

New Directors Appointed

Roger Hagenruber was named Director of Systems Studies 300, effective Jan. 1. He replaces Bob Clem, now Director of Systems Sciences 1600.

Roger joined Sandia in July 1972, and has worked with systems research and systems studies in the weapons analysis directorate. He was promoted to supervisor of a systems research division in 1975 and, in 1980, to manager of Systems Research Department 310. His work for the past several years has basically been in verification, military sensors, and intelligence.

Before coming to Sandia, Roger was an assistant professor of physics at Western Michigan University. He attended the University of Wisconsin where he earned a BS in physics, a BS in American Institutions, an MS in physics, and a PhD in experimental nuclear physics. He is a member of the American Physical Society, and serves as an adjunct professor of political science at UNM.

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

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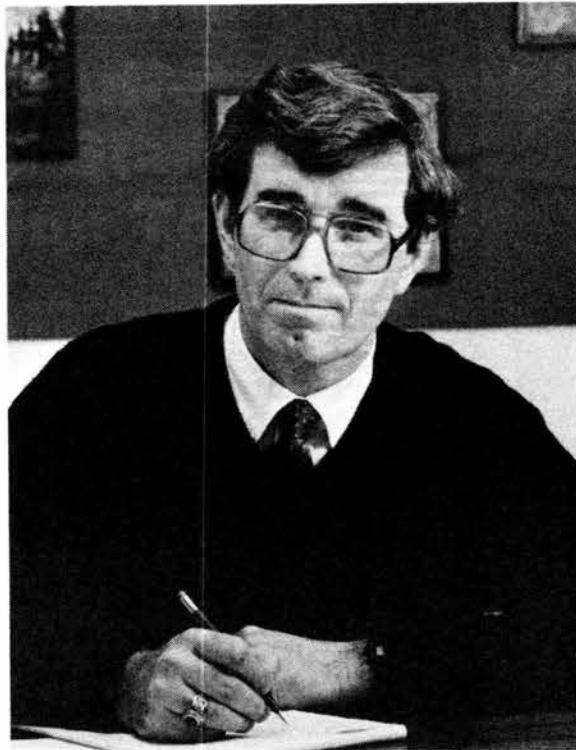
Gene Ives was named Director of Development Testing 7500, effective Jan. 1. Gene assumes the position vacated when Bill Gardner retired last month.

Since joining the Labs in June 1956, Gene has been involved in many phases of development work in both advanced systems and the weapons programs. In 1964 he was promoted to supervisor of a systems division that developed the arming and fuzing systems in the Navy's Poseidon and Trident programs. He was named manager of Advanced Systems Department 1560 in 1974. Since that time, Gene has headed a number of organizations working with weapon programs, including the Pershing, Cruise, W78, W76, W81, and command and control. Most recently, he's managed the Weapon Development Department II 5130.

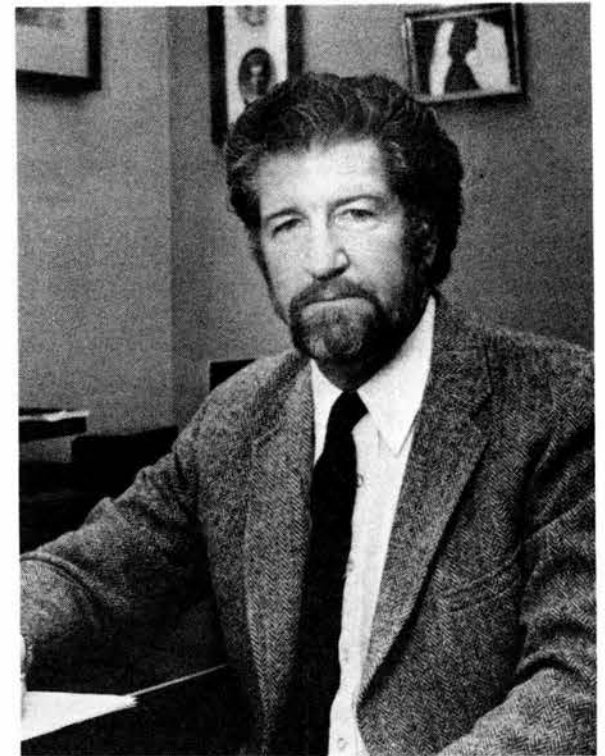
Gene received his BS in EE from Auburn University and his MS in EE from UNM. He enjoys skiing, singing, and acting — activities shared by his wife Dot and their three grown children. They live in NE Albuquerque.

Can't Stand It Anymore?

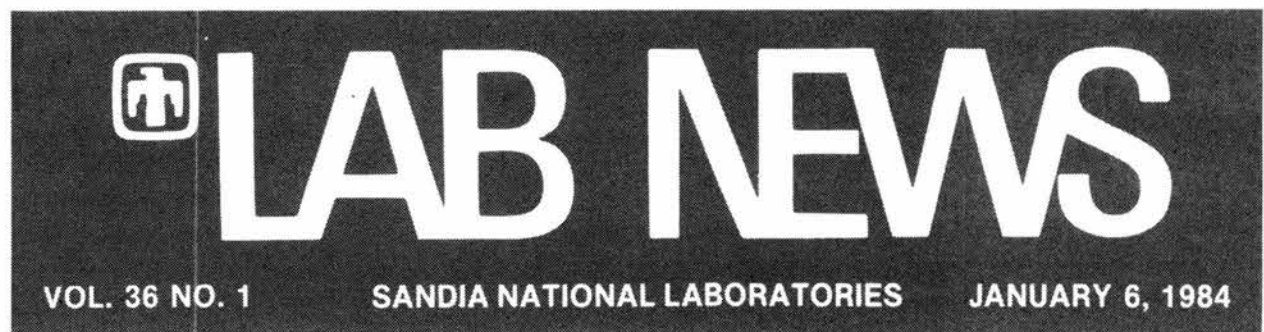
"Stress Reduction Through Exercise" is the topic of the next program in Medical's continuing "Go for Health" series. The program will be presented on Wednesday, January 11, from 12 to 12:30 in Bldg. 815 (outside the Tech Area). The speaker will be Theresa Okwumbua, who was formerly Director of the Sports Psychology Division at Southwest Sports Medicine and who is currently a Child Life Specialist at the UNM Hospital. She will cover the causes of stress and how to use exercise to deal with stress.



ROGER HAGENRUBER (300)



GENE IVES (7500)



New Transistor and SCR

Survive Forbidding Temperatures

Two new Sandia devices, once they're perfected, could function on the surface of the planet Venus, at 460°C (842°F) one of the hottest environments that manmade instruments have been subjected to so far. But plenty of earthbound situations also require devices that can function over a wide temperature range too.

Among these are the drilling of oil, gas, and geothermal wells; control instrumentation for jet and piston engines; and nuclear power plant instrumentation.

Prototypes of a transistor and a semiconductor-controlled rectifier (SCR) that could be used in any of these forbidding locales have been designed, fabricated, and tested at Sandia; the two devices functioned for up to one hour at 550°C (1022°F) — the highest operational temperature ever recorded for such devices.

SCRs are essentially solid-state switches that can be used in any situation that requires power conditioning: switching power on and off; converting from AC to DC or vice-versa; or converting from high-voltage/low-current transmission to low-voltage/high-current transmission.

Many researchers believe that the power conversion and conditioning capabilities of high-temperature SCR's are even more critical than circuit amplification, a function provided by the transistor.

The materials used to make both the transistor and SCR are gallium phosphide and aluminum gallium phosphide (GaP/AlGaP). The new transistor displayed useful current gain and the new SCR provided switching action over never-



DISPLAYING a package that contains the heat-resistant bipolar junction transistor he designed is Tom Zipperian (1141). He has also designed a semiconductor-controlled rectifier (SCR) with similar properties. The two devices function at 550°C (1022°F) for up to an hour—the highest operational temperature ever recorded for such devices. Tom's goal is to develop a transistor and SCR that will operate for up to 1000 hours at this temperature.

before-achieved temperature ranges. Specifically:

Device	Low Temp.	High Temp.
Transistor	-195°C/-319°F	550°C/1022°F
SCR	23°C/73°F	580°C/1076°F

"Sandia's development of a high-temperature gallium phosphide diode and
(Continued on Next Page)

Antojitos

That Swiss Army Knife in Your Car--I refer, of course, to that once innocent appendage to your steering column known still as the turn indicator. Have you looked at any of the modern versions? No longer content to simply indicate intended directionality, these little levers now control more functions than an entire dashboard used to--headlights, parking lights, cruise control so you can rest your right foot, high/low headlight beam control so you can rest your left, and sometimes the horn, for Heaven's sake. "Get out the manual, Martha, I've got to turn at constant speed while I'm turning on my lights and they'll be on high beams but we're in this traffic so I need to honk the horn."

Assuming you're driving a car with automatic transmission, what is it you're saving that left foot for? Its only duty was to hit the dimmer switch now and again. Don't we worry anymore about atrophy? And maybe your left hand isn't at the nine o'clock position on the steering wheel just when you need your bright lights. Or your horn. And maybe you need to indicate suddenly that you're going to swerve but the high beams are on and the overburdened little lever isn't as close to the steering wheel as it usually is. What then, dear automotive engineers? Haven't you heard of human factors?

And, if you really want to give yourself the shuddering chills, imagine the bill for repairing any of the circuitry and switches involved! ●BH

* * *

Commuter's Conundrum--If you tell your boss you were late for work because you had a flat tire, the next morning you will have a flat tire.

Continued from Page One

New Devices

transistor, begun two years ago, provided the technical basis for the new record-setting transistor and SCR," says Tom Zipperian of Compound Semiconductor Research Division 1141. "Essentially, the primary reason our new devices operate at temperatures significantly higher than previous ones is their improved design based on experience gained from the earlier devices."

