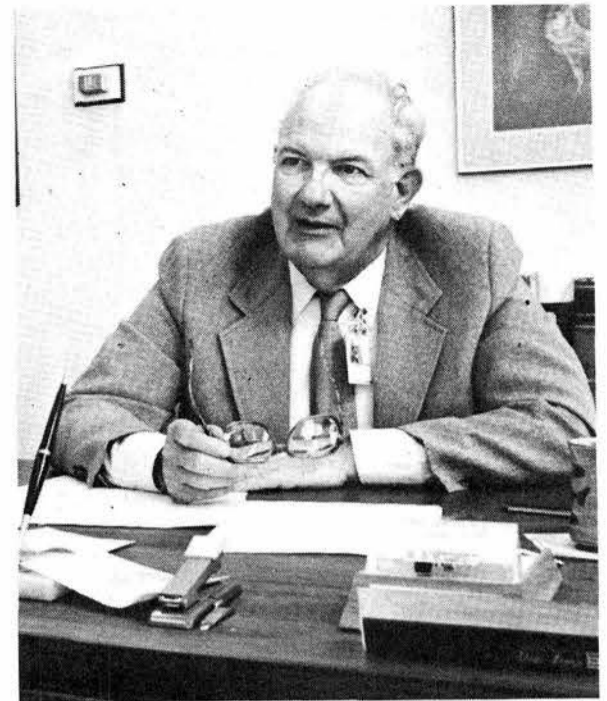




PRESIDENT DACEY and LAB NEWS editor Bruce Hawkinson.



Dacey on Reorganization

Thinking Long Term And Thinking Short Term

[Ed. Note: LAB NEWS recently interviewed President George Dacey to discuss the June reorganization. The interview, while it ranged a bit beyond purely reorganizational issues, is not intended to be a "State of the Labs" message, a message to be covered in a future issue.]

SLN: You surprised some of us when you announced the appointment of two executive vice-presidents, rather than one, last spring. What led to that decision?

GCD: In general, the reorganization was triggered by the retirement of former Executive Vice-President Jack Howard. It was my observation—and that of Jack and Morgan Sparks—that their arrangement was particularized for the two of them. They had similar responsibilities; each

could act in the absence of the other. And if there was any division of activities, it was that Morgan tended to represent the company on the outside, and Jack inside. That's a very common organizational pattern. But it seemed to me it was time for a change.

SLN: Your managerial philosophy is different then?

GCD: I prefer, wherever possible, to have crisply defined responsibilities and authorities. Rather than two people having similar responsibilities, I like a hierarchical structure. So I was seeking a way to give people direct reporting responsibilities, which meant then that I wanted to have the vice-presidents report to the executive vice-presidents.

SLN: How does such a reorganization

help Sandia to do its job better?

GCD: There are two major functions that Sandia, or any company, has to accommodate: One is the thinking, planning and activities that assure the performance of current responsibilities and commitments. In our case, that means weapon design, work in energy, and other activities for the nation. The second function is to look at the long-range future of the company. It's been my observation that if you put those two activities—thinking long term and thinking short term—in the same organization, they can interfere with each other. The long-term thinkers are often pressed into service to solve short-term problems. And so a degree

[Continued on Page Six]



Instrumented Seabed Penetrometers

Seeking the Secrets of Sediments

Two prototypes of seabed penetrators that can be shot deep into the ocean floor to gather data about marine sediments have been successfully tested in the Gulf of Mexico.

Developed by the Exploratory Systems Division III 5627 for the DOE, the 8-foot-long, 8-inch-diameter Instrumented Seabed Penetrator (ISP) can be fired up to 150 feet into the sediments by an underwater gun positioned just above the ocean floor. ISP grows out of terradynamics (earth penetration by high-speed projectiles), a part of our weapons program.

The ISP, designed to operate in water up to 20,000 feet deep, carries instruments that can obtain information useful for oil

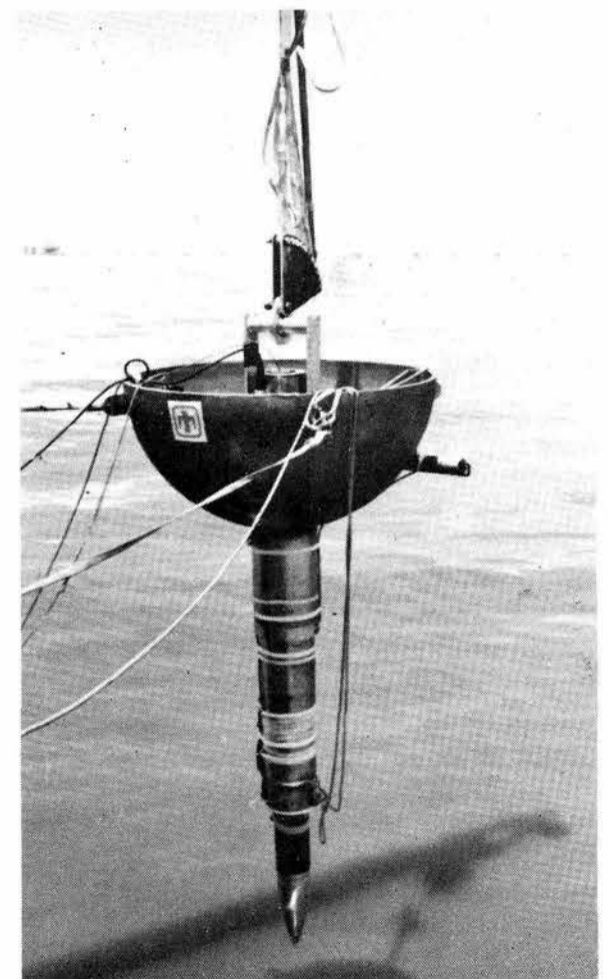
and gas exploration, design of off-shore structures, and defense-related activities such as sonar development and employment.

It also is being considered for use in subseabed radioactive waste disposal site studies and for emplacing solidified high-level waste in geologically stable sediments.

"The ISP could serve as a broad survey tool to pinpoint sites for sediment coring," says Tom James (5627), ISP project leader. "This would make coring, an expensive, time-consuming process, more efficient."

The two ISP prototypes tested in 70 feet of water just south of Venice, La., carried substantially different instrumentation packages. ISP-1 contained a Sandia-

[Continued on Page Five]



GOING DOWN—ISP-1 heads for the Gulf floor 70 feet below. After being fired 90 feet below the floor, the unit detonated small explosive charges to report the penetration depth and to provide data on sound speed and attenuation through sediments.

Antojitos

Creating a Public Nuisance--While that term has other meanings in the legal world, I'm referring to advertisers, sign painters, and, yes, newspaper copy readers who perpetrate graphic injustice upon all of us, not the least of which, of course, are our impressionable youngsters, striving mightily (it is hoped) to learn the One Right Way to spell English. While this diatribe was caused by noting a temporary sign on Eubank advertising SLOLUM WATER SKIS, I tend to wax more wroth over permanent signs--ones offering to paint MERCEDES automobiles or luring you to eat some LASANGA or stop at the PENQUIN lounge. I also become incensed (though I don't smell like it) when both our local dailies report that an Artesian woman (yes, west coast friends, we have genuine Artesians here) was arrested for "wreckless" driving.

I'll stop now, as I realize that I'm tempting the fates that have, in the past, caused LAB NEWS to refer to President George "Dacy" and to wish everyone a MERRY CHISTMAS. ●BH

Con la vara que midas, serás medido. (With the rod that you measure, you will be measured.)

Colloquium

Hans Bethe Urges Nuclear Arms Limits

"The number of strategic weapons in the world has gone beyond all reason," Hans Bethe told a Sandia colloquium audience in a packed Base theater last week. A Nobel laureate, teacher, nuclear physicist pioneer, holder of the Enrico Fermi Award, and political activist, Bethe was introduced as "one of the most thoughtful analysts of technology and society" by EV-P Tom Cook. Recently retired from Cornell University after a 40-year association, Bethe continues as a lecturer and consultant to the weapons program.

His point in the Sandia talk was that an agreement on strategic nuclear arms limitation is long overdue. He feels the best hope for an agreement in the near future would be a re-negotiation of the SALT treaties in the hope of reducing the allowable numbers of nuclear weapon delivery vehicles by a third or, better yet, by half.

With charts comparing the current U.S. and Russian strategic nuclear arsenals, Bethe emphasized that the U.S. is not in an inferior position.

As a matter of fact, he said, the U.S. nuclear submarines and soon-to-be-stockpiled cruise missiles are essentially invulnerable and extremely accurate. The Russians, on the other hand, have invested more than two-thirds of their arsenal's power in land-based ICBMs. He said such land-based missile sites are vulnerable.

For this reason, he said, the U.S. does not need the MX in any shape or form. An attack on a land-based missile site would probably be successful, and the resulting fallout would be disastrous to the population.

He noted that only one-quarter of the U.S. nuclear force is in land-based missiles and these, he felt, are a liability. "We don't need land-based ICBMs," he said.

"On the other hand," he continued, "if I were a Russian strategist, I would be very much afraid of the U.S. nuclear submarines and cruise missiles. They are virtually invisible and unstoppable."

He said that any advance in weaponry brings an automatic response from the other side. The Russians may be four years behind in nuclear weapons technology, but essentially the strategic forces are even. "The only way to stop the momentum in the arms race is by agreement," he said. He noted the growing world-wide peace movement and said, "The time is now to halt the arms race."

"Both SALT treaties were good ones," he went on, "and they limited the arms build-up, stopping the momentum of the race. A side benefit is that the treaties allow no new silos for missile launch sites. And they establish a standing commission where both sides may lodge complaints."

Bethe feels President Reagan's proposal for a new arms limitation treaty that would limit the number of warheads would be hard to verify--"How many warheads in a MIRV?"

He thinks that the SALT treaties, with their emphasis on limiting the number of weapon delivery vehicles, would be more acceptable since the Russians have in-



TOM COOK (20) briefed Joyce Freiwald, technical consultant to the energy research and production subcommittee of the House Science and Technology Committee, on Sandia's energy and weapon programs before she toured several facilities in Areas I, IV, and V.



MEETING THE MEDIA before his colloquium address is Hans Bethe.

dictated a desire to negotiate from standing agreements. He believes a new SALT treaty could be negotiated and in a reasonable amount of time.

Bethe was much concerned about a Pentagon proposal to limit "spy satellites." "We must have our eyes," he said. "Limiting them is unthinkable. They are absolutely vital in any monitoring of an arms limitation treaty."

Sandia Takes CQ/WE Contest

A Sandia team of ham radio operators emerged number one in a recent CQ/WE contest among 66 teams in the Western Electric and Bell Systems. The idea was to see who could make the most radio contacts with other contestants during a 48-hour period.

The Sandia team scored 143,907 points with Jim Baremore (9251) accounting for 75,362. Jim was also the top individual scorer in the contest.

Coordinated by Pete Havey (0324), the team included Ed Graham (2112), John Long (7523), George Kaye (9742), Bob O'Nan (2345), Len Parsons (7424), Don Holck (2123), Mike McLaughlin (9751), Frank Dean (9254), and Jack Webb (2340), as well as Baremore.

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How To See Through Soot

Dave Ottesen of Exploratory Chemistry Division 8315 has developed a Fourier transform infrared spectrometer system to identify chemical components of coal combustion in a dirty gas environment.

"We've never had a satisfactory way to identify molecules present in a combustion reactor full of soot and fly ash," says Dave. "The presence of particles in the gas phase is very deleterious to most optical techniques. Our infrared approach is relatively immune to such interference; it provides a direct correlation between the infrared frequency and the molecules' vibrational energy levels. In this way we get a spectrum that tells us specifically what molecules are present. In some cases we can also determine their concentration and temperature from the infrared data.

