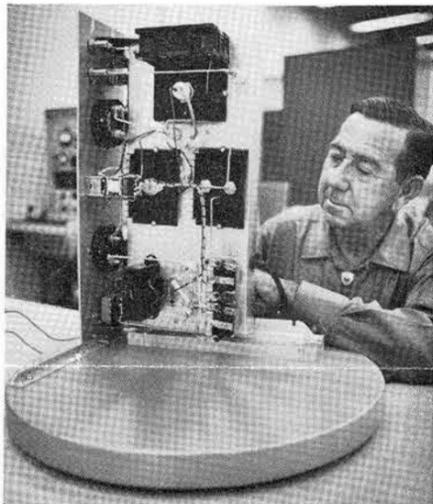


A. P. CLOW, Vice President, Western Electric Company; C. W. Campbell, Vice President 4000; and T. B. Cook, Vice President 8000 (l to r) are shown during a recent Sandia Board of Directors meeting at Livermore. More photos on page three.

D. H. Rushing Devises 'Special Gadget' -- Makes Inspection Work Easier

D. H. Rushing, an electronic inspector in Electrical and Electronics Section 4213-3, has devised a little gadget that makes the work of the group a lot easier.



D. H. RUSHING (4213) displays the device he designed which serves as a rotating work table for checking electronic chassis. The device spins around like a lazy susan, allowing quick access to different sides.

The device resembles a "lazy susan" or rotating serving dish, and its purpose is about the same. Mr. Rushing attaches the electronic chassis with its components to be inspected to the rotating disc of the device. Then he can work either side of the chassis by simply turning the wheel.

"It makes the work go a lot faster," he says. "Before we had the spinning table, we had to wrestle with the chassis and move around the work bench quite a bit to check the performance of the components. Now, it's not only faster but I think we do a better job."

Five of the units have been built for the Section. The group inspects all electronic equipment fabricated by outside suppliers for proper wiring, soldering, and performance, and inclusion of correct components; they then insure that the entire assembly meets Sandia specifications.

Mr. Rushing has been at Sandia 17 years, primarily working in electronic inspection. He has a reputation for building special devices for special jobs. He has devised a piece of equipment to aid in checking of printed circuit connections, designed a unique transformer checkout unit, and modified several existing instruments to perform special functions.

Terramechanics, Sandia Originated, Added to College Curriculum

A few years ago, W. N. Caudle (9327) and members of his division pioneered a field of study dealing with the interaction of earth material formations and penetrating vehicles or projectiles. Bill coined the term "terradyamics" to describe the new science.

Two weeks ago, Bill and three other Sandians participated in the unveiling of what could be termed "academic spinoff" of the science they originated. Bill, along with Vice President G. A. Fowler (9000), Aerothermodynamics Director Alan Y. Pope (9300) and Bill Myre (1210), head of Exploratory Systems Department I, attended the dedication of a Terramechanics Laboratory, part of the Research Annex of Texas A&M at College Station.

The new facility, complete with a terramechanics curriculum, is a direct outgrowth of the earth penetration science originated at Sandia. Texas A&M took part in early work done in the field and is currently doing research in terradyamics for Sandia.

After the dedication, Mr. Fowler described the function and history of Sandia at a faculty-student colloquium; he also discussed Sandia's continuing education programs for employees. A film on Sandia's terradyamics program was shown.

The group toured the facilities of the Research Annex, located on what had been Bryan Air Force Base, outside of College Station.

Doctoral Study Program

Open to New Applicants

The Doctoral Study Program (DSP), initiated at Sandia Laboratories in the fall of 1967 to complement other educational programs, is now open to new applicants. Fourteen Sandia employees are attending universities at present under the DSP. A number of additional employees will be selected to continue or start their doctoral studies under DSP in the fall of 1969.

The program enables employees to remain on roll, at reduced salary, for the length of time required to obtain their doctorates. Persons to be considered for this program should be MS-level employees of exceptional merit and ability whose personal characteristics, past job performance, and academic history indicate high promise in Sandia work at the doctoral level.

The applicant must:

a. Obtain written nomination from the director of the organization having a posi-

tion in which there is a need for the advanced degree;

b. Document admissibility to the university of choice and a proposed plan of study; and

c. Prepare a description of the proposed area of thesis research.

The fact that a candidate was not earlier selected for the 1968 program is not a factor, and such candidates may reapply. However, re-nomination by director is required.

Application materials and additional information may be obtained from D. J. Hosterman (3134), tel. 264-6644, or from J. A. Smith (8214), Livermore ext. 2251. The DSP is more fully described in SCI 4558.

All candidate nominations should be directed to the Education Committee through Division 3134. Nominations should be made as soon as possible to ensure availability of all required documents and information by Jan. 1, 1969.

In Plant Maintenance Area

Sandia Adopts Five-Year Apprenticeship Program

Sandia Laboratories and the Metal Trades Council signed Oct. 16 an agreement establishing a new apprenticeship program in the Plant Maintenance area. Hailed as a major step by both management and union officials, the apprenticeship program establishes a new five-year training program affecting some 30 occupations in Plant Maintenance Department 4510 and offers an opportunity for participation to 167 on-roll employees.

Graduates of the program will be classified as plant technicians in five major areas of specialization. These are (1) electrical, (2) mechanical-pipe fitter, (3) mechanical-refrigeration, (4) structural-carpentry, and (5) structural-millwright.

The agreement establishes the journeyman-apprentice concept in the plant maintenance area instead of a classification system with multiple grades and categories. Employees in the program will have the opportunity to gain advanced technical skills and broader craftsmanship.

The bulk of the training will be conducted on the job in "learn-by-doing" sessions augmented by formal classroom work both on the job and out of hours.

As with the apprenticeship programs in the Development Shops for machinists and electronic technicians, the plant technician apprenticeship program will be administered by a joint Sandia-Metal Trades Council committee.

Prior to the start of the formal program in January 1969, three special committees will assist in the placement of the parti-

cipating employees at their qualified levels within the programs.