"Our tests clearly demonstrate that there are no fundamental impediments blocking the operation of solid-state devices and circuits at temperatures greater than 500°C. However, problems do exist that must be addressed before a technology of this sort can become commercially available."

Problems currently getting attention include corrosion, oxidation, selective loss of volatile materials, and other undesirable chemical processes at high temperatures that limit device performance and life. These processes cause the prototype transistor and SCR to fail after about an hour of operation at 500°C. Sandia's goal is operation for up to 1000 hours at this temperature.

Other potential problem areas that have not yet been addressed include survivability of packaging for high-temperature devices -- the packages must be as tolerant of temperature as the devices they house; and problems associated with thermal cycling -- exposing the devices to alternately high and low temperatures.

"These are conditions commonly encountered in space explorations," says Tom. "But much more development is necessary before any of our devices are ready to go on a space probe."

Medical Corner

There are Second Chances

by Arlene R. Price (3330)

Cigarette smoking -- it's this country's "foremost preventable cause of death and disability."

Smoking plays a major role in death from coronary heart disease, lung cancer, and other causes. It's held responsible for 20 percent of all cancer, 25 percent of all cardiovascular disease, and 40 percent of all respiratory disease.

In other words, cigarette smokers die early -- "excess mortality," the demographers call it. Their studies indicate that heavy smokers between the ages of 30 and 60 have a 19 to 25 percent reduction in life

expectancy. That's the bad news.

The good news is that this excess mortality in ex-smokers is lower. For example, those people who stopped smoking when they were between 30 and 54 years old had a lower death rate from coronary artery disease than did those who continued smoking.

Also, recent studies have demonstrated that the risk of disability from diseases such as lung cancer and chronic obstructive lung disease is sharply reduced in patients who have stopped smoking as compared to those who continue to smoke. It's brutally clear that people of any age can be healthier and live longer if they quit smoking.

For all of these reasons, Sandia's Medical Department tries -- hard -- to assist Sandians in their efforts to quit smoking. The smoking cessation program, aimed at individuals as well as groups, includes the offering of a Quit-Smoking class that has been well received by Sandians throughout the years. Sixteen classes have been conducted over the past four years with 170 Sandians participating. Follow-up contacts indicate that approximately one-third of the participants have successfully quit smoking for good.

During the Great American Smokeout held November 17, ninety-two Sandians signed the pledge to quit smoking. Medical plans to follow up to see how they are doing.

The next Quit-Smoking class will be presented Mondays and Wednesdays, Jan. 16 through Feb. 8, from 12-1 in the conference room of Building T13. To enroll, please contact Arlene Price (3330) at 6-0021.

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Here are some current volunteer opportunities for employees, retirees, and their families. If you are interested, call Karen Shane (4-3268).

Albuquerque Rape Crisis Center needs volunteers in two areas: Phone advocates to answer crisis calls from a home phone, and victim advocates to provide emotional support and information as well as to serve as law enforcement, medical, and legal advocate for the victims. Training sessions will be conducted the end of January.

Four Seasons Nursing Center is looking for volunteers to spend time with elderly patients, perhaps lending assistance in activities programs.

Sandian Speaks At Pastoral Letter Forum

During 1983 the struggle for verifiable test bans, nuclear disarmament and world peace was highlighted among Catholics and many other Christians by the issuance of the Pastoral Letter of the U.S. Catholic Bishops on War and Peace. The letter created a furor at the outset and led to some discussion and soul searching among those in the defense communities.

Rick Wayne (8110) recently took part in a public forum sponsored by St. Michael's Catholic Church in Livermore. The panel included two scientists from LLNL as well as Thomas Ambrogio, the executive director of the Commission on Social Justice from the Archdiocese of San Francisco. The panelists wrestled with such moral issues as how to form their consciences in the light of the Gospel, how to distinguish between the moral principles contained in the formal church teaching, and how to apply those principles to specific issues.

Rick traced the evolution of his thinking over the years he has been at Sandia, working both in solar research and in nuclear weapons technology. He said that both the Pastoral Letter and his own background convince him that his principal guide has to be the preservation of human rights. "That's another way to spell defense, to try to protect what you think is important. We have a right to human dignity, we have a right to religious freedom ... and the Bishop's letter points out that we have a right to defend all this which we believe in.

"We all agree that we want to avoid war, but should it be thrust upon us in the attempt by another society to take away our rights, or for reasons of power or glory, I think we have a moral obligation to resist — using the minimum force necessary, but up to and including nuclear force," said Rick. "There is no excuse for us ever initiating a nuclear conflict, but what if the Soviets or Chinese or somebody else initiates a nuclear conflict? Then we don't have the choice of avoiding it; our obligation is clearly to terminate it as rapidly as possible, not with massive destruction but with a minimum cost overall to global society."

He admitted he didn't know how arms control could be accomplished, but he said such control "is something this country has a very strong imperative to work toward. But any arms control agreement must be verifiable, so that we can believe in it, and it must be sufficiently equitable so that it ensures our national security as well as theirs."

Rick said the country is stuck with a bunch of difficult options at this point — there are a number of alternatives, but he doesn't see any more workable than the path currently being taken by the U.S. He said the international tensions, the hatred, the distrust is like a cancer — "It need not be fatal, but it is there — and we must deal with it."

In concluding, he quoted from the Bishops' Letter: To those who face specific questions in the defense industry, directly involved in the development and production of weapons of mass destruction, we do not presume or pretend that clear answers exist to many of the personal, professional,

and financial choices ... Both those who find it difficult or impossible to continue working in defense industries, and those who choose to continue working in them should be supported by the community, by the church, in this very unclear area.

"The real challenge that the Letter gives us is to address the issue," Rick responded. "We can't ignore the issue, and that is one of the gifts that the demonstrators have given us — they have not really proposed a solution to the country, but they have helped bring the issue before the public eye and make people think about it. Thinking about it, and judging it and ourselves morally, are what I believe we are really called upon to do."

Speaking for the church was Thomas Ambrogio who provided the overview from the perspective of the bishops. "The bishops of the U.S. are beginning to understand that the reality called a strategic thermonuclear weapon has a power unlike anything we have ever seen demonstrated ... and therefore the problem posed, both in strategic and moral terms, is unlike anything the human family has ever faced before." He said the entire tone of the letter is to urge ordinary, reflective, concerned Christians

to take seriously the concerns outlined and to decide on their own conscience what they should do about them.

Quoting from the letter, the church spokesman said any quest for superiority in nuclear power "must be resisted. Every addition to our strategic system must be assessed precisely as to whether it leads to progressive disarmament." He said the bishops are opposed to first-strike weapons and named the MX and Pershing as possibly being in that category. The letter opposed the development of strategies for war-fighting capability and recommends (1) support for immediate bilateral, verifiable agreements to halt the testing, production and deployment of new nuclear weapon systems; (2) support for comprehensive test ban treaty; and (3) removal of short range tactical weapons.

He also quoted a portion of the letter that said, "We do not perceive any situation in which the deliberate initiation of nuclear warfare on however restricted the scale can be morally justified." He pointed out that the bishops are "highly skeptical of the real meaning of 'limited' in the term 'limited nuclear war.'"



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SPEAKING at a forum on nuclear weapons is Rick Wayne (8110), and listening are (from left) John Immele of LLNL and Thomas Ambrogio of the Archdiocese of San Francisco.

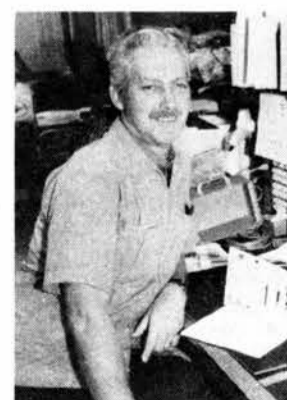
Retiring



George Anderson (8230)



Betty Hogan (8262)



Bill Irwin (8466)



Bety Pajari (8270)

Easing The Problems of Aging

Editor's Note: We're all aging. But surprisingly little is known about the process. What follows is an abridged version of an interview with Dr. Robert Butler, former director of the National Institute on Aging and now head of the geriatrics department of New York City's Mount Sinai Medical Center. The interview, conducted by journalist Paul Friggens, first appeared in Exxon Today (First Quarter 1983) and is reprinted at the suggestion of Sandia Medical and with the permission of the Exxon Company USA.

EXXON: What are researchers learning these days about aging?

BUTLER: The most spectacular development concerns senility, meaning, broadly, impairment of memory and intellectual capacities in the older person. Years ago, people thought of senility as inevitable. If you lived long enough you would become senile due to hardening of the arteries. People believe this even today. But now scientists are discovering that we shouldn't automatically write older people off as senile. We know that senility is not inevitable with long life. Recent studies of the National Institute of Health (NIH) on brain aging suggest that the healthy old brain works as hard and as efficiently as the healthy young brain. We once thought that the loss of 50,000 nerve cells every day after age 20 caused intellectual decline. It appears now that some parts of the brain don't stop growing at age 20 but continue to grow as long as a person lives. It may mean that the brain has a unique, built-in protective mechanism which allows it to compensate for the loss of its cells over a period of time.

EXXON: So older people not only maintain their intellectual competence, they may even improve it?

BUTLER: Right. But now we're talking about the majority. One of the problems in the medical treatment of older persons is the tendency to treat them all the same. Yet, they are not homogeneous. Maybe 15 percent of people over 65 have some mental problems, probably as a result of disease such as Alzheimer's disease, which is incurable. Another is the multiple small strokes that some older people get. But the vast majority of older people do not have diseases in their brains. As a rule, you can say that a person's judgment and general knowledge increases with age.

EXXON: What about those brief losses of memory as we grow older? A sign of senility?

