

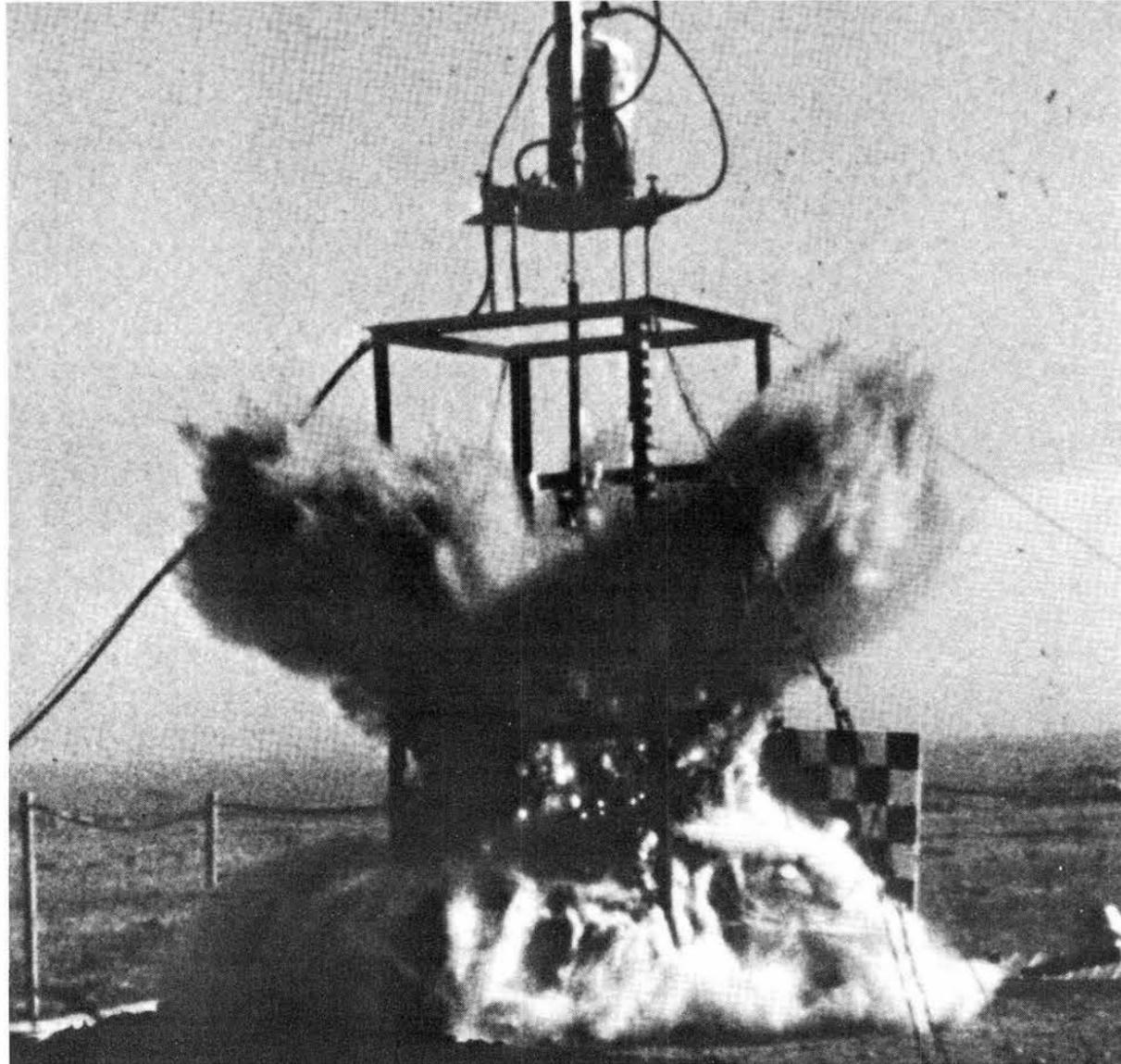


LAB NEWS

VOL. 33, No. 14

JULY 10, 1981

SANDIA NATIONAL LABORATORIES • ALBUQUERQUE NM • LIVERMORE CALIF • TONOPAH NEV



STEAM EXPLOSION results when a mass of molten iron-alumina is dropped into a tank of water. Steam explosion phenomena, part of a larger program in nuclear reactor safety, are being investigated by Dennis Mitchell (2514).

Reactor Safety

Getting A Handle on Steam Explosions in Reactors

For the past several years, the Nuclear Regulatory Commission has pursued a comprehensive reactor safety program, and Sandia has been making major contributions in this program through work being done in the Nuclear Fuel Cycle organization 4400. One concern in the safety of light water reactors is steam explosions, and there is a need for quantitative information on these explosions.

In one type of light water reactor accident, loss of coolant could lead to core meltdown. The question then is, "What happens if the molten core drops into any residual water that may be present?" More questions follow: "Does the molten core, after mixing with water, explode and rupture the pressure vessel? Can missiles be generated which could pierce the containment?"

To help answer these questions, Marshall Berman's Reactor Safety Studies

Division 4441 asked for help from Sandia's Explosive Components Department 2510. Dennis Mitchell of Explosives Projects Division 2514 undertook the task of obtaining data on steam explosion phenomenology. The main concern was the energy conversion ratio (thermal to mechanical) of the fuel-coolant interactions. Dennis says, "My job is to investigate steam explosions and gain some understanding of the phenomena. Specifically, we needed to quantify the conversion ratio as a function of fuel-coolant factors—information which was not available three years ago.

"The literature is replete with models which attempt to describe the physical processes involved in steam explosions," Dennis continues. "Most of these have dealt with the way the molten fuel interacts with the water in releasing its energy.

[Continued on Page Four]

Olson to SNLL; Three New Directors Named

Del Olson, who has been Director of Microelectronics 2100 in Albuquerque, will move to Sandia Livermore to take over the Systems Development Directorate (8100). The post had previously been filled by Bill Spencer, who resigned to take an executive position with Xerox.

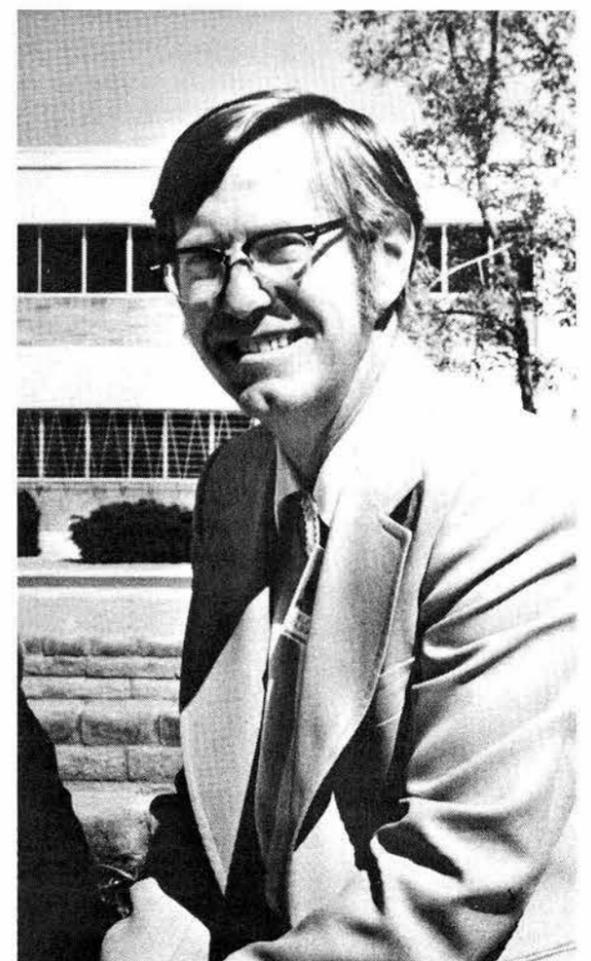
The move was effective July 1. On the same date, three new directors were named. They are Bob Gregory, to succeed Olson as Director of Microelectronics 2100; Bob Clem, promoted to Director of the newly created Systems Technology 1300; and, in Livermore, Dan Hartley, promoted to Director of the newly created Combustion Sciences 8500.

Del Olson is a 28-year veteran of the Labs with most of those years spent in weapon systems work. He was named director, and head of Org. 2100, in April 1978. Del and his wife Dorie have five children, with one still at home.

Bob Gregory came to Sandia in 1963. After promotion to manager of the Integrated Circuit Process Department in 1974, his organization was responsible for bringing the microelectronics and integrated circuit labs into operation. He has his PhD in EE from Carnegie-Mellon and is a Fellow of the IEEE. Bob, his wife Margaret and their three daughters live in the North Valley where he professes a "part-time farmer" status.

Bob Clem first came to Sandia at Livermore in 1958, advancing to department manager in the weapon design area. In 1966 he transferred to Albuquerque to manage the Exploratory Development Department; since July 1975, he's managed

[Continued on Page Two]



Del Olson - 8100

Afterthoughts

I hope this works--"Hopefully" the legions say, on TV by people who should know better, in colloquia by speakers cowed by the boldness of "I hope," and in everyday conversation, sprinkled here and there to fill a pause. The grammarians call it a barbarism, a bastard adverb, and their explanations of why hopefully shouldn't be used are befuddling to those who left grammar and junior high school with a sigh of relief. One way to comprehend what's wrong with hopefully is to compare the basic verb, to hope, with another verb that's similar--to fear. Thus, we might say: "I hope that it will rain" or "I fear that it will rain." An acceptable alternative would be: "I am hopeful that it will rain" or "I am fearful that it will rain." But to say "Hopefully, it will rain" makes no more sense than to say "Fearfully, it will rain." When the impulse strikes to let loose a hopefully or two, be ruthless--stamp it out!

* * *

Clear enough?--One of our energy groups has sent me a letter describing a drilling bit that comes from a Far Eastern country. It reads, in part: "The long duration bit is made of the SiC grain contained iron (copper), many radial mud holes inside it, in drilling a tube is inserted into the bit eccentrically, the tube bottom have a bearinged bar of 1/2 inch thus the tube seal all holes except the lowest, the mud circulation through the lower mud hole carry the cutting upward, the eccentric tube will rotate but the bearinged bar not rotating, the bar is made of tungsten carbide its shape like a ball." Quick now--what does this remind you of? It's a patent application, of course. The letter writer graciously concludes: "Thank you good luck." *js

Success Story, Medical

Most of us at one time or another have taken a physical exam at Sandia Medical. And most of us conclude the exam with nothing startling to report--eyesight a bit dimmer, a recommendation to cut back on desserts and the like.

But these exams aren't always so prosaic, and there are moments of drama, albeit quiet drama. Floyd Coppage, an engineer in 4365, called. "I'd like to see Medical get a pat on the back," he started out.

What happened?

"I was taking one of those periodic physicals last month. Got to the X-ray part and the X-ray technician, Louise Bland, asked me about the mole on my left shoulder. I couldn't see it but I recalled

that it was itchy now and then.

"So she took me into Dr. Clevenger's office. He examined it, asked a few questions and shortly thereafter I was in a specialist's office in town. The upshot of all this is that I had a melanoma--the kind of skin cancer that's real bad news when it's advanced. Fortunately, mine wasn't too far along. I've since had successful surgery to remove it, and the doc says I'm back to normal now.

