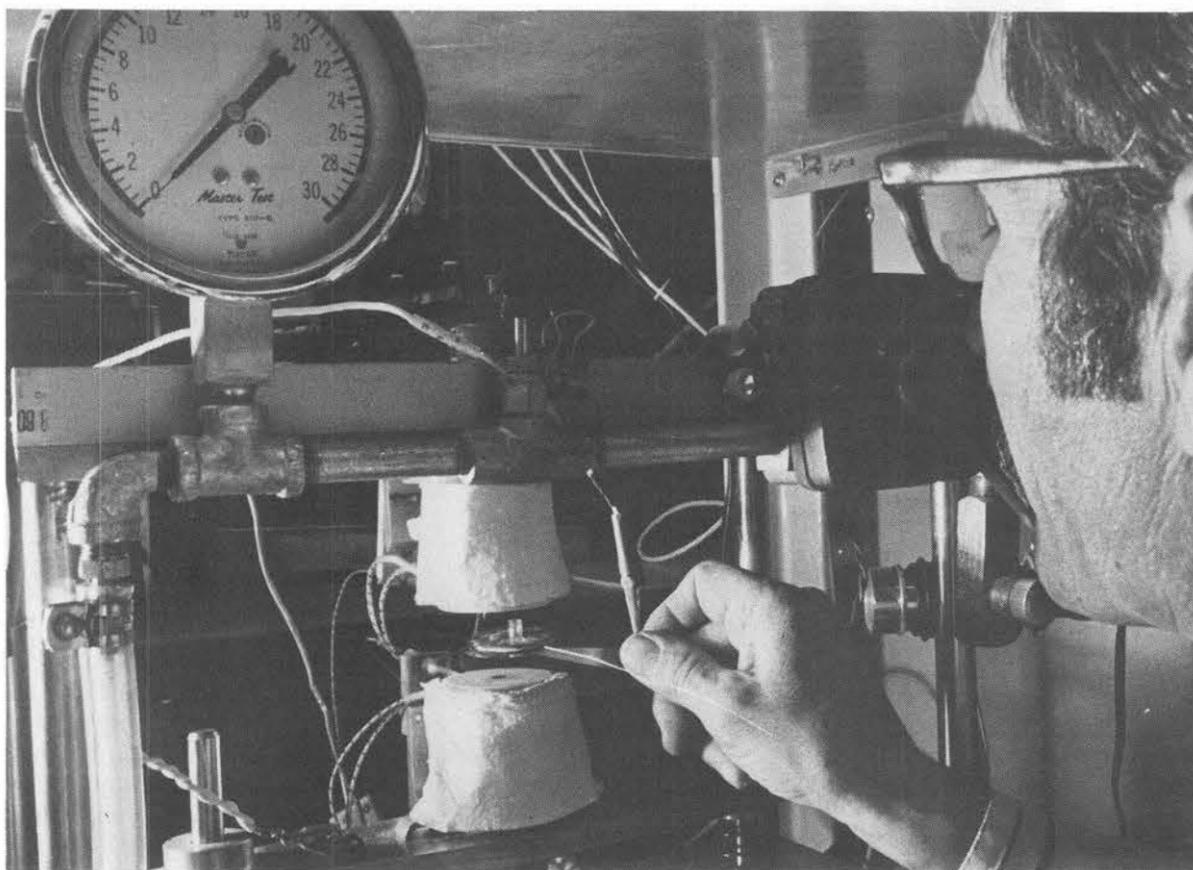


New Long-Lived Thermal Battery Is Smaller, Lighter



PART OF THE DEVELOPMENT PROCESS OF THERMAL BATTERIES involves testing a wide variety of materials and electrochemical properties. Composition, weight, anode and cathode materials are varied and single cells (like the one being inserted here by Don Bush of Exploratory Batteries division 2523) are tested on automatic testers. (See other photos on pg. 2)

LAB NEWS

VOL. 31, NO.2

JANUARY 26, 1979

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



ECP AT WORK — Alicia Snyder, R.N., demonstrates some teaching aids from this American Cancer Society health education kit. The kits, purchased out of the reserve fund of Sandia's Employee Contribution Plan, are used in kindergarten and beginning grades. Alicia is the nurse at Lavaland Elementary School and her willing helpers are first-graders Eric Hemeister and Sandra Padilla. The reserve fund disbursed almost \$3000 in 1978 to nine agencies.

Thermal batteries are key components in nuclear weapons, one-shot devices that have to work when they're needed — even if the weapon has been a long time in stockpile. Sandia has been making such batteries for years, batteries that will survive 20 to 30 years of storage and then produce 25 to 30 volts at 0.1 to 10 amps for activated lifetimes of 15 to 75 minutes.

"These batteries use our traditional calcium/calcium chromate electrochemical system," explains Rod Quinn (who heads Exploratory Batteries division 2523), "but they weigh 7.5 kilograms and occupy a volume of roughly 2000 cubic centimeters. Weapon designers are now asking for much smaller thermal batteries with the same electrical characteristics. What they want is a battery with a useful life after activation of about 60 minutes which occupies a volume no more than 400 cubic centimeters."

Eighteen months ago when the advanced development battery group began work on the small, long-lived thermal battery, they consulted several labs here and in England. Their survey indicated a lithium anode and metal sulfide cathode system held promise. Of specific interest was the work at Argonne National Laboratory where rechargeable thermal batteries using molten salt were being developed.

"We weren't interested in the rechargeable capability," Rod says, "but we were definitely impressed with the fact that their batteries experienced very few side reactions."

Argonne's most promising system uses iron disulfide as a cathode material and a lithium aluminum alloy as the anode. Sandia's first development batteries were made using magnesium in place of the lithium alloy because magnesium is easier and safer to handle and its performance characteristics were well known.

"Building on early work by Don Bush and others in 2523," Rod told us, "we organized a development project group. Arlen Baldwin and Rudy Armijo have since built and tested about 50 lithium alloy/iron disulfide batteries, and the overall results have been very encouraging. We sacrifice about 0.5 volts per cell relative to the calcium/calcium chromate system, but there's no appreciable polarization nor any apparent side reactions. The new batteries are much simpler in design and highly reproducible. Typically, they operate at open circuit for 50 or more minutes."

We asked Rod the difference between batteries like those used in cars and thermal batteries. The principal difference, he explained, is in the electrolyte. A car battery is "wet". It has a liquid electrolyte. In storage (or overnight in mid-winter when your car is outside) it tends to lose its charge. A thermal battery, on the other hand, has a solid anode, a solid cathode and a solid electrolyte. It loses virtually no capacity during storage.

When electrical energy is needed, the thermal battery is activated by firing an electrical match to ignite a pyrotechnic train. This raises the internal temperature to 550°C which melts the electrolyte almost instantly. Electrochemical reactions take place milliseconds after the electrolyte melts and the battery goes to full power in no more than two seconds. A thermal battery ceases to operate when the electrolyte turns back to a solid or the electrochemical reaction is exhausted.

(Continued on Page Two)



ROD QUINN (WHO HEADS EXPLORATORY BATTERIES DIVISION 2523) and Arlen Baldwin (right) watch Don Bush (also of 2523) as he places a single cell of an experimental thermal battery into an automatic tester. Tests measure electrochemical effectiveness of various anode/cathode/electrolyte combinations at variety of heats. Division is working on small, light, long-lived thermal batteries.

Continued from Page One

New Long-Lived Thermal Battery

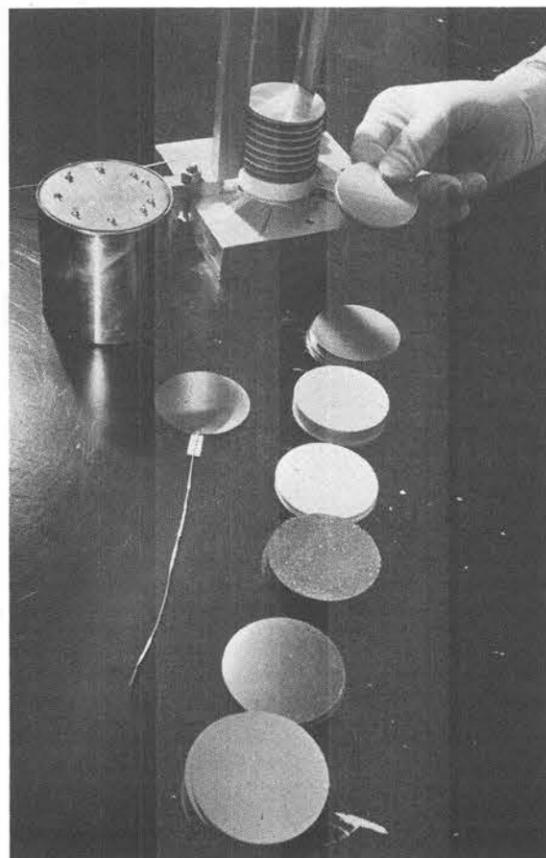
The electrolyte doesn't solidify until the temperature drops to 352°C. One of the principal advantages of the lithium alloy/iron disulfide system (in terms of useful life) is that it operates at temperatures within 25°C of the electrolyte's freezing point (377°C). Calcium/calcium chromate technology has a useable minimum temperature of 475°C.

"There's a lot of work to be done on the new batteries," Rod sums up, "but I think we could comfortably commit ourselves to a weapon program with a three- or four-year delivery date. We need that much time for development — to run our accelerated environmental and aging tests, to study the basic electrochemical processes involved."

Schedule for the lithium alloy/iron disulfide thermal battery is (by the end of FY79) to demonstrate a 28-volt, 0.5 amp, 400 cubic centimeter battery that will last a minimum of 60 minutes. By FY81, the group feels they can exceed the original objectives and by FY82 be capable of producing a 30

volt, 15 amp thermal battery with an activated life in excess of 10 minutes. The job is a difficult technical challenge.

In addition to applications on stockpile weapons, long-lived thermal batteries would also be useful in the JTA (Joint Test Assembly) programs to replace the silver-zinc wet batteries currently used. "These silver-zinc batteries have a limited shelf line," Rod explains, "and they're very expensive. The new thermal batteries could overcome both these problems."



