



THERMORADIATED sewage sludge is dried in tanks in Area III where (l to r) Willis Whitfield, Jim Pierce and Mary Morris (all 5442) remove samples for laboratory analysis. Following treatment the coliform count in the sludge is less than in pasteurized milk. After drying, the product is sent to New Mexico State where experiments are being conducted using it as feed for ruminant animals and as plant fertilizer.

Radioactive Waste Finds New Uses

"Beneficial Uses Program" is new terminology describing activities of Waste Management and Environmental Programs Department 5440 under Jack Sivinski. The former biosystems research group reports significant developments in:

- thermoradiation (simultaneous application of heat and gamma radiation) to sterilize municipal sewage sludge for use as a fertilizer and soil conditioner (LAB NEWS, March 7, 1975). It now appears that this process can also create a product highly nutritious for ruminant animals.

- the exploitation of radioactive waste, a byproduct of nuclear power plants. Actually, the stuff is perhaps too valuable to be labeled "waste." Primarily as a result of the Sandia solidification process (LAB NEWS, Jan. 10, 1975), cesium 137 and other isotopes may be more easily extracted from the radioactive waste — thus providing economical sources for thermoradiation.

- finding new applications for thermoradiation techniques and for radioactive isotope sources.

"Our objective in the Beneficial Uses Program," Jack says, "is to maximize the gainful employment of what is now radioactive waste. How can the radioactive isotopes be separated, packaged and applied to society's benefit? We're working on a number of answers to this question."

Thermoradiation was developed by Sandia in 1969 to help NASA sterilize space hardware. It proved effective with the application of surprisingly small amounts of heat and radiation. Since then, much work has been done using thermoradiation against pathogens and parasites in sewage sludge.

"It now appears that a combination of 500 kilorads at 65° C for 20 minutes would be effective in a 'worst case' situation," Jack says. "This dose can probably be reduced. In any event, sewage sludge could help solve the nation's future fertilizer needs. But, more important, it appears that the product could also be converted to a nutritious product for feeding cows, sheep and other ruminant animals. Such a product, treated only by heat,

(Continued on Page 6)

LAB NEWS

VOL. 27, NO. 22

OCTOBER 31, 1975

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

\$439,150 ECP Total

A total of \$439,150 was pledged by employees this week as Sandia's ECP drive wrapped up. With virtually all cards in, Art Clark (9330), ECP Committee chairman, reports that 76 percent of employees contributed to the campaign, 50 percent at the Fair Share or better level. Average gift of those who contributed is \$104.26.

"The Committee is grateful to those who participate in the Plan," Art says, "and to those who helped conduct the campaign. We lost a number of Plan participants this year when the minimum for membership increased to \$2 per month. Perhaps next year those people will rejoin ECP."

Sandia to Host E-Beam Meet

Next, week, Sandia and ERDA host the First International Conference on Electron Beam Research and Technology. Some 200 scientists from the major nations, including England, Germany, France, Italy, Russia, Israel, and the U.S., will exchange information which may lead to a quicker realization of practical fusion power. Participants include English scientists J. C. Martin and J. D. Lawson, pioneers in the development of electron beams.

Gerry Yonas, manager of Sandia's Fusion Research Department 5240 and conference chairman, says, "The number of important applications of electron beams which have arisen in the last few years has created a community of scientists and engineers needing a forum such as this. We felt that a topical conference would be useful, but we were frankly surprised at the extent of the response. Clearly there is a rapidly growing

(Continued on Page 5)

Afterthoughts

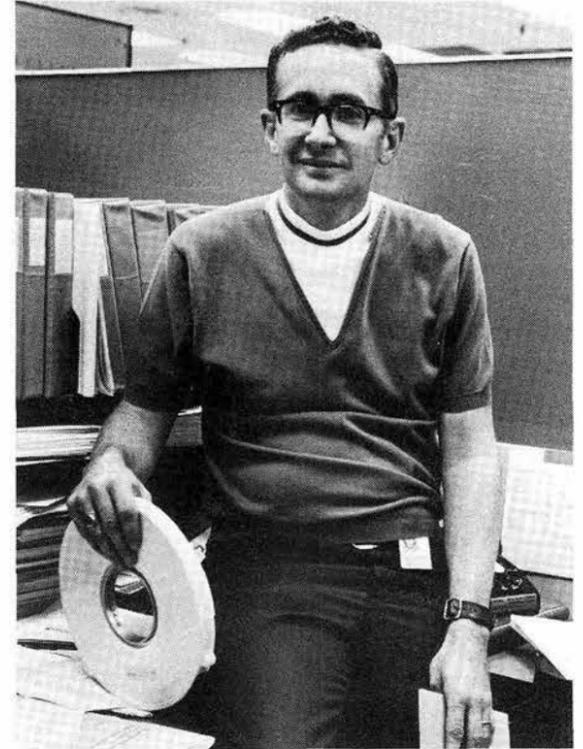
Some Pumpkins--LAB NEWS staff is agreed: more calls to our office were prompted by the pumpkin patch(es) than just about anything that's come along. Some suggested a carving contest, the prize going to the most imaginative sculpture. Others thought the pumpkins should be raffled off. When a whimsical type put ERDA property stickers on them, the callers suggested photos. Actually, we had planned photo coverage for this issue. But pumpkins are supposed to be yellow--right? So we waited, and waited, and then someone picked the whole crop. There's a report that a little kid with a round head and a lost expression has been lurking thereabouts. Do you suppose... Good grief!

* * *

Hamburger, with everything--When McDonald's announced "A Year's Groceries Free and a New Datsun Z" sweepstakes, they also invited customers to "enter as often as you wish." So a group of CalTech students submitted 1.1 million computer-printed entries, much to the consternation of the hamburger moguls. In a statement that brought tears to the eyes of nobody, they charged that "the students acted in complete contradiction of American standards of fair play and sportsmanship." As it turned out, the students had submitted one-third of the entries and received 20 percent of the prizes, including a Datsun, a check for \$3000, and 315 \$5 gift certificates. The young people gave the Datsun to United Way and are using the money for improvements to their dorm. Then Burger King rather neatly got into the act by awarding CalTech a \$3000 scholarship grant in the name of the engineering student who was a principal in the prank. McDonald's is now reported to be examining alternate promotional schemes.

* * *

The Livermore connection--SLL'ers Taz Bramlette and Bob Green: "The Six Phases of a Project (1) Enthusiasm (2) Disillusionment (3) Panic (4) Search for the guilty (5) Punishment of the innocent & (6) Praise and honor for the non-participants." *js



Melvin Scott (2642)

Supervisory Appointment

MELVIN SCOTT to supervisor of Applied Mathematics Division 2642, effective Oct. 16. Mel joined the Reactor Studies Division at the Labs in August 1966, where his assignments included analysis and design of reactors for Area V. He transferred to his current organization in 1973. Before coming to Sandia, Mel worked for two years on the Apollo fuel cell program at Pratt & Whitney Aircraft.

He earned his BS at NMIMT and an MS from Rensselaer Polytechnic Institute. A member of Sandia's DSP, he received his PhD in math in 1972. Mel is a member of the Society for Industrial and Applied Mathematics and the Society for Computer Simulation. Mel, his wife Karen, and their three children live on a ranch south of Los Lunas. They raise Simmental cattle (a breed developed in Switzerland) and quarterhorses.

Giving Blood Is No Sweat

About 1100 Sandians are enrolled in the blood donor program. So says Vern Henning (4213), who coordinates the Labs' program, and we agreed with Vern that the number is impressive.

But it still leaves four thousand or so at Sandia Albuquerque who don't give blood, and that's a pretty impressive number too.

Blood and more blood continue to be urgently needed.

Vern figures there's a lot of you out there

who would donate, except you've got this thing about needles. Or the sight of blood, especially your own great stuff, makes you go bananas. Or perhaps you're concerned about after-effects.

Actually, giving blood is painless. You lie down on the padded table, the technician with the needle is very skillful and, once inserted, it's hardly noticeable. In a few minutes the plastic bag is filled with your blood (though you don't have to look at it), you remain on the table for a minute or two, have a cup of orange juice, and you're ready to go. The only after-effect we've noticed is a feeling of great virtue.

You can sign up to give blood on just about any schedule that suits you -- once a year, twice, or as often as every eight weeks. Sandia donors are picked up in the lobby of Bldg. 832 by the Blood Services van every Tuesday for transport to the KAFB Hospital. It's customary to schedule donors, but drop-ins are welcomed -- just show up in Bldg. 832.

Give it a try. Someone in Albuquerque is out for blood -- yours.

TO: Vern Henning - 4213

I wish to participate in the Sandia Blood Donor Program.

Name (please print)

Org. Ext. Date

LAB NEWS

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gerse martinez lends a hand

&

lorena schneider reports on livermore



MARY LAFRENZ (9633) was awarded this plaque recently at a workshop in Chicago "in recognition of outstanding GIDEP support through voluntary and timely exchange of test reliability and other technical data, effective use of GIDEP data and active participation in GIDEP functions." GIDEP is the Government-Industry Data Exchange Program which maintains files on performance of commercially-available products. Mary maintains GIDEP service in Bldg. 836.

Bill Ryan Applies For Work



Bill Ryan (8264) has been named Sandia/Livermore's representative with the National Alliance of Businessmen (NAB), a group that helps disadvantaged citizens get jobs. Bill will work in the Tri-Valley area, urging industrial firms to develop jobs in support of

the NAB program.

NAB was formed in '68 at Presidential request to be catalytic in providing job opportunities to the chronically unemployed. Later the President asked for additional jobs for Vietnam veterans, especially those with educational deficiencies or other disabilities. Through May of 1974, NAB's record in this area is impressive — 545,000 veteran hires against a target of 350,000.

"Now, in addition," says Bill, "we are promoting jobs for ex-offenders, and the challenge is even greater because these men and women carry the stigma of the ex-con. In the first year NAB placed 7000 ex-offenders in jobs."

Highest Honor in Glass Research to Jim Shelby



Jim Shelby (8334) was awarded the 1975 George Morey Award for outstanding contributions to glass science and technology at the fall meeting of the American Ceramic Society. Jim also delivered the annual Morey lecture on "Structural Implications of Gas Diffusion Studies."

Established in 1969, the annual award (an engraved Steuben bowl) is the highest honor conferred for glass research. Jim was chosen on the basis of recent studies delineating the relationships between insert gas diffusion and the composition, microstructure, and thermal history of various glassforming systems.

Jim joined Sandia in 1968 after receiving BS, MS and PhD degrees in ceramic engineering from the University of Missouri at Rolla. His research work has included gas diffusion in glass, hydrogen reactions with glass, and physical property studies of basic glass systems. Over 30 papers resulting from his research have appeared in various scientific journals.

A member of the American Ceramic Society since 1963, Jim is also affiliated with the National Institute of Ceramic Engineers.

Speakers

Tom Brumleve (8184), "Update on Central Receiver Investigations at Sandia," Solar Energy for Earth Conference, AIAA, Apr. 21-24, University of Southern California, Los Angeles.

Rudy Johnson and Jack Dini (both 8312), "Techniques for Quantitatively Measuring the Adhesion of Electrodeposits," Society of Vacuum Coaters Conference, Apr. 7, Key Biscayne, Fla.

George Perkins (8213), "Business Administration as a Career," Apr. 2; Curt Franklin (8163), "Careers in Electrical and Mechanical Engineering," Apr. 9, Career Guidance Program for Students, Livermore High School.

LIVERMORE NEWS

VOL. 27, NO. 22

LIVERMORE LABORATORIES

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ON HAND for the Credit Union's open house were (from left) Directors Don Wagner (8212) and Joe Maldonado (9713), Credit Union Manager Bill Bristol, and Director Earl Simonson (4152). Winner of the \$50 Savings Bond was Lloyd Meyers (8412).



STEFANIE KING is recently appointed Manager of the Livermore Credit Union.



ANITA WING (right) and Connie Brenton assist Hal Brint (8323) and Alyce Loveless (8424).

LEAP Campaign Goes Over the Top

Final results of the LEAP campaign show that Sandians contributed a total of \$47,665 or 6 percent over the \$45,000 goal. The figure represents an increase of 12 percent over last year's contributions of \$42,586.

The average gift per contributor was \$61.66, up from \$57.24 last year. Of those participating, 123 gave a LEAP share, an increase of 17 percent, and 38 gave a Fair Share.

Sympathy

To Lou Reis (8423) on the death of his mother in Glen Falls, N.Y., Sept. 16.

To Ek Kuroski (8257) on the death of his mother-in-law in Imperial Valley, Calif., Sept. 30.

To Joe Calim (8257) on the death of his wife in Danville, Calif., Oct. 3.

To George Anderson (8330) on the death of his father in Minneapolis, Minn., Oct. 3.

To Lewis Clauson (8185) on the death of his mother-in-law in Seattle, Wash., Oct. 13.



PARKING LOTS would be packed more tightly if each of the 1800 Sandians who bus, bike, or car pool to work drove alone.

We Go A Long Way, But We've Come A Long Way

Buses, bikes, and car pools save Sandians the equivalent of a trip around the world just in getting to and from work each day. In other words, busers, bikers, and car poolers would, if each one drove alone, rack up over 23,000 miles (and over 2000 gallons of gasoline) each day. Add to that figure the 900 passenger-miles accounted for by Sandia's remote area shuttle buses (and the car pools that didn't respond to our recent survey) and the total is about 25,000 miles per day.

