

EXPERIMENTAL EQUIPMENT used in calibration study at various reactors throughout the country is checked over by R. W. Healy (left). Asher Kantz used foils of sulphur and plutonium to determine average neutron energy, and silicon for a second study. Both men work in Division 5311.

Sandia Research Reveals New Radiation Damage Measure

A new way to compare radiation damage produced by different reactors, when each has a different neutron energy spectrum, is the result of a research project recently completed at Sandia Laboratory.

Asher Kantz, assisted by R. S. Neiman, and R. W. Healy (all 5311), has found a way of experimentally obtaining the average neutron energy from two simple measurements. In addition, he has shown that bombardment damage, as measured by the change in electrical conductivity of silicon, is proportional to the average energy. Although this relationship has previously been predicted theoretically, this is the first time it has been proven experimentally.

To determine the average energy, Mr. Kantz measured the effect of radiation upon foils of sulphur and plutonium for many reactors. The reactors used were: X-10 at Oak Ridge, Tenn., the oldest operating reactor in the world; Material Test Reactor at Arco, Ida.; TRIGA, the 10 millisecond pulsed source at San Diego, Calif.; Omega West at Los Alamos; Godiva at Los Alamos and its successor, SPRF at Sandia Lab; and two Bulk Shielding Facilities (swimming pool type reactors) at Oak Ridge.

Works of Sandians to Appear in Issues of The Physical Review

A technical paper co-authored by D. C. Wallace (5151) and Joseph M. Keller, Institute for Atomic Research and Dept. of Physics, Iowa State University, appeared in the May 15 issue of *The Physical Review*.

The article was entitled, "Anharmonic Contributions to Specific Heat."

Mr. Wallace was also co-author with Albert Narath (5151) of an article, "Nuclear Magnetic Resonance in Cubic Sodium Tungsten Bronzes" which will appear in the Aug. 1 issue of the same American Physical Society publication.

Essentially the same experimental equipment was used on the various reactors; however, each presented a different need for modifications which were usually accomplished at each site with cooperation of the operating personnel.

The results of this work can be used to predict radiation damage in the use of Sandia's pulsed reactor (SPRF) and engineering reactor (SERF). In addition, the data obtained from these experiments giving the average neutron energy for many reactors will be useful in choosing a particular reactor for an experiment when there are special requirements.

Bids Received for Two Modification Jobs in Tech Area

Two Albuquerque contractors are apparent low bidders on construction projects in Bldgs. 828 and 802, according to an announcement by the Atomic Energy Commission.

The firm of Bradbury and Stamm is apparent low bidder for modification of Bldg. 828. Their bid of \$91,337 is the lowest of four bids received.

The project will include construction of laboratory space, facilities for drafting support, office space, a dust-free room, and library facilities. Plant Engineering Department project engineer for the project is M. B. Moore (4543-3). Work is to be completed within 90 days after the contractor receives notice to proceed from the AEC.

Apparent low bidder for the Bldg. 802 project is Cillessen Brothers. Their bid of \$64,153 is the lowest of three bids received.

Plant Engineering Department project engineer is K. D. Harper (4543-3). The project will include modification of partitions and stubbing-in of utilities in the basement of Bldg. 802 for use by Graphic Arts Department 3460. Work is to be completed within 90 days after the contractor receives notice to proceed from the AEC.

An Authority Tells: 'Why We Test and Talk'

Remarks of Senator Clinton P. Anderson, D. C. Rotary Club, Washington, D. C., May 2, 1962

Your program committee has selected a timely topic for today in view of the fact that the United States has resumed atmospheric testing.

I believe the President should be commended for the calm and deliberate manner in which he came to his decision on the resumption of nuclear testing. Every opportunity was given for the expression of views by people in the State Department, in the military, in the Atomic Energy Commission, and in the Congress. This was as it should be. He did not lightly reach his decision that we should go ahead.

You and I should recognize that the preliminaries to his decision would not have been tolerated in Russia, nor would some of the aftermath have been possible there. Recently there gathered in the White House a group of Nobel Prize winners. Among them was Dr. Glenn Seaborg, Chairman of the Atomic Energy Commission, who, along with the military, has the responsibility for our program of testing. Also present was Dr. Linus Pauling of California Institute of Technology. Only the day before, he paraded in front of the White House picketing the President to ban the bomb. At the Sunday night dinner were men and women of all political persuasions and all opinions

about nuclear testing. We in America would want it that way.

You and I might well inquire, "Why do we test?" Japanese students parade in the streets, pickets swarm around the White House, Soviet propaganda mills work overtime, even though the Soviets themselves broke the moratorium and resumed testing. As all this goes on, many people in our nation and maybe some in this club would ask, "Why do we run the risk of stirring up world sentiment against us? Why do we resume testing in the atmosphere? What do we have to learn?"

The resumption of atmospheric testing brings us to a new phase of test ban negotiations — of testing and talking. Ever since the Soviets cynically broke the informal test ban moratorium last September and resumed atmospheric tests, we have had a limited kind of test and talk approach. For, as you will recall, the United States resumed underground testing on last September 15, after the Soviets refused to agree to a proposal to ban atmospheric testing.

'Do not be surprised . . .'

Now both the Soviets and the United States have undertaken an atmospheric test series. I am sure that the Soviets will make as much propaganda as possible out of our atmospheric tests, and then conduct whatever additional tests they believe to be in their national

interest. Do not be surprised if the Soviets start testing again soon.

So we have to look at current and future test ban and disarmament discussions in the context of both sides testing in both media—underground and in the atmosphere. In a sense there is nothing new about this situation—this was the situation which prevailed in 1958 and prior years. The old adage: "The more things change, the more they are the same," would seem applicable to this situation.

Today I thought it might be timely to review what we have learned since 1958 in regard to nuclear testing and test ban negotiations. So we get under way: Why do we test?

First of all, we do not test because we are defenseless. Our bombs exist in a wide array of versatile, ingenious, and sophisticated weapons. We have abundant stockpiles and we seem to have capable delivery systems. We have all the bombs we need for the delivery systems we possess, except for the fact that some of these may not have been tested in the delivery systems for which they were intended.

I have great faith that the scientists who devised them were skillful enough to extrapolate from their previous tests and their current explosions so that they would have designed useful weapons. But we would also like to know if these weapons will work under op-

erational conditions. So we engage in some proof testing.

Bear in mind that it is three and a half years since we last tested in the atmosphere, and for a period of three years we did not test underground. The laboratories have been busy. One can press the frontiers of weapon development ahead to some extent in the laboratory, but when the scientist has on paper a device which, if it works as calculated, will be an improvement, the important question can only be settled by testing: Does it work as calculated? National defense is too important to be jeopardized by a possible calculational error or by a theoretical failure to take into account in just the right way all the complicated phenomena in a nuclear explosion. Of course, we know a lot about how bombs work after all these years, but when we want to stretch technology to new frontiers, we have to test the important steps along the way.

' . . . we must not stop'

Our enemy has not stopped in his effort to press ahead the frontiers of weapon development, and we must not stop. I think it absolutely certain that the country which tests will ultimately get ahead in nuclear technology of the country which does not test but depends upon laboratory development.

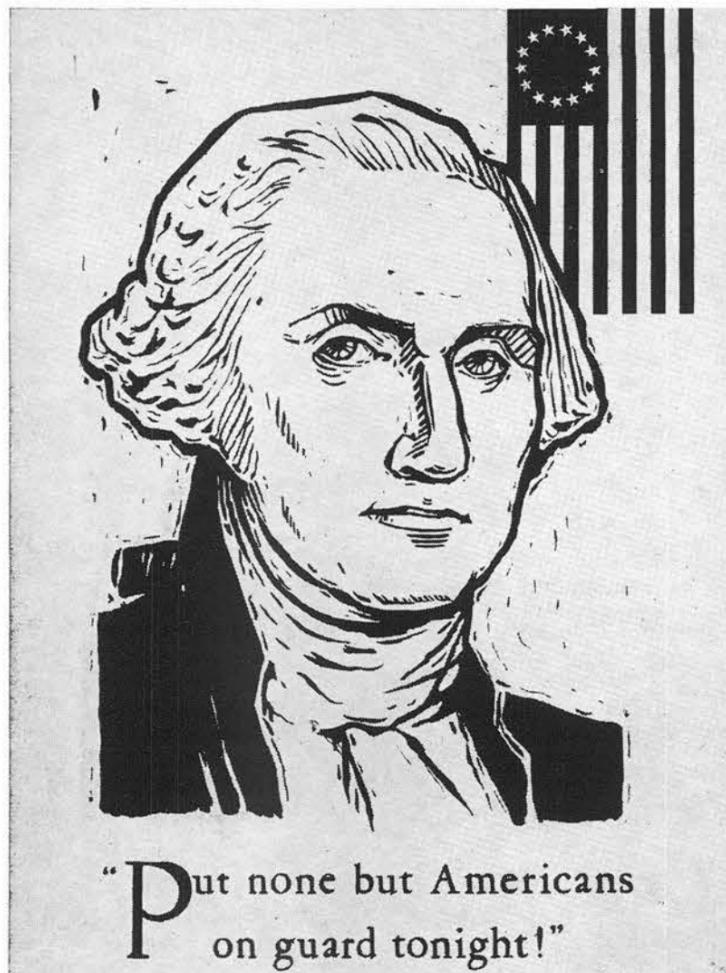
Then we have the problem of developing new weapons and ex-



Clinton P. Anderson
—United States Senator—

panding our nuclear weapon technology. Nuclear weapon technology, indeed, does not stand still; neither do the systems which use nuclear weapons. There is a continual need by the military for nuclear warheads which are properly tailored to the increasing technology of delivery systems. For example: We want smaller weapons with less weight which deliver the same or greater yield. We need weapons of specialized characteristics depending upon the use to which they are to be put. Finally, we study how to make more weapons per dollar (or per pound of uranium mined); or more efficient weapons. We want weapons which are more rugged physically; weapons which are hardened against

(Continued on Page Five)



Editorial Comment

None But Americans

It was a bleak day — and it matched his mood. The General's eyes were bleak as he contemplated the misty hills of New Jersey. —When would Burgoyne begin to move down the Hudson valley? —Did he and Howe intend to link up, or was Howe going to strike south toward Philadelphia? —Perhaps St. Leger intended to cut his way in from the west and join Burgoyne in Albany — if he only knew — if he only had more troops — if —

Lost in thought, he absently nodded his thanks to a soldier who entered and set a tray on the table. An hour later, the orderly found the General still gazing out the window with unseeing eyes, the untouched tray on the table beside him. Quietly, the soldier picked it up and padded back to the kitchen.