"The point is that I probably wouldn't have done anything about a slight itch on a portion of my body I couldn't even see. Thanks to the people in Sandia Medical, I avoided a bunch of trouble."

* * *

We discussed skin cancer with Dr. Clevenger. Thanks to wide publicity given to the problem, most New Mexicans are aware that we suffer a much higher than average incidence of the disease, probably because of our high elevation and sunny skies. Not all skin cancers are as serious as that afflicting Floyd, and some can even be treated in the doctor's office. But none should be overlooked. Here are a few things Dr. Clevenger says to watch for in your personal mole population (and if you can't see the small of your back, then use a mirror or have someone else check it out): changes in color, diameter, outline, surface characteristics (including itchiness), consistency or in the skin surrounding the mole. Common sites for the less serious forms of skin cancer are the head and hands; for melanomas, the common sites are the backs of men and women and the legs of women.



Bob Clem - 1300

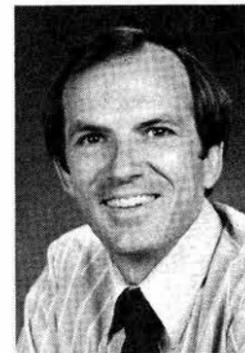


Bob Gregory - 2100

Continued from Page One

New Directors

Systems Research Dept. 1250. His new directorate will be responsible for a combination of systems studies, project engineering, and instrumentation development. Bob's BS in ME comes from Washington State. He's a tennis buff, and he and his wife Caroline have two sons and a daughter--all in school--and they live in Four Hills.



Dan Hartley joined Sandia Livermore in 1968 as an aerodynamicist. He had previously acquired BS, MS and PhD degrees in aerospace engineering from Georgia Tech and spent a year in Belgium doing post-doctorate work. In 1975, Sandia Livermore first undertook work in

the combustion sciences area and, in 1977, Dan was named to head the Combustion Sciences Department. With the completion last year of the Combustion Sciences Research Facility and the upgrading now of this work to directorate level, Sandia is making a strong commitment to this effort. Dan and his wife Linda live in Oakland with their two children.

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Island Using Sandia's VAWT

An historic and fabled island off New England's rugged coast is now the site of an unusual energy source developed here at Sandia. On Martha's Vineyard, a 95-foot-high vertical axis wind turbine (VAWT) that can produce up to 100 kilowatts of electricity in a 33 mph wind is scheduled to start providing residents with electricity to pump water later this month.

Under a project funded by the Department of Energy, the eggbeater-shaped turbine has been erected on an inactive landfill plot on the outskirts of Tisbury, a town on the island. After about a month of testing, the turbine is expected to begin operating on a routine basis.

During windy periods, electricity generated by the turbine will be used to pump water for Tisbury's municipal system. Commonwealth Electric Company has agreed to purchase any surplus electricity and will sell electricity for water pumping during periods of low winds.

The Tisbury VAWT was built and erected by Aluminum Company of America under Sandia's technical direction. Rockwell International selected the site under DOE's New England Wind Project, designed to conduct long-term windmill testing in the New England area.

The Tisbury site on Martha's Vineyard was selected last summer, with aid from a member of the Tisbury Water Board who is also district manager of Commonwealth Electric. After two years of turbine operations, during which the electricity will be provided without charge, DOE will either transfer ownership or the windmill to Tisbury or arrange for it to be removed.

This is the third Alcoa-designed VAWT to be erected under the DOE contract.

These VAWTs have two blades, each attached at the top and bottom of a rotating vertical shaft to form an eggbeater-shaped unit 56 feet in diameter and 82.5 feet high. The 24-inch-wide, 100-foot-long blades, shaped like an airfoil (airplane wing), are extruded and bowed by an Alcoa-developed method. This relatively low-cost technique, combined with the inherent simplicity of the VAWT, should, in areas of high wind, make the output from the machines competitive with conventionally generated electricity.

The VAWT accepts wind from any direction, eliminating the need for a device to turn it into the wind; it needs no feathering device to keep it from producing more power than the rated capacity of its generator; and it has a simple support structure and is easy to maintain because generating equipment is placed at ground level.

Sandia began investigating the VAWT in 1974 and is now testing the turbines in an effort to design long-life, low-cost VAWTs which can be produced and marketed by industry. The VAWT work, funded by DOE's Wind Systems Division, is being performed in Advanced Energy Projects Division 4715, headed by Dick Braasch.



Sandia Livermore Will Manage National Solar Thermal Effort

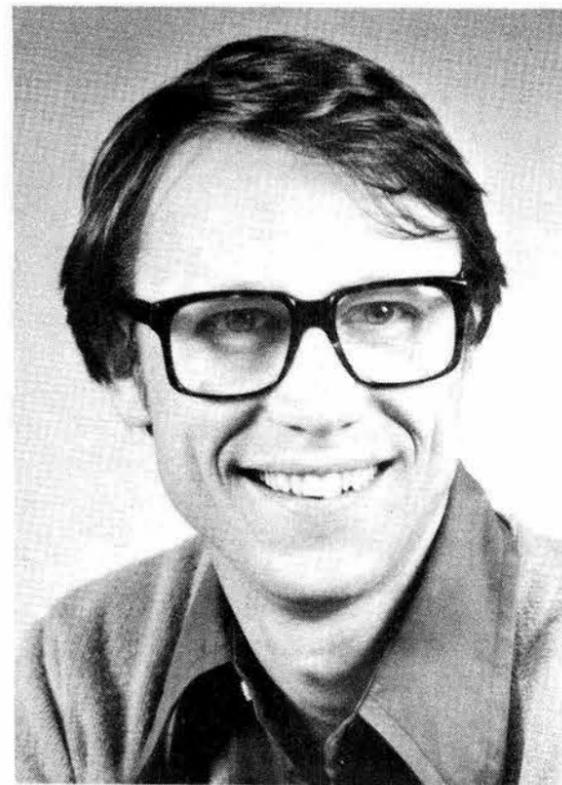
Sandia Laboratories has been selected by DOE to oversee the country's solar thermal systems technology program. Named to head the new Solar Programs Department 8430 is Rick Wayne. Replacing Rick as head of 8450 (renamed Central Solar Receiver Department) is Cliff Selvage (formerly 8420).

Over the past year, DOE's Division of Solar Thermal Energy Systems has been looking for a lead laboratory to do the technical job, as Rick states, of "pulling together all the bits and pieces of the solar thermal program, making sure there are no glaring technical gaps or duplication of effort."

"Our function is to enhance communication and to develop a strategy for achieving the goals of the solar thermal program nationally. Specifically, we'll take the best technical shot we can at developing a reliable and economic alternative to fossil fuels," Rick says.

The program includes a number of laboratories and DOE field offices around the country. To carry out the new task, the new department is being staffed by experienced people from other solar areas at Livermore and Albuquerque. Also created is a new solar programs division (8431), headed by Pat Eicker (formerly 8451). Kirk Battleson (formerly 8452) has been selected to go to DOE's Washington headquarters to serve as Labs representative.

Sandia first became involved in solar energy when then AEC-head Dixy Lee Ray suggested that the Labs determine



Rick Wayne . . . new 8430 head.

what they could do outside the weapons business. After the Energy Research and Development Administration (ERDA) came into being in 1974, Sandia made its entrance into solar work. This included the solar total energy concept using parabolic trough concentrators (at SNLA) and larger high temperature and electric applications using central receiver technology (at SNLL). Solar work at Livermore began in 1975.



COUNTRY ROAD north of Livermore is the locale of this striking photograph by Don Spencer (8265). Though primarily a writer, Don is also an enthusiastic photographer and does his own printing as well. Scenics in black and white are a favorite subject.

Steam Studies

Descriptions of molten fuel fragmentation and heat transfer between the fuel and the water have received considerable attention. The difficulty with the theoretical approaches has been the lack of a consistent, repeatable experimental data base using realistic fuel melt simulants. It was known, from earlier experiments, that melt masses on the order of 25 kg would explode when dropped into water, but those experiments produced very little data related to the quantities of fuel and coolant involved in the actual explosion—primarily due to the methods used to deliver the molten fuels. We concentrated on techniques which would result in reproducible experiments which were well instrumented.”

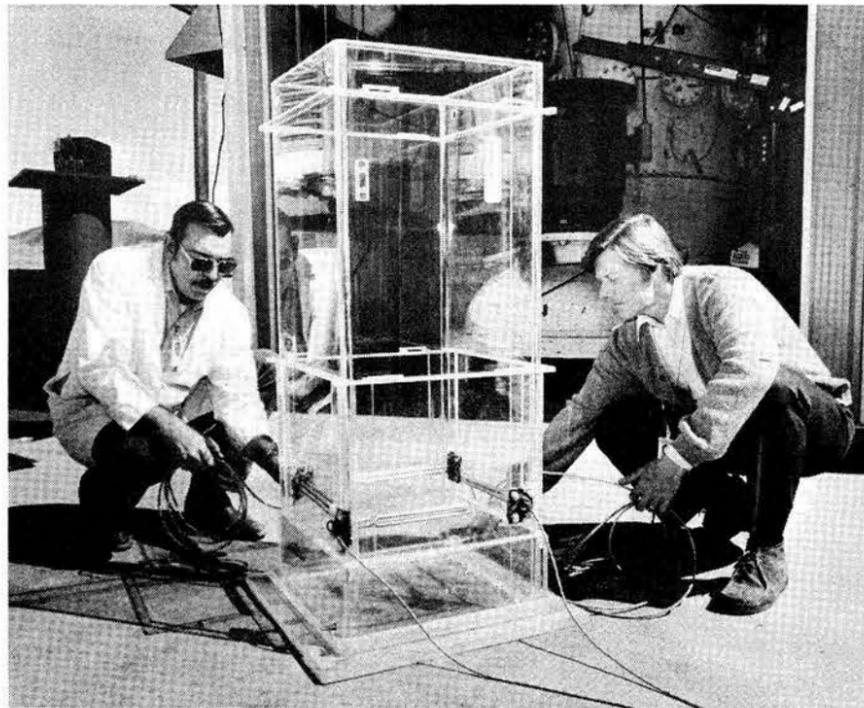
It has been a three-year effort. Along the way, Dennis and his team in Area Y built instrumented facilities and tested various crucible designs. Several series of experiments were conducted with molten masses of iron-alumina ranging from 1 kg to 25 kg at temperatures around 2800°C. A thermite reaction is currently being employed for generating the molten material. Work is also progressing on developing an induction melting capability.

Graphite crucibles were used. Dennis and his team spent a lot of time designing crucibles which would deliver the melt as a coherent mass into lucite tanks of water in a repeatable way. Transparent lucite allowed photography of the resulting explosion.

“If the melt dribbles into the water, the results are unpredictable,” Dennis says. “A steam explosion may or may not occur or you might get a series of smaller explosions. The mechanism of steam explosions requires a molten mass which fragments as it enters the water. Vapor forms around the fragments and isolates the hot fuel from the coolant until a trigger occurs which stimulates vapor film collapse. The explosion then propagates from fragment to fragment with the fuel and coolant interacting until the thermal energy is expended.