THERMAL BATTERIES ARE MADE UP OF A SERIES OF CELLS, the number depending on the voltage. Experimental cells are composed of solid anode, a solid electrolyte, a solid cathode, with a separator between each of the three elements. Stacks of cells are assembled in a jig and then packaged in metal cylinders like one at upper left.

Take Note

Gene Ives (4330) has the title role in the upcoming Classic Theatre production of Shakespeare's "Othello." Director is John Gardner (3140). The play runs Feb. 1-2-3 at Popejoy Hall with the curtain rising at 8:15 p.m. On Sunday, Feb. 4, a matinee will be presented at 2:15.

The production will follow closely the first presentation of the play in a London banquet hall in 1604, according to John. The set will resemble a hall, musicians will play archaic instruments and torches and candles will be used.

Gene will switch characters — from the good guy to the villain — in another production of Othello in May. The Albuquerque Opera Guild will present Verdi's "Othello," and Gene portrays Iago in this rendering.

* * *

Alumni of Menaul School are sponsoring a benefit concert and dance at the Shalako Inn Sunday, Feb. 4, starting at 3 p.m. Singer Mike Ning will present the concert; the Spinning Wheel will play for dancing. Donations are \$4. For tickets or more information, call Betty Gronewald (1765), 4-7644.

* * *

A program for gifted students at Manzano High is being developed by Mel Bernstein of the school's Special Education Department. Students in the program will work on advanced projects in addition to their regular school requirements. To qualify, participants are tested and certified that they meet "gifted" criteria, e.g., they must be in the top 3 percent academically. Mr. Bernstein is seeking volunteers to serve as mentors who could advise program participants on their special projects and on any problems which may arise in the course of their work. He estimates that volunteers would probably spend about one hour a week with the students. Especially needed at present are advisors in the fields of lasers, chemistry, computers, mathematics, art and architecture, as well as other scientific disciplines. If you are interested in serving as an advisor for this program, call Mel Bernstein at 292-0090, ext. 227.

* * *

If you go for books, UNM's Benefit Book Sale is held today, Jan. 26, from 1 to 5 p.m. and tomorrow, Jan. 27, from 9:30 to 4:30. All kinds of books — technical, historical, old & rare, etc. — are put on the block and the prices are set to move 'em out. The sale is held at the Zimmerman Library.

* * *

Beginning in January, most employees will notice a slight decrease in federal income tax withholding because of the Revenue Act of 1978, which President Carter signed into law November 6, 1978.

Tax cuts will be accomplished by raising personal exemptions from \$750 to \$1,000 and increasing the standard deduction from \$2,200 to \$2,300 for single taxpayers and from \$3,200 to \$3,400 for marrieds filing jointly.

However, also effective January 1, the rate of Social Security (Federal Insurance Corporation Act, or FICA) tax was increased from 6.05 percent to 6.13 percent. Furthermore, during 1979, the maximum taxable wage base for FICA payments will increase from \$17,700 to \$22,900. The result for employees who earn more than \$22,900 will be an increase in FICA payments amounting to \$332.92.

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Weapon Valve Actuator Features Improved Safety

Development of a pyrotechnic valve actuator, the MC2949A, which is insensitive to electrostatic sparks generated by the human body, is complete. First use of the new component, developed by Initiating and Pyrotechnic Components Division 2515 under Ed Kjelgaard, will be in the W79, scheduled for production next year. Several other weapon systems are also scheduled to use the valve actuator.

In addition to improved safety during manufacture and assembly, the new component offers advantages in size (volume is less than that of a half-inch cube), performance in extreme environments (from -67°C to 120°C and ability to withstand loads up to 10,000 G's), plus additional safety (in case of fire, the component will not ignite below 500°C, well after the remainder of the system has burned or melted).

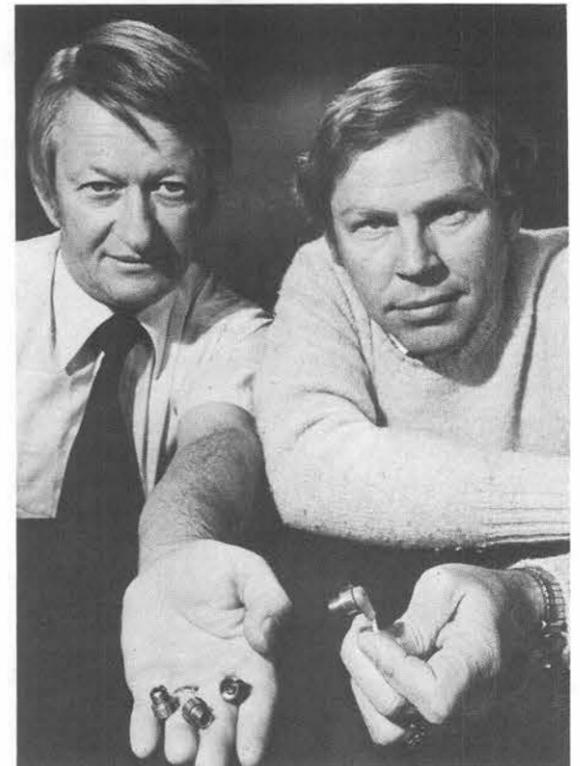
"A prime element in achieving spark insensitivity of the MC2949A, without sacrificing ignition reliability, is a new pyrotechnic material developed in Dept. 2510," Ed says. "The material — a titanium sub hydride/potassium perchlorate — and the way it is packed around the bridgewire gives us the desired characteristics. It is insensitive to electrostatic discharge in both its bulk and

compacted state. In addition, an independent electrostatic safety feature is provided by a shielded chargeholder, electrically connected to the center pin, with a breakdown path provided at the closure disc — outside the powder cavity. More than 2500 units have been tested for safety without a failure. This gives us a reliability statement of 99.9 at 90 percent confidence."

Design engineer Rex Steele (2515) achieved the small size of the new component, essentially by making it a ring connector. It consists of a center pin and two concentric rings, each connected to a pin which provides a dual bridgewire with a common ground return. Since the contacts are cylindrical, no keyways for orientation are required when connecting.

In the original design, an alumina ceramic was used as a header to position the pins. Substitution of a glass ceramic developed by Bob Eagan and Cliff Ballard of division 5845 has cut cost of the component by half — from about \$100 to \$50. (The glass ceramic is much less complex to process and manufacture.)

"In planned production of 60,000 units, this represents savings of \$3 million," Ed says.



SAMPLES of a new valve actuator, the MC2949A, are displayed by Rex Steele and Ed Kjelgaard (both 2515). The component is insensitive to electrostatic sparks generated by the human body.

feed *lib*back

Q. The parking situation in the lots bounded by Gate 6 on the west, Gate 7 on the south and Building 887 on the east is appalling and shows no sign of improving. What gives?

A. Currently there are sufficient paved parking spaces available for all Sandia drivers. Unfortunately, they are not in the right places. There are not enough paved places on the north and east sides of the Area. There is a contract out-to-bid now to pave the two parking lots east of Building 814 and east of Building 860. Of course, this won't add any additional spaces.

Over the short term, as a partial solution, we have graveled a lot under the water tower east of the Motor Pool. Parking bumpers will also be installed soon.

Over the longer term, we expect the pressure on the north and east sides to ease when about 350 people move into the new Safeguards Lab on the south side of the Tech Area. This occupancy should be complete by March 1980. We also have a Systems R&D Lab Building under design for which we expect construction funding in FY 1980. If funded, this building will be occupied in the summer of 1982. It will accommodate about 400-500 people and be located adjacent to the Safeguards Lab.

When the new buildings are occupied we expect to dispose of many of our temporary buildings and mobile office trailers on the north and east sides. This means that our long term parking requirements are on the south — not the east.

R.W. Hunnicutt — 3600

Q. Why don't we save time, energy and money by paving Eubank south to Areas 3 & 5?

A. We have given consideration to paving Eubank south from the Eubank Gate to Area III. We have not proceeded with this project because it would be so expensive. As you probably know, this road crosses Tijeras and Coyote Arroyos. Even a minimum 2-lane road with no bridges or box culverts and generally following existing surfaces would cost several hundred thousand dollars. If we assume 200 cars saved 4 miles per day and averaged 10 miles per gallon the savings would be 20,800 gallons of gasoline per year. At one dollar per gallon the annual cost savings would be \$20,800 and it would take over 25 years to pay off. In addition, the heavy equipment which would be used to construct the road would probably use the equivalent of a year's fuel in the construction process.

An all-weather road with bridges and proper grades would cost several million dollars and would never pay off.

R.W. Hunnicutt — 3600

Q. (from SLL) Why is it necessary to have crowded, unventilated, unlighted (by nature, i.e. windows) spaces for project groups? There is so much building area filled with partially attended labs even in buildings like 912. Couldn't the labs be moved to these less desirable areas?

A. We're sorry about the crowded conditions, but we are faced with this situation for about another year and one-half. At that time a new office building will have been completed, and we will start occupancy of the Combustion Research Facility.

This will not entirely solve our space problems but will provide some relief. We also are hopeful of getting approval and funding in the FY82 budget to construct a new laboratory building. This addition would help considerably in meeting our growing needs.

A.N. Blackwell — 8200

Q. Sandia has been giving Mark Cross pens sets as anniversary gifts, and many people are buying them for personal use. They are the only pen I have found efficient enough for shorthand. The refills for the pens are a little more expensive than the ones carried in Stores, but last almost a year. Would it be possible to stock them in the Stockrooms?

A. Thanks for your suggestion. This item S/N 691 587, refill, fine point, black, should be available in Stores after Feb. 1.

J.C. Strassel — 3700

Q. Can something be done about the 802 stockroom? Many items are obsolete and the stock is scrambled, especially connectors, nuts/bolts and resistors.

A. Sorry you've had problems in the 802 Self-Service Supply Store. We've recently conducted an evaluation of the stores and now contemplate a modern "Customer Service Store" — a consolidated facility that will correct the problems you mentioned, as well as others. A more effective and efficient store is our objective, and the project has high priority within Purchasing.