The cook's back was turned toward him as he entered the kitchen. With a skill born of long practice, he lowered the tray to a sideboard, took a quick sip of the General's brandy, then picked up his musket and returned to his post in the entry. There, the officer of the guard found him 15 minutes later, doubled over in agony.

Suspiciously, the medical officer sniffed at the groaning man's breath. Gasping with pain, the orderly finally admitted that he had sampled the General's brandy. It took but a slight taste to verify the doctor's diagnosis. The liquor had been heavily laced with arsenic — "Enough," as he put it, "to kill a regiment."

The ensuing investigation revealed that a member of the General's guard, a deserter from the British Army, had prepared the tray. Despite a widespread search, he was never caught. Due to his haste, the orderly had received something less than a lethal dose of the poisoned brandy and managed to recover.

When General Washington was told what happened, his reaction was quick and pointed: "Put none but Americans on guard tonight," he ordered, then sat down and penned a directive to Colonel Spotswood, his Aide-De-Camp, creating a Commander-In-Chief's Guard. The following is a part of that order:

"When I recommend care to your choice, I would be understood to mean men of good character in the regiment, men that possess the pride of appearing clean and soldierlike. I am satisfied there can be no absolute security for the fidelity of this class of people, but yet I think it most likely to be found in those who have family connections in the country. You will therefore send me none but natives, and men of some property if you have them."

That was personal security in 1777. Rather simple, but effective nonetheless. Our system today is more complex, but so is the country — and the trials being faced. Flintlocks have given away to intercontinental ballistic missiles; man is on the threshold of space; yet Washington's words still have a ring in them, despite the centuries that separate us from that spring day in Morristown: "Put none but Americans on guard tonight."

Sympathy

To Phil Contreras (4573) for the death of his brother in Albuquerque June 14.

To John Cunningham (2444) for the death of his mother in Canton, O., June 23.

To Augustine Apodaca (4513-1) for the death of his sister in Albuquerque June 26.

To Herman Lopez (4575-1) for the death of his mother in Albu-

querque June 26.

To Fidel Gonzales (4575-2) for the death of his father in Albuquerque June 23.

To J. B. Gonzales (4511-4) for the death of his two brothers in a boating accident near Santa Cruz, N. M., June 22.

To Lovella Montoya (3423-4) for the death of her mother in Albuquerque June 26.

Supervisory Appointments

GEORGE W. RODGERS to manager of Electronic Systems Department 1420.



He has been with Sandia for 14 years, working mainly in the Field Testing organization. A division supervisor for 10 years, George has headed Advanced Electronics Systems Division 1424 for the past two years.

Before coming to Sandia, he worked two years for Westinghouse's Lamp Division in Bloomfield, N. J., in development of vacuum tubes.

During World War II George served in the Army from 1942-46. While in service he attended radar schools at Harvard University and Massachusetts Institute of Technology.

He has a BS degree in electrical engineering from the University of Colorado and has done graduate work at the University of New Mexico.

FRANK W. MULLER to supervisor of Development and Training Section 1443-1, Reliability Development and Systems Evaluation Division.



Frank has worked as a reliability engineer in the same organization since he came to Sandia five years ago.

Immediately prior he attended Texas A&M, where he received a BS degree in electrical engineering. He has completed the required courses for a Master's degree at the University of New Mexico.

Frank has served four years in the Navy, most of the time as an electronic technician on a carrier in the South Pacific.

He is a member of Tau Beta Pi and Eta Kappa Nu honorary societies.

Livermore Pioneer Retired from Sandia At End of June

Merle C. Richard, who retired June 29, was one of the pioneer employees at Livermore Laboratory. He started in June 1957 when the



Merle C. Richard

Laboratory was still located in temporary quarters at the Lawrence Radiation Laboratory.

During the five years he has been with Sandia Corporation, he has been a Staff Assistant in Environmental Test Organization 8121. He has been on leave of absence since last October.

About his retirement plans, he said that he and his wife, La Vere, will continue to reside at 2761 Kelly St. in Livermore, and spend some time visiting their son, daughter-in-law, and three grandchildren in nearby San Leandro.

"If I have time," Merle said, "I might resume my interest in ham radio." Merle has been a ham operator since 1916, when his station consisted of a telegraph key and a Ford spark coil. His call letters then were 7 ER. He has had his present call letters, W6BPC, since 1928.

NOEL O. KENT to supervisor of Administration Section 3241-2, Access Control and Administrative Division.



Noel was hired at Sandia in September 1950 as a security guard and in April 1954 was promoted to Security Sergeant. Before coming to Albuquerque he was a security guard for two years at the Pueblo Ordnance Depot, Pueblo, Colo., and worked a year and a half on a maintenance crew at the Phillips Petroleum Company gasoline plant in Hobbs, N. M.

During World War II, Noel served in the Navy from 1941-46, part of the time in the Pacific Theater of Operations. He is a graduate of Saguache (Colo.) High School.

JOHN E. HINDE to supervisor of Telemetry Component Control Section 7213-2, Telemetry Component Engineering Division.



John has worked with telemetry systems in the Field Test Organization since he was employed by Sandia Corporation in September 1953.

Immediately prior he was at the University of Illinois where he received both his BS and MA degrees in electrical engineering. During his last year there, John worked part time for the University performing construction and maintenance of measuring and test equipment used for study of VHF propagation.

Coronado Club Board Names Six Nominees for Vacancies

The Coronado Club's Board of Directors has named nominees for the six Board vacancies to be filled at the Club's annual meeting on Monday, Aug. 6.

According to the Club's by-laws, Sandia Corporation, AEC, and ACF employees will be represented on the Board in direct proportion to the number of Coronado Club members from each group, and each of these employee groups will be represented by at least one of the 10 elected directors.

The Board's nominees are Peter Creagh, AEC-ALOO; Wally Brown, ACF; Bob Elsbrock (3211-1); Chet Fornero (3153); Jim Mick (4253); and Ed Ronan (7133).

The date of the annual meeting was moved from June to August to enable the Board to present a complete financial report.

In past years reports on financial aspects of the Club's activities have been limited to figures for an 11-month period.

The annual meeting will begin at

7 p.m., and at least 100 of the Club's active members must be present to transact business and conduct the election.



Cecille Hicks (8212-3)

Take a Memo, Please

Accidents spend 24 hours a day looking for places to happen. Safety's the only thing that will tie them down.

No job is so important and no service is so urgent that we cannot take time to perform our work safely.



OFFICE OF PUBLICATION

LIVERMORE LABORATORY
Publications and Public Relations Section 8233-1, Bldg. 912
Sandia Corporation, Livermore, Calif.
Telephone Hilltop 7-5100, Extension 2395

SANDIA LABORATORY
Employee Publications Division 3432, Bldg. 610
Sandia Corporation, Albuquerque, N. Mex.
Telephone 256-4411, Extension 54241

Permission to reprint material contained herein for other than governmental use, may be obtained from the Editor, Lab News, Sandia Corporation

Deadline: Friday noon of the week prior to publication.



L. W. Rook

L. W. Rook Earns PhD Degree At U. of New Mexico

A PhD degree in psychology was awarded L. W. Rook (1443) during recent commencement exercises at the University of New Mexico.

"Cortical Localization of Hand-Edness in the Rat" was the title of his doctoral dissertation.

Mr. Rook previously received an MA degree in counseling and guidance psychology and a BA degree in anthropology from the same university.

He has been at Sandia since June 1961.

Livermore Lab Employee Suffers Disabling Injury

A disabling injury was recorded at Livermore Laboratory June 21 when an employee was sent home as a result of a foot injury. The injury was reported Monday, June 18, by an employee in Project Engineering Division, 8158. He had lifted a 250-lb. weight with a hand-operated hoist and placed it on a shop stool. When he turned away, the weight rolled from the stool, fell, and injured two toes of his left foot. He received medical treatment and reported to work Tuesday and Wednesday. The following Thursday, however, he was sent home after another check of the injury by the Medical Section.

At the time the employee was sent home, Livermore Laboratory had worked 210 days, or 1,225,092 man hours, without a disabling injury. The 8100 directorate, up until June 21, had never had a disabling injury. This represents 2,313 days, or 2,934,872 man hours without a lost-time accident.

Horseshoe Tourney Reps Will Schedule Organization Contests

Representatives for the forthcoming Sandia Laboratory Horseshoe Tournament are being chosen to serve in organizing and scheduling individual tournaments in each general organization, O. J. Foster (3122-2) has announced.

During the months of July and August, the general organizations will conduct their own tourneys and determine their own champions, who will then engage in the laboratory-wide tournament in September.



G. L. Adkins



M. D. Clark



D. C. Hanson



W. F. Hartman



E. E. Ives



James Jacobs



W. D. LaCoss



R. D. Moyer



A. V. Robnett



W. J. Sieger

Ten Additional Sandia Lab Employees Awarded College Degrees Last Month

Additional Sandians who received college degrees at the University of New Mexico last month included the following:

George L. Adkins, Jr. (7133), MS degree in mechanical engineering. His BS in ME was awarded him at West Virginia University prior to his coming to Sandia nine years ago.

Melvin D. Clark (1424), MS degree in electrical engineering. He received his BS in EE from the University of Missouri and has been with Sandia three years.

Donald C. Hanson (7244-3), MS degree in electrical engineering. His BS in EE was awarded him at the University of Nebraska. He has been with Sandia Corporation since March 1959.

William F. Hartman (1113), MS degree in physics. He received his Bachelor's degree in engineering

physics from South Dakota State College, and has been at Sandia five years.

E. E. Ives (7163), MS degree in electrical engineering. He obtained his BS degree in EE from Alabama Polytechnic Institute before coming to Sandia in June 1956.

James Jacobs (7125), MS degree in mechanical engineering. He received his Bachelor's degree in ME from the University of Nebraska, and has been at Sandia more than three years.

W. Douglas LaCoss (1411-2), MS degree in electrical engineering. He graduated from the University of Washington with a BS degree in EE and has been at Sandia seven years.

Robert D. Moyer (2422), MS degree in electrical engineering. He received his BS in EE from

Kansas State University and has been at Sandia Lab since June 1959.

Allen V. Robnett (1413), MS degree in electrical engineering. He graduated from Princeton University with a BS degree in EE, and has been at Sandia six years.

William J. Sieger (7182), MS degree in mechanical engineering. He also received his Bachelor's degree in ME from the University of New Mexico before joining Sandia Corporation four and a half years ago.