Members of the committee for the electrical program are W. B. MacDowell (4513), E. M. Vanvickle (4511), W. C. Elskes (4511), and R. R. Boyd (4512).

The structural program is the responsibility of R. G. Carlisle (4512), G. M. Haycock (4518), W. H. Martin (4512) and J. M. Winter (4513).

The mechanical program committee is H. A. Neuhaus (4518), A. T. Trujillo (4512), L. D. Chapman (4518) and C. S. Sandoval (4514).

These committees served as consultants during negotiations on the apprenticeship plan and prepared detailed listings of plant maintenance functions and the skills required. R. W. Clark (3220) and W. H. Trump (3132) worked in the development of the programs with these committees.

Technical Training and Education Division 3132 is assisting in preparing the content of future training classes. The formal training needed will be tailored for the on-roll employees who are accepted into the apprenticeship program.

Hiring of new employees for the program is not planned at the present time.

R. D. Flaxbart, manager of Plant Maintenance Department 4510, calls the new apprenticeship program the fulfillment of a longfelt need for a training program to assure availability of qualified personnel.

"The program will offer this group of employees a company-sponsored oppor-

(Continued on Page Eight)



SIGNING AN AGREEMENT which establishes a new five-year apprenticeship training program at Sandia are company and Metal Trades Council officials. In the first row (l to r) are R. E. Hopper, director of Plant Engineering and Maintenance 4500; E. C. Peterson, manager of Labor Relations Department 3220; and J. E. Young Jr. (4253), Metal Trades Council President. Standing are R. D. Flaxbart, manager of Plant Maintenance Department 4510; M. W. Alexander (4232), Metal Trades Council Secretary-Treasurer; and H. R. Messenger (4213), Metal Trades Council Vice President.



ISLAND BOUND, to Johnston Island in the Pacific, these Sandians prepare to cast their ballot at the County Court House. They'll be gone over the election day period. Left to right, discussing the ballot are James Reid, Lee Bossart, Ren Moore and Donald Kuehl, all of 9221, and Lucy Jaramillo, County Clerk.

Editorial Comment

Your Vote Could Be Decisive--

American voters going to the polls on Election Day, Nov. 5, will be doing more than deciding who will become the 37th President of the United States. They will also be choosing the occupants of all 435 seats in the House of Representatives, 34 Senate seats and 21 governorships. In New Mexico, voters will be electing two of these Representatives and a Governor, and deciding a number of other important issues.

In many ways these contests are as vital as the Presidential race itself. The composition of the next Congress will help shape the policies of the new Administration, and the wins or losses of the parties in the state contests cannot help but affect national policies. Many of these races are close, and here is where your vote can be decisive.

Time and again, elections at state and federal levels have been decided by a margin of a few votes. In 1960, less than one vote per precinct nationwide could have altered the outcome of the Kennedy-Nixon contest. Yet only 64 percent of the eligible voters cast their ballots in this election.

None of the races, in New Mexico and the nation, is in the bag. Ticket-splitting and the unexpected can and frequently do create upsets that carry favorites down to defeat. Moreover, a handful of votes can decide the really tight contests.

Good advice for Americans in 1968: study the candidates and the issues, follow the campaigns, never assume any contest is sewn up or hopeless—and **vote**.

Ballot Questions

"Should New Mexico have a constitutional convention?" is one of several questions voters will answer on Nov. 5. The others concern directorship of the Albuquerque Flood Control Authority and support of Bernalillo County Medical Center.

The convention referendum is the result of study by a bipartisan commission and a resolution by the 1967 legislature that the question be submitted to the voters. Aim of the convention, according to the commission, would be to design a constitution that is "... short, clear, and so designed that it permits flexibility and changes" while preserving those aspects that have proved of value in the past.

If the convention call is approved by the voters, the 1969 legislature will set up the convention details and will decide if the convention delegates shall be elected or appointed. Following the convention, the proposed constitution would then be placed before the people for approval.

Five Judges to be Elected To County Magistrate System

On Nov. 5, New Mexico voters will cast their votes for the first time to elect judges to the new Magistrate Court system set up to replace the Justice of the Peace system in use since territorial days.

The new court system is a result of a constitutional amendment in a past election. In its last session, the New Mexico Legislature set in motion the judicial reform to take effect on Jan. 1.

A prime consideration in the reform is that Magistrates are paid a fixed, annual salary, thus removing personal or remunerative interest in the outcome of the case. Under the JP system, fees are based upon the number of cases handled.

The Magistrate system is organized on a country-wide basis, with judgeship

qualifications and jurisdictional matters differing according to county population. In counties in excess of 100,000 people, such as Bernalillo County, here are some facets of the new system:

—All candidates for the five Magistrate posts must be licensed attorneys.

—Magistrate judges will be elected for two-year terms the first election and for four-year terms in subsequent elections.

—Magistrates will have jurisdiction in civil actions (including actions in debt, breach of contract and torts) up to \$2000.

—The system will have criminal jurisdiction only in misdemeanors which carry punishment of not more than six months in jail and \$100 fines.

Authors

R. J. Baughman (5154) and J. A. Corli (5272), "Apparatus for Vapor Phase Preparation of Mixed Compounds," August issue, MATERIALS RESEARCH BULLETIN.

M. J. Forrestal (1222), "Response of an Elastic Cylindrical Shell to a Transverse, Acoustic Pulse," September issue, JOURNAL OF APPLIED MECHANICS.

P. J. Chen (1721) and Mortin Gurtin (Carnegie-Mellon University), "On a Theory of Heat Conduction Involving Two Temperatures," July issue, ZEITSCHRIFT FUR ANGEWANDTE MATHEMATIK UND PHYSIK (a Swiss publication).

D. W. Braudaway (7452), "The Radioactive Voltage Standard," Vol. 6, No. 4, INSTRUMENT SOCIETY OF AMERICA TRANSACTIONS.

D. M. Mattox and F. N. Rebarchik (both 5432), "Sputter Cleaning and Plating Small Parts," September-October issue, ELECTROCHEMICAL TECHNOLOGY.

