

COAXIAL RAIL GUN was one of the laboratories U. S. Representative Thomas G. Morris (D-N.M.), second from right, saw during a visit to Sandia this week. Accompanying Congressman Morris were (l to r) R. B. Powell (3000), President J. A. Hornbeck and T. B. Cook (5000).

Serve on National Academy of Sciences Committee

Jack Reed, Luke Vortman Help Write Report on Supersonic Boom Effects

One of the more spectacular technical achievements of the next few years will be the development and flight of a supersonic transport (SST) aircraft. Already the British-French combine has a supersonic Concorde prototype built but not flown. The Boeing SST timetable calls for flight testing in 1970.

Speeds achieved by these aircraft are projected at more than 2000 miles per hour, cutting the airline time from New York to London, for example, from six and a half hours to two and a half hours.

One of the basic questions—other than technology and economics—surrounding the SST development that remains is what to do about sonic booms.

Jack W. Reed and Luke Vortman of Underground Physics Division 7111 are trying to answer part of that question. They are members of the subcommittee on physical effects of the National Academy of Sciences committee on SST-sonic boom. Chairman of the committee is E. F. Cox, a former Sandian now Director of Research, Whirlpool Corporation.

The committee is charged with investigating the physical effects created by SST sonic boom and making recommendations. Both Jack and Luke, through their long association with Sandia field tests and their specialization in blast effects and air pressure measurement, are uniquely qualified to serve in this area. The subcommittee has nine members.

A report issued by the group recently states that the probability of damage to structures from sonic booms generated by supersonic aircraft operating in a normal manner is small. However, considering the large number of structures exposed under a wide boom carpet and for many flights per day, the cumulative annual damage may be significant. The report urges that

steps be taken to explore more thoroughly the areas of remaining uncertainty.

Among the present imponderables discussed in the report are:

—The ways in which sonic boom intensities vary under different climatic and geographic conditions for different types of aircraft and aircraft operations

—The exact nature of the responses of damage-susceptible materials and structures to the boom; and

—The extent to which sonic boom pressures contribute to the normal strains placed on structures by such commonplace occurrences as thunder, wind gusts, street traffic and earth tremors.

Too little is known in these areas to predict accurately what kinds and amounts of physical damage might occur. "Understanding of material responses to transient loadings is not complete and may never be but a higher level of understanding is attainable and is required before realistic answers to these questions can be given finally," the report states.

The report urges establishment of laboratory facilities and a testing program to develop knowledge in these areas before resumption of a supersonic flight test program.

The subcommittee was more concerned about progressive failures from repetitive small booms than damage caused by single large booms.

The National Academy of Sciences committee on SST-sonic boom was established in 1964 at the request of President Johnson to study the effects of sonic boom as they relate to the development of supersonic transport in the United States. Jack was appointed to the subcommittee when it was formed in early 1965. Luke was appointed in 1966.



PHYSICAL EFFECTS from the sonic boom created by the proposed Boeing supersonic transport are the subject of a recent report issued by a National Academy of Sciences subcommittee. Jack W. Reed, left, and Luke Vortman (both 7111) are members of the group.

SANDIA LAB NEWS



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SANDIA LABORATORIES

ALBUQUERQUE, NEW MEXICO
LIVERMORE, CALIFORNIA

OPERATED BY SANDIA CORPORATION FOR
THE U. S. ATOMIC ENERGY COMMISSION



NATIONAL SECRETARIES WEEK, April 21-27, will honor Dorothy Hall (3112) and the other 400 secretaries at Sandia who play an important role in operation of the Laboratory.

Sandia's 400 Secretaries

Honored on 'Their' Week

That period of time is rolling around again when there's special recognition for all secretaries—that indispensable person who types accurately, takes shorthand at astronomical speeds, deciphers longhand, unerringly retrieves filed papers, and, perhaps most important, is pleasant to have in the office.

National Secretaries Week will be held April 21-27 and Secretaries Day, April 24, at which time these women will be honored for the vital role they play in business, industry, education and government. Since 1952, chapters of National Secretaries Association (International) have planned special activities for this occasion.

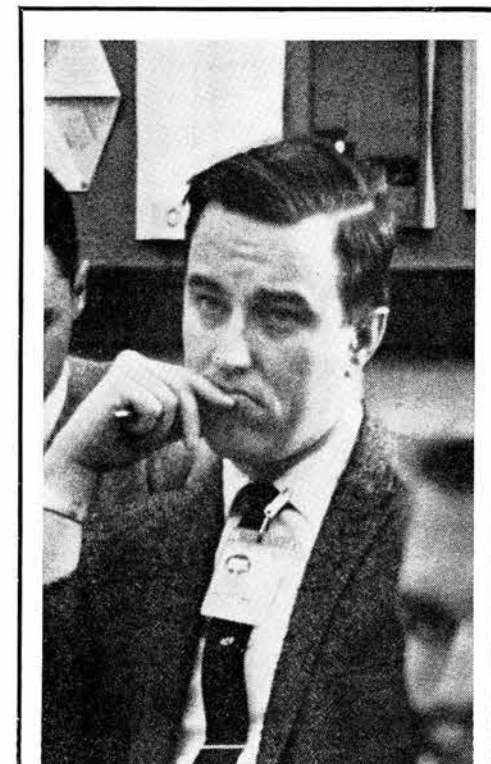
The Albuquerque chapter will hold a Secretary-of-the-Year luncheon April 27 at Panorama Inn. Sandia secretaries holding office in the group include Josephine Hanna (4000), chairman of the nominating committee (also International nominating committee members); Jean Langston (5100), vice president and program chairman; Ann Michele (4510/4570), Bulletin chairman; Mavis Bowland (5131/5132), public relations and welfare committee chairman; and Helen Walsh (1100), Boss-of-the-Year luncheon chairman.

In addition, the NSA chapter will hold an open house Wednesday, April 24, to which all interested secretaries are invited. The event will be from 7:30-9:30 p.m. at Reddy's Rendezvous in the new Public

Service building. Reservations should be made with one of the above officers.

Internationally, NSA has a membership of over 25,000. To join, a woman must have had at least two years of secretarial experience and must be presently working as a secretary. The organization sponsors the Certified Professional Secretary (CPS) program which requires passing a two-day examination on personal adjustment and human relations, business law, business administration, secretarial accounting, secretarial procedures and secretarial skills. To date, 3901 secretaries have passed the examination (roughly a third of the number who have tried), and of these six are Sandia employees; Josephine Hanna, Jean Langston, Helen Walsh, Winifred Sandusky (6000), Betty Pickel (4300) and Esther Coffman (4373).

A CPS study group will be reactivated next fall at Sandia under the sponsorship of M. A. McCutchan (3132) with the above CPS's serving as counselors.



WHAT is holding the concentrated attention of this Sandia employee? See page five for an explanation.

New System Initiated For Multiple Bond Buys

A new system initiated by Payroll Section 4131-3 will speed delivery of U.S. Savings Bonds for employees who have had payroll deductions for a number of designated owners (for instance, in the names of several children).

In the past, the bonds were not issued until the deduction had accumulated enough to purchase the entire package. Now, individual bonds will be issued in sequence as sufficient deductions accumulate.

Any questions should be directed to John Cavanaugh, 4131-2 supervisor.

Editorial Comment

A Meaningful Eulogy

Sections from a sermon given by a Sandia scientist at an Albuquerque Church on Sunday, April 7, are offered for your consideration.

" . . . When senseless tragedy strikes, how can that be God's will? There is no better example of this question than the one we ask now. How can death by violence of a man who has devoted his life to the cause of non-violence be God's will? The tragic event of last Thursday is not unique. History is full of similar events, and many of them mark turning points in history, the dawn of a new age, in which long standing wrongs are belatedly recognized for what they are, and men of good will get on with the business of righting them. Would it not be a fitting tribute to the Christian life that Dr. Martin Luther King led, if his death were to be the instrument of the end of the injustice we all know to exist in our nation? We know this injustice, we know its nature, we know its cause, and we know the remedies it will take to end it. Our press is full of reports of commissions, of surveys by the press, and of knowledgeable and patriotic leaders. There is little disagreement among these on what needs to be done. All that is lacking is the sense of urgency in the minds of the millions who think it is not their problem, or that other matters are more urgent. It would be most fitting if Dr. King's death accompanied this last necessary step—that of moving the minds of those not yet moved.

"I hope that every member of this congregation and of a thousand others across the land, will search his soul with this question: 'What have I done to solve this problem? What can I do?' There is no shortage of answers for those who truly seek the answers . . .

"And the death of this great man will not have been in vain."