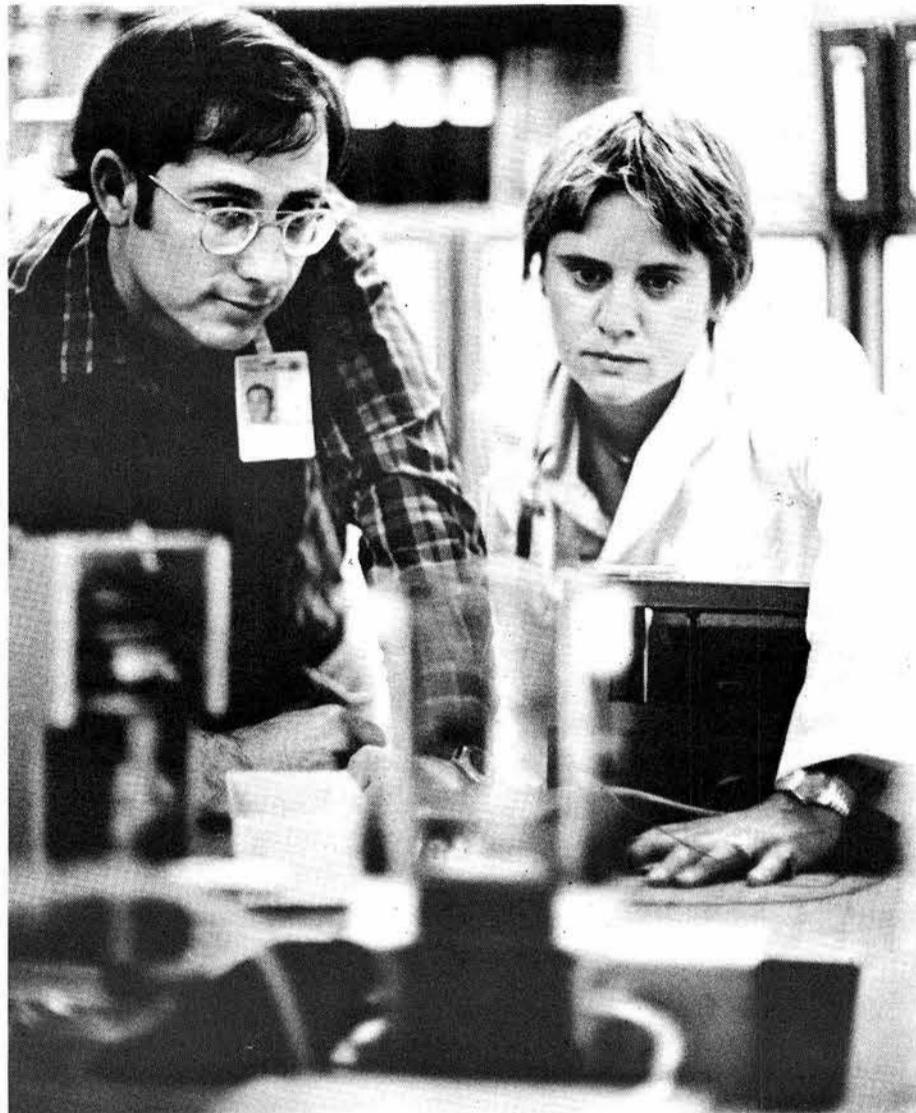
"First we had to determine whether or not the infrared technique would work. In the initial test, Dave Stephenson (8511) and I looked at a highly sooting kerosene lamp flame. This is a thoroughly dirty environment, so we weren't very hopeful of seeing a signal when we focused an infrared beam through the flame. To our delight, we were able to measure a modulated infrared signal—we could detect the presence of small molecules like water, carbon monoxide, and carbon dioxide as well as hydrocarbons."

The results of this test were sufficiently encouraging that the two joined with Ken Hencken (8521) to design and build a burner to look at gaseous hydrocarbon fuels combusting under sooting conditions. Building the burner turned out to be a "monumental job"—Ken had to make three burners before getting one that worked properly.

"Using the new burner, we focused an infrared beam on the flame and moved the burner up and down to study the chemical reactions along the line of the beam in different parts of the flame," explains Dave. "We measured temperatures up to 1700 kelvin, and we found maximum formation of unsaturated hydrocarbons at a flame temperature of 1400 kelvin. This is important because these hydrocarbons might be precursors of soot. Results like this help us understand how soot is formed in flames and suggest ways to reduce formation."

A major new direction for Dave's research is to apply the infrared technique to the study of coal combustion. Larry Thorne (8315) has joined Dave in this work, and they are being assisted by Karen Siegfriedt (8313). "The chemistry of coal combustion is incredibly complex," explains Dave. "We're trying to answer such questions as—what are the combustion products, their concentrations and temperatures, and how are these related to the unreacted fuel? Just recently, we showed for the first time that usable broad-band infrared data can be obtained from a flow reactor that is burning pulverized coal particles."

The spectroscopic information provided by absorption of the infrared probe beam



OBSERVING A FLAME created by combusting coal are Dave Ottesen (8315) and Karen Siegfriedt (8313). A Fourier transform infrared spectrometer, developed by Dave, focuses an infrared beam through the flame to identify chemical components of combustion.

as it passes through the stream of burning coal is detected and digitized. Since the spectrometer system uses an interferometer, the resulting data have to be Fourier transformed by a dedicated mini-computer to yield a spectrum of infrared absorption as a function of frequency. The mincomputer also controls the operation of the interferometer and the collection of data.

"We just obtained a second interferometer that's specially designed for this work," says Dave. "Our laminar flow reactor is quite similar to one being used in Department 8520's Coal Combustion Laboratory. I expect to combine my method with other analytical techniques being developed in the Combustion Directorate, such as measuring particle sizes by laser, to give us a better overall picture of coal combustion.

"We hope our infrared data will give us additional insight into the processes which produce fouling and slagging products as well as unwanted sulfur and nitrogen oxides. Our results might lead to optimizing variables such as the coal grinding process, and the temperature and composition of the gases in the reactor during combustion.

"There's a whole forest of variables in this work, but the data we obtain will eventually help tell us how to produce cleaner-burning fuels."

Take Note

Ken Tschritter (8412), a hobby viticulturist in Livermore, recently entered some of his homemade wines in the Amateur Winemaking competition at the Alameda County Fair. Ken captured two prizes—a first place for his Johannisberg Reisling and second place for his 1978 Ruby Cabernet. Among the panel of nine judges for the winetasting was Barry Schrader (8212).

Sympathy

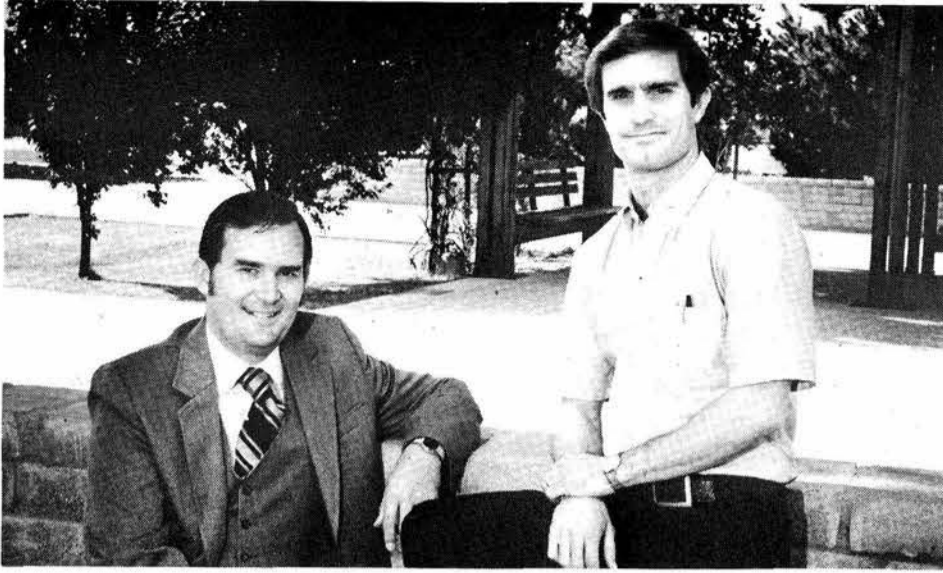
To Stan Serpa (8262) on the death of his sister in Gustine, Calif., June 11.

To Ray Gott (8315) on the death of his mother in Woodland, Calif., June 17.

Retiring



Alyce Joyce - 8414



LARRY GRUBE (2451) and PAUL YARRINGTON (5533)



TED LUERA (9451) and ALLAN BENJAMIN (9411)

Supervisory Appointments

LARRY GRUBE to supervisor of Design Definition Division I 2451, effective July 16.

Larry joined Sandia in 1966 as a draftsman, following his graduation from Penn State University with an associate degree in drafting design and technology. In January 1975 he became Sandia's quality assurance representative at the GE plant in King of Prussia, Pa., for the MHW heat source used in the Voyager I and II spacecrafts. Larry returned to the Labs' drafting group in 1977. His most recent assignment—evaluating three-solids modellers—was with a software development group (2457).

In December 1980, Larry received his BS in ME from UNM; he's presently working on his master's degree. Larry enjoys camping, volleyball and softball. He and his wife Lydia have two sons and live in NE Albuquerque.

* * *

PAUL YARRINGTON to supervisor of Computational Physics and Mechanics Division II 5533, effective July 1.

Joining the Labs in 1974 as a member of the technical staff, Paul was assigned to the group that he now supervises. Since 1979, he has been with the Light Water Reactor Safety Research and Development Division 4443 as a program manager for DOE-funded research.

Paul received his education from the University of Illinois. He has an MS in nuclear engineering and a BS and PhD in theoretical applied mechanics.

Paul and his wife Marsha have three children and live in NE Albuquerque.

* * *

ALLAN BENJAMIN to supervisor of Nuclear Systems Technology Division 9411, effective July 1.

Since coming to Sandia in 1977 as an MTS in the nuclear reactor safety group, Allan has worked on heat transfer analyses; more recently, he's worked on systems analysis, serving as project manager on three programs supporting the work of the NRC.

Allan earned his BS in aerospace engineering and MS in ME from Brown

University. He received a PhD in ME from UCLA. He is a member of ASME.

Allan is a former concert pianist but for the past several years has played the piano only for his own enjoyment. He also enjoys biking, skiing, and traveling. He and his wife Gail have two children. They live in Glenwood Hills.

* * *

TED LUERA to supervisor of Reactor Applications Division 9451, effective June 16.

Since joining the Labs in April 1980, Ted has been an MTS in the Neutron Effects Simulation Staff 4450A. Before coming to Sandia, he worked at White Sands Missile Range as a project engineer in the Nuclear Weapons Effects Laboratory and, for seven years, as reactor supervisor at the WSMR fast burst reactor.

Ted received his BS and MS in physics from the University of Chicago and his PhD in nuclear engineering from UNM. He is a member of ASTM and IEEE. He enjoys racquet ball and four-wheel driving. Ted lives in Taylor Ranch.

'Put a Little Weekend in Your Life'

Fairs, Festivals, Fiestas & Feast Days

During the month of August, New Mexicans have a wide choice of places to go and things to do, just to get away for a day or a weekend. Many of these celebrations honor a religious or historic event, others mark the passing from one season to another, and some—well, it just seemed like a good time to get together.

Following is a list of events taking place throughout the state during this month. Inquire from local chambers of commerce for more specific information. Some Indian events occur on weekdays; however, many activities continue through the evening. Call local pueblos for information.

6-8—*Lincoln*: 14th Annual Old Lincoln Days. Pageants depicting events of the Lincoln County War, parade, fiddlers' contest, arts and crafts fair, food booths, ghost town tours.

9-10—*Picuris Pueblo*: Annual San Lorenzo Feast Day. 9th: Sunset dance, 10th: dances, foot races, pole climb.

10—*Acoma, Cochiti, Laguna Pueblos*: Annual San Lorenzo Feast Day. Corn dance, Acoma. Grab day, Laguna and

Cochiti.

12—*Santa Clara Pueblo*: Annual Santa Clara Feast Day. Corn, Harvest, Buffalo or Comanche dances.

12-15—*Belen*: 189th Annual Our Lady of Belen Fiesta. Masses, parade, carnival, dances. Late afternoons, Our Lady of Belen Parish.

12-15—*Los Alamos*: Arts Festival, all day, evening, Fuller Lodge Arts Center.

12-15—*Gallup*: 61st Annual Inter-Tribal Indian Cermonial. Indian sports and rodeo, 2:15 p.m.; dances, 8:30 p.m. Games, demonstrations, exhibits, all day. 13th: All-Indian parade, 10 a.m. Red Rock State Park.

13-15—*Las Vegas*: San Miguel County Fair.

