



# LAB NEWS

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ON the barren mud flats that stretch forever in western Utah, two Sandia engineers examine their handiwork—the tail section of an earth penetrator dropped shortly before from a helicopter. The tail section detached from the penetrator and remained near the surface, by design, while the penetrator

continued down some hundred-plus feet. Experiment is investigating possible use of penetrator for disposal of high level radwaste in ocean bottom sediment. Other photos, page four.

## Compound Semiconductor Lab

### **New Lab Develops Special Microelectronics**

Sandia National Laboratories has established a Compound Semiconductor Laboratory (CSL) to develop special microelectronics for advanced weapons and energy programs.

The CSL specializes in high-temperature and microwave electronics, radiation-hardened optoelectronics, and novel photovoltaic cells—devices generally not provided by silicon semiconductor technology or not being developed by industry. Superlattice devices, made up of many very thin layers, are also being studied.

Compound semiconductors have a crystalline lattice structure similar to silicon, but they contain atoms of two or more elements (most commonly gallium and arsenic or phosphorus).

Compound semiconductor devices are more expensive than silicon-based devices but have become increasingly important because they have capabilities that silicon devices do not have. For example, silicon technology cannot produce a light-emitting diode (LED) and, another property of silicon, charge-carrier velocity for a given applied field is lower.

The CSL, capable of prototype device fabrication from substrate to a packaged unit, is an outgrowth of Sandia's long history of semiconductor materials re-

search which has led to development of techniques and facilities for growing and analyzing semiconductor thin films.

Sandia also operates the Center for Radiation-hardened Microelectronics (CRM), which develops technologies and designs large-scale silicon integrated circuits for operation in high-radiation environments. The CRM and CSL are separate because of concern that silicon devices would become contaminated by materials used in compound semiconductors, reports Roger Chaffin, supervisor of Solid State Device Physics Division 5133, which coordinates CSL operation.

The CSL's crystal growth techniques include liquid phase epitaxy, molecular beam epitaxy and metal organic chemical vapor deposition. Other capabilities include ion implantation, metallization, photolithography, dicing, bonding, and packaging.

Goal of the high-temperature electronics work at the CSL is development of diodes and transistors that function at 500°C. These devices are needed for weapons electronics as well as for instruments used in geothermal and underground coal gasification research, jet engine controls, nuclear reactor safety equipment, and planetary probes.

"We have already demonstrated liquid phase epitaxially grown gallium phosphide diodes that show no degradation after 2000 hours of operation at 300°C and good rectification characteristics at 400°C," Chaffin says. Several hundred of these have been provided for evaluation for possible use in Sandia-developed high-temperature geothermal well logging tools.

"Most recently," he adds, "we have demonstrated a gallium phosphide transistor that exhibits current gain up to 450°C. This was accomplished by use of a Sandia-developed LPE growth technique that uses magnesium instead of zinc as a p-type dopant."

The next generation of these transistors and diodes, expected in prototype form later this year, should operate reliably at 500°C. They will have electrodes made of non-crystalline amorphous metals such as nickel-niobium and silicon-tungsten instead of gold or aluminum. The metallization technique to yield these new electrodes is under development at Sandia and the University of Wisconsin.

Optoelectronics work in the new laboratory is directed at development of

[Continued on Page Two]

## New Semiconductor Lab

radiation-hardened photodetectors as part of an effort to identify techniques that can be used to enhance the safety of nuclear weapons.

Recently developed heterojunction gallium aluminum antimonide and gallium aluminum arsenide photodetectors have been tested in the presence of ionizing radiation and found to have a signal-to-noise ratio 1000 times better than the best commercially available devices.

A key factor to the hardening is use of compound semiconductors that have a high optical absorption coefficient. These semiconductors permit use of an active layer thickness about 1/30 of that required in silicon photodetectors.

The aim of the CSL's multijunction photovoltaic research is a solar cell with a 30 percent conversion efficiency, about one and one-half times the maximum currently available from silicon solar cells. Economic studies indicate that such a high-efficiency compound semiconductor device could be competitive with less expensive silicon cells in concentrator applications.

Currently, research emphasis is on

### Colloquium

## Now, Astound Your Friends—Fly!

Technology, taking a giant step backward to the Wright brothers, has now produced the ultralight aircraft. Bearing a slight resemblance to the Kitty Hawk contraption—but considerably more air-worthy—the one-passenger ultralight takes off and lands at speeds of 25 miles an hour and can reach an altitude of 14,000 feet.

Larry Newman, president of American Aerolights and a crew member on the first trans-Atlantic balloon flight, recently presented a colloquium on the history, design and construction of ultralight aircraft. Newman's company manufactures the "Eagle," now being sold nationwide.

The unique feature of the ultralight is that no pilot's license is required. Although they have landing gear or float systems, ultralights can be launched and landed

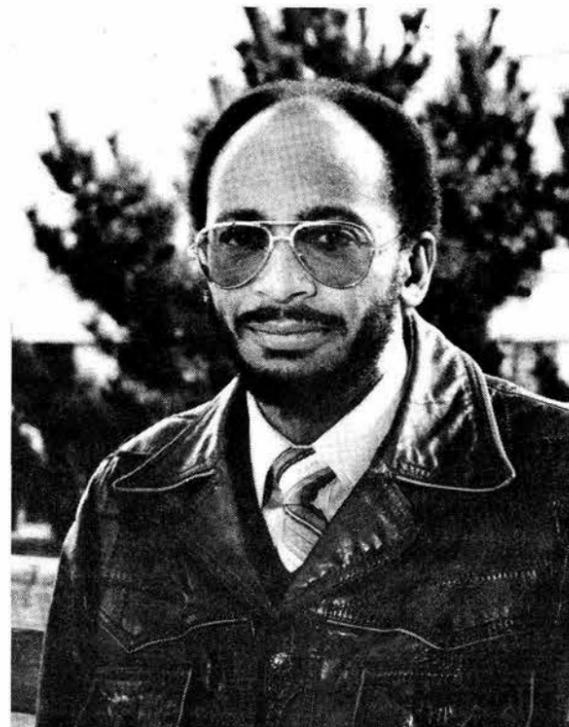
solely on foot; the FAA requires no license for such craft.

A design innovation is its use of a canard—a small wing ahead of the main wing in the manner of the Wright brothers' craft—which, says Newman, eliminates stalls and spins. This feature makes the ultralight quite safe to operate, and it can be flown after a few hours' flight training. It is very safe, Newman emphasizes, only if the manufacturer's instructions are strictly followed—stunts such as loops may have fatal consequences.

With ultralight aircraft, the experience of flight is now made available at an expense that is relatively modest when compared to those of standard aircraft. Besides recreational applications, others uses are being explored for the ultralight—among these are aerial spraying, search and recovery operations, herding cattle, and fish spotting.

identification of multilayer crystalline growth techniques as a basis for device fabrication. These include molecular beam epitaxy and metal organic chemical vapor deposition (MBE and MOCVD). MBE involves placing a substrate and the desired elements—gallium, phosphorus, arsenic, etc.—into an ultra-high vacuum system. When the elements are heated, they evaporate and recondense on the substrate, producing the desired crystalline layer. For MOCVD, gases carrying the desired elements impinge on a hot substrate, producing a chemical reaction that grows the crystalline layer. MBE and MOCVD also appear to be the primary techniques for fabrication of superlattice semiconductors which consist of multiple thin layers of different elements. Superlattice technology provides a new degree of freedom in design of compound semiconductor devices because carrier behavior is influenced by both layer thickness and material type. This new technique is expected to permit development of very high-speed digital devices and photodetectors that respond to new wavelengths.

## Supervisory Appointment



PAUL McKEY to supervisor of Mechanical Measurements, Inspection and Apprentices Section 1485-3, effective Feb. 1.

Paul came to the Labs in 1973 as a mechanical measurements apprentice. Following completion of the five-year apprentice program, he worked with the mechanical measurements section as well as the mechanical calibration group.

Before coming to Sandia, Paul attended Allied Career Institute in Detroit, worked as a draftsman, and served four years in the Air Force. He enjoys outdoor activities, especially hiking. He and his wife Martha have one son and live in the NE heights.

### Sympathy

To Mildred Broomfield (2146) on the death of her mother in Chicago, Jan. 27.

To Eloy Marquez (1242) on the death of his father, Jan. 31.

To Sam Espinosa (1543) on the death of his father in Denver, Jan. 8.

To Al Fite (1252) on the death of his mother in Albuquerque, Feb. 15.

To President George Dacey on the death of his mother in Albuquerque, Feb. 14.

### Congratulations

Renee Byington (3713) and David Zittel (2342), married in Albuquerque, Jan. 30.

CARMEL MARES (1110) was one of 30 lucky New Mexico hunters who drew a special license to hunt oryx in the state. He bagged his 600-lb. animal after two and a half days of hunting with special permit on White Sands Missile Range. The oryx, a straight-horned African antelope, was imported by the New Mexico Department of Game and Fish several years ago as part of its exotic game program. The animal is prospering in New Mexico—the herd on WSMR numbers about 600.



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# Engine Inventor Harvey Pouliot Retires

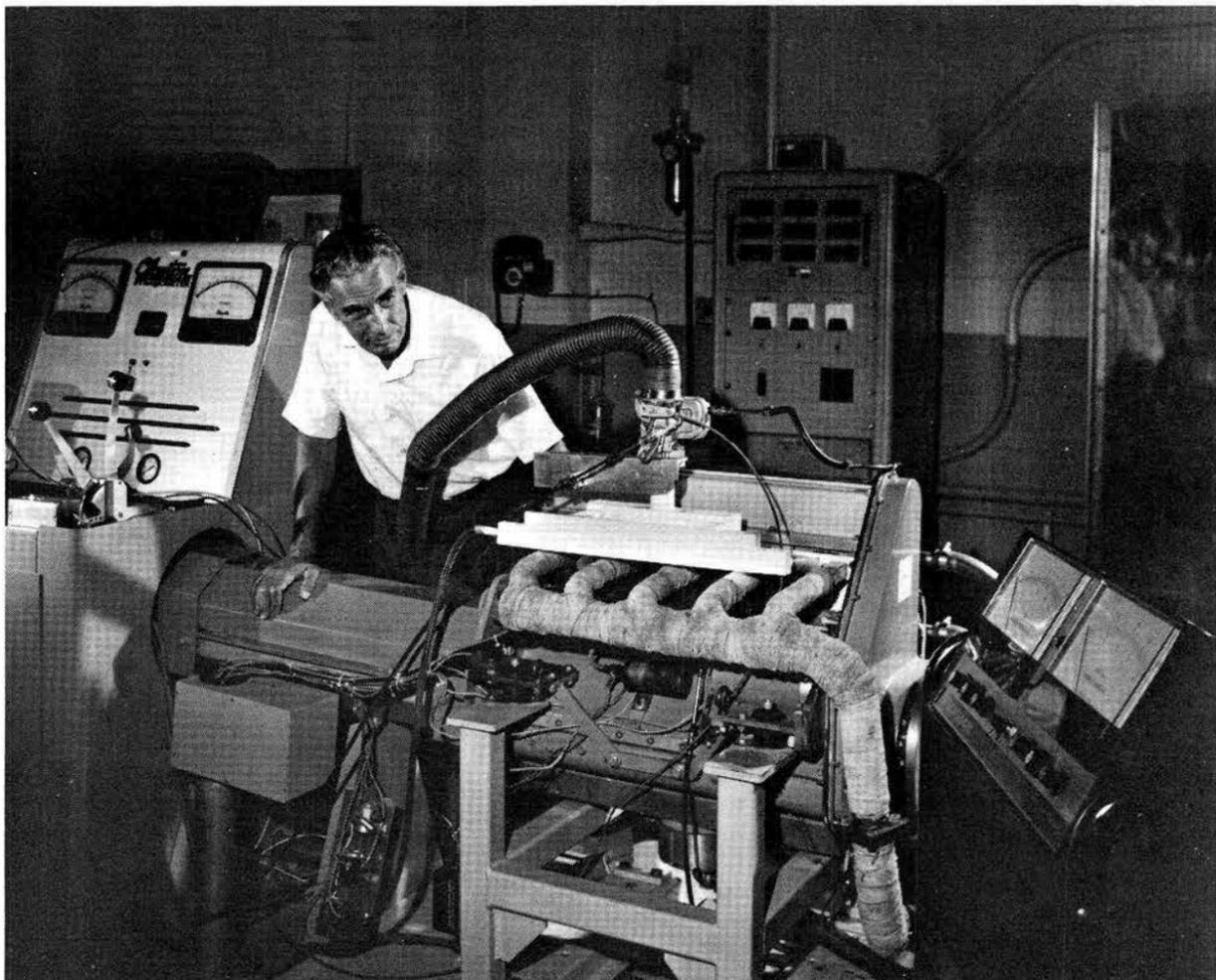


The inventor of the "Pouliot engine" is retiring from Sandia Livermore—again. And what does Harvey Pouliot (8441) plan to do in retirement at age 62? Well, he'll work at developing yet another experimental engine in his basement laboratory in the home he is constructing near Grass Valley.

Harvey, who came back to Sandia in 1980 after four years in Detroit, had designed his "retirement" home and then began building it—alone. Now he has decided to spend full time on the project which will eventually lead to that 2100-foot basement lab and more experimenting and inventing—something he has done all his life.

The Pouliot prototype engine was developed at Sandia between 1974 and 1976, winning national acclaim when the variable displacement concept proved to offer nearly 30 percent better fuel economy in laboratory testing. It saves gasoline by allowing the motorist to adjust the engine's horsepower for varying driving conditions, operating a pedal that changes the length of the piston strokes, and eliminating the need for a throttle.