Speakers

T. H. Martin (5221), "Flash X-Ray Machines," Ninth Nuclear Engineering Education Conference, March 25-26, Argonne National Laboratory.

H. D. Arlowe (7335), "Specialized Signal Conditioning: Problems and Solutions," American Society of Civil Engineers, New Mexico Section, March 29, Albuquerque.

R. I. Butler (7342), "Use of Quartz Gages to Measure Shock Pressure in Solids," Rocky Mountain ASTM Meeting, March 29, Albuquerque.

M. M. Sluyter (9321), "Continuing Education—Facts and Fallacies," annual meeting of the Southwestern Section of Mathematical Association of America, April 12-13, Las Cruces.

H. H. Wicke (5321), "On Uniformly Mu - Complete Mappings," American Mathematical Society, April 16-20, Chicago.

C. M. Percival (5133), "Rohamite, A New Kinematic Concept," Ninth Annual Engineering Symposium, Brigham Young University, April 20, Provo, Utah.

R. H. Dungan (1132), "An Investigation of the Properties and Phase Relationships in the Antiferroelectric Region of the System $Pb(Mg_{1/3}Nb_{2/3})O_3 - PbTiO_3 - PbZrO_3$ "; D. A. Northrop (5154), "Vaporization of Hot-Pressed Lead Zirconate-Lead Titanate Materials of Near-Theoretical Density"; and G. H. Haertling (1317), "Hot Pressed Ferroelectric Ceramics for Electro-Optical Applications," Spring Meeting of the American Ceramic Society, April 20-25, Chicago.

C. C. Bates (1321) and J. R. Guth

(2451), "Testing High Reliability Relays by Use of Automatic Equipment," 16th Annual Relay Conference, April 23-24, Oklahoma State University.

F. W. Bingham (5121), "Inelastic Energy Transfers in $0^+ - Ar$ Collisions in the Energy Range 50-200 KeV"; and S. R. Dolce (7113), "Time of Emission of K X Rays in the Spontaneous Fission ^{252}Cf ," American Physical Society, April 22-25, Washington.

L. W. Kennedy (5637), "One Dimensional Approximation to Laser Induced Tensile Failure in Solids"; and N. C. Anderholm (5637), "Laser and Stress Induced Damage in Lucite," Southwestern and Rocky Mountain Division, American Association for the Advancement of Science, April 28-May 1, El Paso.

J. M. Hueter (2563), "Value Engineering," April 4 and 5, and "Value Engineering and the Creative Challenge in Engineering," April 8 and 10, UNM mechanical engineering students.

C. S. Johnson (7252), "The Scientific Quest for ESP," Evening Optimist Club, April 11.

G. W. Hughes (7224), "Visual Tracking of Artificial Satellites," Van Buren junior high English class, April 16.

J. D. Shreve (5234), "Digging Another Canal in Panama with Atomic Devices," Albuquerque Rotary Club, April 18.

Local Aviation Association Sponsors Clinic and Fly-In

The New Mexico Aviation Association is sponsoring an Aircraft Owners and Pilots Association (AOPA) Flight Training Clinic April 25-28 at Western Skies Motel. Six courses, which require four hours of ground school and four to six hours of in-flight instruction, will be offered.

The AOPA courses are 360° Rating, Instrumentation Nav/Com, Instrument En Route Procedures, Instrument Approach Procedures, Instrument Pilot Refresher and Pinch-Hitter. In addition, the AOPA Instrument Written Examination and the AOPA Private Written Courses will also be offered.

The local aviation association is also sponsoring a fly-in April 26-28. A tram ride to Sandia Crest on Friday night, various activities at the Sunport, a dinner dance Saturday and breakfast Sunday are included in the registration fee.

Additional information may be obtained by contacting J. O. Avis (2525), a member of the board of directors of the N. M. Aviation Association. C. D. Herndon (1632) is a member of the group's flight committee. About 150 Sandians are members of the AOPA and some 20 belong to the local aviation association.



HARLAN LENANDER (2500) relaxes at the keyboard of his electronic organ. He will receive an honorary Doctor of Science degree from Southwestern College at Winfield, Kans., his alma mater, on June 2.

'Satisfactions from Exciting Work'

H. E. Lenander Honored

Harlan E. Lenander, director of Manufacturing Development 2500, will receive an honorary degree of Doctor of Science on June 2 from his alma mater, Southwestern College, Winfield, Kans.

Mr. Lenander has earned many awards since he graduated cum laude from Southwestern in 1939 with honors in physics and majors in physics, mathematics and chemistry; but he is particularly pleased with the honorary degree.

"It is completely unexpected," he says, "and a rare honor. Southwestern confers few honorary degrees."

Through the years, Mr. Lenander has maintained close relationships with former professors and classmates, and the interests he pursued in college are his interests today. Foremost is the involvement with science, as demonstrated by his achievements in the nuclear weapons program. Other interests include music—choir, band, piano and organ (he was student conductor at Southwestern)—athletics (intramural basketball champion), mechanics (he still rebuilds and drives Model A's, a campus classic), and people (he was student counselor for the Dean of Men).

After graduation from Southwestern, Mr. Lenander attended Duke University graduate school. World War II interrupted the studies three hours short of a degree. During the war, he worked for the U.S. Navy Department, Bureau of Ordnance, in Washington, D.C. and San Francisco, designing degaussing equipment which protected naval vessels from magnetic mines. He became responsible for all degaussing stations on the west coast and Pacific Islands. During this time, he took classes at George Washington University and the University of California, accumulating 150 hours in electronics.

In 1946, he became involved with guided missile projects at the Navy's China Lake installation and was responsible for project engineering at the test station, including issuance of reports on projects, conclusions and recommendations. He received the Navy's outstanding service award.

Authors

J. G. Eberhart (1111), "The Critical Surface Tension of Uranium Dioxide," Vol. 25, 1968, pages 103-105, JOURNAL OF NUCLEAR MATERIALS.

M. J. Forrestal (5636), "Transient Response at the Boundary of a Cylindrical Cavity in an Elastic Medium," March issue, INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES.

Irving Auerbach (9326), "Irradiated Polyethylene III. Free Radical Formation," January issue, POLYMER.

He joined Sandia in 1949 as supervisor of a full-scale test division and participated in all of the nuclear test series conducted from 1951 through 1955. He was named manager of a full-scale test department in 1951 and held subsequent assignments in instrumentation development, electronic component development and electro-mechanical development.

In 1959, he was named director of Electromechanical Component Development; and in 1961, director of Systems Development with responsibilities for nuclear weapons development. In 1963, he moved to his present assignment, director of Manufacturing Development.

But Mr. Lenander does not measure success in terms of a series of titles. He feels to have been involved in the nuclear weapons program during the critical post World War II period is satisfaction enough.

"The fact that the United States had a nuclear arsenal of overwhelming magnitude gave the world the stability that it had during a period of very real threat," he says. "And the world has not changed much. There is less danger of using nuclear weapons now, but it is still vital that we maintain our country's strength. None of us want—we pray that the time will never come—to unleash nuclear weapons. The threat is enough of a deterrent."

Success to Mr. Lenander is measured more in human terms—the friends who have shared the work of exciting projects, the associations of professional organizations, the fellowship of St. Paul's Lutheran Church (he is a Deacon and vice-president of the congregation, and he has sung in the choir for 15 years), participation in fraternal organizations, and the service performed in community organizations such as Boy Scouts (he has been a cubmaster, scoutmaster, district committeeman and a member of the Kit Carson Council executive board). He served in the recent Girl Scout drive to improve the Chaparral Council's permanent camp facilities.

"Still," he says, "nothing is as important as my family."

Mr. Lenander has a son who is now studying at the University of Tennessee to become a dentist and a daughter taking a medical technology course at Pacific Lutheran University. Both are outstanding students.

During those moments when he has time for himself, Mr. Lenander plays a swinging organ—tunes from the "big band" era. He helps his son rebuild and restore Model A Fords, and he is an accomplished handyman—furniture, cabinets, patio additions and other woodworking projects.

For fun, there's nothing better than gathering a group around the piano or organ to sing the old songs.

"Rock 'n roll has got to go," he says.

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APRIL 19, 1968



FORMAL SECRETARIAL ORIENTATION PROGRAM established at Livermore Laboratory includes a tour of the computer facility. G. B. Drummond of Management Information Division 8115 explains computer operations to secretarial new hires (l to r) Pamela Robinson, Judith Reid, and Sherry Bowen (all 8242-1).

New Hire Secretarial Orientation Course Inaugurated at Livermore Lab

Secretaries at Livermore Laboratory are now receiving a comprehensive orientation course as they come on roll.

The course has been established to fill a need for a formal orientation program for secretaries before their first assignment.