13-15—*Socorro*: Fiesta de San Miguel, all day, San Miguel Mission.

14-15—*Chama*: 39th Annual Chama Days. Parade, rodeo, arts and crafts, dances, food booths and barbecue. All day, Rodeo grounds.

14-15—*Raton*: Street Arts and Crafts Fair. All day, Courthouse grounds.

15—*Zia Pueblo*: Annual Our Lady of

Assumption Feast Day. Corn dance.

19-22—*Bosque Farms*: 43rd Annual Bosque Farms Fair. Exhibits, horse shows, fiddlers' contest. Rodeo Assn. Arena.

20—*Crownpoint*: Navajo Rug Auction. Crownpoint Rug Weavers Guild, 7 p.m., Crownpoint Elementary School.

20—*Santa Fe*: Wheelwright Museum Auction of Indian rugs and other Indian art. Summer benefit. Preview: 10-noon, Auction: 1 p.m.

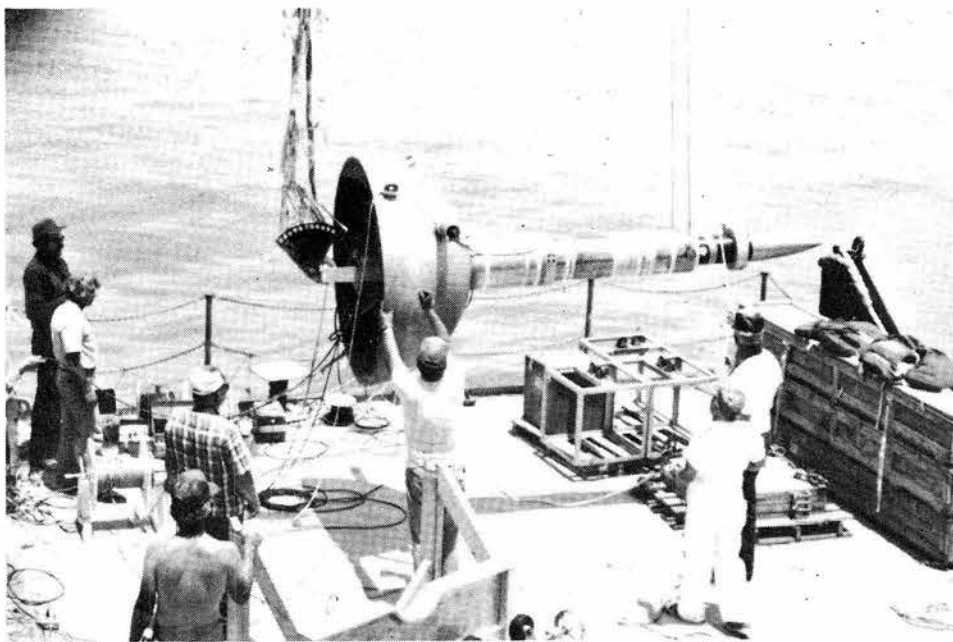
20-22—*Zuni Pueblo*: Zuni Tribal Fair. Parade, rodeo, dances, games, arts and crafts, barbecue, all day, Fairgrounds.

21-22—*Albuquerque*: Feria Artesana. Outdoor festival celebrating visual, literary, and performing arts of the New Mexico Hispano. Tiguex Park.

21-22—*Santa Fe*: Indian Market. Juried Indian arts and crafts show and sale. All day, Plaza.

21-29—*Los Alamos*: Los Alamos County Fair. Parade, rodeo; 25th: Nostalgia Night, 7 p.m., Fuller Lodge Arts Center.

28—*Isleta Pueblo*: San Agustin Fiesta. Spanish fiesta, carnival, concessions, no dances.



HEADING OUT and over the side of the "jack-up barge" (a boat with 135-foot jack legs that permit it to stand on the Gulf floor) is ISP-1. Looking on are (from left) a member of the barge crew, Don Argyle, Dan Talbert, Stan Kurowski, Tom James, Gerry Beard, Jack Bahlman, Jim Gallagher, and Jim Trentham. (Photos by Wayne Hancock, 3153)



GETTING DOWN to the work at hand—attaching a load-cell to the line used for recovery of the ISP-2 telemetry package—are Jack Bahlman, Ray Wood, Jim Gallagher, and project leader Tom James.

Continued from Page One

designed package that calculated penetration depth (90 feet) and provided data about sound wave propagation through sediments. Specifically, ISP-1 housed an axial accelerometer, an analog-to-digital converter, a microprocessor, and an explosive acoustic telemetry system (EATM) that transmitted data to hydrophones placed at known seafloor locations. Wires linked the hydrophones to shipboard computers.

As the unit entered the sediments, data to determine penetration depth were gathered by the accelerometer and integrated by the microprocessor. When the penetrator stopped, these data were transmitted from the EATM to the hydrophones as acoustic signals generated by the detonation of minute (sub-gram) amounts of explosive powder. The time intervals between the detonations were proportional to the distance traveled by the penetrator.

Arrival times of acoustic pulses at different hydrophones, located increasingly distant from the penetrator, revealed how rapidly sound traveled through the sediments. Pulse amplitudes at the different hydrophones established acoustic-attenuation—the ability of sediments to absorb acoustic energy.

Sound speed and attenuation play a role in locating deeply-buried oil and gas; attenuation also affects sonar transmissions.

ISP-2's package contained an accelerometer and solid state memory that stored projectile deceleration data for surface interpretation. These data contribute to an understanding of sediment strength and other characteristics, information that could be used for design of off-shore structures like oil rigs, and to studies of sediments being considered as a disposal medium for radioactive wastes.

The gun used to propel the 750-pound ISP 125 feet into the seafloor was designed by Sandia and is based on a gun used by the Navy to secure anchors in sediments. Its five-foot-diameter reaction vessel contains a breech plug, firing mechanism, and combustion chamber for M6 propellant. The penetrator fits into a four-foot-long, 12-inch-diameter barrel attached to the

Sediment Secrets Sought

reaction vessel.

Lowered to the seafloor, the gun fires either by mechanically sensing the sediments or by receiving an electrical signal from the ship. Water depth and expected soil strength determine the amount of propellant required to achieve desired depths. Impact velocity is typically about 300 feet a second (225 mph).

"All major goals were accomplished during the field test," said Tom. "Equipment performed as designed, actual penetration depths closely paralleled predictions, and information about sediments

in the test region was increased."

The credit for the success of the test goes to Ray Wood (1582), Tom Oakes and Jim Trentham (both 1583), Stan Kurowski (2514), Jose Suazo, Jack Bahlman, and Jim Gallagher (all 5653), George Reis and Wayne Young (both 5621), Don Argyle and Terry Calloway (both 5627), Horace Lucero (5632), Carl Sprague, Gerry Beard, Toby Garcia, and Charlie McInnis (all EG&G). The program is headquartered in Tom Edrington's (5627) division. Sandia's sled track and horizontal actuator were used extensively in preparing for the test.

Colloquium

Vehicles That Stroll, Not Roll

Walkers!

*With a shock of recognition, the officer identified the Empire's All Terrain Armored Transports. Each machine was formidably armed with cannons placed on its foreside like the horns of some prehistoric beast. Moving like mechanized pachyderms, the walkers emitted deadly fire from their turnstile guns and cannons.**

Although we're not exactly at the state where an army can place an order for a few hundred metallic beasts like the fictional ones described above, surprisingly sophisticated "legged vehicles" or "walking machines" are being developed. This was the message delivered in a recent colloquium entitled "Robot Vehicles for Rough Terrain Locomotion" by Robert McGhee of Ohio State University.

"Fifty percent of the land surface of the earth is inaccessible to wheeled vehicles," he says, "while nearly all of it is accessible to humans or animals on foot. A disadvantage of wheeled vehicles is that a wheel tends to dig itself into the ground—especially when climbing a steep grade. Humans and animals are much different—our legs and feet enable us to climb much steeper grades than can any wheeled vehicle because loose soil piles up at the back of the foot instead of the front."

*Donald F. Glut, *Star Wars: The Empire Strikes Back* (New York: Ballantine Books, 1980), p. 53

Conventional vehicles for off-road locomotion typically employ either tracks or wheels attached to the vehicle body by a passive suspension system. In contrast, man and animals achieve locomotion through systems of articulated levers, individually powered and flexibly coordinated—an arrangement that permits rapid adaptation to terrain irregularities.

The present generation of legged vehicles began in 1963 with an eight-legged machine. However, since this was before micro- or minicomputers were available, the human operator had to control all of the machine's complex movements. In 1964, McGhee approached GE with an idea for a legged vehicle controlled by an autopilot. Finding no interest, he went home and by 1967 had built one in his garage. Christened "Phony Pony," it was the first electronically controlled walking machine—a true robot with no operator interaction.

McGhee is now working on a six-legged "Hexapod" vehicle with 18 joints—three per leg—that should be operational in 1984.

"There are as yet no commercially successful walking machines equipped with electronics," says McGhee, "but we're working on it."

Just watch out for Luke Skywalker—he can lasso 'em to the ground!

Thinking Long Term and Thinking Short Term

of organizational separation is, I think, healthy. Many companies have the research department, for example, report through a separate chain of management outside the development activities.

So we wanted to have two organizations, one responsible for our current output, and one that looks toward the longer term. If you look at the resulting organizations, that's essentially what we have. Tom Cook has reporting to him all of the current programs in both energy and weapons, in both Livermore and Albuquerque. His job, among other things, will be to integrate the activities of the Laboratories irrespective of geography. I think that, by and large, we've done that over the years; for example, we don't duplicate in Albuquerque the work on tritium that's done in Livermore, and we don't duplicate in Livermore the work that's done on components in the 2000 organization. But perhaps we can go even further. I think that Tom, with his long and thorough knowledge of Livermore and his career-long experience in the weapon program—at Albuquerque as well as Livermore—is in a great position to do that. So, his responsibility is to assure that our commitments are met and that we do so with the greatest efficiency among our various locations.

SLN: How about Al Narath's role?

GCD: Al's job is partly to oversee the work that supports these output programs, but, additionally and importantly, to focus on the longer term. For that reason, he has the research area and the component development area, where a lot of the futuristic activities will take place as we go toward very large-scale integrated (VLSI) devices. He also has Organization 300 reporting directly to him, at his choice, because he wants to take a personal hand in its activities. Its responsibility, among other things, is to plan explicitly for the longer term technical activities of the company.

SLN: I'm glad you mentioned that. Why is it that Organization 300, the old 1300 group, was plucked out of the fold and made accountable directly to Mr. Narath?

GCD: Well, in addition, of course, we added Andy Lieber's organization (5610) to it. The 300 organization has two responsibilities that are interlinked, and I think that putting them together is important. One is the assessment of the world situation, what the threat is, and what the Soviet capabilities are. The second responsibility is to think about the system implications that this threat and counterthreat situation leads to—what kinds of new capabilities are feasible, and what kinds of things should the nation and the company be looking toward.

SLN: Do you see Sandia becoming involved with conventional weapon systems?

GCD: I would rather say *integrated* nuclear/conventional systems. My opinion rests on the following observation: Western societies seem unable or unwilling to match

the Soviet bloc in brute force. We are unwilling, I think, as is Western Europe, to spend the requisite fraction of our gross national product on conventional materiel and arms, and we're unwilling to draft millions of young men and women. And yet we need to defend the Western world against an adversary that *does* arm to the teeth.

Now, how do you do this? Well, it seems to me that the West has two advantages. One is that our posture is basically defensive, and the defense can defend with a lesser force. And two, the West leads the Soviet bloc by a decade or so in the most advanced kinds of technology, especially in things like microprocessors and VLSI circuits. And so one can imagine a build-up of force based on *technology* in which fast action, surveillance, and computer control can counter the brute force that the Soviet bloc has at its disposal. This notion seems to me to be promising enough to justify some forward thinking about Sandia's role in such a scenario. It's worth doing because if you postulate an integrated, computerized battlefield of the future, then you have to ask, "What are the multi-program capabilities that would be needed to look at a complicated system like this?" There are few other national resources that have the same spectrum of capabilities and system expertise that the national weapon laboratories have. Therefore, it seems to me that there is a role for the laboratories in integrating nuclear and conventional systems. Well, that's a round-about way of saying that Sandia may have a broadened role in the future. We need to think this through and have a clear idea as to what our capabilities are and what kinds of things we could offer to the country. That is the mission of the 300 organization.