Looking at it now after six years of advances in the field, Harvey feels that this particular prototype wasn't developed further by Detroit because of its complexity and the tremendous costs of retooling in the auto industry. Surveying the industry today, from the perspective of someone who lived and worked in Detroit from 1977 to 1980, he feels that as of this year the American automakers "are ahead of the field (internationally). They have '82 models with the big car ride and feel, yet mileage is competitive with the best imports." He still believes in the feasibility of 60 to 75 mpg cars, but they have to evolve in time. He sees the role of laboratories, such as Sandia's Combustion Research Facility, as that of continuing research that private industry cannot afford. "It's important to continue research here, transferring the knowledge gained to automotive engineers so they can do a better job of controlling emissions, and improving mileage and performance as well."



HARVEY POULIOT (8441) with his variable displacement engine back in 1976. He has 30 patents to his credit.

What expertise does Harvey have in engineering and research? He never got further in formal education than a high school diploma but was already inventing things in school and received his first patent, relating to high-speed monotype casting, before he finished high school in 1936. From there he went to work, maintaining printing equipment and giving little thought to more education. He later worked in machine shops and, before he was 20, had been hired to set up a model shop for a mining company. He quickly learned how to do his own machining and how to design and build prototypes.

Harvey soon wound up at Sandia Albuquerque, getting involved with the model shop and engineering group. In

1956 he became one of the original staff to locate at Livermore.

The opportunity to develop the variable displacement engine came under ERDA and its energy conservation program. The budget gave him one chance only to make it work . . . and it did.

A company in Detroit, Vadetec Corp., had observed the engine tests and was studying the concept of a new transmission they wanted Harvey to help develop. He stayed with Vadetec through his four-year contract, perfecting the transmission through four prototypes. It is now being field tested.

Now free again to pursue engine research, Harvey plans to work on a new concept that doesn't use variable stroke but would offer equivalent benefits in fuel economy. Yet it would be a simpler model that could possibly be assembled on existing production equipment, not requiring the major retooling of his earlier design. He admits that even if he does build a successful prototype "the chances of selling it to a major automaker are small. But I'll keep at it. I just plain like engines."

### Sympathy

To Walt Dzugan (8214) on the death of his son in Walnut Creek, Dec. 18.

To Lorena Schneider (8215) on the death of her father in Buffalo, N.Y., Jan. 3.

To Mel West (8213) on the death of his mother in Tracy, Nov. 28.

### Retiring



Mickey Rindone (8444)



Irvin Pytlik (8271)



Jack Renaud (8213)

# Field Test of Penetrator Goes For Muck

It's called mud, m-u-d, and for more than a hundred miles along Interstate 80 west of Salt Lake City the signs remind you time and again that it's mud. With no drainage, the huge natural basin ringed by mountains steadily collects fresh water, adds gobs of salt (thus effectively killing vegetation), and becomes a quagmire, large economy size. Sometimes the water is on the surface, an inch or two deep, but more often it lies just beneath the surface, six or so inches down. A tourist with a flat might be tempted to pull off onto the innocent-appearing surface, thus the warning signs. The flat would quickly be the least of his problems.

A few miles east of the Utah/Nevada border, a group of Sandians gathered along the edge of the interstate. They were involved in a program whose aim is to investigate the feasibility of imbedding high level radwaste deep in the ocean sediment at the bottom of the sea. To imbed this material, an earth penetrator vehicle would be used, of a type that Sandia has been experimenting with for more than a decade. The mud flats of Utah were selected for the experiment because of their similarity to deep ocean sediment.

A helicopter was used to drop the penetrators into a target area some ten miles north of the highway. (In actual use, the penetrator would be lowered over the side of the ship to a depth just above the ocean floor, then explosively propelled into the sediment.) Telemetry data was gathered on the penetrator as it plunged into the mud, descending more than a hundred feet below the surface.

To recover the sheared-off tail sections of the penetrators, a specially equipped truck—4WD with big tires and chains—drove rapidly over the ten squishy miles, leaving a spectacular rooster tail of mud in its wake. The driver learns that while the entire surface is soft and grasping, some spots are more so, and the trick is to keep moving and not bog down (as has happened on previous trips). After a few such trips, the truck is heavily festooned with the stuff. It's sticky and



very salty, and it takes a fire hose to blast the mud off the truck.

These penetrator drops illustrate the complexity of field testing, with four Sandia organizations taking part. Wayne Young is the penetrator project engineer, and he worked closely with Bill Jacoby; both are in Chris Dalton's Exploratory Systems Division 5621. Jim Gallagher represented Mechanical Design Division 5653. Gordo Miller's Mobile & Remote Division 1137 and Bill Hereford's TM Development & Evaluation Division 1582 provided logistic and telemetry support. Photographs here show aspects of the experiment.



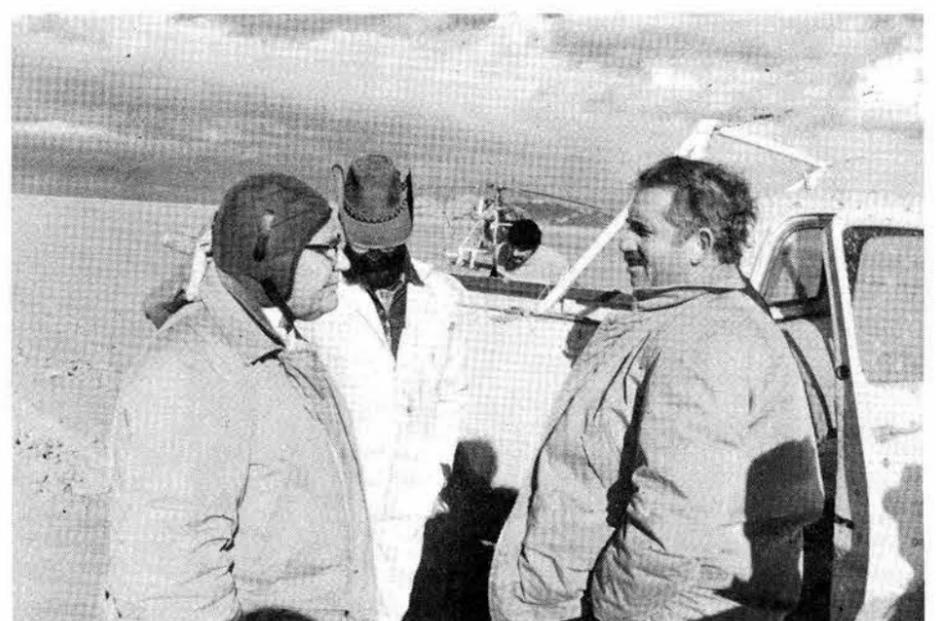
PREPARING penetrator for drop by helicopter are Bill Jacoby (5621), left, and Jim Gallagher (5653).



HELICOPTER carried 750-pound penetrator on line underneath to drop area 10 miles north. Back seat was occupied by telemetry gear.



RETRIEVING sheared-off tail section, Wayne Young and Bill Jacoby contemplate tenacity of mud. Sample of mud tested in laboratory froze only when temperature was lowered to 5°F because of high salinity.



OUT at the drop area following drop, Wayne Young (5621), right, and Ed Stout (1137) discuss telemetry data, while Don Goodrich (1137) listens. Weather was sunny, cold and windy during experiment.

## Industrial Total Solar Project Nears Finish

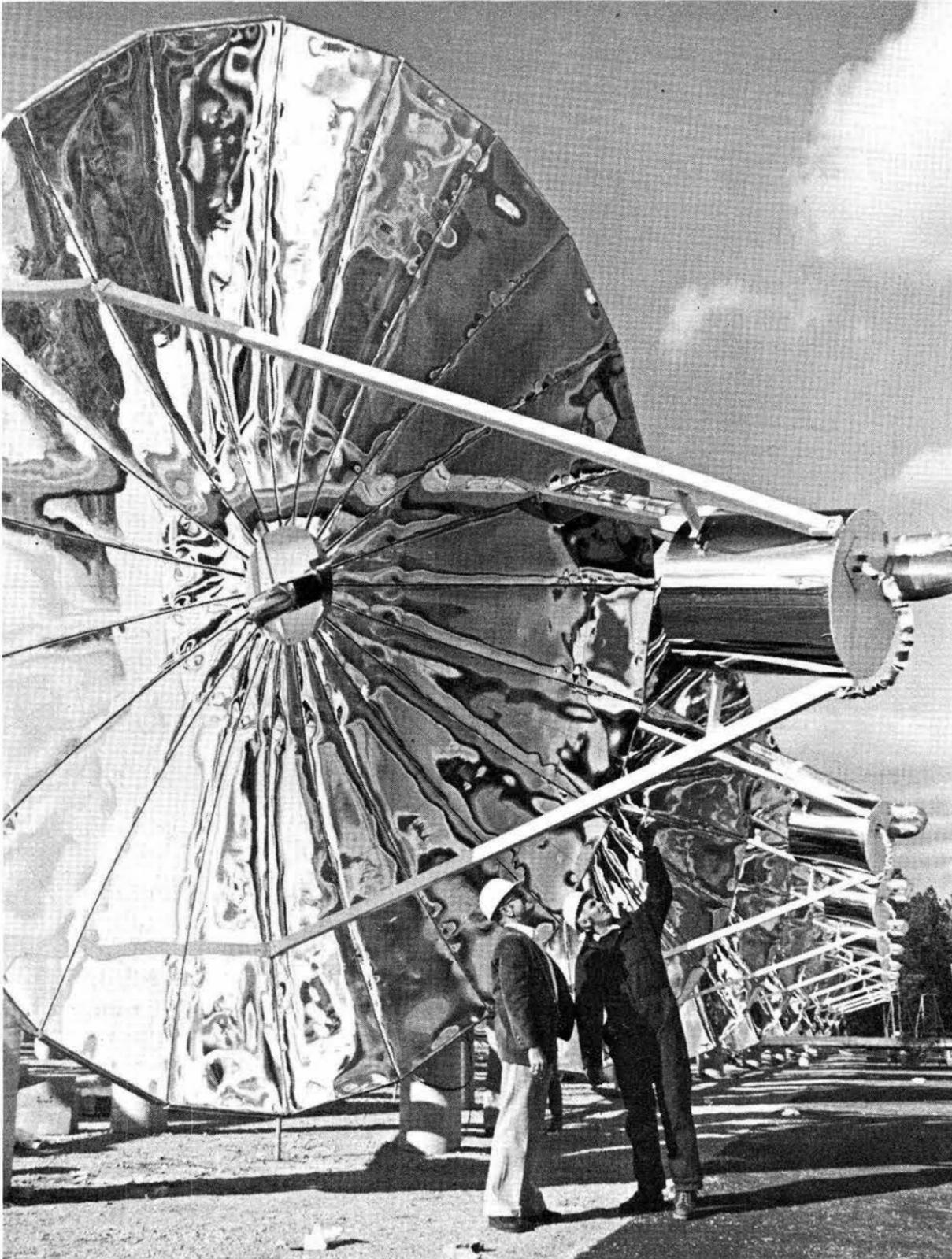
In Shenandoah, Georgia, work on the solar energy project on the Bleyle Knitwear plant is nearing completion, reports Jim Leonard, supervisor of Systems and Applications Development Division 4717. The first electrical generation from the 114 parabolic dish collectors is expected by the end of this month. Formal dedication ceremonies are scheduled April 21.

Project leader Bob Hunke, who has been at the Georgia site for two years, returns to Albuquerque this week. Test engineer John Zimmerman, at the site for the past eight months, will return in early summer.

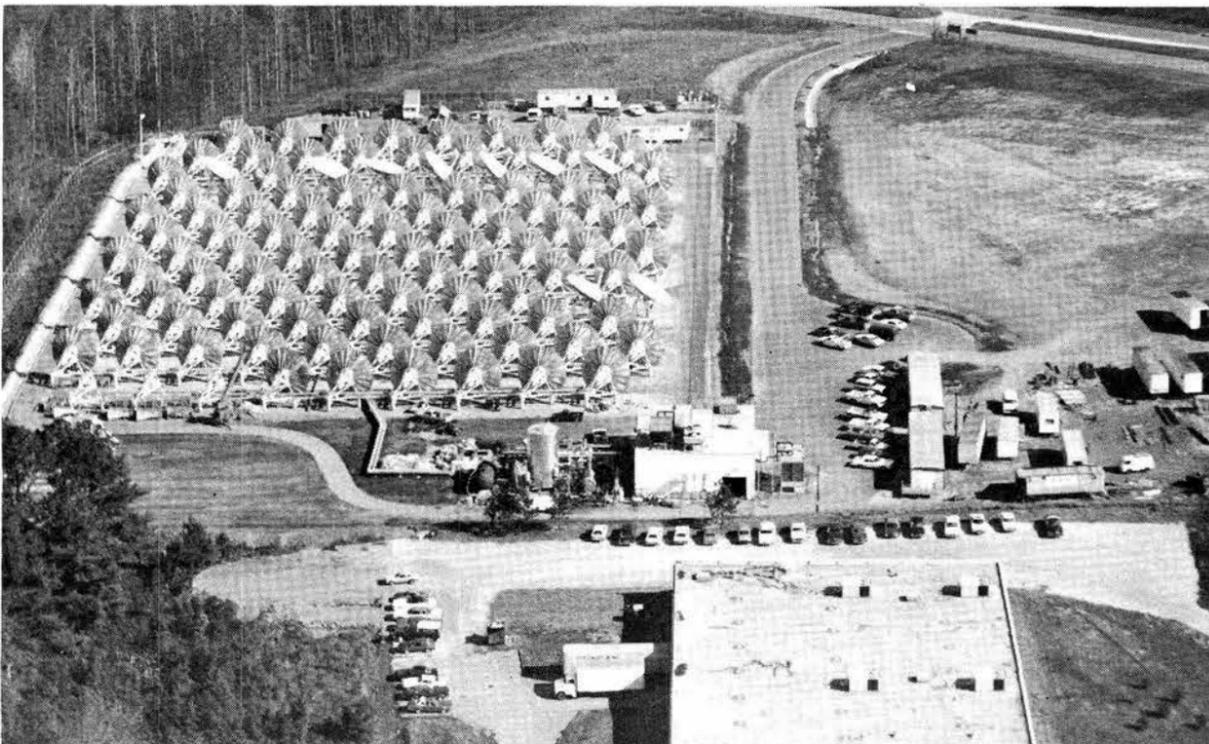
Sandia will continue with advising, consulting and writing of analytical reports on the project. Division 4717 has provided technical support and management to the project since its beginning. It grew out of research on the total solar energy concept started here in 1972.