R. E. Nettleton (5151), "Similarity Transformations for Ferroelectric Perovskites," Vol. 39, No. 9, JOURNAL OF APPLIED PHYSICS.

R.W.P. King (Harvard University) and C. W. Harrison, Jr. (2625), "The Transmission of Electromagnetic Waves and Pulses into the Earth," Vol. 39, No. 9, JOURNAL OF APPLIED PHYSICS.

R. C. Powell (5113), "Energy Transfer between Chromium Ions in Nonequivalent Sites in $\text{Li}_2\text{Ge}_2\text{O}_7$," Sept. 10 issue, PHYSICAL REVIEW.

G. A. Samara (5132), "Effect of Pressure on the Metal-Nonmetal Transition and Conductivity of Fe_3O_4 ," Sept. 16 issue, PHYSICAL REVIEW LETTERS; "Pressure and Temperature Dependence of the Dielectric Properties of Hydrogen-Bonded Ferroelectrics: $\text{LiH}_2(\text{SeO}_3)_2$ and $\text{LiD}_2(\text{SeO}_3)_2$," Sept. 10 issue, PHYSICAL REVIEW.

A. R. Sattler (9114) and F. L. Vook (5111), "Partition of the Average Energy Deposited in Germanium as a Function of Incident Neutron Energy," Sept. 10 issue, PHYSICAL REVIEW.

D. M. Schuster (5432) and Marvin Moss (1224), "Dispersion-Strengthened $\text{Al-Al}_2\text{O}_3$ by Plasma Spraying," October issue, JOURNAL OF METALS.



A. M. Hoge

P. D. Shoemaker

Two Complete Sandia's Tech Institute Program

Alfred M. Hoge (2325) and Paul D. Shoemaker (7652) recently received certificates for completing a course of study equivalent to that needed to earn a technical institute degree. The work was done under Sandia's out-of-hours education program.

Mr. Hoge completed all 20 courses in the mechanical technology curriculum in the Sandia program. He has taken classes in the out-of-hours program since joining Sandia in 1948, but he took his first course in the tech institute program in 1960. He is a staff assistant in Electro-mechanical Division II 2325.

Mr. Shoemaker completed the required courses in drafting and design technology during the past four years. He has averaged completion of three courses each year in the out-of-hours program while working as a staff assistant in the drafting organization. Paul also farms 16 acres near Peralta. He transferred some of the credits earned as an engineering student at UNM to the Sandia program. Currently, he is enrolled in a calculus class at UNM.

Employee Training and Education Division 3132 offers technical institute level courses in electronics, drafting and design, and in mechanical and industrial technology. Classes are conducted during noon hours or after work. Students study on their own time and must maintain satisfactory scholastic standing.

WE Assignments Span 40 Years For Comptroller R. G. Luckey

Forty years sounds like a long time to work for one employer, but for R. G. Luckey, Comptroller 4100, "there is enough challenge with Western Electric and Sandia to make it unnecessary to look elsewhere."

Mr. Luckey joined WE Nov. 7, 1928, as a payroll clerk at the Kearny, N.J., Works and subsequently spent many years in cost and accounting work. He was made a department chief in 1943, and later became assistant superintendent as well as superintendent of accounting. In 1955 he moved to New York City as Comptroller of the Defense Projects Division; this organization was responsible for development of the Arctic Dew Line, the White Alice Communication Network in Alaska, and the Sage System in the United States.

"Working in Defense Projects was a rare experience. I was in at the start—before the existence of any procedures or forms — and saw the organization built into operational status," he says. Former Sandia President S. P. Schwartz was also with this WE division, and when in 1959 he asked Mr. Luckey to consider joining Sandia, Mr. Luckey said "yes" even though he had never been to Albuquerque.

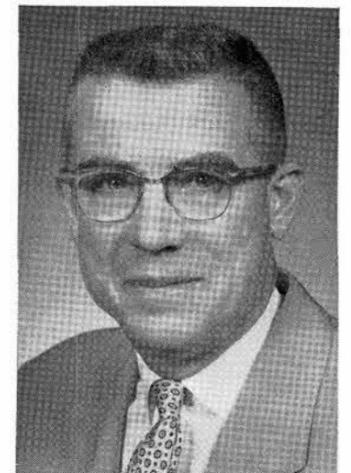
He is active and holds offices in the New Mexico Society of the Sons of the American Revolution, National Society of SAR, Albuquerque Rehabilitation Center, Zia Council of the Telephone Pioneers of America, and the Accounting Advisory Committee of the Universities of New Mexico and Texas.

How does one celebrate a 40th anniversary? Mr. and Mrs. Luckey and another couple, Mr. and Mrs. Pete Shonka (he is retired from Sandia and WE) flew to Mexico City for the Olympics.

Sympathy

To E. W. Upchurch (2613) for the death of his father in Kansas, Oct. 15.

To C. H. Carlson (2632) for the death of his father in Ashland, Wis., Oct. 24.



Mr. Luckey

SANDIA LAB NEWS



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NOVEMBER 1, 1968



A. P. CLOW (left), Vice President, Western Electric Company; C. W. Campbell, Vice President 4000; S. J. Buchsbaum, Vice President 5000; and M. M. May, Director of LRL. Frank Moon (8230) is in background.

Sandia's Board of Directors Meet at Livermore Oct. 24

These candid shots of several members of the Board of Directors, with various members of the staff, were snapped while the Board was at Livermore for its recent meeting and briefings on Sandia projects.

G. ACCETURA (left), Vice President, Bell Telephone Laboratories; and L. Gutierrez, Director 8100.



T. M. BURFORD (left), Director 1700; and P. E. Hogin, Vice President, Western Electric Company.



H. G. MEHLHOUSE, Vice President, Western Electric Company; R. B. Powell, Vice President 3000; and R. A. Baroody, Department Manager 8160 (l to r).