'When the nation changes its direction, then we must be ready to change.'

SLN: So they might look at the integration of the nuclear and the non-nuclear—smart bombs, that kind of thing?

GCD: I think it's entirely possible that we'll find ourselves getting into at least some aspects of the computerized, instrumented battlefield of the future. It's certainly true that if we are contributing to the thinking that must occur early in the evolution of such a capability, then we'll be more likely to have a role than if we don't.

More basic than that, the role of Organization 300 is to think about Sandia's future in broad terms, whatever it happens to be. We should be thinking about that future enough in advance of the march of events so that we have some opportunity to influence them. When the nation changes its direction, then we must be ready to change. For example, when the country decided to de-emphasize its weapon work and increase its expenditures on energy programs, we were ready to contribute because we'd been thinking about energy.

If there are similar future shifts of emphasis, we must be ready to respond; that's what the role of the long-range activities planning group is all about.

SNL: Do you consider yourself more of a futurist than others at your level at, say, Bell Labs or Western?

GCD: Not really. I'm obviously concerned with the future of Sandia, but I think that anyone who's responsible for a company has to think about its future. The daily activities involving well-defined programs tend to be institutionalized—their own momentum carries them along. But thinking about the future is hard because, of course, one doesn't know what it's going to hold. And yet it's vital—current programs finish, change occurs, and a company, if it's to stay healthy and stay intact, has to be ready for whatever the future may hold. In R&D the whole point is to create things that do not now exist. So I think that R&D executives tend to think more about the future than do executives in general. It's easy to find examples of industries that decayed because they didn't think sufficiently about the future—the railroads, of course, immediately spring to mind; they thought of themselves as railroad companies instead of transportation companies and so they didn't plan for a world filled with buses and trucks and planes and other alternate modes.

SLN: Another group that seems to be outside the mainstream of organizations is Organization 100. Is that a managerial decision on your part?

GCD: Yes; when you separate organizations into clear areas of orthogonal responsibility—the present and the future, or whatever other divisions you draw—you must find some way of appropriately dividing the total resources. That is, how much should be spent, for example, on present commitments and how much on future commitments? These activities need a kind of impartial referee, a group such as Organization 100 that is accountable to neither activity directly. The organizations will, after all, occasionally compete with each other for funding. Furthermore, the funding of programs in a government laboratory like Sandia is a very complicated matter involving interactions between the Congress, the Administration, the staffs of various Congressional groups, the military, and local politics as well as federal politics. It is necessary to have a single corporate posture. We have to be able to convince our principal sponsor, the Department of Energy, as well as all of our other customers (on reimbursable projects, for example) that we have all programs manned and funded, and that we have neither over- nor under-utilized our resources. If we are held to a level-of-effort activity as national policy, then we must fit the total commitment within the total resources. That's a big job, one that I think we have to take very seriously. In fact, one of the things that we need to learn how to do better is to say "no" even to a very important national job if we do not have foreseeable resources to do it properly. It's



much better, in my opinion, to be candid about our capabilities early on than to fail to perform as the programs progress.

All the things I've been saying here lead to the point that the whole direction of the company—the size, the funding, the disposition of our various programs between energy and weapons, between present and future, and so on—those all come together in the funding process in Paul Stanford's 100 organization, and that's why we need to keep it as a corporate organization. Similarly, the corporate planning staff (Organization 400) reports at the corporate level as it has in the past.

SLN: Why did the Pulsed Power Sciences directorate, a former 4000 organization, end up with the former 5000 organizations?

GCD: Gerry Yonas' programs are futuristic—devices and ideas and understandings, not, as yet, a deliverable product. Furthermore, I think that the technology that's involved is closer to that of our other research activities than, for example, to weapon development. As specific accomplishments occur in the high power technology, as concrete jobs with specific deliverable outputs spin off, I would expect those jobs to be done in Organization 20. But, for now, pulsed power has a more natural home in research.

SLN: How about Bill Myre's organization?

GCD: The new 9000 organization, of which Bill's group will be a part, has in almost every instance a system that is being delivered; 9000 is the output and delivery organization, so to speak. It has weapon systems, energy systems, and now safeguards systems—all deliverable systems. At the same time, Orval Jones' new organization, the 7000 group, also has a common theme—the support activities that are required in testing, in quality assurance, in shop activities, and other groups that directly support the system groups in 9000.

It is also true that a principle often used in organizational structures relates to size and span of control. People can effectively supervise organizations of a certain size; if they get too big, they get out of control. Therefore, a certain amount of "load-balancing" is nearly always necessary. If an organization logically fits in any of several places, the final determinant is often simply to balance the load so that no one has too much or too little to do.

SLN: Is there any special significance in the fact that, with two executive vice-presidents, we'll now have three Sandians on our Board of Directors?

GCD: No, I don't feel there's anything very significant about it. The Board now

has eight members—and involves, as it should, representation from both inside and outside the company. It's clear, I think, that in order for us to perform under our prime contract, we must be able to attest, not only by form but also by action, that we do, in fact, behave according to the Bell System practices—that's what the contract calls for. In most matters, we follow either the Bell Laboratories or Western Electric practices. That's why we have audit groups, and that's why we have Western and Bell Labs people on the Board.

SLN: Does Sandia's organization more nearly reflect that of Western or Bell Labs?

GCD: It reflects some of each. On technical matters such as hiring and pay and working conditions for engineers and scientists, we follow Bell Labs. On quality assurance and procurement and purchasing and legal matters—business matters in general—we tend to follow Western Electric. Which precedent to follow is usually pretty clear, but sometimes decisions are necessary. For example, we recently adopted a relocation plan to more nearly approximate the Bell Labs version of the Bell System plan rather than the Western version. The rationale is that the people we're most likely to move from one location to another are engineers and scientists.

There are, of course, differences, too. Neither Bell Labs nor Western Electric is a government organization. Neither of them has the specifically political or Congressional involvement that we do, so many procedures have to be different.

SLN: That brings us to this question—how will the reorganization help us in communicating Sandia's capabilities to our various funding sources in Washington?

GCD: The organizations in Washington that control our budget are fractionated. There are several Assistant Secretaries of Energy and, under them, several organizations which have this or that feature of a program. So we do not have a single person or single committee, as in the old days, with whom we must interact. Both the Senate and the House have their separate committees, and the programs controlled by the DOE are split up into a large number of segments. We try, to the extent that we can, to organize ourselves internally so that a particular group that has a particular job to do will be as well matched as possible to the Washington structure that funds and controls that particular job. That means that the major contacts between Washington and Sandia tend to be at the project level. It's only at that level that there is a unique, one-to-one correspondence between those responsible for the funds and those responsible for the job. We have recently decided that Sandia needs to align its planning and controlling functions with the funding sources. We are establishing two major planning committees. One, much like the old Weapon Committee, will oversee all of the programs that are funded by the Office of Military Application (including inertial confinement fusion). That, in fact, represents the bulk of our work. The other committee is responsible for oversight of those programs not funded by Military Application—other work for the Assistant

Secretary for Defense Programs, like nuclear materials security or reimbursable activities from DoD or energy activities

'One of the things that we need to learn how to do better is to say "no."'

from Basic Energy Sciences or programs from other sources. The reason for the new arrangement is that, while we would like to plan our programs in totality, there is, in fact, very little interaction between "different colors of dollars"—if money that we get is, say, painted blue, it must be spent only on blue projects. The monies that we get from other sources have their own individual colors, and they must be spent and controlled and finally accounted for on the work that was authorized to be done. You can't trade dollars back and forth. The new structure recognizes that fact.

SLN: Let me return for a moment to future *vs.* current programs. Is there a likelihood that our funding sources will favor the programs that have an immediate, short-term result over those that may have a result only several years down the road?

GCD: Fortunately, over the years the weapons program has provided a respect for, and funding of, research basic to the defense mission. For other programs, on the other hand, there is a greater tendency for funding to be directed toward specific jobs for specific amounts of money and specific results. The long-range, free enterprise kinds of research tend to be harder to fund. Given that tendency, we are thinking about a plan to equalize basic support for our technology base by applying a certain percentage of incoming specific funding to technology base renewal. After all, the reason that people come to Sandia and ask us to do jobs—the reason we can, in fact, do them well—is that we have over the years built up a base of technology and

'Those who request specific jobs and thus exploit our basic capabilities should in conscience help support renewal of that technology base.'

facilities. Therefore, those who request specific jobs and thus exploit our basic capabilities should in conscience help support renewal of that technology base. It's insurance that we'll be able in the future to do the kind of job they want to have done. This kind of support is explicitly recognized in the DoD contractor community by what's called IR&D—Independent Research and Development. DoD, when it contracts with general industry, puts in a certain amount of IR&D money that's specifically intended to create future technology. We need to do a similar kind of thing, and we're in the midst now of thinking just how it should be done.

SLN: Finally, do you have any broad observation in regard to the reorganization you'd like to share?

GCD: Well, one can look too much at organizational patterns for significance.

[Continued Next Page]

'Good people, well-chosen programs, and good intent will result in good work, good products, almost independently of the organization.'

It's been my experience that good people, well-chosen programs, and good intent will result in good work, good products, almost independently of the organization. The basic thing that one must have is a staff of highly trained, highly competent, highly motivated people. How one organizes can help, obviously—one can impede with bad organization or one can lubricate with good organization—but one shouldn't look too much for significance. As long as the organization is reasonably logical and people are given the freedom and the support they need to do the work, I think that good things will happen. So one shouldn't look to organization for more than it can, in fact, provide.

One of the things people should recognize is that this is only one of many organizational patterns that could be put together—it's certainly not the last that there will be at Sandia—there'll be changes from time to time in other directions. This one is not sacred.

It's also true, I think, that organizations have to be changed every so often just for the sake of change—it stirs things and people up to put them into new patterns; it revitalizes thinking.

SLN: When you refer to good people, well-chosen programs, and good intent, are you describing Sandia?

GCD: I certainly am. I think that the broad management choices that have been made over the past decade or two have created tremendous improvement since I was here before (1961-63). For example, the decision made 20 years or so ago to upgrade the educational background of the staff, to move toward advanced degrees rather than bachelor's degrees, has had a major effect on Sandia. Another major factor that I think has stood the company in good stead is the choice of programs, outside the traditional weapon role, which are synergistic with the major mission. That was a good move; in the first place, it made us immediately competent in the new areas of work; secondly, it made it possible to move people back into the weapon program as the pendulum swings.

One of the things that we didn't do quite as well as to match our physical resources to our other resources. Too many of Sandia's buildings and pieces of equipment were allowed to become obsolete. In the last several years, we've made substantial efforts to remedy that problem. We now have a number of new buildings under way, but there's still a long way to go.

Finally, it's my observation that Sandia is one of the two or three best R&D laboratories in the country, if not the world. It's too bad, but I believe it's true, that many of our historically excellent R&D institutions in the private sector are moving away from basic research. They have become more product-oriented with short-range objectives. I hope the nation will cherish and preserve those institutions that, like Sandia, still maintain a broad spectrum of R&D.

Take Note

The Rio Grande Zoo is looking for docents. A docent is a volunteer, very knowledgeable about the zoo and its inhabitants, who conducts tours and gives talks to visiting groups. There's a training course for volunteers. If interested, attend an introductory coffee Monday, Aug. 16, at 10 a.m. in the zoo barn, or call Alice Fienning, 298-0743.

* * *

What would it take to keep you around town during the Labor Day weekend? A rodeo? A carnival? Big bands? Gunfighter shootouts? A 10,000-meter run? Square dancing? Fiddlers? How about armadillo races? Or *Tammy Wynette*? All the above plus \$2 chicken dinners and more are part of Kirtland's Labor Day festivities. Tickets for each of the events during the Sept. 2-6 weekend are available (and inexpensive) at both Officers' Clubs, the Enlisted Club, Que Pasa Rec Center, the Youth Center, and Rec Services (Bldg. 20200, Rm. 239).