Among those receiving Bachelor's degrees were: Bruce T. Bauer (7322), BS in mathematics; Marrian Salomon (1414-1), BBA in accounting; John E. Tarpley (2544), BS in electrical engineering; William P. Thomas (2542-3), Bachelor's degree in business administration (listed erroneously last issue); Herschell B. Young (4422), BA in English.



R. R. Prairie

R. R. Prairie Earns PhD Degree From North Carolina State

A PhD degree in statistics was granted R. R. Prairie (1442-1) during the June commencement exercises at North Carolina State College.

His doctoral dissertation was entitled "Optimal Designs to Estimate Variance Components and to Reduce Product Variability for Nested Classifications."

His MS degree in statistics was also from North Carolina State. At the University of Minnesota he received a BS in biology.

He has been at Sandia five months.

Plan to Vote on Consolidation of IAS and ARS

A. Y. Pope (7130) attended a meeting of the Council of the Institute of Aerospace Sciences in Los Angeles on June 18. He is a member of the Council.

This meeting was one of a series of meetings to bring about the merger of the American Rocket Society and the Institute of Aerospace Sciences. The new society will be called the American Institute of Aerospace and Aeronautics (AIAA).

Members of both the ARS and the IAS will soon receive information on this proposed merger and a vote will be held this summer. A straw vote has indicated that 96 per cent of the members are in favor of the merger.

But life goes on at Dominic . . .

Home Away from Home is a Long Way From Home for Many Sandia People

South Pacific is more than a musical comedy to many Sandia Corporation people this year. It's a new life, and though somewhat lonesome at times, not so bad when circumstances which took them there are considered.

Communications from Sandians at the forward areas are business oriented, but occasionally there is time for a paragraph or two telling of life during Dominic's off-hours. Following are a few such excerpts from letters received at Sandia:

The first weeks of the operation, JTF8 personnel were busy receiving shipments, uncrating equipment, and setting things up. These were days marked by intense activity, and, as in all setting-up operations, there were moments of uncertainty. Many found that the responsibilities that faced them in the States also faced them in the Pacific.

Such items as drivers' licenses threatened to expire. Wedding anniversaries, birthdays, and other occasions needed remembering. Doctors' prescriptions required re-filling. Some men found that the comforts of home didn't necessarily follow them into the field.

For many, the term "roughing it" undoubtedly took on a new and slightly sinister meaning. "Tell people coming this way to bring everything they will need because the camp store has not been opened. Electric razors cannot be used without an adapter . . ." wrote one Sandian, anxious to warn others on the way.

Conditions Vary
Conditions and facilities varied from site to site. From Christmas, a Sandian commented on office space and equipment available to his group: "We were assigned 400 sq. ft. of office space . . . It is in a desirable location that is blessed with a good breeze and well-arranged. The job of rehabilitation is just about complete." In early March, office furniture at this site consisted of a letter-sized safe, two

British wooden storage cabinets and a new typewriter. However, shortly, more equipment was received, and working and living conditions rapidly improved.

Personnel made quick adjustments to life in the tropics. One Sandian had this to say about getting along in the tropical sun: "Tell people coming out to be sure and bring a straw hat or cap . . . The men who are wearing caps seem to all have blistered ears . . . The sun is so hot that it's difficult to get a tan without blistering . . . The man planning to work outside very much should also bring a pair of sturdy shoes." Many discovered that coral can be unkind to bare feet.

Sandians in Hawaii forwarded some enthusiastic comments about their life there. "Nearly everyone speaks with an accent which is hard to understand at times," one observes. "Lihue is like a small country village . . ."

Some found exciting things to do with their off-duty hours. Others were charmed by Hawaiian customs. "We went to a luau Saturday night," writes an employee on Kauai. "There were at least 300 couples . . . We all sat on the floor for our dinner. We had roast pig, chicken, raw fish, opehe, poi, baked sweet potatoes, salad, and other dishes I can't remember the name of."

Ten Lovely Girls
"There were about 10 lovely girls just going around asking people if they wanted more to eat . . . I liked the pig, chicken, and raw fish. The opehe was all right, but the poi I kind of thought was tasteless."

As time passed, the tropical way of life became more familiar, and by mid-June comfortable adjustments had been made. Many test personnel had become full-fledged men-of-the-world. "A few weeks ago I took a three-day cruise . . . down across the equator. Those of us who had never been across the equator on a ship before were in-

itiated into King Neptune's Royal Domain as we crossed the equator . . . What an initiation it was!"

The same employee observes: "Christmas Island is much better than I expected it to be . . . The first month was without a doubt rough. But the food is excellent, the climate is wonderful, and living conditions in general are good."

"There are millions of beautiful birds, lots of coconut palms, some bushes called 'nogoodnik' bushes, and that is about all that grows on the island. At night, millions of land crabs come out of the ground and crawl all over the place and sometimes even in bed with you. . . . The fishing is excellent if you don't mind getting in the water with shark, barracuda, moray eel, octopus, and all the other things that inhabit the South Seas. Needless to say, there is very little swimming with all those things for play mates."

For many Sandians in the Pacific, their experiences this summer will live in their memories forever. But some aspects of their surroundings have become somewhat commonplace. These days, many find space in their letters to talk about that perennial subject, the weather: "The weather has been fairly decent. In Lihue, where the average rainfall is 40 in. a year, we have a brief shower about 5 a.m. every morning and temperatures of about 70 at night and 80 in the daytime. At the worksite where the average annual rainfall is 20 in. a year, we have had 30 in. already this year. The temperatures are about 75 at night and 85 in the daytime."

"News from Albuquerque has been very scarce," one letter writer concludes. In the main, Sandians in Albuquerque have been kept well-posted on the leisure activities of their friends with JTF8. But personnel in the South Pacific never seem to receive quite enough mail from home.

Service Awards

15 Year Pins



Jo O. Davis
2534
July 10, 1947



Kenneth Harrington
2441
July 10, 1947



Clem M. Dixon, Jr.
4611
July 10, 1947

10 Year Pins

July 7-20

L. L. Flores 5311, E. K. Gardner 3451, Helen E. Gelwicks 3241, M. M. Karnowsky 1121, J. H. Mitchell 4576, G. M. Nielsen 3451, Ishmael Ortega 1122, E. J. Peterson 4253, Louie Bryant 3242, J. M. Hammond 4622, A. F. Hurford 1431.
C. B. Litz 4514, G. B. Marks 3463, J. R. Sisenos 4151, Anna Marie Canavan 3446, L. W. Newman, Jr. 2313, L. E. Cole 4171, H. W. Richardson 7324.
C. G. Scott 7233, J. P. Watterberg 7125, Ernestina M. Romero 3452, J. C. Cunningham 2444, J. R. Hanna 3424, Joan Hartnitt 4333, R. K. Heck 1321, R. S. Nelson 4421.
Jane T. Robertson 3462, Beulah E. Hansen 4132, Maridel D. Hanson 4423, A. L. McReynolds 4623, M. A. Petrillo 3452, Ruth A. Redmond 3441, W. C. Garcia 3232, D. T. Judd 7321, and R. C. Reineke 1431.

Meet Sandians Who Completed Technical Development Program



R. G. Absher
2413-3



M. F. Aker
2441-2



J. B. Allen
7221-2



R. L. Alvis
2452-3



J. D. Applegate
7125-2



A. E. Asselmeier
1431-3



J. H. Barnette
7133-2



F. D. Betche
2451-1



R. H. Brasch
2421-1



H. E. Bradley
2344-2



David Byrne
7134



G. R. Case
7124-3



J. P. Cline
2422-1



A. E. Giddings
2544-2



D. O. Gunderson
7146-1



R. L. Henderson
7311-2



J. A. Henley
2533-2



C. F. Jacobs
7522-2



George Kambourelis
7162-1



J. U. Kincaid
7122-1



L. J. Klamerus
2564-1



R. J. Klingler
7323-1

Sixty Eight Men Wind Up Four Semesters UNM Study and SC Work

The first class has completed Sandia's Technical Development Program which was adopted in July 1960. In this program staff members with Bachelor's degrees divide their time between classes at the University and work assignments at Sandia.

Primary objective of the TDP is to insure that new members of the technical staff acquire a sufficient background of knowledge in modern analytical methods and basic scientific concepts necessary to accomplish the technical mission of Sandia Corporation.

The class, comprised mainly of mechanical and electrical engineers, participated in a concentrated two-year course of graduate study in which there was heavy emphasis on mathematics, statistics, and modern nuclear physics as well as advanced work in EE and ME. The TDP members enrolled for nine credit hours each semester for four semesters.

The Technical Development Program is administered by Personnel Research, Training and Education Department 3130 through the cooperation of the University of New Mexico.



J. W. Kane
2451-1



J. W. Keizer
5132



D. R. Kendall
2412-3



R. H. Kotoski
2452-3



R. D. Krieg
1422-4



D. J. Kuehl
7323-1



James J. Lang
7183



L. J. Langston
2543-2



Albert Longnecker
7221-1



L. F. Luehring
7323-1



D. L. Mangan
1413-3



W. L. May
7115-2



J. F. McDowell
2564-2



David McVey
7133



D. E. Merewether
7164-2



K. H. Miller
2422-2



J. A. Milloy
2542-1



R. A. Mitchell
7321-1



G. O. Moe
7118-2



D. K. Morgan
2344-3



D. G. Mueller
5433



R. L. Nagel
1432-1



D. R. Nance
2563-2



A. R. Nord
7185-3



J. W. O'Neill
7184-2



O. L. Oren
2532-3



D. F. Palmer
7311-3



W. K. Ream, Jr.
1111-2



R. P. Roberts
1432-1



A. J. Russo
7117-2



R. L. Rutter
7251-1



H. W. Schmitt
2561-1



D. C. Schultz
2543-1



L. W. Scully
7224-1



L. J. Seligman
7312-2



T. T. Shishman
7224-3



N. F. Siska
2451-2



S. C. Steely
7232-3



P. A. Stokes
1442-3



W. H. Sullivan
5432-2



L. E. Terry
1431-1



Kenneth Timmerman
7311-2



Theodore Trybul
7183



Ralph Wardlaw
7117-2



G. H. Whiting
7147-2



T. L. Workman
2541-3

'Why We Test and Talk'

attack. So we do some developmental testing.

This, of course, ties into our missile program. The military will be carrying nuclear warheads to various parts of the country to place in an Atlas or Titan or Minuteman missile, and we want them to be safe. We would not want an accidental drop to wipe out a portion of our citizens. Further, they might be stored in a silo ready for use, and we would hate to have a surprise attack from some other power land in the neighborhood with such force that our own weapons are detonated. Hence, we make them stronger and try to guarantee that they will not be prematurely detonated. This involves the tremors that are evident in the earth when there is an underground explosion.