BUTLER: Several times during our talk I've tried to remember names and couldn't. But if I can't remember a particular name on a particular day, does that mean I am getting senile? As we get older, we accumulate more information, and our brains become overloaded. So what appears to be forgetfulness may just signify that we must sift through a larger file before coming up with the right information.

EXXON: I must say that I'm relieved. But what of those who are diagnosed as senile?

BUTLER: We've learned that some 10 to 20 percent of cases of "senility," which is a

lay term, not a medical one, are caused by a variety of underlying physical conditions. There may be metabolic disorders, toxic states due to excessive medication, or even malnutrition. Many of these could be reversed if treated in time. There are also promising findings having to do with the effect of enzymes on aging. Scientists are looking closely at various pathways in the brain and at neurotransmitters that bear upon memory. They are examining changes in bones that make them thin, particularly in women, and so lead to broken hips. For example, women who take calcium, exercise regularly, get some sunshine, and avoid smoking have fewer broken hips. Science is also studying slow viruses which take years to show effects. Other researchers are examining the possibility that certain metals might have a cumulative effect on brain tissue. We're also looking into genetics as a clue to aging.

EXXON: What significance does this have for us all?

BUTLER: It translates into a message of hope. We are beginning to have some understanding of all the underlying biological changes that occur with age. That, in time, may lead to remedies that will put an end to the fear that you will lose your mind as you grow old. It also may help us make some real inroads in cutting down the need for nursing home care.

EXXON: I have the impression that few of us will need nursing home care. True?

BUTLER: You are right. In fact, only 5 to 7 percent of all people over 65 are in any kind of institution at any given time. About 20 percent have some brief institutionalization during their lifetimes. I don't mean to minimize these figures, but I want to stress that 95 percent of the elderly are not in any kind of long-term facility and that 80 percent of those who survive to 65 and older will never be in a nursing home. However, as life spans grow longer (we call it "survivorship"), the use of nursing homes is likely to increase a little.

EXXON: That takes care of one of the myths about aging. Are there others that could be dispelled?

BUTLER: One myth says that older people are unproductive. Yet, we are already beginning to see that attitude change as the mandatory retirement age has been raised to 70 in the private sector. And we know from studies that absenteeism is less among older workers, that their dependability is good relative to other age groups, and their capacity to continue to be productive is high. Many older persons work right up to the end.

EXXON: Which raises the question, just how old is "old" today?

BUTLER: We don't have good markers for aging. There's no chemical tracer or biological test. So we use chronological age, and that's not the world's best predictor. At the time of the American Revolution, average life expectancy was about 35 years. At the turn of the century, it was 47; now it's 73 years. In previous centuries, a person in his 30s could look old and be old because of disease. Now, people are living longer and looking younger.

EXXON: Have we extended human longevity, or have we improved our chances of survival?

BUTLER: As far as we know, we have not extended the essential, inherent life span, which is probably genetically determined. But the chance to survive has been dramatically improved. Today, 83 percent of newborn babies will live into their 60s, compared with 33 percent just 150 years ago. The gain has given the nation a population of 26 million people over the age of 65. What's more, they are increasingly vigorous and healthy. They are working longer and taking better care of themselves than ever before.

EXXON: This development surely must have wide social and political implications. Can you suggest some?

BUTLER: The enjoyment of a longer life is a priceless reward in itself. Husbands and wives may enjoy each other's company for a longer time. It's likely that 40- and 50-year wedding anniversaries will become fairly common. But for the country, the advantage is an increasing number of experienced, thoughtful, prudent people who have, in my judgment, contributed more than they have taken out.

EXXON: But some seem to feel that a large population of older people will be a burden on the country, that the government will have to become that caretaker for old people. Has there been a change in the role of families as caretakers of older people? Are families abdicating their responsibilities?

BUTLER: No, that's another myth. In 1900, for example, the larger family, with lots of brothers and sisters, aunts and uncles, probably living on a farm, took care of the older man or woman. Today the number one caretaker of older people is still the family. Studies confirm this. American families have not abandoned their old people. Of course we see exceptions. But there have always been exceptions.

EXXON: Yet, the government clearly has assumed a larger role in caring for the elderly, has it not?

BUTLER: True. We now have Social Security, Medicare, Medicaid, and a variety of allied programs that the NIH oversees. In 1935, the U.S. became the 28th nation to develop its Social Security System. But the government has never contributed a nickel to it. Employees and their employers have always shared the cost of Social Security equally and directly.

EXXON: In your opinion, do you think the government should assume responsibility for the aged?

BUTLER: Not exclusively. I think it should be a collaborative effort of federal, state, and local governments and the private sector. In the latter area, companies such as Exxon have outstanding pension and insurance programs for retired employees, and they are to be congratulated. But not all companies meet these responsibilities. Likewise, the large foundations, which dispense funds for many worthwhile activities, should channel money into

(Continued on Next Page)

Fun & Games

projects having to do with geriatrics and the elderly. Their involvement up to now has been minimal. I don't think we should leave it to the federal government alone.

EXXON: Speaking of company plans for the elderly, how do companies benefit from these plans?

BUTLER: They gain in employee morale and loyalty. When our "baby boom" grows gray and 20 percent of our population is over 65, those corporations that have been out in front in developing imaginative policies will be rewarded by the motivation of their employees. For example, some companies have health promotion and fitness programs that seek to keep older employees well. Some have discussion and counseling programs that inform older employees about medical and psychological changes that accompany aging so that older employees may enhance their productivity. Still others have flexible policies regarding retirement so that there is little emphasis on age. Some have active communication and social programs for retired employees that permit them to stay in touch with each other and with company concerns. All of these programs help a company because they assure a loyal, experienced, and increasingly productive work force. Beyond that, the more enlightened of our corporations understand that they bear a responsibility to the country in creating a work environment in which both young and old may enhance their quality of life.

EXXON: To sum up, does it seem to you that we are entering upon a new era of hope for those who are growing old?

BUTLER: Definitely. We cannot prevent people from growing old, and we cannot forestall death indefinitely. But we now have a chance to do something about the debilities of aging. We can intervene with treatments that relate to hormones, like estrogen; that relate to diet, such as calcium; and medications that control blood pressure, which is a high risk factor for strokes. And we have the new gerontology, which instead of focusing on disease, disability, and death, is beginning to get behind the underlying mechanisms of aging. As a result, this is the first century in which people from countries around the world can expect to grow old successfully, comfortably, and happily.

Dr. Butler's Nine-Point Guide To a Long, Healthy, Happy Life

1. Make sure your diet contains no more than 30 percent fat, and get plenty of roughage.
2. Avoid white, granulated sugar, or use it only in moderation. You can get sugar in fruit and vegetables.
3. Cut down on your use of salt, which is a predisposing factor in hypertension, or high blood pressure. For most people, overuse of salt is just a habit that can be broken.
4. Remain as physically active as possible. Regular exercise such as walking or swimming will help to maintain your cardiopulmonary stamina.
5. No smoking. For some, smoking is lethal. And moderate your drinking of alcohol. Many hospital admissions report "excess alcohol" as one of the diagnoses.
6. Develop a habit of congeniality. Don't be an old crab. Smile at people. A cheerful disposition helps to alleviate stress. Show others you care about them and they will care about you.
7. Keep people in your life. It's well documented that those who develop friendships and maintain an active social support system actually live longer. We need familiar things and familiar people in our lives.
8. Maintain a sense of purpose. You don't have to become a do-gooder. But you should pursue a substantial interest that challenges you physically and intellectually and that keeps you in touch with the mainstream of life. Stay busy.
9. Think young. Now 86, the comedian George Burns knew what he was talking about when he made the following remarks, reported in *Time*: "A lot of people practice getting old. They start to walk slower and they hold on to things. They start practicing when they are 70, and when they're 75, they're a hit. They've made it. They are now old."

Burns then added, "Who the hell wants that?"

Skiing, Downhill — The American Lung Association and KOB-AM Radio are sponsoring a Limited Edition Ski Privilege Card good for complimentary all-day lift tickets at each of six ski areas in exchange for a \$20 donation. A thousand cards will be sold; buying one will enable you to ski at Angel Fire, Red River, Rio Costilla, Sipapu, Sugarite, and Cloudcroft and help the Lung Association at the same time. More info from ALA at 265-0732.

* * *

Skiing, Cross Country — Want to ski tour in the Jemez, or Chama, or elsewhere in the state and get a ski lesson to boot? Retired LAB NEWS editor John Shunny is leading weekend tours, under the auspices of the Sandia Employees Recreation Program, for two to eight intermediate or strong beginners; cost is \$50 per group per day (not including transportation). John has the credentials — he's a X-C instructor at Sandia Peak and a Nordic Ski Patroller registered with the National Ski Patrol. Call John on 265-1620 or Tom Lenz on 4-8486.

Reztilup Prize Goes to 'Bad' Tech Writing

The Reztilup Prize awaits the winner of the best "bad" original technical writing by Sandians in a contest spearheaded by Donna Rix (6220), a tech writer and a tech writing instructor. Modeled after the Bulwer-Lytton Fiction Contest (he's the writer who immortalized "It was a dark and stormy night"), the contest judges will choose a Reztilup (that's Pulitzer backward) Prize winner plus other Dishonorable Mentions. Judges include Sandians known to tend toward literacy, winners may be published in the LAB NEWS, deadline is Jan. 31, and it should be fun. Contact Donna on 4-8221 for more info.