* * *

Voter registration drives have been scheduled by the League of Women Voters at Winrock Center on Aug. 13 (10-8), Aug. 14 (10-6), and Aug. 15 (noon-5); at Sandia Sept. 9 (times and location to be announced); and at the State Fair Sept. 14-21. If you or yours have moved or turned 18 recently, remember to register. (Now if we could only register to remember . . .)

* * *

Your club need a speaker? Lovelace Medical Center has a new bureau of speakers ready to enlighten you on any of a dozen and a half medically related topics.



CELEBRATING a double anniversary is Willie Garcia (3163). Not only is Willie retiring from the U.S. Naval Reserve as a Chief Petty Officer after 41 years of military service, but he's also been with Sandia 30 years. Willie was recently issued the "magic card"—a military ID for retirees entitling him to the same benefits as someone who's served 20 years on active duty. "I have enjoyed my double career," says Willie. "Both Sandia and the Navy have been very good to me."

(No, engineer burnout isn't one of them.) Call 842-7357 for complete info.

* * *

John Cronin (7473) is the featured caller at the Merry Mixers square dance in White Rock, Sept. 18, at the Pinon School from 8 to 10:30. A caravan of Rio Ramblers plans to accompany John in camper-type vehicles for an overnight jaunt. Anyone interested in joining the group is urged to contact Virginia O'Neill (3152), 4-1477.

* * *

Through Aug. 29, Adobe Gallery in Old Town has a show called Clowns—the Delight Makers. All the local Indian clown figures—including mudheads, koshari, Hano clowns—will be represented in one medium or another.

* * *

"Good Evening" is what the Vortex Theatre guarantees you'll have if you attend the comedy revue by that name Aug. 6-29. Written by Peter Cook and Dudley Moore, the show runs Fridays and Saturdays at 8, Sundays at 2:30. Tickets are \$4 (\$3.50 for students and seniors); matinees \$2.50. The Vortex is just off Central on Buena Vista. Reservations at 247-8600.

* * *

The Air Force has named Col. Bob Francis commander of the new Space Technology Center headquartered at Kirtland. The Center comprises three Systems Command labs—Air Force Weapons Lab, KAFB; Air Force Geophysics Lab, Hanscom AFB; and Air Force Rocket Propulsion Lab, Edwards AFB—with each lab reporting to Col. Francis. The Center will focus on the technical disciplines of launch vehicles and spacecraft technology.

Fun & Games

Fishing—Catching a 40-inch-long, 29-pound striped bass in Lake Hamilton near Little Rock, Ark., was the highlight of Jude Worden's (1483) recent vacation. Using minnows, Jude also hauled in 12 and 18 pounders. He's having the big one mounted.

* * *

Bowling—The Coronado Club mixed bowling league meets Wednesday, Aug. 11, to get organized for the coming season. The meeting will be held at the Club at 6 p.m. Openings exist for teams and substitutes. For more info, call Dick Simmons (9221), 4-3524, or Bill Barton (1635), 4-4387.

* * *

Horseshoes—The Sandia Labs Horseshoe Club will host the annual doubles and singles championship tournament on Aug. 14 at 9:30 a.m. at Los Altos Park. The men's division will be divided into classes by ringer percentage; there will also be a women's class. The doubles will be mixed play with partners decided by the singles play. More info from Jim Fisher (2422) or Leo Bressan (268-5367).

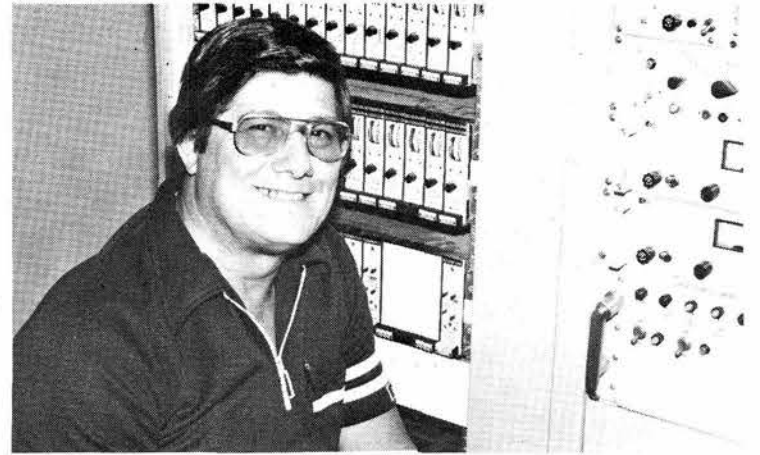
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LAB NEWS

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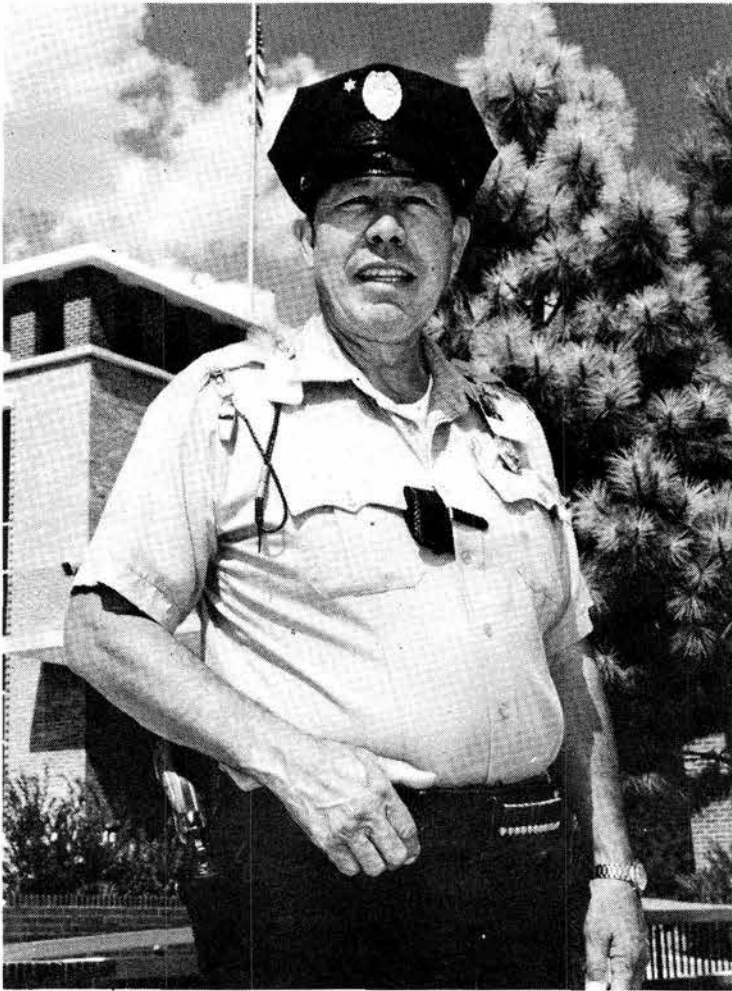


John Cunningham - 2553 30



Cal Sato - 9755

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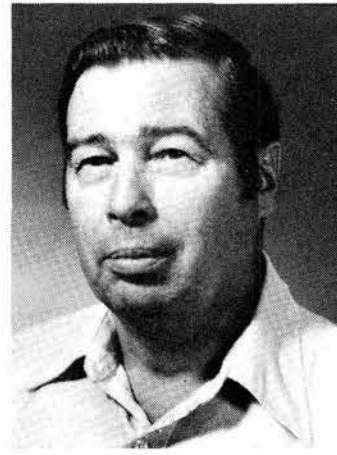
Al Angel - 3435

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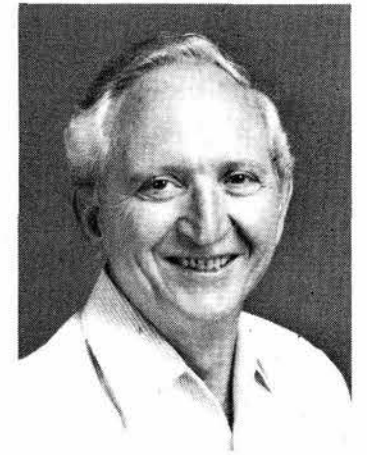
Mac Spivey - 8168

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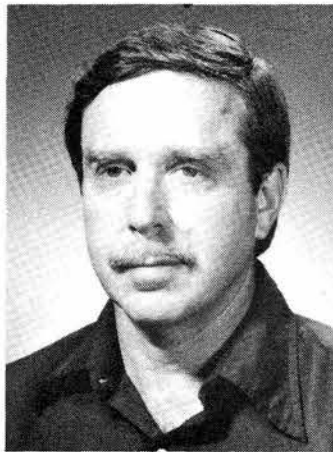
H. W. Richardson - 7542

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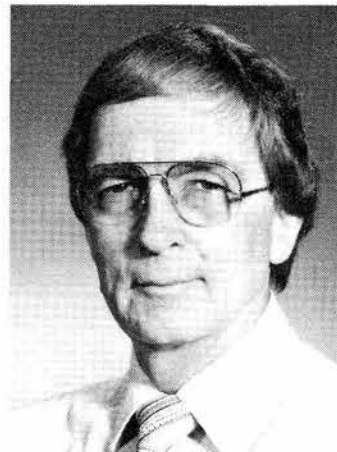
Bill Morehouse - 8162

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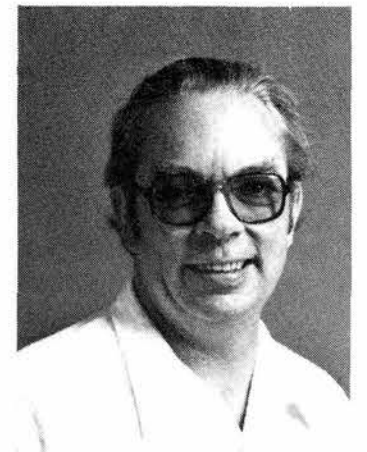
Paul Longmire - 9341

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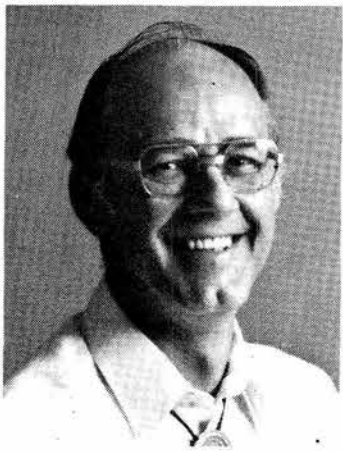
Ron Fugazzi - 3522

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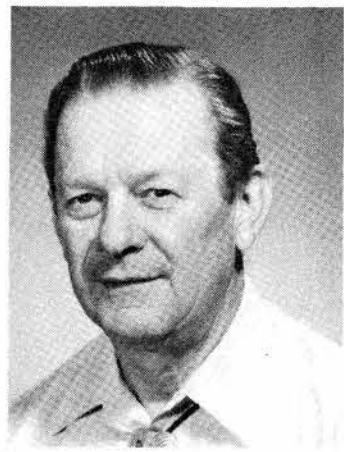
Ken Byrne - 8111

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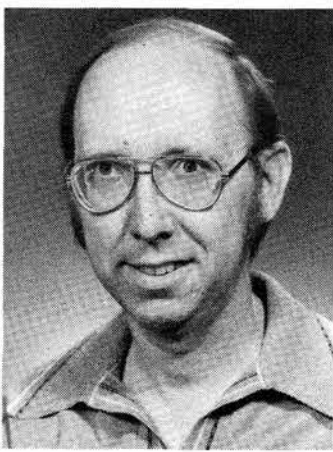
Otto Schreiber - 8329

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Norman Elliott - 1627

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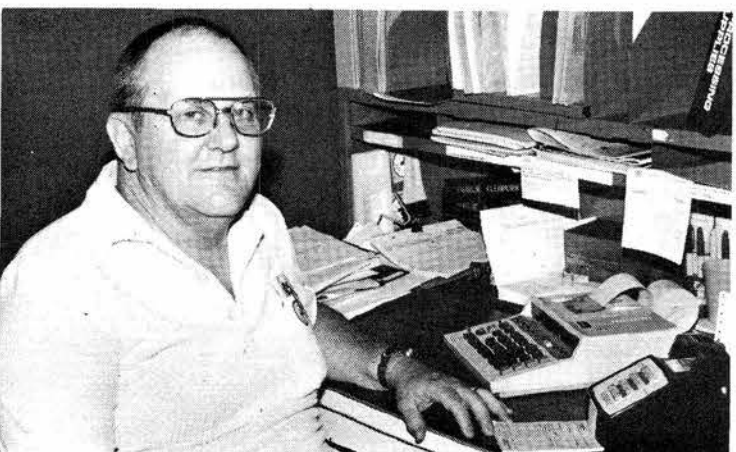
Ron Jones - 2614