Some 1800 Sandians customarily use some alternative to the "one car and one driver" form of commuting. That's almost a third of the workforce, a significant change from the spring of 1972 when more than 80 percent of us drove alone to work.

It's also true, of course, that in 1972 only two city buses ran Sandia Special routes, no rural routes existed, bicycles were generally perceived as playthings of the grade school set, car poolers competed with everyone else for the best parking spaces, and OPEC was only a gleam in the Arabian eye.

Thanks to an unofficial Employee Transportation Committee, seven additional bus routes have been established, and the Committee has been trying for two and a half years to get three or four more city routes — only to be blocked by City Fathers, City Mothers, a Shortage of Buses, and The Way Things Are. The nine Sandia Special buses are allowed to pick up and drop off their 350 passengers within the Tech Area.

Sandia's computerized car pool matching program helps employees who live near each other find each other. Reserving parking slots make pooling attractive and help equalize the travel time for poolers vs. non-poolers. Our 550 car pools carry some 1300 people about 9000 miles a day. If each pooler drove alone, the mileage total would be over 22,000 miles.

Biking also is more attractive, thanks in part to ETC member Sharla Vandevender (4734) who heads the City-County Bikeway Study Committee. That group has furthered the biking cause from the Wyoming gate to the State Capitol. On a good day, 200 bikers leave their cars at home.

Sandia management has supported the ETC's efforts. For example, reducing the lunch period to 30 minutes means reducing the temptation to drive to McDonald's or to pick up the laundry during noon hour. And setting remote area work hours at 8:15 to 4:15 means employees out there can easily bus, bike, or car pool to Area I, then use one of the three Sandia-provided shuttle buses.

* * *

It's not easy to break the drive-by-yourself habit. But once you do, you like it. That's our conclusion after talking with some of those who have.

Bike riders tend to statements like "It's exhilarating — the breeze, the speed, the fresh air. Keeps you in shape too."

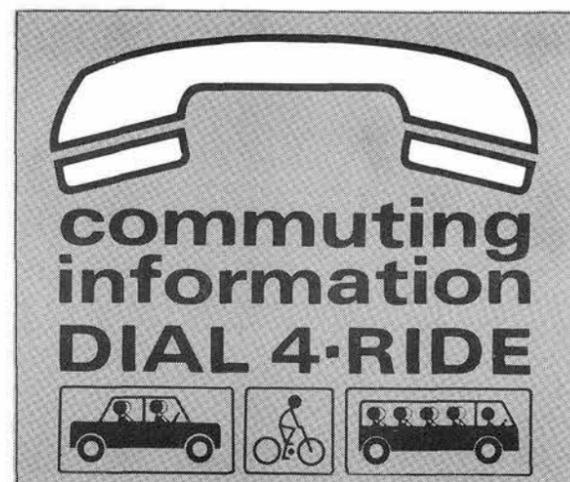
Bus riders: "It's relaxing. I watch the scenery or take a nap or talk while someone else worries about the traffic."

Car poolers: "I like the sociability of the group. We have stimulating discussions — in two-a-day installments."

One motivator is economic — the "I'm riding to work for 2.9 cents a mile" approach. Or, "I don't need a second car" or "My insurance rates went down."

Ecology plays a role: "Get people out of their cars, clean up our air." And statistics: "Fuel savings, if everyone car pooled, would exceed 100 million gallons a week."

Most Sandians who bus, bike or pool recognize that valid reasons keep some of their colleagues in their lonely cars. But if you're still a Lone Ranger and want to change, you can get commuter information by dialing 4-RIDE. •bh



Events Calendar

- Nov. 1 — Ferguson Library: "Creative Dramatics for Elementary School-Aged Children," 10:30 am.
- Nov. 1 — New Mexico Federation of Music Clubs: Scholarship Benefit Concert, 8 pm., Keller Hall.
- Nov. 1-2 — Albuquerque Children's Theater: "Peter and the Wolf" and "Bracko the Prince Frog," 1:30 & 3:30, Popejoy Hall.
- Nov. 2 — Enchanted Mesa Indian Arts: "Navajo Rugs from the Old Hubbell Trading Post," Opening reception 11-5:30, hangs through Nov. 16.
- Nov. 4 — Club Culturale Italiano: "Movies on Italy," 7:30 pm., Reception Center, 146 Quincy NE.
- Nov. 7 — The New Mexico Ballet Co: "Fashion with Dancing Mannequins," 7:30 pm., Mid-Town Holiday Inn.
- Nov. 7-9 — Southwest Arts & Crafts Festival, State Fair Grounds, Agriculture Exh. Bldg., 10-10.
- Nov. 9 — Rodey Theater Film Festival: "Day of Wrath" (Denmark, 1943), 7:30 pm., Rodey Theater.
- Nov. 12 — Audubon Wildlife Film Series: "Vanishing American Wildlife," 7:30 pm., Popejoy Hall.
- Nov. 12 — Harvest and Corn Dances Fiesta, details from Pueblo Office 834-7445, Jemez Pueblo.
- Nov. 13 — Arlen Asher-Bob Brown Jazz Workshop: Jazz Concert, 8:15 pm., Simms Fine Arts Center.

Continued from Page One

Electron Beam Fusion: A Progress Report

interest throughout the world in the use of electron beams to directly heat and compress fusion targets, accelerate ions, and excite high power gas lasers."

The Sandia contingent will share their recent findings with particular emphasis on their program to investigate the feasibility of using e-beams as a trigger for fusion explosions.

One measure of the progress in e-beam fusion at Sandia is the new accelerators — Proto I, which has just begun operation, and Proto II, which is in the initial stages of development. Another measure is the number of people now involved as well as the support by ERDA for the program. The third and most significant measure is the increased sophistication of the high voltage techniques used in the new facilities, the greatly improved diagnostic methods, and the computational techniques used to design experiments, correlate results, and allow extrapolation to higher power levels.

* * *

Proto I is the first high-power, short-pulse electron beam accelerator designed especially to heat and compress fuel pellets in fusion experiments. At peak power, over 2 trillion watts, it will be used to irradiate a fuel pellet for 24 nanoseconds (24 billionths of a second) with two 400,000-amp beams.

Eventually, with enough power (approximately 100 trillion watts) and a short enough time (approximately 10 nanoseconds), a net energy-producing fusion reaction should take place: the energy produced by the fusing of the individual atoms would be greater than that required to generate the beams. Proto I, which represents an early but significant step toward fusion, relies on low jitter, oil-insulated lines developed by Ken Prestwich. Ken is also looking into the possibility of using the same technology in Sandia's laser development program.

Beyond Proto I is Proto II, due to be operational next spring. Proto II will use a water dielectric rather than Proto I's oil dielectric. A water dielectric can store considerably more energy per unit volume than oil. But it had been thought that the simultaneous switching of the channels used to generate e-beam power could not take place in water. Further, water pulse forming lines would slow the pulse rise time — the speed at which the beam reaches full power. But recently Tom Martin and Pace Vandevender proved the feasibility of using water dielectric in generating short pulses, and they showed that simultaneous switching of the channels with rise times of a few nanoseconds is achievable. Proto II should deliver a peak power of 8 trillion watts.

* * *

The second measure of progress is the level of effort now going into the e-beam fusion program. Over 50 people are now involved. And the current budget is \$4.7 million; it should grow to \$7 million next year.

"And last June," says Gerry, "we received \$300,000 for design definition of EBFA (Electron Beam Fusion Accelerator), a major



E-BEAM PLAQUE, designed for the First International Conference on Electron Beam Research and Technology, is examined by Sandy Hudson, conference coordinator, and Gerry Yonas, conference chairman (both 5240). Conference runs Nov. 3 to 6 at 4-Seasons motel.

feasibility experiment proposed as a line item in the FY '77 budget. We hope to receive an additional \$400,000 in the near future to hire an architectural firm to do the final design of the facility. In FY '76 the construction budget includes only a small addition to our present facilities, but FY '77 looks good at this point for a major new facility. ERDA's Budget Review Committee has recommended \$14.2 million, subject to approval, of course, by the Office of Management and Budget and by Congress early next year."

* * *

The third measure of progress is Sandia's improved ability to predict test results, record test data with increased precision, and analyze those data later. The major goal here is to determine the degree of symmetry of loading and subsequent compression of the spherical fuel pellet after irradiation by the e-beam. The key to symmetry is apparently the "beam pinch," that is, the tight focus achievable. The speed of focus is also critical — the beam, ideally, should pinch to 1 mm early, not late, in the exposure period.

Says Al Toepfer, supervisor of Electron Beam Research Division 5242, "We have vastly improved our diagnostic capabilities. For example, we are now obtaining up to four high resolution holograms or target response in a time interval of 15 nanoseconds, thanks to work by Paul Mix." Jim Chang has been responsible for obtaining high quality flash radiography of imploding targets, and Mel Widner has been using these data, along with Frank Perry's optical measurements of implosion times, to determine beam energy deposition characteristics."

John Freeman, supervisor of Plasma Theory Division 5241, describes the theoretical work as "a combination of studies instigated by the experiments, and feasibility

studies of a more speculative nature. For example," he continues, "current flow in diodes is carried not only by electrons but by ions as well." Computer calculations of diode focusing performed by James Poukey, now include the self-consistent motion of both types of particles. This code is currently the state-of-the-art in the field, and its predictions are being tested in Proto I experiments. At the same time, Milt Clauser is studying what benefits might be obtained by using the ions instead of the electrons for pellet implosion. Initial studies indicate that a significant reduction in beam power might be possible with ions. Both theoretical programs are tied in with experiments on spherical ion diodes being studied by Paul Miller.

"Obviously, the course we're following has many steps," concludes Gerry, "and we can envision only some of these steps clearly now. We have to move on to increasingly higher power levels which pose greater challenges in concentrating that power.

"We at Sandia are part of a worldwide program, steadily moving toward the time when we'll be able to make solidly supported statements about the feasibility of various approaches to fusion. We should be able — in the next five years — to tell which method is preferable and then cut our options. We are in an exciting race with an enormous payoff."

• bh

LAB NEWS Issue Dates

Thanksgiving and Christmas holidays have caused LAB NEWS issue dates to be slightly modified: Nov. 14, Dec. 5, Dec. 19, and Jan. 9. Ad deadlines are at noon on: Nov. 7, Nov. 25, Dec. 12, and Jan. 2, respectively. With the Jan. 9 issue, the schedule reverts to every-other-Friday as usual.

Thermoradiation

has been on the market for years. Cost can be reduced and production increased with thermoradiation. Under a Sandia contract, New Mexico State University is conducting feeding tests with animals along with other plant growth tests of the thermoradiation treated sludge. At this point, results look very promising but all data must undergo final evaluation."

Department 5440 is currently producing the product on a small scale. A pilot plant facility is planned to treat 10,000 gallons of sewage sludge per day. A 1.4 megacurie Cobalt 60 source has been obtained at no cost to serve as the gamma source for the pilot plant. As design progresses and data becomes available, cost analyses are being performed. Here again, preliminary figures are encouraging. An early projection indicates a product cost of \$16.50 per ton. As animal feed, a market price of \$50 per ton could be assumed.

"These are conservative estimates," Jack says, "but they are indicators of very real possibilities."

A sizeable plus in this program is the Sandia solidification process developed by Bob Dosch (5824). An ERDA contract is financing further development of the process by Department 5820 to remove isotopes from high-level liquid wastes. The isotopes are converted to ceramic form and made into rods for handling and for use in apparatus. As nuclear generating plants become more numerous, the supply of radioisotopes will increase while their cost diminishes.

A bonus in the reclaiming of isotopes relates to the ultimate disposal of the waste. With isotopes such as cesium 137 and strontium 90 removed, radioactive lifetime of the residue is reduced, and requirements for disposal can be less stringent.

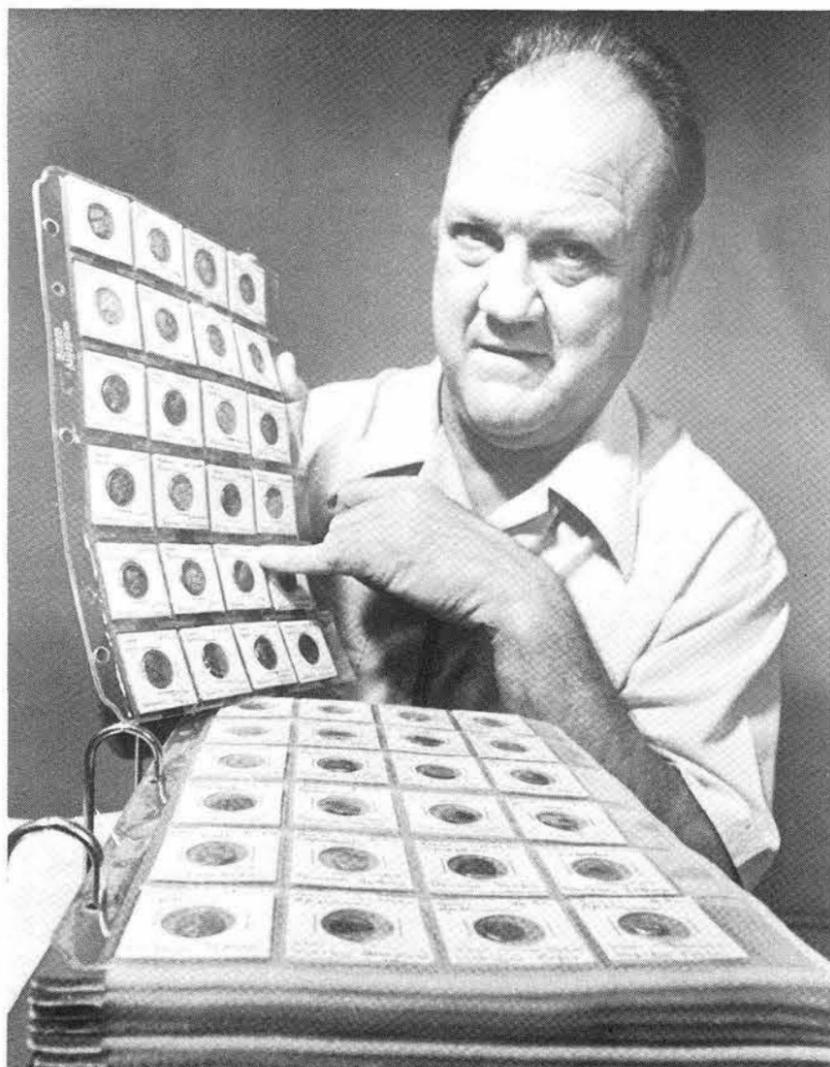
Other applications of thermoradiation include sterilization of food to increase shelf-life without affecting taste or texture.