Science, Religion Symposium Set Jan. 9-10

The 1984 Science, Philosophy, and Religion (SPAR) symposium is Jan. 9-10 at the Air Force Weapons Lab, KAFB. Theme of the symposium is "The Development of the Whole Scientist in the National Defense Environment." Panelists are Maurice Katz, Deputy Director of OMA; Rabbi Sylvan Schwartzman and Gerald Nash, both UNM professors; and Louis Rosen, director of LANL's Meson Physics Facility. Moderator is USAF Lt. Gen. (ret.) Ernest Hardin, now Assistant to the Manager of DOE/AL. More info from SPAR on 256-3595.

BONNIE SKENANDORE (left) and MITZIE MORRATO (both 3155) are the two artists whose work was on display in Bldg. 802 last month and, during January, is on exhibit in the Tech Library. Most of Bonnie's work — drawing and painting — is portraits. Mitzie's work is done with soft colored pencils. The juxtaposition of works of realism to those of fantasy makes an interesting exhibit.



EXPERTISE REVISTED



NOVEMBER, 1933: "Lord Rutherford spoke sensibly when he told the members of the British Association for the Advancement of Science at their recent meeting: 'Anyone who says that, with the means at present at our disposal and with our present knowledge, we can utilize atomic energy is talking moonshine.'"

—Scientific American



NESTOR ORTIZ (6430), JAKE DeVARGAS (3410), and LEO KLAMERUS (2154)



NEIL HARTWIGSEN (5261), BOB EAGAN (1840), and JOE SENA (2634-1)

Supervisory Appointments

NESTOR ORTIZ to manager of Nuclear Fuel Cycle Systems Safety Department 6430, effective Dec. 16.

Nestor joined the Labs in March 1977 as a staff member with the reactor safety organization. A year-and-a-half later he was promoted to supervisor of Nuclear Fuel Cycle Risk Assessment Division; he headed this group until his present promotion.

Nestor received his BS in EE and MS in nuclear engineering from the University of Puerto Rico. He earned his PhD, also in nuclear engineering, from M.I.T. Before joining Sandia, Nestor was a department head with a Puerto Rican public utility and worked for the AEC in Germantown, Md. He is a member of the American Nuclear Society.

A member of the '83 champion Sandia softball league, Nestor also plays in the Labs' volleyball league. He and his wife Regina have two daughters and live in the NE heights.

JAKE DeVARGAS to manager of Property Management Department 3410, effective Dec. 16.

Jake joined Sandia's accounting organization in August 1955; he worked with this group for almost a year before taking a military leave-of-absence for three years with the Air Force. Returning to Sandia in 1959, Jake joined the computing department. He was a programmer, systems analyst, and project leader on a number of data base programs. In 1976 Jake was promoted to supervisor of a budget division. He was named Assistant to Vice President Powell (3000) in 1980. Since November 1982, he has supervised Equal Opportunity and Affirmative Action Division 3511 while continuing as the 3000 VP assistant.

Jake earned his BBA from UNM and has done graduate work toward an MBA. He is active in the PTA organization at both the school and county levels, and he serves on the Board of Directors of the Family Counseling Service. Jake enjoys fishing and woodworking. He and his wife Cipi have five children, one at home. They live in the NE heights.

LEO KLAMERUS to supervisor of Interconnections Division 2154 — a function in

the Electronic Technology Department 2150 — effective Dec. 16.

Following graduation from Washington University (St. Louis) with a BS in EE, Leo joined Sandia in June 1960 as a member of the Technical Development Program. He continued his education at UNM and received MS degrees in EE and computer science. Leo worked with the component engineering organization until 1975 when he transferred to the Nuclear Fuel Cycle Programs Directorate. He was project engineer on a number of programs for NRC. For the past year, Leo has been with CAD/CAM Integration Division 7611.

Leo enjoys skiing, fishing, softball, and teaching; he's been a math instructor at the U of A since 1975 and in Sandia's Out-of-Hours and INTEC programs since 1974. He developed INTEC's first engineering math refresher course. Leo and his wife Jan (7522) live in NE Albuquerque.

NEIL HARTWIGSEN to supervisor of Advanced Facilities Protection Division 5261, effective Dec. 2.

Neil joined the Labs in 1967 as a staff member in a component environmental test group. He was a project engineer for explosive component testing with this organization until 1974 when he moved to Safeguards and worked on access denial methods. In 1979 Neil was assigned to the strategic petroleum reserve program and was project engineer for leach / fill technical support. He then transferred to the sludge radiation program and was a project engineer for a year-and-a-half. Neil returned to Safeguards where his most recent work has been with the Savannah River Reactor Safeguards project.

He received his BS in ME from Valparaiso University and his MS in engineering from UNM. Neil is a member of the Los Lunas school board. He and his wife Cheryl have two children; they live in Los Lunas.

BOB EAGAN to manager of Chemistry and Ceramics Department 1840, effective Dec. 1.

Bob joined the Labs in 1971 as a member of the technical staff in the glass ceramics materials organization and worked primarily on glass-to-metal hermetic seals. Bob's

group, in conjunction with Process Development Laboratories Department 7470, developed the capability to melt and form a variety of glasses and glass ceramics. Bob was promoted to supervisor of Ceramics Development Division 1845 in 1977.

He received a BS in ceramic engineering from Alfred University (Alfred, NY) and his MS and PhD, also in ceramic engineering, from the University of Illinois. He is a member of the American Ceramic Society and the National Institute of Ceramic Engineers. Bob enjoys traveling and woodworking. He and his wife Judy live in Cedar Crest.

JOE SENA to supervisor of Tech Control Center Operations Section 2634-1, effective Nov. 18.

Joe joined Sandia's computer organization in February 1978. Before coming to the Labs, he had been a communications contractor. Joe was a project leader for the Bldg. 802 tech center and was later named coordinator for all the tech control centers.

He earned a BS in business administration from the U of A, and has done graduate work toward an MBA. Joe served as director of volunteer services with the juvenile probation organization; the hobby he enjoys most is photography. He and his wife Christine have four children. They live in NE Albuquerque.

JACK HICKMAN to manager of Reactor Systems Safety Department 6410, effective Dec. 16.

Jack joined the Labs in July 1962 as a member of the Technical Development Program. He earned his BS in EE from Oklahoma State University and his MS in EE from UNM. Jack first worked with a weapon system group. In 1967 he transferred to the nuclear safety division and for the next two years served as a technical advisor to the Joint AEC/DoD Nuclear Weapons Safety Board. From 1969 to 1974, he was a safety analyst in the safety assurance division of the nuclear safety department. Jack was promoted to supervisor of safety assessment technologies division in 1974. His transfer in 1976 to supervisor of Reactor Systems Safety Analysis Division 6412 was a change in the direction of his career at the

Take Note

One of the longest-operating Christmas charity projects at the Labs is the one financed and conducted by the people in Design Information Center Directorate 7600.

Dave Nichols (7651) was the project chairman for 1983. He reports that almost \$1600 was donated by his group. The money was used to buy gift certificates for either food or clothing for 25 needy families. The names of these families were supplied to Dave and his committee by the Salvation Army.

In a separate drive, Rosemarie Dobbins (7655) collected toys and then spent time matching toys to kids from the list supplied by the Salvation Army. With added donations of food in addition to money, the group was able to help three more families not on their list. Distribution of the gift certificates was made on Dec. 21.

Dave was pleased with the results — "This charity has been in operation at Sandia for 25 years, and the drafting people always come through. In fact we surpassed our 1982 total by \$300."

* * *

The Albuquerque, Downtown, and Duke City Business and Professional Women's Clubs are sponsoring a women's career advancement workshop called "On the Way Up — II" on Feb. 15 from 8 to 5:15 at the Convention Center. Marilyn Machlowitz of *Working Woman* magazine is keynote speaker. Cost is \$40 before Feb. 1; call Lauretta Dickey at 265-6738 for info and registration.

* * *

Speaking of Up, the Up With People show hits town Jan. 14 at 8 in the Kiva auditorium. The cast of 130 young men and women needs lodging; if you can help, call the Chamber of Commerce at 842-0220, ext. 24. Tickets for the show from Worldwide Tickets at 6209 Menaul NE.

* * *

The South 14 Bookstand—If you have a place in your library for New Mexicana, then consider *The California Column in New Mexico* by Darlis Miller, published in 1982 by UNM Press. In her preface, Prof. Miller writes: "At the start of the Civil War, California volunteers—known as the California Column—marched overland across the Southwest desert to help expel Confederates from New Mexico. Before this force of some 2350 men reached the Rio Grande in 1862, the Confederates had been driven from the territory." The column remained for the duration, however, and afterwards 340 of the volunteers elected to muster out and remain in New Mexico. This book traces their lively history as members entered mining, farming, ranching, business, politics, and even some lawlessness. It's \$9.95 at the LAB NEWS office in Bldg. 814.

Congratulations

Charles Peden (1134) and Martha Anderson, a daughter, Amanda Marie, Nov. 14.

Sympathy

To Hilda Roche (3533) on the death of her father in South Dakota, Dec. 12.



JACK HICKMAN (6410), DENNIS MIYOSHI (5240), and DON DOAK (7610)

Labs — from nuclear weapons safety to light water reactor safety.

Jack enjoys hiking and backpacking; however, his primary hobby is building an airplane. He and Bill Snyder (6400) recently completed their airplane (a future LAB NEWS feature). It has already made one successful flight. Jack lives in NE Albuquerque.

* * *

DENNIS MIYOSHI to manager of Safeguards Engineering Department II 5240, effective Dec. 16.

Coming to Sandia in February 1969, Dennis joined an instrumentation development organization that was working on upper atmospheric projects. His next assignment was a study of the properties of underwater light. In March 1976 he was promoted to division supervisor of a special projects group that supported safeguards programs. Most recently, Dennis has supervised the Facility Systems Engineering Division 5265.