In the meantime, we regret the inconvenience you've experienced during this period of transition.

J.C. Strassel — 3700

Group Seeks Bio-Engineering Solutions

An organization unique among technical societies exists in our town. It's called the Medical Aids Research Foundation (MARF). Organized by members of ASME, the group now consists of engineers from mechanical and other disciplines — EE, materials, manufacturing — and medical doctors; all share an interest in bio-engineering.

The physicians, especially orthopedists, are continually confronted with mechanical problems in treating their patients, and in some cases MARF has been able to help. Leon Wilson (5524) explains: "Our philosophy is to help the person who needs help right now. The doctor or physical therapist tells us, 'Here's what I'm trying to do with this patient. Can you help?' We take it from there as an engineering problem. We evaluate, design and build. And sometimes we're successful!"

Some of the successes are simple modifications of existing equipment, and some are complex solutions to complex problems. The list of work completed is impressive.

A woman whose hands were badly crippled by arthritis couldn't open the door of her mobile home. MARF engineers designed and installed a handle which she could grasp and operate.

Leon and Fred Hansen (5623) developed a walker for a nine-year-old victim of cerebral palsy. The child's original walker supported her body by her armpits. This was painful and caused her head to fall forward. The new walker supports her weight on her forearms with a cuff arrangement and is adjustable to grow with her.

Tony Veneruso (4736) helped solve a very special problem. A quadriplegic patient with no voice box could not communicate, even with the WE Sonavox (a device held against the throat which provides sound while the patient enunciates) because he lacked the strength to exert enough pressure to activate the box. Tony solved the problem by using two Sonavoxes, installing one on the arm of his wheelchair to act as a master switch to activate the one held against his throat. When he was finally able to speak he said to Tony "It's like being released from prison."

Bob Alvis (4722) and Leon recently completed an automatic commode seat for wheelchair patients which raises and lowers with a piston-driven arrangement. It has been installed at Bataan Hospital for evaluation, and the patent will eventually be assigned to MARF.

Much MARF work helps children in the special education classes at Mark Twain School. Currently, the group is looking at a letter and number board that could be operated much like a typewriter while being monitored by the teacher at her desk. The board would serve as a teaching device and also could be used to promote manual dexterity.

"We've never solicited funds," Leon says. "Our expenses are met out of our pockets and by an occasional contribution, and the work is done by volunteers, usually in home workshops. Some projects have resulted in patents that members have signed over to MARF, and perhaps someday these will provide an income."

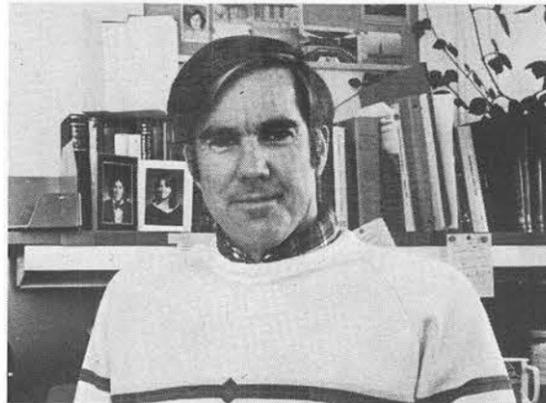
Other Sandians, members of MARF, include Tom Lane (5520), Ralph Wilson (1470), Geoff Myers (5815), Ken Butler (1481), and Tony Parisi (retired).

LIVERMORE NEWS

VOL. 31, NO. 2

LIVERMORE LABORATORIES

JANUARY 26, 1979



AL BAKER (8450A) is now in Germany.

Now in Germany

Baker In For Selvage

Al Baker (8450A) is spending a year in Germany helping to manage the International Energy Agency's SSPS (Small Solar Power Systems) program. The program goal is to build two 500-kWe solar-powered generating plants, one a central receiver system (like Barstow), the other a distributed collector system (like the mid-temperature one at Albuquerque).

Al pointed out that he's not really replacing Cliff Selvage (8470), who recently returned from a year as DOE's technical representative on the same program (LAB NEWS, Jan. 6, 1978): "Cliff handled the difficult formulation stage. My scope is somewhat narrower — get the now more-or-less well-defined systems into construction." Eventually the two systems will provide working data useful to solar engineers and others in the IEA. Almeria, near the Mediterranean coast of Spain, is the tentative site for the two systems.

Al left the States early this month with wife Nancy and 10-year-old daughters Deborah and Kendall. Though Al's office is in the Cologne headquarters of DFVLR (the NASA of Germany and the group managing the SSPS program), the family lives in Bonn so that the twins can attend an American school. "I read German," said Al, "but I don't speak it. By the time we return, I hope all of us will be comfortable, if not fluent, in German."

Piston Cylinder"; Jim Miller (8354) and Bob Kee (8331), "Results from Computational Models of Laminar Diffusion Flames"; Steve Margolis (8331), "Nonlinear Asymptotic Analysis of a Steady, Nonadiabatic Premixed Laminar Flame"; and Harry Dwyer (8352) and Billy Sanders (8354), "A Numerical Approach to the Calculation of Asymptotic Regions in Fluid Mechanics," 31st meeting of Division of Fluid Dynamics, American Physical Society, Nov. 19-21, Los Angeles, CA.

Speakers

Ed Cull (8452), "Solar Receivers," Invited Graduate Seminar, Department of Mechanical Engineering, UC/Berkeley, Nov. 7.

Len Hiles (8452), "Solar Central Receiver Systems," AIAA Meeting, Sept. 19, Sacramento, CA.

David Stephenson (8353), "Theoretical Fitting of Computer Processed Laser Raman Spectra from Methane and Propane Air Flames," annual meeting, Optical Society of America, Oct. 30-Nov. 3, San Francisco, CA.

Mike Baskes and Bill Wilson (both 8341) and Chuck Bisson (8325), "Calculation of the Trapping and Migration of Vacancies and Nickel Self-Interstitials in the Presence of Rare Gases and Dislocations," DOE Workshop on Solute Segregation and Phase Stability During Irradiation, Nov. 1-3, Gatlinburg, TE.

Ken Wilson (8347), "Hydrogen Trapping Studies in Fusion First Wall Materials," Fifth Conference on Applications of Small Accelerators, North Texas State University, Nov. 6-8, Denton, TX.

Chuck Hartwig (8342), "Raman Spectra of Cesium Alumino Silicates Wastes," annual meeting, Materials Research Society, Nov. 29-Dec. 1, Boston, MA.

Carl Hiller (8453), "The Chemical Heat Pump/Chemical Energy Storage System for Solar Heating and Cooling," Energy Storage Technology Workshop, Nov. 7-8, Dublin, CA.

Jim Bartel (8313), F.P. Gerstle, Jr. (5844) and R.B. Pettit (5842), "Principal Materials Problems in Solar Dispersed Power and Central Receiver Systems," 1978 American Society for Metals Materials and Processing Congress, Nov. 7-9, Philadelphia, PA.

Bill Ashurst (8354), "Vortex Simulation of a Model Combustor" and "Vortex Simulation of a Four-Stroke



SANDIA'S FIRST VAN POOL heads home to Manteca. Shown here are (l. to r.) Jim Alvarez (8257), Cal Feemster (8315), Dan Hardin (8463), Stan Serpa (8256), driver-coordinator Keith Burris (8166) and Ben Turpin (8423). The pool has a total of 11 members, leaving a space for four more riders. Contact Keith for more information.

New Steel for Coal Gasifiers Developed at Livermore

With the uncertain supply of domestic and foreign natural gas and the large proven reserves of coal in the US, conversion of coal into gas has obvious economic and political advantages. But before coal gasification can proceed on a large scale, some major technical advances must be made.

One of these is to develop structural materials — particularly steel — that can survive for long times inside a coal gasifier. Bob Bradshaw of Materials Development Division I 8312 and Ron Stoltz of Materials Science Division 8316 have made some significant strides in doing just that.

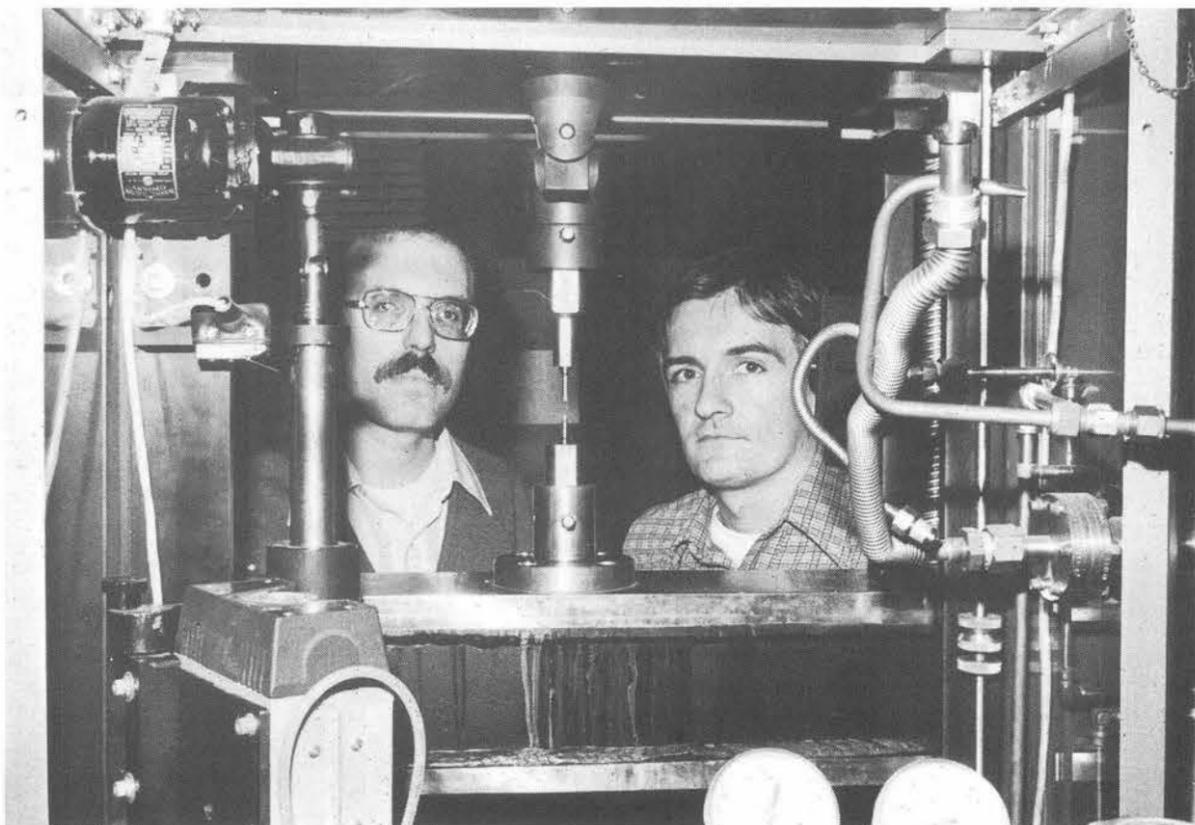
Turning coal into gas means burning a fraction of it inside a large (perhaps 300-foot high) reactor. The burning coal is mixed with either oxygen (if the result is to be a gas similar to natural gas) or air (if the result is to be a lower-BTU gas useful in some industrial applications). Proper conditions for the mixing and burning are assured by a mass of internal hardware, all of it usually made of steel.