"Only preliminary work has been done in this area," Jack says, "but it looks promising. For instance, we tried a simple experiment with milk and increased the storage life from 12 days (in a refrigerator) to about 28 days. The implications are many, but we have neither the time nor manpower to pursue this. Other agencies are interested, and we are supplying our thermoradiation-effectiveness data and technology to them."

"Some very real possibilities exist for beneficial uses in medical areas," Jack continues. "Thermoradiation might be effective in eliminating viruses such as hepatitis from human blood used for transfusion. Of course, this research will have to be exhaustive and, again, does not lie within Sandia's charter. However, as in the case of the Sandia clean room development, the medical profession is showing interest and, ultimately, progress will be made."

Several months ago, Jack visited remote Alaskan villages to study sanitation problems. In the winter, everything freezes. Radioactive heat sources installed in plumbing systems could remove serious health problems during the Arctic deep freeze months in these villages. Sandia is cooperating with the Public Health Service to solve these problems.

"We're on the threshold," Jack says. "As a scientist, I have to be conservative but my enthusiasm is not easily contained. The future looks very exciting." • dg



GEORGE REIS (5625) displays his collection of ancient Roman coins. Individual coins at right are typical in their remarkably preserved detail. The bottom coin, called a Quinari, is extremely rare. Value: \$2500.



It's Only Money

'I Hold History in My Hand'

"Darius I was a Persian king who threatened Greek civilization around 500 B.C.," George Reis (5625) is saying. "If it weren't for the battle of Thermopylae, we might all be speaking a language based on Persian."

George is looking at a small silver coin, a little thicker than a dime with crude but distinguishable markings.

"This coin is called a Siglos and was minted about the time of Darius I. It is a historical reality, 2400 years old, which you can feel and see. People used it to buy food, shelter and clothing. I guess that's why I collect coins."

George picked up his first Roman coin when he was in the Navy in 1939. Since then he has shopped bazaars, hock shops and coin stores everywhere buying, trading and selling. In 1960 George traded most of his miscellaneous coins and decided to concentrate on silver Roman coins. His collection spans the time between 500 B.C. to 500 A.D. With some 350 individual coins, the collection is valued in excess of \$30,000. He keeps it in a safe deposit box in a bank.

Individual coins are valued from \$2 to \$2500. "The nice part," George says, "is that the collection does not decrease in value. In ancient times there was inflation just as today. Many of the old Roman emperors, for economic reasons, would debase their coins — cut the amount of silver and add copper or some other base metal, very much like our coins today. Finally, people lost confidence in their money. But about 300 A.D. Diocletian put a stop to it. He recalled all the old coins and issued new ones where the intrinsic value of the silver matched the face value of the coin."

"Many of the Roman emperors would take their mint with them on their travels or on army campaigns. When they needed money, they minted some. In time the imperial mints became fixed, however. The history of Roman coinage is pretty well known — as is Roman history. They were good record keepers."

George buys most of his coins through dealer catalogs nowadays. He needs only a certain few to complete his collection — a coin or a series from the various eras of Roman history.

"Patience is the name of the game," he says. "One of these days, the coin I need will be listed. In the meantime I help local dealers and collectors with the identification of ancient coins, attend shows and wait. One of these days . . ." • dg

Death

Jim Boespflug of Switching Devices Division 2327 died Oct. 23 when the light plane he was piloting crashed on landing at Lordsburg. He was 43. Also dead is his 16-year-old daughter.

Jim had worked at the Labs almost 18 years.



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R. J. Eagan (5864) and G. J. Jones (2334), "Bubble Formation in Glass by Reaction with Silicon and Silicon-Germanium Alloys," Vol. 58, No. 7-8, JOURNAL OF THE AMERICAN CERAMIC SOCIETY.

P. J. Feibelman (5151), "Film-Asymmetry Effects in Resonant Photoexcitation of Plasmons," Vol. 35, No. 9, PHYSICAL REVIEW LETTERS.

P. S. Peercy, I. J. Fritz (both 5132) and G. A. Samara (5130), "Temperature and Pressure Dependences of the Properties and Phase Transition in Paratellurite (TeO₂): Ultrasonic, Dielectric and Raman and Brillouin Scattering Results," and Peercy, Samara and B. Morosin (5154), "Pressure and Temperature Dependences of the Dielectric Constant, Raman Spectra and Lattice Constant of SnI₄," Vol. 36, No. 10, THE JOURNAL OF PHYSICS AND CHEMISTRY OF SOLIDS.

T. P. Wright and G. R. Hadley (both 5241), "Relativistic Distribution Functions and Applications to Electron Beams," Vol. 12, No. 2, PHYSICAL REVIEW A.

J. E. Schirber (5150) et al, "De Haas-van Alphen Studies of the Fermi Surface of a(uranium)," Vol. 17, No. 5, SOLID STATE COMMUNICATIONS.

G. J. Kominiack (5834), "Silicon Nitride Films by Direct RF Sputter Deposition," Vol. 122, No. 9 JOURNAL OF THE ELECTROCHEMICAL SOCIETY.

J. W. Reed (5644), "Fuel Savings by Lowering Thermostats," Vol. 189, No. 4207, SCIENCE.

M. E. Riley (5211), "Approximations for the Exchange Potential in Electron Scattering," Vol. 63, No. 5, THE JOURNAL OF CHEMICAL PHYSICS.

C. E. Barnes (5112), "Photoluminescence in High-Resistivity CdTe:In," Vol. 46, No. 9, JOURNAL OF APPLIED PHYSICS.

L. D. Berthoff (5162), L. D. Buxton (1812), B. J. Thorne (5162), R. K. Byers (5166), A. L. Stevens (5167) and S. L. Thompson (5166), "Damage in Steel Plates from Hypervelocity Impact. II. Numerical Results and Spall Measurement," Vol. 46, No. 9, JOURNAL OF APPLIED PHYSICS.

G. A. Carlson (5225), "Dynamic Tensile Strength of Mercury," Vol. 46, No. 9, JOURNAL OF APPLIED PHYSICS.

R. G. Easterling (1223), "Randomization and Statistical Inference," Vol. 4, No. 8, COMMUNICATIONS IN STATISTICS.

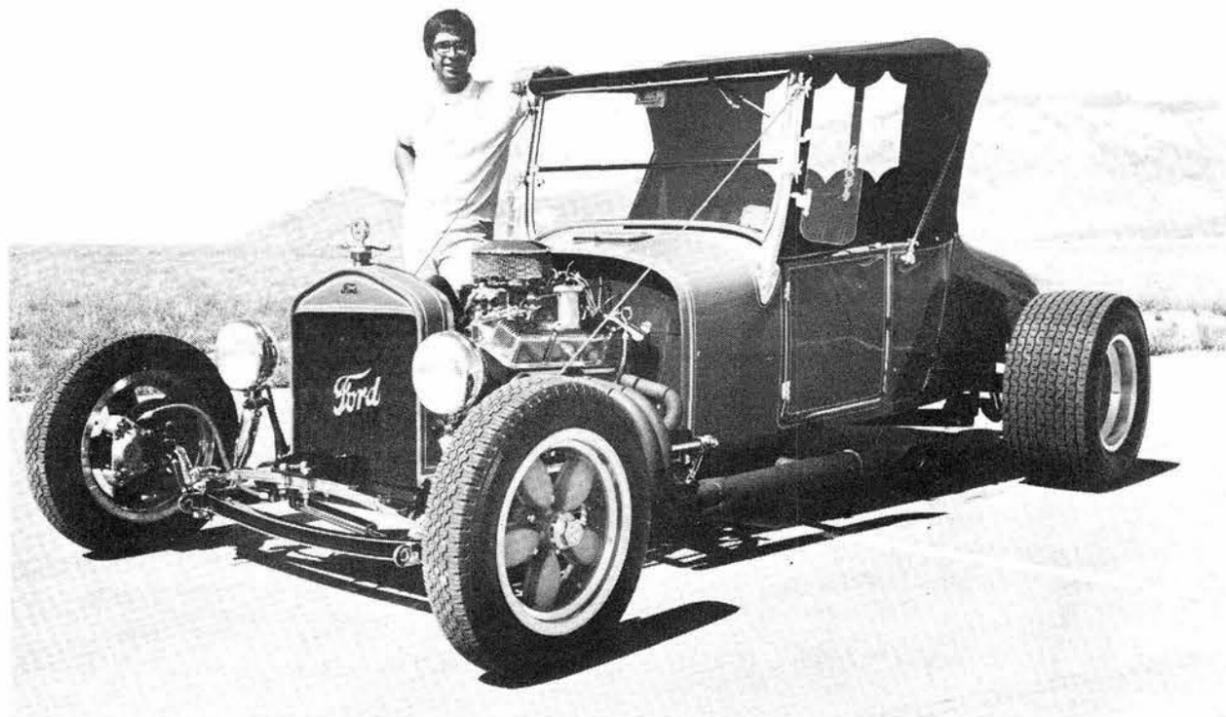
M. J. Landry (2441) and G. S. Phipps (9412), "Holographic Characteristics of 10E75 Plates for Single- and Multiple-Exposure Holograms," Vol. 14, No. 9, APPLIED OPTICS.

P. C. Lysne (5131), "Kinetic Effects in the Electrical Response of a Shock-Compressed Ferroelectric Ceramic," Vol. 46, No. 9, JOURNAL OF APPLIED PHYSICS.

F. L. Vook (5110), "EFFECTS OF RADIATION ON MATERIALS - Results of an APS Sponsored Study of Physics Problems Relating to Energy Technologies," Vol. 28, No. 9, PHYSICS TODAY.

P.J. Feibelman (5151), "Evaluation of Wave Functions for a Surface Potential Barrier Having Friedel Oscillations," Vol. 12, No. 2, PHYSICAL REVIEW B.

D.B. Hayes (2513), "Wave Propagation in a Condensed Medium with N-Transforming Phases: Application to Solid-I-Solid-II-Liquid Bismuth," Vol. 46, No. 8, JOURNAL OF APPLIED PHYSICS.



DON MARCHI (5155) presents his flaming orange hot rod. The machine took two years of leisure time to build.

Among Other Things

Don Marchi Builds Hot Rod

Don Marchi (5155) is a young man with great energy and many enthusiasms (note calling card).

One of his latest is a hot rod. Yes, a 50's-style streamline flake-tangerine baby with a deep-gutted roar and a quick and nimble style.

"Always wanted one when I was a teenager," Don says, "so a couple of years ago I couldn't pass up an offer to buy the beginnings of this machine."

Two years, hundreds of hours and dollars later, Don has the epitome of hot rods —

- 1927 Ford Model T Roadster body chopped and channeled

- Chevy 301 engine with full race cam, solid lifters and balanced aluminum pistons (11 1/2 to 1 compression)

- 650 Holley 4-bbl carb
- Corvette 4-speed transmission
- Revlock clutch
- Disc brakes
- Olds rear end with 4.88 gears
- Flaming VW orange paint
- Chrome plating and chrome plating

Plus other things — hand carved wooden instrument panel with Stewart-Warner gages, color-coded wiring and fuses, roll bar mounts, luxurious upholstery and carpeting, and a dummy parachute.

"The parachute is just for show," Don says, "I'll never drive it fast enough to need a

NEW CARS	CALL GIRLS	JURY BRIBES	WHEEL CHAIRS
BED PANS	ELECTIONS RIGGED	BLACK MARKET SURPLUS	
COTTON PICKERS	CHICKEN PLUCKERS	PICKLE PACKERS	
BABY SITTING	ARTIFICIAL INSEMINATION	LAWNS MOWED	
TRASH HAULING	HORSE TRADERS	MANURE BROKER	
DICKERER	DONNIE MARCHI	PRINTER	
HOTEL RESERVATIONS	TEQUILA	BEER	STEAKS
PERFUMES	ONE-WAY RAILROAD TICKETS	WRENCHES	
ANYTHING WHOLESALE	HOLES FOR SALE	BRASSIERES	
ALSO AN ASSORTMENT OF ODDS AND ENDS			MOSTLY ENDS

parachute to brake it."

Don drove it to Ruidoso recently for a two-day get-together of New Mexicans who dig hot rods, antiques, classics and customs. Then next summer he will take it to Tulsa for a national meet and maybe win a few prizes.

Winning prizes for machines is one of the things that Don does. One wall of his den is covered with trophies for his customized '57 Harley Davidson motorcycle which, incidentally, sits in chrome-plated splendor in the center of the room.