J. P. MOLNAR (left), Executive Vice President, Bell Telephone Laboratories; and T. B. Cook, Vice President 8000.



Sandia Family Hosts European Girls Under Foreign Exchange Programs

Morris Mote (8312) and his wife Eleanor recently added two "extra" girls to their family which already includes four teenage daughters. They are hosting two European visitors — 23-year-old Liv Marit Megard from Norway and 18-year-old Janneke Schermers from Holland.

Liv came to the United States because of her interest in 4-H leadership training. A graduate of Oslo University, she is a 4-H advisor whose assignment will include working with the Lapps, helping them to preserve their ancient skills and traditions. Morris says Liv explained that even though the rural-oriented club for children started in America, it quickly spread to Europe and is very popular in the Scandinavian countries.

She arrived in this country in May under the International Farm Youth Exchange (IFYE), a 4-H endeavor, and has stayed about three weeks with each of four families in Kentucky and four more in California.

This is the first time she has been out of Europe and she feels the "family guest" arrangement is the best way to learn about a country and its people. It's also her first chance to actually use the English language, first studied at 16 and now spoken with considerable facility.

For Liv, with her interest in 4-H leadership, the Mote family was a happy choice. All four Mote girls are active members in 4-H, and during Liv's stay it was learned that one daughter, Betty Gail, had been chosen as a state delegate to attend the annual Chicago convention, and another, Glenna, will be an alternate delegate for the national conclave next month.

Janneke, the other guest, is staying with the Mote family for a year under the

Youth for Understanding Program (YFU). This program sponsors foreign students in our country and, in turn, arranges for Americans to go abroad; under the program, expenses are paid by the student's own family. Glenna Mote took part earlier, staying in South America for two months in 1967.

Morris says that the YFU program was born right after World War II, "out of desperation" when the Michigan Council of Churches tried to find homes for German orphans brought over by the State Department. It now brings large numbers of exchange students in for a year from Europe and Japan, and for six months from South America. More than a hundred of the former are in the Bay Area alone, while another hundred are coming in from South America in January. Christina Farias from Brazil stayed with the Motes the first half of 1967.

Janneke is taking a year off from school in the Dutch system, even though she is attending high school here. School is so much harder in her homeland that the only outside activity she says she had time for was accordion lessons. She also notes that about 80 percent of the Dutch students fail at least once in high school.

She is enjoying school here and likes the curriculum because she can take courses not offered in the Netherlands, such as American history, speech, drama, typing and band. She is learning to play the glockenspiel and has taken her first piano lessons. But when she returns, it will be back to the books, probably in the medical field; she hopes to study at the University in Amsterdam.

The Motes feel that exchange programs such as these are excellent ways to foster improved understanding among the peo-

Take Note

Earle A. Paxton of Library Division 8232 presented a paper at the 31st annual meeting of the American Society for Information Science (formerly American Documentation Institute), held Oct. 20-24 in Columbus, Ohio. The paper, "Integrating Major Library Functions into One Computer-Oriented System," was co-authored with Elizabeth K. Bodie (also 8232) and Mary Ellen Jacob, a former employee.

Nelson's "Ringers" recently won three out of five play off games to become the 1968 champions of the Sandia Slo Pitch Softball League. The play off concluded three months of competition among the five teams of the league for the winner's trophies. About 90 Sandians took part in the games. Highest batting average (.541) went to Mike Auman (formerly 8172). Home run trophies went to Mike Nicholson (8164) and Doyle Baker (8153). A special plaque was awarded to Mike Nicholson for a "first" at SLL. He hit the ball out of the ball park—a distance of 305 feet.

ples of the world. "The visitor shares in all the activities, problems, and joys of the host family, seeing a community from the inside," says Morris. "There can hardly be a better way of gaining an understanding of a people. We believe in it to the extent that we have had four foreign students in our home, one daughter sent abroad, and we also provide a 'home away from home' for our Taiwanese 'daughter' now pursuing a PhD program at the San Francisco Medical Center.

"And this thing is spreading—Glenna's Uruguayan host family is sending their son to Pleasanton this winter under YFU."

The Mote family recommends the experience for everyone.

Bill Chapin (8168) and Gene Aas (8323) shot low net scores of 73 to tie for the first place trophy in the Sandia Employees Golf Club tournament Sept. 20 on the Palm Course at the Sunol Golf and Country Club. This was the first night tourney the league has played. Since Bill and Gene's scorecards also matched on a hole-by-hole comparison, a playoff will be held in the near future to determine the winner.

In the "best ball, blind partners" feature, Ron McClellan (8314) and Rodger Page (8332) finished in first place and V. K. (Gabe) Gabrielson (8321) and Al Baker (8154) placed second.

Jerry Norton (8322) was one of a group of civic and business leaders from Livermore Valley who recently flew to the Dallas/Fort Worth area on a day's excursion as guests of "Six Flags Over Texas," a leading tourist family entertainment center. The excursion was sponsored by the center to illustrate the basic concepts and operational procedures to be used in the development of a proposed "Six Flags Over California," to be built near Pleasanton. Jerry serves as president of the Business and Professional Women's Club of Pleasanton.