And there's the problem. Inside the reactor, due to the sulfur from the coal and the hydrogen introduced during the gasification process, hydrogen sulfide is produced. The hydrogen sulfide rapidly penetrates the chromium oxide surface layer that normally protects the steel from corrosion. It then reacts with the steel itself and either greatly weakens it or, in the extreme, completely transforms the steel to liquid corrosion product.

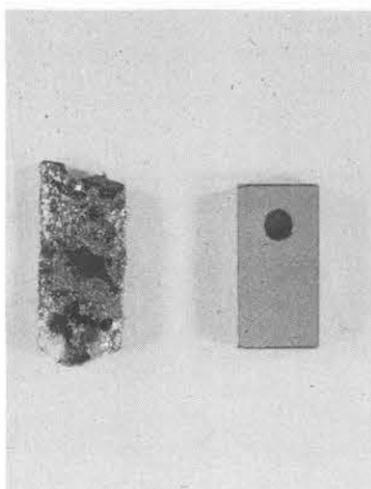
The new steel contains a small amount of titanium (three percent by weight) in addition to the iron, nickel, and chromium of standard stainless steels. But that small fraction of titanium, mixed with the chromium, produces a smooth gray protective layer of chromium and titanium oxides that, remarkably, is nearly impervious to hydrogen sulfide.

Extensive tests of the new steel indicate that titanium doesn't affect its fabricability (you can make the same things out of it in the same way as the standard stainless steels) or its weldability (you can weld it, and the welded seam is also resistant to attack). The only negative trade-off is a loss in ductility at intermediate temperatures (1500° F).

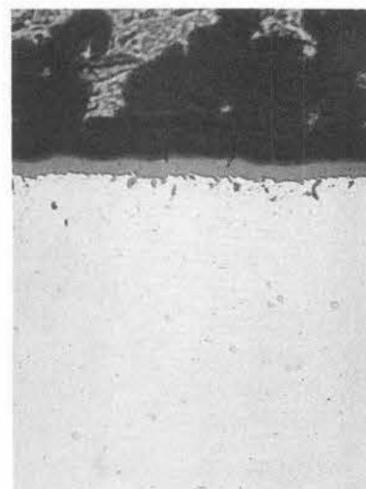
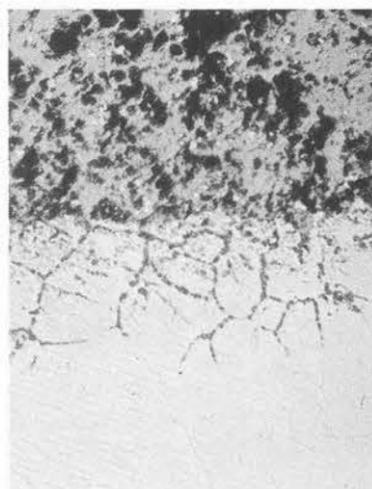
The new steel is the result of close cooperation between Ron, a metallurgist, and Bob, a chemical engineer. Ron determined the optimum alloy chemistry and measured the new steel's fabricability and mechanical properties. Bob designed the high temperature corrosion tests that took place in the high pressure test cell (LAB NEWS, May 20, 1977),



THE INSTRON tensile test machine framing Ron Stoltz and Bob Bradshaw was used to check the tensile strength of a new steel that shows promise of longevity inside a coal gasifier.



TITANIUM HELPS — Both stainless steel samples were exposed to the same corrosive environment. But the one on the right contains a small amount of titanium, enough to prevent the metal failure exhibited by the left one.



OLD VS. NEW — Cross-section views (at 500X) of two alloys exposed to the same corrosive atmosphere dramatize the effect of titanium addition. The traditional stainless steel (310 alloy) is not protected by its chromium oxide layer (along top, and hydrogen sulfide has eaten into the steel along its grain boundaries). New steel with titanium (right) is protected by its narrow layer of chromium-titanium oxides.

and he evaluated the new steel's corrosion resistance. Exploratory development work, now completed, was performed for DOE's

Office of Fossil Energy. The next step is to check the steel's performance in prototype gasifiers.

Retiring



John Pearce (8420)



Ray Hanson (8423)



Chuck Shinneman (8413)



Orval Wallen (8412)



DICK SCHWOEBEL (5110) & JIM MITCHELL (3161, below) recently were presented with these plaques recognizing their contribution to the successful transatlantic flight of the Double Eagle balloon. Dick was technical director while Jim served as press officer. Flight took place last August, landed crew in Miserey, France.

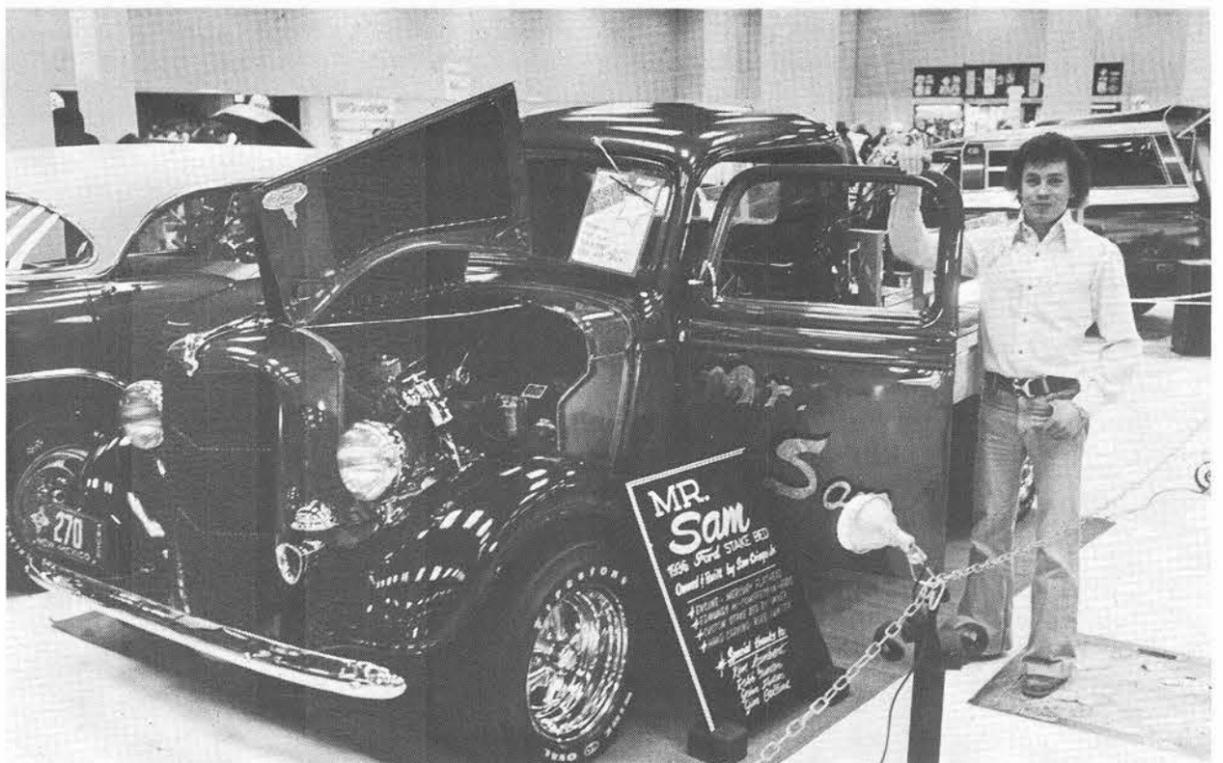


A GENERAL PEERS, while Andy Lieber (5610) and President Sparks look on. General Haig, commander of NATO forces, spent an afternoon at the Labs where he attended briefings on weapon safety, security and survivability. Here he watches demonstration involving explosives.

Sandia PEOPLE Report



PAINTER Cliff Pecha, who retired in 1973, is one of 53 retiree craftsmen who offer their services to Sandians through the Retiree Job Reference Service maintained by the LAB NEWS. To use the service, drop by our office in Bldg. 814.



FIRST PLACE in a recent custom car competition at the Civic Auditorium was awarded to Sam Griego (1485), who has a habit of winning prizes. Six years ago Sam found the chassis and rusted cab of this '36 stake bed pickup truck. He scrounged parts here and there and completely rebuilt it — including a hand-carved rear panel and the wooden pickup bed. Engine is a full bore Merc flathead. Paint is numerous coats of candy apple red with brown fenders and trim. Sam also had two other vehicles in the show — a '56 Chevy pickup with a glass bed and an immaculate '63 Bentley. Two years ago Sam took first place in the same competition with his custom van.