“In all experiments where an explosion resulted,” Dennis continues, “a propagating wave could be observed in the melt-coolant mixture. Propagation velocities of 250 to 550 meters per second, dependent on the melt-coolant mixture geometry, were measured. Peak pressures of 100 megapascals (14,000 psi) were measured in the water phase near the exploding mixture. Experimental measurements of water chamber wall velocities and computer calculations based on experimental data both indicated that one to three percent of thermal energy contained in the melt was converted to kinetic energy.”

From experiments conducted in an open geometry, Dennis moved to a more sophisticated test facility with a containment vessel which provides more precise measurements and the capability of recovering debris. Debris collected from the experiments was characterized to deter-



LUCITE WATER TANK is instrumented before installation in the test chamber by Paul Langdon and Dennis Mitchell (both 2514). Transparent walls of the tank permit filming of experiment with high-speed motion picture cameras.

mine fragment size and distribution.

“The debris showed that there is a correlation between mass-averaged debris diameter and the conversion ratio of the explosion,” Dennis says.

All of the steam explosions were photographed using high-speed motion picture instrumentation. The optical data are analyzed and correlated with other measurements to give needed information about the explosions.

Experiments were also conducted in the test chamber at elevated pressure (1.1 megapascals, 150 psi) in order to test predictions that spontaneous explosions can be suppressed under these conditions. It was found that the spontaneous explosion was suppressed. However, when a trigger shock (small detonator) was applied, an explosion as vigorous as those at ambient pressure occurred.

The data collected led Dennis to the conclusion that there are similarities between steam explosions and chemical detonations and that experimental and analytical methods used in explosive work could be applied to the steam explosion problem. These observations were used by Dennis and Mike Corradini (4441) to formulate models which are being used to analyze the experiments. Mike is extending and improving these models as additional experimental data become available.

The work is also coordinated with an extensive small scale laboratory effort conducted by Lloyd Nelson (5836).

The results have been published in several SAND reports and delivered to NRC for incorporation into its reactor safety studies. The steam explosion studies being performed at Sandia are also being used by the Federal Republic of Germany in its reactor safety programs.

“Next,” Dennis says, “we will be melting more exotic materials called ‘coriums’ which contain various mixtures of materials which would be present at different times in a reactor core meltdown. These ‘corium’ materials will more closely simulate those expected in a molten reactor core. The fragmentation and the yield may be different in steam explosions using these materials. And we will be looking at larger quantities of melt to study scaling effects.

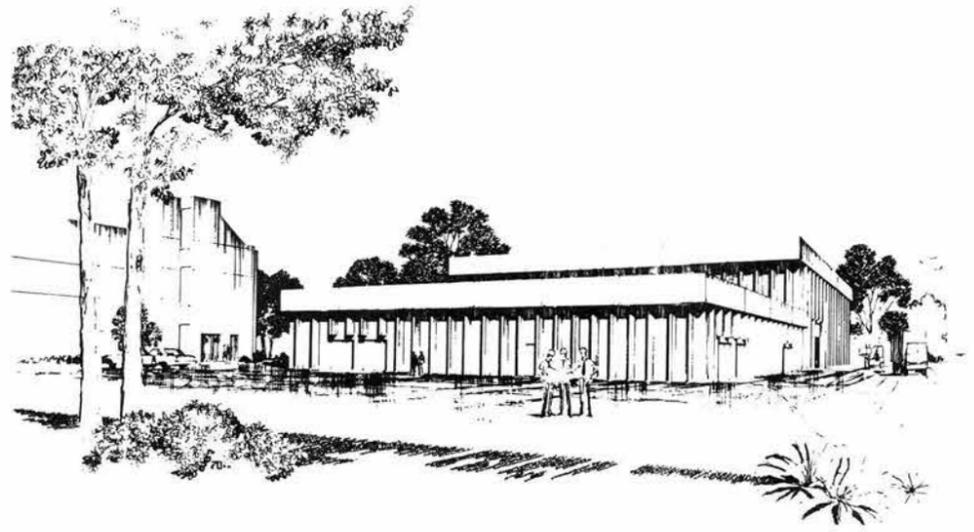


IN OPEN GEOMETRY a crucible (above) is readied for a steam explosion experiment in Area Y by Walt Nickerson and Carl James (both Ktech Corp.). The graphite crucible is designed to deliver the melt as a coherent mass into the water chamber.

“In the meantime, because our test facility was designed to be versatile, others are planning follow-on work which will include hydrogen combustion experiments and experiments which will study other modes of contact between molten fuel and water. We anticipate several more years of effort in this area.”



HOW THINGS BEGIN—With a small group in the early morning on the empty mesa, ground is broken by Gerry Yonas (4200, at right) for the Pulsed Power Research Lab. President Sparks, at left, was there to note the occasion.



Sketch shows structure, scheduled for completion in February 1982. Its 12,000 square feet will house both high and low bay areas. Site is just north of PBFA in Area IV.

Colloquium

The Sun & A Few Anomalies

A recent colloquium featured Eugene Parker from the Lab for Astrophysics and Space Research of the University of California speaking on "The Wily Sun." Our nearest star's wiliness consists in the puzzles it presents to observers; every bit of new data about the sun seems to unfold deeper mysteries.

Parker points out that the traditional view of the sun as a stable celestial orb doesn't square with our present knowledge that it does not exist in such an ideal state.

For instance, the sun possibly has become brighter within the last 40 million years. A change of even three or four percent in luminosity should have significant effects on Earth's weather. Calculations show that a reduction in luminosity would cool the Earth considerably, and in a few thousand years the oceans would freeze over.

What was the Earth like millions of years ago if the sun were estimated to have been one-third less luminous than it is now? The geologic record shows that it was never frozen over solid. One possible explanation: in earlier times Earth's atmosphere contained more carbon dioxide, producing a greenhouse effect which maintained life-sustaining temperatures. As the sun's luminosity increased, our atmosphere lost just the right amount of carbon dioxide to maintain life. Parker characterizes this delicate balance as akin to "walking a tightrope" and surmises that it would have "a profound effect on estimates of the number of planets that might be supporting life in the universe."

Parker then turned his attention to sunspots, revealing tables of sunspot activity going back a thousand years. His data come from Chinese, Korean, and Japanese observers, since not until the 17th century did astronomers in western Europe begin observing sunspots. (Sunspots may be seen with the naked eye at sunrise or at sunset in a cloudy sky. Be careful, retinal damage may result from staring at the sun.)

An absence of sunspots from 1645-1715 coincided with the "Little Ice Age" in the

northern hemisphere. Although sunspots are "cool" areas (they're magnetic fields erupting through the surface) that prevent heat from rising, the lack of sunspots in this period denotes an absence of solar activity, meaning no solar wind and, in turn, an increased cosmic ray flux on Earth. Although the effect on climate from sunspot activity is indirect, and the exact causal relationships are unknown, it is evident that Earth temperatures may rise—or decline—with the level of sunspot activity.

Astrophysicists are at a loss to explain why solar activity fluctuates. Some feel that magnetic fields might be created by non-uniform rotation—the convective zone

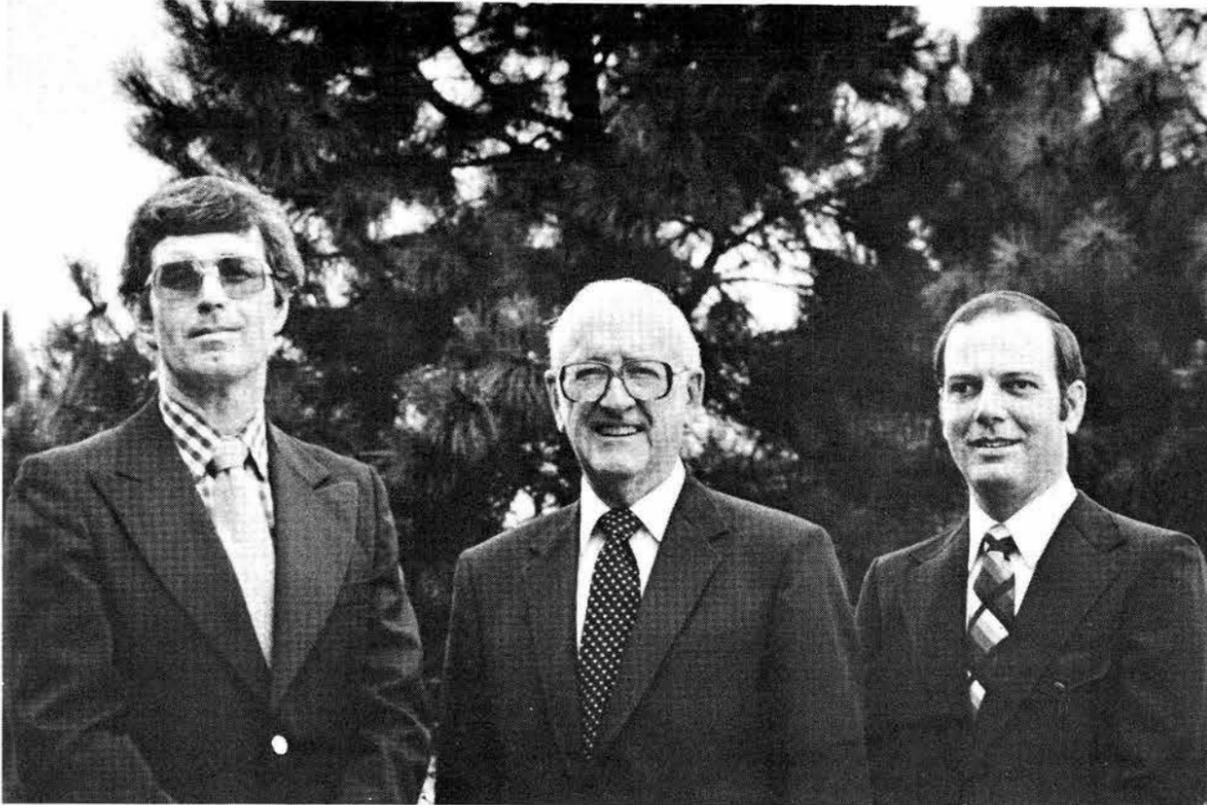
(upper layer) rotates in 25 days while the core (where the nuclear reaction takes place) might rotate in three or four days.

Another puzzle is the number of neutrinos detected from the sun—far smaller than various estimates have predicted. Parker hypothesizes that if the sun's interior turned over slowly (two or three times in four billion years), the production of helium would diminish which, in turn, would affect production of neutrinos. However, there's no explanation for what might cause the interior to turn over.

Parker does provide one reassuring note—the sun's life span is 10 billion years, and it's about halfway through it now.



DIDN'T RAIN & WASN'T HOT, so the first annual Tonopah Test Range picnic, held in Paradise Park in Las Vegas, was a success. Arranged by Bob Helgesen and Jim Enlow, the picnic combined forces—Sandia, EG&G, and REECo people from both TTR and NTS. Photo was taken by Diana Root, EG&G.



ROGER HAGENGRUBER (1310), JIM KELLY (3541), and KARL WIEGANDT (2457).

Supervisory Appointments

ROGER HAGENGRUBER to manager of Systems Research Department 1310 (newly created), effective July 1.