Recently we have been testing underground. That is a reasonably practical way of measuring the yield of not too large bombs, but to contain and test very large bombs this way is slow and exceedingly costly.

The desired technical data obtained are never as good as those obtained when the device is detonated where one can see it and obtain pure samples of its debris almost immediately.

We have made excellent progress in testing underground in Nevada since last September, but it is not enough. The nation which tests at will in the air will beat the nation which tests underground.

Underground testing cannot do anything in the weapons effects area except study underground effects. Most of the important questions now before us are questions of what a weapon does in other environments where it is more likely to be militarily used.

'We must find out'

So much for the weapons either in the stockpile or virtually ready for the stockpile, and the weapons we are trying to develop. They represent, as I have said, a wide array of diverse, ingenious and sophisticated versions. But we have far from seen the end of the nuclear weapon frontier. We either know or can estimate the effects of a weapon dropped from an airplane near Johnston Island or exploded on the ground at Christmas Island. But we have not done nearly enough work on other effects which weapons have in addition to the conventional effects of radiation, heat and blast. We know that weapons exploded at very high altitudes have widespread geophysical effects. Can these be exploited for military use? We must find out.

Next there is a problem of size. The Russians have exploded a very large bomb, and while also they needed that occasion to rattle sabers and talk rather tough, this did not take us by surprise. We know how to make large bombs too. Our laboratories know how to make a bomb as large as the military desires. But the question then arises: Could such bombs be used for other than mass destruction?

We would probably admit that in mass destruction they would not be too useful. A five megaton bomb will take out the heart of Washington and scorch the country for miles around.

What possible military target is important enough to demand a 100-megaton bomb? I can think of no single target which would justify its use. Therefore, we might ask: Are there military uses other than mass destruction? Will such bombs fit in with our national and military objectives?

The only way to learn these things is through studies of the effects of nuclear explosion in a variety of environments and with the most sensitive experimental tools. So we do some effects testing.

In 1958, this country exploded some high altitude shots, including the Argus shots in the South Atlantic and the Teak and Orange shots in the Pacific. While the

Joint Committee was briefed, the material was regarded as highly classified. But months later the *New York Times* broke a story on it which many of us thought was leaked, and yet not all the information was completely revealed.

'read your newspaper'

Hence, I can only do today what I could have done with the original Argus shots: I can read to you from the *New York Times* of Monday, April 30, a front page story with a heading, "H-Test May Wipe Out Radiation Belt." I can quote liberally from the story which in turn was based to a degree on the appearance of Dr. Harold Brown, Assistant Secretary of Defense for Research and Development, on the Sunday television program, "Meet The Press."

The story related that we would fire three hydrogen bombs in an initial Johnston Island series in June and July, and these bombs would have about a megaton or less of power. One will be exploded up about 500 miles, and others would be 30 to 200 miles up respectively.

The highest and biggest explosion is expected to lead off a series and their purpose will be "to assess their usefulness, for example, as a defense against missiles." This could be based on the argument that neutrons released by a bomb explosion might render incoming bombs harmless.

The article refers to the effect of the blast upon people in areas beyond the continental limits of the United States, and says that for the first time Honolulu will be able to see the fireball of a hydrogen bomb at the instant of explosion.

"This time," says the story, "it will be well above the horizon. However, the distance of some 990 miles from Honolulu to the bomb, plus the atmosphere's filtering effects along the last part of the light's path, is expected to protect Hawaiians from eye damage."

Yesterday, about noon, the Joint Committee on Atomic Energy got a statement from the Atomic Energy Commission, announcing that during June or July three high-altitude nuclear detonations are planned to be conducted in the vicinity of Johnston Island in the Pacific.

The details check so closely with the Times story that I realize the newspaper had accurate information. My only suggestion to you is: read your newspaper every day. And my suggestion to the military is: talk frankly to the American people. They are strong, courageous and understanding. They should be equipped with the truth.

'... why we talk'

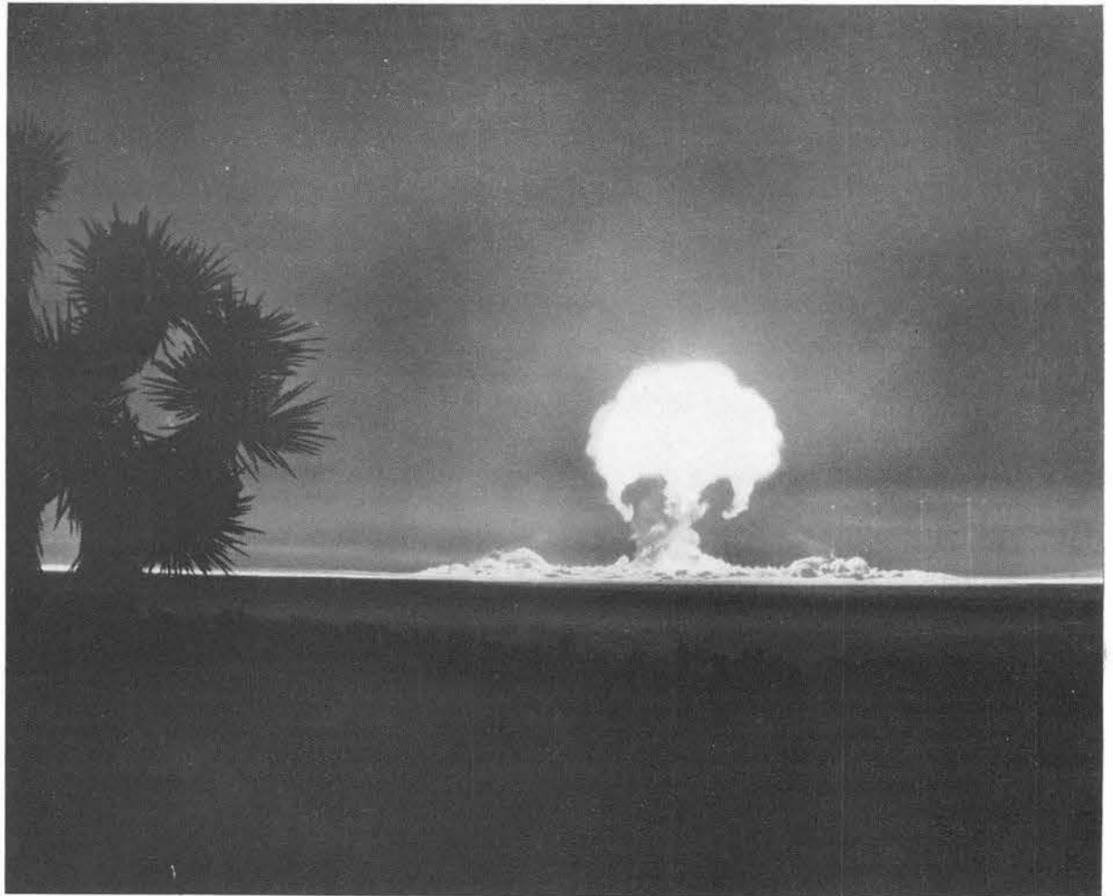
Now that we have covered the matter of why we test, let us now consider briefly why we talk.

The reasons why we talk—why we have negotiated with the Soviets in good faith—and continue to negotiate, seem quite obvious. We and our British allies want somehow to end the nuclear arms race with the Soviets and also to prevent, if we can, other countries from achieving an independent nuclear capability. I would emphasize here that a nuclear weapon is not "just another weapon" to be played with by the military of any country, including our own.

Perhaps the best way to understand why we are talking about the test ban would be to review some of our experience in talking to date. But time does not permit. In my opinion, the United States has made some mistakes and received some surprises which might have been avoided. I am frankly concerned that we may have made too many concessions and may make more in the future unless forewarned. But, nevertheless, the stakes are so high that we must continue to talk and to negotiate.

Perhaps if I sketched out the Soviet and U.S.-U.K. positions, it would help clarify my point.

The Soviet position in test ban negotiations has been basically



"I HAVE GREAT FAITH in the scientists who devised them (our nuclear weapons) and who were skillful enough to extrapolate from their previous tests and their current explosions so that they

would have designed useful weapons. But we would also like to know if these weapons will work under operational conditions. So we engage in testing."
—Sen. C. P. Anderson, to Washington businessmen.

consistent throughout, although they have given some indications here and there of flexibility and concessions. Essentially the Soviets purport to want a comprehensive ban on all tests (atmospheric — underground — underwater — and outer space) but with no effective international controls and inspections to enforce such a treaty.

The United States has attempted to gear a ban on various types of testing to effective international controls and inspections. Thus, in 1958, we agreed to a moratorium on all tests while we attempted to work out an effective control and inspection system based on a report by an international conference of experts.

Unfortunately we soon learned that the report of the experts was erroneous on the consistent detection of underground tests, having been based on only one underground test in 1957. The trick in identifying underground nuclear tests is to distinguish between nuclear explosions and earthquakes. As you might guess, the smaller the earthquakes the more there are of them.

The mistake in the original Geneva system was that the experts thought their detection, identification, and inspection system would enable them to detect and identify underground shots down to about 5 kilotons (one-fourth of the Hiroshima bomb). As a result of the United States Hardtack test series in the fall of 1958, we found these figures were off by a factor of 4. So the manageable control level of testing was found to be around 20 kilotons instead of 5 kilotons as previously thought.

'substantially muffled'

A further factor which clouded our position was the discovery of the possibility of "decoupling" or muffling of underground shots whereby the seismic recording could be cut down by a factor of up to 300 to one. It was figured out theoretically, and later confirmed by experimental TNT shots, that by exploding nuclear weapons in large underground cavities the seismic waves could be substantially muffled.

Thus, by some time in 1959, it was evident to the experts, and others, that the original Geneva system of 180 stations, including 21 in the Soviet Union, was not adequate. It would only handle the 20 kiloton range, and

had not contemplated the further problem of decoupling.

In these last few words, I have used the terms "decoupling," "muffling," "seismic recordings" and "seismic waves." These were no part of our scientific and diplomatic language only a few years ago. As used in nuclear matters, they are sometimes hard to understand and difficult to explain. Perhaps that is an indication of why I think the public needs to be constantly told what is planned, what is attempted, and what the results have been.

'problem of inspections'

Since 1959, the problem of inspections has been the chief item of contention between the United States and the Soviets. I thought that the final proposal of our Government on March 15 last, which Ambassador Dean handed to Mr. Tsarapkin and which modified our previous proposals by taking out the threshold of 4.75 degrees of seismic magnitude (here go those difficult words again), was a very attractive proposal to the Russians which I thought they would accept as a basis for negotiation. Surprisingly, they were not interested; and that may explain why I am willing to predict that the Russians will soon resume atmospheric testing.