Albuquerquean Meets Alburquerquean

Last fall, Nick De Lollis (5813) spent several weeks in Spain and made a point of visiting a certain town named Alburquerque. In fact, he even called upon the *alcalde* (mayor) to present to him some mementoes of the Double Eagle balloon flight.

Spanish Alburquerque is relatively small (about 7100 people) and, in its setting, resembles our Albuquerque — situated on a high plain and experiencing little rain. An agricultural community, it is largely dependent upon its olive trees. A truly striking castle dominates the town.

Nick smilingly noted that Alburquerque has its version of a Chamber of Commerce. Here's a sample from one of their handouts which, as near as we can tell, discusses what a great place it is for tourists.

"Pasado y future se conjugan aqui y de tal simbiois puede y debe un Alburquerque que ofrezca al vistante las maravillas de su patrimonio y, a su vez, se abra paso a las nuevas formas de vida moderna. Existen ambiciosos proyectos para abrinros de cara al turismo y a la vez, mejorar el nivel de vida de sus habitantes."

If you want to visit the other Albuquerque, it's in western Spain and almost on the border with Portugal. Nick says the mayor is well prepared for Albuquerque visitors — he has a large file in his office documenting a steady procession of visitors from here.



CASTLE IN SPAIN — More precisely, in Alburquerque, Spain, which Nick De Lollis (5813) made a point of visiting with his wife while on a European trip. Nick stopped by the mayor's office to present him with a memento of the Double Eagle flight. The other Albuquerque, located near the Portugal border, is a small (7,100 people) city in the olive tree belt.



Fit is Better

You Can Practice Health . . . or the Alternative

(Ed. Note: Don Hamilton, administrator at Albuquerque's Presbyterian Hospital, prepared this article, which first appeared in the *Presbyterian Hospital Bulletin*. Its message is particularly appropriate with the advent of the new year.)

Last year, Americans spent over 120 billion dollars on health care. We also smoked nearly 600 billion cigarettes — and smokers forfeited up to five minutes of life with every cigarette. We supported over 7000 hospitals with more than 1.5 million beds. And our

national sweet tooth left us with some two billion pounds of excess blubber. Deaths related to this excess subtracted seven years from the average national life span.

We graduated over 15,000 new doctors.

We also drank 50 billion bottles of beer and over 800 million gallons of wine and alcohol — and paid the price in human life again. Almost two-thirds of all murders and nearly one-third of all suicides involve alcohol abuse, as does roughly half of all fire deaths, fatal car accidents and drownings.

In sum, we have chosen a lifestyle that sacrifices health. And then we try to buy health back. Unfortunately, as we are discovering, health is not always for sale. Today's physicians, of course, do perform remarkable feats. But, as the medical economist Victor Fuchs wrote in *Who Shall Live?*, "At present, there is little that medical care can do for a lung that has been overinflated by smoking or for a liver that has been scarred by too much alcohol."

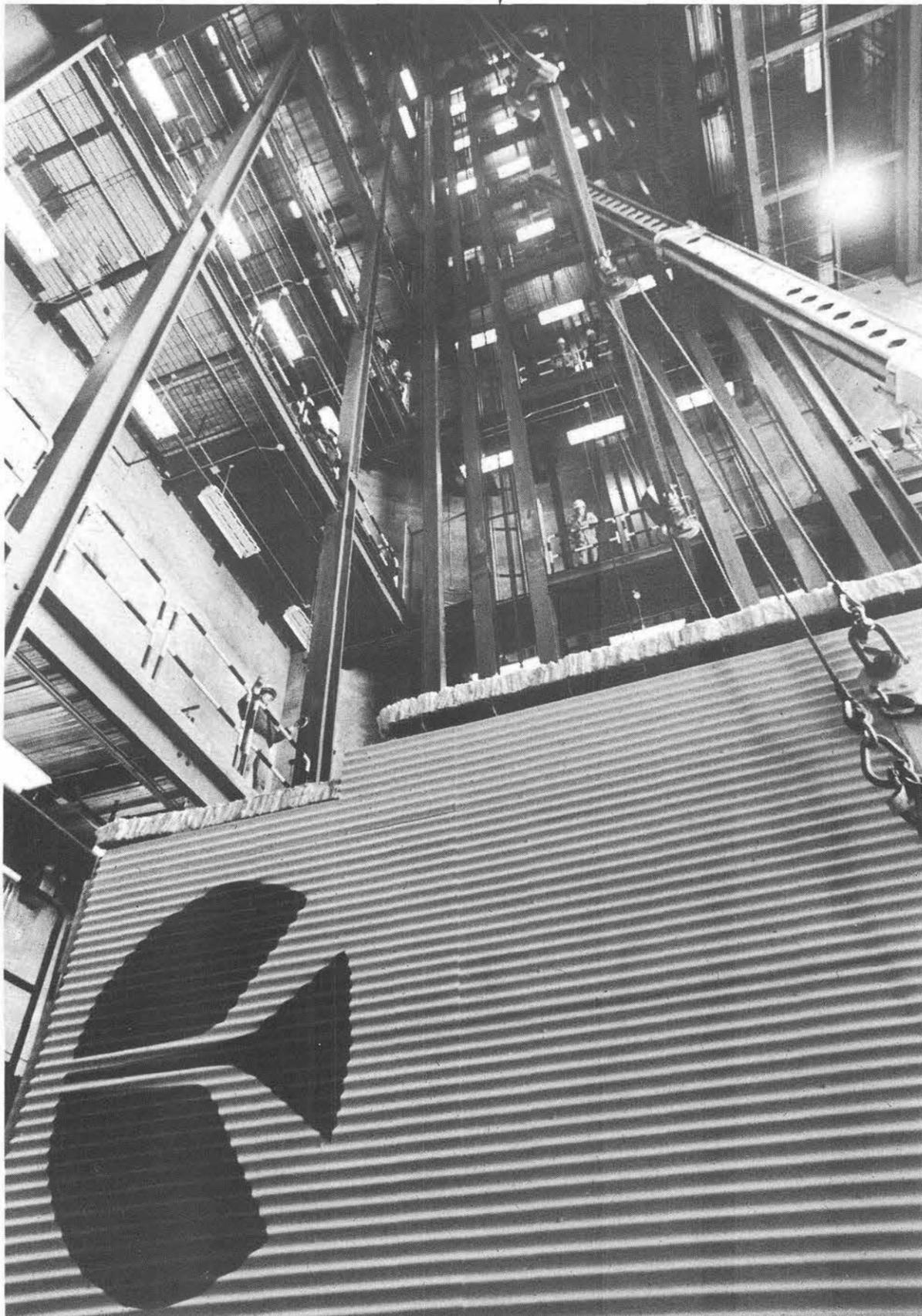
If longevity is a state the overwhelming majority of Americans can afford to choose, the question becomes how best to do it. The Human Population Laboratory of the California State Department of Health has spent more than 10 years studying the life patterns and resulting health of 7000 adults in Alameda County. In performing this study, seven health habits were identified that provide at least the foundation for an answer.

For example, a 45-year old man who practices six of these habits, the Laboratory finds, can expect to live 11 years longer than a man of the same age who observes fewer than three — 78 years to 67. Even more dramatic, a man 55 to 64 years old who has observed all seven habits will have the same physical condition as a man 25 to 34 years old who has observed only 0-2. There is no magic elixir in all of this, no exotic prescription, only these seven habits:

- meals at regular times — no snacking
- breakfast regularly
- moderate to brisk exercise two to three times a week
- adequate sleep (seven or eight hours a night)
- no cigarette smoking
- moderate weight
- alcohol in moderation (if at all).



GENERAL ADVISORY COMMITTEE to the Arms Control & Disarmament Agency met at Sandia earlier this month for briefings on weapons and other Labs programs. Group is chaired by IBM's Thomas Watson. Members shown here are Margaret Wilson, Jane Pfeiffer, Harold Agnew and William Jackson (GAC staff).



GOING UP — This unusual perspective shows a prototype boiler from McDonald/Douglas as it is about to be emplaced on elevator within the Solar Thermal Test Facility. Tests over a period of several months will take place once the boiler is raised to position where heliostats can focus sun's rays upon it. Work is done by Solar Thermal Test Facility Division 4713.

Fun & Games

Biking — Last issue we advised that the New Mexico Wheelmen meet for a ride every Sunday morning at 9 at Popejoy Hall on the UNM campus. Sorry, it's not 9 but 10 a.m. All bikers are welcomed, members or not.

If you're looking ahead, the next Century Ride will be on Sunday, April 22. The Century offers both a 50 and 100-mile leg, and all manner of unlikely cyclists show up and usually complete one or the other course. It's hard, but it's leisurely, which doesn't make it hardly leisurely, just a kind of perverse fun.

* * *

Frisbee golf — A while back we mentioned the existence of this new game, and we have now learned that a Frisbee course has been defined on the campus of UNM. It's a 15-holer, has two water holes and a bunch of par 3's and 4's, and even a par 5. If you want to see the layout, it's available in the LAB NEWS office.

* * *

Running — Several track meets are coming up. On Feb. 3, the 16th annual Jaycee Invitational is scheduled at Tingley. On Feb. 4 (Sunday) and again on the weekend of Feb. 10 and 11, the AAU Track Meet will also be held at Tingley.

* * *

Skiing — For downhillers, the next major Coronado Ski Club trip is to Purgatory, Feb. 10 through 12. You drive and make your own motel reservations. CSC is getting discounted lift tickets and has organized a few get-togethers. Carl Peterson (5632) is honcho.

For touring skiers, there's a short tour set for Sunday, Jan. 28, in the Jemez Mtns. that is aimed at family participation. Those interested should meet at Goodwill on San Mateo at 7:30 a.m. A more ambitious (10 miles) tour is planned for the following Sunday, Feb. 4, on Sandia Crest. Tourers for this one meet at Western Skies at 9 a.m. (Why aren't they called "tourists?")