Roger's work, since coming to the Labs in July 1972, has been with systems research and systems studies in the weapons analysis directorate. He was promoted to supervisor of Systems Research Division 1251 in 1975. Major responsibilities in his new position include the performance of studies in a number of reimbursable areas.

Educated at the University of Wisconsin, Roger earned a BS in physics, a BS in American Institutions, an MS in physics, and a PhD in experimental nuclear physics. Before joining the Labs he was an assistant professor of physics at Western Michigan University. He is a member of the American Physical Society, the Albuquerque Committee on Foreign Relations, and serves as an adjunct professor of political science at UNM.

Roger enjoys skiing, woodworking, racquet ball and squash. He and his wife Donna have three children and live in NE Albuquerque.

* * *

JIM KELLY to supervisor of Position Evaluation and Job Classification Division 3541, effective July 1.

Since joining the Labs in February 1952 as an auditor, Jim has filled assignments in business methods, benefits, personnel, and position evaluation; most recently, he has been personnel representative for the 2000 vice presidency.

Jim earned a BS in economics from Marquette University and did graduate work in accounting at the University of Iowa. He and his wife Alice enjoy traveling. They have four children and two grandchildren and live in NE Albuquerque.

* * *

KARL WIEGANDT to supervisor of Project Design Definition Division VI and

Software Development 2457, effective July 1.

Joining the Labs in July 1968 as a draftsman designer, Karl worked on the W69 project, the multiple-code coded switch and, most recently, on the acquisition and systems development of MADDs (Machine Aided Design Definition System).

Karl earned his associate degree in drafting and design technology from Penn State. Under Sandia's EAP he obtained a BS in math from the U of A and, as a participant in the Labs' University Part-Time Program, earned his MS in computer science from UNM. Karl is a member of the Institute for Certification of Engineering Technicians and the Rio Grande chapter of the Association for Computer Machinery. He enjoys volleyball, bowling and motorcycling. He and his wife Elizabeth have two children and live in the NE heights.

Take Note

Dr. Karl Moedl, Albuquerque surgeon, will discuss recent advances in the diagnosis and treatment of breast cancer in Medical's Go For Health series on July 14. The lecture will be in Bldg. 815 (outside) from 12 to 12:30 p.m. and men, as well as women, are encouraged to attend.

* * *

The Que Pasa Rec Center is sponsoring an outdoor flea market at the Center on Sunday, July 12, from 1 to 5 p.m. Tables are \$3, and reservations may be made on 4-5420.

Congratulations

To Richard (2455) and Carmen Graham, a daughter, Lisette Marjorie, June 23.

To Brian (4553) and Chris Joseph, a daughter, Briana Christine, June 13.

Q. Would it be feasible to have a listing of new and deleted items in General Stores published with the first employees' bulletin of each quarter? Being knowledgeable about new items could be valuable to those of us who use desktop computers and to those who do a great deal of electronic bread-boarding and fabrication.

A. I believe we can best satisfy your request by posting regular monthly memoranda at the central Self-Service Stores location in Area I at T-51 and at the Stores' Issue Counter in Bldg. 887. These memos, "New Items Stocked by General Stores" or "Cancellation of Stock Items," will be posted on a bulletin board above the log-out desk in T-51 (southwest corner) and on a clipboard at the Issue Counter. The three most recent issues of these two monthly documents will be maintained at each location.

These listings are sometimes fairly extensive, so that issuing long, involved tabulations in a quarterly issue of the company bulletin would reach a large number of employees who may not have your same interest. We feel that the posting in the Self-Service Store, and at the Issue Counter, will reach our most interested customers.

Thank you for your suggestion.

J. C. Strassel—3700

Q. A heating coil ruptured in the attic of Bldg. 844 on the evening of May 15 allowing water and papier mache from the acoustical tile to pour down in Room 4, a primary standards calibration laboratory, as well as the hall. There was minor damage to sensitive equipment but the full extent of the damage could not be determined without examining the electronic equipment in cabinets exposed to the water drainage; the loss could have been considerable. Home phone numbers of lab personnel were listed on an emergency sign, but no one was contacted. Why are security and maintenance personnel not instructed to consult with concerned laboratory personnel when a serious problem like this occurs?

A. Security personnel normally do call the line organization when something goes wrong during nonoperational hours. We don't know why someone in your organization was not notified, especially when you have an emergency notification list posted.

In checking back over the shift activity report for May 15, we find that a security supervisor was notified by the security patrol of a leak in the ceiling of building 844. The security supervisor in turn notified maintenance personnel who stopped the leak, and the janitorial supervisor who had the area mopped up.

D. S. Tarbox—3400

SCORE Helps Local Business Firms

About 450,000 new businesses start in America each year. There are 400,000 failures—50 percent fail within two years, 90 percent within five years.

* * *

SCORE (Service Corps of Retired Executives) is a national volunteer organization working closely with the Small Business Administration in support of the free enterprise system. There are 350 SCORE chapters with more than 12,000 members.

In Albuquerque, the local chapter of 70 members is headed by Lou Paddison, retired Sandia director of QA. Six other retired Sandians are members of the group—Don Bliss, Bill Davis, George Felzman, Ed Herrity, Larry Neibel and Ted Swanson.

"Our job as SCORE members," Lou Paddison says, "is to offer our counsel and experience to business owners who ask for help. From our cadre of retired professionals we offer expertise and experience in any area of modern business from accounting, computer systems, banking and credit management to advertising and marketing.

"Since retirement," Lou continues, "Larry Neibel has become an expert in export marketing and the mechanics of import/export business. Don Bliss is an expert on energy conservation, George Felzman on government procurement, Ed Herrity on accounting and financial planning. Ted Swanson and Bill Davis are advisors to the Robert O. Anderson graduate school of business at UNM helping students perform business analyses. These skills and experience are available along with others. And we're volunteers—our counsel is free."

Local SCORE members took on about 1000 "clients" last year. The largest category was service organizations—child care, bookkeeping, service stations, auto repair shops, landscaping—followed closely by retail businesses and restaurants.

The degree to which SCORE members become involved in the client's business depends on the client. SCORE service has ranged from designing accounting systems to designing production machinery. These were unusual cases—the SCORE rule is to show the way, let the client do the work. Most of the help is in the form of information. The SBA provides more than 250 publications on specific subjects such as tax structures, depreciation tables, and how to do business with the federal government.

During the winter months, SCORE presents monthly one-day workshops for people considering going into business.

"On the average," Lou says, "SCORE volunteers spend about one day a week on SCORE business. We have a desk to man here at SBA headquarters, 5000 Marble NE, and a volunteer is available every weekday morning. We also provide advisors at UNM five days a week at the business school. Our volunteers are performing analyses at our clients' business



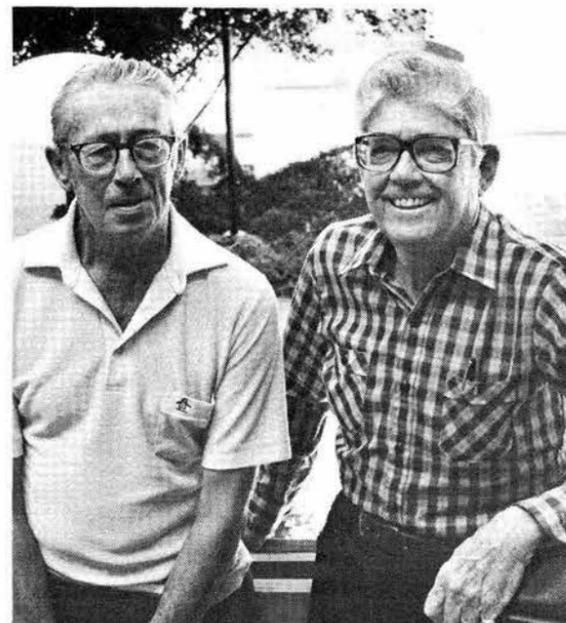
RETIRED SANDIANS who are now active in SCORE include George Felzman, Don Bliss, Ed Herrity and Lou Paddison, chairman of the local chapter.

locations. There are meetings and consultations. We can become very involved."

SCORE records show that most businesses in New Mexico fail primarily because of lack of management know-how (90 percent). Almost half of new business owners enter fields where they lack experience or competence. They are over-optimistic about New Mexico markets, keep inadequate records and have inadequate working capital.

On the positive side, business success reflects the owner's individualism, personal energy and imagination coupled with an understanding of financial record keeping, credit management and observing basic business principles.

"Small business employs more than 40 percent of the nation's work force," Lou says. "And if a business is successful, it's good for all of us. The local community is stronger; the national economy is stronger."



SCORE MEMBERS Ted Swanson and Bill Davis work with UNM's graduate business school as student advisors.

The satisfaction of working with SCORE is that we make a contribution—our work counts for something.

"When you retire, you're suddenly faced with a very real feeling of loss—the work you did meant something but now that you're retired, you're just supposed to pursue pleasure. That's fine but only up to a point. It still helps to feel that you're making a contribution. SCORE provides that opportunity."

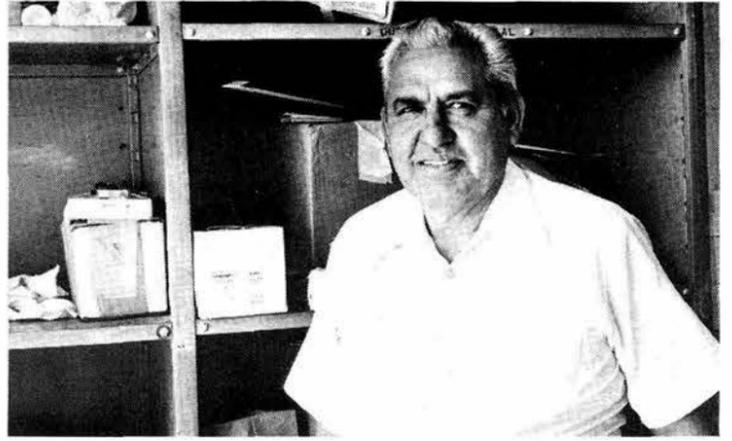
Events Calendar

- July 10—Navajo rug auction, Crownpoint, NM, elementary school, 7 p.m.
- July 11—UNM's Klaus Keil speaks on "Jupiter, Saturn and Their Moons: Results of the U.S. Voyager Fly-Bys," Alpha Centura, Albq. Federal Savings & Loan, 4901 Central, 7 p.m.
- July 11, 15, 24—Santa Fe Opera, "La Boheme"; July 10, 17—"Il Barbiere Di Siviglia"; July 18, 22—"Daphne," 9 p.m., Opera Theater.
- July 12—Arts in the Parks: Old Town Plaza, "Fiesta Day," dancing, poetry, and performance by La Compañía de Teatro de Albuquerque; July 19—Roosevelt Park, "Fantasy Day," music—jazz to bluegrass; 2-5 p.m., no charge.
- July 13—Lecture Under the Stars: "Search for Evidence of Noah's Ark," 8 p.m., UNM Union Ballroom; July 20—"Frontier Women," Central Mall, 8 p.m.
- July 16-19, 23-26—"Godspell," musical, Albuquerque Civic Light Opera Association, 8:15 p.m., 19th & 26th, 2:15 p.m., Popejoy.
- July 18-19—Santa Clara Pueblo: eight northern pueblos Artists and Craftsmen Show, dances, food booths.