Funded at \$26.3 million by DOE, the solar installation will now be tested, operated and managed by Georgia Power Company.

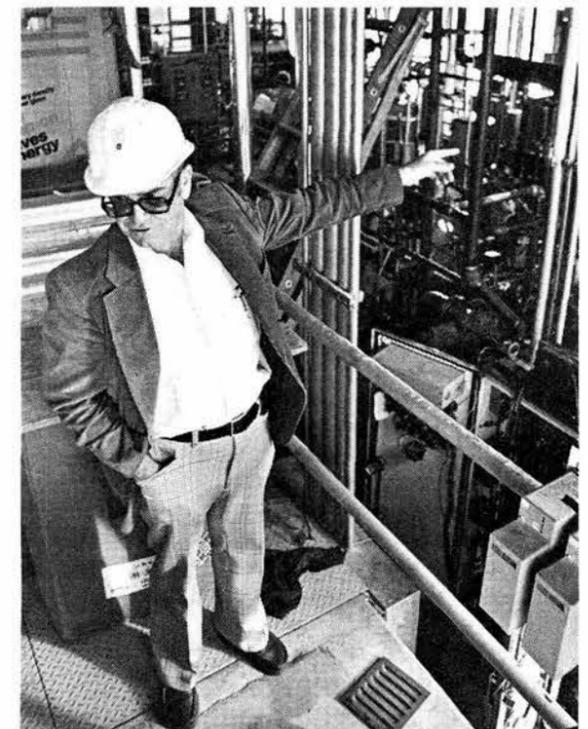
Photos courtesy of photographer Jim Gathany, Newnan (Georgia) Times-Herald.



BOB HUNKE, Sandia project leader, and John Zimmerman (both 4717), test engineer, make final inspection of the Shenandoah solar collector field. Each of the 23-ft.-diameter parabolic solar collector dishes heats a silicone fluid at the point source receiver to 400°C (750°F). Fluid then is circulated into a steam-generating heat exchanger for electricity generation or, when not needed, into an 11,000-gallon storage tank. On weekends, surplus electricity is fed into the Georgia Power Company grid.



SOLAR TOTAL ENERGY project at Shenandoah, Ga., is nearing completion with formal dedication ceremony set April 21. The field of 114 parabolic dish collectors provides 400 kilowatts of electricity and 1380 lbs. of steam per hour for the 25,000-sq.-ft. knitwear plant. Exhaust heat downstream from electrical generation is further used for industrial processes and for space cooling. The Shenandoah project, first and largest industrial total solar power application in the world, was under Sandia's technical and management direction.



BOB HUNKE (4717) explains that the Shenandoah solar project contains well over a mile of insulated piping in which 14,000 gallons of a silicone fluid circulate, ultimately driving a Rankine-cycle turbine and a 400-kilowatt electrical generator



JOHN ZIMMERMAN (4717) peels the last protective plastic covering from surface of a collector dish at Shenandoah.

## Eldon All Abuzz Over Bees

Here is the intrepid LAB NEWS team scaling a rickety ladder to the garage roof where it finds itself in the midst of an apiary—home to the fearsome *Apis mellifera*—a creature renowned for its lightning-fast attacks, its unpredictability, its . . .

“Actually, honey bees are really quite gentle little creatures,” says beekeeper Eldon Boes (4724) as he stands devoid of protection next to a hive while hundreds of the vicious little marauders buzz around, “unless, of course, you get them angry.”

Aha! And no doubt they are quick to anger at the mere drop of a lancet?

“Bees naturally get upset after I’ve harvested the hive’s honey,” explains Eldon as he approaches a hive—still without any protective apparel. No sneak attack from the bees yet.

“Bees tend to go for hairy surfaces—probably an inherited awareness that furry animals are their natural enemies. I’ve been stung a few times. Once I found a swarm at the base of a bush in someone’s front yard. Since I’d read that swarming bees are docile and don’t sting, I scooped up the swarm with my bare hand. Immediately I ran into an illiterate bee who hadn’t read the same book. Another time, I was up a 28-foot ladder, without netting, sawing off a branch with a swarm on it. Well, the branch snapped and went crashing to the ground, bouncing off other branches enroute. Talk about vexed and angry bees—about 50 chased me down the street, but I outran them.”

I eagerly accept the protective netting and gloves proffered by Eldon.

“Swarming, by the way, is the process whereby new colonies are formed,” Eldon continues. “The old queen leaves with part of the colony and they all cluster on a



BEE-LADEN HONEYCOMB is lifted from the hive by Eldon Boes (4724). The honeycomb is a wooden rectangular frame with wax cells upon which the bees build comb—honey storage cells.

nearby branch while scouts look for a new home. If you take a swarm and put it into an empty hive, the bees usually stay there.

“Artificial hives are made up of a series of boxes called ‘supers’ which are stacked on top of one another. Each contains several frames with wax bases. These frames slide in and out of the super and are a convenient way to harvest honey. A natural hive can be a hollowed-out opening in a tree or even in a wall.

“Each colony or hive consists of between 10,000 and 100,000 bees but only one

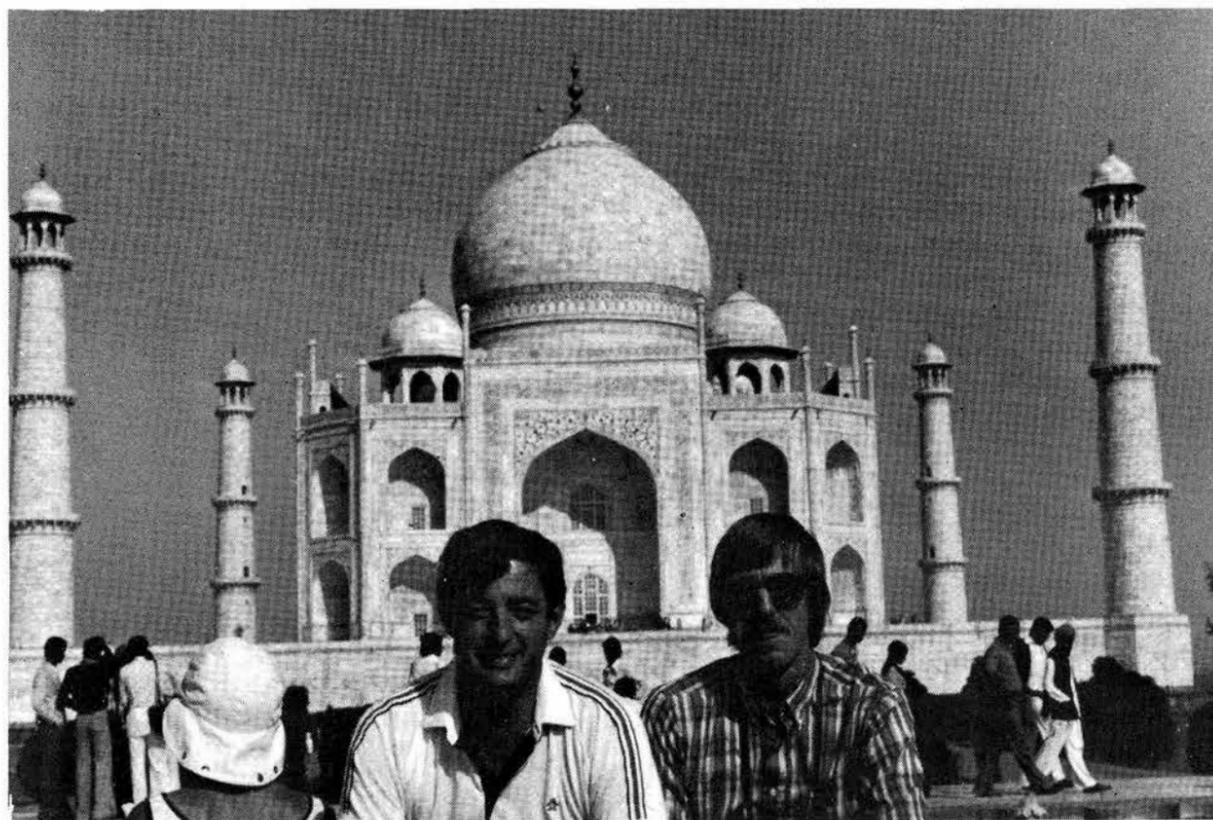
queen. The queen mates just once and produces 2000 eggs daily during the summer. A worker is a sexually immature female incapable of laying eggs, and drones are males whose only real purpose is to fertilize a queen—since only one will get the chance, most drones do no more than help heat the hive and eat honey. Otherwise they hang around the hive until the workers kick them out.

“Bees collect almost all their honey between March and July. They carry pollen, which is a sticky paste, to feed the young bees. Honey, the adult bees’ food, is made from nectar—a sweet liquid from blossoms. Bees ingest it and then regurgitate it as honey. There’s no difference between natural and processed honey—the only processing is some filtering to eliminate pollen particles. Honey can differ in color and taste according to the source of the nectar.”

I relax a bit since it’s increasingly apparent the little devils aren’t at all hostile—in fact, they ignore us as they go about their business.

“I’ve been keeping bees for six years,” Eldon continues. “There are about half a dozen beekeepers from Sandia that I know. You can get started by building a hive and catching a swarm. Hives complete with bees can even be ordered through a mail-order catalog. I have a list of beekeepers at Sandia and anybody interested can call me at 268-4481. There are no zoning restrictions on keeping bees—in fact, most of your neighbors could be beekeepers and you’d never know it.”

Eldon sends us off with two jars of delicious honey produced by his diligent flying friends. And all our fears about being attacked by swarms of bloodthirsty killer bees have turned out to be a lot of beeswax.



SPONSORED by the National Science Foundation to present papers at an international physics conference in New Delhi, India, Harry Weaver (2146) and Carl Seager (5132) also visited the Taj Mahal, an Indian national park. They report that the technical program, which summed up the current status of photovoltaic cells and integrated circuitry, was excellent. Except for the crush of humanity (India has a population of 600 million, only 300,000 motorized vehicles), the Sandians enjoyed the experience.

# Medical Researchers Find Exercise Works (for monkeys anyway)

So you get out there four or five times a week and work your socks off running, or biking, or swimming. You feel better, you lose a few pounds and you like to think you'll live longer because . . . well, just because. In fact, there's a paucity of hard evidence to demonstrate scientifically that those who exercise regularly will indeed enjoy longer lives.

The problem in making such a demonstration lies in the nature of the beast. We exhibit too many variables, of genetic makeup, life style, even in our exercise routines, to enable a nicely controlled experiment on exercise vs longevity.

But now comes (from Dr. Mossman in Sandia Medical) the highly regarded *New England Journal of Medicine* for December 1981 and a lead article that seems to suggest that exercise does make a difference, a significant difference, at least in a species not all that different from man: the monkey.

"Reduction of Coronary Atherosclerosis by Moderate Conditioning Exercise in Monkeys on an Atherogenic Diet" is the engaging title of the work and, reading through the article, I began to appreciate the lucidity and simplicity of your average Sandia technical report dealing with, say, quantum mechanics. Consider this passage:

"The mean serum content of total cholesterol (Fig. 1) rose markedly from values of 102 mg per deciliter (2.6 mmol per liter) in sedentary normal controls to about 620 mg per deciliter (16.0 mmol per liter) in both sedentary and exercise-conditioned groups on the atherogenic diet. The non-conditioned poor exerciser in the exercise group . . ."

But let me give you the substance of the report, bearing in mind that the original is beset by the many qualifiers medical researchers are wont to include. Twenty-seven monkeys were divided into three groups. The first, a control group, was fed a normal monkey diet (Purina Monkey Chow) and followed no program of exercise. The second group was given an atherogenic diet—one calculated to produce fatty deposits on the inner lining of arteries—and this group also followed no program of exercise. The third group was fed the normal monkey diet for a period and was then shifted to the atherogenic diet. This group pursued an exercise regimen: for one hour three times a week each ran on a treadmill wheel especially designed for the purpose.

The experiment ran over a three-and-a-half-year period. Results were dramatic. In post-mortem studies, the hearts of exercise-

conditioned monkeys were found to be considerably larger than those of the sedentary animals, both those on the normal diet and those on the atherogenic diet. Quoting from the report, "The heart weights of conditioned monkeys were also much greater than those of either sedentary group . . . In sedentary monkeys receiving the prolonged atherogenic diet, the diet induced striking, grossly visible coronary atherosclerosis. In contrast, coronary arteries of exercise-conditioned monkeys had much less involvement with lesions and furthermore had coronary arteries of considerable caliber . . ." In other words, the exercisers didn't have as much crud clogging up their arteries as the non-exercisers. In spite of the junk diet, their hearts and arteries were in better shape even than those of the monkeys on the normal, no-junk diet.