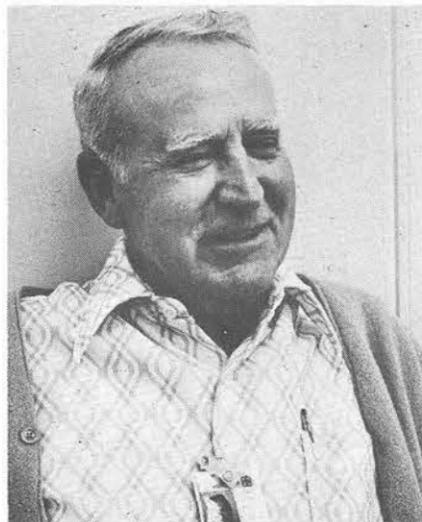


Dave Horowitz has started a one-man campaign to bring a little reality into the lives of the fantasy peddlers. After watching a double feature that included a bad print of Woody Allen's "Annie Hall" and a good print of "The End" (advertised as "one of Burt Reynolds' funniest," but which bored him spittleless), Dave did the unprecedented — he asked for his money back: "It's about time Hollywood learned truth in advertising applies to them, too." We can hear Hollywood's response now: "But, Dave, truth is an illusion."

Retiring



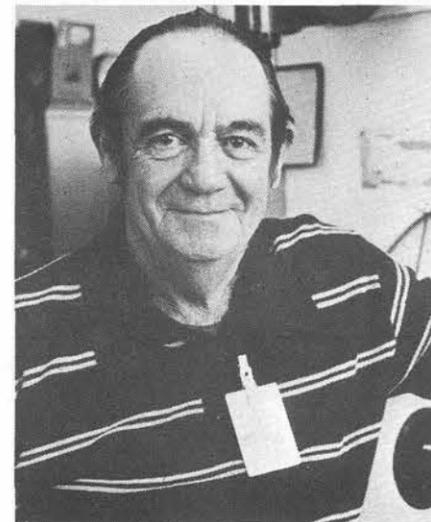
Francis Gross (3733)



Elliott Airmet (1212)



Fred Callahan (3411)

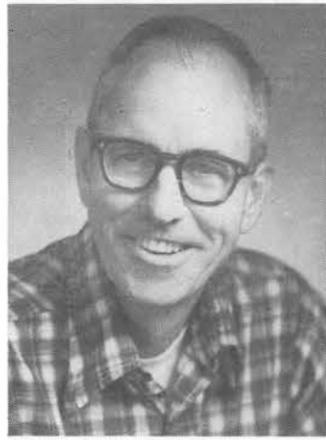


Jim Weber (2351)

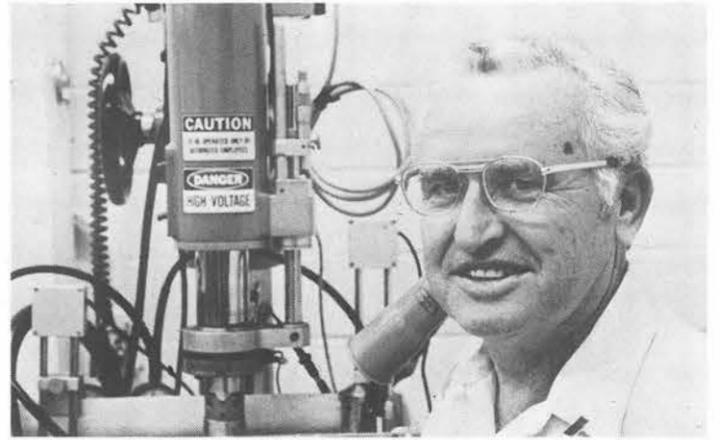
MILEPOSTS

LAB NEWS

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Frank Cupps - 8265 20



Royce Bewley - 1481 20



Gladys Lydic - 4360 15



Rosalie Gallegos - 1473 30



James Hamilton - 3312 10



Frank Petrini - 8423 20



Phil Sites - 8123 20



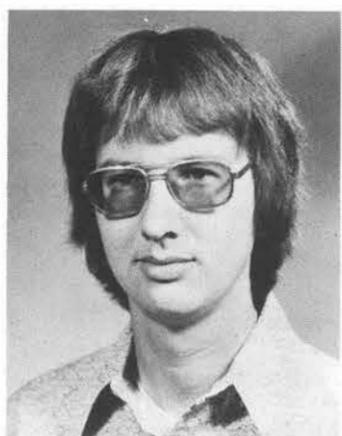
Charles Masse - 2426 25



Francis Cunningham - 8161



Myrtle Patterson - 3152 25



Kerry Sturgeon - 2455 10



Henry Street - 5844 15



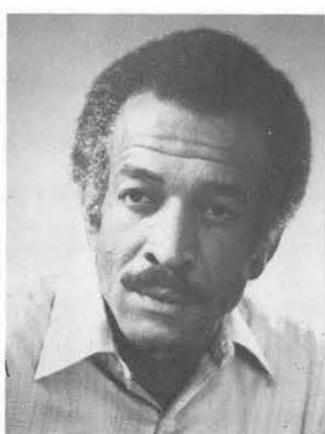
Ruth Dillon - 3615 15



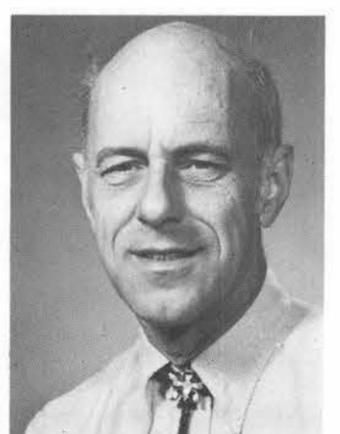
Pat Quigley - 2433 25



Jim Rego - 8424 20



Sylvester Grisby - 8123 20



August Binder - 1754 25



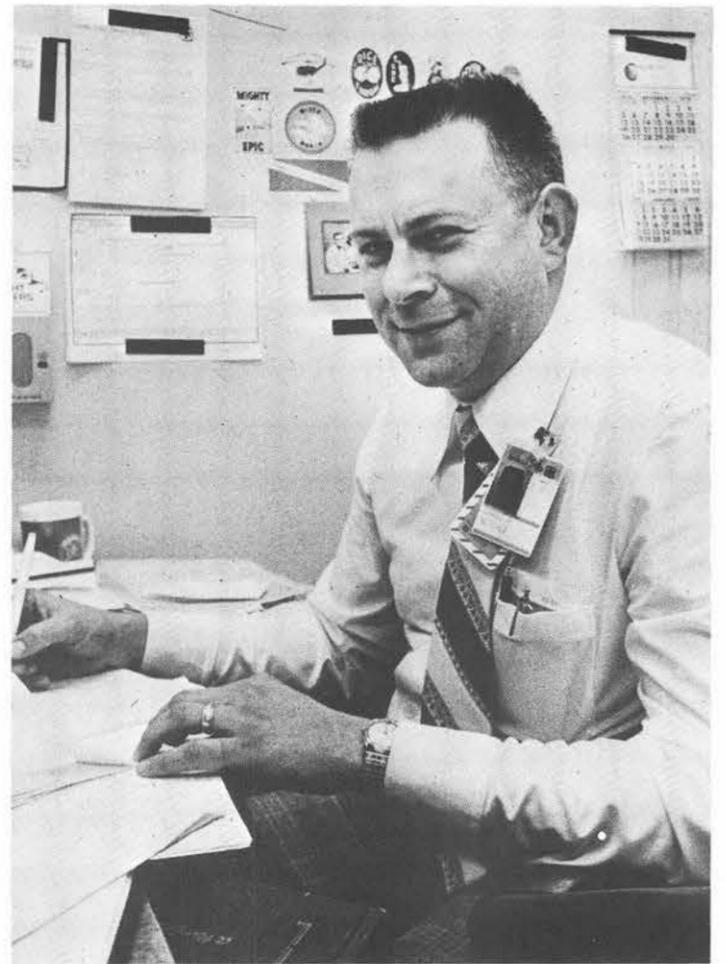
Jesus Luna - 2165 30



Fred Johnson - 8423 10



Bill Walker - 1414 30



Jim Metcalf - 3312 10



Marge Smith - 1522 25



Keith Gawith - 1483 15



Claire Smith - 1482 10



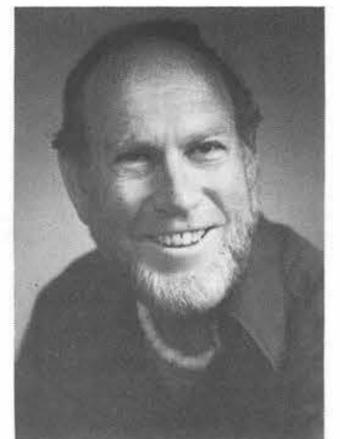
Bill Wilson - 8341 10



Chet Chester - 1422 30



Donald Bower - 1732 20



Walt Maupin - 8254 30



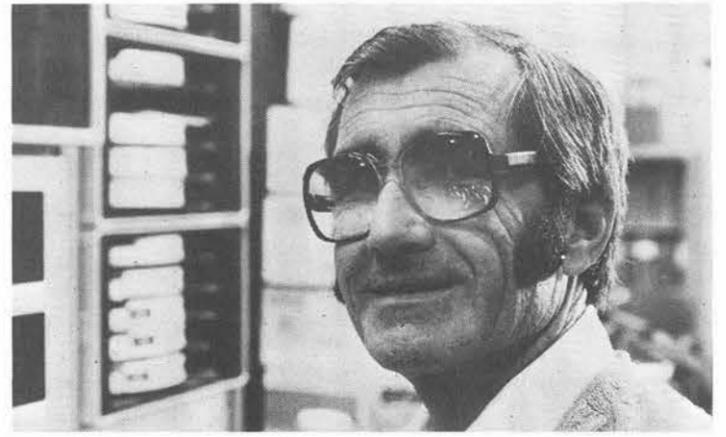
Francis Graham - 3221 20



Billy Duggin - 4233 30



Albert Clamp - 1423 30



Alan Bolles - 1587 30



Evelyn Pafford - 2620 15



Shirley Carson - 8323 10



Charles Martin - 1124 30



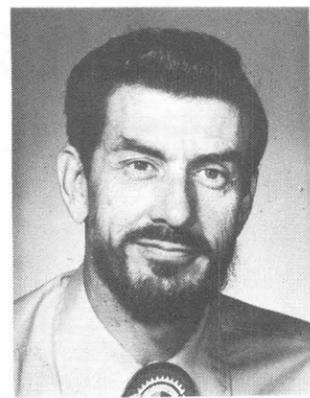
Al Bastion - 8257 20

Vibration Seminar Set

Vibration and Modal Testing Division 1542 is offering a series of seminars on vibration testing and modal analysis. Each seminar is conducted in two half-day periods by people in the division. The first half day begins with Dan Gregory discussing sine vibration followed by Fred Cericola and Jim Doggett discussing random vibration and facility limitations. Dave Smallwood starts the second half day with a presentation on transient testing followed by Arlo Nord's presentation on modal and signature analysis. Dave Schafer wraps up the seminar with instrumentation do's and don'ts and a discussion of anticipated facility developments.