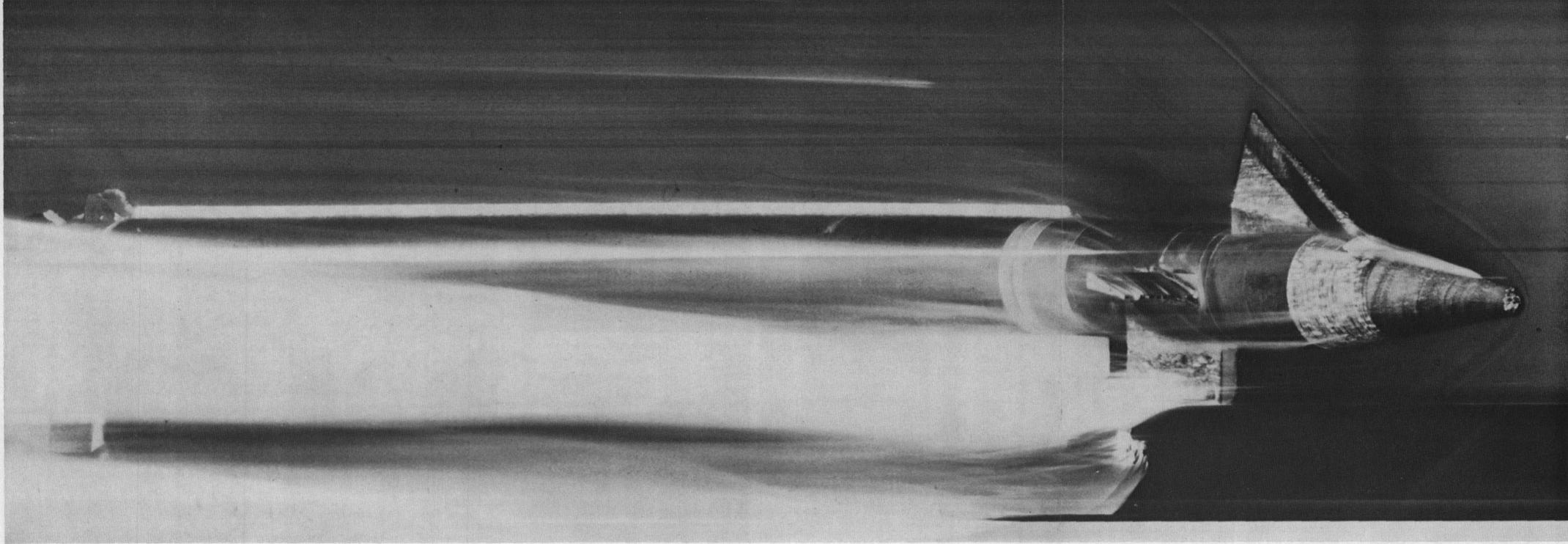
Welcome . . . Newcomers

Oct. 18-21

California	
Bernard J. Dunne, Tracy	8242
Adana M. Echer, Pleasanton	8242
Doris MacMillan, Livermore	8231
Transfers from Albuquerque	
Robbie D. Chapman	8128
Ray E. Johnson	8128

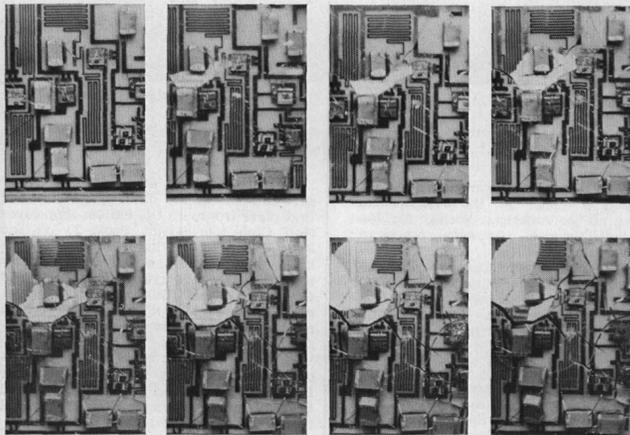
Congratulations

To Mr. and Mrs. Keith Christian (8313), a son, Dieter Roy, October 17.



SANDIA ROCKET SLED, near Mach 6, is "frozen" by Photometrics. Note sharp detail in shock wave and incendiary effects of high velocity. Original photograph was made on 5/4-inch color film using a streak (or image-motion) camera.

PHOTOMETRICS: New Science of Visual Data



HYBRID MICROCIRCUIT, about one square inch in size, is being studied here to determine spall threshold. Photographs were taken during destructive shock tests at a rate of four million frames per second. About 18 microseconds elapse between frames. Progress of deterioration is measured precisely by the film. Camera used was a Beckman-Whitely Model 189 with a rotating turbine-driven mirror projecting images consecutively on film positioned around the mirror.

"Photometrics" is a word coined to describe a science which serves other science. Like other space age technology, photometrics did not exist 10 years ago. Then it was called "technical photography" or "photo-instrumentation."

To the staff of Photometrics Division 7226, it matters little what you call it. The job is the same—to get the visual data required in the research, development and testing activities of Sandia Laboratories.

Many of the division's 33 members—engineers, chemists and technicians—have been in the business since the days of the Manhattan Project. The mission is the same—get pictures—but the job is much more complex and demanding, and the equipment is about as sophisticated as any in the space age.

—Cameras that expose film at a rate of 14 million frames per second.

—Timers that can open a shutter for nanoseconds.

—Mechanisms that synchronize a spinning mirror and exposure of film to the burn rate of explosives.

—Illumination systems that make possible a sharp image on film of the shock wave in front of a Mach 6 rocket sled.

—Film that can record a density ratio ranging from one to one million.

—Color film that shows with 0.003-inch precision, the peeling of layers of a nose

cone subjected to a 7000°F. plasma jet.

Still, the physical aspects of the job remain as strenuous as they were in the early days of full scale testing, albeit somewhat more exotic.

Sandia photometrics men have operated equipment on the slopes of a smoldering volcano, chased parachutes in speedboats, waded Canadian rapids, chopped brush in tropical forests, developed film near the Arctic circle, kicked mules in the swamps of the Deep South, strung wires deep in tunnels of the Nevada Test Site, sweated in the heat of the desert, shivered with cold in an open aircraft at 20,000 feet, and worked under the surface of the Atlantic and Pacific oceans.

And they have brought back the data. More than 400,000 feet of color film were exposed last year. They have participated in 433 separate projects or tests so far this year.

In the field, they're on their own, with full responsibility for obtaining the data. They're resourceful. If there isn't a piece of equipment or a lens or a shutter or trigger mechanism in existence to get a job done, they invent the item. Then they build it themselves or stay in the shops until someone else builds it from their sketches.

Talking to Sandia research and engineering people about visual data, they will

offer advice about what can be done using present techniques, or even what might be done, if necessary, to get the data.