Another area contains trophies awarded for his mint-condition '65 Corvette, a splendid machine entered in a number of auto shows.

One last enthusiasm: Don is an accomplished magician. He performs benefit holiday magic shows for local hospitals and United Way agencies.

Still, he regrets giving up raising skunks.

• dg

E.J. McGuire (5211), "Multiplet Auger Transition Rate for Partially Filled Shells," Vol. 12, No. 1, PHYSICAL REVIEW A.

K.K. Murata (5151), "Thermodynamics of an Itinerant-Electron Ferromagnet at Very Low T / " Vol. 12, No. 1, PHYSICAL REVIEW B.

J.E. Schirber (5150) and B. Morosin (5154), "Lattice Constants of B-PdD with x near 1.0," Vol. 12, No. 1, PHYSICAL REVIEW B.

J.P. Van Dyke and W.J. Camp (both 5151), "Susceptibility Expansion for Classical Scalar Models," Vol. 35, No. 6, PHYSICAL REVIEW LETTERS.

H.O. Pierson (5834) and M.L. Lieberman (5731), "The Chemical Vapor Deposition of Carbon on Carbon Fibers," Vol. 13, No. 3, CARBON.

M.L. Lieberman (5731), "Kinetic Factors in the Chemical Vapor Deposition of Carbon from Methane," Vol. 13, No. 3, CARBON.

R.M. Curlee (5825) and M.L. Lieberman (5731), "Pyrocarbon Formation from Benzene in the Preparation of Carbon/Carbon Composites," Vol. 13, No. 3, CARBON.

M. J. Clauser (5241), "Ion-Beam Implosion of Fusion Targets," Vol. 35, No. 13, PHYSICAL REVIEW LETTERS.

D. Emin (5155), "Thermoelectric Power Due to Electronic Hopping Motion," Vol. 35, No. 13, PHYSICAL REVIEW LETTERS.

N. R. Keltner (9331), "Transient Response of Circular Foil Heat-Flux Gauges to Radiative Fluxes," Vol. 46, No. 9, THE REVIEW OF SCIENTIFIC INSTRUMENTS.

D. A. Nissen and B. H. Van Domelen (both 2523), "Regular Solution Theory and the Surface Tension of Molten Salt Mixtures," Vol. 79, No. 19, THE JOURNAL OF PHYSICAL CHEMISTRY.

T. V. Nordstrom, R. W. Rohde (both 5832) and D. J. Mottern (deceased), "Explosive Strengthening of a Cu-Be Alloy," Vol. 6, No. 8, METALLURGICAL TRANSACTIONS A.

H. O. Pierson (5834), "Boron Nitride Composites By Chemical Vapor Deposition," Vol. 9, July 1975, JOURNAL OF COMPOSITE MATERIALS.

Speakers

H.D. Monteith (9344), "Contributions of Eastern Religions," Aug. 19, Sandia Kiwanis Club.

B.W. Marshall (5717), "Solar Energy Research," Aug. 20, Belen Rotary Club.

H.R. Shelton (3132), "I'm OK, You're OK," Aug. 21, Los Altos Kiwanis Club and Aug. 29, staff of the Services for the Blind.

G.W. Hughes (1243), "Astronomy," Aug. 22, Rio Grande Lions Club.

C.S. Johnson (9421), "Just a Galaxy Away," Aug. 25, Rio Grande Lions Club.

T.F. Marker (6010), "What is the Oil Industry?" Aug. 28, Los Altos Kiwanis Club.

H.J. Rack and W.F. Chambers (both 5822), "Interface Migration in Pb-Sn-X," Bell Telephone Laboratories, Aug. 26, Atlanta, Ga.

R.E. Cuthrell (5834), "ARC Initiation at Potentials Near the Melting Voltage," Bell Labs, Sept. 2, Murray Hill, NJ.

C.L. Olson (5241), "Sandia Collective Acceleration Program," Meeting on U.S. Programs in Collective Accelerators, July 10, Berkeley, Calif.; "Ion Acceleration by Relativistic Electron Beams," Novel Acceleration Mechanisms Group, 1975 Isabelle Summer Study, July 14-25, Upton, Long Island, NY. J.E. Schirber (5150), "Pressure Induced Electron Transitions," University of Maryland, Aug. 29, College Park.

G. Yonas (5240), et al., "Target Irradiation Studies Using Relativistic Electron Beams," Gordon Conference, Aug. 18-22; and at Advisory Group Meeting on Experimental Aspects of Laser-Electron Beam Produced Plasmas, Aug. 25-29, Trieste, Italy.

L.F. Shampine (5122), "Quality Software for Non-Stiff Ordinary Differential Equations, National Meeting of the A.I.Ch.E., Sept. 7-10, Boston, Mass.

H.J. Rack (5832), "The Relationship Between Thermal Embrittlement and Hydrogen Cracking in 18Ni(250) Maraging Steel"; W.J. Kass (5834), "Hydrogen Transport in 4130 Steel"; W.G. Perkins (2413), "Computational Investigation of the Effects of Barrier Layers on the Permeation of Hydrogen Through Metals"; N.J. Magnani (5831), "The Hydrogen Cracking of U-O.75 wt.%Ti," International Conference on the Effect of Hydrogen on Behavior of Materials, Sept. 7-11, Jackson, Wyo.

G.C. Nelson (5825), "Calculation of the Change in Surface Composition of Binary Alloys Due to Sputtering and Its Application to the Cr/Au System," 1975 ISS Users Conference, Sept. 8, Minneapolis, Minn.

J.E. Kennedy, J.W. Nunziato (both 5131), and D.R. Hardesty (8115), "Initiation and Detonation Studies of Condensed Explosives Using Interferometric Techniques," 5th International Colloquium on Gasdynamics of Explosions and Reactive Systems, Sept. 8-10, University of Orleans, Bourges, France.

S.T. Picraux (5111), "Implantation Metallurgy"; Picraux et al., "Temperature Dependence of He Trapping in Niobium"; J.A. Borders (5111), A.G. Cullis and J.M. Poate (both BTL), "The Physical State of Implanted W In Copper"; D.K. Brice (5111), "Replacement Collision Probabilities for Energetic Incident Ions"; G.W. Arnold (5112) and J.A. Borders (5111), "Diffusion and Aggregation of Implanted Ag and Au in a Lithia-Alumina-Silica Glass," International Conference on Application of Ion Beams to Materials, Sept. 8-12, Warwick, England.

L.F. Shampine (5122), "Solving Systems of Nonlinear Equations," Computer Science Colloquium, Sept. 10, Murray Hill, N.J.

M.S. Sweeney (5241), "Electron Beam Fusion Targets," Sept. 12, UNM Dept. of Physics and Astronomy.

S.T. Picraux (5111), "Analysis of Light Nuclei in Solids Using Nuclear Reactions"; Picraux, "Ion Channeling Studies of the Lattice Location of Interstitial Impurities: Hydrogen in Metals"; Picraux, "Channeling Analysis of Implantation Disorder in Al"; R.A. Langley (5111), "Depth Profiling of Deuterium and Helium in Metals by Elastic Proton Scattering: A Measurement of the Enhancement of the Elastic Scattering Cross Section Over Rutherford Scattering"; Langley, "Study of Tantalum Nitride Thin Film Resistors"; J.A. Borders (5111) and G.W. Arnold (5112), "Applications of Ion Beam Analysis to Insulators"; R.S. Blewer (2413), "Practical Aspects of Depth Profiling Gases in Metals by Proton Backscattering: Application to Helium and Hydrogen Isotopes," International Conference on Ion Beam Surface Layer Analysis, Sept. 15-19, Nuclear Research Center, Karlsruhe, Germany.

W.A. Von Riesenmann and M.H. Gubbels (both 1544), "Analysis of an In-Pile Reactor Tube," 5th National Conference on Mechanical Vibrations, Sept. 17-19, Washington, D.C.

T.D. Padrick (5215) and R.E. Palmer (5216), "Relative Yield and Rate Constants for Decay of I^* Produced by Alkyl Iodide Photolysis"; Palmer and

Padrick, "Sandia High-Power Atomic Iodine Photodissociation Laser"; A.K. Hays (5215) J.M. Hoffman and G.C. Tison (both 5212), "Molecular Iodine Laser Near 3400 cm^{-1} "; J.C. Tison, J.M. Hoffman (both 5212) and A.K. Hays (5215), "Studies of Rare-Gas-Halogen Molecular Lasers Excited by an Electron Beam," Second Summer Colloquium on Electronic Transition Lasers, Sept. 17-19, Woods Hole, Mass.

A. D. Swain (1222), "Human Factors Engineering," Albuquerque Chapter, N.M. Society of Professional Engineers, Aug. 27.

G. W. Hughes (1243), "Astronomy," Los Altos Kiwanis Club, Sept. 4.

T. F. Marker (6010), "What Is the Oil Industry?," Caravan Shrine Club, Sept. 8.

M. W. Edensburn (5711), "Solar Energy Research," N.M. Association of Building Design, Sept. 11, Albuquerque.

R. W. Harrigan (5717), "Solar Energy Research," Reserve Officers Association, Sept. 16, Albuquerque.

R. A. Holloway (9623), "Metrication in the United States," Sandia High School assemblies, Sept. 18.

J. M. Hueter (3131), "Creativity for Craftsmen," Albuquerque Club of Printing House Craftsman, Sept. 16.

R. S. Blewer (2413), invited review paper, "Depth Distribution and Migration of Implanted Low Z Elements in Solids Using Proton Elastic Scattering," 170th National Meeting of American Chemical Society, Aug. 25-26, Chicago.

R. C. Hughes (5814), "Charge Transport and Storage in SiO_2 ," International Symposium on Electrets and Dielectrics, Sept. 1-5, Sao Carlos, Brazil.

R. E. Cuthrell (5834), "The Solid-Phase Bonding of Gold," seminar at Bell Labs, Sept. 2, Murray Hill, N.J.

K. E. Lawson (5833), "Pattern Recognition on the Quantimet 720 Image Analyzing Computer," 4th International Congress for Stereology, Sept. 4-9, Gaithersburg, MD.

M.R. Scott and H. A. Watts (both 2642), "A Systematized Collection of Codes for Solving Two-Point Boundary-Value Problems," AIChE meeting, Sept. 7-11, Boston.

S. T. Picraux (5111), "Implantation Metallurgy," International Conference on Application of Ion Beams to Materials, Sept. 8-12, Warwick, England.

D. W. Bushmire (2431), "Gold Aluminum Intermetallic Study," ASTM meeting, Sept. 9, Chicago.

R. A. Butler, B. W. Duggin (both 5233), and F. H. Mathews (9321), "Mesh-Initiated Large Area Detonators," paper presented by D. H. Anderson (2510), JOWOG -9 meeting, Sept. 15, Aldermaston, England.

S. T. Picraux (5111) and J. Bottiger and N. Rud (Univ. of Aarhus), "Depth Profiling of Hydrogen and Helium Isotopes in Solids by Nuclear Reaction Analysis," and Picraux, "Ion Channeling Studies of the Lattice Location of Interstitial Impurities: Hydrogen in Metals," International Conference on Ion Beam Surface Layer Analysis, Sept. 15-19, Karlsruhe, Germany.

J. O. Harris (2521), "Retinal-Burn and Flashblindness Prevention With PLZT Devices," 28th Annual Conference on Engineering in Medicine and Biology, Sept. 20-24, New Orleans.

C. L. Schuster (1735), "Surface Electrical Potential Measurements as a Means of Determining Fracture Orientation"; L. D. Tyler (1111) and W. C. Vollendorf (1133), "In-Situ Stress Measurements and Fracture Mapping Resulting from Hydraulic Fracture Experiment"; Tyler and Vollendorf, "A Mined-Back Experiment to Observe Hydraulic Fractures Formed During In-Situ Stress Measurements," Petroleum Mechanical Engineering Conference, Sept. 22-25, Tulsa, Okla.

J. O. Harris, J. T. Cutchen (both 2521), and B. J. Pfaff (USAF/ASD/SMC), "Thermal/Flash Protection With PLZT Window Mosaic Devices," Survival and Flight Equipment Association Conference and Trade Exhibit, Sept. 21-26, San Antonio, Texas.

C. W. Jennings (2433), "Filament Formation on Printed Wiring Boards," Institute of Printed Circuits Fall 75 meeting, Sept. 22, Chicago.

J. L. Colp (5710), W. N. Caudle (5716), and C. L. Schuster (5733), "Penetrometer System for Measuring In Situ Properties of Marine Sediment," Ocean '75 Conference, Sept. 22-24, San Diego.

L. D. Tyler (1111) and W. C. Vollendorf (1133), "In-Situ Stress and Fracture Mapping Resulting from Hydraulic Fracture Tests in an Underground Tunnel Complex," 16th symposium on Rock Mechanics, Sept. 22-24, Minneapolis, Minn.

R. H. Croll, Jr. and C. W. Peterson (both 5645), "A Laser Velocimeter Data Acquisition, Processing and Control System"; R. A. Hill (5642), C. W. Peterson, A. J. Mulac and D. R. Smith (both 5642), "Raman-Scattering Measurements of Temperature and Density in Low-Density Supersonic Flow," Sixth International



ERDA spends a great deal of time explaining its programs to the Congress, and Hollister Cantus (second from left), as director of ERDA's Office of Congressional Relations, came here to learn about Labs activities. Bob Scott (left), ERDA/ALO, Paul Bergson, Special Ass't., and Charlie Winter (4010) accompanied Mr. Cantus.