Nothing would suit me better than to try to outline the entire course of our negotiations with the Russians, but that would consume a period of time which I neither desire to use nor intend to take.

One thing, however, is apparent in our new course of testing and talking. World opinion has not been as inflamed toward us as some feared. Most of the neutrals and many of our former antagonists recognize that the Russians started it and that we have been forced to follow.

True, some people have worried that we are facing a great risk from nuclear fallout. It is my opinion that the nature of our testing program is such that these tests will minimize the danger from nuclear fallout.

I think the types of weapons we will test and the size of the blasts they will produce will keep the fallout in line with the rate of decay which now tends to destroy the accumulated fission material circling the earth. But if that is not the result, if there is some slight possibility of future impairment

of health, I hope we, as citizens, will recognize that as we worry about the hazard of nuclear testing, we must worry infinitely more about the hazard of a nuclear war.

'The hazard of losing ...'

Many eminent scientists recognize that it would take an enormous rate of testing, one which I do not believe that any nation seriously contemplates, to pose any real hazard from world-wide fallout. The hazard of losing our whole way of life because an enemy was stronger, it seems to me, would be a far greater hazard than testing.

Hence, we continue to talk and to hope. It is clearly apparent to us that the task of achieving a workable test ban is much more difficult than originally conceived. Likewise, we have learned that the task of joining it with a workable disarmament treaty seems farther in the future than it did four years ago.

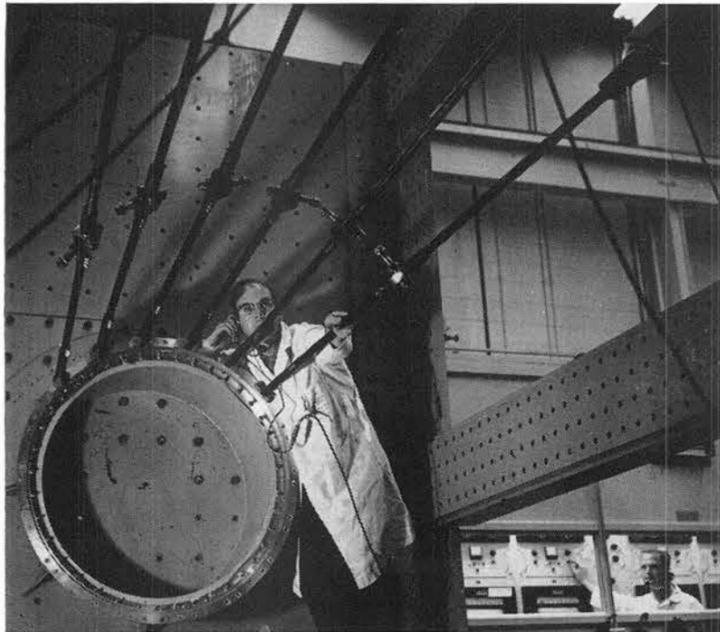
I do not know what will come from these endurances, but I do have hope that we will be constant students of this segment of world affairs and thereby will be able to understand the problems of our diplomats and the decisions of our leaders.

A half century ago Bishop William A. Quale wrote a book called, "In God's Out-of-doors." His theme was that we could not judge the beauty of a tree until the harsh, cold winters of the northern plains. Then, stripped of its leaves, we could see the actual beauty developed by a slow growth in the colder climates.

I walked many times through woodlands on the Dakota prairies and mentally thanked Bishop Quale for helping me to appreciate beauty. He suggested a new beatitude: "Blessed are those who help us to see."

These next few months, while we test and talk and while the Russians test and criticize, will be a difficult period for our diplomats, our scientists, our public servants, and the President. These will also be difficult months for our people. My hope is that those in places of responsibility will share their burden with the American people by clearly presenting to them the information required for intelligent support of national leadership. Then we will be able to say with Bishop Quale: "Blessed are those who help us to see."

Giant 'Erector Set' Bends, Breaks It's Part of Testing



PARACHUTE FIXTURE, about to be tested, is mounted inside one of the steel frames in Bldg. 864. Howard Nunez checks the six pull rods which will exert force on the fixture. Bill Putnam, lower right, is in the control room where automatic equipment can run test.

In the Static Jig Testing Laboratory, Bldg. 864, are four cage-like frames of structural steel known as the "erector set." With these cages providing the base, Section 7322-1 can apply forces up to 750,000 lbs. to components and systems.

These tests duplicate some of the stresses and strains of rocket launch, re-entry, supersonic drop, and other operational maneuvers to which Sandia products may be subjected.

"In the Static Test Lab," Harry P. Wheeler, section supervisor, says, "we can run any item through a test series to find its breaking point. We can test items of only a few inches in length to complete systems 20 ft. long. Two overhead bridge cranes and hoists can handle up to six tons each."

Sandia design engineers, striving for maximum strength and reliability, find the structural tests invaluable.

Varying Force

In performing the tests in the static jigs, hydraulic cylinders apply the force. These cylinders, ranging in size from one and one-half to 14 in. in diameter, can be arranged to apply varying amounts of force at any point on the test item. The cylinders can be controlled manually or programmed through an "automatic load maintainer" which can control up to 12 cylinders simultaneously.

Loads applied to test items are generally of different magnitude and directions. Any combination of

compression or tension can be controlled. After a particular test is set up, all loads are controlled by one master knob on the automatic load maintainer. In addition, force-versus-time curves can be drawn automatically during the test on the strip chart recorders in the automatic load maintainer.

Emergency shut-down can be accomplished by hitting the emergency stop button.

Strain gages, displacement gages, and load cells are used to instrument tests. The outputs from one to 100 channels of these transducers may be recorded on an automatic data logging system every two minutes. This digital system makes it possible for the data to be handled automatically.

Stress Analysis

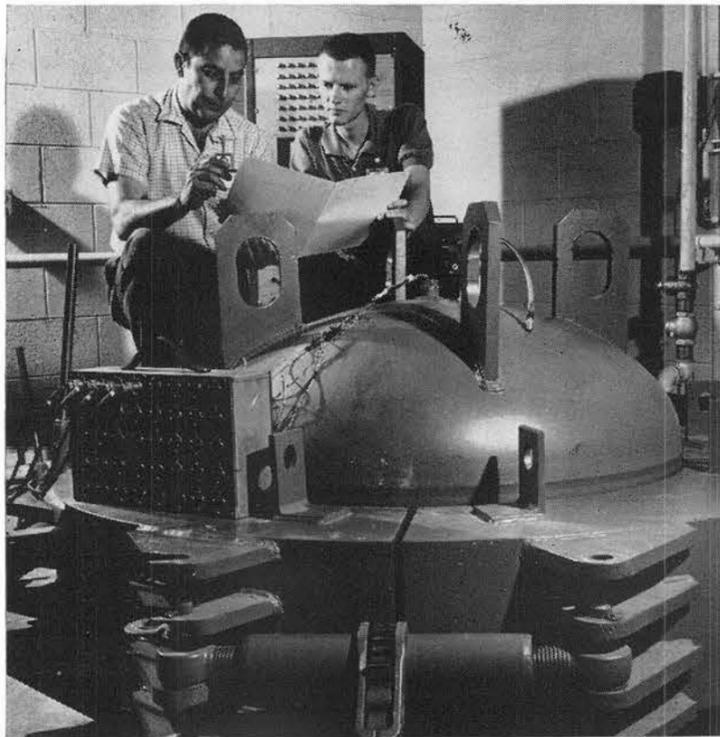
Stress analysis can be performed by using the Stresscoat process. A

thin liquid, which dries into a thin brittle layer, is sprayed onto a test item. Under a load in a static jig, the Stresscoat cracks and reveals the area and pattern of strain.

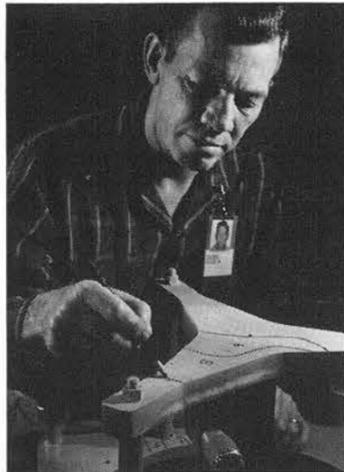
The Lab also uses a standard tension-compression machine which can apply loads up to 300,000 lbs. This machine is used for smaller test items up to six ft. in length.

The hydrostatic test facility, also used by Section 7322-1, consists of one large vessel, nine and one-half ft. deep, and a smaller vessel, three and one-half ft. deep. These vessels are filled with water which may be pressurized up to 1400 lbs. per sq. in. for testing structural strength and for leak detection.

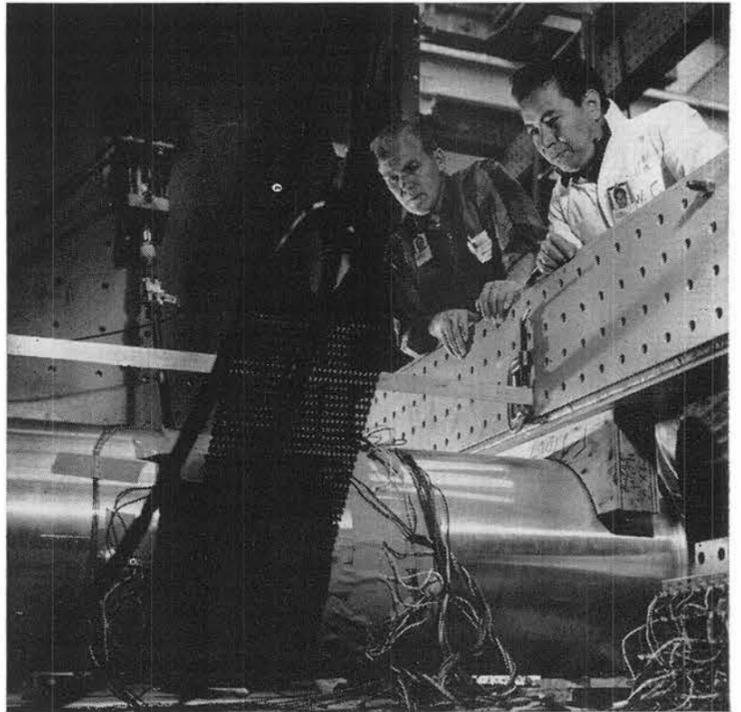
Tests in the Static Jig Lab are performed to meet requirements of design engineers.