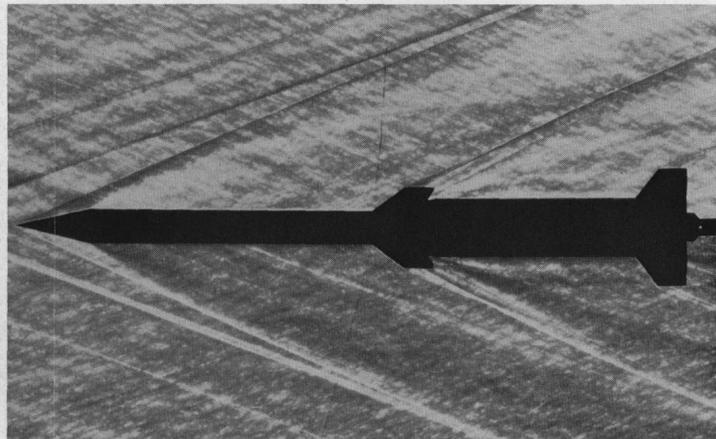
Photometrics Division is currently working on the development of a new camera that will have a shutter speed of 10 nanoseconds (10⁻⁹ seconds) and an integral source of light from a laser. Ten nanoseconds is such a brief instant that light travels only 118 inches, less than 10 feet, in this time.

"As our technology has evolved over the years, most of the data gathered by Photometrics Division has been from objects that grow smaller and smaller while traveling faster and faster," Mike Levesque, Division 7226 supervisor, says. "Also, many tests are now being covered using non-ex-

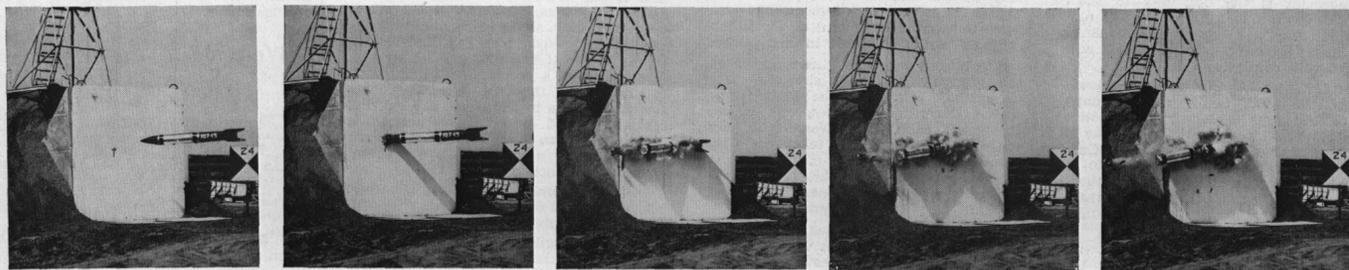
plosive light sources. This development has been critical in the growth of photometrics. An explosion furnishes sufficient light for a test, but may be undesirable for other reasons. Non-explosive testing means use of an external light source and this can be a problem. For instance, to photograph a two-square-foot object at four million frames per second with a shutter speed of 44 nanoseconds (44 billionths of a second) requires 200 million watts of light."

The photographs on these pages show that Photometrics men solve the problems. The pictures (most of the originals were in color) are a random sample of the work of the division. As you can see, they get the data.

EXPERIMENTAL SHAPE embodied in a 10-inch model undergoes aerodynamic testing in Sandia's hypersonic wind tunnel. Photometrics provide shock wave data from which aerodynamic behavior can be plotted. Shutter speed for the picture was about one-millionth of a second. The camera, adapted by Division 7226 personnel, used a \$1.50 spectacle lens to produce the final image.



BRIEF ENCOUNTER—A test unit is photographed as it meets a concrete target in a test to determine effects of impact. Individual frames were taken from 70mm color movie film.



Unit was traveling about 1000 feet per second. The film provides valuable attitude and trajectory information as well as data on the sequence of structural deformation.

Escort for International Air Cadets Good Way to Visit Jamaica

For the past 21 years, the Civil Air Patrol's annual International Air Cadet Exchange has provided an opportunity for air-minded young people of the United States and 20 foreign countries to visit each others' lands.

For this year's annual exchange, Richard T. Dillon (1830) spent nearly a month as escort to six cadets — all college students — visiting Jamaica. Before leaving home, he helped make arrangements for a group of foreign air cadets who visited Albuquerque during the same period.

The program began with a visit to New York City and briefings by government officials in Washington, D.C.; the flight to Kingston followed. The cadets and their escorts were greeted by the Prime Minister and the Governor General of the island. While in the Kingston area, the visitors stayed in private homes; however, as additional groups arrived, the IACE participants moved on to Moneague, a mountainous area about 40 miles northwest, where a "tent city" was erected.

"It was a 'Gunga Din'-type camp," Dick says. "The officers were quartered on the hilltop, the sergeants halfway down the hillside, and the cadets were at the valley bottom."

"Driving in Jamaica is an experience," Dick recalls. "The best roads are like the worst parts of North 10 in the Sandias. Jamaicans drive on the left side of the road and have a complicated system of signals. For instance, if you want to pass a car, you beep your horn two times, the driver ahead gives a hand signal, then you hold your right hand out of the window. If this procedure is followed exactly, the driver ahead of you and drivers of any oncoming vehicles are responsible for your safety since you have complied with the system."

Three types of food were offered: camp food, native food (mostly chicken), and

tourist food (mostly beef). The herds of cattle on the island are an out-growth of the bauxite industry—companies are required to plant trees and reseed the mined-out land, and the livestock bring additional income.

The Americans spent several days flying out of Montego Bay before returning to Kingston where they boarded a plane for Panama, the central loading point for South America-bound cadets. Closing ceremonies for the 1968 IACE program were held there.

Dick became a cadet at the inception of the Civil Air Patrol program in 1944, when it was more or less a training ground for the Army Air Corps. He joined the New Mexico CAP 10 years ago and has been state wing commander for the past three years.