Dennis earned his BS in physics from Stanford University and his PhD in experimental solid state physics from Cornell. He is a member of the American Physical Society. Most of his off-the-job interests are concerned with activities of his children —

Albuquerque Youth Soccer and the Albuquerque Youth Symphony. Dennis and his wife Geri have two daughters; they live in the NE heights.

* * *

DON DOAK to manager of Computer Aided Design and Integration Department 7610, effective Dec. 16.

Don joined Sandia in June 1958 as a staff member in the engineering analysis department. In 1974 he transferred to the advanced mechanical development organization and, in 1976, was promoted to supervisor of the division. Since last October, Don has headed the NWC (Nuclear Weapons Complex) CAD/CAM Integration Division 7611. Sandia is the lead laboratory for CAD/CAM integration in the weapons complex.

Don received his BS in aeronautical engineering from Purdue and, under Sandia's Computer Science program, earned an MS in ME computer science from UNM. He is a member of the American Society for Mechanical Engineers. Don enjoys woodworking, antique car restoration, and fishing. He and his wife Nancy have five children, one still at home, and two grandchildren. They live in NE Albuquerque.



NUCLEAR REGULATORY COMMISSION Chairman Nunzio Palladino paid his first visit to Sandia last month. He was briefed on all Sandia programs with special emphasis on the ones being conducted for the NRC. He also toured the Annular Core Research Reactor facility and saw a fuel rod meltdown test set-up that's part of an NRC project, then went on to Sandia's new Flame Facility where burning hydrogen in reactor containment buildings is being simulated for study. Finally, he visited the Large Melt Facility where he was briefed by Dana Powers (6422, right). From left, Bill Snyder (6400); Norman Haller, Palladino's assistant; Palladino; and Jack Walker (6420).

It Takes GUTs to Explain the Universe

GUTs is the acronym for Grand Unified Theories, the topic of a colloquium by Alan Guth from MIT's Center for Theoretical Physics. Guth was trained in elementary particle theory, but a few years ago he decided to "dabble in cosmology" — and not, he assured his audience, out of jealousy of Carl Sagan either.

He and his colleagues are now well beyond the dabbling stage. In fact, they're attempting to reconstruct the history of the universe when it was almost unimaginably young, say 10^{-35} second after the Beginning.

Guth's talk, "The New Inflationary Universe," refers to the expansion of the universe, and if there's a "new" inflationary universe then presumably there's an old one. That is, of course, the one defined by the standard Big Bang cosmology. But, says Guth, there are problems with this theory. A few years ago he suddenly realized that GUTs made it possible to imagine a time before the Big Bang when the universe was inflating exponentially at an incredible rate. And it seems that his concept not only solves the problems encountered by the Big Bang theory but may also set a framework for asking a *really* big question: "Where did all the matter and energy that make up our universe come from?"

"When I was a graduate student, very little was known about the four major forces in the cosmos," says Guth. "There was an apparently perfect quantum electrodynamics theory but none for strong (or nuclear) reactions, just an obviously wrong one for weak (beta decay) interactions, and only a classical theory of gravity. We had no idea how quarks interacted, or of gravity at the quantum level — although at the classical level it seems to be described exactly by the theory of relativity."

The late 1960s, however, brought some "astounding" progress. GUTs, though still incomplete, appeared capable of explaining and unifying three of the four known forces (gravity remains much less tractable). "It was the end of the dark ages," exults Guth.

A "unified" theory is exemplified by Maxwell's equations, which treat electricity and magnetism, once considered unrelated, as different aspects of the same phenomenon. One of the dramatic predictions of GUTs is that weak, strong, and electromagnetic forces would all look the same at the inconceivable energy of 10^{14} GeV. "It would take an accelerator one light year [the distance traveled in a year by light moving at 186,000 miles per second] in length to achieve this energy level today," explains Guth. "Since such an accelerator is unlikely to be funded, we had to turn to our only possible laboratory — the universe in its infancy."

Albert Einstein was originally dismayed to discover that his equations predicted an unstable cosmos that had to be either exploding or imploding. Within a few years, however, it was demonstrated experimentally that all the galaxies are indeed rushing away from each other at speeds proportional to their distance from each other. If we extrapolate far backward in time, the universe now visible to us must

once have been much smaller and hotter. At the tender age of 10^{-35} second, when it was about 10 centimeters across, energies of 10^{14} GeV would have been commonplace. In principle, GUTs can describe the evolution of the cosmos since that time.

One of GUTs' great successes has been the prediction that, starting in a matter-antimatter symmetric state, the universe could indeed evolve into what we now observe: mostly photons but with a slight (nevertheless, for us, significant!) net amount of ordinary matter.

Accompanying that success, however, was a dismal failure: the prediction that the modern world should be chock full of heavy magnetic monopoles — so many, in fact, that the universe would necessarily have already collapsed under their gravitational attraction!

It was Guth's inspiration to go back *before* the beginning of the Big Bang to find a solution for the monopole problem and, as it turned out later, for two other problems that had been bothering cosmologists: the "horizon problem" and the "flatness problem." The solution invoked the concept of an "inflationary" stage for the embryonic cosmos.

The world, according to Guth, may have started out from literally nothing. Nothing. No space, no time, no matter — only the primordial laws of physics. In this "ultimate free lunch," as Guth likes to call it, a quantum fluctuation could have produced a pinpoint of space-time-mass. (Well, somewhat smaller than a pinpoint, say about 10 kilograms in a trillionth the space of a modern proton!) Such a pinpoint could have expanded exponentially, doubling and redoubling in size perhaps a hundred times, before the forces described by GUTs could evolve from their primordial state of equality to the varied laws of physics as we see them today. At the end of this "inflationary" period, we reach the beginning of the Big Bang. The rest is history.

So how does this eliminate the monopole glut? Well, it seems that monopoles are really some sort of dislocations in the vacuum (topological knots in the Higgs field, if you prefer). And if our universe is really an inflated version of something that was only a trillionth of a proton in diameter, all these knots would have been "combed out" of existence during the inflation.

And the "horizon problem"? The blackbody radiation that we see filling all space is more than 99.9 percent isotropic. This radiation was last scattered when the universe we now see was about 100,000 years old, just cool enough for most free electrons to attach themselves to atoms and stop being good scatterers. So the universe at that age must have been extremely homogeneous.

But at that age the universe we now see wasn't "in causal contact" with itself. That is to say, the "event horizon," the distance light could have traveled in 100,000 years, reached only one percent of the way across. (This comes about because the event horizon increases linearly with time, one light year per year, but the size of a given piece of the universe expands more slowly,

as the two-thirds power of time.) So there is no explanation for such a universal homogeneity *unless* the entire universe was originally inflated from a homogeneous pinpoint, tiny enough to be indeed causally connected! It's a nice point that Guth wasn't even aware that the "horizon problem" existed at the time he solved it.

And finally, the "flatness problem." According to Einstein, there are two kinds of exploding universes. A "closed" universe has sufficient mass density for gravitational forces to slow down and reverse the explosion, leading finally to an implosion. An "open" universe has too little mass density and must expand into eternity. Of course there is a fine mathematical line between these two types called "flat," but any real universe will diverge away from flatness with ever-increasing rapidity as time goes on.

Now the fact is that our universe today looks very "flat." Its mass density is certainly within a factor of ten of being on the critical dividing line. Because of the divergence business, it must have looked "flatter" in times past. At the age of 10^{-35} second its mass density must have been equal to the critical "flat" value to about 15 decimal places. "That's like balancing a pencil on its point so precisely that it's still there a billion years later," says Guth. How did we get so lucky? Easy. The inflation preceding the Big Bang stretched the infant universe out into near-perfect flatness. One hundred doublings give the 15 decimal places with ease.

Guth's talk was replete with mind-boggling concepts. For example, why should our pinpoint inflating into a universe be unique? There should be many such bubbles rising out of the primordial chaos, different universes separated by "nothing." But since they're all expanding (theoretically), someday our universe could make contact, or meld, with one or more of these other universes (again, *very* theoretically). Or then again maybe not. The "nothingness" separating the bubbles/universes might present an impenetrable barrier.

Anyway, getting back to our own neck of the cosmos, Guth says that the universe extends much farther than the currently observable universe. He concluded by admitting that his models are somewhat contrived: "We have to develop more elegant models. The nice thing about the new particle theories is that they predict many observable features of our present universe — the early universe is the experiment we use to test our theories."

• *cm (with thanks to Crawford MacCallum—1231)*



Why do autumn leaves fall?

1. Autumn comes before winter.
2. Every winter we have high winds.
3. Every winter large objects with large surface areas get blown over (or torn up by the roots).

A tree without leaves has a small surface area, as compared with a tree with leaves which has a large surface area.

Ergo, every autumn those trees with any sort of seasonal sense at all shed their leaves, which are pretty useless anyway when there's not going to be much sun around, and ride out the storms on bare poles.

Is this sufficient for my Nobel Prize?

— Letter to *New Scientist*

Astute Amateur Achieves Automated, Accelerated Adobe

As was noted in these pages not too long ago, New Mexico hasn't spawned very many national trends. And if we ever do inspire our compatriots in the other 49 states into some kind of off-beat activity, it will probably have something to do with adobe. (We were bitterly disappointed when those know-it-all New Yorkers didn't use adobe to build the World Trade Center.)

Even though adobe is not as yet widely used in the construction of high-rises, its popularity has been increasing rapidly — particularly in the last decade. Now, capitalizing on this trend, Jim Honeycutt (7485) has designed and built an adobe-making machine.

"About five years ago, a friend — who was also a contractor — asked me to help him build a machine that would produce adobe bricks cheaply and quickly," says Jim. "A hydraulics man was also involved and among the three of us we came up with the first adobe-making machine of its kind that presses small blocks.