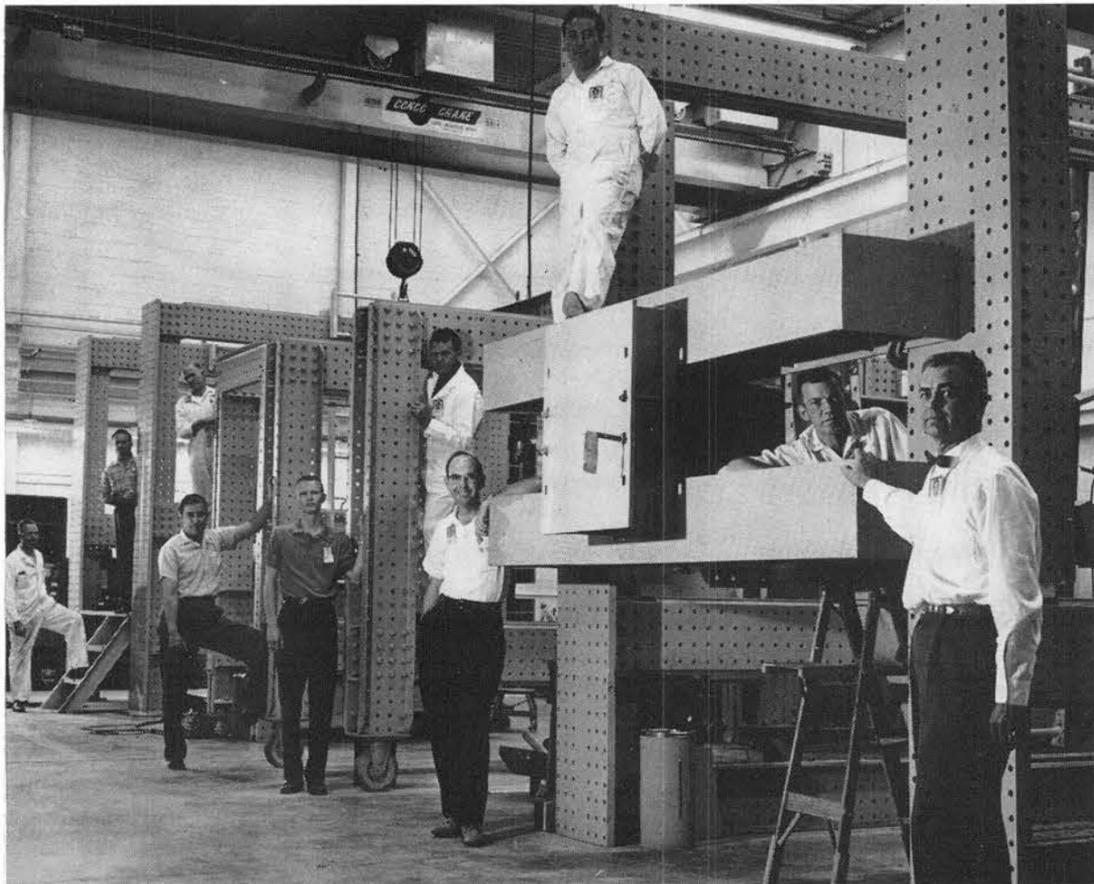
DISCUSSING specifications for a component inside large hydrostatic test vessel are Juan Mata, left, and Sam Martin. The tank can test items up to seven and one-half ft. long when filled with water under pressure. It is used for structural and leak testing.



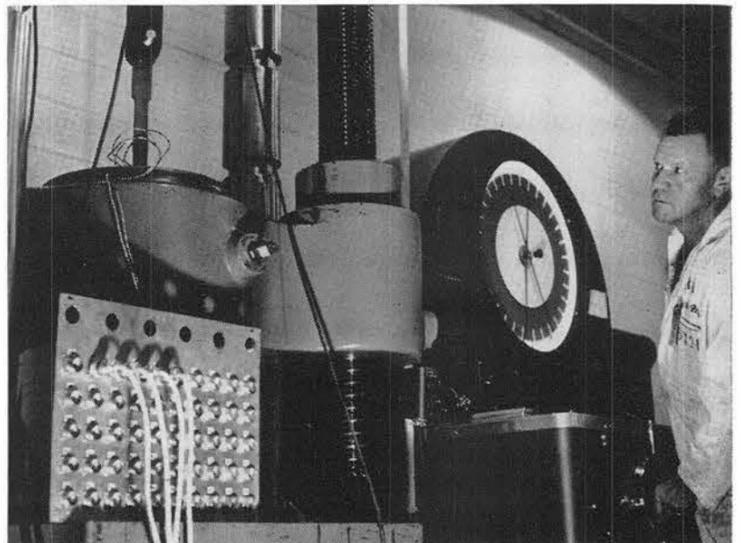
PATTERN OF STRESS is revealed by cracks in the "Stresscoat" sprayed onto handling gear prior to undergoing static test. Eldon Coomes marks the pattern with grease pencil to further aid stress analysis.



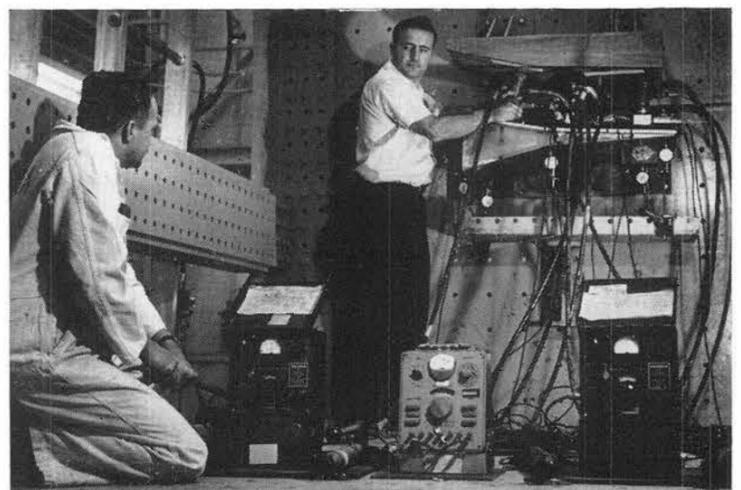
ALUMINUM CYLINDER will be tested to determine breaking point. Force is exerted by hydraulic cylinders to the wire mesh strap under the cylinder. Data will be measured by transducers attached to the test specimen. Checking setup are Harry Warrick and Gil Leyba.



GIANT ERECTOR SET is no playground for men provide the support for tests which apply forces up to 750,000 lbs. Right is H. P. Wheeler, Supervisor.



STEEL TENSILE SPECIMEN, center left, is set up for a "pull-test" which can be as great as 300,000 lbs. Operator is Andy Imrisek.



BILL PUTNAM, left, and Larry Woolrich prepare a test which will duplicate aerodynamic forces on the fin of a test vehicle. Larry is adjusting one of the hydraulic cylinders which will exert force.

L. R. Hassebroek to Head Photography at New Mexico Fair

Leroy R. Hassebroek (4423-1) has been named superintendent of the photography department at the New Mexico State Fair. He succeeds the late Clifford C. Anderson who died May 27.

For the past nine years, Mr. Hassebroek has assisted unofficially in the operation of the fair's photography department. This year, the photographic department will sponsor the Silver Anniversary International Pictorial and Portrait Print Salon at the fair.

"The International is open to anyone who wishes to display his photographs," Mr. Hassebroek commented. "But entries are limited to portraits or scenic."

Closing date for entries to the Salon is Sept. 4. Dates of the exhibition of prints are Sept. 13-23.



MEMBERS OF SANDIA'S first Technical Development Program class were addressed by Corporation President S. P. Schwartz during a luncheon at the Coronado Club in their honor June 28. The

Educational Committee, which helped set up the program, and members of Staff Training and Educational Division 3131, which administers the program, were also among those present.



CLOSE-CROPPED LAWN in front of Sandia Laboratory's Administration Building 800 is the work of Elanterio S. Torres, left, and Willoughby E.

Glisson of Labor Support and Grounds Maintenance Division. Cuttings from one mowing are piled in foreground and will later be carted away.

Welcome Newcomers

July 18-28

State	Name	Address	Phone
Albuquerque	Shirley A. Bain		3126
	Dennis R. Benedict		4574
	K. J. Datz		7246
	Charles M. Greenwood		7223
	Jacqueline T. Hagenauer		2341
	Zona Mae Hamm		3126
	Virginia L. Hoff		3126
	Virginia E. McCabe		3126
	Blaine H. Patrick		7242
	Florindo Salas		3444
	Anna Lee Stewart		3126
	*Richard T. Tregellas		2544
Ruben E. Trujillo		4574	
Stephen H. Vigil		3444	
*Lester G. Welborn, Jr.		2422	
Ralph K. Wenzelburger		4574	
Arizona	James C. Kohl, Phoenix		1313
	Ronald K. McIntyre, Phoenix		4352
Arkansas	David B. Holt, Nashville		7113
	Joseph F. Metralier, Little Rock		1442
	Kazuo Oishi, Scott		7312
Colorado	Ronald L. Fugazzi, Boulder		4112
Idaho	Kenneth R. Prestwick, Moscow		5113
Illinois	William H. Gilbert, Jr. Urbana		7311
	Bruce A. Strausberg, Chicago		3426
Indiana	Lucien R. Van Blaricum, Jr., Lafayette		7221
Iowa	Friend K. Bechtel, Ames		1432
Kansas	*John C. Crawford, Manhattan		5131
	John R. Guth, Lawrence		2452
Kentucky	Denis E. Lowry, Lexington		7125
New York	Charles R. Hills, Binghamton		1124
	Lawrence A. Lang, Cortland		1112
North Dakota	Dale R. Breding, Grand Forks		7221
	Nels D. Magnuson, Battineau		1443
Ohio	Harry M. Kittredge, Dayton		7211
	Paul A. Longmire, Columbus		1442
	Thomas S. Rathke, Dayton		7311
Oklahoma	Jon A. Bedingfield, Oklahoma City		4332
	Brooks W. Bell, Stillwater		7511
	Johnny L. Duncan, Stillwater		1432
Pennsylvania	Thomas L. Evans, Reynoldsville		7325
Virginia	Larry E. Lind, Blacksburg		7223
* Denotes rehired			
Returned from Leave			
	Merle L. Quisenberry		4412
	Charles H. Treat		7183
Temporary Summer Staff			
	Kenneth R. Applegate, Albuquerque		1122
	Merton K. Bratton, Jr., Albuquerque		2344
	Thomas J. Burgess, Chicago		5131
	Thurlow Caffey, Albuquerque		5412
	Richard P. Charoff, Trenton, N. J.		1112
	William C. Choate, Gainesville, Fla.		1312
	S. Arthur Cone, Albuquerque		1321
	William M. Dante, San Francisco, Calif.		7223
	Richard C. Dove, Albuquerque		7323
	Louis C. Garby, Boulder, Colo.		7131
	Harold I. Knox, York, Pa.		4410
	George W. Petznick, Ithaca, N. Y.		5426
	Wendall C. Robison, Lincoln, Neb.		1322
	Ralph L. Rosenbaum, Albuquerque		1313
	Robert A. Settles, Columbus, O.		5413
	Edward M. Shoemaker, Urbana, Ill.		5150
	John H. Welsch, San Jose, Calif.		5426

Second Annual Bridge Tourney Opens at Club

The second annual Coronado Club Open Pair Bridge Tournament will be held Monday, July 9, at 7 p.m. This duplicate bridge competition is open only to Sandia Corporation employees. Further information may be obtained from W. Howerton, ext. 48144.