Any persons interested in helping with the local CAP cadet program are asked to contact Dick.

Speakers

L. S. Nelson and N. L. Richardson (both 5271), "Luminous Boundary Layer Surrounding a Zirconium Droplet Burning in an Oxygen-Containing Atmosphere," 1968 technical meeting of the Eastern Section, Combustion Institute, Oct. 21-22, Amherst, Mass.

Irving Auerbach (9342) and D. F. McVey (9328), "The Role of Microstructure in the High Pressure Ablation Performance of Graphite"; J. D. Theis, Jr. and H. O. Pierson (both 5412), "Effects of Deposition Temperature on Properties of Pyrolytic Carbon/Carbon Felt Composites," American Ceramic Society Graphite Conference, Oct. 22-24, Pasadena, Calif.

L. W. Bickle and M. G. Vigil (both 7342), "The Performance Characteristics of Concentrated-Charge, Explosive-Driven Shock Tubes" and "Explosive Primacord Driven Shock Tubes and Blast Wave Parameters in Air, Sulfurhexafluoride and Freon-C318"; J. T. Foley (1543), "Normal and Abnormal Dynamic Environments Encountered in Truck Transportation," 39th Shock and Vibration Symposium, Oct. 22-24, Monterey, Calif.

A. D. Swain (1642) "Human Factors Applied to Accident Prevention," National Safety Congress and Exposition, Oct. 28, Chicago.

E. D. Jones (5114), "Crystal Field Interactions in Rare Earth Intermetallic Compounds," Seventh Rare Earth Research Conference, Oct. 28-30, Coronado, Calif.

J. F. Banas (1712), "On the Optimal Aperiodic Control of Time Lag Systems," Second Asilomar Conference on Circuits and Systems, Oct. 30-Nov. 1, Monterey, Calif.

O. L. Burchett (5164) and E. R. Dunaway (5162), "Photographic Techniques for Mechanical Material Property Measurements"; T. A. Duffey and S. W. Key (both 5162), "Experimental-Theoretical Correlations of Impulsively Loaded Clamped Circular Plates," 1968 Fall meeting of the Society for Experimental Stress Analysis, Oct. 29-Nov. 1, San Francisco.

W. A. Millard (9325) and W. H. Curry (9322), "Dynamic Stability Characteristics of a High Fineness Ratio Bomb"; H. R. Vaughn (9341) and J. K. Cole (9325), "An Analysis of Reentry Vehicle Roll Rate Behavior and the Effect of Thermal Distortion"; A. C. Bustamante (9513), "The Autorotation Characteristics of Various Shapes in Subsonic and Hypersonic Flows," Third Technical Workshop on Dynamic Stability Problems, Nov. 4-7, Moffett Field, Calif.

H. H. Patterson (9230), "The Challenge of Vietnam," Naval Reserve, Oct. 24, Albuquerque.

H. D. Sivinski (1740), "Planetary Quarantine for Space Exploration"; D. W. Ballard (5414), "Laminar-Flow Clean Room," Sphere of Science, Oct. 25.

N. J. Pollard (2633), "Microelectronics," Sunrise Optimist Club, Oct. 29.

T. B. Sherwin (3430), "FR Awareness," Hospital Auxiliaries of New Mexico, Nov. 8.

B. L. Gregory (5112), "Radiation Damage in Silicon," Electron Device Group Meeting, Oct. 21, Pittsburgh, Pa.

A. D. Bridegam (7651), "Careers in Drafting and Design," Santa Fe High School Career Guidance, Oct. 9; "Use of Computers and Automated Graphics Equipment," Albuquerque Chapter, Society of Technical Writers and Publishers, Oct. 24.

Whitewashers Beware -- Typing Correction Fluid Is Potential Hazard

Sandia secretaries and typists hardly ever make typing mistakes, but most have some familiarity with the little bottles of opaque white correction fluid. The stuff works. Just paint over the mistake and type on. For this reason, the correction fluid is a valuable item and in wide use at the Laboratories. (A report that it's delivered in railroad tank cars is baseless.)

However, Safety Engineering Division 3351 has issued a caution. It seems that correction fluid will expand under certain conditions and break the bottle, a potential hazard.

The conditions are these: If the bottle is filled to the brim with thinner, then capped and shaken and held in the hand the mixture will expand and break the bottle.

In checking this out, a Sandia safety engineer was carrying a bottle in his hand to the Safety Lab when it broke. The force was not sufficient to cause the bottle to explode but it did break. The safety man was uninjured.

Laboratory tests did not show any explosive ingredients other than the flammable liquid toluene. Under almost all circumstances, the correction fluid is safe to use. Just don't fill the bottle of correction fluid or thinner to the top.

Events Calendar

Nov. 1-3, 7-19—"Harry, Noon and Night" (a bitter comedy of an American individualist in modern Germany), Old Town Studio, 1208 Rio Grande NW. For reservations, tel. 242-4602.

Nov. 2—U.S. Marine Band, 2 p.m. and 8:15 p.m., UNM Popejoy Hall.

Nov. 5—Community Concerts Association presents the New York Woodwind Quintet, UNM Popejoy Hall.

Nov. 5-10—Ice Capades, Civic Auditorium.

Nov. 7—Albuquerque Symphony Orchestra conducted by Jose Iturbi, UNM Popejoy Hall.

Nov. 9—YWCA charter bus trip to Laguna and Acoma Pueblos, Ice Caves, El Morro National Monument, and lava beds near Grants. For reservations, tel. 247-8841.

Nov. 12—Ceremonial dances at Jemez and Tesuque Pueblos.

Nov. 14-15—Holiday Idea Show, Civic Auditorium.

Nov. 16-17—Sandia Peak Ski Patrol-sponsored Ski Swap, Flower Bldg., State Fair Grounds.

Engineering Responsibility to Society Theme of Ninth Annual ASME Symposium

"Responsible Technology — A Mandate for Engineering" is the theme for the Ninth Annual Technical Symposium co-sponsored by the New Mexico Section, American Society of Mechanical Engineers, and the University of New Mexico College of Engineering. Sessions will be held Nov. 15-16 on the UNM campus.

