; rear axle for '74 Bronco, \$50; rear drive-line, \$25. Brammer, 266-5158.

GOLDEN RETRIEVER puppies, AKC. Pinkham, 256-1535.

GARAGE SALE—April 11-12, 8:30-5 p.m., several families: toys, antiques, household items, etc., 3213 Alcazar NE. Lewis, 883-5454.

L78x15 mud & snow tires; AM/FM car radio; Dodge or Chev. stock rims; 10-spd. bike. French, 821-3711.

LABRADOR RETRIEVER, pick of the litter, excellent hunting dogs or pets, male or female available. Benson, 268-9727.

SOFA, Ethan Allen, blue print; pecan veneer formal dining room set; sofa bed; 8x10 wood frame building. Burns, 293-5547.

REFRIGERATED air conditioner, 10,000 BTU, fits casement & slide-by windows, new, still in box, \$300. Manzanaras, 298-1240.

CAMERA, 35mm, 4 lenses: 35, 50, 135 & 200mm, w/flash and 2X converter, \$275. Archuleta, 821-5389.

WET SUIT, White Stag Deep, x-lg., full 2-piece, \$125. Draper, 877-2802.

SEARS elec. stove, continuous cleaning oven, copper-tone, 2 1/2 yrs. old, \$200. Sullivan, 299-4836.

NIKKOR LENS, 50mm, F1.4 A1 converted. Passman, 821-4999.

3-PIECE bdr. set: chest, bed, night stand, \$150; sofa, green, \$140; chenille bedspread, full, white w/colored flowers, \$13. Smith, 299-7151.

TURKEY CALLS, box type, handmade, tested in La., tom or hen calls,

Sartori, 294-7837 after 4.

OUTBOARD MOTOR, 2 HP Johnson, less than 1 hr. use, \$295. Merritt, 884-8487.

CAMPER fishing hut, \$850. Padilla, 296-2346 after 6.

CAMERA, '72 Exacta 500, 50mm 1.2 lens, case, Vivitar lightmeter & case; Rolli electronic flash w/P/C cord, \$125. Foster, 299-6240.

COLOR TV, 21", newly reconditioned, \$110. McConnell, 268-3109.

TRANSPORTATION

'75 DODGE Dart, 6-cyl., 4-dr., AT, PS, PB, radio, cruise, 36,000 miles, below book, \$2400. Caskey, 298-1146.

'63 CORVETTE, split window coupe, 71,000 miles, 327 engine, was an original F.I. Barnaby, 821-0301.

'74 CHEV Impala stn. wgn., AC, AT, PS, PB, CB, trailer hitch, new tires, one owner, \$900 or best offer. Palmer, 299-4722 after 5.

'77 KZ400 KAWASAKI, custom seat, extras, 50 mpg, 10,000 miles, \$800 or best offer. Wilcoxon, 296-8295.

'70 CHEVY Carryall, AC, radio, 4-wd, \$1200. Mason, 281-3052.

'78 CORDOBA, 15,800 miles, luxury pkg., \$5500. Baca, 298-1505.

'78 MAZDA GLC, 30 mpg, AC, low mileage, NADA \$3850, \$3595 or trade for older car w/AT. Mathey, 345-6312.

'69 CHEVY pickup, lwb, 4000 miles on new engine, heavy 1/2-ton w/4-spd. trans., radials. Dees, 869-6949.

'78 CHEVY Malibu, 7300 miles, AC, power, AM-FM cassette 4-speaker stereo & more, best offer over \$3700 wholesale book value. Grant, 881-6243 or 255-0576.

'73 SUBARU WAGON, red, 20-22 mpg city, 35 highway, \$1100 or best offer. Corradini, 266-4307.

'73 OLDSMOBILE 98, 4-dr. sedan, fully equipped, power, best reasonable offer. Corner, 255-6910.

'67 FORD F-100 pickup, 3/4 ton, long bed, small V8, saddle tanks, over-loaders, \$800 cash. Kaminski, 877-2988.

'63 CORVAIR, orig. owner, R&H, SR tires, 4-dr., AT, make offer. Kerr, 299-7527.

AIRPLANE, 1966 Beech A23-24 200HP, 1430TTA, 730TTE, IFR, MK16, COM/NAV11, ADF, MBN, recent paint, no damage, \$12,800. Crow, 821-0956.

10-SPD. bicycle, 24" wheels, 17" frame, child or small adult, \$55. Drumheller, 821-9527.