The first class was held last month. Course instruction covers such subjects as the administrative policies and procedures with which a secretary must be familiar, secretarial duties with emphasis on handling classified documents, functions of the Laboratory's support groups, and orientation to total work environment. Office skills improvement and personal development are also included.

The secretarial orientation program is conducted by the Personnel Division 8212, with employment representative Evelyn Foote serving as course coordinator and instructor. Evelyn sees that the course work schedule is observed and all areas of job-related activities are covered. She serves as an instructor in secretarial tasks, such as preparation of time cards and attendance records and the handling of travel reservations and vouchers.

Commercial film strips, tape recordings, and other audio-visual aids augment and add variety to the orientation program.

Specialists from service groups such as document control, security, technical library and visitor control meet with the new secretaries and discuss their function and how it interacts with the line organization.

"One of the most interesting parts of the training program was touring the Lab's administrative areas," says Sherry Bowen (8242-1), one of the new hires. "Guidance by people who work in the areas helped us relate our secretarial jobs to the overall purpose of the Lab. It is a big bonus to know as much as possible about the place where you work."

"I was most impressed with the practical approach to our training. The people who spoke to us were frank and genuinely interested in answering our questions," comments Judy Reid, another new hire. "In addition to the paperwork, we were taught such basics as opening a safe lock, monitoring procedures, and procedures for hand-carrying documents. You are far more relaxed when you reach the job as a helper."

Pam Robinson, who also attended the first class, adds, "Classified procedures are

not so terrifying when presented by the program's system of creating dummy documents and handling them through all the required steps. Self-confidence grew after we sat with the division secretaries, watching our lessons fall into a pattern."

After completing the course, new employees are placed in helper-trainee positions at the division level. From the helper-trainee positions, the girls will bid on secretarial openings as they occur.

To evaluate the degree of success experienced in the course presentation and the amount of learning that has taken place on the part of each trainee, three measurements are being used: first, self-tests at the end of each instructional period; second, individual trainee evaluation by the course coordinator when the employee completes the course and before she transfers as a helper-trainee; and third, individual trainee evaluation by the supervisor for whom the trainee is working after she has been on the assignment.

"This evaluation provides feedback for improving the course," says Evelyn. "Deletions, additions and revisions can be expected until such time as the course satisfies our specific needs. Although the first orientation course required three weeks, realistic time limits can only be set after the course has been given several times.

Take Note

J. L. (Les) Rowe (8220) has been designated Elk of the Year for 1967-68 by members of the Livermore-Pleasanton Elks lodge. The award is part of the nationwide Elks program to honor one member whose activities during the previous year best exemplify the aims of the Order of Elks.

Manager of Information Systems Department 9230, H. H. Patterson, will revisit Livermore Laboratory as colloquium speaker on April 23. He returns to update his presentation made last year regarding the activities of Department 9230.

Further information about the colloquium will be posted on the Laboratory bulletin boards the week of April 15. Tickets are required for admission. A. N. Blackwell (8110) is serving as host for the colloquium.

Al Alford, supervisor of Manufacturing and Shop Liaison Section 8223-5, was guest speaker at the April meeting of the Rotary Club in Richmond, Calif. Title of his talk was "How the Public Gains from Government Research and Development," and included a showing of the films "The Sandia Story" and "Sandia Spinoff."

Artist Ben Aikin in One-Man Show at San Francisco Gallery

A one-man show by artist Ben Aikin of Technical Art Section 8233-2 is currently on display through May 13 at Galeria Carl van der Voort, 1 Jackson Place, San Francisco. Carl van der Voort has galleries in London, England, and Ibiza, Spain.

The show is open to the public and may be viewed from 11 a.m. until 6 p.m. daily except Sundays and Mondays.

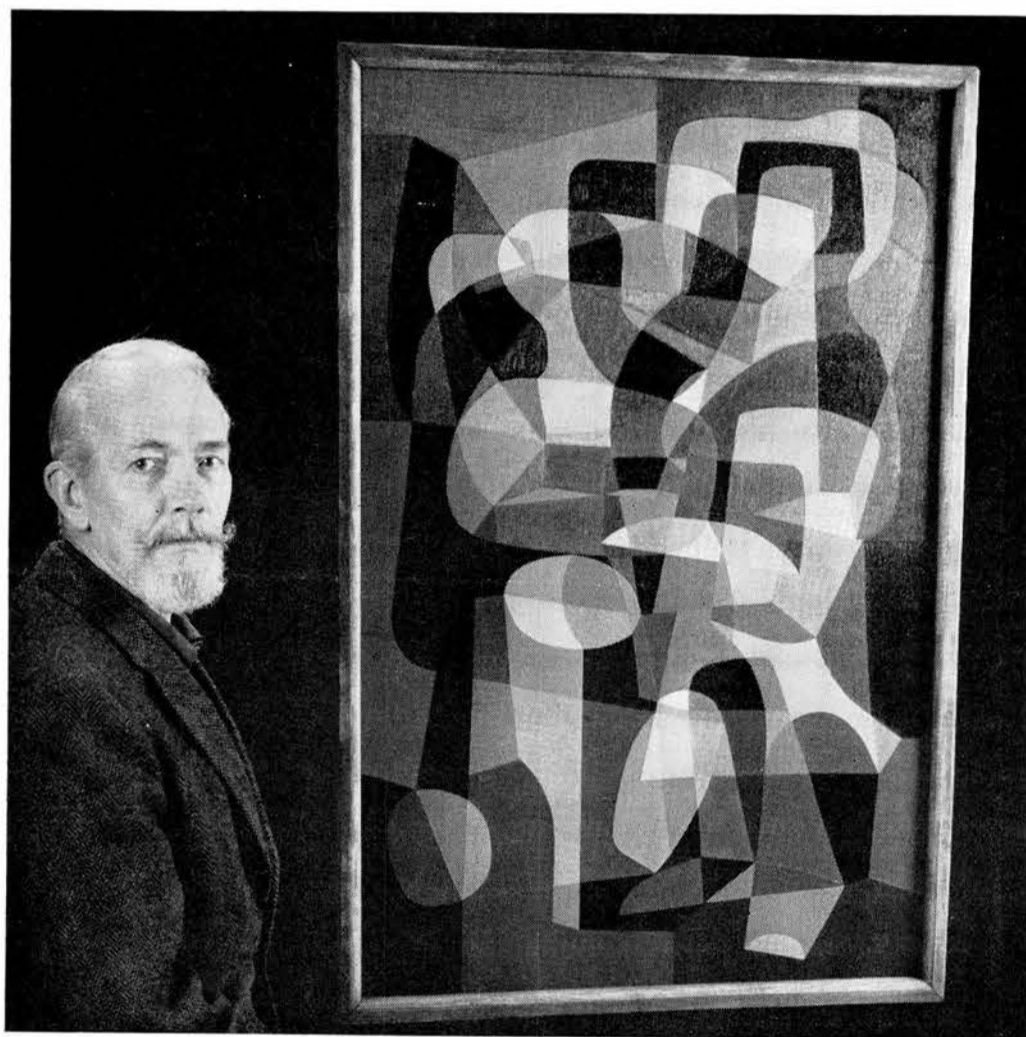
Nine large oils and several smaller works in gouache (opaque water colors) are included in the exhibit. All of the paintings are abstractions.

Ben studied at the Art Center School in Los Angeles. His works have been shown

in galleries and art museums in Decatur, Ill., St. Louis and San Diego, and locally with an art group called "The Wall."

Among his contributions to art in the Livermore Valley is a five- by eight-foot mural which he presented to the City of Livermore about four years ago. The mural, portraying the early history and life of the Livermore-Amador Valley during the rancho and mission era around 1830, hangs in the Civic Building.

Ben has been a technical artist at Livermore Laboratory since October 1959. Before joining Sandia, he worked in advertising design and illustration for various companies in Illinois and California.



"ENCOUNTER," most recent work of artist Ben Aikin of Technical Art Section 8233-2, is included in this one-man show at Galeria Carl van de Voort in San Francisco through May 13. Eight additional large oils and several smaller works in gouache are on exhibit.

Technology Briefing for Industrial Arts Teachers

Livermore Laboratory plans to conduct a day-long briefing in the latest industrial technology for about 75 high school and college industrial arts teachers on Saturday, April 27.

"The purpose of the briefing," says Les Rowe (8220), who initiated the undertaking, "is to acquaint the teachers with Sandia's advanced technology in various subject areas so that they can provide advice and vocational counsel to their students about current activities in industry."