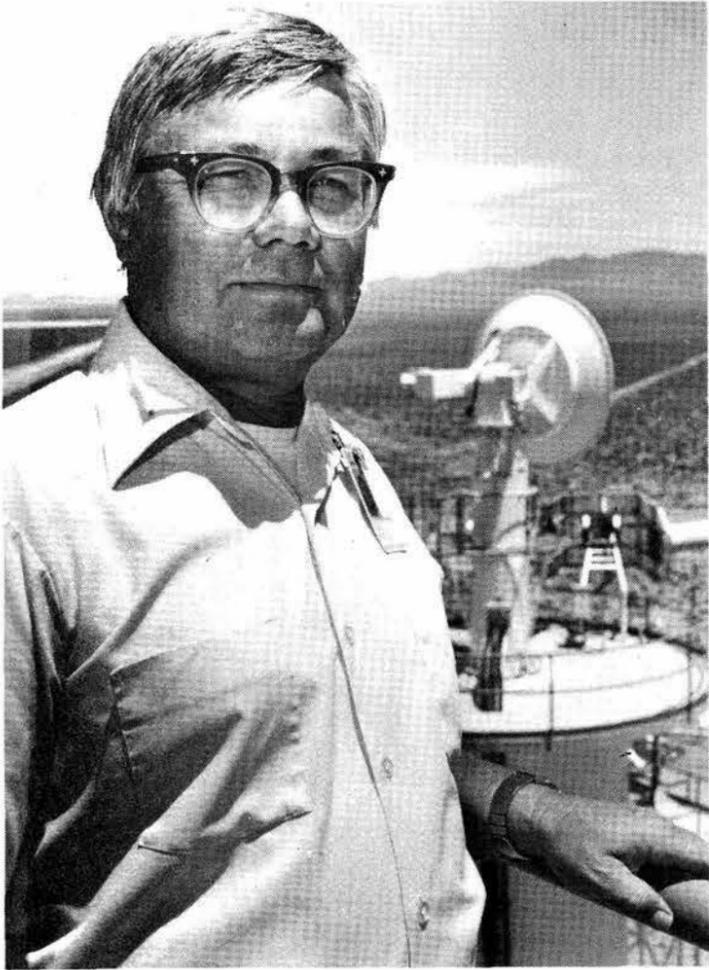
MILEPOSTS
LAB NEWS
 JUNE 1981



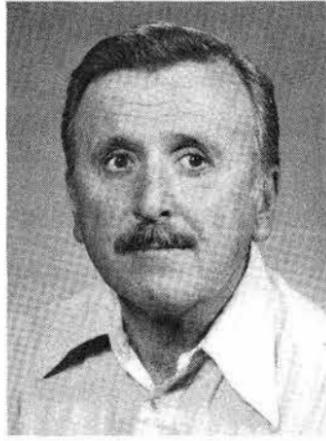
Betty Sherred - 3255 25



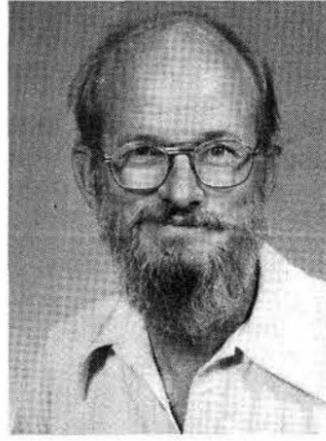
Marcos Martinez - 3423 25



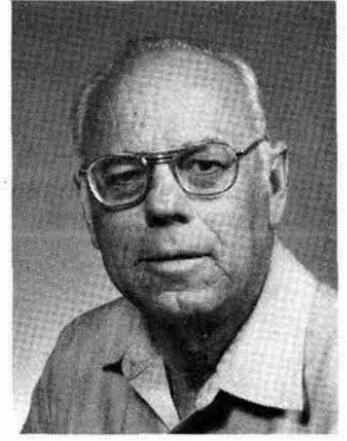
Henry Stuckert - 1171 25



Ed Kociscin - 2458 20



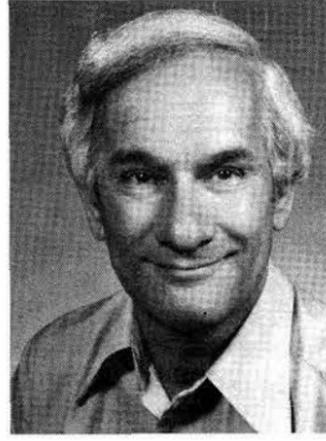
Lew Suber - 1754 20



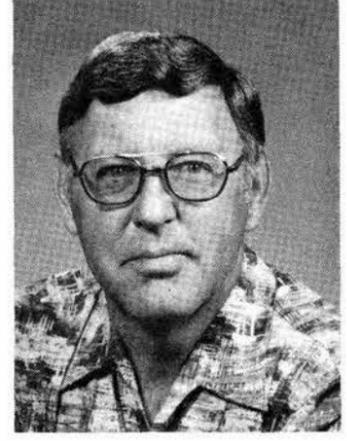
John Irwin - 5652 25



Robert Frazer - 1523 20



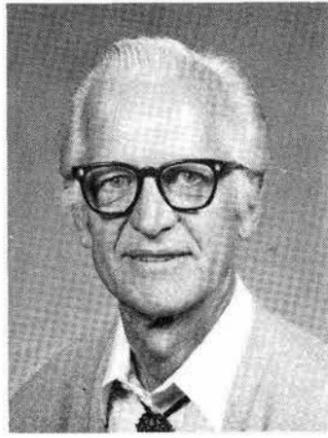
Robert Holt - 1754 20



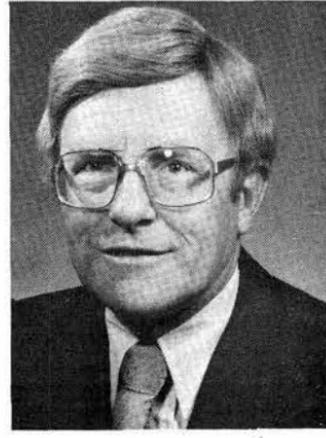
Fred Pfeffer - 1135 30



Vi Salas - 3252 25



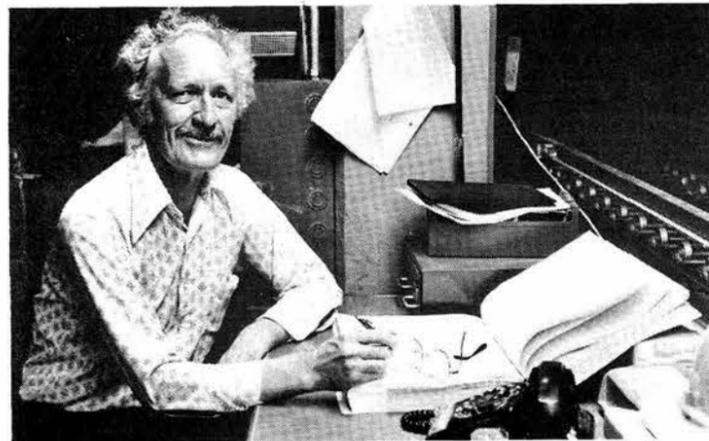
Chester Ricker - 3542 30



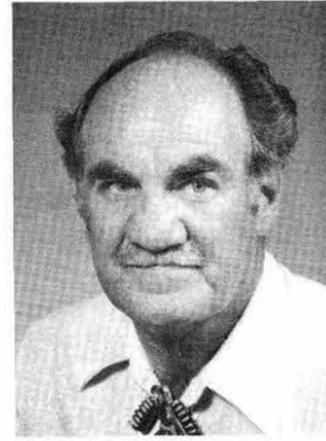
Marv Torneby - 3531 20



Dale Landis - 2455 25



Joe Sanchez - 3742 25



Leland Pierce - 2521 25



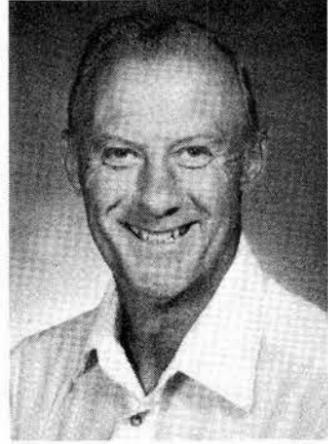
Carl Smith - 2458 20



John Lloyd - 4342 25



Gene Copeland - 1543 30



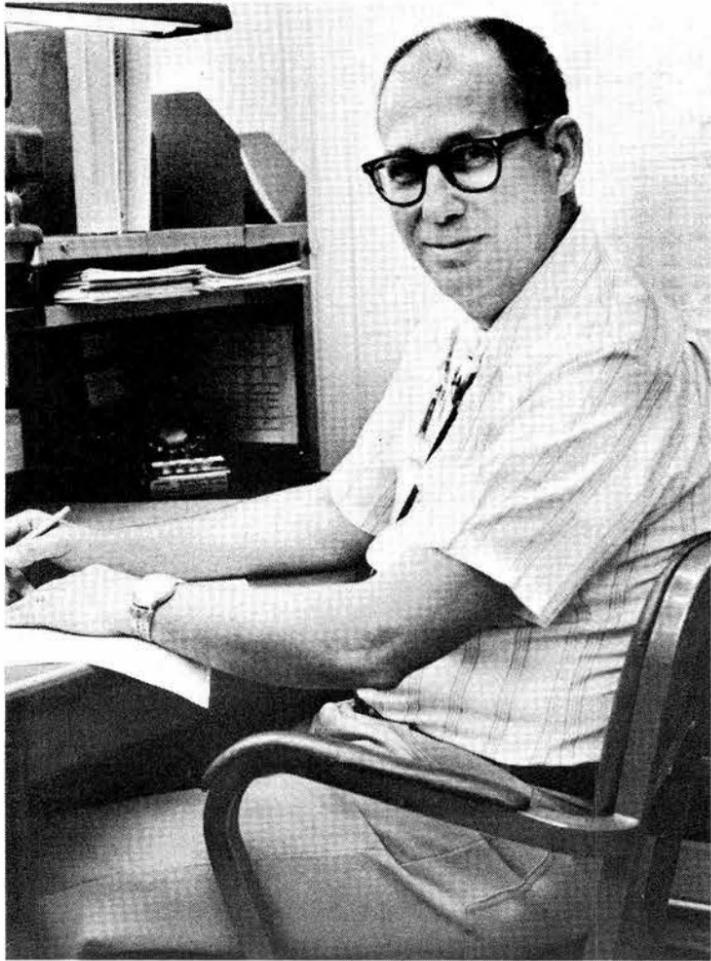
George Perkins - 2516 20



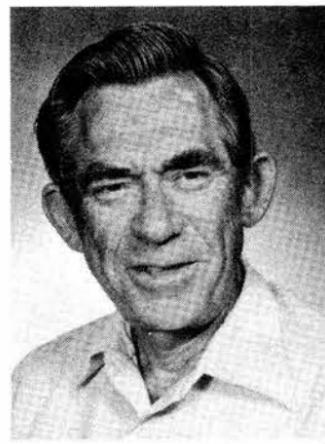
Charley Zaffery - 1246 20



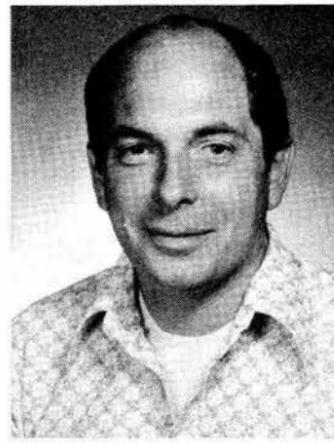
Dell Gutierrez - 3618 15



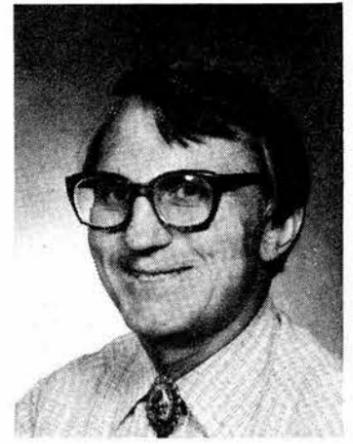
Ed Lane - 2332 25



Stan Howard - 1725 30



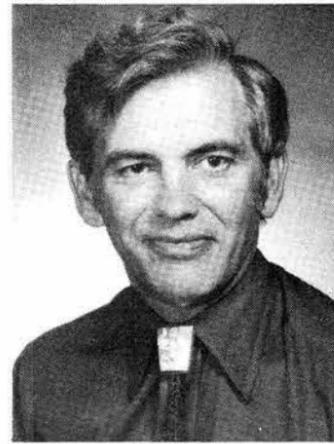
Bob Wemple - 5836 20



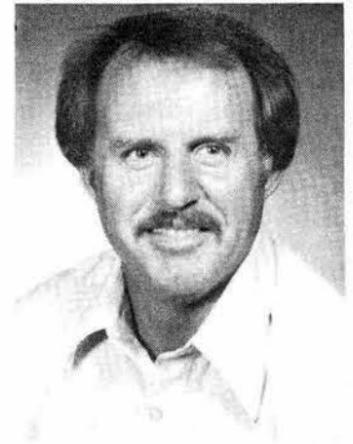
Don Arquette - 2342 25



Pete Rand - 5813 20



Matt Gubbels - 4543 20



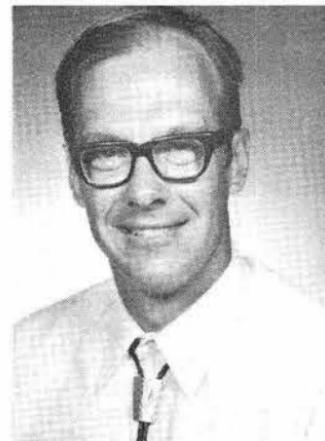
Gene Lisotto - 4342 20