"We use dirt that isn't more than 35 percent clay — the rest is sand. A local gravel company delivers the dirt to the construction site where we also set up the machine. We make the blocks right where they're going to be used. If the right mixture of dirt is available onsite, then we use that."

Jim's bricks are pressed to dry with no more than 3 to 5 percent moisture content. The blocks are 3-5/8 by 6 by 12 inches. They're ready to use as soon as they come out of the machine and there's no drying period as in standard adobe.

"We dump the dirt into a big hopper that empties out to a conveyor belt," Jim explains. "The dirt goes through an auger that mixes the dirt and deposits it in molds. A hydraulic ram then compacts the dirt at 2220 psi — 11 inches of dirt is compressed to 6 inches. The machine can make 10 blocks a minute — that's up to 4800 a day."

Comparing his bricks with handmade adobe, Jim points out that his are much easier to line up since they're all exactly the same thickness. A mixture of mud and sand is used between the blocks as mortar. They can be plastered and, unlike traditional adobe, nails can be driven into the blocks — it's a lot like hammering a nail into hard wood. And they can be painted just like concrete.

"Handmade adobe blocks are subject to a lot of breakage," Jim continues. "Besides, they can only be made during the summer and the quality varies with the weather conditions. The mud has to settle, and that leaves cracks. And finally, handmade adobe sells for 50 cents to 75 cents a block — our bricks sell for 25 cents apiece."

Jim is looking forward to an adobe-oriented second career after retirement. He and his partners have put up the walls for three houses and recently built an entire model house themselves. Now working in Galisteo, they're also eyeing some foreign markets in Mexico, Australia, and the Middle East — areas where there is little or no timber.

In the distant future? An adobe space station would show up those New Yorkers!



NO CHIPS off these new blocks, especially since Jim Honeycutt turned them out with his adobe-making machine. It can make 10 dry-pressed blocks a minute—that's 400 a day. The dirt is dumped into the big hopper that empties out to a conveyor belt; the dirt is then deposited in molds where hydraulic rams compact it into ready-to-use blocks.



The 861 Cafe

The staff of the Sandia Cafeteria is introducing a new variety of menu items. Here are new items offered and the dates they will be served. Clip this article and bring it with you—you'll receive a free ice cream with your meal.

Jan. 5 Shrimp Chop Suey with chow mein noodles \$2.50

Jan. 6 Catch of the Day (different selections of fresh fish) \$3.50. Individual Chile Relleno Casserole (whole green chile smothered in meaty red chile topped with cheddar cheese) \$2.25

Jan. 10 Ropa Vieja (marinated, charbroiled and thinly sliced flank steak with hot salsa, rolled in a hot floured tortilla, served with spiced hominy) \$2.30

Jan. 11 Loaded Omelette (sautéed onions, chili, cheese) served with a golden hash brown \$2.15

Jan. 13 Seafood Crepe with newburg sauce (shrimp, scallop, haddock) rolled in a French pancake \$2.75

Cowpoke Brunch (2 eggs any style, minute steak, and a golden hash brown) \$2.50

Jan. 20 Juarez Burger (charbroiled beef steak topped with chili con queso) served with pinto beans and Spanish rice \$2.85

Also daily chalkboard specials — always a good deal.

EXPERTISE REVISITED



"I can accept the theory of relativity as little as I can accept the existence of atoms and other such dogmas." (Ernst Mach, 1838-1916)

Events Calendar

Jan. 4, Feb. 1—Artifact Identification Service, free, 2-4 p.m., Maxwell Museum of Anthropology, 277-5813.

Jan. 6-8, 13-15, 20-22—"Vista del Puente," a bilingual version of Arthur Miller's "A View From the Bridge," 8 p.m. Fri. and Sat., 3 p.m. Sun., La Compañía, 256-7164.

Jan. 7-8—Photo Contest at the Rio Grande Zoo; half-price admission to anyone with

a camera, Feb. 17 deadline for submitting photos, 843-7413.

Jan. 8—Symphony Orchestra with Isaac Stern, violinist; 3 p.m. Popejoy. Jan. 12-13—NMSO with Lynn Harrell, cellist, 8:15 p.m., Popejoy.

Jan. 18—Workshop on Pueblo Feast Day Etiquette, 6-9 p.m., Maxwell Museum of Anthropology, 277-2924.

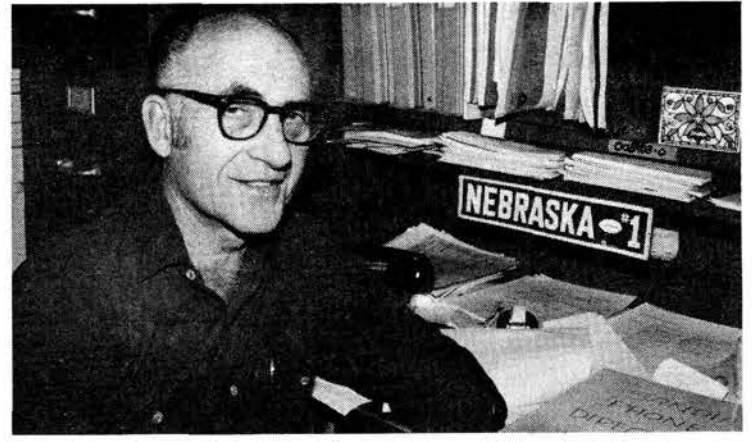
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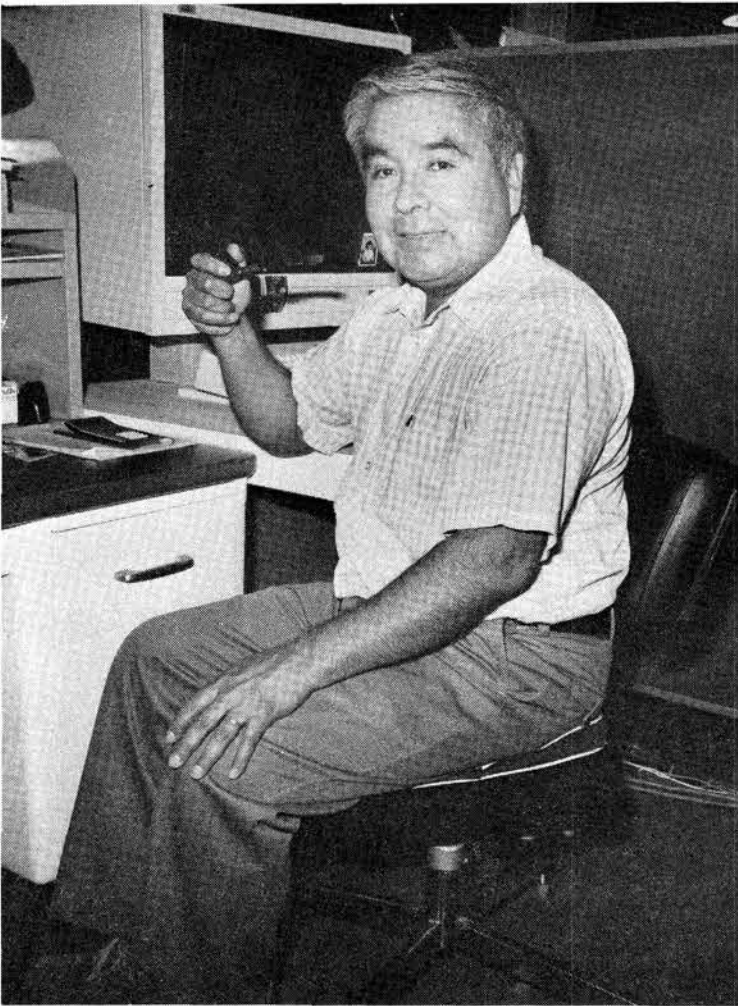


Herb Anderson (7223) 35



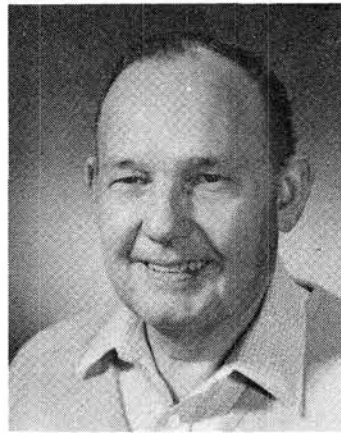
Wayne Trump (3521)

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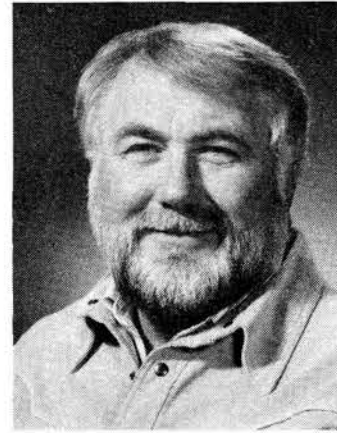
Juan Abeita (7654)

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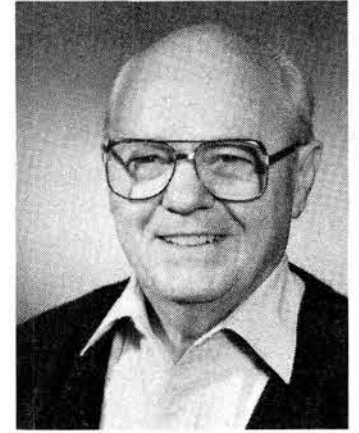
Ken Goin (6257)

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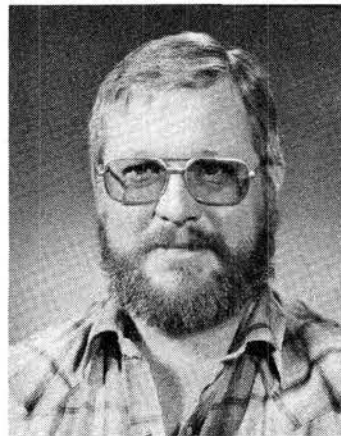
Henry Street (2523)