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David Judd - 2625

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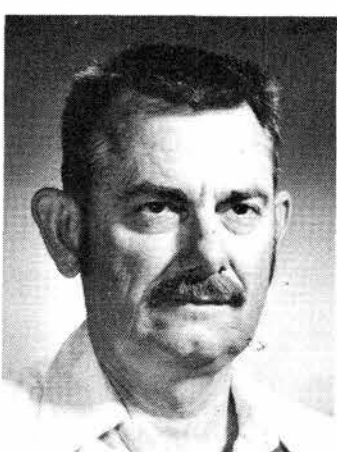
Charles Clendenin - 2611

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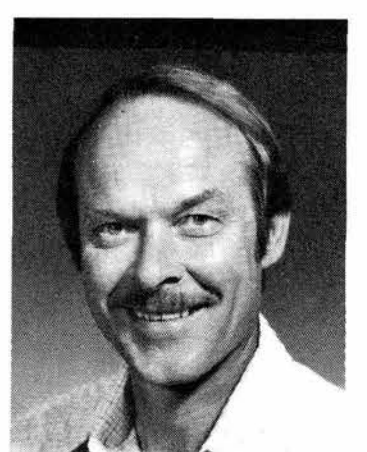
J. D. Jones - 9372

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T. C. Looney - 7583

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Ken Flynn - 9344

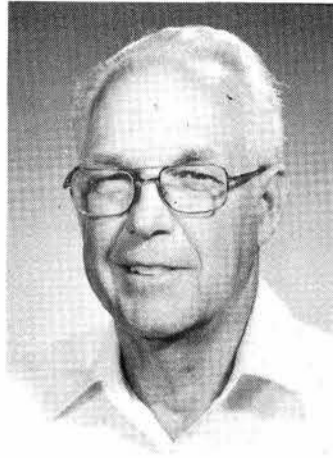
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Pete Peterson - 7481 30



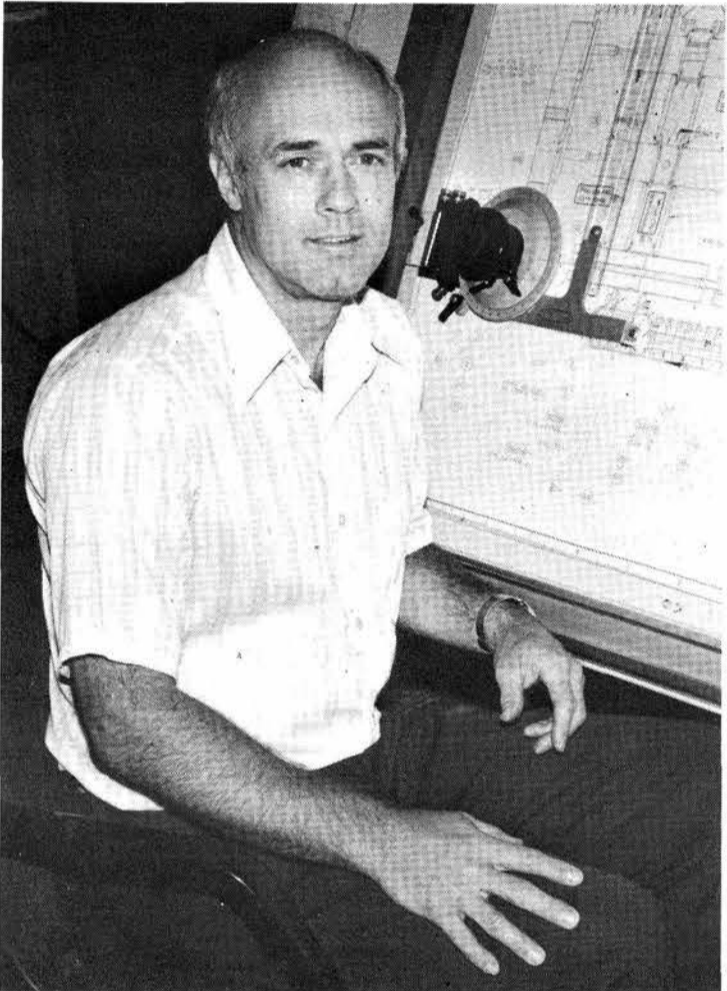
Jo Davis - 7546 35



Gene Nielsen - 2625 30



Gene Cox - 3435 25



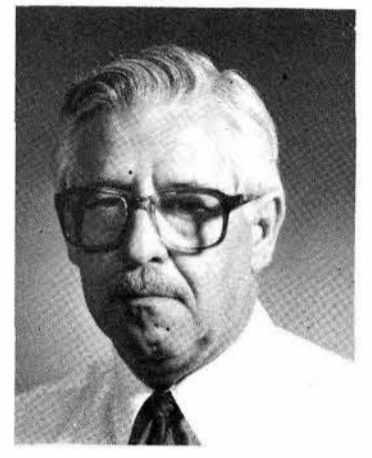
Ron Williams - 2451 25



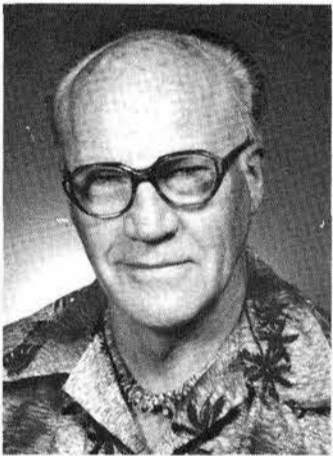
Bud Newman - 7213 30



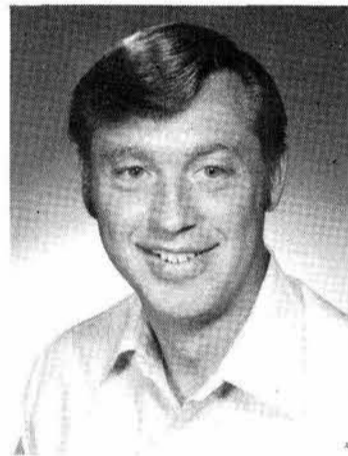
Roy Roger - 3421 30



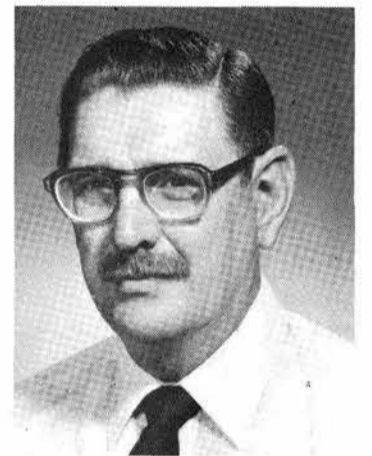
Duane Randall - 1652 25



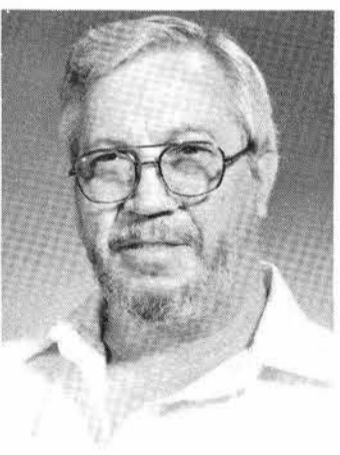
John Sundberg - 7213 30



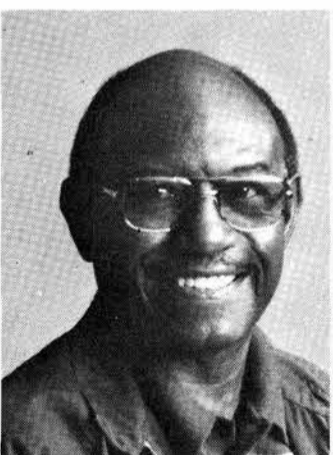
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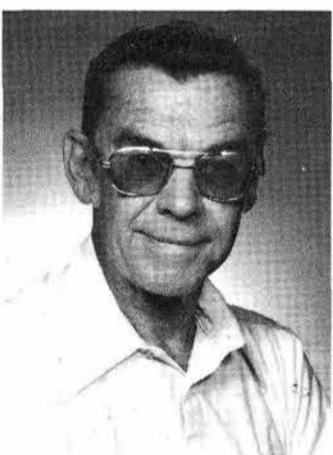
Ed Hansen - 9262 30



Jim McCreight - 9221 25



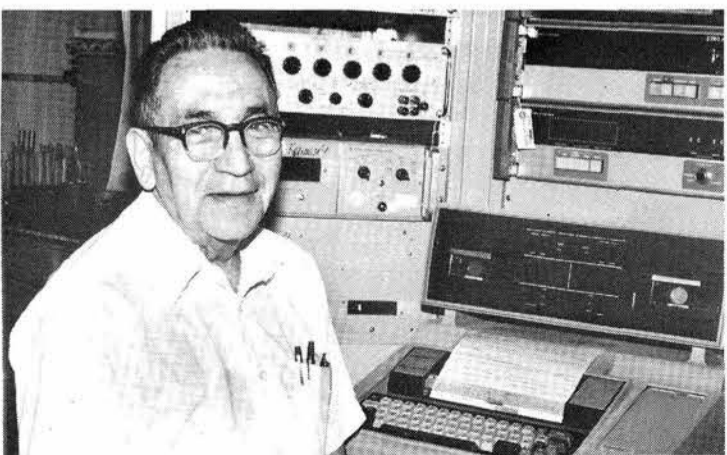
Charles Brown - 8336 15



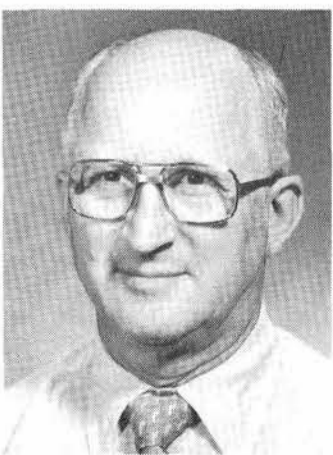
Al Hurford - 7411 30



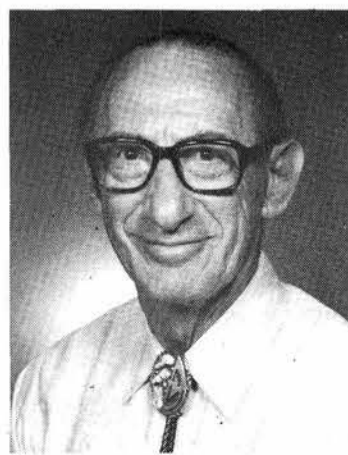
Larry Tichenor - 1472 25



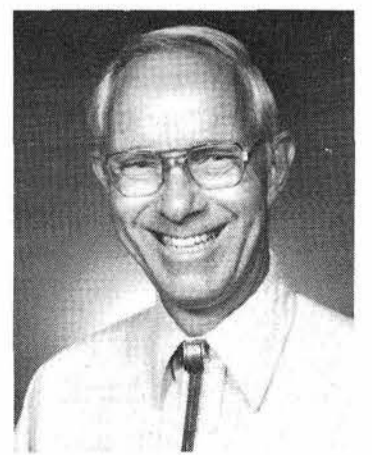
M. M. Karnowski - 1832 30



David Weingarten - 2153 25



Herman Levine - 1822 25



Wil Vandermolen - 7554 25

Events Calendar

Aug. 8—Chamber Orchestra of Albuquerque, Pops Concert, 8:15 p.m., Rio Grande Ballroom, Sheraton Old Town. Tickets (\$6, \$5 seniors & students) at Ticketmaster, at the door, or 247-0262.

Aug. 9—National Radio Theater, KUNM 90.1 FM, 10 p.m., two comedies: "George Washington Crossing the Delaware" and "The Ugly Duckling"; Aug. 16, 23—"A Tale of Two Cities," in two parts.