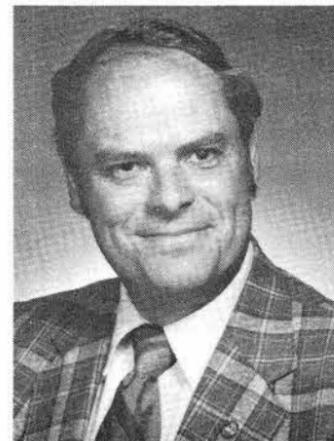
Jay Holton - 3652 15



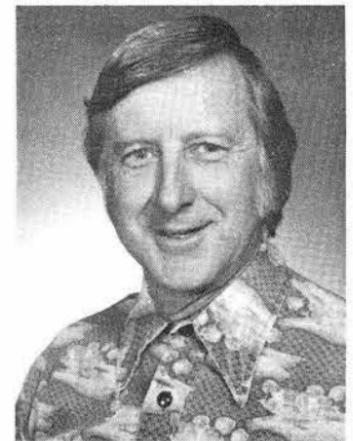
Lewis McEwen - 1132 25



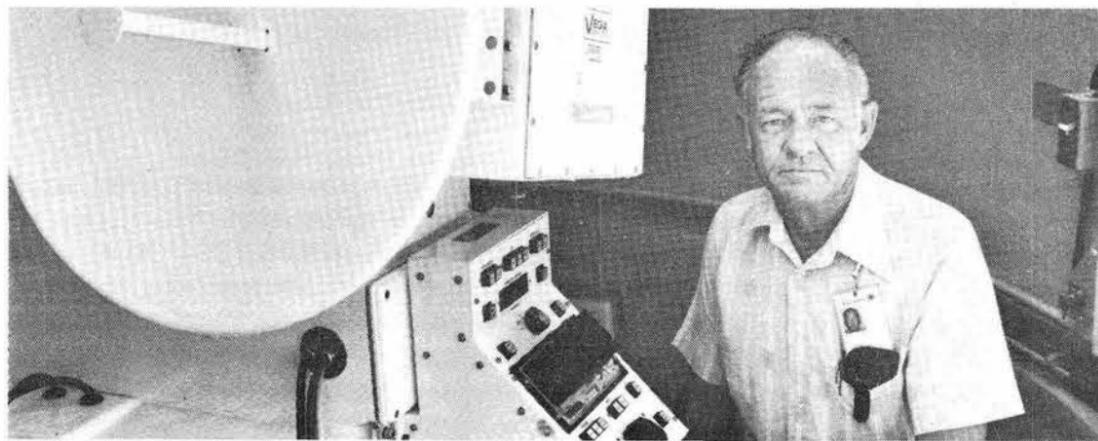
Stewart Kohler - 2326 15



George Wright - 5633 20



Milt Zimmerman - 1762 25



Addison Cockrill - 1172 25



Stewart Ingram - 1556 25

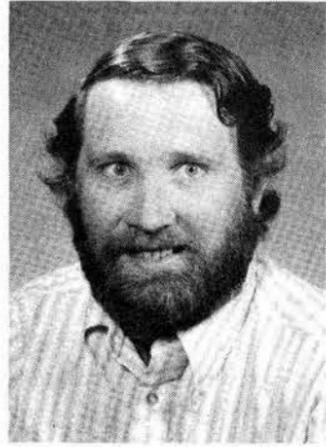


Sam Jeffers - 4315 25



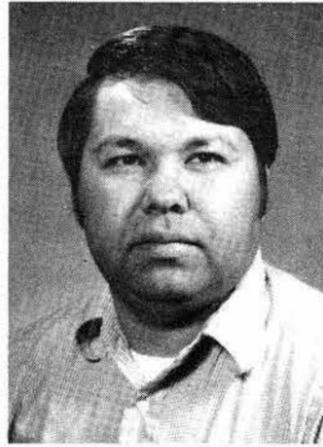
Jack Leroy - 1721

25



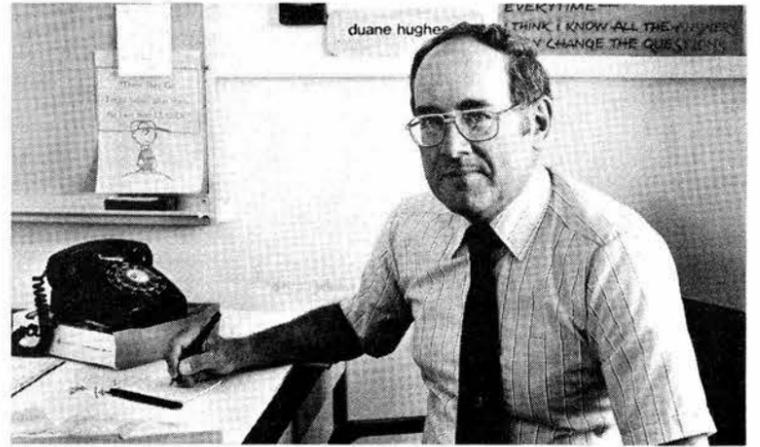
Robert Hughes - 5152

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George Laguna - 2524

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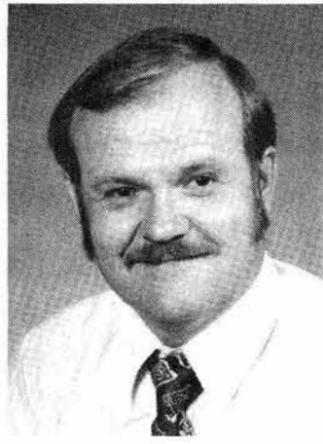
Duane Hughes - 3521

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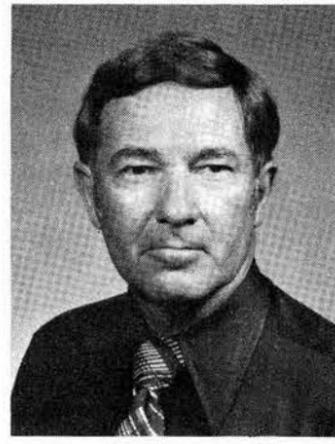
Richard Orzel - 1172

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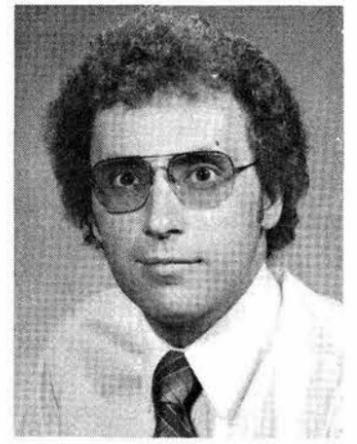
Jim Jorgensen - 2115

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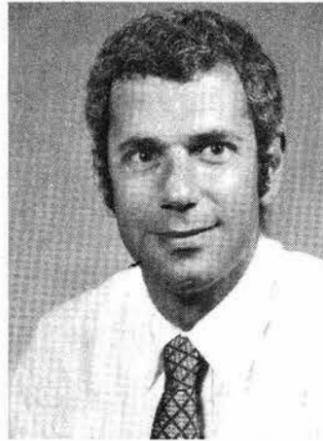
Don Lundergan - 1262

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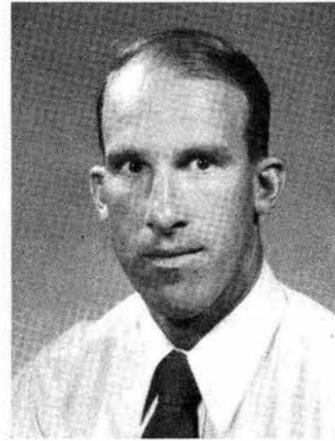
Tom Philbin - 3715

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Richard Palmer - 400

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Paul Mix - 4242

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Dick Ballard - 8212

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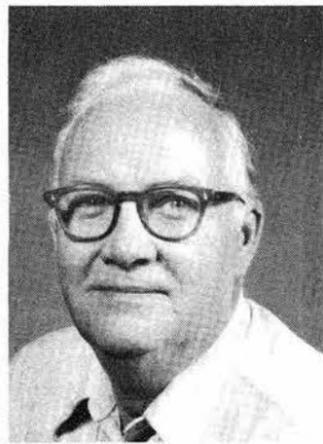
Roger Abbott - 1581