'69 FORD F100 1/2-ton, overload springs, PS, 4-spd., new tires, shocks, AC, AM radio, \$1750. Baca, 242-9772.

'72 CUTLASS, new brakes, gauges installed, recent tune-up. Hesch, 881-9874 after 6.

'74 WINNEBAGO Chieftan, 25', sleeps 7, 45,000 miles, Michelin radials, fully equipped, AC, stereo, \$11,500. Crawford, 884-8640.

20" BIKE, purple Stingray. Faucett, 265-8626 or 255-0320.

'79 TOYOTA Corolla 2-dr. sedan, AC, AT, radio, \$4600. Patterson, 299-1062.

'73 OLDS 98 coupe, AC, PS, PB, AM/FM stereo, PW, cruise control, \$1250. Rea, 299-7758.

'79 CHEVY Luv pickup, 10,500 miles, 4-spd., yellow, \$4400. Murchio, 831-2326.

'72 PINTO Squire wagon, AC, 4-spd., new: tires, carb, distributor; luggage rack, red w/wood trim, \$1295. Marchi, 299-3653.

'69 DODGE Coronet, 6-pass. wagon, 318V8, AC, AT, PS, steel radials. Aeschlman, 281-1227.

SCHWINN BICYCLE, child's 20" w/

training wheels, \$50. Bertram, 294-8350.

'77 280Z 2+2, AM-FM-tape, AC; new tires, battery, water pump & tune-up; silver color, Book \$7700. Morrison, 877-7425.

BICYCLE, ladies' Sears 3-spd., 26" lightweight w/basket, \$55. Brammer, 266-5158.

'72 MAZDA RX-2, \$500; '77 Garelli mo-ped, 2500 miles, \$350. Burns, 293-5547.

'67 CHRYSLER Newport, 4-dr., AC, PS, PB, radio. Conklin, 298-8217.

AIRCRAFT: 1/2 partnership w/2 Sandians in '68 Cessna 172, \$3900. Benson, 296-4282.

'69 VOLKSWAGEN squareback, AT, new paint, recently rebuilt engine. Chavez, 831-9591.

'68 DODGE pickup D-100, 225 CID, 6-cyl., std. trans., \$395. Sieglitz, 898-5939.

'71 DATSUN 510 wagon, 4-spd., AC, AM-FM cassette, sb radials, \$1195. Orear, 256-1941.

'75 RABBIT, \$2800 or trade newer AT pickup; 750 Honda-Four, 15,000 miles, loaded, \$1800. 161 Chama NE, Gallegos, 258-0271, 255-5264.

RALEIGH 3-spd., coaster brake, 24" wheels, \$100. Passman, 821-4999.

'75 TOYOTA Land Cruiser, green, 29,000 miles, \$2900. Hamilton, 298-5005 after 5.

'77 T-BIRD, white over lt. green, many extras. Kelly, 867-2718.

REAL ESTATE

BRICK HOME, 1820 sq. ft., 3-bdr., den & fp, carpet throughout, lawn & sprinklers front & rear, trees. Warden, 266-8452.

TAYLOR RANCH, 3-bdr., 1 1/2 bath, pitched roof, low equity, 9 1/2% assumable VA loan. Andersen, 296-5195.

MOBILE HOME, 14x80', 1979, 3-bdr., 2 bath, fp, carpet, AC, unfurnished, \$22,000, assumable note. Stark, 293-4842.

FARM: 45 acres south 85 in Los Chavez area, \$11,000/acre. Berlier, 864-8825.

2-BDR., 1 1/2 bath, customized home, walk to shops, restaurants, bus stop, priced mid-50s. Pickel, 298-6046.

NORTH VALLEY, 4-bdr., 2 bath, half acre off Rio Grande Blvd., below appraisal. Mecklenburg, 344-6793 after 5.

1/2 ACRE LOT in Tome (near Los Lunas), fully landscaped, sprinkler system, fence, water well. Martinez, 877-6277.

FOR RENT

SAN DIEGO, CALIF.: 3-bdr. house available April to mid-June, 1 blk. from Balboa Park, take all-part. Acton, 299-3276.

2-BDR. APT., unfurnished, near Indian School & Juan Tabo, pool, carpet, drapes, all appliances, storage area, \$240. Tyner, 294-5289.

NEWLY remodeled house in North Valley, 1-bdr., \$200/mo. plus utilities, no kids or pets. Padilla, 898-3115, 898-0379.