The *Journal* was itself sufficiently impressed by the study to comment on it editorially. While noting there is no assurance that the experiment and its finding can be readily duplicated in human beings, the editorial concludes:

"Meanwhile, this important experimental study should encourage physicians to consider the potentially protective value of prior and continued regular physical exercise for prophylaxis against the primary events of coronary heart disease." •js



## R E T I R I N G



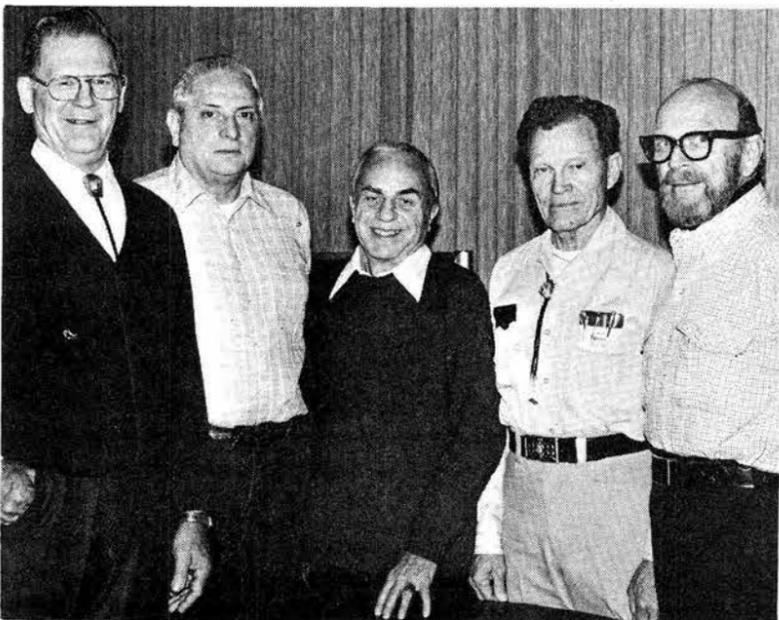
Margaret Boyd (3733), Willard Rappleyea (1481) and Mary Winter (3252).



Carmel Mares (1110), Ray Chandler (1417) and Phil Young (4315).



Dale Peckumn (3611)



John Birdsong (1116), David Brown (4747), Bob Newman (1585), Lemmie Shaw (1414) and Lurl Ostrander (3146).



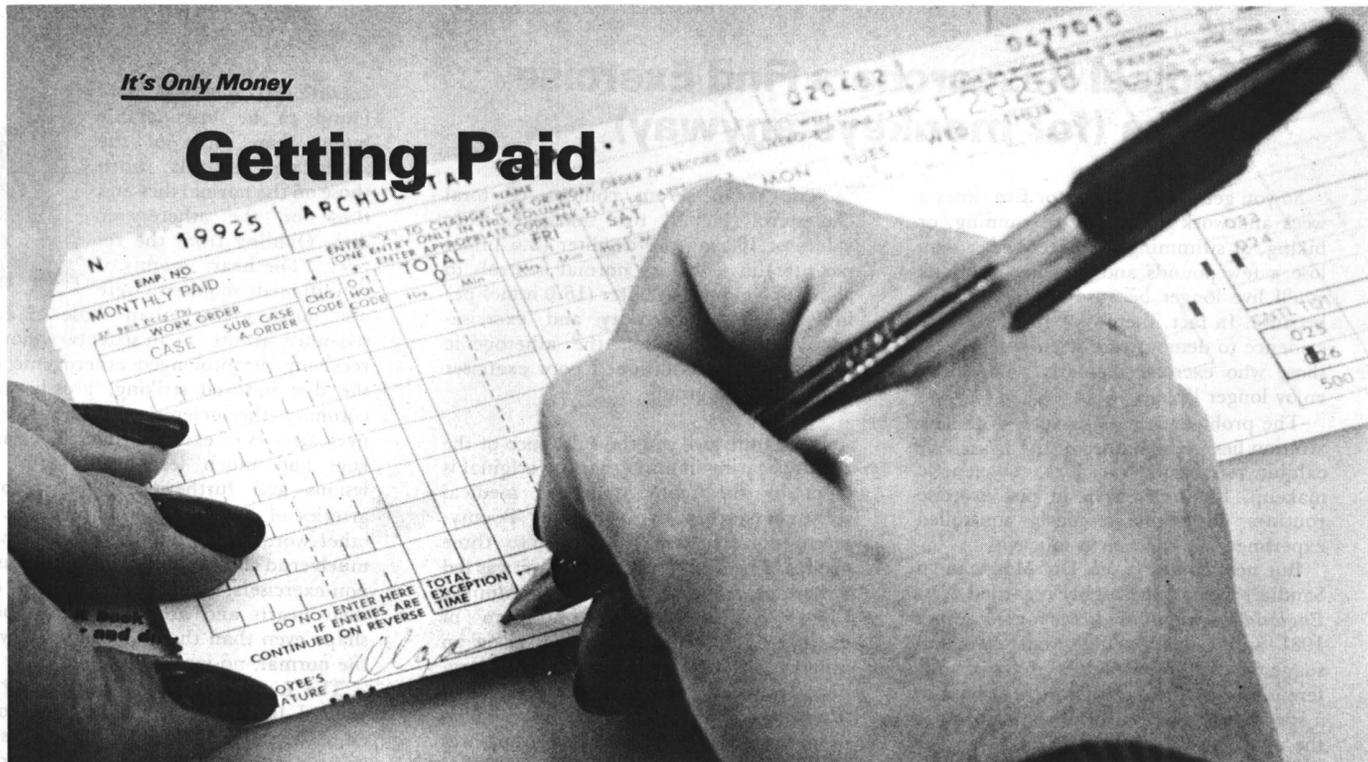
Charles Ortiz (3434), Julian Chavez (3435) and George Curry (1724).



Buford Coleman (3741)

It's Only Money

# Getting Paid



Every one of us knows when it's payday. And we expect our checks to be on time. They always are—the Labs has never missed a payroll. Last fiscal year, 217.8 million dollars was paid to Sandians.

LAB NEWS followed the process that insures delivery of your paycheck on the right day and in the correct amount.

The first step in meeting the payroll is always the time card, a sort of itemized bill from the employee to the company saying, "I worked—you owe me."

Employee Accounting Division 3252, headed by Alice Morgan, and Theresa Phelps' Payroll and Travel Section 3252-1 have the giant task of compiling all the information contained on the time cards. Consider, for instance, that there are at least 500 possible variations to any employee's standard time worked (overtime, deductions, contributions, holidays, etc.). Once this mass of data is assembled—the payroll clerks complete the job in frantic 10-hour periods on Thursday and Friday of every week—an outside contractor key-punches the information to produce a magnetic tape which is back at Sandia by midnight Friday. Ending the time-card week on Thursday allows a running start at the weekend.

Mike Robles' Data Processing Operations Division 2632 takes over and runs the payroll during the weekend when there is less competition for computer time. The payroll computer system, pre-programmed and with a massive data base retrieval capability, produces checks, statements, new time cards for the next pay period, and various reports (attendance, vacation balances, deductions, rates of pay, labor transactions). The payroll procedure is not limited to time keeping and payment activities but encompasses labor distribution statistics as well as up-dated employee records.

Programmers John Williams, John Stathis and Scott Kramer (all 2625) are

responsible for maintaining the programs for the Univac Dual 1108 computer. Currently, these programs are being re-written for use on the 1100/82 computer.

All these organizations look forward to a completely new payroll system, now under study, to be installed on the 1100/82 computer. The new system will offer more up-to-date and simplified processing and reporting through use of a standard commercial software package. More news of this will be announced over the next few months.

On Mondays, time cards, reports and checks are back in the payroll office where final computations are completed. The checks are then delivered to Mel Snyder, supervisor of Financial Division 6021.

Checks destined for individual delivery are "signed" mechanically with an authorized signature while another machine stuffs

the envelopes. For direct deposits in a bank or the Credit Union, Finance sends one very large check along with a tab of who gets what. The biggest check goes to the Credit Union, where some 2700 Sandians have their earnings deposited.

Checks for Livermore and Tonopah are sent out by express mail. Bank letters are hand-carried to local banks while statements and in-house checks are delivered to Mail Services Section 3154-4.

Careful handling in the mailroom accounts for a minimum of lost or mis-delivered statements. Joe Hernandez and his crew treat the statements as priority mail. The envelopes are delivered to each employee's organization and then to you.

And, on each Thursday when you sign that new time card, the process starts all over.



CECIL TAFOYA AND DAVE MILLS of Mail Services Section 3154-4 sort payroll statements into empty bins to avoid mixing with other mail.



SENIOR CLERK Charlotte Gilmer oversees the 10-hour sprint each Thursday and Friday by Employee Accounting Division 3252 to collect payroll data to feed to the computer. Lulu Eady (seated) is sorting time cards by charges into workable-size batches.

What happens, you ask, if the computer breaks down? Mike Robles answers: "Problems are inevitable in a program of this size. While we're running the payroll, one of the programmers and one of the payroll supervisors are on call. If we have a mechanical problem that can't be quickly fixed, we have a back-up system we can move to."

John Williams adds, "The payroll program is large and complex and, routinely, is in a constant state of change. For example, pay rate or tax rate structure changes affect the program."

Alice Morgan voices the complaint echoed by everyone who works with the system. "One of the biggest problems? Late time cards—get them over here promptly so that we can pay you!" •nt



SALLY HANKINS of the Credit Union accepts the check and bank letter from paymaster Clory Valdez (6021) for the last payday in January. The three-and-a-quarter million dollar check reflects the popularity of direct deposit at the Credit Union.

## feedback

*Q. The 6600 Open NOS computer system has become an extremely valuable and popular tool and, as a result, is showing symptoms of overutilization. Now that the CRAY is being acquired, are there any plans to dedicate the 7600 or the CYBER 76 to Open NOS?*

A. We recognize that NOS is overloaded. The Sandia Computer Committee has been grappling with the question of what can be done to alleviate the problem for the near term as well as for the long term within our budget constraints.

Putting the 7600 in the open partition connected to open NOS is being considered. However, since the NOS operating system does not run on the CYBER 76 or the 7600, this would enhance the batch processing capability, but not the interactive time-sharing capability. In fact, it would reduce the latter since it would require some of the resources of the NOS to perform the front-end function for the 7600. It is not clear what will be done in the short term, since the ADP budgets are set for FY '82 and FY '83.

For the long term, there is an item in the FY 1984 ADP budget to replace the NOS system with a larger and more capable system. This has recently been approved by the Sandia Computer Committee.

Lee Hollingsworth—2600

*Q. With the new requirements for display of the badges, I would like to suggest that each employee be issued the plastic neck chains which are issued at NTS.*

A. Thank you for your suggestion. The problem with chains is that employees have trouble adequately surrendering badges on chains to the Security Inspectors for examination when entering Tech Areas. For this reason, although we have no objection to those currently in use, we have chosen not to encourage further use by issuing chains.

D. S. Tarbox—3400

*Q. We are responsible for the loss of, and the list cost of, calculators issued to us by the corporation regardless of the circumstances surrounding its disappearance, so we are told. Please elaborate.*

A. As you are undoubtedly aware, Sandia is placing special emphasis on assets protection. This is the result of recent government regulations and WE audits that severely criticized the Laboratories procedures.

One of the areas receiving attention is that pertaining to the financial responsibility for small, highly desirable items that can easily be converted to cash or used at home. The policy established for these items, of which small, hand-held calculators are one, does provide for assigning individual employee responsibility. However, to answer your specific questions:

1. Employees are expected to give good and reasonable care to government prop-

erty assigned to them—similar to that given their own personal property. Only when adequate care has not been taken will an employee be billed for loss or damage.

2. If an employee is billed, it is the lesser of (a) the acquisition cost less depreciation, (b) the replacement cost of a new item based on a current quotation, or (c) twenty-five percent of the acquisition cost.

The policy and procedures pertaining to this subject are covered in SLI 6920, App. A, "Sensitive-Controlled Property" (currently under revision), with a clarification in Sandia Bulletin, Vol. 33, No. 4, dated 3/4/81, titled "Sensitive Controlled Property."

C. R. Barncord—3200

*Q. Having moved to another office recently, I'd like to know why the moving date can't be given. Not knowing when you will move is awkward, what with packing up frequently used stuff and securing your desk.*

Also, the boxes sent for moving purposes are too large for the usual density of materials moved. The number of books or papers in 60 lbs. [the limit] does not fill the box, leaving a big void which crushes when you stack the packed boxes.

A. There are approximately 300-400 unscheduled work orders (Telecons) for moving furniture and Lab equipment each month. Under normal workload demands you should expect to have your request honored within three to four working days. These work requests are not assigned by dates but are assigned by zones within the Tech area so as to avoid unnecessary travel by moving vans and trucks. If there is an unusual or specific move date requirement, you can request that the telecon operator make a notation on the work order request indicating your special requirements and every effort possible will be made to meet your special needs. Work orders requiring telephone moves and close coordination with other organizations are usually coordinated with the requester. However, it is difficult to predict times and arrange dates for the large volume of short-order moves. We will try to improve our performance in this area.

The acquisition of boxes for moves of just one or two people, on a Telecon order, is the responsibility of the individual. The Management News Brief of August 27, 1981, stated that moving boxes would be available in the dock areas of Bldgs. 802, 805, 821, 880, and 892 and in Bldg. T-50, the Self-Service Storeroom. The latter had been stocking large boxes, 24"x16"x12". General Stores also stocks three other sizes, 18"x18"x18", 16"x16"x16" and 12"x15"x10". The Medical Department has concurrently been concerned about overloading of boxes and has recommended the use of a smaller box. Thus, in the near future, the Self-Service Storeroom will stock the 12"x15"x10" box. This size will also be issued in quantities by 3600 for major moves.