The agenda—organized by Bill Jamieson, Matt Connors (both 8242) and Dr. Owen Harlan, coordinator of Vocational Education of the Alameda County School Department—includes lectures and laboratory demonstrations in drafting, electronics, graphic arts, machine shop, plastics and welding.

Teachers from 16 high schools and three colleges located throughout the East Bay Area are expected to attend.

Those making presentations include Tom Dadian and Ray Gott (both 8142); Bill Schmedding and Russ Richards (both 8223); Ralph Jaeger (8231); Joe McManus and Hugh Odell (both 8233); Bill McGuire, Mickey Rindone and Gene Lopp (all 8252); and Gordon Bjork (8253).

Special security arrangements are being made by Wes Hodges (8236-1).

Sympathy

To Jim Ackerman (8242-1) for the death of his mother-in-law in Oakland, April 2.

To Dorothy Fones (8252-5) for the death of her sister in Hayward, March 18.

To George Hosoda (8233-3) for the death of his father in Sacramento, March 31.

To Charles Romano (8243) for the death of his sister in Oakland, March 18.

Welcome . . . Newcomers

April 6 - 16

California	
Susan M. Cormier, Hayward	8243
Dorothy P. Hagen, Livermore	8215
Gail E. Patton, Livermore	8215
Richard W. Reynolds, San Francisco	8125
Transfers from Albuquerque	
Donald R. Adolphson	8142
Bruce R. Nevin	8119
Sherry L. Smith	8155

Bill Stalcup Buys Bonds

Bill Stalcup (4574) buys U. S. Savings Bonds. Bill is a janitor responsible for the training areas and conference rooms in Bldg. 892 and the areas in Bldg. 868 and 872. He takes care of them with pride.

Pride is basic with Bill. He's proud of the fact that he can perform a full day's work with a handicap (he was wounded as a forward artillery observer during World War II) and proud of the fact that a janitor can have a good life in this country.

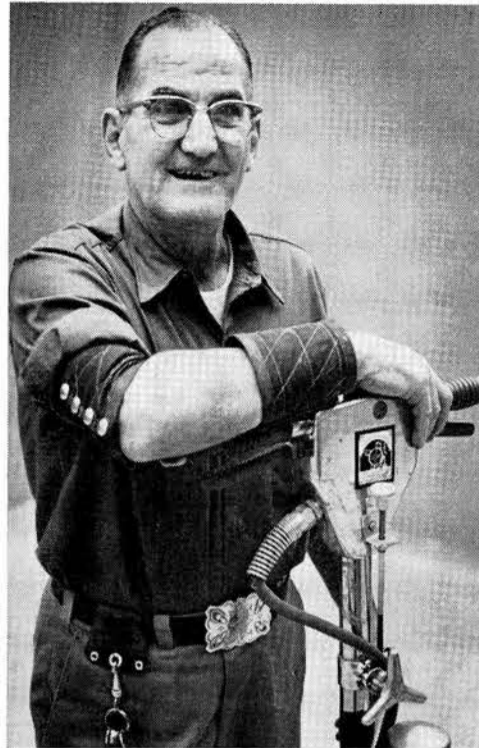
He buys bonds because he's proud of his country and proud of the boys "over there."

"I was over there during World War II," Bill says, "and I'd go again if it were my job to go. Those boys need all the help they can get so I buy bonds."

Bill bought bonds when he was in military service, when he worked for RCA, and now he buys them at Sandia. He's cashed them in when he needed money, but he's saving them for retirement now.

"Bonds are the best investment a guy can have when he's getting close to retirement," Bill says. "I'm going to start taking it easy in about three years and my bonds will come in mighty handy. They're wonderful savings, easy to accumulate as the paydays go by; and the first thing you know, you've got a nice little nest egg."

Bill figures that if he can afford to buy bonds, anybody can afford to buy bonds.



BILL STALCUP (4571)
"If I can afford Savings Bonds, then anybody can afford Savings Bonds."



AWARD OF MERIT presented by the American Society of Tool and Manufacturing Engineers to Gerald L. Morrisroe (2522), right, is admired by Robert W. Henderson, vice president 2000. The award was presented at a recent ASTME Region Seven annual meeting in Portland, Ore. It is presented to honor outstanding members who have substantially contributed to the activity, growth and prestige of their chapters and have assisted materially in the work of the organization's national committees. Gerry is national chairman of ASTME's Information Systems Subdivision and vice chairman of the group's Manufacturing Systems Division. He is past chairman and has held numerous offices in the Albuquerque Chapter.

Visit to Australia Renews Fondness for America

A month-long exploratory trip to Australia to investigate the feasibility of migrating there after retirement was a rewarding experience for Mel McCutchan (3112) and his wife during their recent vacation.

Some six months of planning went into the trip which included the major Australian cities, stops at the Fiji Islands and Tahiti and a visit to New Zealand. Aside from sightseeing, Mel also met with bankers, businessmen and business counselors to discuss the general economic climate.

Their first stop was Fiji where they participated in a village feast of watermelon, passion fruit, curried beef, wild rice, a variety of vegetables and roots, and fried bananas. The meal was prepared in the open but they ate in a large thatched meeting hall with a palm-leafed roof. To get a better insight into local life, the McCutchans rode buses to tour island sites and chat with natives.

When the plane came to a stop on the apron at Sydney, their first stop in Australia, a crew boarded the plane with equipment and proceeded to fumigate the interior before the passengers deplaned and went through customs. The McCutchans then flew on to Brisbane for the weekend. Because the stores and offices were closed, they spent considerable time just window shopping. Posted prices of articles were comparable to those in Albuquerque.

Following a two-day trip to Rockhampton, about 550 miles north of Brisbane, they returned to their favorite Australian city. Mel met with Brisbane businessmen

and bankers and then spent the remainder of a week exploring the city and surrounding areas.

Many of the houses are built on stilts to permit the breezes to waft under the floors as a form of air conditioning. However, the temperatures seldom exceed 86 degrees there.

The McCutchans were impressed with the Ausies' depth of friendliness to the United States. At a church service they attended, for example, the Australian flag was displayed on one side of the altar and the U.S. flag on the other side. They did encounter some oral communications problems, however, because of the Ausies' tendency to shorten words, such as "ther-den" for thirteen.

"Everyone seems brisk and full of enthusiasm," Mel reports. Maids and hotel workers talked freely about their ambitions. People they talked with indicated there is a great deal of emphasis on manual labor and less emphasis on intellectual pursuits like research. They also take pride in a one-class society, but there appeared to be a distinction between employees and employers.

"The employees' wages are set by a state tribunal. A laborer receives a weekly wage of \$32, a journeyman \$57 and an aircraft mechanic \$67. On the other hand, employers have a free market. They can make as much money as possible," Mel adds.

"Because of a money shortage, interest rates vary from about 7½ to 15 percent. The tax structure is also generally higher than ours. On a \$10,000 income, for ex-

ample, they must pay about 35 percent federal income tax. In addition, the six states also have comparable high real estate and sales taxes," Mel says.

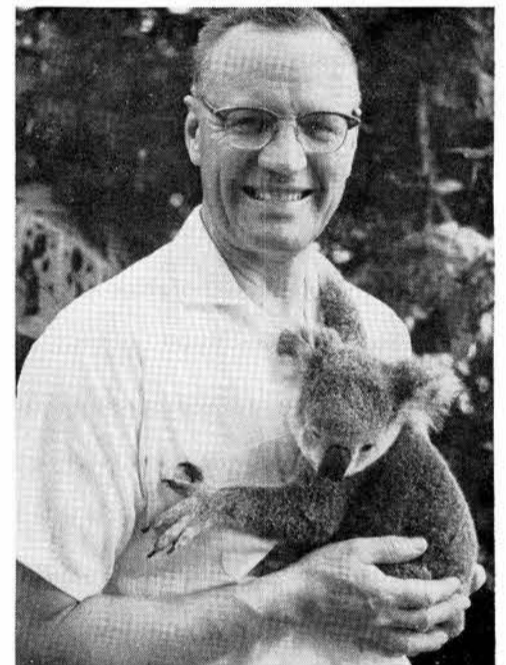
One local custom that intrigued Mel was the way men gathered in pubs to drink beer for about an hour after work. All of the men-only pubs were crowded with workers and the din could be heard over a block away. After the refreshing interlude, the men would head home to eat dinner.

The McCutchans then left Brisbane for Sydney, where from the air it looked like every house had a red-tile roof. After a four-day visit, they took a bus over the Snowy Mountains section of the Great Dividing Range, which extends along the east side of the country, into the area of vast sheep and cattle stations. There they saw great expanses of land, a little poorer than anticipated because of the present drought. Much of the land has been leached of minerals, they were told, but planes are being used to spread trace minerals for enriching the soil.