Aug. 9, 12, 17—Santa Fe Opera, "Die Fledermaus" (in English); Aug. 10, 19—"The Marriage of Figaro" (in English); Aug. 7, 11, 20—"Mignon" (in French); Aug. 14, 18—"Die Liebe Der Danae"

(in German); Aug. 13—"The Confidence Man," 9 p.m., tickets at The Broadway. Aug. 15—"The Day It Snowed Tortillas," traditional New Mexico folk tales, Joe Hayes, master storyteller, 2 p.m., Maxwell Museum.

Aug. 20-22, 27-29—Albuquerque Civic Light Opera, "Dear World," 8:15 p.m., 2:15 p.m., Sun.; Popejoy, 345-6577.

August—La Compania Nuestro Teatro: Aug. 6-7, 14-15, 20, 27-28—"O.K.," a sophisticated, contemporary look at modern life, by Venezuelan playwright Isac Chocron; Aug. 8, 13, 21, 22, 29—"Nuevo Mexico, Si," a musical drama of the history of the state. Reservations and information, 256-7164 or 266-3770.

fixed hiback

Q. Is the Credit Union considering paying market interest rates on share accounts? This, of course, would be based on the assumption that borrowers using shares as collateral would pay interest of at least 2% above what their shares were earning.

A. The SLFCU Board of Directors is discussing the possibility of offering a money market type account; however, there are no immediate plans to increase the dividend rate on regular share accounts in an effort to compete with the Money Market Funds.

C. L. Turner
SLFCU General Manager

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CLASSIFIED ADVERTISING

Deadline: Friday noon prior to week of publication unless changed by holiday. Mail to: Div. 3162 (MO125).

RULES

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

MISCELLANEOUS

NEW LABS CAPS now in stock; new design, same price (\$6); South Highway 14 Village Project. LAB NEWS, MO-125.
BUNDY clarinet, \$75. Clabaugh, 299-0721.
FREE unbroken fireplace kindling to person who hauls said piles off my Cedar Crest property. Matter, 281-1277.
10-SPD. BIKE, \$55; girls one-spd. bike, \$45; backpacks, \$20 ea.; 2-man Mt. tent, \$60. Patterson, 299-1062.
GE REFRIGERATOR, white, 11.5 cu. ft., \$75. Cox, 296-1337.
TWO snow/mud tires, F87-14, WW, tubeless, \$40 for set. Cano, 296-6955.
T/C Hawkin .50 cal. caplock muzzle-loader, new, \$225; S&W model 29, 6" barrel, wood case w/ or w/o scope, make offer. Ma, 883-4438.
COVERED hauling trailer, \$350; roof-mounted 4-bike rack, \$75; HO train set, \$100; hair dryer, \$75. Pryor, 344-2931.
PIANO, Starck model, needs tuning, \$800. Yost, 298-4307.
FRENCH Provincial game table, \$125; 4 folding chairs, \$20 ea., together \$195; cherry library book stand w/slant top, \$80. Horton, 883-7504 after 5.
YARD SALE, Aug. 7, 8. Books, beds, tent, heater, wheelchairs, 10 cents & up. Flynn, 810 Shirley NE.
SNOW FENCE, used, 179', 3', & 4' heights, w/posts, \$25. Brinegar, 299-7887.
COPPERTONE drop-in range & hood (controls), \$75; white porcelain kitchen sink, deep, \$35; kingsize gold vinyl headboard & bed frame, \$70. Iverson, 869-3123.
FOUR cemetery lots Sandia Memory Gardens, Blk. #10, lots 1-2-3-4, take \$500 cash all 4 lots. Lewing, Box 1731, Sun City AZ, 85372, 602-584-1465.
PORT. electric typewriter, interchangeable type including infinity, integral, sq. root, pi, fractions, brackets, addition & equal signs, \$100. Gabaldon, 292-1527.
SEARS 52-gal. elec. water heater, used 2 yrs., \$60. Guidotti, 298-8818.

CRAFTSMAN chainsaw w/chain, needs overhaul; 2 thermatru insulated metal doors, 32" & 36", make offer. Marshall, 281-5821.
GE dishwasher, permanent hook-up or faucet adaptor, port. cutting board top; 25" Magnavox color TV, needs tube. Troy, 255-7632.
SMALL tent trailer, \$300; Coleman stove, lantern, heater & 2 army cots. Mowry, 292-1527.
FRAME for children's swing set w/slide, \$15. Caskey, 294-3218.
12" B&W Magnavox TV, \$30; 6' redwood picnic table, 2 benches, \$25. Young, 256-9158.
4 SBR mud snow tires, 175/70R13, \$30. Johnson, 298-5286.
SEARS compact refrigerator, 2.5 cu. ft., \$125. Jeffrey, 294-4676.
CANVAS camp cot, \$5; 20 new cupboard door handles, \$6. Arnold, 898-1467.
GRANDFATHER CLOCK, black walnut, Westminster chimes, moon dial, 74"x16 1/4"x10", \$650. Sutherland, 345-1183.
FREEZER, Sears upright frostless, 19.6 cu. ft., tawny gold, \$350; Kodak pocket Instamatic Model 60, electronic shutter, \$50. Cockelreas, 256-7570.
AMANA window-mount air conditioner, 18,000 BTU/hr., 220 VAC, \$95. Martin, 255-8030.
LAWN SPREADER, Imperial Mark II, 21", \$10. Stang, 256-7793.
VANITY dresser w/mirror, dbl. bed, \$50; B&W 19" TV, \$20. Prior, 296-2930 after 6.
ALUMINUM alloy wheels, 2 ea., 14x6 & 14x7 w/4x100mm bolt pattern, mounted w/steel radials, \$40 ea. Lipkin, 881-6038.
PUPPIES, mother Springer Spaniel, father German Shorthaired Pointer, will be avail. Aug. 9. Henderson, 294-5164.
RIFLE .30-06 Springfield, \$187.50 w/ or \$172.50 w/o Weaver K4 scope; includes case & spare parts. Womels-duff, 281-1693.
PORTABLE exercise pen for pets, 12 steel mesh panels 24"x42" high w/door, folds for carrying, \$50. Romine, 281-5682.
INFANT STROLLER, folding type w/umbrella, \$20; infant seat, \$7; windjammer mounting bracket for Kawasaki KZ650, \$25. Barnard, 831-4114.
GUITAR, Ovation Custom Legend, acoustic & electric, in Ovation moulded case, \$750. Goens, 281-5419.
RUGER old Army .44 cal., black powder revolvers, new in box, 2 at \$185 ea. Tucker, 877-1140.
DINETTE TABLE & four chairs, \$100; camel color recliner, \$100; gold velvet cane chair, \$175; Jungle Jim, \$25. Haid, 292-0159.
HALF SIZE VIOLIN, \$10. Marder, 268-9643.
BUMPER POOL TABLE, \$75; green shag rug & pad, \$50; bathroom sink, white, \$5; misc. light fixtures. Luikens, 881-1382.
CHILD'S tricycle, \$20. Weiss, 821-8256.
DOUBLE bed; blue velour bedspread 108x118; 30" clothes closet; Travler icebox; 5" plastic palm tree. Beasley, 298-3398.
POOL, 24'x12'x4', new filter & pump, \$600; 8'x7' sectional garage door

w/hardware, \$50. Wronosky, 296-7265.
HUNTING BOW, 45-pound Bear Kodiak Recurve, \$60/best offer; electric trimmer, \$20; motorcycle helmet, \$15. Holt, 294-6928.
18" ROTARY lawn mower, \$39.50; 2 chairs & loveseat of aluminum-redwood construction, \$35. Mason, 299-2836.
SEARS Kenmore zig-zag sewing machine, cams & buttonholer, w/ sewing table, \$100. Graham, 293-7302.
BEDROOM FURNITURE: 64" dresser w/mirror, 2 24" nightstands, queen-size headboard, \$375; chair, off-white velour-type fabric, \$200. Harris, 821-8524 after 5.
CORNET, Reynolds, \$100. Stirbis, 821-5344.
UTILITY TRAILER, 4'x8', HD, 2" ball hitch, 15" Ford Wheels w/radials, 1 yr. light use on new bearings, \$300. Hoffman, 292-1589.
LOVESEAT, \$75; bookcase w/sliding door, \$5; bookcase, \$7.50; maple nightstand, \$20; stereo, \$50; hydraulic jack, \$7.50; fender mirror, \$12.50. Hauer, 298-3624.
WATERBED, kingsize headboard, heater, \$100. Attermeier, 293-7088.
ELECTRIC bass guitar; "Magnus" tabletop chord organ; Bell cycling safety helmet. Spraggins, 266-6403.
SEARS upright freezer, frost free, 19.6 cu. ft., avocado green, \$300. Lobitz, 821-1509.
CULLIGAN Mark 5C water softener, \$75; Ademco auto security alarm, new \$35; exterior wood door, 32"x80", \$10. Pate, 293-5393.
CLAUSING horizontal milling machine w/Collet chuck, Collets, Arbors, vise, accessories, single phase. Bennett, 298-1142.
COCKER SPANIEL puppies, tan or black, \$75; reserve with deposit, ready Aug. 22; Daiwa mini-spin system, \$15. Jones, 299-4776.
ANTELOPE RIFLE, .25-06 Ruger M-77 w/6X Redfield 4-plex crosshair scope & 2 boxes factory ammo, \$370. Brammer, 266-5158.
1.5 CU. FT. Panasonic refrigerator, \$95. Lowe, 299-7725.
PIANO, Wurlitzer console w/bench. Summers, 881-7765.
71 PINTO rebuilt engine for parts. French, 299-3916.
TODDLERS' car seat; baby swing seat; child safety gate; redwood fence pickets, 3' length, 50 cents ea. Stephenson, 296-9330.
APPLIANCES, furniture, refrigerator, much more, Aug. 7, 9-4, 1423 Sigma Chi NE. McAniff, 243-6530.

TRANSPORTATION

78 BMW R100S, 13K miles, \$3500. Richey, 298-6648.
79 KZ400, half fairing, 55 mpg city, \$950. Scott, 294-8627.
75 CHEVY Luv pickup, Mikado pkg., 42K miles, new upholstery, white spoke wheels, wide tires. Roesch, 296-8248.
77 CHEVY Pickup 6, 1/2-ton, LWB, AT, PS, PB, 40K miles, reg. gas. Lauriano, 867-5839 after 6.
74 OPEL Manta Rallye coupe, 4-spd., \$950. Prevender, 299-5253.
73 CAMARO 350, AT, PS, PB, AC, new paint, \$2500. Walters, 293-5381.