R. W. Hunnicutt—3600

## AT&T Names Consent Decree Planning Group

Six top-level study groups made up of telephone company presidents and AT&T officers have been formed to direct the process of developing the plans needed to carry out the terms of the proposed 1982 consent decree.

The six groups will focus on the key issues that must be addressed to prepare for implementation of the proposed decree. Commenting on the study group assignments, AT&T Chairman Charles Brown said that "the matters to be addressed by these study groups are important for the future of the Bell System" and noted that the work will be planned and scheduled with care and with an appropriate sense of urgency.

The groups and their areas of study are:

**Drawing exchange boundaries**—this study group will identify new "exchange area" boundaries for the prospective local exchange companies.

**Centralized staff**—the aim of this group is to determine those functions that can best be done on a centralized basis for the prospective local exchange companies and the structural arrangements for the provision of those functions.

**Personnel considerations**—this group will identify and analyze the personnel requirements and considerations to be addressed before and after the consent decree is implemented.

**Corporate structure**—this group's mission will be to recommend a structure that will optimize the ability of the prospective local exchange companies to provide high-quality telecommunications services, earn well and maintain access to capital markets.

**Asset assignment**—This study group will be responsible for the overall development and implementation of plans for assigning telephone plants in conformance with the consent decree.

**Access charges**—the objective of this group will be to identify and analyze financial, operational, regulatory and other issues with respect to access charge tariffs and their implementation.



LOOK FAMILIAR? Tom Devlin (8275) was wandering through the Alameda (California) flea market when his eye was caught by a table display of belt buckles, one of them this specimen. It's a stranger to us, but the S.14 Village Project committee is sufficiently impressed to take steps to add a similar buckle to the Sandia T-shirts and caps already in inventory. (Note: the new buckle's T-bird will be looking in the approved direction.)



VIRGINIA MILLER (ret.) adds a *chile ristra* to this country store, constructed by her husband Sid. Authentically furnished, the store, along with her collection of dolls and miniatures, will be on display at the Collectors Showcase, Feb. 27-28, at the State Fairgrounds.

## Sandians Sponsor Collectors Showcase

Someone once said that if you accumulate at least five items of similar use or design, you are a collector. As a collection grows, the collector usually begins to buy and sell as a means of refining the collection. And he or she reads and advertises in trade journals and exhibits at various shows.

Virginia Miller, a Sandian who retired last month, has been a collector most of her adult life. She is an antique furniture buff but, about 10 years ago, she became a serious collector of dolls and miniatures.

## Medical Offers 'Starting Over'

Marital separations and divorce have been rapidly increasing in the United States for many years. Separation or divorce is one of the most disruptive experiences an individual or a family can experience. For many people it is linked to the emergence of a variety of health problems.

To help Sandians deal with the experience of marital separation or divorce, Sandia Medical is sponsoring a new class, "Starting Over," running from March 2 through April 1, 12 to 1 p.m., Tuesdays and Thursdays, in the solar conference room in the personnel building 832. Please contact Arlene Price at 6-0021 to sign up for this class.

Arlene, Medical's clinical psychologist, will also present a noon talk in building 815 (outside) on divorce, including some trends and factors contributing to divorce. The talk will be held Tuesday, Feb. 23, from 12 to 12:30.

She felt that shows for collectors were too limited, usually one per year, and too specialized: doll show, antique show, gun show, coin show.

Two of her co-workers—John Jewell (2527) and Terry Mason (1471)—helped Virginia solve the problem. In April last year, the three Sandians held their first Collectors Showcase. This was followed with a second and third show in August and November.

"We have space for 104 booths," John says, "and sold out for our last show. We've seen an increase in exhibitors as well as paid admissions. We plan to hold four shows per year."

The Showcase allows any collector to rent a booth. A sampling at the last show included coins, antiques, dolls, miniatures, guns, newspapers, comic books, glass, china, and more.

"We also have contemporary arts and crafts," Virginia adds, "such as wood-carving, weaving, stained glass, leaded glass, jewelry and watercolors. The exhibitors—from New Mexico, Texas, Colorado and Arizona—include amateur, professional and commercial collectors. And all the items are for sale."

John and Terry were not collectors at the beginning of their venture. John notes, however, that he's probably spent more than he's made because of the oak furniture he purchased. And Terry is showing an interest in coin collecting.

John recalled some of the best selling items at the last show: "Fruit jars, punch boards and old newspapers—there's something for everyone."

The next Collectors Showcase will be held in the agricultural exhibit hall at the State Fairgrounds on Feb. 27-28.

## Take Note

Lew Sisneros (3726) is president of the Purchasing Management Association of New Mexico, and he will discuss the Minority Business Owners Trade Fair on "Somos Bilingues en KABQ" on Feb. 20 at 8 a.m. and on "Somos Bilingues en KOAT," Feb. 28 at 7:30 a.m. The Trade Fair takes place March 4 and 5. Denny Gallegos (3743) will provide musical entertainment during both programs.

\* \* \*

A reminder: there is a Goodwill collection box on Base, just south of the Post Office in a parking lot. A note from this self-supporting agency states, "Traditionally, the flow of contributed material slows down drastically during the first three months of the year . . ." So clean out the closets and garage . . . Goodwill does a super job with its handicapped trainees.

\* \* \*

Tom Lenz, C-Club rec manager, reports that a stress reduction class will be offered. Entitled Stressaway, it utilizes Kundalini Yoga, ". . . a relaxing and strengthening technique emphasizing deep breathing and diaphragmatic breathing (breath of fire)." Hmm. Well, it also promises greater endurance and "no radical positions, e.g., headstands." There's a free introductory class. Call Tom on 4-8486.

\* \* \*

Retiree Bill Carstens has the lead role in Orson Welles' play, *Moby Dick—Rehearsed*, running March 5 to 8 at the University of Albuquerque's Stage 1. Bill says the play deals with a group of actors putting on a performance of *Moby Dick*. Curtain time is 8 p.m., tickets are \$4, and call the box office on 831-1111.

\* \* \*

Sandia retirees are asked to consider volunteer work with young people in a number of areas, including literacy, drug abuse, and running away. RSVP is the name of the group, and they need tutors, vocational instructors, and receptionists. Present emphasis is on improving literacy. Call 766-4950 for more information.

\* \* \*

Mina (5633) and Don (2545) Carnicom will present a slide show, "The Galapagos Islands and Ecuador," on Thursday, Feb. 25, at 7:30 p.m. at Albuquerque Federal, 4901 Central NE. The show recounts their visit to those areas in 1980 and is presented under the auspices of the NM Zoological Society. The Galapagos Islands are where Darwin made his observations leading to his famous work "On the Origin of the Species."

\* \* \*

The call is out for all alumni of the University of Texas to join a get-together on March 12 at 7 p.m. at the Old Town Plaza. Bring your family for some fun on the plaza, followed by dinner at La Placita. Reservations are due by March 5;



W. KENNETH DAVIS, Deputy Secretary of Energy in the Department of Energy, visited the Labs last week for briefings on Sandia's weapons, safeguards, and energy programs. He is flanked here by President Dacey and Al Narath (VP-4000) as the group toured the Particle Beam Fusion Accelerator, a model of which is displayed on the table.

contact Karen Grube (5621), 294-2559, or Jerry McDowell (5635), 292-1099.

\* \* \*

From the New Mexico Department of Game and Fish comes the reminder that taxpayers filling out the New Mexico state income tax form may donate part or all of their refund to the Department of Game and Fish for wildlife management. The money will be used to benefit non-game species, endangered species and those that are rare and in need of help and management. Your donation is tax-deductible next year. It's line 23 on the tax form.

\* \* \*

President George Dacey will discuss Sandia's special role and importance in national technical endeavors at a dinner meeting of ASME Feb. 23. The meeting is scheduled in the Regent Hotel. Make reservations with Doris Miller (1542), 4-6543, or Steve Burchett (5521), 4-2866, by Feb. 19.

\* \* \*

Larry Lopez (3151) is the author of an article in the current issue of *New Mexico Historical Review*. Part of a larger study of the Rio Puerco Valley, the article discusses early efforts (1880-1910) of land speculators to organize large-scale irrigation projects and land sales in the Rio Puerco area.

\* \* \*

Videotape replays of the following programs, presented earlier by Medical, will be shown in building 892, conference room 216, from 12-12:30 p.m. on the dates indicated: Feb. 22, "Trim Down Now," by Susan Harris; March 1, "Skin Cancer," by Dr. J. Wendall Robison; March 15, "Aging and Hearing," by Dr. Carl Hattler; March 29, "Time Management," by Peggy Van Hulsteyn.

\* \* \*

National Engineers Week will be held Feb. 21 through 26. Activities include: engineering displays at Winrock Center, open house at UNM's College of Engi-

neering on Feb. 26, and an Engineering Liability Conference on Feb. 24. Guest speaker at the annual luncheon at the Hilton Inn at noon on the 25th will be Jerry Geist, president of PNM. Geist will address the theme, "The Engineer: Pioneering America's Revitalization," as it applies to New Mexico engineers. Luncheon tickets (\$9) are available from Bob Alvis (4717) or Bob Balthaser (1415).

\* \* \*

Ed Barber (1472) called to point out that he, too, was at Salton Sea Test Base and was one of the original crew, still on roll, that moved to Tonopah to construct the test range in 1957. We inadvertently left him out of the TTR 25th anniversary article in last issue.

\* \* \*

Other Sandians retiring this month, but not among those in our "Retiring" photos, include Ed Hirt (2432), Tom Lonz (3212), George Rodgers (2340), Joe Suknot (1485), Carmen Gabriel (2541), Alton Purington (1131), Maggie Wheeler (2426) and Velda Messersmith (3434).

\* \* \*

For New Mexico fans, two new books have been added to the S.14 Project bookstand in the LAB NEWS trailer. The *Guide to New Mexico Mountains* and *New Mexico Place Names* both are handy, Reader's Digest size volumes that make a useful addition to your car's glove compartment. When you drive through Pep, N.M., or admire Tschicoma Mountain from a distance, you can refer to these texts for an informative rundown. And, if you want to climb that mountain, the Guide gives route information. The books are \$5.95 each.

\* \* \*

Attention bass fishermen: the Kirtland Bassmasters meets on Thursday, March 4, at 7 p.m. at the Que Pasa Rec Center. "Tournaments, movies, clinics, guest speakers" are on the agenda. More information—243-1695 or 298-3975.

## Fun & Games

**Table Tennis**—Bill Roady (2561) emerged champion of the recent Sandia Labs Table Tennis Association Singles/Doubles tournament. Runnerup was Skip Aragon (3612). Other winners included class A singles: Art Andazola (2522), first, and Jim Gosler (2636), second; class B singles: Gene Aronson (2646), first, and Pat Knight (2311), second; novice singles: Leo Chavez (3417), first, and Daryl Aberon (2455), second.

Championship doubles: Skip Aragon (3612) and Carter Kidd (3417), first, and Tom Barger (1522) and Joe Rodzewich (2454), second. Class A doubles: Dave O'Brien (2451) and Louis Archuleta (2432), first, and Rand Rozelle (2451) and Leo Chavez (3417), second.

The league plans a team tournament on March 13. If you're interested in competing in the tournament or in joining groups who play in various Labs buildings during lunch breaks, contact Tom Lenz, C-Club recreation manager, 4-8486, or Steve Breeze (2452), 4-2505.

\* \* \*

**Slow Pitch Softball**—With the rapid approach of a new season, Charles Ringler (1762), president of the Sandia Softball Association, sends the call out for new members and new teams. If interested, contact him on 4-4776. Membership in the league costs \$15. Teams will be organized and league play starting about April 1.

\* \* \*

**Skiing**—For X-C buffs, the Sun Run cross country ski race will be held Sunday the 21st at the Sandia Peak Ski Area. The 7.5 km race begins at 12:30 p.m. and includes both expert and citizen's brackets, the latter determined by age. Sponsor is the NM Skin Cancer Project, the ski area and Gardenswartz Sportz. Tomorrow, the 20th, NM Ski Touring Club heads for Hondo Canyon. Meet for this one at ANB, Academy & San Mateo, at 7 a.m.

\* \* \*

**Running**—A Sandian has been given an honorable mention in the annual listing of Masters Athletes of the Year. He is Jim Schirber (5150), and his award takes note of his national titles in 1981 in the 800 and 1500 meter events in the 50 to 54 age bracket. The *National Masters News* is the compiler of the annual listing.