Following a tour of Canberra, the capitol and relatively new city with wide boulevards, the McCutchans went on to Melbourne for a four-day stay. There they visited with W. T. Moffat (7330), who had just arrived in Australia for a visit with his son.

The next port of call was North Island of New Zealand, which Mel believes has a climate like northern California. They were surprised to find nickel soft drinks and ice-cream cones, and 1937 vintage cars. The area is undergoing a generally depressed economic state because of Great Britain's cutback in its imports.

Mel and his wife like the Australians



SLEEPING KOALA BEAR was not disturbed by Mel McCutchan's visit to a wild life reserve near Brisbane. The marsupial sleeps about 18 hours a day and feeds on eucalyptus leaves at night.

and the country very much. They also enjoyed their vacation. However, they now view the United States with much greater appreciation, especially for its greater economic opportunities. Their long-range plans for retirement now center in the Southwest area of the U.S.

Mathematicians Write Textbook On Boundary Value Problems



MATHEMATICIANS L. F. Shampine (left) and P. B. Bailey (5321) check a copy of their new book "Nonlinear Two Point Boundary Value Problems."

Academic Press has just published a book, **NONLINEAR TWO POINT BOUNDARY VALUE PROBLEMS**, which was written by P. B. Bailey (5321), L. F. Shampine and P. E. Waltman. The book is in the publisher's Mathematics in Science and Engineering series of monographs and textbooks.

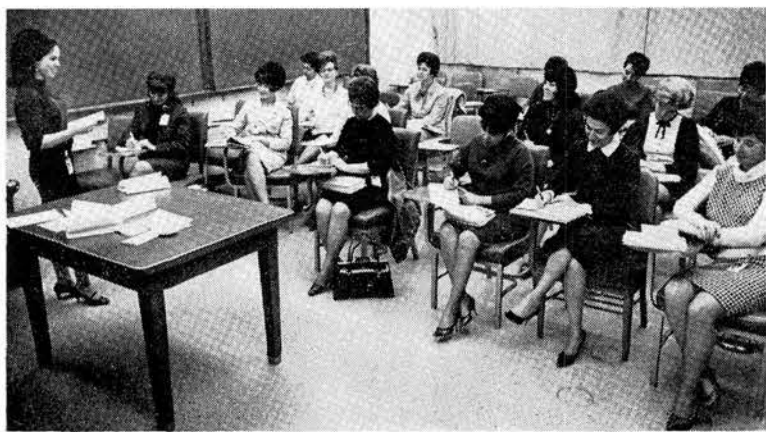
The authors present a number of methods helpful in the study of nonlinear boundary value problems for differential equations of the second order. The book shows how questions of existence and uniqueness of solutions of boundary value problems can be studied and also discusses how solutions can be computed.

The authors explained, "This is not a study of the subject in depth, nor is it written primarily for mathematicians. Instead, we hope it will be useful for those active in the sciences (with some knowledge of mathematics) who would like an introduction to the field."

Professor Shampine is on leave of absence from Sandia to teach at the University of New Mexico, and Professor Waltman was formerly employed by Sandia but is now with the University of Iowa.



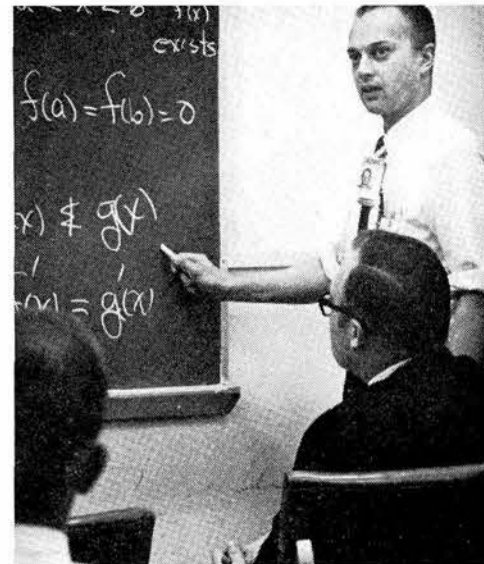
NAVAJO CHILDREN from the Aneth (Utah) Boarding School recently visited Sandia as part of a program designed to motivate the children for career opportunities. During their visit to the Sphere of Science, Mrs. Dorothy A. Cowboy (3126), left, described her job responsibilities in the Navajo language as many of the children did not understand English.



DICTATION for developing shorthand skills is a popular Out-of-Hours course. Marcella S. Luna (3126), left, is the instructor.



SCIENTIFIC-TECHNICAL RUSSIAN course offers students practice in translating Russian language. M. I. Weinreich (3421) is instructor.



MATH REVIEW for engineers is one of the 99 courses offered. J. L. Todd (1314) is the instructor.

12 O'Clock Scholars

Learn During Lunch Hours

Over 15,000 enrollments during the last five years attest to Sandia employees' interest in learning during their free time. It also underscores the effectiveness of the Laboratory's Out-of-Hours educational program, one of the best of its type in the country.

The noon-hour scene shows many Lab employees carrying textbooks as they hurry from their work site to a classroom. They are engineers, secretaries, scientists, clerks, technicians, messengers, supervisors and craftsmen. Most are "lunch-hour" students. Some are instructors. All benefit from the program.

During any given semester, about one-quarter of the Laboratory employees are taking educational work on their own time. Currently there are 2109 enrollments in a total of 99 courses, consisting of 176 classes each week. Seventy-two courses are given during the lunch hour and the remainder after working hours. They are on the university, technical institute, trades and clerical levels.

Speaking at a meeting in Princeton, N.J., last year, a Western Electric personnel executive stated that as far as he could determine Sandia has the best overall (industrial) educational system in the United States. He went on to say that during a visit to the Laboratory the previous year he witnessed "... a most startling exhibition. Hundreds of people crisscrossing between buildings and filling every available classroom and conference room for 40-minute class sessions. Bag lunches were consumed while listening and taking notes. ..."

Employee participation, quality of instruction and the resulting dissemination of knowledge are measures of the program's success.

High Level of Participation

Current enrollment in the program includes 533 staff members technical, or about 34 percent of all technical staff members here at the Laboratory; 358 staff assistants; and 83 technical supervisors. About 130 are taking two courses and 11 are taking three courses.

The best attended courses, with about 1051 enrollments, are non-credit universi-

ty-level courses. Employee participation has been high in these courses since 1964 when they were changed from basic refresher courses toward more emphasis on training in recent technical developments. At that time, the courses were carefully analyzed and redesigned to assist employees in keeping pace with technical advancements.

Students have expressed several reasons on critique sheets for the high level of participation: "the knowledge gained is directly applicable to the job," "the instruction is consistently excellent," "taking out-of-hours courses is a very convenient way to keep up with or catch up with fast-changing technology," and "taking courses is intellectually stimulating."

High participation also indicates that employees feel Sandia's mission requires their continued educational development, and they are willing to devote their free time to self improvement.

Sandia Instructors

The 103 "faculty" members' credentials compare favorably with any educational institution. For example, of the 48 instructors teaching university-level courses, 22 have PhD degrees and 14 have Master's. Most have had previous experience in teaching and all are experts in their areas.

Many instructors, who are also employees, feel that the Out-of-Hours program offers a convenient opportunity for teaching, which they consider an important part of their self-development program. The program serves as an outlet for the talents of many experienced instructors and a proving ground for neophyte instructors.

Instructors plan the course content with the help of Employee Training and Education Division 3132. The educational staff surveys Laboratory needs, schedules classes, arranges for facilities and textbooks, and maintains liaison with instructors.

Division 3132 personnel under Earl H. Wilson continually evaluate the results of the program in terms of Sandia's needs, course effectiveness and future requirements. To inject new thinking into program planning, a newly-organized committee made up of representatives of three

different personnel groups is currently analyzing all facets of the program. Committee members are R. E. Day (3132), W. N. Dehon (3131) and D. L. Hughes (3134).

Program Objectives

Goal of the broad training program at Sandia has always been to maintain a flexible program designed to meet the changing needs of the Laboratory. The education concept that evolved as a result of this emphasis provides not only for maintaining technical competence now but also for planning against future obsolescence of employee's knowledge and skills. It has stressed educational opportunities that will maintain a dynamic research and development laboratory.