Congress on Instrumentation in Aerospace, Sept. 22-24, Ottawa, Canada.

R. A. Graham (5131) and J. R. Asay (5167), "Piezoelectric Rate Coupling — A New Electrical to Mechanical Coupling Effect"; I. J. Fritz (5132), "Ultrasonic Investigation of the 250°K Phase Transition in BaMnF_4 ," 1975 Ultrasonic Symposium, Sept. 22-24, Los Angeles.

G. S. Snow and P. D. Wilcox (both 2521), "A Novel ZrO_2 -Pt Seal for Oxygen Sensors," 1975 Joint Fall meeting, Basic Science and Electronics Divisions, American Ceramic Society, Sept. 22-24, Indianapolis.

N. J. Magnani (5831), "Exfoliation Corrosion of the B-61"; Magnani, "Stress Corrosion Cracking of Uranium Alloys"; S. L. Pohlman (5831), "Corrosion and Electrochemical Behavior of HP-9-4-20"; Pohlman, "Galvanic and Crevice Corrosion," JOWOG 12 meeting, Sept. 22-25, LLL.

J. H. Metcalf (3313), "Reduction of Radioactive Effluent from the Weapons Testing Program"; A. L. Stanley (3313), "Environmental Monitoring System for Radioactive Effluents at the Nevada Test Site"; J. R. Wayland (5413), "Heavy Metals in Estuarine Benthic Organisms and Sediments: Data and Model"; J. R. Wayland, "Heavy Metals in Dominant Benthic Species and Sediments: Model and Comparison to Data"; F. P. Hudson (1811), "Stratospheric Pollution Studies"; B. D. Zak and P. E. McGrath (both 1811), and C. A. Trauth (5251), "Sandia Laboratories Environment and Safety Program," Third ERDA Environmental Protection Conference, Sept. 23-25, Chicago.

E. P. EerNisse (5112) and D. K. Brice (5111), "Sputtering of ErD_2 : Experiment and Theory"; R. A. Langley (5111) and R. S. Blewer (2413), "Measurement of the Stopping Cross Sections for Protons and ^4He Ions in Erbium and Erbium Oxide: A Test of Bragg's Rule," VI International Conference on Atomic Collisions in Solids, Sept. 22-26, Amsterdam, The Netherlands.

J. R. Adams and D. K. Kramer (2431), "A Study of the Oxidation of Tantalum Nitride by Ellipsometry and Auger Electron Spectroscopy"; J. R. Adams, "Complex Refractive Index and Phosphorus Concentration Profiles in P_{31} Ion Implanted Silicon by Ellipsometry and Auger Electron Spectroscopy," 3rd International Conference on Ellipsometry, Univ. of Nebraska, Sept. 23-25, Lincoln.

J. D. McClure (1542), "An Overview of Some Energy Related Structural Problems," combined Texas, N.M. and Mexico section Meeting, American Society of Civil Engineers, Sept. 25-27, El Paso.

R. P. Reed (1116), D. A. Northrop (5732), et al., "In Situ Coal Gasification Experiment"; L. D. Tyler (1111), and W. C. Vollendorf (1133), "Physical Observations and Mapping of Cracks Resulting from Hydraulic Fracturing In Situ Stress Measurements"; R. G. Hay (1731), "Detection of Hydraulic Fracture Orientation and Dimensions in Cased Wells," Society of Petroleum Engineers - AIME Annual meeting, Sept. 28, Dallas, Texas.

J. H. Biffle (1541) and H. A. Sumlin (2644), "Three-Dimensional Structural Analysis Using Interactive Graphics," Conference on Applications of Computer Graphics in Engineering, Oct. 1-2, Hampton, Va.

W. G. Perkins (2413), "He Release Characteristics of Metal Trinitides"; W. J. Kass (5834) and L. C. Beavis (2413), "He Emission from Scandium-Tritium Solid Solution as a Function of Grain Size"; R. A. Langley (5111), "Techniques for Studying Hydrogen Isotopes in Materials: Ion Backscattering and Nuclear Microanalysis," International Conference on Radiation Effects and Tritium Technology for Fusion Reactors,

Oct. 1-3, Gatlinburg, Tenn.

W. Y. Velez (5121), "On Normal, Radical Extensions of the Rationals," Math Dept. Colloquium, UNM, Oct. 2.

R. G. Dosch (5824), invited paper, "An Alternate Approach to Nuclear Waste Solidification," Biennial Joint meeting of the Rocky Mt. Chapter of the American Industrial Hygiene Assoc. and Rio Grande Chapter of the Health Physics Soc., Oct. 2-3 Albuquerque.

T. R. Guess (5847), invited paper, "Fufo-Gladd Bomb — An Analytical Study to Determine Minimum Weights of Curved Wings," Second Workshop on the Application of Metal Matrix Composites to DOD Requirements, Oct. 2-3, Washington, D.C.

P. J. Chen (5131), "Some Properties of Curved Shock Waves in Elastic Fluids," 17th Annual meeting of the Society of Natural Philosophy, Oct. 2-3, Georgia Institute of Technology, Atlanta.

S. M. Myers (5111), "Defect-Enhanced Diffusion of Zn in Al Under Heavy-Ion Irradiation"; D. K. Brice (5111), "Atomic Displacement Distributions for Light Energetic Atoms Incident on Heavy Atom Targets"; W. B. Gauster (5111), "Annealing of Dislocation Loops in Neutron-Irradiated Copper — Investigated by Positron Annihilation," International Conference on Fundamental Aspects of Radiation Damage in Metals, Oct. 5-10, Gatlinburg, Tenn.

D. A. Benson (5167), "Total Vapor Pressure Measurements Using Pulsed Electron Beam Heating," Meeting of the Electrochemical Society, Oct. 5-10, Dallas, Texas.

L. S. Nelson (5824), "Supercooling of Laser Melted Silicates: Application to the Formation of Meteorites"; and "The Combustion of Laser-Ignited Plutonium and Uranium Droplets During Free Fall Through Air," Symposium on High Temperature Processes Induced in Materials by the Absorption of Radiation, Oct. 5-10, Dallas, Texas.

P. H. Holloway (5825) and H. J. Stein (5112), "Auger Electron Spectroscopic Analysis of Silicon Nitride on Silicon," Symposium on Techniques for Surface and Thin Film Analysis, Oct. 5-10, Dallas, Texas.

C. J. Northrup (5834) and J. F. Lakner (LLL), "The Uranium-Hydrogen System," JOWOG 28 Conference, Oct. 6-10, Oak Ridge, Tenn.

J. E. Kennedy (5131) and D. R. Hardesty (8115), "Thermochemical Estimation of Explosive Energy Output," Meeting of the American Defense Preparedness Association, Oct. 7-8, LASL.

W. B. Leslie and R. W. Dietzel (both 2515), "Low Voltage Ignition Studies on a Spark Insensitive - High Temperature Resistant Explosive," and "Titanium Hydride, Potassium Perchlorate - A Spark Insensitive Pyrotechnic Materials," 1975 Annual Meeting Pyrotechnics and Explosives, Oct. 7-9, Los Alamos, N.M.

N. J. Magnani (5831), "Stress Corrosion Cracking of U-0.75 wt.%Ti and of U-1% Quint," JOWOG 22 meeting, Oct. 7-9, SLL.

D. A. Benson and R. R. Boade (both 5167), "Electron Beam and NTS Measurements of Effective Gruneisen Parameters in Carbon Composites," 5th Symposium on Nuclear Survivability of Propulsion and Ordnance Systems, Oct. 7-9, Stanford Research Institute, Menlo Park, Calif.

B. W. Marshall (5717), "On the Use of Solar Energy in a Total Energy Concept," 2nd Annual UMR-Missouri Energy Council Conference on Energy, Oct. 7-9, Rolla, Mo.

feed back

To get a response to your comments and questions about Sandia Labs, complete a Feedback form (available near bulletin boards) and return it to the Feedback administrator. The substance of questions and responses of wide interest is published in LAB NEWS.

Q. For some time now the occasion to use one's employee number has been scarce. Thus, when one is asked for this number (e.g., in signing up for Sandia courses), it has been forgotten. I know I am not unusual in this matter, having checked with several of my compatriots.

I suggest we either (1) abolish the number in favor of one's social security number or (2) begin to print the employee's number on the badge as badges get replaced for various reasons.

A. The need to use an E-number when filling out forms is now more prevalent than in the past, and this is by design rather than by accident. In 1973 Sandia decided to utilize E-numbers rather than SS numbers as an employee identifier. It takes many years to change primary identifiers in all programs and input systems at a large data processing installation such as we have at Sandia. One of the computer applications you mentioned, Sandia courses, had a change in identifier from SS number to E-number this last year. The other computer application you mentioned, Sandia badges, has not yet been converted to E-number. There are many priorities ahead of converting the security badge system from SS number to E-number. In the meantime, call 4-5678 if you happen to forget yours (the locator).

R. J. Edelman — 4200

Q. Why does the TWX service (Org. 2633) use the standard mail service? The object of a TWX message is to avoid delay. Yet the recipient will not receive the message for at least a day after receipt of the TWX. Couldn't org. 2633 deliver the message directly as soon as it is received or at least call?

A. We have two categories of TWX delivery service. Incoming TWX's, which are priority, classified, or addressed to Director and above, are delivered by a special

Survey Results

Retirees Work Pleases Most

A few issues back we mentioned the apparent success of the LAB NEWS retiree job reference service, and now we're pleased to report statistical confirmation. One hundred and fifty customers of the service were surveyed, and of the ninety who replied virtually all expressed their satisfaction. Some comments:

"The idea is a terrific one and should be promoted. Many retirees are excellent craftsmen . . ."

"Haven't had much need for the service, but should I need work done in the future I will use your service first."

"Mr. Pecha did an excellent job and maintained his original schedule."

"Found this service helpful and anticipate further use of it."

And many more similar comments.

The principal drawback cited was not finding the skill or occupation needed. Retirees get LAB NEWS, and we hope they will note this list of skills that Sandians have looked for but not found: carpenter to add a room; upholsterer; furniture mover; electrician; typewriter service; stucco-man;

messenger. A message of this category should be delivered within 4 hours after its receipt in the Com Center. This service can be provided economically because we are piggybacking on special messenger service in support of the Computer Center. This category represents about 25% of the incoming TWX's. Routine TWX's are delivered four times a day to the Mail Room or in the case of TWX's for the purchasing organization to the Building 802 computer pickup point. Masters for engineering releases are also delivered to the 802 computer pickup point. From the Mail Room, the TWX's go via the regular twice-a-day mail service. As you stated, a message of this category should have been delivered within 24 hours after its receipt in the Com Center. Approximately 100 TWX's of this type are received each day. We do not have adequate staff to provide special messenger service for this category of TWX, nor are we able to call all recipients. We do not believe most organizations require this type of service, however, if you wish to be called, please give your name to E. Garman, and we will make an effort to fill your request.

L.E. Hollingsworth — 2600

Suggestion: The motorcycle parking lot near Gate 1 is in need of repair. The soil has eroded away from the concrete strips in places, allowing them to protrude above ground level. When some cycles are parked on their side stands on these strips they are more susceptible to being blown over by the wind or knocked over by a bump from a passerby. My suggestion is that this lot as well as the lot behind medical be paved.

A. The two motorcycle parking lots will be paved, and we will try to complete the work before cold weather.

R.E. Hopper — 9700

carpet layer; plumber; arts & crafts person; concrete repairman; air conditioner setup and winterizing; sheet metal worker; cabinet maker; carpenter framer; janitor; mason; refrigerator repair; machinist; bricklayer; and live-in apt. manager.

Several women stated a need for a "Mr. Fixit," someone who could replace a washer, do a little painting and repair a sagging door.

About 45 resumés are now carried in the retiree job reference file, and we plan shortly to contact each retiree listed to update his or her resumé and to insure that they wish to continue to be listed.

A couple of survey respondents would like to be able to call LAB NEWS, state their need, and have one of the staff dig through the resumés for them. No way. We run this on our own initiative on the basis of minimum time investment and, with a limited staff, the additional work involved in providing telephone service would be difficult to justify.

The retiree job reference file may be examined in LAB NEWS office, Bldg. 832, east end. Survey returns are also available for review.

Counselor, Probationer, Friend



PAUL MATSON (2513) and probationer. Paul and his friend recently spent an afternoon in Santa Fe, visited the SCORE exhibits at Sandia, and attended a wrestling match. Vital attributes for a counselor are open-mindedness and being a good listener.

The Volunteer Probation Counselors Community Service Program has been in effect in Bernalillo County since January 1974. Coordinator Judy Glover explains that the program is based on the idea that one volunteer counselor matched to one probationer makes a good match. "The program handles first offenders and some repeat offenders," Judy says, "persons convicted of a misdemeanor. The judge can impose a sentence of up to one year in jail, but by using trained volunteers as Probation Counselors, the judge has an additional option."

Besides counseling, the court can assign some type of community service work to persons on probation. The work takes advantage of any training or skills the offender can offer.

"The important requirements for volunteer counselors," says Judy, "are patience and receptiveness. Even though we're dealing with persons convicted as adults, we see some very immature 18- 19-

and 20-year-olds. They come directly to us after being sentenced, they're angry, hostile and suspicious, and most of them are scared. Each has a particular need, and we hope that our volunteers can help them gain some self-esteem. After all, they're losers at whatever it was they tried — driving, drinking or even being a criminal."