CONDOMINIUM, 2-bdr., carpet, drapes, laundry, garage & swimming pool, near shopping, schools & bus. Priddy, 884-8392.

LG. 1-bdr. house, fenced garden area, \$225/mo., 517 Virginia SE. Liguori, 256-3613.

VALLECITO LAKE CABIN, near Durango, modern accommodations, fp, fishing, boating, horseback riding, Silverton train, daily/weekly vacation rates. Croll, 881-7235.

3-BDR. HOUSE, 1 1/2 bath, AC, stove, refrig., drapes, 2-car garage, walled corner lot, near Eubank and Candelaria, \$325/mo. Cleveland, 298-0218.

1-BDR., new Townhouse, \$180 + elec., adults, no pets, 161 Chama NE, \$100 DD, 2 miles from Wyo. gate. Gallegos, 268-0271, 255-5264.

WANTED

STEREO photography equipment: stereo cameras, stereo projectors, accessories. Mattox, 821-3945.

'70 GRADUATES of Rio Grande High School: 10-yr. class reunion; send name & address to PO Box 5155, c/o Phyllis P. Sanchez, Abq. NM 87185.

UNUSUAL PETS, room for large ones, will breed yours, no snakes. Peterson, 821-2236.

THIRD MEMBER from 6-cyl. auto. Chevy or GMC 1/2 ton pickup '55-'62 w/pinion gear stamped 13-44 & ring gear stamped 3707340. Betterton, 884-8528.

FOUNTAIN or waterfall for in-door terrarium. O'Neil, 898-5753 after 5.

8 HP Cushman engine, running or not. Donaldson, 255-4024.

COUPLE to share flying expenses (by private plane) to Las Vegas, Nev., approx. \$150/couple, lv. 4/25 a.m., rtn. 4/27 p.m. (dates may be flexible). Wilson, 296-5965.

RATTLESNAKES, dead or alive, minimum 24" long, dead less than 12 hrs., \$5 ea. Mills, 298-1315.

FREEZER, upright, about 10 cu. ft., in good condition. Yaniv, 881-8085.

FISHING hip boots or waders. Kevschen, 821-2848.

WORK WANTED

SUMMER WORK: lawn care, 3/4 ton truck; hauling, odd jobs, general labor, house sitting. Brian Nelson, 881-0148.

SHARE-A-RIDE

NEED 3rd or 4th for car pool, vicinity Del Rey, Jade Park to Area 1, will alternate weeks to suit. Courtin, 821-2042.

FORM or join 2- to 4-person car pool, Peralta/Bosque Farms to Gate 10, 7, or 6. Risse, 869-2037.

FORM car pool vicinity NW of Coronado Shopping Center, prefer alternating weeks. Gustafson, 881-4927.

NW VAN POOL: alternate riders, stops at Rio Rancho & Corrales shopping centers; also any point on Coors Rd. between Corrales SC and I-40. Steele, 898-8034, or Sieglitz, 898-5939.

RIDE WANTED, 9608 Robin NE. Smith, 299-7151.

LOST AND FOUND

FOUND: 1 bus ticket in Bldg. 836, 3/18/80. Hansen, 869-2716.

LOST—Rx glasses w/pink/orange plastic frames, safe deposit key #404, glasses in black case w/blue tag on left stem, black fur-lined leather gloves, wallet w/license & credit cards, Weiser key, 6 or 7 keys on ring.

FOUND—5 keys on leather strap w/rock & turquoise cross, gold ring pin, padlock w/combination on bottom, beige glove w/tan leather strips. LOST AND FOUND, Bldg. 814, 844-5677.