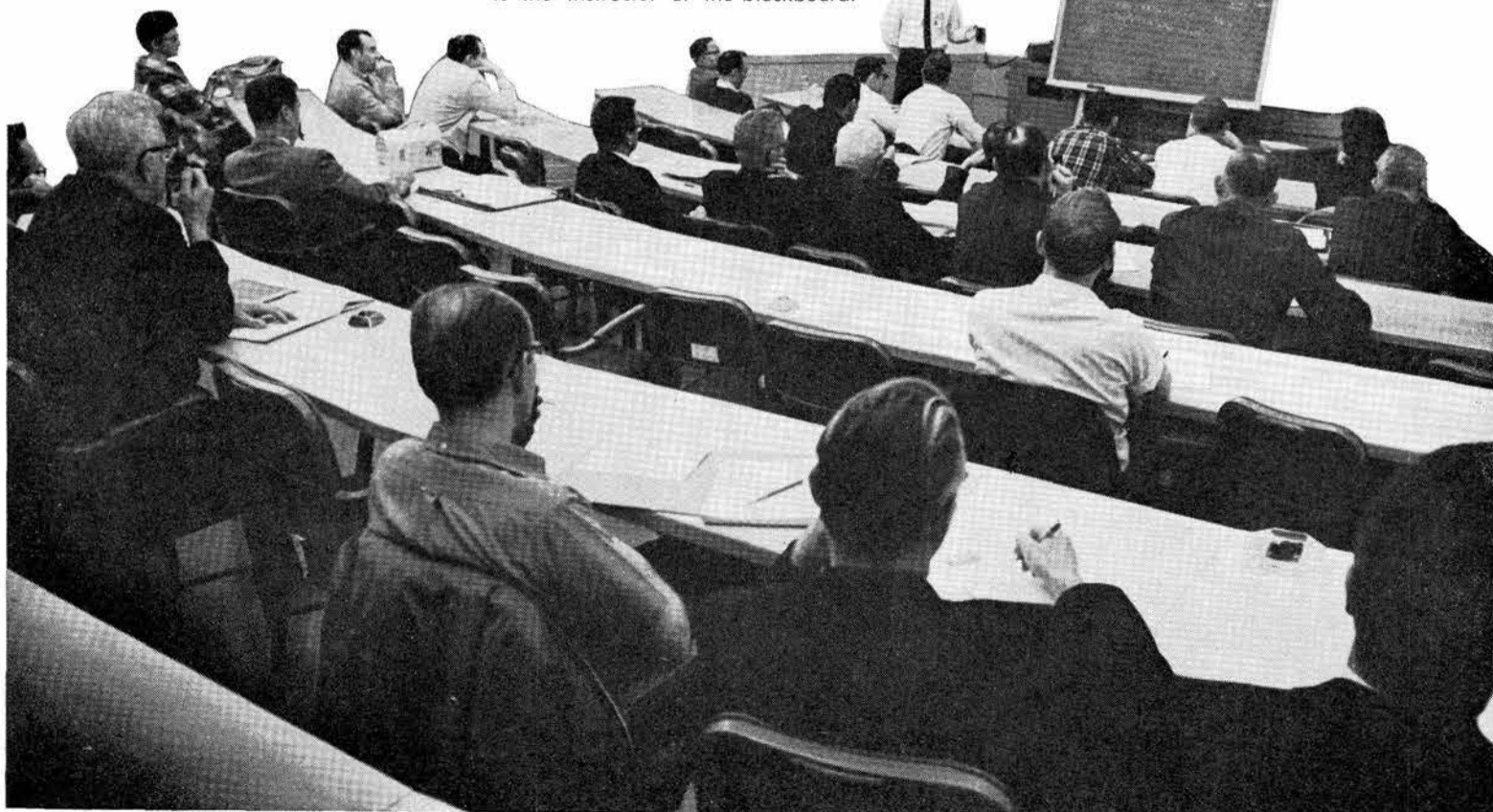
A series of non-credit lectures was started last year as part of the Out-of-Hours educational program. Because of their popularity, the lectures on most recent developments in science and engineering have become a regular part of the curriculum.

The 48 different university-level courses currently being offered include such subjects as metals at elevated temperatures, vectorial mechanics, antenna theory and survey of oceanography. Technical institute courses, numbering 20, include dynamics, metallurgy, hydraulics and thermal physics. In addition, 31 trades and clerical courses are offered.

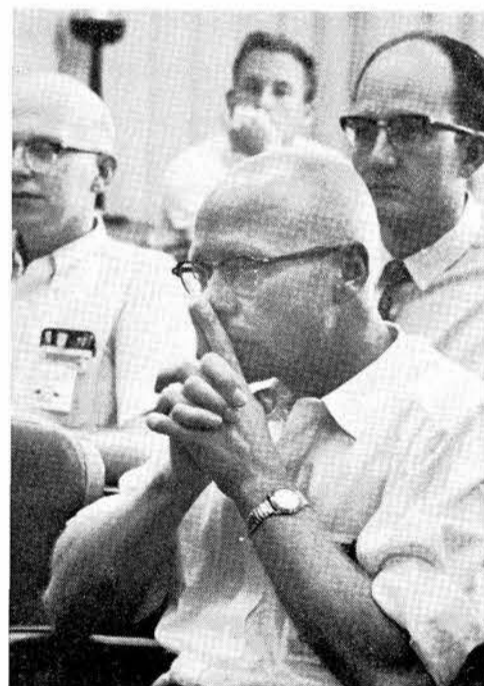
The Out-of-Hours program was started in the fall of 1955, with 12 students completing courses. In the spring of 1958, employees were encouraged to enroll in these courses as a way of preparing themselves for future assignments. The program was also expanded to include 26 different courses. A total of 550 employees participated and there were 1665 enrollments. Thus, each participant completed an average of 1.76 courses. The program has continued to grow since then.

All courses offered in the Out-of-Hours program are evaluated against cost and need. The courses must be related to Sandia's activities and necessary to the employee's development. No general or hobby courses are offered.

BASIC COMPUTER PRINCIPLES is the subject of this group's attention during the noon hour. J. H. Spitzer (9426) is the instructor at the blackboard.



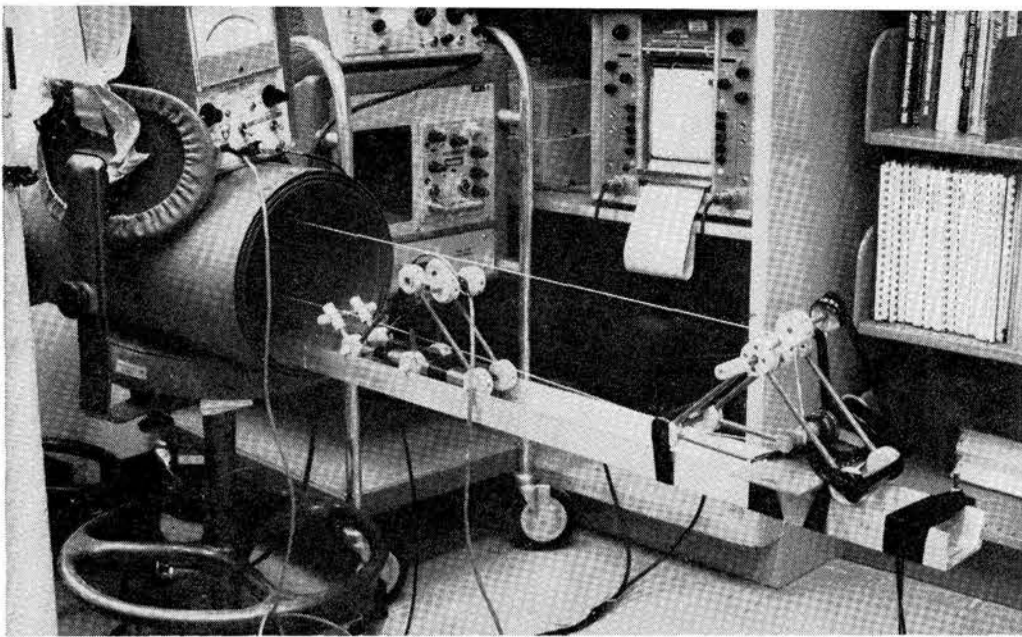
"LUNCH-HOUR" STUDENTS listen intently to the instructor in a class on stress wave propagation. Left to right are A. W. Battaglia (1316), D.S. Mason (1142) and P. P. Stirbis (1548).



FORTY-MINUTE class sessions usually demonstrate the employees' eagerness to learn. The attentive student in the foreground is David Overmier (7122).



SUPPLEMENTAL INSTRUCTION is provided by E. L. Jacobs (1414), right, as part of a programmed self-instruction course.



TINKER TOY PARTS, an aluminum channel, nylon cord, a small DC motor, and a sensor made up an assembly to obtain readings of remnants of the earth's magnetic influence inside a magnetic shield system. The off-beat rig saved time, money and functioned perfectly.