The probationer may have been convicted for an offense associated with drinking; larceny under \$100; disorderly conduct; or shoplifting. And, according to Judy, for most the crime was an impulsive act or an error in judgement — not the premeditated act of an experienced criminal.

Judy's office trains the volunteer counselors, who attend an arraignment and trial in Magistrate Court and make a tour of the county jail. Counselors are asked to spend a minimum of four hours a month (and more if both people are agreeable) with the probationer, preferably sharing a social situation — fishing, bowling, attending sports events or pursuing whatever interests they share. "We want them to have something to talk about other than the arrest. We don't want a re-hash of the past. We're concerned with future successes," Judy says.

During their relationship, the counselor may detect a need for additional help for the offender or even for a family member. Working with Judy, the counselor has access to numerous community programs — mental health, learning disabilities, alcoholism, counseling, etc. — which may hold an answer to the problem. Counselors also encourage their "clients" to continue their education — try for the GED certificate, enroll at TV-I, or even acquire college credit.

Forty volunteers are now matched with probationers and an additional 25 are within training. One recent volunteer is Sandian Paul Matson (2513).

For the last three months, Paul has been working with a 20-year-old on probation for theft. "He has all sorts of problems," Paul says. "High school drop out, a drinking problem and, following his conviction, he lost his job. He feels he's the original 'born loser' and it's tough to shake that attitude. I'm still feeling my way with him, but it's a great feeling to know that the time I spend talking with him and listening to him may help him.

"We know that 85 percent of convicted felons have a record of at least one misdemeanor," Paul says. "If we volunteers can help break that cycle, from misdemeanor-kill

"We know that 85 percent of convicted felons have a record of at least one misdemeanor," Paul says. "If we volunteers can help break the cycle, from misdemeanor-to-felon, then it's worth it."

The program needs more counselors. Training classes are conducted monthly; the next class starts Dec. 13. If you're interested, call Judy Glover, telephone 766-4073 during office hours. • nt

Sympathy

To Russell Leahy (3283) on the death of his aunt in Wichita, Kans., Oct. 8.

To Ruth Wright (2152) on the death of her father in Pennsylvania, Sept. 23.



THE HAPPY HOOKER — Bob Sharp (9751) will exhibit about a dozen of these hooked wool rugs and wallhangings at the invitational Southwest Arts and Crafts Festival. Creating his own designs — contemporary and Indian motifs — Bob applies them to a heavy burlap, then completes the rug using a frame and a specially designed needle threaded with four-ply yarn. Doug Ballard (9351) will also join the more than 150 exhibitors. Doug will show his pen and ink with watercolor wash drawings of southwest scenes. The Festival will be held in the Agriculture Exhibit Hall on the State Fairgrounds, Nov. 7, 8 and 9. All work is for sale.



STRIDING into Bldg. 892 for briefings, ERDA's Deputy Administrator Robert Fri is accompanied by President Sparks. Mr. Fri's visit is a follow-on to the recent visit of Administrator Robert Seamans.

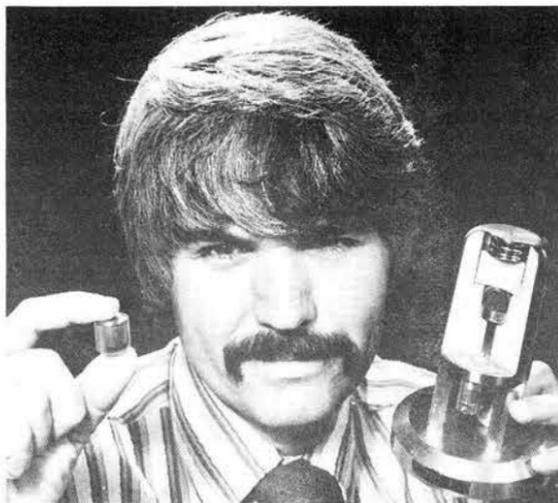
Patent Awarded For Tiny Heat Source

ERDA was recently awarded a patent for a radioisotopic heat source invented by Gary Jones (2334), J.E. Selle and P.E. Teaney (both Mound Laboratories).

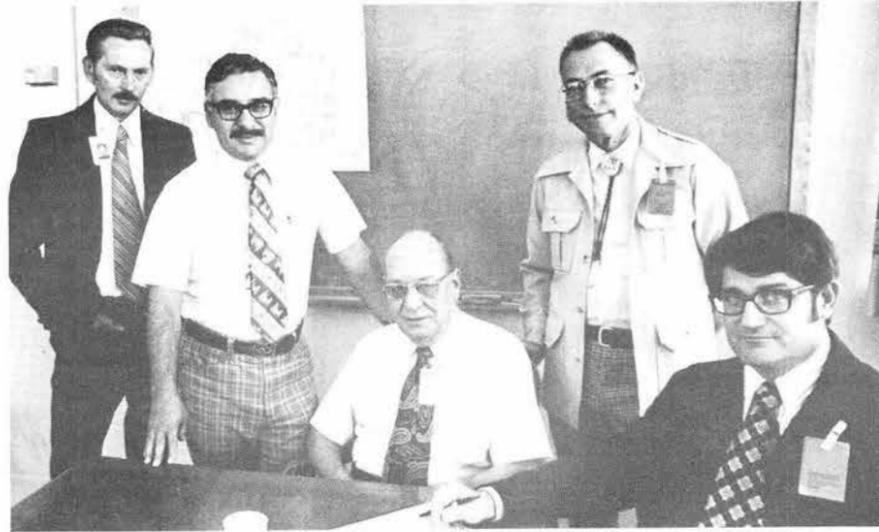
The patent covers a method allowing tantalum to be used as a container for plutonium 238 dioxide, the radioisotopic fuel. Normally, tantalum absorbs oxygen from the plutonium and becomes brittle. Addition of yttrium metal inside the fuel container and then heat-treating the capsule to 1350°C (2400°F) stabilized the plutonium and tantalum. Yttrium absorbs oxygen.

Result is a thimble-sized heat source stabilized at 500°C (932°F) which, when incorporated into a generator configuration, produces electricity — two volts, 25 milliwatts — for a minimum of 16 years.

Gary joined Sandia in March 1970 after earning a PhD in metallurgy from Iowa State.



INVENTOR Gary Jones (2334) displays his radioisotopic heat source, left, and a cutaway model of the heat source in place in a generator. The unit produces current for 16 years.



FEDERAL ENERGY ADMINISTRATION official, John Harper, right, visited Sandia recently to get a first-hand view of energy conservation methods in use at the Labs. Building maintenance, vehicle maintenance, utility systems, car pooling and mass transportation were described by a number of Sandians. Others are, from left, Bob Welt (ALO), Leo Apodaca (SAO), Bob Hopper (9700), and Jess Harris (State of NM).

Take Note

Geochemist Peter Modreski (5831) has been active on local TV. Recently he was guest speaker on the educational science program "Science Potpourri," which is aired on KNME-TV. The show was done in two half-hour segments, the first being devoted to Pete's discussion of igneous rocks, while the second concerned itself with sedimentary and metamorphic rocks. Pete also took part in a workshop for elementary school science teachers which dealt with earth science. At Sandia, Pete is currently working on the magma research program.

Friends of the Albuquerque Public Library make the claim that books have a future, and they do good things for Albuquerque's public libraries. Recently, for

example, they made cash grants to each branch library for purchase of needed equipment. One branch expended the funds in a children's summer program. FAPL is low-key in approach, so its current membership drive isn't attended by balloon launchings and telethons by Jerry Lewis, but you can support the printed word by sending \$2 for yourself, or \$5 for your family, to FAPL, 501 Copper NW, 87102.

The recycling center on KAFB has been moved from its location near the Thrift Shop to the intersection of Texas and M Sts. The center takes steel cans, aluminum cans, and clear, green, and brown bottles. These items should be segregated, each from the other, and placed in the marked containers. No newspapers, please.

Recreation Notes

FUN & GAMES

Cross Country Skiing — Is one aspect of the snow scene that strikes two primal chords: it's fun and it's cheap (relatively). Thus its popularity has grown manifold. Curt Frank (5811) is president of the Ski Touring Club this season, and he informs us that the Club is planning a dry-land ski school for beginning ski tourists late in November, which will be followed by learning sessions on the real thing. The Club sponsors outings every weekend during the season, which we'll cover in this column in future issues.

Sandia Runners — In the Tour of Albuquerque Marathon, SRA'er Henry Dodd (4751) came in 5th overall with the excellent time of 2:49. This is dramatic improvement over Henry's time from last year: 3:56. In the same event, Mark Percival (2411) was 1st in the 35-39 bracket, while Irv Hall (1223) and Joe Abbott (2112) were 1st and 2nd respectively in the 40-45 group. Jim Martin (3714) on his first 26-miler turned in an impressive 3:52.

One noteworthy incident: a marathoner in his mid-20's collapsed a few hundred yards from the finish line. He was unconscious and going into shock. Fortunately, two MD's were nearby and began immediate treatment for heat exhaustion, a serious condition characterized by high body temperature — up to 105°. The physicians stated the collapse was brought on by acute dehydration; in the fairly cool weather the runner (who recovered) hadn't been too thirsty and passed up most of the water offered during the race. The message is clear, for runners, bikers or

anyone engaged in strenuous activity: drink frequently and beyond your thirst.

Bowlers — The Sandia Labs Bowling Association will hold its 12th Annual Handicap Tournament (five-member team, singles and doubles) on Nov. 8-9 at Holiday Bowl. The team event will be bowled on Saturday and singles and doubles on Sunday. For more information, or if you need a partner, contact either Leo Bressan (9532) or Dora Montoya (1342).

Mountain Rescue — Don Mattox (5834) sends LAB NEWS the AMRC Newsletter and we generally find a couple of items in the terse summaries of rescues that bring a grin or a grimace:

"2-22-75 Search. Campers. Parents worried because of bad weather. Strike team found boys who were doing great. Indecision on part of authorities as to what to do. Finally left boys alone. 50 man hours."

"2-27/28-75 Evacuation. Plane crash in Sandias . . . Teams found both pilots dead. . . AMRC teams also looked for missing search team members (not AMRC) and assisted reporter who wasn't doing too good. 325 man hours."

AMRC has conducted more than 20 missions this year, searching for overdue hikers, evacuating injured climbers, and the like. About half its members are Sandians.

Gym Schedule — Starting Nov. 1, it's 8 to 8, Saturdays 9 to 5, and Sunday/holidays 1 to 5.