SHOPPING CENTER

CLASSIFIED ADVERTISING
Deadline: Friday noon prior to week of publication unless changed by holiday.

RULES

1. Limit: 20 words
2. One ad per issue per person
3. Must be submitted in writing
4. Use home telephone numbers
5. For Sandia Corporation and AEC employees only
6. No commercial ads, please
7. Include name and organization

FOR SALE

GENERAL MOTORS utility trailer, licensed, with spare wheel. Kishbaugh, AM 8-0670.

WASHING MACHINE, Kenmore, deluxe model. Davis, Ponderosa Trailer Court, Space No. 3.

24" GIRL'S bike, just repainted, \$15. Stueber, 8410 Flower Pl. NE, AX 9-2414.

EVAPORATIVE ROOM cooler, Travel Aire 830, 2-speed, \$15. Paris, AX 8-2939.

3/4 TON refrigeration window air conditioner with stand and sheet metal transition for casement window. Muzzey, AL 6-4930.

1/2 ACRE LOT, has water, gas, electricity, phones, school, mailroute, utility house. Also 1/2 acre adjoining. Shea, Sandia Knolls, ext. 28258.

TWO REFRIGERATIVE air conditioners, 220 volt, one-ton, thermostatically controlled. Alberts, AX 8-0142.

CHINESE RED O'Keefe & Merritt gas range, oven, broiler, griddle, fully automatic, like new, \$150. Campbell, AM 8-6580.

4-BDR HOUSE in NE, 1 1/2 baths, 1700 sq. ft., drapes, carpeting, AC, SW landscaping, opposite school, available Oct. \$16,000. Shunny, AX 9-2787.

GO KART, McCulloch, MC-6 engine, \$150. Beauty Rest mattress w/matching box springs, \$40. Cashion, 242-3345.

TABLE LAMP, brass; brass bookcase (3 shelves); 2 wrought iron stands; 2 dinette chairs, \$15. Thorp, AL 6-9559.

*58 LAMBRETTA scooter, 125 LD, 8000 miles. Clay, AX 9-1769.

BOY'S SCHWINN English racer, 26", \$25; girl's 24" bicycle, \$15; power lawnmower, \$10; horse stock racks for narrow bed Chevrolet 1/2-ton truck, \$50. Schurr, AX 9-2985.

ACCORDION, Italian-made by Trontalent, 120 bass, \$100. Gower, 877-1223.

SOFA and matching club chair, grey frieze. Joseph, AM 8-5414.

*57 BUICK Special station wagon, R&H, good tires, fair otherwise. Strome, 1409 Georgia NE, AM 8-2689.

WINDOW FAN, 20" Homart, two speeds forward and reverse w/timer. Jones, AX 8-1391.

POMERANIAN/CHIHUAHUA puppies, two males, two females, six weeks old, \$15 each. Mrs. Davis, 9406 Claremont Ave. NE, AX 8-1957.

SOLID MAPLE bed, with double coil springs, 39" wide, \$15; portable pressure gage testing set, range 0-300 psi with carrying case, \$5. Hill, CH 3-3493.

PORTABLE EVAPORATIVE cooler, practically new, two speed, \$15. Everett, AX 9-6057.

WESTINGHOUSE refrigerator, full width freezer, \$50; blond step and corner tables, Formica top, \$15. Clark, 298-2340.

*59 VOLKSWAGEN sedan, low mileage, Hurley, AX 9-5709.

JOHNSON VIKING II, \$140; also Knight VFO, \$15. Kanode, 408 1/2 Cornell Dr. SE, CH 3-0493.

STEEL WINDOWS, 2 x 8's; 1936 and '48 Ford engines; 20' building wall w/four windows each; pipe w/fittings. Villella, 9204 Susan Dr. SE, no phone.

MUST SELL 4-year-old home, NE, 3-bdr, walled yard. Take over present \$9,300 loan, low payments. Finn, AX 9-7535.

ALL SCHOOLS close, 3-bdr, 1 1/2 baths, living, dining, den, electric kitchen, oak floors, carpeting, patio, garage, no down. Frankel, AM 8-0100.

*57 PONTIAC station wagon, 6-pass., \$595. Class, 299-6648.

NEXT DEADLINE
FOR SHOPPING CENTER ADS
Friday Noon, July 13

*60 MCRRIS Minor "1000", 2-dr., R&H. Kinoshita, 9412 Snow Heights NE, AX 9-6491.

BOY'S BICYCLE, 26", like new, \$25. Cleveland, AX 8-0218.

FRIGIDAIRE refrigerator, \$35. Nogales, 1100 Silver SE, CH 7-1178.

BEACH UMBRELLA, blue, seven ft. diameter, aluminum two-piece pole, \$10 or best offer. Kyrloch, DI 4-3083.

LOOM, four harness, 20 in. Structo Art-craft with \$12 worth of thread, \$75. Hensinger, DI 4-1504.

NEW RCA 1YC-11 portable, cartridge, recorder 2-track record and play mono or stereo, 40% off original price. Pilkington, AM 5-0013 after 5 p.m.

SIAMESE CAT, female, 3 months, \$10. Murfin, AX 8-0760.

AUTOMOBILE AIR conditioner, 12 volt evaporative type, \$20. Gustafson, 1920 Saint St. NE, AX 9-3270.

PIONEER AUTOMATIC water softener, 9 1/4 years guarantee remaining, sold by Culligan for over \$380, my price, \$280. Hughes, 344-8786.

ROBERSON 3 BDR, den, 1400 sq. ft., landscaped, patio, must sell immediately. Priced low, varied terms. Yourick, AX 9-7382.

LIVING ROOM suite, 2 pc. maroon, first \$35 takes it. Kerstetter, 10510 Snow Heights Blvd. NE.

UMBRELLA TENTS: one 9x9 and one 9x12, both with floors. Will consider \$50 or best offer. Duvall, 898-2295.

FRIGIKING AUTO air conditioner, large compressor, \$60. Caldes, BU 2-3272.

AUTO COOLER, window type, used one trip, \$8; 1956 Ford country sedan, AT, R&H, one owner, first \$600 takes. Bowen, AL 5-6759.

2 BDR rental house, landscaped, walled yard, \$9500, \$400 down, \$68 month, NE Heights, close to Sandia. Farnar, AX 9-6007 after 5 p.m.

DINING CHAIRS, 4, Philippine mahogany, no scratches but need re-gluing, \$20 takes all. Burns, CH 2-2407 after 5:30 p.m.

ELECTRIC GUITAR w/amplifier, \$200 or trade; single bed, \$20; baby car bed, \$5; electric vaporizer, \$5. Naumann, 11716 Summer Ave. NE, 298-1953.

KNIGHT TUBE tester, \$25; Heathkit Balun coils, \$5. Lathrop, AL 5-1901.

*48 DODGE pickup 3/4 ton, 4-speed, R&H, looks good, runs good, \$325 or trade for lighter, later, 6 cyl. PU. Miller, AL 5-2577.

GARAGE DOOR 7x8', 5 sections, 1 glazed, w/hardware, \$35; paint sprayer w/compressor, \$35; Electro skill saw, \$20; clock radio, \$15. \$90 takes all. Aaron, BU 2-3124.

METAL WORKBENCH on wheels; 6:40x15 tubless tires (w/w); two 26" bicycle tires and wheels; child's spring horse; maple finish table. Phillips, 1020 Morris NE.

ROTH VIOLIN, full size, like new, \$50. Landavazo, AX 9-6579.

FOUR TIRES, 8.50x14, white wall, some tread, recappable, \$3 each. Sherwin, AL 5-8866.

MOTORCYCLE, '54 Harley-Davidson 74, crash bars, saddle bag, spotlight, \$375. Gonzales, CH 2-5084.

19" ROTARY lawn mower, Briggs and Stratton motor, only 8 months old, \$35. Brown, 1328 Princeton NE, AL 5-5593 or AL 5-0566 evenings.

*56 BUICK Special, auto. trans., R&H, PB, ww tires, \$500. Morton, AX 8-2637.

ENGLISH SPRINGER spaniel puppies, purebred, excellent family and hunting companions, registered AKC. Barth, BU 2-3134.

MOTORBOAT, 14' aluminum skiboat with 25 hp electric starting engine and trailer. Life jackets, other extras. Buchanan, AX 9-7487.

3-BDR and den brick home, landscaped, carpeted, drapes, curtains, washer-dryer, dishwasher, disposal. Pearl, 256-6541.

BASSINETTE, Infanseat, jump chair, all like new. Sayers, AX 9-1833.

ANTIQUE MAHOGANY six drawer chest, double bed and chair; Lawson style loveseat, aqua upholstery. Osner, AX 8-1140 after 6 p.m.

WANTED

ELECTRIC POTTER'S wheel and electric kiln. Hart, AX 9-1123.

NEW MEXICO Sun Trails magazine, Vol. 7, No. 7, and Vol. 8, No. 1 and No. 5. Jones, 526 Dartmouth Pl. SE, 255-3390 after 6 p.m.

RIDE FROM 1200 Wilmore SE (1 block from Yale). Davis 243-2315.

RIDE FROM vicinity of Sixth and Indian School Rd. NW to Bldg. 802. Dyer, CH 2-8830.

TO Indianapolis area starting July 14. Will drive and share expenses. Meikle, AX 9-4640.

RIDE FROM 522 Granite NW to Bldg. 800, Candelaria, ext. 52259.

ONE-WHEEL Trailer. Timmons, AL 5-5933.

TRADE ham equipment for typewriter, binoculars, guns, lapidary equipment, star gazing telescope or what have you? Cash also acceptable. Roane, 2909 Garcia St. NE.

FOR RENT

DUPLEX with stove and refrigerator, garage and water paid, 417 1/2 Rhode Island SE, \$50 per month. Saavedra, 268-6945.