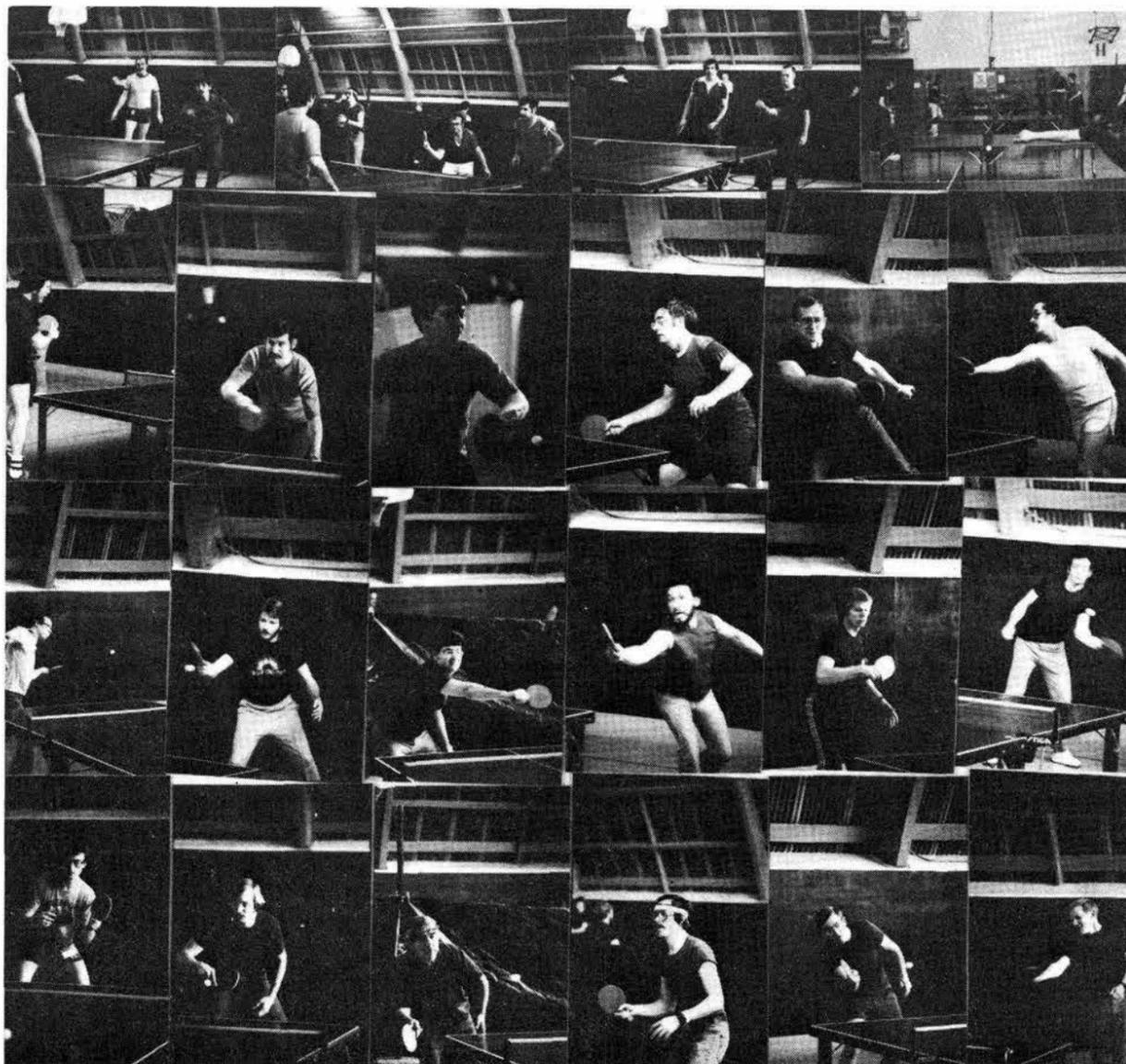
Incidentally, in the same newspaper, one item caught our eye: a man named Clive Davis was chosen top long distance master, having run the Boston marathon in 2:42. Clive, hold on, is 65 years old.

\* \* \*

**Biking**—The tenth annual Tour of the Rio Grande Valley will blast off this year on April 18. The 100-miler follows the accustomed format and starts on the UNM campus at 6:30 a.m. LAB NEWS has entry blanks and tour descriptions.

\* \* \*

**Tough**—"... How tough are you??" asks the poster, and it seems that Albuquerque



**ACTION**—lots of it—marked the recent singles/doubles tournament of the Sandia Labs Table Tennis tournament. Bill Roady (2561) took the singles championship honors from a field of 29 competitors. Photos by Dennis Runyan, collage by Louis Archuleta (2432).

is to be visited by the 2nd annual "Toughman Contest," March 5 & 6 at the Civic Auditorium. Now, since so many of you will want to participate, here's a few more details—"All applicants welcome . . . bar bouncers, bar brawlers, construction workers, lumberjacks, truck drivers, policemen, firemen, farmers, etc. . . . fight three 90 sec. rounds, no biting or kicking . . ." Sound good? We think Sandia and Los Alamos ought to field a separate bracket—how about "I'm The Toughest PhD On The Block?"

\* \* \*

**Women's softball**—The organizational meeting for this group is set for Wednesday next, Feb. 24, at 4:45 p.m. in the El Dorado Room of the C-Club. Aim is a slowpitch league made up of employees, spouses and dependents. The meeting will discuss skills clinics, length of the season, coaching and costs. Food and drink, yes. Try to make it.

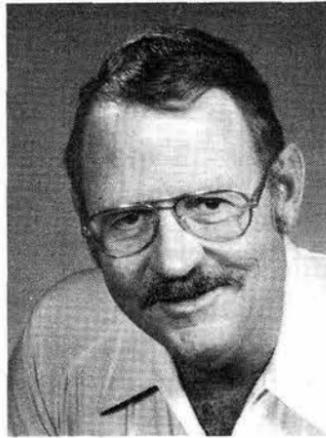
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**Corporate Cup**—Is set for May 22 and 23 at the University Stadium. Sandia has taken the honors in the first two runnings of the Corporate Cup, but we may have our hands full this year. APS is coming up with a team . . . and school teachers run fast. Plan to attend the organizational meeting Tuesday, March 9, at noon in Bldg. 815 (outside). Especially needed are plus-40 women to participate in several of the events.

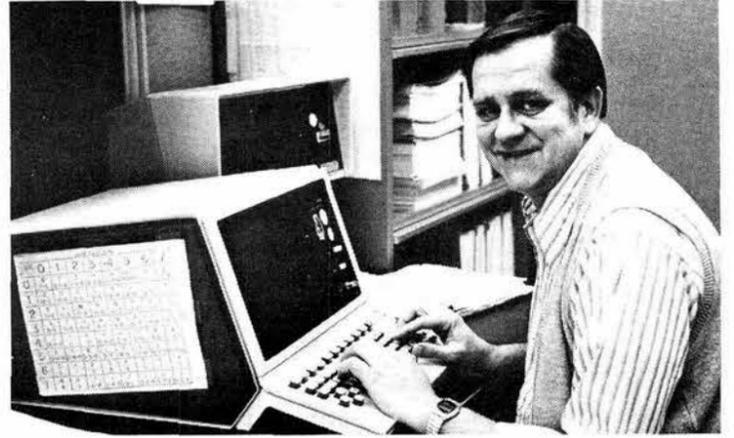


**PLAY BALL** and play in the new slowpitch women's softball league now organizing, say Jaye Bullington (1310) and Noreen Gilbertsen (5521). If you're interested, call recreation manager Tom Lenz at the C-Club, 4-8486.

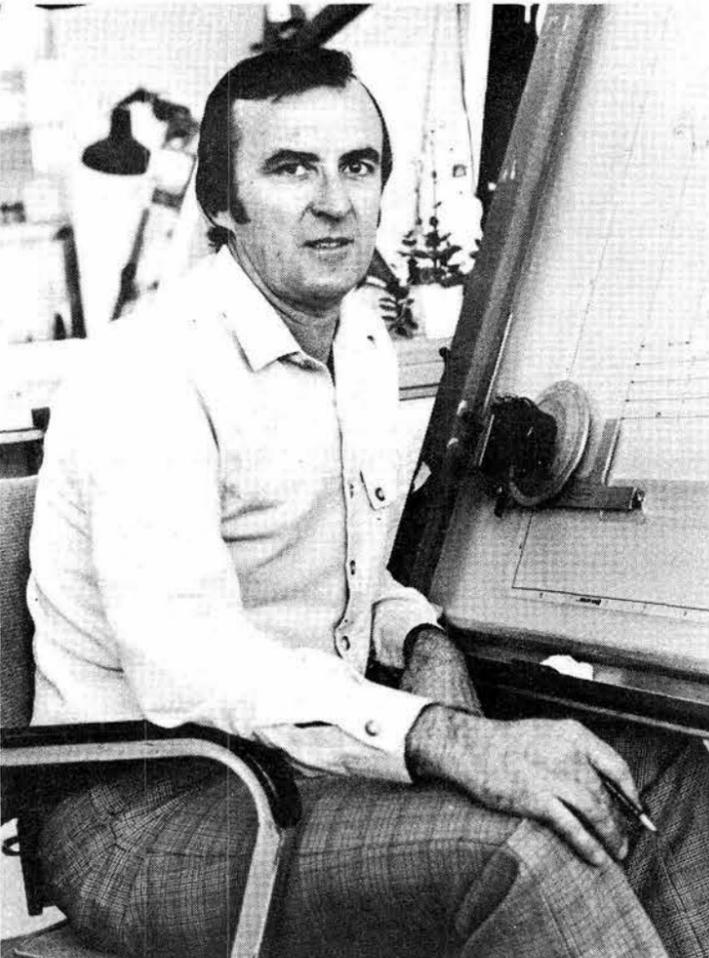
**MILEPOSTS**  
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**FEBRUARY 1982**