Tinker Toys to the Rescue

Jokes and Jibes Notwithstanding, Simple Approach Sometimes Best

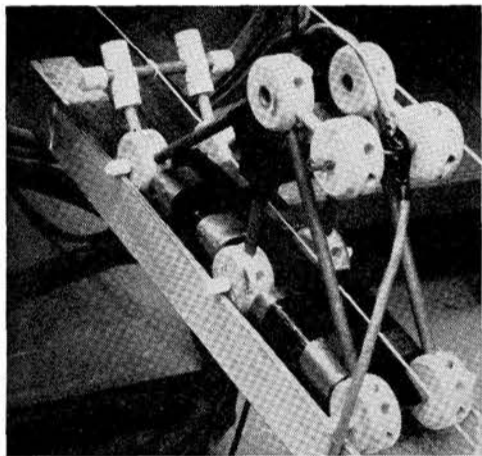
"He's flipped!" said the scientists as they peered into the laboratory. There amid the usual maze of instrument panels, wires, and tubes were the green, blue, yellow and red parts of a Tinker Toy set assembled for a "test run." There sat Jack Burkhardt understandably smug about the whole thing.

Jack, who is a staff aide in Radiation Division I 7112, figured he had just saved at least 20 hours of fabrication time—and this was a rush job. In addition, there was a saving in materials cost and drafting time, and the device worked perfectly.

The experiment required the measurement of remnants of the earth's magnetic influence inside a specially-built magnetic shield system. A magnetometer would make the readings as a small fluxgate sensing device was moved through the six-foot-long shield.

That sounded simple enough, but there were restrictions. The sensor had to be aligned to repeatedly track along the center line of the pipe. There could be no twisting or turning. No ferrous metals could be used. The movement had to be smooth and at a relatively slow speed, about a half minute to traverse the six feet through the pipe.

"A wheeled carriage assembly appeared to be the logical answer," Jack says. "I remembered there were parts of a Tinker Toy set in one of the nearby labs (they make fine portable isolation chambers for lab tests), so I used the parts to make a three-wheeled assembly and tried it out. It



TINY SENSING DEVICE was carried on this contraption, and was moved through a six-foot-long magnetic shield system.

didn't work at all. It had a tendency to climb the walls of the pipe, changing the orientation of the probe.

"After that I didn't have a clear idea of what I wanted. I started moving the wheels and straight parts around and by the time I had a workable idea, the part was already made. There was no need to have it fabricated."

The "design and manufacture" time was one hour. The device to hold the sensor consisted of a superstructure of wheels, blocks and straight sticks which moved along an aluminum channel track. Ends of the cross sticks were covered with shrink tubing lubricated with silicon grease. This was the bearing surface. Movement was initiated by means of a nylon cord "cable," driven by a governor-controlled DC motor.

About 50 test runs were made through the shield system, and there was virtually no variation between results of the first test and the last. There was a leak at a joint that allowed magnetic flux to enter the chamber. The future design of such a system would require a change. The experiment was over. The Tinker Toy parts were returned to their box. Things are pretty drab around the lab without those bright colors.

New 3310 Radiation Safety Lab Planned

The Atomic Energy Commission opened contractors' bids March 14 for construction of a radiation safety and surveillance laboratory for Sandia's Environmental Health Department 3310.

To be located south of Bldg. 892, the new laboratory, designated Bldg. 869, will require one year of construction time. It will contain 14,500 square feet and will include a full basement. Laboratory and office space will be provided for the department's 38 employees.

Activities of the department will be consolidated in the new building and equipment from Bldgs. 829, 830 and 857 will be relocated.

Unusual features of the new building include a novel window treatment which will eliminate use of interior shades. For the technical activity of the department, the building's design will provide for downdraft hoods for the chemical labs in the basement which will exhaust into a common plenum and then out a single tall stack. Glass plumbing will be used for visual inspection of the chemical drains.

An installation on the roof will provide power outlets and facilities for the department's air sampling activities.

Shielded areas in the basement will be provided to receive radioactive materials for examination, analysis and storage. Also included will be an "iron" room for detection of very low-levels of radiation. It will be built from surplus steel from the U.S.S. Franklin now being dismantled.

Other areas will be provided for field sampling equipment assembly and calibration, bacteriological laboratories, toxicology labs, a complete film dosimetry laboratory and records storage.

Frank Scheer (4543) is the Plant Engineering Department project engineer for the new building.



NEW SANDIA EXHIBIT at the Albuquerque Sunport features rolamite, an almost frictionless device that was invented at the Laboratory. Mrs. Jean Gates (4518) examines the exhibit that was installed in the terminal building recently. It was designed by R. H. McHarney (3463-3) and built by Community Relations Division 3433. It will remain on display for about three months.

High Country Springtime Snow Camp Has Merits -- No Litterbugs Around

When the days get long and the snow at lower elevations turns to mud, do the skiers give up? Nope, they start debating the merits of snowshoes over skis for tracking into the wilderness.

That's why the last week-end in March engineers Bill Fulcher and John Davenport (both 1344) headed for the high country above Santa Fe ski basin—that and the fact they both enjoy the beauty of undisturbed snow fields.

Considerable planning preceded the trip. They compared the merits of various types of food, stoves and sleeping bags, but the real slide-rule activity began when it came to selecting tents suitable for high altitude use. As might be expected, each firm's product had good points and bad. They decided the only answer was to design and make their own one-man tents.

The two engineers ordered the special material and thread, read a book on how to operate a sewing machine, and took over the Fulcher living room for a couple of weeks. John proved to be the best seamster. Each tent, complete with snow pegs, sectional aluminum frame poles, and carrying bag weighs less than four pounds.

Bill and John decided upon the Windsor trail into the Pecos Wilderness because they had hiked on it several times during the summer. As it happened, the still-deep snow covered streams and other landmarks and they had great difficulty in even finding the marked trail.

They covered about three and a half miles before reaching a suitable camp site. It was rough going. A storm was moving in but fortunately it didn't last long. The skis were hard to maneuver in areas where the forest was dense. The snowshoes were especially difficult to use on a lateral traverse across a steep hillside. Each man was carrying a 45-pound pack at 10,000-

10,800-foot altitude.

Their estimate that it would take twice as long as in the summer to cover the distance and set up camp proved to be correct. Forays out from camp were made to gather dry wood for the open fire over which they were melting snow. A tiny butane cartridge stove (of the type used by the American expedition on Mount Everest) was used for cooking. Bill explained its advantages. "We could control the heat, no ashes fell in the food, and there wasn't the problem of scouring soot off the bottom of cooking utensils."

Snowshoes had to be worn in moving around the camp; without them the men sank hip deep into the snow. Dinner was delicious: steak, hash browned potatoes, and butterscotch pudding. All come freeze dried.

After dinner they took turns snowshoeing around a nearby level area. As they moved, large slabs of wind-packed snow broke off and settled. Both Bill and John are members of the Ski Patrol and they recognized this condition as a potential slab avalanche if there was any grade to the slope.

The men went to bed before sunset, but not before hanging a thermometer outside one of the tents. At 2:30 a.m. the mercury was at the 36° mark, at 5:30 a.m. the temperature had dropped to 20°.

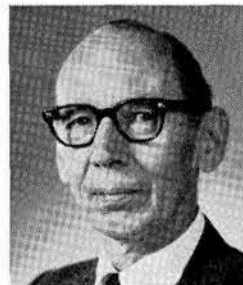
In the morning, the snow was hard as concrete which made breaking camp easier. They switched equipment and started back. The check-out trip had proved that camping in the snow could be enjoyable with the proper equipment and that the big problem was cold temperatures rather than the amount or kind of snow. They were also convinced that skis were more versatile than snowshoes on all terrain and varying snow conditions, at least in the Spring. They're ready to try it again.



EARLY SPRING TREK into the Pecos Wilderness found John Davenport (1344) plodding away on snowshoes. It was easier going for Bill Fulcher (1344) with cross-country skis and climbing "skins." Both carried 45-pound packs for the overnight trip.



Retiring



Edward P. Hutson, supervisor of Records Control Section 4623-1, will retire April 30 after 18 years with Sandia. He joined the Laboratory in May 1950 in a supervisory capacity in the Security organization, and transferred to his current position in June 1960. During World War II he served three and a half years in the Navy, and before his employment at Sandia had worked in the coal industry in Chicago and Minneapolis.

"I decided a number of years ago," Mr. Hutson says, "that I would retire at age 62. However, with Sandia's improved retirement plan, I've been able to move that date up a couple of years."

Mr. and Mrs. Hutson will retire to the Highland Lakes area, about 60 miles from Austin, Texas. They have made a number of trips to the area in the past two years and will eventually purchase a house there. Among the attractions of this lake and hill country for the Hutsons are fishing, hunting and gardening.