TRAVEL trailer, sleeps 5, easy to trail, some time still available this summer. Colp, AM 8-8035.

LOST AND FOUND

LOST: Prescription glasses in open top case with Norristown, Pa., address; dark grey framed glasses with aluminum temples, ground lens, lost at Diamond D 6/21/62; glasses in case with name Burton Hill; 1958 University of New Mexico ring with initials FGH; silver ring with purple stone; silver molded drop earring. LOST AND FOUND ext. 26149.

FOUND: Glasses in pink case marked Dr. Hauser; 5 years SC pin. LOST AND FOUND ext. 26149.



"STAND BY, and we'll get your family on the phone," says Tom Jones (8132-1), at microphone, to Roger Baroody (8131) in Hawaii. Bud Pearson (8222-2) dials Roger's home. When call is completed, phone will be connected to the radio for direct conversations.

Amateur Radio Operators Bringing Dominic Staff Nearer to Families

Sandia Lab and Livermore Lab personnel stationed in the Pacific with Operation Dominic are keeping in close contact with their families even though they are thousands of miles away.

Thanks to the efforts of amateur radio "ham" operators this is possible.

"The schedule of radio contacts with the Pacific depends a good deal on the people in the test area," E. W. Kersten (2313) explains. Kerner is one of the amateur operators who frequently talks with personnel in the Pacific. "At certain times, it's impossible for them to transmit, so we let them establish the schedules of contacts with us."

Albuquerque and Livermore operators talk regularly with Sandians in Hawaii and Johnston and Christmas Islands.

Kerner talks with Kauai on Thursday evenings and with Johnston Island on Sundays. Pete has a schedule with Kauai on Tuesday evenings and with Johnston Island practically every night. Livermore operators have a twice-a-week schedule with Hawaii. Main contact on Johnston Island is Jack Garriot (7323). Barber's Point operators include Keith Baltz (7213), Tom Banks (7212), and Art McMullen (1424). Ed Groves, another operator who provided amateur communications from the Pacific during the 1958 test series, is on the air from the Pacific again—this time from Johnston Island.

Mrs. Loyt Lathrop, whose husband works in 7213, also operates an amateur station and provides

communication services for Sandia personnel in the Pacific. "There are many operators from Sandia Corporation and elsewhere who communicate with the Pacific," she explained. "And although their work is little known, they contribute a very worthwhile service."

In addition to his contacts with the test area, Kerner also communicates regularly with Albuquerque personnel at other remote locations.

Tom Jones (8132-1), Bud Pearson (8222-2), and Andy Gross (8122-2), man the radio equipment at Livermore. They use a 1000-watt single-side-band transmitter which belongs to the Livermore Radiation Laboratory amateur radio club, call letters WA6YHJ.

"We transmit at 21 megacycles since that's the best frequency for our late afternoon broadcasting," said Tom, "and we stay on the air until our signal fades out, or there are no more calls to be made—usually, about two hours."

A signal will fade because of the position of the sun, Tom explained. The sun's presence changes the ionosphere, that portion of the atmosphere which allows radio waves to travel great distances. "When our signal fades out we could change to another frequency and get a strong signal again, but normally we're through broadcasting by then," Tom said.

The LRL club equipment, housed in a trailer at LRL, can reach any spot in the world. It uses an articulated rhombic antenna which is 45-ft. high and 400-ft. long.

Sandia Speakers

Following is a list of speakers, titles, and places of presentation for talks by members of Sandia Corporation.

C. H. Maak (1121), "Fractured Toughness of Metals," Albuquerque Naval Reserve Research Unit, June 13.

S. E. Harrison (5322), "Measured Behavior of Gamma-Ray Photoconductivity in Organic Dielectrics," 1962 Summer General Meeting, American Institute of Electrical Engineers and Aero-Space Transportation Conference, Denver, Colo., June 17-22.

S. C. Rogers (5321), and H. K. Gummel, Bell Telephone Laboratories, Murray Hill, N. J., "Transistor Transient Response to Ionizing Radiation," 1962 Summer General Meeting, American Institute of Electrical Engineers and Aero-Space Transportation Conference, Denver, Colo., June 17-22.

G. H. Bouchard (5322-1), "Measurement of Bremsstrahlung Dose and Spectrum from a 600 Kvp Pulsed X-ray Generator Using Photographic Film," 1962 Summer General Meeting, American Institute of Electrical Engineers and Aero-Space Transportation Conference, Denver, Colo., June 17-22.

F. N. Copping (5322-2), "Transient Photoconductivity of Polystyrene and Polyisobutylene Exposed to Pulses of Neutron and Gamma-Radiations," 1962 Summer General Meeting, American Institute of Electrical Engineers and Aero-Space Transportation Conference, Denver, Colo., June 17-22.

E. I. Alvarez to Retire From Sandia Early in July

Evaristo I. Alvarez, a Corporation employee for 10 years, plans to retire July 31.



Mr. Alvarez has worked through the years as a dismantler in Processing Salvage Division 4621.

He and his wife plan to remain in Albuquerque, where they live at 1014 North Second. They have a son in Albuquerque and daughters in Roswell, N. M., and in California.

Later in the summer the couple plans to travel to Seattle to visit the World's Fair and stop in California enroute to see their daughter. Mr. Alvarez admits to being a hunter and fisherman "from way back" and will follow those sports in his leisure time.

Tuition Refunds Paid Employees Enrolled in Bay Area Schools

The Educational Aids Program at Livermore Laboratory helped defray expenses for several Sandians who were enrolled in Bay Area colleges and universities during the spring semester.

A total of \$300 in tuition refunds was paid to 11 industrious students who were enrolled part time at the University of California at Berkeley and at San Jose State in San Jose.

Among those attending school not previously reported in the Sandia Lab News were L. H. Bakken (8116-1), who is working for his PhD in civil engineering; F. J. Papps (8233-1), studying for his MA in mathematics; H. J. Jensen (8122-3), MS in electrical engineering; J. R. Keski (8115-1), PhD in engineering science; P. D. Leiserson (8212-2), Master of Business Administration; A. T. Nathan (8115-1), course work in atomic physics; E. A. Paxton (8233-2), course work in basic reference materials and services; and P. T. Schoemann (8123-1), PhD in electrical engineering.



Alexander Jack (3311) —"Prayer Plumes" author—



Cecilio Sanchez (4413) —"Prayer Plumes" illustrator—

First Book of Trilogy by Sandia Author Appearing in Bookstores

Prayer Plumes, a book-length narrative poem written by Alexander Jack (3311-1), will be appearing in bookstores throughout the country this month.

Planned as the first of a trilogy portraying an Indian youth from birth to the knowledge of death, Prayer Plumes will be followed by Drum Beats, which Mr. Jack has ready in manuscript form. Vantage Publishing Company is handling both.

On the book jacket of Prayer Plumes, Mr. Jack defines the purpose of his poem as "to bring others the realization that the American Indian is fundamentally a spiritual soul, not the ignorant savage portrayed to us over the years."

"I have attempted," he said, "to show White Cloud's daily life, his way of identity with things animate and inanimate, as possessing a spirit

which is the true essence of God in all things."

A deluxe edition of the book will appear later and contain a number of colored illustrations. The original oil paintings are by Cecilio E. Sanchez (4413). Mr. Sanchez has completed five of the paintings already and will show them during the Old Town Crafts Fair in July. A draftsman at Sandia Lab, he is a self-taught artist and has previously had one-man exhibits of his works at the Sandia Base Library.

Mr. Jack has a Bachelor's degree in anthropology and has done considerable archeological research in Old Mexico and in Chaco Canyon, N. M. At one time he was a participant in the Western States Governors' Conference of Indian Affairs and has been personally interested in Indian affairs for many years.

AEC Issues More Reports on Tests at Operation Gnome

The Atomic Energy Commission has issued four more reports on individual experiments or operational procedures conducted in conjunction with the Dec. 10 Project Gnome nuclear detonation near Carlsbad, N. Mex. The reports, available from the Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C., include:

"Design, Testing and Field Pumping of Grout Mixtures," 24 pp., 75 cents, a final report of the U. S. Army Corps of Engineers covering the waterways experiment station's studies, drilling consultant services, and field grouting phases of the project.

"Federal Aviation Agency Air-space Closure," 20 pp., 50 cents, a final report prepared by the Federal Aviation Agency of ac-

tivities conducted to ensure air-space user safety during the Gnome nuclear detonation by restricting designated airspace.

"Close-In Shock Studies," 28 pp., 50 cents, prepared by Lawrence Radiation Laboratory, summarizes measurements of shock parameters, including particle velocity profile and peak shock pressures, attempted in the salt close in to the Gnome nuclear explosion.

"Weather and Surface Radiation Prediction Activities," 22 pp., 50 cents, a preliminary description of facilities and summary of Project Gnome support activities provided by the U. S. Weather Bureau.

Other reports available on Project Gnome were listed in the Lab News, June 22, 1962, p. 6.

Blue Barron Orchestra Plays at Coronado Club Tomorrow Night

Blue Barron and his orchestra with "music of yesterday and today" will play at the Coronado Club tomorrow night. The dance will be from 9 p.m. to 1 a.m. Tickets are \$2 per person, and it's not too late to call the Club for reservations, Ext. 37276.

Saturday, July 21, the Club will offer its annual Hawaiian Luau. This year's Luau will feature Prince Pokii and his Royal Polynesians, who will play danceable American and Latin rhythms. In addition to the South Sea island band, there will be floor shows featuring Hawaiian singers and dancers.

The buffet (6-8 p.m.) menu will include Hawaiian-style barbecued spareribs, baked salmon, chuck wagon roast beef, and a Hawaiian fresh fruit bowl.

The Club will have a Hawaiian decor, and there will be favors for all who attend. Prices are \$2.60 for members and \$3.60 for guests. Reservations are being accepted now at the Club office.

The supper club will be open tonight and next weekend. Arlen Asher will play for dancing, and the floor shows will be at 9:30 and 11 p.m. on Fridays and 10:15 p.m. and midnight on Saturday.

Sandia's Safety Record

<p>Sandia Laboratory HAS WORKED 1,475,000 MAN HOURS OR 42 DAYS WITHOUT A DISABLING INJURY</p>	<p>Livermore Laboratory HAS WORKED 54,000 MAN HOURS OR 11 DAYS WITHOUT A DISABLING INJURY</p>
--	--



ARRANGEMENTS for short-wave communication between Sandia Pacific test personnel and families in Albuquerque are made by (l to r) Pierre Chevalier, Mrs. Loyt Lathrop, and E. W. Kersten.