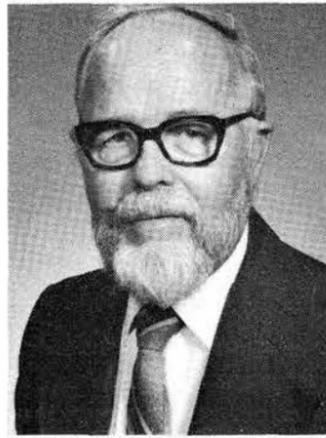
Bob Manhart - 3151 15



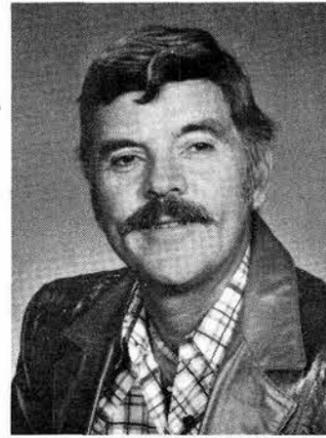
Zig Piscotty - 2636 15



Duane Benton - 2456 20



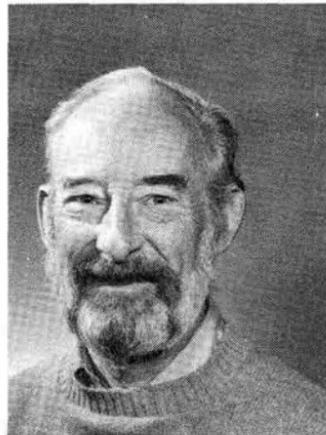
Paul Robertson - 1716 30



Fred Bauer - 4543 30



Lollie Nunez - 8161 15



Ed Sheperd - 4551 30



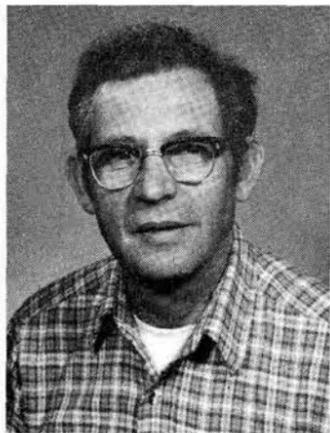
Barry Gilkes - 3155 20



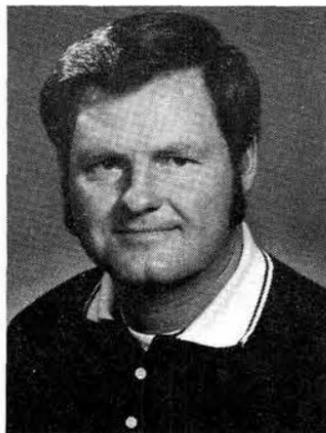
Diana Shimada - 8271 10



Marty Abrams - 8124 10



Preme Ulibarri - 1535 30



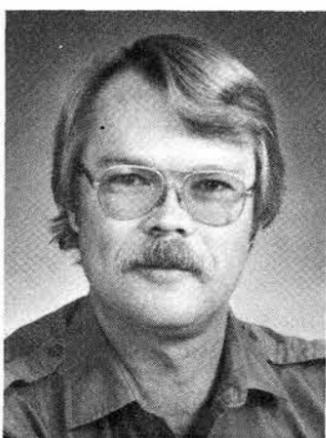
Ben Duggins - 1533 15



Terry Mason - 1471 15



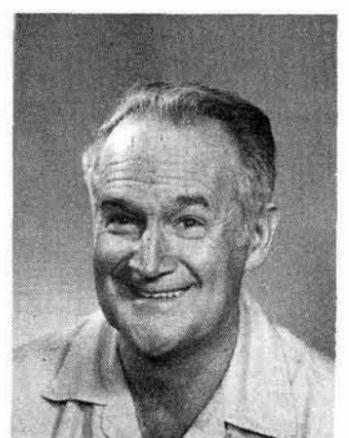
Dick Toth - 4442 15



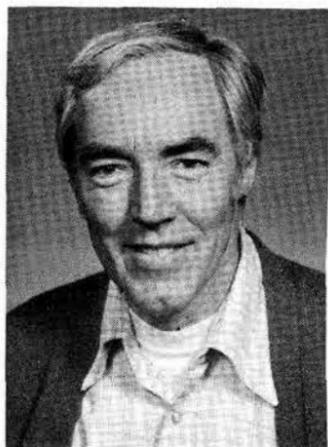
Curt Cofield - 8463 10



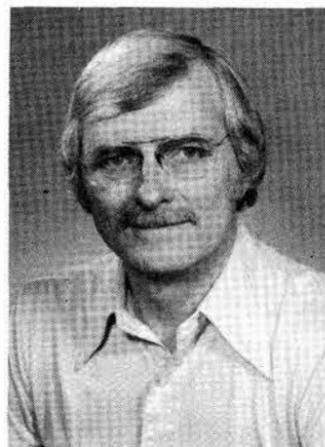
Paul Pierce - 2336 15



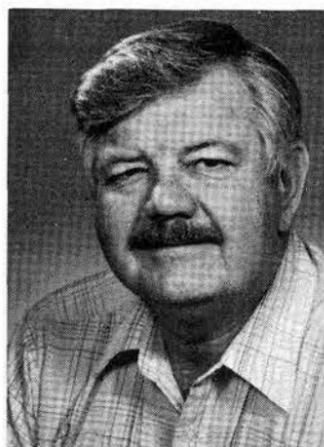
Ed Hirt - 2432 30



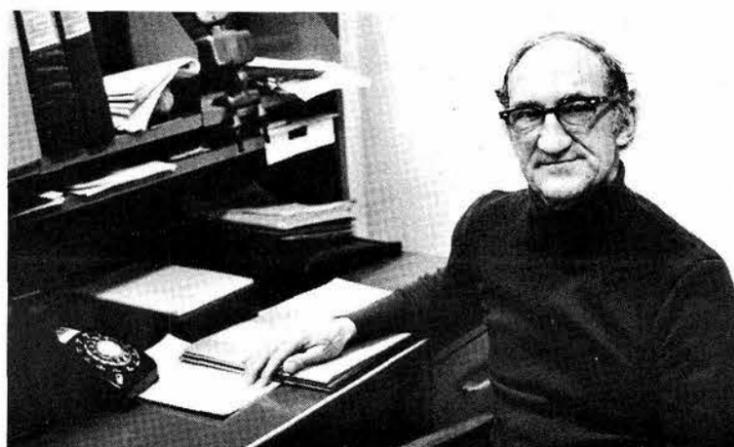
Larry O'Connell - 1426 25



Bob Huguen - 1315 20



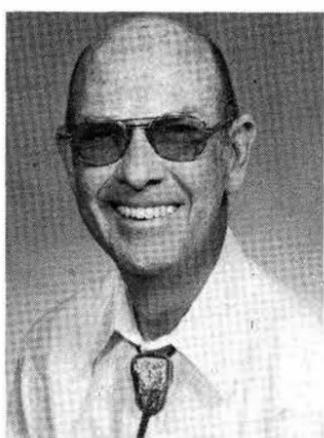
Bill Brooks - 4221 25



Tex Vandi - 2433 30



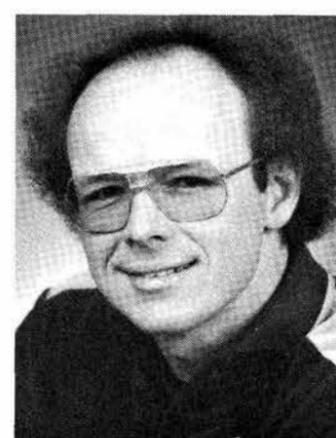
Frank Garcia - 2551 20



Howard Nunez - 1541 25



Wes Estill - 8133 25



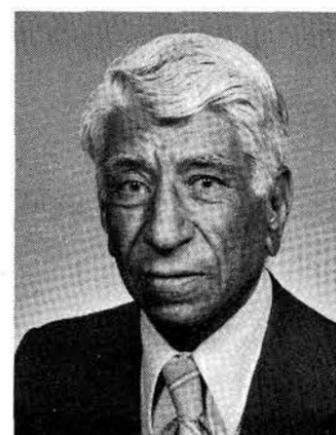
Don Osbourn - 8271 15



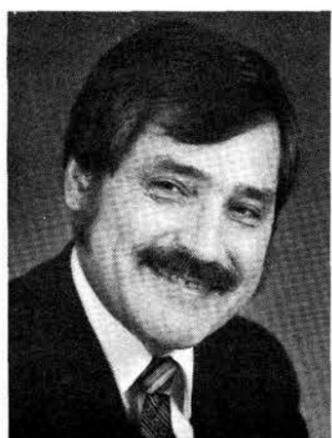
Bob Milby - 8152 30



Cleavord Giles - 3422 30



Ernest Fuentes - 2551 25



Cliff Schafer - 8453 25



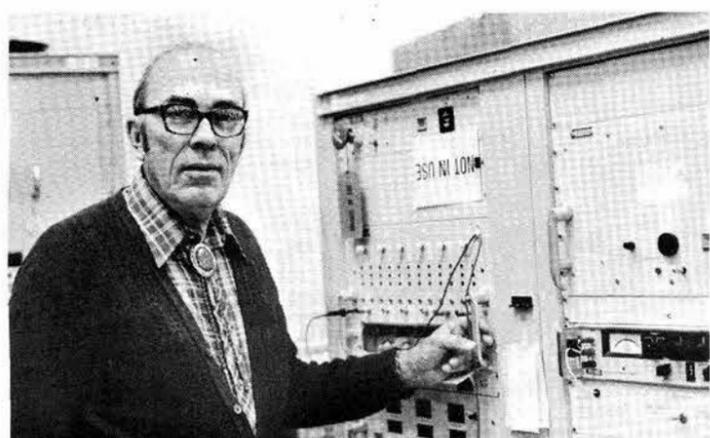
Walt Troy - 3432 25



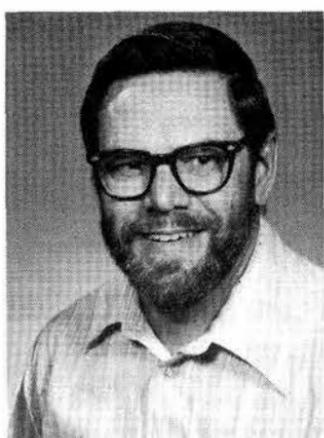
Lyle Davis - 2113 25



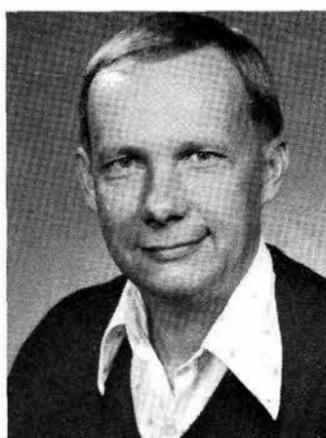
Connie Ortiz - 1481 30



Tom Moody - 2153 30



Marv Plugge - 1721 25



Bob Anderson - 2457 25



Joe Darginnis - 8216 25

## New Videotapes Help Supervisors, Secretaries

If you are a new supervisor suddenly overwhelmed by a plethora of new detail, take heart, help is on the way. Education & Training Division 3523 has produced three videotapes—one each on time cards, property management, and hazardous materials—that go far to clear up the mysteries associated with these subjects.

While these videotapes respond to newly appointed supervisors' requests for briefings on their new duties, long-term supervisors, secretaries, or any persons with a need to know can also find them useful.

These three tapes are the first of a projected series of briefings on the general topic of assets protection. Future tapes will deal with property protection, classified material, personnel actions, employee benefits and other Labs-related topics.

In the films Sandians speak candidly about time and assets management. Concerned line organizations provide information on who does what and where to get help.

## Events Calendar

Feb. 19-21, 25-28—"American Buffalo" by David Mamet at the Vortex Theater, 8 p.m., Sunday at 2:30 p.m., call 247-8600 or 345-5407.

Feb. 19-21—Outdoor Living Show, Ag. Exhibit Hall, State Fairgrounds, 268-5122.

Feb. 20—Beginner's Genealogy Workshop sponsored by the NM Genealogical Society, Botts Hall, Central at Edith, 1:30 p.m., public invited.

Feb. 21—Audubon Wildlife Film Series: "Wilderness Alberta," 7:30 p.m., Popejoy.

Feb. 21—The Scholars, a capella vocal ensemble, 4 p.m., First Methodist Church.

Feb. 24—Albuquerque Youth Symphony, 8:15 p.m., Popejoy.

Feb. 26-27—NM Symphony Orchestra with Nancy Shade, soprano, and Jon Garrison, tenor, 8:15 p.m., Popejoy.

Feb. 27-28—Collectors Showcase, Ag. Exhibit Hall, State Fairgrounds.

Feb. 27-28—Special Cumbres & Toltec Scenic Snowplow Run, Chama, 1-756-2201.

Feb. 28—The Magnificent Mazowsze, national folk ensemble of Poland, 8:15 p.m., Popejoy.

Feb. 28—Cars concert, Tingley Coliseum, 243-3208.

March 5-6—"Orpheus & the Underworld," Albuquerque Opera Theater, 8:15 p.m., Popejoy.

March 5-8—Puppet Circus, an all-puppet show for adults, U of A Theater Dept., 831-1111.

March 5-8—"Moby Dick—Rehearsed," a play by Orson Welles, 8 p.m., U of A, Stage 1, 831-1111.

The tapes are available at the Individualized Learning Center, Bldg. 892. Call Olivia Harris, 4-3396, to arrange for viewings.

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

### CLASSIFIED ADVERTISING

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

### RULES

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

### MISCELLANEOUS

- SANDIA caps & T-shirts, \$6; *Guide to N.M. Mountains, New Mexico Place Names*, \$5.95; S.14 Village Proj., LAB NEWS (next to Bldg. 814).
- CHINA, English Garden pattern 1221, 8 place settings, \$25. Chorley, 296-1454.
- MODEL 94 Winchester 30-30 rifle, lever-action, w/swivel mounts for strap, \$75. Marquez, 344-8455.
- DOUBLE size mattress box spring & single mattress box spring. Padilla, 877-2116.
- DOUBLE BED, Sealy box spring, mattress, headboard, footboard, frame, oak, \$150; full bedspread, \$20; 8-cup auto. Mr. Coffee, \$20. Sanchez, 821-6391.
- SEARS Kenmore microwave oven, \$170; Pioneer 5x424 AM/FM stereo receiver/amp, \$95. Paul, 299-6387.
- HOIST, heavy duty steel chain hoist, 2000 lb. capacity, \$100. Oberkamp, 292-4366.
- NAKAMICHI 700 cassette deck w/ remote control, \$500; audio research dual 75 power amplifier, \$475. Clement, 299-1501.
- CHAIN LINK FENCE, 3' tall, approx. 100' long, some hardware included, make offer. Letson, 344-9812.
- WOOD screen door, full screen w/3 hinges, latch & black grill, 80-3/8" x 35-3/4", \$30. Smith, 299-7151.
- MAYTAG dishwasher, \$60 or best offer. Romero, 888-3890.
- SKIS, K-2 170's, \$30. Bassett, 898-1840.
- TOILET, china, \$30; used cement blocks, 6x8x16, free, about 25; dog, Welsh Corgi, about 4 yrs. old, spayed & shots, children's dog. Day, 881-2664.
- FREE 5-mo.-old part poodle female, housebroken. Hymer, 293-6029.
- USED color TV console, \$75. Perea, 898-8328.

- FM/AM/FM stereo radio w/4-channel amplifier system, \$125; Sandia Memory Gardens lot, \$1000 or best offer; single bed, complete, matching dresser, \$225. Edwards, 884-7853.
- ONE PAIR L60x14 tires on white spoke wheels, \$57 total; roll bar, \$60. Nelson, 881-0148.
- 6' GLASS patio door w/screen & hardware, \$60; band trumpet, \$190; 4 wheels & hubcaps for 79 Toyota PU, \$55. Grosbier, 881-1958.
- SLIDE TRAYS, Carousel 80's & 140's, most brand new, \$3 to \$6.50. Glaser, 293-8110.
- JACKET VEST, brown, nylon shell & lining, down-filled, medium-regular, brand new, \$35. Price, 821-0431.
- AM, FM stereo, record player, 6 speakers, in large Danish modern console, \$120. Davis, 294-0139.
- CABER SKI BOOTS, used once, men's 9 1/2. Fraser, 892-8435.
- CAMPER for LWB truck, has heater, radio, dbl. bed, radio, \$500 or make offer. Fisher, 842-8560.
- PARAGON model A-99B high-fire kiln w/furniture, 7 cu. ft. on castors w/removable collar, \$250. Rich, 242-5653.
- WAGONWHEEL type chandelier, antique metal trim, 24" dia., \$20. Anderson, 296-0892.
- 35-GAL. aquarium w/under gravel filter, 2 air pumps, light, plants, rocks & heater, \$100. Kaiser, 884-7514.
- ETCHING by Amado Pena, "Dos Dancantes," current value \$400, sell for \$375. Harris, 344-2815.
- BABY ITEMS: potty chair, bath tub, outside swing, car seat. Sullivan, 299-6545.
- RACE CAR TRAILER, 2 axles, tool box, tire rack, ramps, lights & wiring, \$695. Pyzel, 883-0291 after 6, or 843-6525.
- 25 HP outboard motor, Buccaneer model 22D15B, no gas tank, \$125. Murphy, 881-1520.
- 2 OCCASIONAL CHAIRS w/ottoman, reupholstered in red rose velvet design on white background, \$450; lamps. Spradling, 292-4680, 3312 Britt NE.
- TOW BAR designed for VW but usable on other makes, used once, \$40. Myers, 298-2677 after 5.
- FURNITURE: 15" B/W TV; 23" color TV; L-shaped sofa; recliner; swivel chairs; console stereo. French, 821-6144.
- BRAZIL Contempo smooth leather couch & matching chair, \$600. Reif, 299-2665.
- SIMMONS queen size hide-a-bed, floral pattern; picnic table & benches; exercise platform. Brooks, 7425 Arroyo Del Oso, evenings.
- SWIVEL ROCKER, \$90; occasional chairs (pair), \$60; K&S gas lawn mower, \$65; Kenwood speakers cabinets, rough, \$50/pr. Quintana, 898-6718.