MILEPOSTS
LAB NEWS
October 1975



Glenn Fowler - 1000 30



Lillian Funk - 8433 15



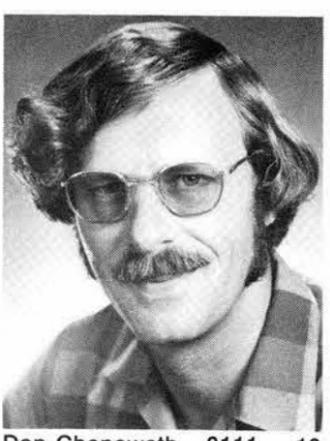
Ernest Lovato - 3645 25



Neal Humble - 9742 25



Manuel Aguilar - 3734 25



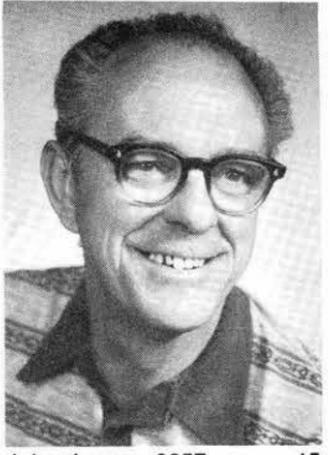
Don Chenoweth - 8111 10



Charles Allen - 9550 25



Floyd Hursh - 9633 20



John Jesse - 8257 15



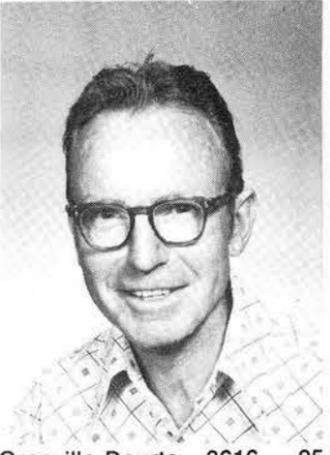
Dale Shenk - 9622 10



Henry Williams - 3644 20



Ralph Johnson - 5155 10



Granville Dourte - 3616 25



Scotty Romine - 8252 20



John Moore - 1739 10



Tony Gallegos - 9713 25

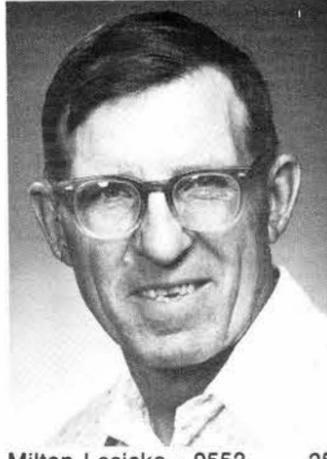


James Fisher - 2635 25



Ralph Richards - 4010

20



Milton Lesicka - 9552

25



Mel Reynolds - 3254

25



Lee Hollingsworth - 2600

25



Robert Fleming - 3617

25



Ernie Peterson - 4220

25



Art Castillo - 3251

25



Joseph Szymanski - 9553

25



John Tenbrink - 1523

25



Henry Austin - 9711

25



Melody Laffoon - 3733

10



Benjamin Cordova - 9754

25



Carl King - 9551

25



Gerald Cobb - 9412

25



Edward Stout - 9414

25



Betty Brake - 1543

20



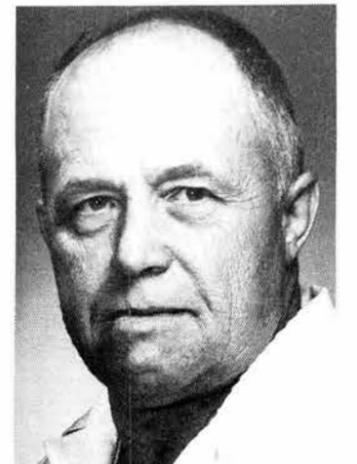
John Callahan - 3711

20



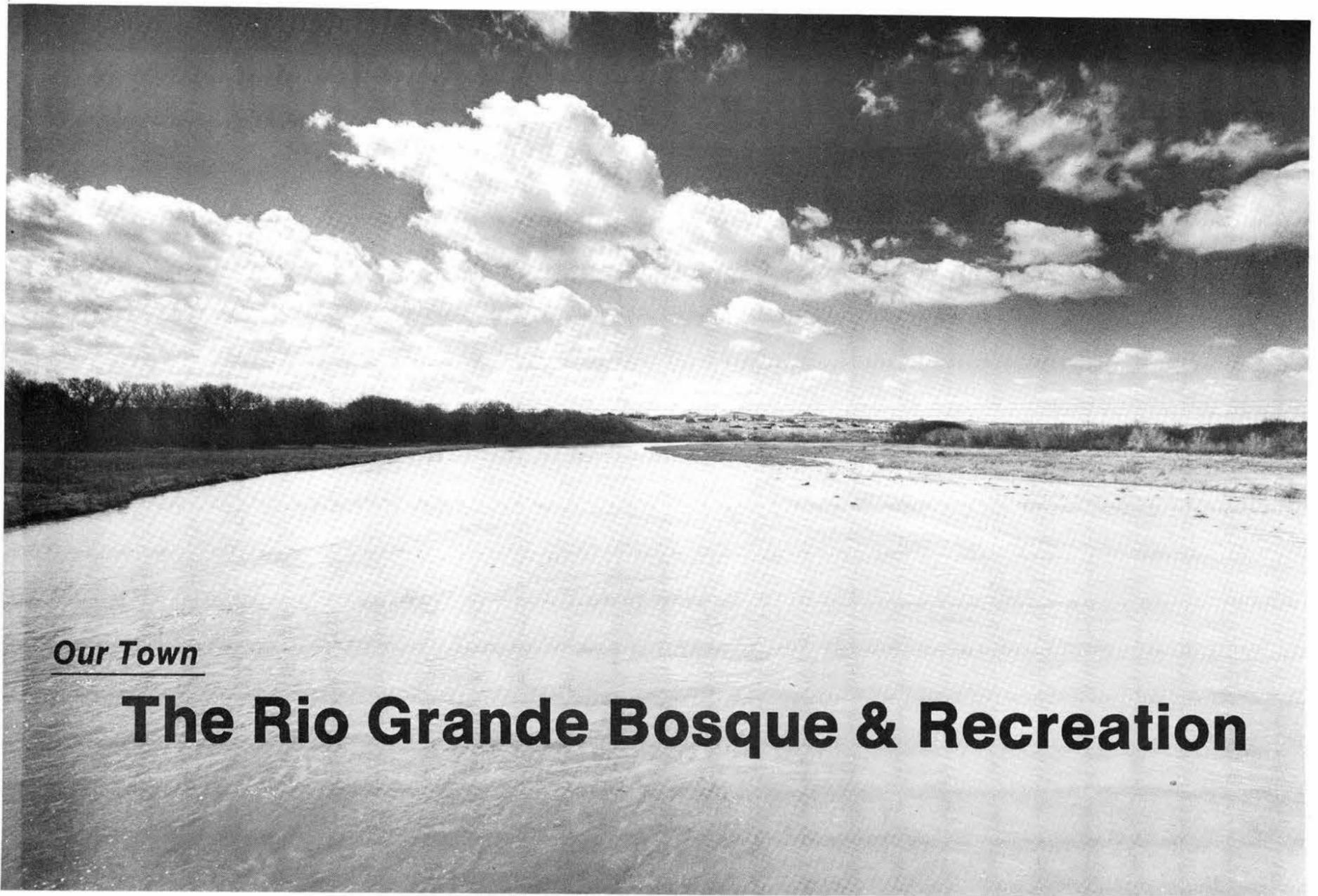
Myron Barnes - 3252

25



Leroy Henderson - 9712

25



Our Town

The Rio Grande Bosque & Recreation

Bosque (bos-kay), n. Wood, forest, grove; any woody place.

There is a comprehensive plan, prepared after more than a year of study at a cost of \$40,000, which proposes to turn the Rio Grande Bosque, from Sandia Pueblo on the north to Isleta Pueblo on the south, into a 35-mile-long green nature preserve and recreation area.

Dams with standing small lakes would provide swimming, fishing, and boating. A number of trails for hiking, horseback riding, and bicycling are planned. Several new park sites for family picnicking and outings are included.

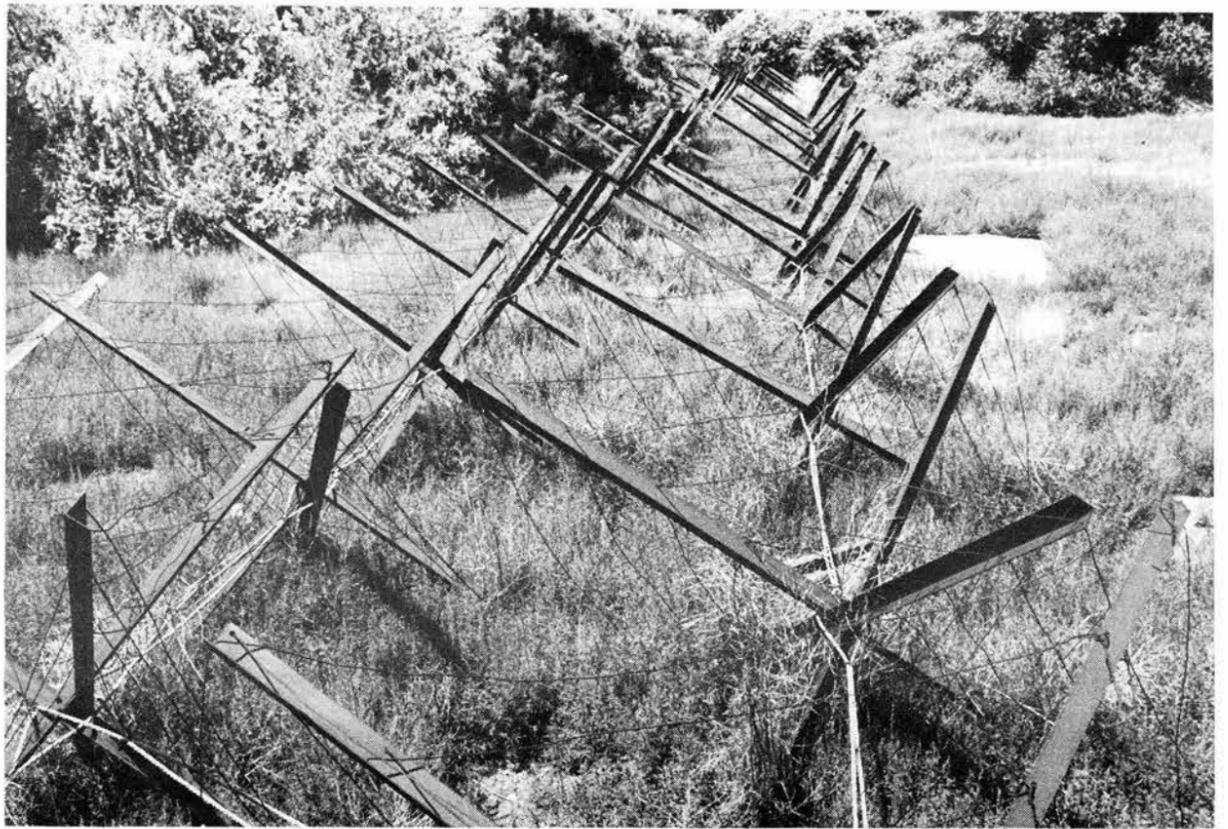
A nature study center is proposed for the "Ox Bow" site now owned by Albuquerque Public Schools and adjacent to the University of Albuquerque. The site is occasionally used for this purpose now, but it contains no facilities. The proposal would also create an amphitheatre on the river bluff on U of A property.

Access to the river for recreational use is the simple concept of the plan. Along with recreation, and possibly just as important, is the concept that the bosque would be a nature preserve — large areas would be left undisturbed except for the trails.

It is an appealing plan.

One of the frustrating things about living in Albuquerque is the fact that you can't get to the river. Irrigation and drainage ditches are formidable barriers, not to mention the miles of steel jacks, useful for flood control and about as passable as a barbed wire entanglement.

The truth is that the public, at present, is not welcomed, in fact is discouraged from visiting the river bosque within the metropolitan area. Controlled by the Middle Rio Grande Conservancy District (with a number of other governmental agencies), the river has traditionally been a resource for



STEEL JACKS along the bosque are formidable barriers to access to the river.

irrigation. Flood control and drainage are other official considerations.

The plan was initiated by the Bosque del Rio Grande Nature Preserve Society and financed by a grant from the National Endowment for the Arts. More than likely, it will be implemented in bits and pieces through the remainder of this century. The recent bond election approved three small park developments along the bosque that are part of the overall plan — a new park north of Candelaria and west of Rio Grande, a new park on the West Mesa bluff near the diversion channel, and start of development work to link San Gabriel State Park (near

Mountain Road) to Tingley Park south of Central. Access to the river, however, is not included.

In the meantime, the Bosque del Rio Grande Nature Preserve Society is whittling away at obstacles — and there are many. There are advocates for the plan in the Chamber of Commerce and in the state legislature. Opposition exists, however, among some Valley residents.

Still, the Rio Grande bosque is one of the great resources of the city. The river has nurtured life in these parts for centuries. It could have a greater and more important (and pleasurable) role in the future. • dg

Breeder Reactor Conferences

Two meetings dealing with safety aspects of liquid metal fast breeder reactors (LMFBR) will be held in Albuquerque Nov. 11-14.

Approximately 150 engineers and scientists from the United States, France, United Kingdom, Germany, Italy, Spain, and Japan have been invited to the meetings.

The first meeting, Nov. 11-12, will be on "Fast Reactor Fuel Motion Diagnostics." It is co-sponsored by the Nuclear Regulatory Commission (NRC) and the Energy Research and Development Administration (ERDA).

The second meeting, Nov. 13-14, will deal with "Post Accident Heat Removal." Sandia Laboratories is sponsoring this meeting, and serving as host for both meetings.

LMFBR is an advanced nuclear reactor cooled by a molten metal — sodium — which produces, or breeds, plutonium in the course of burning its uranium fuel. Since plutonium can also be used as reactor fuel, the breeder is counted on to reduce the need for uranium later in this century.

The meeting on fuel motion diagnostics

will deal with development of instrumentation for use in experiments to determine what would happen in the LMFBR core if an accident occurs which affects the reactor's fuel rods. Data obtained through use of such instrumentation will be used in testing computer codes being devised to model various effects of potential core disruptions.

The meeting on heat removal will discuss means of cooling the reactor core should an accident occur. Although the reactor would be shut down, the disrupted core would continue to produce heat through decay of fission products, and this heat should be dissipated to minimize safety hazards.

Jim Powell, supervisor of Radiation Physics Division 5423, is serving as local chairman of the diagnostics meeting; Richard Coats, supervisor of Reactor Studies Division 5422, is chairman of the other meeting.

Sandia is engaged in research for NRC on various safety aspects of the fast breeder. The first demonstration breeder in the U.S. is now under development at Clinch River, Tenn.

AIAA Meet Here Nov. 17-19

About 200 attendees are expected at the AIAA Aerodynamic Deceleration Systems Conference here Nov. 17-19. Dave McVey, Dean Wolf, Ted Botner (all 1332), George Stone (1331) and Bill Pepper (1332) are members of the Conference Committee.

Sandians presenting papers during the three day meet include:

Ray Rychnovsky (8158) and Roger Everett (8157), "Wind Tunnel Tests to Evaluate a Lifting Transonic Parachute"; Bill Pepper and Jim Reed (1345), "Parametric Study of Parachute Pressure Distribution by Wind Tunnel"; Dave McVey and Bill Pepper, "A Wind Tunnel Parametric Study of Ribbon Parachutes"; Wayne Sundberg (1543), "Finite Element Modeling of Parachute Deployment and Inflation."

Ray Rychnovsky, "A Lifting Parachute for Very Low Altitude/Very High Speed Deliveries"; Dean Wolf and Harold Spahr (1343), "A Parachute Cluster Dynamic Analysis."