77 VW Campmobile, 81,700 miles, front tire carrier, AM/FM stereo cassette, 40 ch CB, \$5400. Flynn, 299-4929.
HONDA 70, low miles, street legal, \$340. Hymer, 293-6029.
'81 HONDA CB750F, 8K miles, header, race fairing, S&W shocks, \$2500 cash. Leisher, 281-5258.
79 FORD Fiesta, 48K miles, white w/red interior, \$3100. Simpson, 281-1308.
CANOE, alum. Grumman, 17' w/sail & side boards, \$400. Carrick, 266-0191.
FRENCH-made Gitane 10-spd. men's bike, 21", \$75. Cockelreas, 256-7570.
'80 MUSTANG, 2.3L, AT, 19.2K miles, AM-FM cassette, avg. retail \$5250, sell for \$4450. Stang, 256-7793.
77 MERCURY Marquis, completely equipped for trailer pulling; '68 Ford 1/2-ton pickup. Bailey, 298-0517.
'67 FORD Fairlane, for parts, engine o.k., \$95. Coughenour, 294-3528.
'56 T-BIRD HT convertible, peacock blue, AT. Sandoval, 293-6261.
'76 CHEVROLET Blazer, 4x4, \$3500; '76 Datsun pickup, needs work, \$1500. Tillman, 294-0615.
77 DODGE Aspen wagon, special edition, lug. rack, split seat, one owner, AC, PB, PS, AM-FM-tape, 40K miles, \$2950. Gosler, 294-2324.
'73 GMC w/9 1/2" self-contained Mobile Traveler, 67K miles, \$6500. Romero, 821-6998.
78 FORD Fairmont Futura, 2-dr., white, loaded, 30K miles; '79 Chevrolet Chevette 4-dr., white, 4-spd., 27K miles; both below book. Kinoshita, 299-6491.
76 BLAZER 4x4, 4-spd., 350 engine, manual hubs, AC, PS, PB, 750-16 tires, chrome wheels. Owens, 268-4779.
75 FORD Mustang II 2-dr. HT, AM-FM-8TK, std. 4 cyl., new paint, \$2200. Pafford, 298-8913.
74 OPEL Manta Rallye, 1.9L 4-cyl., AT, 57K miles. Bleck, 298-0504.
BICYCLE, boys' 20" Schwinn, \$20. Wright, 296-3850.
'67 OLDS Vista Cruiser, stn. wgn., AT, PS, PB, Jones, 266-4186.
72 PLYMOUTH Duster, 6-cyl., 3-spd., \$550. Payne, 299-5966.
'65 DODGE half-ton, 66,700 miles, rebuilt engine, ladder, racks, tool bins, HD shocks, \$1400. Rizkalla, 268-4497.
73 VW Super Beetle, seats re-upholstered, engine rebuilt, AM-FM-tape, \$2100. Pierson, 884-3174.
78 HONDA Hawk, 400cc, windshield, bags & trunk, \$950 or best offer. Begeal, 881-4540 after 5.
72 MAVERICK, std., 2-dr., 6-cyl., \$750. Gendreau, 268-3436.
73 VEGA wagon, 4-spd., 14K miles on engine, clutch, tires; new paint, shocks, AM/FM/CAS. stereo, \$2000; Hays, 294-1386.
'65 CORVAIR, Monza sport coupe, \$2500. Wentz, 299-5274.
77 CHRYSLER Cordoba, AT, PS, PB, AC, AM-FM-8TK stereo, 2 new radials, \$1600. Turpin, 883-8042.
RALEIGH Record 10-spd. bicycle, \$115. Pate, 293-5393.

REAL ESTATE

LOS LUNAS, 1/2 acre, south of HS, utilities, \$10K/low down w/terms,

consider equity in home. Cook, 268-6406.
LAS CRUCES: 3-bdr., den, 1 1/2 bath, 1500 sq. ft., near NMSU, separate garage behind house. Beasley, 298-3398.
3-BDR. HOUSE, 1428 sq. ft., 1 1/2 bath, fp, near Chelwood & Indian School. Ling, 281-5328.
'69 BILTMORE mobile home, 12x44, 1 bdr., lg. bath, kitchen & front LR, set up in NE park, \$5000. Watson, 881-3924.
HOUSE, 1350 sq. ft., near San Antonio & Wyoming, payments \$605, assumable equity around \$15K. Yio, 821-3569.
'77 SKYLINE mobile home, 14'x70', 2-bdr., 2 bath, 4-Hills MHP, dbl. wide lot. Cooper, 881-4503.
9 ACRES near Estancia, \$15K, 10% interest, 10% down, corner location, electricity-telephone. Thomas, 256-1921.
OVER 3 acres near Mora in tall pines, well, cleared building site, storage shed, electricity, \$15K, \$5K down, terms negotiable. Beck, 256-3350, or Hanks, 1-387-5126.
3-BDR., all brick, Rice house, den w/fp, country kitchen, near Sandia High, 10% assumable loan. Cameron, 292-4635.
4-BDR., 2 bath, den, \$72K, 7 1/2% loan, qualify income under \$33K; not house owner 3 yrs. Shelton, 255-8264.
BOSQUE, 1/2 acre lot, 10x52 trailer, all landscape, orchard, 2 wells, dbl. garage slab, 2 storage sheds. Shattuck, 869-2738.

WANTED

USED Atari game console. Kar-nowsky, 255-4045.
FULL SIZE cherry wood headboard, frame, mattress, springs, dresser/mirror; LPG grill & rotisserie, negotiate price. Johnson, 296-1917.
NIKON AI 50mm lens (not series E). Christenson, 292-1491.
1/4-TON Chev. 7:50-16 one piece steel rims, 8-hole. Romesberg, 869-6979.
SHELL for long-bed Mazda or Courier. Erickson, 296-0126.
LARGE drafting table for college arch. student, w or w/o accessories. Gunter, 892-0652.
MALE roommate (non-smoker) to share expenses for spacious 4-bdr. furnished house. Guidotti, 298-8818.
ANSWERING MACHINE, cheap, any condition as long as it works. Davis, 281-2429.
GASOLINE TANK for '48 CJ2A Jeep. Summers, 881-7765.
PLAYPEN, wooden w/safety std. spaced bars. Hudson, 884-7621.

WORK WANTED

YARD WORK wanted, teenager working for team travel expenses, references. Luke Atkins, 298-5762.
YARD WORK—mowing, trimming, hauling, what have you. Paul Prew, 296-3815.
ROTOTILLING, mowing, light hauling, any other yard work. Paul Holt, 294-6928.

Singles Mingle Tonight

TONIGHT AT HAPPY HOUR, the first Friday of the month, singles mingle in a reserved section of the ballroom while the music starts early and lingers late. Frankie and the Corvettes, a versatile group playing fifties-style, pop, and western, start at five and play until midnight. Chef Bill Potts spreads a chicken Cacciatore and baked fish buffet specially priced at \$4.95. Single members may bring one guest of either sex; other non-members pay \$1 admission.

Next Friday, Aug. 13, Country Capers hold the bandstand while roast beef and fried chicken top the buffet menu.

TOMORROW is Variety Night at the Club which means watching a movie, enjoying an inexpensive dinner with the kids, and a good time munching popcorn and drinking soft drinks. The movie is a full-length animated cartoon from MGM called *The Lord of the Rings*. Hot dogs, hamburgers, French dip sandwiches, and pizza are available at 5; the movie starts at 6. Admission is 25 cents per person.

A BAR PROMOTION by the Miller Lite draft people is set for Thursday, Aug. 19, with glasses of their brew selling for 25 cents. Door prizes will be given away every half hour between 5 and 8 p.m.

ANNUAL MEETING of the Coronado Club membership is scheduled Sept. 13 at 5:30 p.m. Seven new members of the board of directors will be elected. The nominating committee announces the following candidates: Don Hosterman (9742), Jack Mortley (7421), Ernie Montoya (3612), Phyllis Sanchez (3510), Shirley McKenzie (2432), Tom Mehlhorn (4231), and Don Graham (3162).



Shirley Meloche (3141)



Mary Wood (1841)

Following the meeting, cash door prizes will be given away—\$100, \$50, and four \$25 prizes. A free open bar (well drinks and draft beer) plus a spread of munchies and goodies will be available for one hour following the close of the business meeting.

THE BIG ONE this month is a repeat of the Club's popular Casino Night where the ballroom is converted into Las Vegas on the Rio Grande, and there's casino action starting at 7 p.m. You trade \$2 of real money for a bundle of play money as admission and try your luck at blackjack, craps, chuck-a-luck and poker. Some 50 volunteers will deal, baby, deal. A basket of door prizes will be given away including a TV and some small appliances plus a biggie weekend in Las Vegas for two. Sam's Town Hotel and Gambling Casino provides the room; Western Airlines the transportation. If that isn't enough, consider this—Elton Travis and the Westernaires play for dancing while green chili stew and French dip sandwiches are available.

ATTENTION, devotees of UNM athletics! The Coronado Club Wolfpack will hold a swim party and potluck dinner at a private home on Aug. 15. Membership is open to any member of the C-Club. If you're interested in joining or renewing your membership, come to the party. Details from Pat Horne (884-7821) or Bill Minser (299-1364) before Aug. 11.

SIGN UP NOW for the Club's annual "Fun" golf tournament, scheduled Tuesday, Aug. 31.

TRAVEL DIRECTOR Frank Biggs (4231) reports a change in the Las Vegas by air trip which reduces the price to \$158 and to two nights at the Maxim Hotel. The trip is scheduled Sept. 12-14. Or, you could go by charter bus Sept. 12-15 for \$130.

Frank is holding a meeting at the Club next Tuesday, Aug. 10, at 7 p.m. with slide shows and previews of all scheduled trips. Information will be available with listings of all trip details.

Other Club travel packages include: New England—Quebec City, Sept. 25-Oct. 3, \$410 plus air fare (currently \$210).

Two one-day charter bus trips to ride the Cumbres & Toltec, Sept. 26 and Oct. 2, \$42 for adults, \$30 for children 11 and under.

A two-day trip on the Cumbres & Toltec on Sept. 25-26, \$82 per person.

Canyon de Chelly, Oct. 30-31, \$82 per person.

Mazatlan, Nov. 1-8 or Nov. 8-15, \$359.

Pacific Mexican Coast Cruise, Oct. 23-30, \$789.

Dallas Cowboys package, Nov. 25-27, \$225.

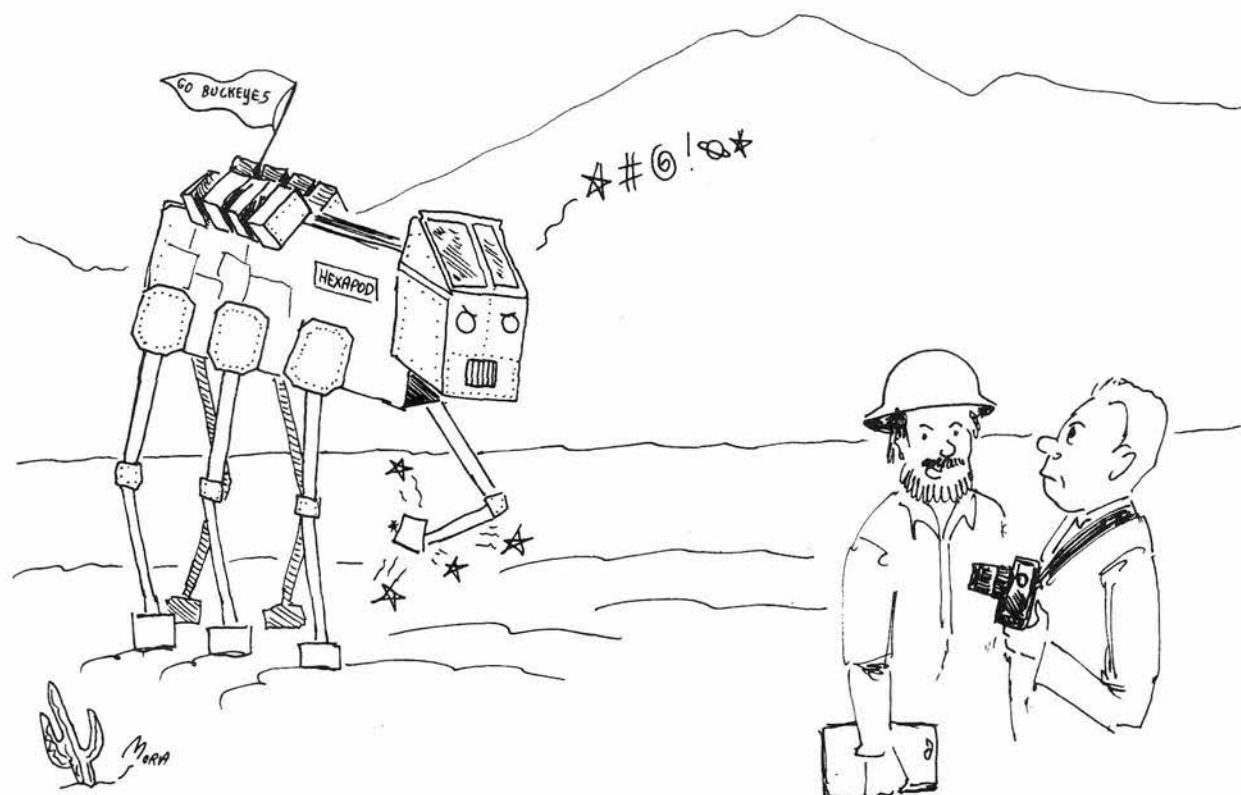
Trip literature is available at the Club office or see Frank in the lobby tonight between 5 and 7.

Sympathy

To Bob Colgan (3153) on the death of his mother in Philadelphia, July 26.

To Jim Young (3435) on the recent death of his sister in El Paso.

To Les Lamkin (3435) on the recent death of his father-in-law in Florida.



"It can handle any type of rough terrain, but it just can't hack those goatheads."