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Jay Grear - 1232

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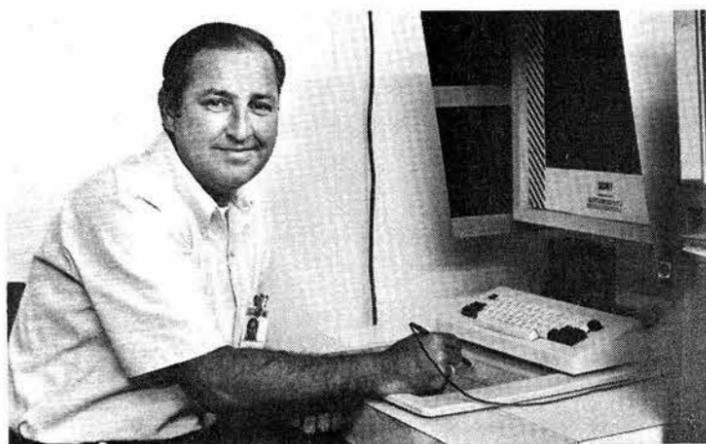
Phillip Young - 4315

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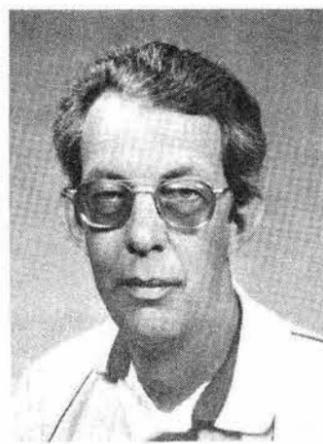
Dewey Berry - 2436

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Bill Drozdick - 2454

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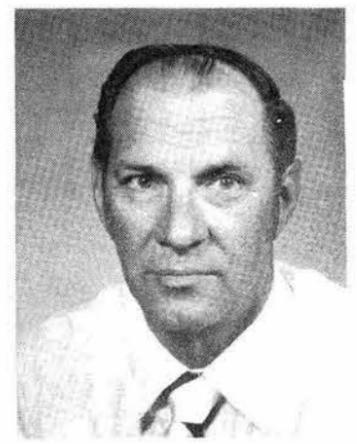
Richard McKnight - 1751

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John Rosborough - 2166

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Don Burns - 2323

25

Fun & Games

Running—At the TFA/USA National Masters Track Meet last month, Jim Schirber (5150) came away with two national championships, winning both the 800 and 1500 metre events in the age 50 to 55 category. The meet was held in Atlanta, Georgia.

Hobby show—The Que Pasa Rec Center is sponsoring a hobby show on Saturday, July 11, from 1 to 4 p.m. You may enter your hobby in the show or just come out to see what's on display. Ribbons will be awarded. Contact: 4-5420.

Shooting—The Labs Rifle & Pistol Assn. collected some 10 awards in the 1981 NIRA-NRA Rifle and Pistol Matches. The .22 pistol team, Dave Bennett (4414), K. K. Ma (2331), Bill Stephenson (2355), and Dick Vivian (1211) won third place among 32 competing teams. Bob Davis (4221), along with Bennett, Ma and Vivian also placed in the individual .22 pistol competition among 184 competitors. In the precision air rifle match, Dave Overmier (1535), Don Bliss (ret.), and Joe Curzi (2432) were individual winners in a field of 57. Ray Mosteller (1132) and Dave Bennett received individual awards in the precision air pistol match among 84 entries.

My Favorite Old Photo



In 1916 on the western front in France, fighting for the Kaiser, Papa was captured by the French. German POWs were treated harshly. When the United States entered the war, some American soldiers happened by his POW camp and tried to strike up conversations with the German prisoners. The French guards would have none of this, whereupon the American soldiers turned on the guards and taught them some manners. Papa was so impressed by this that he resolved to emigrate to the United States, which he did following the war. He settled in the German section of Manhattan in New York and, since he had been a *conditorei* (a baker of fine pastries) in his native Bavaria, opened this shop at 80th St. and 2nd Ave. in Manhattan. This photo, taken in 1930, shows Helen (my mother) and August Postenrieder in the doorway of their shop. (Emery Postenrieder, 3532)

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

CLASSIFIED ADVERTISING

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

RULES

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

MISCELLANEOUS

LAB NEWS has lots of new books & several years' of vintage *Playboys* & caps & T-shirts. MO-125, next to Bldg. 814.

SOFA, traditional, flowered, 96" x 34"; stereo AM-FM console w/cassette recorder, player, Sears; fireside chair, olive green, 25" high. Bureta, 292-5421.

1973 8' OVERHEAD CAMPER, for LWB, sleeps 4-6, 3-burner stove w/oven, sink, table, 5-gal. butane tank, jacks, outlet for 120v w/12v back-up, \$500. Wilfred, 255-8288.

CAMPER SHELL, fits short narrow box, \$275; dune buggy, needs transmission work, as is \$800; dishwasher, port., new, \$275. Griego, 281-5851.

MAYTAG clothes dryer, elec., white, \$75. Gubbels, 884-3711.

RIMS & TIRES, alum. w/tires B60-13, \$60 pair, F60-14 chrome, \$25/pr.; antique tub, \$100. Erdman, 292-0258.

FREESTANDING fireplace, \$25; workbench, \$25; rooftop TV antenna, \$15; acoustic tile, \$10; Arizona junipers, \$1 ea. Mozley, 884-3453.

FREEZER, 14 cu. ft., \$75. Meyer, 296-9066.

TWO extra long twin, genuine foam rubber mattress sets, \$60 for one set, \$100 for both. Urevitch, 299-7046.

CAMPER SHELL, LWB, \$50; crib, \$50; toddler car seat, \$25; infant car seat, \$15. Blaine, 883-2865.

BEDROOM SET, white, dresser, mirror, nightstand, headboard, mattress & box springs, \$225 firm. Cano, 296-6955.

KENMORE port. dishwasher, harvest gold, butcher block top, \$175. Vasquez, 243-4944 or 898-3005.

SOLID cherry buffet or stereo cabinet, \$450. Madsen, 294-3235.

OVAL POOL, 25x16x48", needs liner, w/filter, safety ladder, deck, \$350 as is, buyer takes apart. Valdez, 298-2654, 5:30-10 p.m.

PUSH TYPE lawn mower, \$25; baby scale, \$3; baby clothes, 25 cents to \$1. Simons, 821-9343.

HAM TRANSCEIVER FT-101-2D mike, fan, DC-DC converter, \$800. Nogle, 299-3863.

FACTORY repair manuals for '76 Toyota Celica, 6 manuals, \$10. Russell, 292-3279.

TABLE SAW w/saw blades & attachments, shaper & wire brushes, \$80. Moulds, 247-8433.

FURNITURE, 2 households: sofas, tables & chairs (maple & modern), bedroom (dbl. & twin), chairs, tables, lamps, etc. McIlroy, 299-4977.

PORT. ELEC. typewriter, \$75; Sanyo movie camera, zoom, auto. load, \$100; movie projector, \$95; paint sprayer, Black & Decker, \$25. Eagan, 281-5696.

SEARS Kenmore model 70 auto. 2-spd. washer, 8 push-button cycle selector, \$75. Brion, 298-1761.

ROWING MACHINE; air hockey game; ski rack for CJ7; women's 26" 5-spd. bicycle; pottery, misc. Cox, 293-5518.

AKC Norwegian elkhounds, male & female, Parvo & D.M. shots, born 5/5/81, 40 champions in pedigree. Flora, 281-5919.

3-PIECE corner living room set, turquoise & gold, \$250. Aragon, 265-9109.

JOHNSON 3 HP outboard motor, low hours, \$175; pickup tire chains, 7.50x16, used once, \$30. Schneider, 299-6243.

REFRIGERATOR, 17 cu. ft. white Frigidaire. Peters, 293-6356.

SOLID OAK dining table, 48x34", extra leaf, 4 matching upholstered chairs, carved design on all, \$275. Dalphin, 265-4029.

HIDE-A-BED sofa, 7' queen-size. Ronan, 268-0726.

GARAGE SALE: July 11-12; blouses, size 16; patch quilt material; yarn; cast iron kitchen sinks; kitchen utensils. Meidal, 520 Calif. St. SE, 255-6690.

274 SHARES of Rio Grande Valley Bank stock, current value \$12/share or best offer. Hansen, 898-3544.

CRAFTSMAN paint sprayer, 1/2 hp compressor, 1 qt. sprayer, \$35. Worrell, 299-0381.

POOL filter parts, Sears; bag of diatomaceous earth; gas heater; cement mixer; see, make offer. Liguori, 256-3613.

RECEIVER, 4-band, National NC-60, w/phone output, standby switch, bandspread tuning, etc., \$40. Hughes, 299-6674.

ROADRUNNER travel trailer, 17', self-contained, sleeps 6, elec. & butane refrig., 4-burner stove w/oven, thermostat control heater, 2 butane bottles, \$1750. Jaramillo, 1-864-8491.

STEREO SPEAKERS, Ultralinear 210, 3-way, 12" woofer, 4" mid-range, adj. hi-freq. knob, PB, CKT, BKR protection, \$199 pr. Johnston, 299-1830.

TWO bunk beds w/mattresses, \$50; bookcase bedframe w/o mattress, \$25. Fitzgerald, 884-4607.

'72 JAYCO Eagle tent trailer, sleeps 8, \$1700. Beattie, 898-2706.

DOG HOUSE, hand-made, for medium/lg. dog, \$50. Krafft, 881-3486.

PHOTO LEITZ enlarger, etc.; silver-smithing acetylene tank, etc.; elec. VTVM, etc.; mech. pipe wrench, etc.; trailer window awning. Cundiff, 256-0043.

DISHWASHER, J. C. Penney, avocado green, \$75. Auerbach, 296-1489.

REG. SHELTY puppies, 4 mos. old, \$125. O'Malley, 294-8337.

S&W MODEL 27, 8-3/8", .357 magnum, 3T, w/presentation case, \$350; wing (AMF) hunting bow, accessories, \$65. Ma, 883-4438.

OPEL shop manual, 1974, \$6.50. McIntire, 884-3709.

TRANSPORTATION

BICYCLE, motocross-style, Mongoose BMX frame, worth \$200 new, \$80 or best offer. Walters, 293-5381.

'73 FORD Pinto, 4-spd., white w/green trim, \$1000. Combs, 296-7244.

'74 MONTE CARLO, PB, PS, AT, AC, maroon & silver, \$1500. Barber, 884-4969.

'76 10 1/2' cabover camper, fully self-contained, refrig., sleeps 6, swamp cooler, 8tk., on '74 3/4-ton Chevy pickup w/aux. gas tank. Hansen, 898-3544.

10-SPD. Raleigh men's bike, new tires & tubes, 23 1/2" frame, tourist saddle, \$100. Coffin, 265-4187.

'80 RENAULT-5 (le car), 19,000 miles, \$4000, beige, tinted glass. Bergeron, 292-7490.

'76 COUGAR, silver, AT, PB, PS, \$2000 firm. Vasquez, 243-4944 or 898-3005.

YAMAHA DT 400 Enduro, rebuilt engine, new back tire, 55 mpg, \$850. Jacobs, 292-6174.

'71 INTERNATIONAL Travelall, V8, AT, PS, PB, AC, \$1000. Wheat, 865-5505.