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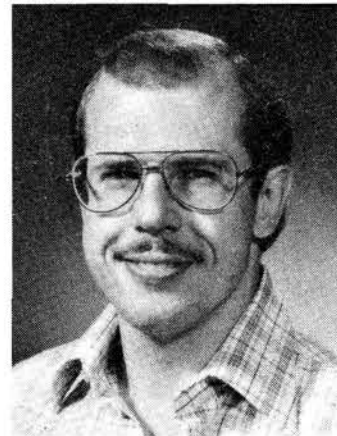
Bob Finnell (7423)

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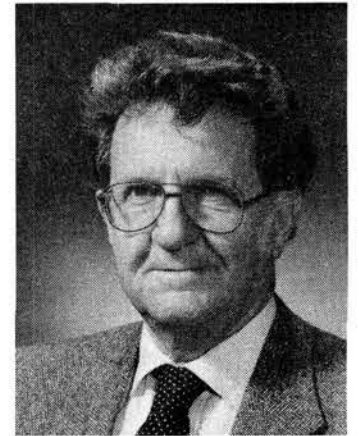
John Corley (1245)

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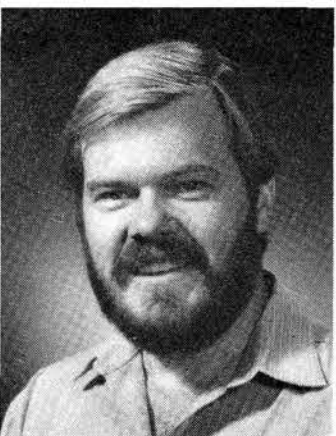
Tommy Cabe (6256)

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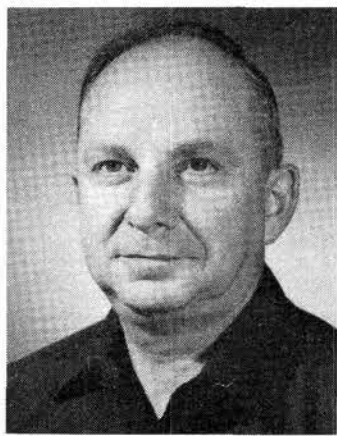
Bob Scipes (124)

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Ed Williams (3615)

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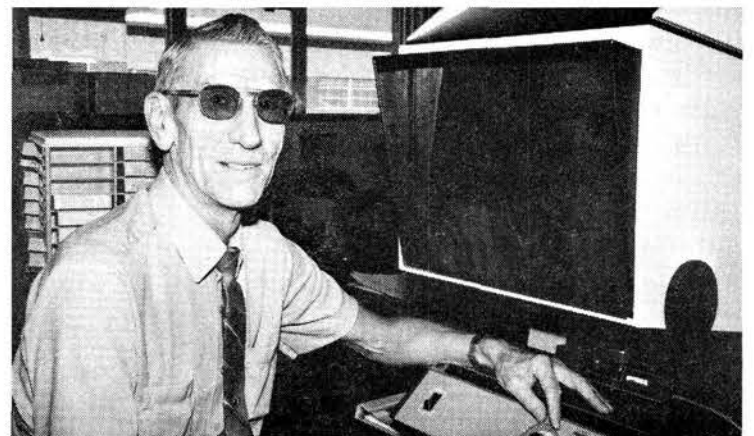
Donald Bower (5232)

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Bob Boyd (3612)

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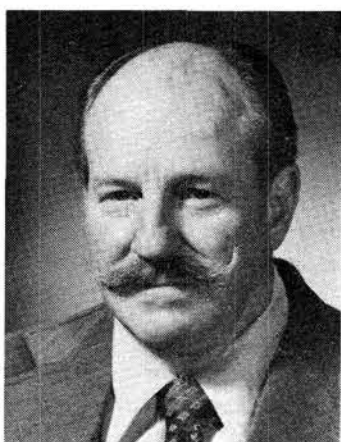
Lucky Sanders (7633)

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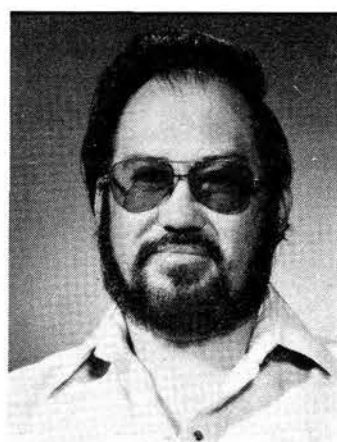
Fran Roelle (2600)

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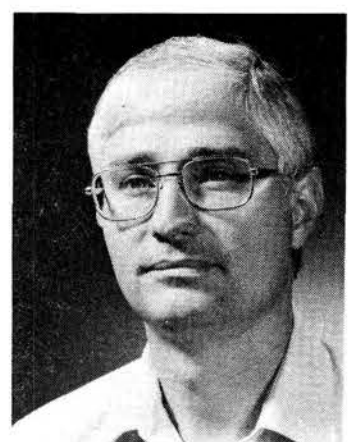
Bill Meahl (7546)

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Vic Gabaldon (3423)

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Charles Adams (1521)

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Biking on the Bumps

Adaptability is the key to success of a species. And if bicyclists can be considered a species, they'll probably inhabit the earth longer than the dinosaurs did.

It used to be that you could ride a bicycle only on a reasonably smooth terrain — preferably a paved street, at worst a hard-packed gravel road. No more! Now intrepid bicyclists can tackle the roughest terrain. They can ride on the desert, on mountain trails, in deep snow (well, maybe not *too* deep).

Tom Mayer (5313) is one of the pioneers of this new kind of biking. "I was riding 10-speed bikes on mountain trails in 1963," he says. "I put aluminum rims and fat tires on my regular racing touring bike, bending the bike frame to make 'em fit."

Recently, things have become much simpler for Tom and other aficionados of bumpy biking — last year all-terrain bikes (also called mountain bikes) started coming out on the market. His first one cost about \$750; now there are some 20 manufacturers, and prices range from under \$300 to \$5000.

"The all-terrain bikes weigh only 26 to 33 pounds," says Tom. "And they're real quiet. I've seen more game — deer, elk, coyotes, rabbits — on a mountain bike than I ever saw while hiking. Besides, flat, level land that's boring to hike is great fun on a bike. Riding in mountains is also a real challenge."

"Fat tire bikes have a minimal impact on the environment. We do less damage to a trail than hikers do. We go on side roads, trails, arroyos, creek beds, even across fields."

Another neophyte mountain biker is Dave Ginley (1154): "A couple of years ago I started lusting for one of these bikes," he explains. "This part of the country is ideal for them. An all-terrain bicycle has improved handling and safety — it's real responsive for commuting and has incredible cornering power. I ride mine 80 percent of



PROUD OWNERS of all-terrain bikes pose with their new-generation machines. From left are Dave Ginley (1154), his wife Lucy (nearly nine months pregnant when picture was taken, and yes, she was riding her bike at the time), and Tom Mayer (5313). At right, Tom and Dave demonstrate their hill-hugging technique; Lucy was gutsily keeping up with them just out of picture range.

the time as opposed to my regular 10-speed.

"I have two sets of tires — one for commuting and the other for off-road use," Dave continues. "I don't worry about potholes and if I hit gravel, I just go right through it for the fun of it. Fat tires are also very resistant to glass and goatheads on the streets."

Dave says that the off-terrain bike is ideal for "technofreaks" — it has a long, oversized frame for great strength and a more cushiony ride, 15 to 18 speeds (the secret of mountain climbing), and an amazing array of components specifically designed for these bikes. They have cantilevered brakes that are more powerful than those on regular 10-speeds.

"It's a bike for people who grew up on BMXs and now want something better than a racing or touring bike," says Tom. "Riding one of these bikes is part hiking and



part cycling. The cranks are about two inches higher so they can clear rocks and other obstacles up to a foot high.

"Off-road bicycle riding is a sport that needs to be learned," adds Dave. "Even a good 10-speed biker can't make an instantaneous transition. Ride with other people at first. Start on dirt roads, escalate to steep dirt roads, then to relatively flat trails, and finally to mountain trails. You have to crash a few times, just like in skiing. It's a new wave machine."

What next? Pedal polo among the ponderosas?

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6. No commercial ads, please.
7. No more than two insertions of same ad.
8. Include name and organization.
9. Housing listed here for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

CODE-A-PHONE 1000 telephone answering system, never used, \$50, has message counter, ring

selector, variable length announcement. McGee, 299-0661.
 DRY BAR, top & front opens for serving, doors on bottom, make offer; couch, small, makes into bed, harvest gold. Hitchcock, 294-4591.
 EARLY AMERICAN hexagonal closed cabinet end table, \$85. Snelling, 294-5751.
 END TABLES, 3 matching tables manufactured by Lane, Mediterranean style, \$200. Konrad, 294-2807.
 BATHROOM sink, white porcelain, 19" w/chrome Eljer faucets & drain stop, \$20; folding bed frame & mattress, \$20. Joseph, 299-6989.
 LAMP TABLE, maple, early American, beige shade, \$25. Benderman, 298-7354.
 POTTERY by Pablo: grey on white service for 6, casserole, 2 serving bowls, pitchers, never used, paid \$325, sell for \$250. Adams, 881-6836.
 RCA Colortrak II model No. FFR469WR solid state, cable jack, new remote control, 19" portable, \$400. Tippy, 298-3758.
 TV/radio/recorder player, needs picture tube, \$50; wood chests, \$90. Lackey, 898-6638.
 ETAGERE, two, 7' tall, wood w/lamps &

thick glass shelves, \$250 ea. Owens, 296-8557 after 6.
 CB RADIO, Midland Convoy Buddy, 24-channel w/antenna, \$40 OBO. Henry, 266-6467.
 CANON FTb camera, 50mm 1:1.8 lens, 28mm 1:3.5 lens, 4 filters, auto flash, rubberized lens hood, \$350. Marrs, 821-5144.
 SNOWTIRES: 2 Sears HR78-14 Dynaglass mounted on 14" wheels, \$70 ea.; one new Uniroyal P205/70-R14 ww, \$60; 4 grey stack chairs, \$20. Dyckes, 298-8380.
 MOTORCYCLE trailer, homemade, \$100. Ellingson, 299-4056.
 GAS water heater, 40-gal., 11 yrs. old, doesn't leak, \$15. Trump, 299-5162.
 SNOW chains for 6.70x15 tires, \$20; skis, 170 cm beginner, \$35; intermediate, \$70; ladies Munari boots, 6½-7, \$70. Lassiter, 299-1492.
 TIRE CHAINS, unused, fit many 13 & 14" tires, \$20; wood-look dinette: 36x58" (incl. leaf), 4 chairs, \$100. Erickson, 296-0126.