Seminar sessions are planned for February and March. Videotape recordings of the presentations are also available. The seminar may also be presented at SLL and LASL if interest warrants. Call Dave Schafer on 4-8686 if you wish to sign up or need additional information.

Labs Man Spread Thin in Texas



IT'S not everyone who finds a namesake road sign, but a friend of Rosco Champion's (4722) was driving somewhere west of Abilene, Texas, did a double take, jammed on the brakes and backed up to get this photo. Since he's already a household word in the area, Roscoe reports that he's considering the Texas political arena.

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

CLASSIFIED ADVERTISING

Deadline: Friday noon prior to week of publication unless changed by holiday. Mail to: Div. 3162 (814/6).

RULES

1. Limit 20 words.
2. One ad per issue per category.
3. Submit in writing. No phone-ins.
4. Use home telephone numbers.
5. For active and retired Sandians and ERDA employees.
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.

MISCELLANEOUS

- 4 STD. WHEEL RIMS from '78 Chev. Camaro, F78x14, \$16. Barber, 299-1752.
- DINETTE SET, round table w/leaf & 6 chairs. Harris, 821-8524.
- NEW Martin fireplace, folding glass doors, free standing type, \$300; used Sears built-in dishwasher, \$25 or best offer. Wright, 281-5828.
- NEW Uniroyal GR-78 steel belted radial, \$75 new, asking \$40 or best offer. Wilcoxon, 296-8295 or 293-4327.
- GARAGE DOOR OPENER, screw type, cost \$140, sell for \$85; receiver & 2 transmitters, \$50; color TV, \$90. McConnell, 255-2488.
- LENS for Minolta camera, 35mm, f4 Rokkor 9m, \$35. Allen, 296-6453.
- BRONCO ROLL CAGE, attaches to existing roll bar, new, ready to install, cost \$52.50, sell for \$30. Cook, 869-6921.
- PACHINKO (Japanese pinball) machine, wired, extra balls & floor stand, \$20. Dippold, 821-5750.
- SEWING MACHINE in cabinet, zig-zag, \$65; port. sewing machine, \$25; sewing chair, storage under seat, \$15. Smith, 299-7151.
- MAC Mauser (copy), model 1916 military 9mm, \$45; antique Paris field glasses, \$25; German rifle scope. Smitha, 881-1001.
- SKI EQUIPMENT: (used 4 times), Olin Mark IV 180's; Salomon 555 bindings; orange Hanson's, size 8 1/2-10, \$395 or boots only \$150. Grimes, 294-3083 or 299-2548 after 5:30.
- FIREPLACE, large, freestanding; black, \$130. Aronson, 268-7109.
- 750x17" SPLIT rim wheels & tires, 8-hole pattern, fits GM pickups, make offer. Hymer, 298-2232.
- 1974 23' TRAVEL TRAILER, fully self contained, \$4000 or best reasonable offer. Owens, 881-0815.
- GERMAN SHEPHERD puppy, AKC

- reg., black, female, 5 mos. old., \$125. Martinez, 821-8692.
- 23" PENNEYS console color TV, just serviced, new picture tube w/1 yr. warranty. Strascina, 294-0305 after 5.
- TURNTABLE, Dynakit monaural preamps & Mark III amplifiers. Clark, 296-4541.
- MOVING SALE: '75 World books w/Childcraft, \$200; top Viking sewing machine, 3 1/2 yrs. old, \$400, Ward, 243-3463.
- 10-GAL. AQUARIUM, complete w/all accessories, pump/filter, heater, reflector top, artificial plants, gravel, misc. items, \$20. Bear, 881-7128.
- CYCLONE fence, 4' high, 51' long, pipe top, 2 gates, 3' - 6', you remove, \$75. Stuart, 299-9190.
- HOTPOINT elec. range top, coppertone, 20"x30", \$15; matching hood w/lights & fan, 17"x36", \$15. Rost, 268-2326.
- THREE DOORS from remodeled house, cheap; Kenmore washing machine, runs, \$50. Schroeder, 344-1011.
- SPAIN TRIP for middle school students, July 3-July 11, sponsored by American Institute for Foreign Studies. Contact Judy Koepke, 292-2209.
- KAY electric guitar & Sears 2-channel amp, model 40XL w/reverb, tremolo & foot switch, \$80. Gray, 265-1883.
- SMALL CAMPER & boot for long wide pickup bed. Dean, 299-3281.
- GE refrig-freezer, avocado color, side-by-side, 20.5 cu. ft. Nogle, 299-3863.
- SEAT COVERS, clear vinyl for '77 Vega hatchback, front & rear seats, never used, \$30. De Vargas, 255-4490.
- SLEEPER SOFA, pullman full size, brown & white herculon fabric, 3 yrs. old, \$125. Moulton, 293-0373 after 6.
- AKC Great Dane puppies, excellent bloodlines, will be 6 wks. 2/10/79, \$300. Bogdan, 821-9242.
- AM RADIO, new, fits most '79 & older GM cars & pickups, \$35. Torres, 265-7914 after 6.
- SKI BOOTS: Molitor, Flow Bladder, size 8, new \$210, sell \$30; Nordica Astral GT model, size 7M, used thrice, \$170 list, \$90. Stevens, 299-6086.
- CANDLEWICK GLASS WARE, 33 pieces, \$20; gold velvet swivel chair, \$65. Sublett, 298-1004.
- SPEAKERS, Cerwin Vega model 211's, \$250 for the pair. Myers, 883-0104.
- TWIN BED, maple headboard, box spring, orthopedic mattress, \$50. McIntyre, 256-1513 after 5.

- SOFA BED; rollaway bed; easy chair; dining table w/chairs; metal etagere; misc. furniture. Fortman, 298-2550.
- YAMAHA ORGAN, 2 keyboards, pedals rhythm, approx. 1 yr. old, \$500. Randolph, 299-2057.
- RADIAL ARM SAW, Sears 10" w/cabinet base, blade & hold-down attachment, \$200. Heckman, 298-3116.
- MODEL PLANES: 2 "U" control line, Fox 0.15 Schneurle engine, accessories, \$35. Madden, 296-1082.
- HEATHKIT 2M transceiver, "Lunchbox," built but never used, w/crystal, \$20; rug shampooer/floor polisher, Sears 2-sp., brushes & pads, \$25. Smith, 242-9576 after 12.
- ELEC. STOVE, Hotpoint, 30", w/oven & storage cabinet, white, \$200. Cordova, 299-1652.
- QUEEN SIZE BED, incl. mattress, box spring, hollywood bed frame & headboard, \$100 or best offer. Kubiak, 345-3640 8-5.
- TRUMPET, Bundy, \$150; GE stereo, port. w/speakers in case, \$25. Johnson, 884-8123.
- SCIENTIFIC AMERICAN, 1960 through 1975; *Astounding Science Fiction*. Parman, 281-5465.
- STEEL GARAGE DOOR, 8'x7', all related hardware, \$40, no delivery. Wheeler, 281-3321.
- AKC FOX TERRIER puppy, male, sometimes called Rat or Toy Terrier, all shots, \$125. O'Neal, 298-2859.
- SKI RACK, Barretrafter, luggage rack, mountable, \$20 or trade for gutter mount type; tire chains, fit BR78-13, \$8. McCulloch, 821-4404.

FOR RENT

- 3-BDR., 1 1/4 baths, lg. LR/DR w/fp, 2-car garage, max. storage, Louisiana Lomas area, dishwasher, range, fenced yard, \$375/mo. Carlyon, w99-2318.
- 3-BDR., 1 1/4 bath, unfurnished, near Winrock, available now, lease only. Schwoebel, 298-4295.
- CONDOMINIUM studios near Winrock, furnished, private patios, jacuzzi, in/outdoor pools, clubhouse, all utilities paid, \$225/mo. Orlando, 821-3011.
- SKI CHALET near Taos Ski Valley, deluxe accommodations, fully equipped kitchen, sleeps 8. Peet, 294-1250.
- 2-BDR unfurnished, dishwasher, drapes, carpets, range, refrig., storage closet, on Chelwood & Sandia bus route, \$200/mo. Wiczer, 296-4496.

- HOUSE IN NE heights, Eastridge area, available between 8/1/79 & 9/1/80, terms are somewhat flexible. Reif, 299-2665.
- 2-BDR. townhouse apt., dishwasher, garbage disposal, carpeting, near Central & Tramway, view, \$225/mo., first month \$200. Berg, 296-2695.
- TAOS SKI VALLEY CHALET, luxury, 3-bdr., 1 1/2 baths, sleeps 8+, fully equipped kitchen, ski to lifts, spacious, private. Marion, 294-8256.

WANTED

- UPRIGHT FREEZER, recent model in good condition. Yaniv, 821-0999.
- MEN's fast pitch softball players to play in city 2A or 3A division. Call Tom Plummer, 296-4327 or Eric Kehl, 298-9582.
- GOOSE DECOYS, any kind, O'Bryant 268-9049.
- 10-GAL. aquarium hood with fluorescent light. Stearns, 281-3872 after 6.
- TWO TRUNKS. Ward, 243-3463.
- SMALL kitchen table w/2 or 4 chairs. Noel, 298-2142.