LUSH GREEN PATIO of the Coronado Club awaits opening of the Club's twin pools May 30. Among the many permanent improvements is momentary Deanna Rawlinson (5633) who is enjoying the pre-season patio sunshine.

Club Patio-Swimming Area Sees Improvements; Boat Show Next Week

Springtime at the Coronado Club means patio and swimming area renovations. Workmen are putting the finishing touches on a number of improvements anticipating the pool opening date of May 30.

The Club's patio, expanded last year, is a thing of beauty—the grass is green and lush, the trees are trimmed, furniture is painted, new walks and other concrete have been installed, and the expanded snack bar area is complete.

Paint on the twin pools is being sand-blasted and a new non-slip white marble plaster is being applied. The non-skid stuff will also cover walks around the pools.

The dressing rooms are being renovated, and a completely new check room for clothing has been added. An attendant will be on duty in the check room during pool hours.

Jim Kelly (3112), board member responsible for swimming, reports a full program is planned for the summer and facilities will be first rate. Mark the calendar now. May 30 is opening day for the pools and an all-day party is planned.

Noon Boat Show

A special boat show for Coronado Club luncheon patrons is scheduled during the noon hours Monday, Tuesday and Wednesday of next week. In addition to a selection of boats (all the way from sport jobs to cabin cruisers), a group of campers will be on display. The equipment, courtesy of Cardinal Marine and Sports, will be available for inspection and personnel will be on hand to answer questions. The idea is to have a good lunch at the Club and then browse through the display area in the parking lot.

Social Hours

Tonight, the Club's famous southern fried chicken buffet will be the feature of social hour. The buffet costs \$1.25 for members, \$1 for kids. Phil Graham will be on the bandstand while Pat Reich and piano will entertain in the main lounge.

On Friday, April 26, the Rhythm Masters will make the happy music while the hearty chuckwagon beef buffet will be spread. The buffet costs \$1.75 for adults, \$1.25 for children.

The Aristocrats will serenade Friday, May 3, while the sea food buffet is featured. Pat Reich will entertain in the main lounge.

Bridge

Duplicate bridge meets Monday, April 22 at 7 p.m. The monthly master point competition will be held Monday, April 29, at 7 p.m. Ladies bridge meets Thursday, May 2, at 1:15 p.m.

Nat'l Library Week April 21-27

National Library Week has been proclaimed for April 21-27. On the state-level, Calla Ann Crepin (3421) is serving as executive director and John Gardner (also 3421) is public relations director for the observance.

At Sandia Laboratory, John is gathering material for a display in Bldg. 804 to depict the wide range of general science journals available. Posters and mobiles promoting National Library Week will also be placed in the building.

Sandia Safety Signals

Yard Chemicals

Spring is the time for spraying the yard and garden. Most pesticides are poisonous to humans and can cause illness and death if improperly used. Never transfer them to unlabeled containers. Follow directions on labels and never inhale the dust or vapors. Skin contact should be avoided.

Never Rely on a Traffic Light

Intersections are dangerous because a lot of complex traffic movement is crowded into a small area. You cannot depend on the other fellow to observe common courtesy and traffic regulations.

Jackrabbit Starts

Fast acceleration to move your car uses more gas, and every time you hit the brake you're using gas. So if you want fuel economy, try to time your driving with the traffic lights.



BARBARA CHEEK of the Coronado Club's office staff invites you to a boat and camper trailer show in the Club's parking lot during the noon hours Monday, Tuesday and Wednesday of next week.

Take Note

Winning pair of the recent National Industrial Recreation Association sponsored duplicate bridge tournament held at Sandia Laboratory was Mr. and Mrs. R. W. Mottern (7332). Their score will be in competition with winners of other regional contests. Winners will compete in the national playoffs, and the champions will be awarded an expense-paid Caribbean cruise. Fifty-four members of the Sandia Employees Bridge Association participated in the tourney.

Twenty Sandians will participate in a Test Equipment Symposium at Sandia Laboratory April 23-24 for representatives of agencies throughout the Atomic Energy Commission complex.

The theme for the two-day symposium centers on exchanging experiences on today's problems related to test equipment.

W. J. Howard, vice president 1000, will deliver the keynote address and R. W. Henderson, vice president 2000, will conduct a special session for symposium speakers and out-of-town attendees. L. J. Paddison, director of Product Test Equipment Development 2400, will deliver the closing remarks.

Other Sandians participating in the program are R. W. Roberts (2452), G. Carli (2442), J. R. Holpp (2115), G. L. Morrisroe (2522), L. B. Hobbs (1415), C. R. Alls (1426), J. A. Southwick (2412), A. C. Littleford (2444), W. W. Westman (2114), L. M. Spivey (8138), D. R. Deathrage (2452), K. S. Davis (2442), J. S. Maxon (2414), C. L. Johnson (2443), G. H. Donaldson (2453) and H. G. Jeblick (2491).

Sandians interested in attending the sessions may make arrangements by contacting A. C. Littleford tel. 264-3934.

The regularly-scheduled evening of poetry readings, sponsored by the UNM English Department, will feature the works of John Gardner (3421-1) and Professor Warren Wagar (UNM) on April 26 at 7:30 p.m. The location on campus is still to be announced.

Mrs. Bertha Allen, supervisor of Technical Libraries Division 3421, has been invited to participate in a program for Indiana University and Indiana State University library science classes at Indianapolis on April 25.

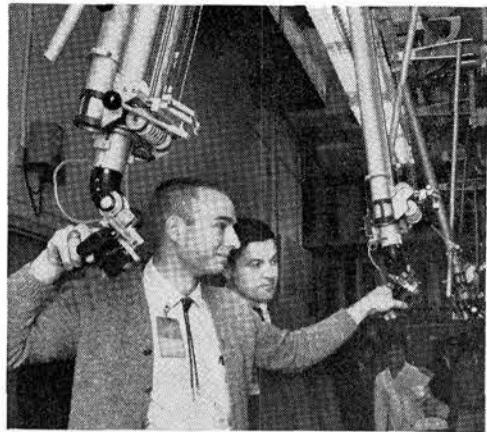
Purpose of the day-long program is to acquaint students with library services, facilities, and operations within the Bell System.

Presentations will be made by W. H. Fisher, head librarian, Western Electric Engineering Research Center, Princeton, N.J., and F. H. Spaulding, head of library technical processes, Bell Telephone Laboratories, Holmdel, N.J., as well as by Mrs. Allen. Members of the Indiana Chapter, Special Libraries Association, will use slides to depict "Putting Knowledge to Work in Indiana Special Libraries."

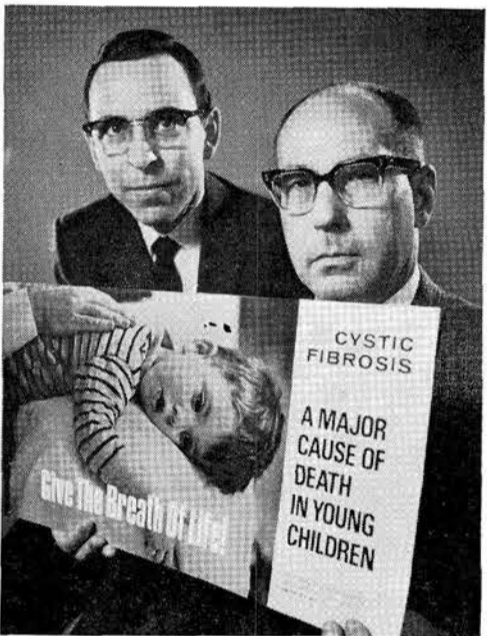
Welcome . . . Newcomers

April 1 - 12	
Albuquerque	
David A. Archuleta	4631
Amadeo C. Carter	3415
Alice M. Doriguzzi	3121
Roy E. Smith	4574
Idaho	
*R. Neil Horton, Boise	9413
New Jersey	
Stephen M. Petty, Bellmawr	9422
Washington	
Frank C. Perry, Mercer	7113

* Denotes rehired



HEALTH PHYSICS graduate students from the University of Oklahoma toured Sandia's reactor facilities and health physics labs recently. Professor R. Y. Nelson (right) watches as one of his students, George Kaye, a former Sandia summer hire, operates a remote handling apparatus.



SANDIANS WHO SERVE—Newly-elected officers of the New Mexico Cystic Fibrosis Association include E. H. Gallegos (4137), left, treasurer; and W. D. Ulrich (1511), president.



Nettie Beth Schrock (5121)

Take a Memo, Please

Buying Savings Bonds is investing in your country, and this country is worth investing in.