TRANSPORTATION

'69 BRONCO, AC, new tires, 84K miles, \$2900. Dupree, 294-1835.

'72 TRIUMPH 650 Bonneville motorcycle, customized, \$2000 or best offer; '65 Dream Honda, 250cc, \$100 as is. Gonzales, 344-4933.
 '78 FORD Fairmont sta. wgn., AC, PB, PS, AT, roof rack, 6-cyl., \$2500; boy's 20" Schwinn bicycle, \$50. Hickox, 299-0772.
 '76 CHEVY 2-ton truck, steel flat bed, \$5500 OBO. Garcia, 873-0380, 877-6823.
 '71 IMPALA for parts, 350 V8, positraction, all accessories, make offer. Burton, 869-2541.
 '77 LANCIA BETA sedan 1800, twin cam engine, 5-spd., factory air, 25K miles, \$2495. Svensson, 898-3078.
 '74 CAMARO 2-dr coupe, new paint, AT, PS, PB, 6-cyl., AM-FM radio. Romero, 294-1033 after 4.
 '66 MUSTANG, completely restored; new paint, engine, & trans.; 200 CID, 3-spd., \$3300. Martin, 869-2049.
 '83 GRAND PRIX, 250, V6, AT, AC, PS, PB, AM-FM stereo cassette, tilt wheel, custom interior, brown, take over payments. Daut, 255-2529.
 '81 FORD Bronco XLT 4x4, PS, PB, AC, 4-spd.; '78 Honda CR250R, \$600; Centurion 12-spd., 1 yr.,

\$175. Mason, 821-8217.
 '69 FORD van, new 5-yr. battery, tires 95% tread, 62K miles, cruise control, electronic ignition, \$2500 firm. Stuart, 299-9190.
 '83 OLDS Omega, 2-dr sedan, 4-cyl. front-wheel drive, AT, AC, PS, PB, 27 mpg town, 11,000 miles, \$7800. Banach, 836-6477.
 '74 FORD Courier pickup, 4-spd stick, new tires, new tune, free camper shell, \$1250 or best offer. Jackson, 897-4192.

REAL ESTATE

HOUSE in NE foothills, 3-bdr., 2 bath. Great Room w/fp & cathedral ceiling, landscaped, \$82,900. Kelly, 299-7190.

WANTED

TWO used kitchen base cabinets, 24", tops not necessary, reasonable. Harrington, 822-0660.
 CHEVY Citation, '82, '83, or '84, minimum options: 4 dr., V6, AT, AC, PS. Burton, 869-2541 after 6.
 FEMALE roommate to share house in SE near Ridgecrest, fp, garage, den, yard, non-smoker, no pets, \$175/mo. Cook, 256-3298.
 TO copy owner's manual for a 1980 Suburban. Percival, 299-6606.

New Buffet, Menu Starts At Club Tonight

STARTING 1984 in a freshly painted and redecorated building, the Club returns to regular Friday night Happy Hour scheduling but with a difference. Members who come to dine will be delighted with a new buffet featuring both a seafood and beef entree. The \$6.95 tab includes soup and salad bar, vegetable and baked potato. If this doesn't grab you in your tummy, then you can choose your dinner from a new standard menu featuring fine steaks, seafood, diet selections, and even hamburgers. Dining hours are from 6 to 8:30 p.m. Also, and this is more good news, the Club will accept Mastercard and Visa plastic money for dining room tabs of \$10 or more. Reservations (call 265-6791) always help.

On the bandstand tonight is a favorite country and western group called Western Flyer. Karen Edwards instructs free western dance lessons from 7:30 until 8:30. Happy Hour prices are in effect from 4:30 until 8:30 when the music starts.

TOMORROW NIGHT is family night at the club with a free movie scheduled. This one is the classic film by Walt Disney featuring Julie Andrews and Dick Van Dyke called *Mary Poppins*. Food service starts at 5 p.m., the movie at 6.

NEXT THURSDAY, Jan. 12, will be the second time Club manager Mitch Griffin wheels out his already-famous Thursday Night Fresh Seafood Buffet. If you missed it last night, you can make it next Thursday. The way it works is that Mitch calls his contacts back in New England early in the week and checks on how the catch is going. He orders something special to be flown in for the Thursday buffet. You don't know exactly what it's going to be, but you do know that it's the best available that week. Mitch knows about seafood. Ask someone who was there last night. And, the price is only \$7.95 for adults, \$4.25 for kids under 12. In the background, the Sandia Jazz Corporation (formerly Arlen Asher Trio) plays some very exciting music, very quietly.

NEXT FRIDAY, Jan. 13, La Ultima returns to the Coronado Club bandstand and plays some Latin and swingtime melodies. The beef or seafood buffet will be featured along with the new standard menu. Coming up on Jan. 20-21 is a "Western Weekend" with the Isleta Poor Boys on the bandstand both Friday and Saturday nights. The buffet on Saturday will be a biggie — barbecued beef ribs special.

CORONADO SKI CLUB meets Tuesday, Jan. 17, at 7 p.m. in the ballroom. There'll be the usual Ski Club special door prizes and special prices.

TRAVEL — The Club announces a new travel package to Hawaii March 24-31 for \$488. The trip includes air fare and lodging. Two-bedroom kitchenette accommodations are available at extra cost.



SANDIANS WHO VOLUNTEER at the Martineztown House of Neighborly Service were honored recently with a certificate of appreciation. Dody Hoffman (3431) accepted the certificate on behalf of Sandia from George Mercer, executive director of Martineztown. She qualified for the honor by serving as a loaned executive to United Way (Martineztown is a UW agency) and by volunteering through VIA to visit homebound Martineztown residents.

feed back

Q. Last week, a colleague and I went to Pantex. When I set up my trip, I requested a National rental car because a recent Travel News indicated National was \$4 less than Avis, and Avis had just raised its rates 7 percent. So when I got to Amarillo, I went to National. No reservation. Then I looked at my itinerary and noticed that I had a reservation with Avis. I believe the daily charge was only \$25. Does SNLA have a contract with Avis at a specified rate?

When we checked into Howard Johnson's East, I paid for my room with my Sandia VISA card. The charge was \$39.59.

Then my colleague paid cash for his room. The motel clerk told him it would be \$32.10. Then she did a double take, looked at the reservation, and said, "Oh, I'm sorry. That should have been at the corporate rate. That will be \$39.59."

I thought "Corporate Rate" was less expensive than the ordinary rate. Why do we (on government business) pay more than we should?

A. We appreciate your interest and concern in the SATO operation and the economies involved. The SATO people are continuing the hotel and car rental procedures that were previously established by Sandia; SATO receives no remuneration for this portion of their activity. Usually, room reservations are accumulated during the day. Then one call is placed to, say, Howard Johnson's central reservations office in Oklahoma City, or Holiday Inn in Memphis, or National Car Rental in Minneapolis, perhaps making 20-25 reservations at once during the one phone call for many different locations.

Looking into your question, we called Howard Johnson's East in Amarillo and learned that their company offers a basic rate, discounts to government, corporate rates, sometimes an individual commercial rate (which lodges are allowed to negotiate separately), and a senior citizen discount. We learned that their government rate had just been increased to the \$37 (plus taxes)

rate that you paid. We did learn that Sandia could be considered for that special commercial rate now at \$30. Because Sandians regularly travel to Amarillo, we have now listed Howard Johnson's East as a location we will call directly to take advantage of that rate. Again, we appreciate your bringing this to our attention so that the better rate could be negotiated.

The same thing is true in Amarillo for rental cars. There are three locations in the country (the Avis agency in Amarillo, Hertz in Carlsbad, and Thrifty in Lexington, Kentucky) where the local agencies offer us a better rate than the one we have negotiated with their central offices. We call them directly too. We are pleased that your printed itinerary directed you to the Avis counter, as we feel that listing is a valued service developed by the SATO office

R.R. Russell - 3700

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Q. I am a handicapped person who drives my car inside the tech area. On occasion I drive it to the Sandia Cafeteria, but I have never been able to park in the handicapped parking places. I have observed people parking there without any handicapped stickers on their cars and walking into the cafeteria. The last time I went I saw a truck pull into a handicapped space, and four men walked into the cafeteria. They appeared to be construction workers.

Can something be done about this? I've even tried going early or late to lunch—still no luck.

A. Something certainly can and will be done to correct the situation that you describe. Security Inspectors have been assigned to monitor these parking areas during the lunch hour to ensure that only handicapped people use the parking spaces reserved for them near the cafeteria.

D.S. Tarbox - 3400