REAL ESTATE

- 4-BDR. LG. HOME in NE heights, den w/separate rec/pool room, convenient to Base & shopping, \$86,200. Ellis, 299-6224.
- 3-BDR., 1 bath, lg. kitchen & LR, single garage, on 1/3 acre, fully fenced, NW valley, \$31,000. Gustafson, 298-2888.
- 2 ACRES LAND in Edgewood, south of I-40, view, wooded, water & elec. Humberstone, 264-2564.
- BAILEY & WARD home, 3-bdr., 1600 sq. ft., energy pkg., 12 mos. old, extras, \$59,700, \$20,800 CTL or refinance. Kerschen, 821-2848.
- 3-BDR. MOSSMAN, Alta Monte addition, LR w/fp, DR, 1 1/4 baths, util. rm., lg. den, mature landscaping, near schools. Pacini, 881-8075.
- 440 MOUNTAIN ACRES, nearby, timbered, consider investment group for whole, or will sell 40 acre tracts separately. Causey, 881-7534.

LOST & FOUND

- LOST — Ladies gloves: brown leather w/fur lining, lt. beige knit w/leather palm, pr. of dk. brown, black knit w/leather palm, brown knit; wire frame safety glasses; silver bell

- earring, engraved "Siam"; 7 keys on ring; brown print head scarf; red polka-dot kerchief; gold tie chain, similar to miniature coat hanger; silver Sandia earring w/screw back.
- FOUND — Plain silver loop earrings for pierced ears, Sandia 20-yr. bolo tie. LOST AND FOUND, Bldg. 832, 264-1657.

TRANSPORTATION

- '63 CORVAIR, 4-dr., \$1500. Kerr, 298-7527.
- '77 BONN. Brougham, 27,000 miles, 400, PS, PB, CC, TW, PW, PL, AM/FM 8 track, spoke wheelcovers, velour interior, loaded, \$5900. Dryer. Silva, 869-2102.
- '67 MUSTANG, restored approx. 95%, uniquely equipped, orig. owner, w/papers. Wright, 281-5828.
- ENGLISH BICYCLE, lt. wt., 3-sp., new tires & tubes, horn, Thompson, 268-4060 before 2.
- '70 FORD F600 2 or 6-ton V8, new motor, hydraulic tail lift, 15' bed, \$6000. Sanchez, 877-0326.
- '69 CHEVY str. wgn., 61,000 miles, AC, AT, radial tires, \$895. Sena, 294-5581.
- '77 CHARGER SE, power seats/windows, locks, etc., sunroof, AM/FM stereo cassette, claret red/white accents, assume payments. Shaffer, 268-1712.
- '75 MG Midget w/2200 miles, \$2800. Zamora, 831-2454.
- '78 DATSUN, kingcab, 5-sp., less than 7000 miles, shell & boot, \$4100. Whittet, 294-7136 after 5:30.
- '75 CAN AM 125 MX DIRT BIKE, rebuilt engine, \$395; Motocross boots, "Full Bore" size 8 1/2, \$50; Bell helmet, size 7 1/4. Shirey, 298-6362.
- '70 TOYOTA Corona 4-dr., AT, \$700. Kidd, 256-1020.
- '77 CHEVY Impala 2-dr., PS, disc brakes, 305 V8, AC, AM/Fm, 26,000 miles, \$4000. Tatman, 265-4095 after 5.
- '66 CHEV. Impala 4-dr., AT, PS. Lynes, 268-0144.
- '76 MGB, red, radio, low mileage, 17K. Thalhammer, 298-8521.
- '71 INTERNATIONAL Travellall 304, 4-sp., new paint-tires-clutch-brakes, \$1350, new Pace CB in box, \$85. Matthews, 869-2370.
- '75 MOTORCYCLE, Honda 550, 12,000 miles, \$1100 or make offer. Long, 266-4616.
- '72 CHEVY Blazer 4x4, 350, AT, AC, PS, PB, alum. wheels, towing, 75K miles, \$3500. VanDenAvyle, 898-6474.
- '76 KAWASAKI 900, 17,000 miles, \$1200. Randolph, 299-2057.

Jamaica Travel Package

TONIGHT'S HAPPY HOUR sees a choice of lobster newburg or roast sirloin on the buffet, the Three of Us & Jeremiah on the bandstand. Next Friday's Happy Hour will feature barbeque ribs on the buffet, Jeanne Rich & Friends playing for dancing. Call the Club office by midweek to reserve your buffet tickets — 265-6791.

SHRIMP PEEL TOMORROW is the big one this month with a generous buffet spread and the Mellotones playing for dancing. You should already have your tickets but if you're just now getting organized call the Club office and see if there's been any cancelations.

SINGLES MINGLE next Friday, Feb. 2, starting at 4:30 in the El Dorado Room. In addition to munchables and door prizes, a disco demonstration is scheduled.

VARIETY NIGHT on Saturday, Feb. 3, features a Walt Disney movie very popular with the youngsters a few years back — "The Bears and I." Bring the family for super sandwiches about 6, the movie starts at 7.

TRAVEL DIRECTOR Ed Neidel announces a new trip package to Jamaica on March 30-April 6 for \$524 per person. Price includes round trip jet fare from Albuquerque, transfers, seven nights at Montego Beach, and a cocktail party with entertainment. Call Ed on 4-5264 for more info.

Ed has called a meeting of anyone interested in the "go-as-you-please" trip to the British Isles on Tuesday, Feb. 6, at 7:30 p.m. in the El Dorado Room. Some movies taken in the same area a couple of years ago will be shown. Ed will be there to discuss how to best



LEG, BROKEN, AVOIDING SAME could be the title of this photo which shows O'Neill Burchett (1552, left) and Jack Hanna (1500) trying out the Coronado Ski Club's binding checker. The device helps insure bindings are neither too tight nor too loose. Contact O'Neill or Jack to line up binder checker for your use.

use some of the features of this package — for instance, the trip includes hotels and options of a rental car or a rail pass. Stop by to see the movies — it's a good show.

THE WOLFPACK plans to travel to Tucson by charter bus for five days starting Feb. 14 to attend the Tucson Open golf tourney. Lodging, breakfasts, cocktail parties and bus fare costs \$148 (dbl). Call Pro Padilla, 4-3462, for more info.

EVERYONE is invited to a Wolfpack-sponsored meeting Tuesday, Feb. 6, at 7:30 in the main ballroom. Dominic Lanza, manager of Albuquerque's professional volleyball team, the Lasers, will discuss professional volleyball and show a film.

Events Calendar

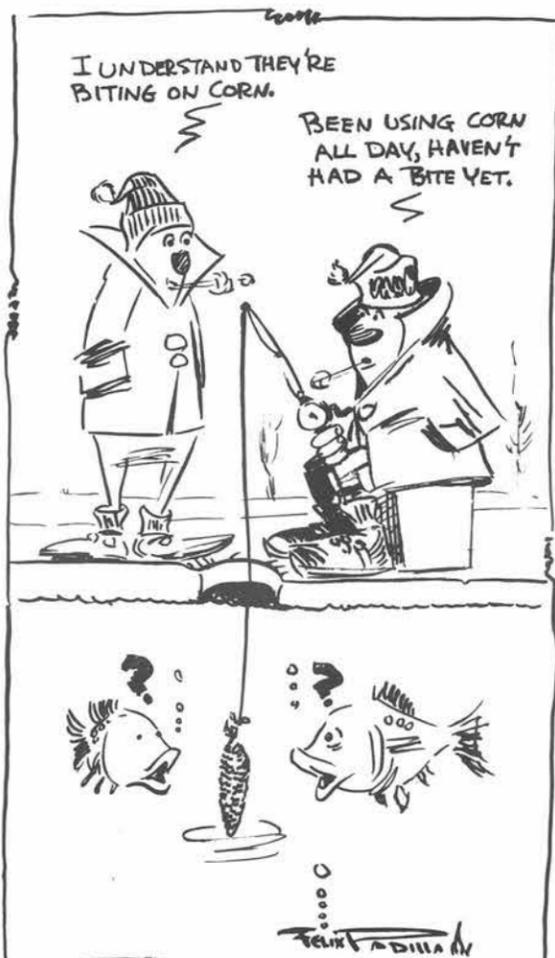
- Jan. 26 — Mimi Tung, pianist, Keller Hall, UNM, 8:15 p.m.
- Jan. 26-31, Feb. 1-3 — "The Clouds," Rodey Theater, 277-4402.
- Jan. 26-28 — "Play It Again Sam," Tiffany Playhouse, 242-0441.
- Jan. 27, 28 — "The Round Eyed Rumpelstiltskin," Albuquerque Children's Theater, Popejoy, 277-3121.
- Jan. 29 — "South Africa, The Cape to Kenya," Kiwanis travel-adventure film. Popejoy, 277-3121.

Sympathy

- To Don Marchi (2515) on the death of his father-in-law in Albuquerque Jan. 3.
- To Joe Gallegos (1482) on the death of his father and his aunt in Albuquerque on Jan. 6.
- To Evelyn Ratcliff (2500) on the death of her father in Amarillo on Jan. 18.
- To George Tucker (3312) on the death of his father in Florida, Jan. 18.

Congratulations

- Orlando "Fonzo" Espinosa (1485) and Mary Olson, married in Las Vegas, Nev., Jan. 12.
- Gerald Cessac (2166), a son, Nicholas Leonard, Jan. 14.
- Cliff Selvage (8470) and Josiane Zabe, married in Carson City, Dec. 29.



FRIDAY	SATURDAY
26 — HAPPY HOUR <i>Lobster Newburg or Roast Sirloin of Beef</i> Adults \$6.35 Under 12 \$3.25	27 — SHRIMP PEEL Members \$7.00 Guests \$8.00
THREE OF US & JEREMIAH	THE MELLOTONES
2 — HAPPY HOUR BBQ RIBS Adults \$4.95 Under 12 \$2.50 JEANNE RICH & FRIENDS	3 — VARIETY NIGHT Walt Disney Movie "The Bears & I" Sandwiches 6 p.m. Movie 7 p.m. Free to Members