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4. Use home telephone numbers.
5. For Sandia Laboratories and ERDA employees only.
6. No commercial ads, please.
7. Include name and organization.
8. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

TRANSPORTATION

- '64 OLDS convertible; cast iron kitchen sink; 29" x 40" casement window. Phillips, 255-0143.
- '72 PICKUP truck, 1/2-ton, 6-cyl., long wide bed w/camper shell & many extras. Newman, 256-9174.
- '73 YAMAHA 175 Enduro, \$450. Campbell, 293-3115.
- '72 YAMAHA 100-MX, \$250. Fox, 299-9031.
- '67 FORD Fairlane 500 station wagon, AT, R&H, good tires, \$550. Baker, 898-3206.
- '74 VW Super Beetle, yellow, new tires, radio, below book, \$2850. Sublett, 298-1004.
- '72 YAMAHA DT2-MX 250cc dirt bike. Snelling, 268-5895.
- '69 YAMAHA 125 Enduro w/electric start, \$195. Coalson, 298-0061.
- '73 DATSUN 240Z AM/FM, 4-spd., air, ski rack, steel belted radials, radial snow tires, below book. Lundquist, 266-0893.
- '69 CHEVY 9 passenger wagon, PS, PB, AT, AC. \$800. Arthur, 256-7359.
- '67 FORD Club wagon van, AT, 6-cyl., electronic ignition, steel belted radials, \$995. Sheives, 821-9285.
- '70 HUSKY 250cc dirt bike, \$450; '69 Yamaha 125cc Enduro, \$250. Sena, 881-2224.
- '66 DODGE, 1/2-ton, V8, 4-spd., lwb, \$400; '73 Honda 450, DOHC, 3000 miles, \$995 firm. Williams, 255-4109.

- '75 OLDS Cutlass, fully equipped, 2500 miles, consider trade-in, priced under book at \$4350. Miller, 255-1324.
- '70 CHEVY, 350 eng., 2-dr. Sport Coupe, well below book price, after 3 pm. Lewis, 299-7217.

MISCELLANEOUS

- FIREWOOD, South Hwy. 14 Village Proj., split, delivered & stacked, \$57.50/cord, \$31.25/1/2 cord, LAB NEWS, 4-1053.
- CAMPER cover, fits lwb, insulated, paneled, curtains, 36" high. Mead, 255-3403.
- WICKER twin size headboard, \$9; complete set, Melmac dinnerware, \$7. Bland, 265-6286.
- BELL bicycle helmet, 7/4, 2 extra set of sizing pads, \$20; 350-18 trials tire, \$5. Healer, 298-6967.
- SEARS space heater, 5500 btu, \$85; 3 steel windows, 3'x4'. Padilla, 877-2116 after 5:30.
- '66 INTERNATIONAL engine & trans., \$125; VW convertible top, \$100; Coleman evaporative cooler, used 1 yr., \$75. Navratil, 268-1879.
- CABIN sailboat, 17 ft., Venture, w/trailer & outboard. Bouton, 898-3562.
- DISHWASHER, Frigidaire, portable, yellow, meat block top, \$30. Datorie, 299-1868 after 5.
- DRESSER with 34" x 36" mirror; sleep or lounge couch, make offer. Fisher, 266-2266.
- PIONEER QX-8000A, 4-channel receiver, \$300. Garrison, 881-1851.
- COUCH, makes into bed, champagne beige, no rips, tears or worn spots. \$100. Iverson, 869-3123.
- FREEZER, 12 cu. ft., GE, works OK, \$100, you move it. Leisher, 281-5258.
- BARITONE horn, 3-valve, gold, Reynolds; trombone, gold, student model, Olds; automatic .380 Walther. Rose, 298-4849.

- 2-PIECE sectional, ea. section 4', gray/white, needs repair 1 spring in back & possible recover, \$30. MacGregor, 255-4389.
- HABITRAIL gerbil outfit w/food, litter & gerbils, to good home, \$30. Madden, 296-1082.
- 90" DRAPES, floor-to-ceiling, antique satin, burnt orange w/gold fringe, tassle tie back, swag & cascade valence, 1 yr. old, make offer. Pope, 293-1072.
- KITCHEN dinette set, 5 chairs & table w/leaf, \$50. Hole, 255-1444.
- 13 4-FT. wrought-iron railings, 7 posts, 5 flanges, \$60; used glass sliding patio door frame, sill & screen for 6' opening, \$35. Jercinovic, 255-8027.
- VIVITAR 11:1 power zoom Super 8 camera, \$125; GE bw portable TV, \$55; baby crib, \$5; bunk beds, \$20. Flynn, 299-4929.
- BABY crib, car seat, dlb/stroller, swing & car bed. Williams, 294-4766.
- FORMICA kitchen cabinet top, \$50; kitchen table w/4 chairs, matches cabinet top, \$50. Schamaun, 298-5192.
- WATER bed, \$50; port-a-crib, \$10; Umbroller stroller, \$10. Walsh, 268-1654.
- NEW dinette set, \$75; complete single bed, \$33; dresser, \$30; kidney table, \$5; misc. items, 4 8.00x16.5 tires, \$15. Lewin, 898-2303.
- 18 FT. flatbottom ski boat, 327 Chevy engine, V-drive single axle trailer, \$2000. Sena, 881-2224.
- SUN studio lead guitar amplifier, \$200; Alvarez elec. guitar, \$100. Neilsen, 299-0198.
- SEARS heavy duty dryer w/maintenance policy thru 1/10/76, \$125; Speed Queen washer, \$75. Hayes, 296-3909.
- 6 HEAD choice beef calves, will sell 1 or all, local delivery can be arranged if needed. Causey, 881-7534.
- S&W COMBAT masterpiece 22 cal., target, hammer trigger

- grips, holster, model 18, \$150; '71 Yamaha 90cc Enduro, \$200. Adams, 881-4351.
- SIMMONS 6 yr. baby crib, white. Reuter, 298-7320.
- COFFEE table, new, solid oak; coffee table & 2 end tables, bleached mahogany; 2 table lamps, avocado. Ricker, 296-2191.
- HOMMERLUND HQ-170 receiver, 10 hrs. use, Heathkit transmitter, etc., will talk price, after 5 pm & on week ends. Lewis, 299-7217.
- KITTEN, house broken, half Siamese, female, needs good home. Austin, 298-5352.
- QUEEN size hide-a-bed, dinette table & chairs, upholstered chair, Westinghouse elec. roaster. Redmond, 344-6813.
- '75 MCGREGOR Tourney clubs, irons 2-9 plus pw 39" shaft, woods 1, 3, 4, 43" shaft, D-3 swing weight, \$235. Collins, 294-5555.
- SEARS portable air purifier; Olympia portable typewriter; 2 blue bedroom lamps; set of Engineer's compasses; folding golf cart. Dauphinee, 821-2998.
- PUPPIES, male, half cocker half Brittany Spaniel, both parents have pedigree, \$10. Tischhauser, 293-9768.
- SKI boots & bindings, Henke, size 5-6, Large size 9 1/2-10; Cubco bindings, used 1 yr.; \$12 ea. Hawkinson, 281-5239.
- REFRIGERATOR/FREEZER, Sears Coldspot, frost-free, 16.3 cu. ft. w/ice maker, avocado, \$225; washer/dryer, Sears Lady Kenmore 800, \$200. Crumley, 299-5293.
- RED DUN mare, 11 yrs old, Western pleasure & halter, very gentle, good disposition, make offer. Sillivan, 268-3230 or 869-3188.
- SLIDING glass door assembly, 77" high, 100" wide, complete, \$55; screen, \$10; Rangaire kitchen range hood, new, \$70. Knight, 881-4831.
- ROSSIGNOL (G-SL-400) size 175's skis w/Salomon 202

- bindings, \$90; San Marco boots, size 6, \$40. Dollahon, 881-7952.

REAL ESTATE

- COCHITI Lake lot, near proposed golf course, sell at '70 price, \$4420 cash or \$2000 and take over \$47.61 payment. Stevens, 266-0314.
- HOME, 32 acre Sandia Mountain land against National Forest, permanent streams, apple orchard, hay barn, irrigation system. Maak, 281-5402.
- 3-BR/DEN, NE Heights, near schools, parks, shopping, freshly painted inside & out, newly re-roofed, fruit trees & shrubbery, \$22,900 at 4 1/2, \$77/mo. Delashmutt, 299-5813.

FOR RENT

- 2-BDR., apartment, close to Carlisle & Gibson, 3818 Crest Ave. SE, \$145/mo., Archuleta, 898-1197 or 821-5405.
- SKIING vacation? 2bdr., 2-bath, condominium at the lifts of Purgatory, sleeps 8, special rates. Carson, 292-1926.

WANTED

- SMALL size bicycle. Arnold, 898-1467 after 5:30.
- BAND saw, most any size or condition. Colp, 255-0228.
- METAL tool box for a wide bed pickup truck. Bryan, 294-0045.
- SWAP, 200mm 3.5 Vivitar auto-telephoto lens w/Universal mount for 20 or 28mm wide angle for Minoltas. Trump, 299-5162.
- USED Salomon 502, 505 or 555 ski bindings, Marker M-4 toe. Healer, 298-6967.
- IRON pipe, 3 1/2" outside diameter or 1 1/2" circumference, about 16-18 ft. long for basketball goal post. O'Bryant, 268-9049.
- BOATBUILDERS: Have snipe started, you finish, all materials and tools. Fitzmorris, 266-6785.



A BRADLEY GT body does exciting things for a VW. C-Club membership does exciting things for your social life. Elaine Hurley (3162) and GT-Man Jack Walker

(5220) discuss slight problem: how lady with skirt vaults/climbs/skampers into the GT.

JUST — ponder tonight's Happy Hour line-up: Chili Rellenos, Carne Adovada, Ricardo Montalban, Beef Tacos, Arroz Espanol, Dolores Del Rio. Most await your gustatory pleasure in just a few hours. Sol Chavez will make dancing easier (by playing music) from 7 to 10. And from 9:30 on, Denny will do things with a G-string seldom done in the lounge. (Tonight is about your last chance to see those pseudo-pslanderous pictures taken when you weren't watching during the 25th Birthday Merry-Thon last July.)

BECAUSE — the French Quarter is one of the most exciting places in the world (in the country?) (in Louisiana?) (well, in New Orleans), it's been selected as theme of November's Biggest Party. We'll watch dancers from the Mike Haley Studios who

can-can (and will-will). They'll do other dances as well and as skillfully. We'll get a chance to try our own terpsichorean talents too when the Dixie Kings take the throne. By the time they abdicate, we'll feel the excitement of French Quarter, and we'll have tasted it as well: coq au vin rouge, crab quiche Lorraine, beef burgundy, rice pilaf, and lots more. Pick up tickets by the 8th; members \$5.50, guests \$6.50; no cancellations after Thursday at 4.

YOU'RE — thinking about an intimate little office Christmas party. You want privacy, appropriate decorations, maybe a piano. Where to go? How much the toll? Call Sandi at 265-6791. She'll explain the various Christmas party packages for small groups — or for large ones, for that matter.

PARANOID — about persecution by horsemen who have no heads and toads who drive classic cars and dancers who do all the dances your head remembers but your feet don't? Be brave: fight your phobias at Family Vaudeville tomorrow night. With or without a family, you're going to like: A. Arthur Murray Staff Presents (a dance troupe demonstrating oldies-but-goodies from the ballroom); B. *Ichabod and Mr. Toad* (vintage Disney version of the Legend of Sleepy Hollow and *The Wind in the Willows*); and C. an improved food menu.

DOESN'T — baked McCahon with sour cream sound great? Natural Persuasion *au jus*? Roast Beef on the bandstand? Maybe Tom Potato in the lounge? That description of Happy Hour next Friday may be a bit mixed up, but all the essential ingredients are there. You be there too.

MEAN — and lean and keen on the slopes this year. That's a great goal, but a skier is only as good as his/her skis. Learn everything you didn't know about those strange slats before strapping them on at the Ski Repair Clinic at 7 on the 4th. It's free to Ski Club members; others may join then and there. Call Gerry Barr (4-3836) for more info.

THEY'RE — only \$1.75 apiece. They save you 75¢ each time they're used. They're discount tickets to Commonwealth Theatres (Cinema East, Hiland, Los Altos, Lobo,

Eastdale, Montgomery Plaza — a total of ten screens). A couple that sees two movies a month could save enough with the tickets to pay C-Club dues and have 50¢ left over for popcorn.

NOT — that you're a bad dancer, of course, but after watching Arthur Murray Staff Presents tomorrow night and Mike Haley's Can-Can-Doers on the 15th, you just may want to polish some old (or acquire some new) dancing skills. Sign up in November or December for a series of six dance lessons beginning in January, costing \$20, and teaching all the old and new ballroom steps.

OUT — of your car and into the bus makes going to games much less of a fuss. Tomorrow the "let's do it again, Lobos!" crowd will depart the Club at 12:45 for the UTEP game. Why fight the traffic alone when you can relax and enjoy the to-and-from trip? 50¢ for members, \$1 for guests. Happy Hour before and after.

TO — catch the Conquistador Cruise to the Caribbean at Christmas, sign up *immediately* and get all the (very few really) dollars in by the 15th. Just a few slots to fill to keep prices at their very lowest. If you're signed up already, persuade some friends to come along and make it a real party. You'll all come out ahead but not afoot if you stay abreast of Club travel packages.

GET — your reservations in, Sanadoes, lest you miss John Marshall, the funny guy in the Safeway commercials. His PR blurbs portray him as a cross between Rod McKuen and John Denver with a tinge of Emma Bombeck. Should be delightful entertainment. A no-host (or hostess) luncheon too. Reservations with Sandra Ruth by the 7th. Meeting at 1 on the 11th.

YOU — Wolfpackers starting to think baseball yet? At least one local type is. His name is Norman Ellenberger, and in addition to some other skills, he's a regaler of note — and of people attending the meeting at 7:30 on the 11th. Incidentally, non-Wolfpackers are welcome to come and hear Norm, meet his coaching staff (a stout cudgel used to enforce training rules), and explore the advantages of joining the Wolfpack World.