- 30"x60" DESK w/42" L.H. return swivel chair & plexiglass mat, \$250; office copier, \$500; correcting element typewriter, \$300. Hesch, 881-9874.
- CHOPPING BLOCK (table), rock maple w/oak skirting, never been used, \$180. Hesch, 294-3298.
- PIANO, Wurlitzer console; 7.75x14 used tire, mounted on 5-hole wheel, \$25. Summers, 881-7765.
- KITCHEN cabinet doors, 24 assorted sized w/hardware, used, \$100; 6'x6' pitchback, \$10. Kaiser, 296-5215.
- CARPETING, 12'x18', avocado green, low pile, includes padding, \$75; patio swivel chair, metal w/padding, has hood, \$45. Sublett, 884-4426.
- HIKING BOOTS, Munari, men's 5 1/2 M, \$12; adult Cubco bindings, boot plates, \$10; doorway chinning bar, \$4. Kepler, 298-5652.
- SEWING MACHINE, Sears Kenmore cabinet table utility, decorative stitches, button-holer, recently serviced; matching brown sofa & chair. Shortencarrier, 292-3575.
- WOODS, 1, 3, 4, 5, custom built, never used, matched swing weights. Bonahoom, 296-4450.
- SEWING AIDS; dress forms, light fixtures; curtain rods. Luikens, 881-1382.
- SECTIONAL, 2-piece, French; matching coffee & lamp tables, leather inlay tops; colonial chair, ottoman, maple table. Randall, 821-0388.
- USED Hotpoint elec. oven, \$25. Johnston, 299-1830.
- WATCH BAND, man's, turquoise & silver, flex band, \$75 or make offer. Hughes, 299-6674.
- TRUCK TIRES, 10x16.5 on 8.25x16.5 8-hole rims, 4 ea., \$125. VanDen-Avyle, 898-6474.
- NIKON FM 45mm Nikkor AI, both w/orig. boxes & instructions, \$245; Komura 300mm f/5, \$50. Passman, 821-4999.

### TRANSPORTATION

- '65 HONDA Dream motorcycle, make offer. Marquez, 344-8455.
- '79 MERCURY Monarch, AT, AC, AM-FM cassette, cruise, inline-6, Rogers, 298-7907.
- '80 BUICK Skylark, V6, low mileage, loaded. Cronin, 256-0096.
- '74 DODGE Dart Custom, 4-dr., PS, PB, AT, AC, AM radio, 85,000 miles, \$1250 or make offer. Rich, 242-5653.
- '80 DUCATI 900cc w/fairing, lowers, bags, radio, etc. Letson, 344-9812.
- '76 BMW R90/6, 20,000 miles, \$2700. Darwin, 293-2261.
- '80 DATSUN 4x4, 6000 miles, \$7200; '69 Ford Bronco, needs some repair, body & engine sound, \$2200. Tafoya, 883-6090 or 884-9220.

- '70 TOYOTA Corona, PB, AC, mag wheels, 3000 miles on rebuilt engine, \$1100 or best offer. Rohwein, 298-8391.
- '75 FORD supercab, PS, AC, PB, wide tires, 390 engine, dual battery, w/9 1/2' Idletime camper, camperboot, fully equipped. Arana, 299-1214.
- '75 CORVETTE conv., two tops, low mileage, \$8700. Perryman, 281-3020.
- KAYAK, Lettman, Mark I, paddle & spray skirt, \$300. Heidrich, 881-6040 after 5.
- '70 LARSON tri-hull 18'3" boat, open bow, 165 HP 1/0 Mercruiser, tandem axle trailer, full canvas, fully equipped, \$4250. Bradley, 298-2263.
- '74 VW BUG special edition, 72,000 miles, \$3200. Lynn, 293-2485.
- BICYCLE, Gitane, 23" frame, Shimano 600EX drive components, alloy rims, center pull brakes, Avocet saddle, microadjust, \$195, negotiable. Baldwin, 821-5924.
- '79 BOBCAT, 4-spd., moon roof, new paint, 32,000 miles, 18 mo. maintenance policy, AM-FM cassette, \$3450. Brooks, 7425 Arroyo Del Oso, evenings.
- '76 CHEVROLET Malibu, blue, 4-dr., PS, PB, AT, cruise, AC, 305, new radials, 72K miles, \$2500. Hesch, 881-9874.
- CAMPER SHELL for SWB pickup, \$300; '65 4-dr. Ford V6 Falcon, runs but needs transmission work, \$400. Zamora, 898-1295.
- '78 PONTIAC Grand Prix, V6, PS, PB, AC, \$4100. Hesch, 294-3298.
- LADIES' 3-spd. bike, green, \$75. Kraft, 821-6417.
- '80 CHEV. Citation, AT, AC, PS, PB, 4-cyl., best offer over \$5000. Pershall, 822-0814.
- '74 KAWASAKI 750 motorcycle, completely stock, \$1500. Hansen, 266-4157 after 2:30.
- '74 BUICK Century wagon, 70,000 miles, \$100 under book. McClennahan, 292-3119.
- SCHWINN bicycle, men's 3-spd., new tires, tubes, pedals & seat, \$35. Luikens, 881-1382.
- '80 SUZUKI motorcycle, GN400, 75 mpg, black & gold, \$1200. Lavasek, 292-7820.
- '67 OLDSMOBILE convertible, 75,000 miles, PS, PW, etc., extra top, AT, AC, AM/FM/8TR, power seats, \$2750 or make offer. Hughes, 299-6674.
- '79 CHEVY Impala, small V8, AC, AT, PS, PB, 4-dr., \$3000 or best offer. Simmons, 255-3297.
- RALEIGH 5-spd. touring bike, 23" frame, \$75. VanDenAvyle, 898-6474.
- '76 EL CAMINO w/fiberglass top, 305 V8, PS, PB, AC, AM/FM, new radials, 57,000 miles. Davis, 298-4530.

### REAL ESTATE

- LARGE old terrone & adobe house on corner lot, 4 plus acres. Valencia, NM, owner may finance. Norcott, 865-7789.
- 3-BDR. HOUSE w/studio, 1-car garage, 1 1/2 bath, 1319 sq. ft., 8 1/4% assumable, \$15,000 CTL, \$368 PITI. Rich, 242-5653.
- 4-BDR., 2 1/2 bath, den w/fp, 2-car garage, NE heights, assumable 8 1/2% loan, 2080 sq. ft., \$81,800. Chen, 298-6477.
- 3-BDR. patio house, NE heights, 1 yr. old, professionally decorated & landscaped, hot tub off master suite, \$106,000. Edwards, 292-4700 after 5.

### WANTED

- CADILLAC, 1972 or 73 model, good condition. Miller, 281-3189 after 6.
- CHILDREN'S SKI equipment, for girls ages 10 & 13, reasonable condition & price. Sciocca, 293-0633.
- TO RENT: motorhome to sleep 5 adults. Pike, 299-6153.
- SMALL GAS ENGINE for small alternator, 2 to 4 HP. Stromberg, 255-6131.
- STEREO microscope, prefer 10X & 30X with WF eyepieces. Flesner, 265-2136.
- CHILD'S swing set, prefer one w/slide & glider; also used sliding glass doors. Morrison, 877-7425.
- STUDENT DESK(s), suitable for late grade school through high school use. Bonzon, 296-3022.
- NEED BABY SITTER to sit in my home in the south valley, willing to pick up & take home. Draper, 877-2802.
- TRADE 25 yr. service award battery-driven carriage clock for wind-up model. Luikens, 881-1382.
- PERSON to care for house & small children, ages 2 and 9 years, room & board plus monthly stipend. Young, 842-0348.
- SHELL for Chev. Luv pickup. Stixrud, 292-5002.
- ANTIQUE furniture to repair, will repair for you or buy to repair. Long, 296-2590.

### LOST & FOUND

- FOUND—BRACELET w/turquoise setting, parking lot south of B821. Simpson, 4-7921.

## Two Bands Play Tonight

CONTINUING THE POLICY of music early and music late, two bands will play for Happy Hour tonight—Natural Persuasion featuring singer Charlie Baca plays from 5 until 7:30, then Jeanne Rich and Friends holds the bandstand from 8 until midnight. In the meantime, special prices are in effect all evening, and the dining room offers menu selections until 9:30.

To arrange babysitting for Friday nights, call the KAFB-East Nursery (located about two blocks from the Coronado Club) on 4-2314. Cost is 80 cents an hour per child, and supper may be arranged if you call early. You will have to show your Coronado Club membership card.

TOMORROW is a Saturday biggie at the Club with a prime rib buffet starting at 6 p.m., followed by dancing with Marci and the Talk Abouts on the bandstand from 8 to 12. Members pay \$7.75, children under 12, \$4.50. Your Club calendar discount ticket is good for \$2.50 off the top. Reservations are not required.

MONDAYS continue as Ladies' Night at the Club with a very special price on well drinks and draft beer—only 25 cents. The portable dance floor is installed in the main lounge near the juke box.

On Tuesdays, Happy Hours run from 4:30 until 8:30 with special prices and a free spread of munchies and goodies at 5:30.

Wednesdays, it's three for one. Three well drinks or three draft beers for \$1.

NEXT FRIDAY, Feb. 26, sees Sassafras on the bandstand from 5 until 7:30, then Jim Meek and the Country Showmen take over until midnight. The dining room offers fine steaks, seafood and a chef's special. Happy Hour prices are in effect all evening.

MARK SATURDAY, Feb. 27, on your calendar now and plan to take your youngsters to the annual Kids Karnival at



CLOWNS AND KIDS—Charlie Clendenin (2611) in the Tweety Bird suit and Dick Shepardson (3251) as Sylvester the Cat are a couple of clowns getting Dick's children—Ricky, Michelle and Leslie—set for the Coronado Club's annual Kids Karnival scheduled Feb. 27 from 10 until 2. Game booths, prizes, and lots of hot dogs, hamburgers, etc., are part of the fun.

the Club from 10 until 2. There will be game booths, clowns and all kinds of goodies. Youngsters pay \$1.50 for a book of 10 tickets.

UPCOMING EVENTS—By popular demand, another Singles Mingle March 12; Coronado Club Retiree Dinner Dance March 27.

TRAVEL DIRECTOR Frank Biggs (4231) announces a new Coronado Club travel package to Cozumel, a resort on the Caribbean coast of Mexico. The package includes airfare, airport transfers, seven nights at the Hotel Cozumel Caribe and the Mexican government's 10 percent value-added tax. Cost is \$459 before May 15, \$409 after. Check at the Club office for departure dates.

The charter bus trip to Laughlin-Las Vegas is about full, Frank reports. Cost of this tour March 14-17 is \$130.

Another trip to Las Vegas April 4-7 costs \$185 and includes airfare, transfers, baggage handling and three nights' lodging at the Maxim Hotel. Deposit \$50 now, pay the balance by March 5.

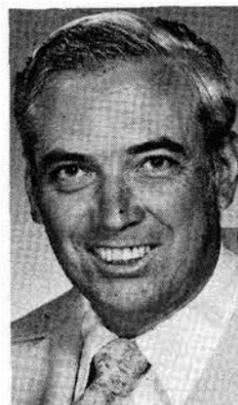
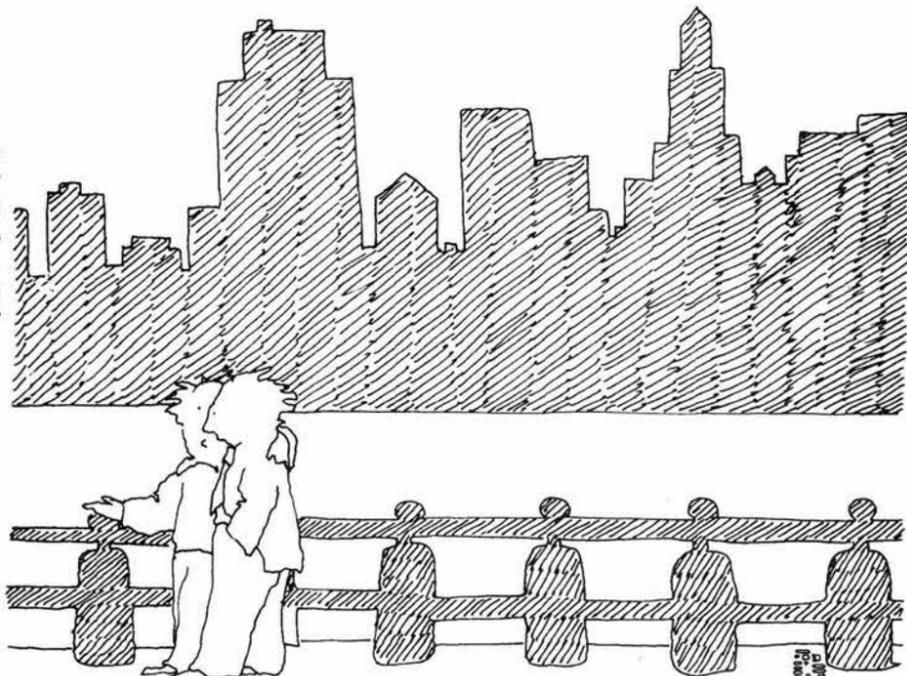
Space is available on the two Mazatlán trips, April 18-22 for \$352, or April 18-25 for \$427. The package includes airfare, lodging at the Playa Mazatlán, transfers, hotel taxes and departure taxes.

A few seats are open on the charter bus trip to Chaco Canyon April 24 for \$20.

"We need at least 32 people on the Washington, D.C., and vicinity trip to sign up by March 5 to make it a go trip," Frank says. "Price of the package is \$300 plus airfare (currently about \$400). The trip includes all transportation, lodging, visiting the Washington Monument, Smithsonian Institution, Mt. Vernon, Monticello, Charlottesville, Richmond, Williamsburg, Yorktown, Jamestown, and Civil War Monuments."

Talk with Frank about these trips and pick up travel literature in the Club lobby tonight between 5 and 7.

"Fred, you can't take it so hard. So what if she left you? Women leave men all the time. Maybe not so they can go to Boise, Idaho, but Fred, you're still young. You've still got it!"



## Death

Bob Burnett of Detonating Components Division 2513 died Feb. 5 after an illness. He was 50.

He had worked at the Labs since June 1953.

Survivors include his widow, a daughter and two sons.