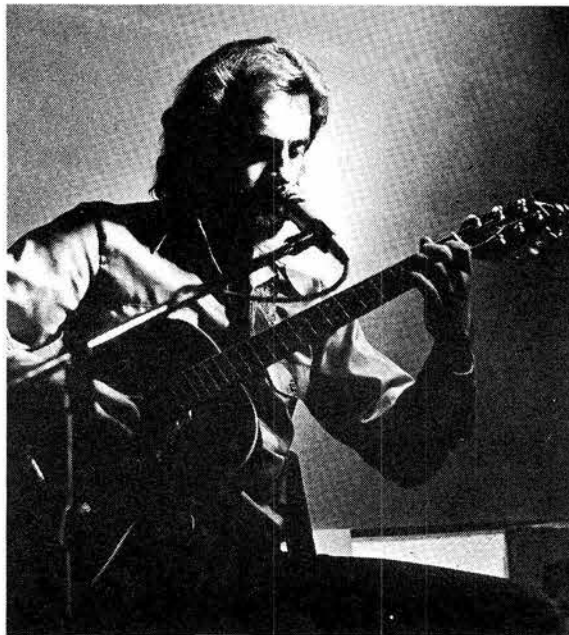
Casino Night Set April 19

TONIGHT at Happy Hour the main ballroom and dining area are out of the action but action abounds in the main lounge. Gary Waters and guitar entertain while Happy Hour prices (cheap) are in effect all evening. Next Friday, April 11, sees roast duck or loin of beef on the buffet menu and Youngblood wired into the bandstand. Call the office, 265-6791, by mid-week for buffet reservations.

TOMORROW at Variety Night, the Miguel Caro Dancers perform a mixture of classical and contemporary Mexican folk dance starting at 7 p.m. The movie is "So Dear to My Heart," a Walt Disney classic combining live actors and animated characters on film. Super sandwiches are available starting at 6. Admission is free to members and families.

THE CORONADO CLUB WOLF-PACK is a group of Lobo fans that arranges special group rates to attend UNM sports activities, including several out-of-town events each year. The Wolfpack's annual membership meeting is scheduled Tuesday, April 8, at 7 p.m. If you're interested, you're invited. Elections will be held to fill vacancies on the Wolfpack board of directors.

SANADO WOMEN meet for lunch on April 8. Ernest Young will discuss interior decorating. Call Donna Urish, 299-1456, right now to find out about reservations.



POPULAR SINGER Gary Waters entertains in the Coronado Club main lounge every Friday Happy Hour this month.

THE BIG ONE this month is Casino Night set Saturday, April 19. The Club is turned into a miniature Las Vegas-type casino with crap tables, black jack, chuck-a-luck and all that. You exchange your \$1 real money admission for a bundle of play money and get with it. The odds are great. Also, Elton Travis and the Westernaires play for dancing and door prizes are given away all evening. Mark your calendar now.

JULIAN ROMERO [DOE] is newly appointed to the Club's board of directors replacing Pat Crane who resigned.



A book borrower in Milwaukee has 67 overdue books and fines totalling \$500. The Public Library doesn't intend to drag him in for questioning, however, because 12 of the unreturned books involved the marital arts, with titles like: "Blackbelt Techniques," and "Beginning Kung Fu."

Events Calendar

April 4-6, 11-13, 18-20—"I Never Sang For My Father," Vortex Theater, 2004 Central SE, 8 p.m., 247-8600.

April 4-5, 11-12, 18-19—"Murder On The Nile," Tiffany Playhouse, 3211 Central NE, 8 p.m., 243-4642.

April 6—Cochiti, San Felipe, San Ildefonso, Santa Ana, Santa Clara and Santo Domingo Pueblos: Easter Celebration, basket or corn dances.

April 7—"Chicago," Broadway hit musical vaudeville, 8:15 p.m., Popejoy.

April 9—Rose Society Plant Exchange, Albuquerque Garden Center, 10201 Lomas NE, 7:30 p.m., 296-6020.

April 9—The Romeros, guitarists accompanied by the UNM Orchestra, 8:15 p.m., Popejoy.

April 9-12—Annual Nizhoni Dances: Indian arts & crafts, speakers and dances, 1-5 p.m., 7-9 p.m., UNM campus.

April 11-13—Albuquerque Art Assoc., Springtime Exhibition, NM State Fairgrounds, Ag. Bldg., F&S 10-9, Sun. 10-6, free admission.

April 12—Albuquerque Youth Symphony Concert, 7:30 p.m., Popejoy, 842-3684.

April 13—Vladimir Ashkenazy and the NM Symphony Orchestra, 4 p.m., Popejoy.

April 16-18—"Oklahoma," Cibola High School Performing Arts Dept., 7:30 p.m., CHS Theater.

April 18-19—"La Boheme," Albuquerque Opera Theatre, 8:15 p.m., Popejoy.

Through April 17—Albuquerque Craftworks II, all media crafts exhibition, Downtown Center for the Arts, 216 Central SW.

Safe Deposit.

Take stock in America.
Buy U.S. Savings Bonds.

GRAPHIC DESIGNER JIM WALSTON (3155) and Uncle Sam both point out that Sandia's Savings Bond drive is about to begin. Jim's display and posters go up next week and the drive begins April 21. Goal this year is 95 percent participation.