'78 YAMAHA XS-750 special, fairing, luggage rack, padded backrest, alarm system, recent engine overhaul, \$1995. Hesch, 881-9874.

'72 DATSUN 510 wagon, recently replaced valves, rings, radiator, brakes, shocks, battery, muffler; 114,000 miles, snow tires, wheels, \$1800. Camp, 281-5020.

'78 HUSQVARNA 3900R dirt motorcycle, rebuilt engine, lights, speeds, \$975. Boyer, 842-0262.

'72 INTERNATIONAL Travelall, 390 cu. in. V8, tow pkg., AC, PS, PB, AT, dual tanks, \$2000. Anthes, 884-3644.

'77 DIESEL Rabbit, AM-FM radio, sunroof, sell below NADA retail blue book, or consider trade for VW Westfalia camper. Clark, 296-3924.

TRACTOR, Gravely, walk behind, 7 hp, elec. start, w/rotary plow, tiller, tool bar, blade & furrower, \$750; dune buggy, runs, but needs work, \$250. Wray, 299-0530.

SCHOOL BUS, '71 Ford, 66-passenger; '77 Layton travel trailer, 23' fully self-contained. Tolbert, 869-2507, 869-2729.

'78 HONDA 750 f Super Sport, many extras including Quicksilver fairing, oil cooler, new tires, etc., \$2000. Bailey, 299-0184.

'80 PONTIAC Grand LeMans, loaded, \$5600. Gallegos, 881-1363.

REAL ESTATE

FOREST PARK LOT, next to National Forest, water system, covenants, below appraisal, owner finance. Eagan, 281-5696.

WINROCK Villa Condo, assumable

mortgage, low down, luxury efficiency, all kitchen appliances. Scott, 881-5349 or 898-8385.

PASSIVE SOLAR, Cedar Crest, 3-bdr., redwood house w/brick floors, greenhouse, on half acre, 6 mos. old. Blankenship, 281-2733.

NE HTS. 3-bdr., 1 1/2 bath, garage, sprinklers, covered patio, mid-50s. McClelland, 293-6313 or 884-9133.

LITTLE TURTLE townhouse, 1226 sq. ft., 1-bdr., den, fp, garage, tennis & pool, below appraisal. Burd, 884-9133 or 293-6313.

2 ACRES, sell or trade, zoned for horses, 1 mi. north of Tanoan CC & west of Sandia Hts. in North Abq. Acres, \$14,900 each. Monette, 345-0404.

10 ACRES near Juan Tomas, covered w/trees, southern exposure, \$2250/acre. Baack, 296-2312.

WANTED

MINI-MOTOR HOME to sleep 5 or more. Hansen, 898-3544.

RADIO CONTROL for RC model airplane, 4-channel. Harley, 898-0594.

CAMPER, cabover, 8 1/2-9 1/2' w/toilet, in good condition & clean, Mitchell preferred. Cronk, 892-1729.

SPARE WHEEL & tire for small trailer, tire size 4.80x8, 1-piece wheel & hub. Dunton, 892-5678.

DRIVE MY CAR to Chicago or northern Indiana first week of Aug. Heath, 255-7230.

5-HOLE 12" wheels for trailer; amber & red running lights. Worrell, 299-0381.

ENGINEERING & scientific instruments, old but serviceable or repairable, such as sextants, transits, theodolites, anemometers, balances, scales, barometers. Hughes, 299-6674.

SHARE-A-RIDE

ALTERNATE RIDERS needed for Paradise Hills-Taylor Ranch to I-40 Vanpool. Call Babb, 898-8591, Champion, 4-RIDE.

LOST

IN-EAR TYPE HEARING AID. Ehrman, 281-3976.

Steak Tonight, Dragon Mañana

TONIGHT at Happy Hour the buffet spread features 8-oz. New York steak and all the trimmings. A group called Crosswinds hold the bandstand.

TOMORROW at Variety Night, *Pete's Dragon* is the movie and it's free to members and families. A super supper is available starting at 5 p.m., the movie starts at six.

NEXT FRIDAY, July 17, the Happy Hour buffet is a seafood special with shrimp, scallops, oysters, fish and lobsters. Family Reunion plays for dancing. Make your buffet reservations by mid-week and don't forget to use your calendar discount coupon which is good for \$2.50 off the top for the buffet cost.

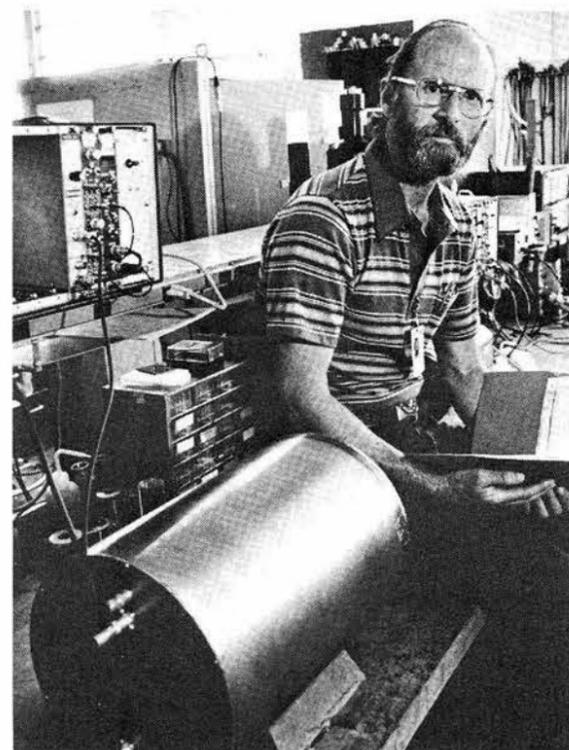
TRAVEL DIRECTOR Frank Biggs (4231) reports a change in the charter bus trip set for Labor Day weekend. The plan now calls for leaving on Saturday, Sept. 5, for Carlsbad, visiting Carlsbad Caverns, seeing the Desert Botanical Gardens, lunching on the bus and staying at White City with a chuckwagon dinner that night.

On Sunday, Sept. 6, you visit the New Cave and then go on to Juarez for the rest of the day. That night is spent in El Paso with a late checkout Monday morning. In the afternoon, you tour White Sands and return to Albuquerque. The price is \$109 per person. A deposit of \$50 is due now, the balance by Aug. 4.

Time is running out for signup for the Cumbres-Toltec tour July 26. This is a two-bus and train combination, Frank says, where you go to one end of the scenic railroad by bus, ride the train across the mountain, and come home on the second bus. The price is \$42 (\$30 for children 11 and under) and includes snacks and refreshments on the bus up and back. Frank needs a full signup by July 16. A repeat of this same package is set for Sept. 26.

Other trips include: Gallup Indian Ceremonial, Aug. 8, \$28; Las Vegas, Nev., Sept. 13-16, \$110; Canyon de Chelly, Oct. 24-25, \$78; Mazatlan, Nov. 2-9 and Nov. 9-16, \$369; and the Caribbean cruise, Dec. 13-20, \$1031.

See Frank in the lobby tonight between 5 and 7 p.m. for complete details.



INVENTOR ED JACOBS (2352) uses his new arsenic activation neutron detector (in foreground) to count DD neutrons at 2.5 MeV. The device recently received a patent.

Patent Awarded For Neutron Detector

DOE was recently awarded a patent for an arsenic activation neutron detector invented by Ed Jacobs of Applied Technology Division 2352.

For years, Sandia has developed pulsed neutron generators for weapon applications, and the instrument for measuring neutron output has been the lead counter, perfected in the mid-1960s. Earlier, an instrument called the silver counter was used, but it was slow and inefficient.

The lead counter, now a secondary standards instrument, is particularly useful in measuring DT (deuterium-tritium) neutron outputs at 14 MeV. When the Labs began investigating DD (deuterium-deuterium) neutron generators at 2.5 MeV in connection with our work on the cancer tube, the lead counter was of no use—it is insensitive to neutrons of this energy. The old silver counter could be used but it is still slow and inefficient.

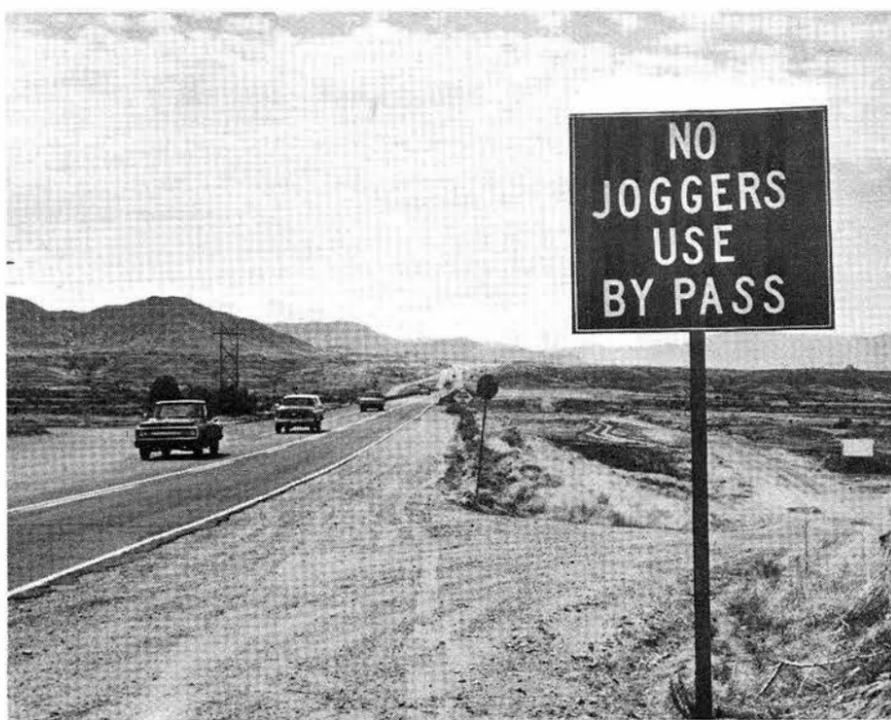
A laboratory instrument to measure the DD output quickly and conveniently was needed.

Ed started with the periodic table, looking for a material with the desired response to a pulse of DD neutrons at 2.5 MeV. A number of materials underwent testing and it was determined that powdered arsenic, when encapsulated in a polymer, had the desired characteristics.

The new detector is composed of a layer of the encapsulated arsenic which receives the neutron output from the DD generator. The neutrons activate the arsenic which then decays by gamma emission. The gammas are counted by a scintillator-photomultiplier and associated electronics. The half-life of an arsenic gamma reaction is 17 milliseconds.

Ed's laboratory instrument can be modified for production testing. In the meantime, it can be used to count both DD neutrons and DT neutrons.

QUESTION: Is this sign, which you see near the bridge over Tijeras Arroyo, (a) an assertion, as in "No joggers use by pass and few of them shower as well," (b) a lament, as in "No joggers use by pass, alas, alas," (c) a philosophical insight or (d) the answer to an earlier question put to a laconic individual: "Hey, do the joggers use the bridge?" We like the theory that it's a secret communication between roving bands of cattle mutilators.



"Oh no, Marie and I feel that depriving him of his self defense would be unnatural."