As opposed to previous symposiums of highly technical nature, this year's program will be more concerned with the professional engineer's role in society—as a citizen with a major voice in decisions on projects, fund allocations, and policies.

Program chairman H. D. Sivinski (1740) explains, "There will be no 'mechanism' content; instead, speakers will discuss ways in which engineers of the future can better integrate into society. I believe the symposium will have an impact on scientists, technologists, and (in general) all 'thoughtful' people."

Other Sandians helping with arrangements are: A. R. Eiffert (4250), general chairman; A. L. Thornton (2352), administrative chairman; Jack LeRoy (2321), registration; R. E. Berry (9512), publicity; and E. L. Emerson (7624), chairman of the New Mexico ASME chapter.

Registration is expected to reach 300 with both members and non-members in attendance. Pre-registration forms are available from Mr. LeRoy.

Gov. David F. Cargo has been invited to make the opening statement Friday morning. Dr. R. C. Dove, dean of the UNM College of Engineering, will be chairman of Session I which will include talks by Congressman George E. Brown, Jr., of California and Dr. Frederick Smith of the University of Michigan's School of Natural Resources.

Earth's Ecology

Congressman Brown is a member of the Subcommittee on Science, Research, and Development of the House Committee on Science and Astronautics. His talk, "Problems Engineers Cause," will point to the social implications of engineering practices. Mr. Smith will discuss "The Study of the Earth as a Total Ecological System and the Role of the International Biological Program." He is in charge of analysis of ecosystems for the International Biological Program. This 50-nation effort deals with the immediate or potential ability of man to damage the ecological system of this planet.

The afternoon session, which will be chaired by Dr. Stirling Colgate, President, New Mexico Institute of Mining and Technology, will lead off with "Regional Design for Human Impact," presented by Philip H. Lewis, Jr., joint chairman, University of Wisconsin Landscape Architecture, and Urban and Regional Planning Departments. Mr. Lewis is a believer in the theory that nobody in engineering thinks enough about the quality of human environment. His concern is with how to make landscapes (and their inevitable progress-type improvements) worth living in.

Air Pollution

Robert M. Jameson of Washington, D.C., will discuss "Challenging the Air Pollution Problem with Systems Analysis." In his opinion, air pollution is a systems engineering problem even more challenging than the Apollo program. Mr. Jameson is with the National Pollution Control Administration of the U. S. Department of Health, Education, and Welfare.

Many Sandians are acquainted with Frank C. DiLuzio, president of Reynolds Electrical and Engineering Company, Las Vegas, Nev., who will speak on "Institutional Barriers to Engineering Success." His background with AEC/AEO and private industry, and as Assistant Secretary of the Interior for Federal Water Pollution Control make him well-qualified to discuss barriers to successful interaction between political entities, governmental agencies, professional societies, and the engineering community.

The final speaker Friday afternoon will be Murray Stein, assistant commissioner (Enforcement), U.S. Department of the Interior Water Pollution Control Admin-



FINAL ARRANGEMENTS for forthcoming ASME symposium on "Responsible Technology—A Mandate for Engineering" are readied by (l to r) A. R. Eiffert (4250), general chairman; H. D. Sivinski (1740), program chairman; and A. L. Thornton (2352), administrative chairman. The seminar will be Nov. 15-16 at the UNM campus.

istration. He will discuss "Improvement of the Environment within the American Legal System" from the standpoint of developing legal engineering solutions. He has been active in developing model statutes, administrative procedures and interstate compacts (including those of the Colorado River basin) and, as a lawyer, has handled all pollution enforcement cases under the Federal Water Pollution Control Act.

Parasite Control

For banquet speaker, Program Chairman Sivinski found a man well able to discuss a problem which was caused by technology, and which was later solved by more advanced technology. The subject, "Control of the Sea Lamprey in the Great Lakes," deals with the fresh-water parasite that in recent years virtually destroyed commercially-valuable lake trout and whitefish before being brought under control. The speaker will be William F. Carbine, regional director, U.S. Bureau of Commercial Fisheries, Ann Arbor, Mich., who has worked on this ecological problem from the beginning.

Session III, Saturday morning, which will be chaired by Dr. Richard Duncan, Vice President, Research, New Mexico State University, will begin with Dr. S. P. Olmstead, Dean of Faculty for Wilmington (Ohio) College, discussing, "The Engineer—Conscious Agent of Social Change?" He recently led a year-long study, sponsored by a Carnegie Foundation grant, to determine how engineering schools can bridge the gap between technology and society. Parts of the study have been adopted by the American Society for Engineering Education.

Responsibilities

The training tomorrow's engineers will need in development of the greater sense of responsibility needed for the consequences of their contributions will be the subject of a talk by Clarence Linder. He is a retired General Electric vice president, president of the Engineers Joint Council, and one of the founders and now vice president of the National Academy of Engineering.

The summary paper Saturday morning will be presented by former Gov. Jack M. Campbell, who is head of the Institute on State Programming for the 70s and a member of the advisory board to the American Council on Education's study of systems of higher education. He will correlate the content of the symposium papers and emphasize the relationship between technical, social, and economic problems in the Southwest.

Human Error Predictions Discussed in Europe

Sandia's technique for human error rate prediction and its associated Sandia Human Error Rate Bank (SHERB) were discussed last month before groups in Denmark and England by Alan D. Swain of Systems Reliability Division 1642.

As guest of the Danish Atomic Energy Commission, Mr. Swain spoke on "Human Reliability Assessment in Nuclear Reactor Plants" during a symposium on operator reliability and man-machine problems in nuclear reactor plants. The meeting was sponsored by the European Atomic Energy Society and was held in Riso, Denmark. Representatives from 10 countries attended.

Mr. Swain later lectured on "Assessment and Prediction of Human Reliability in Man-Machine Systems" at the University of Aston in Birmingham, England. Attendees included members of the school's applied psychology department, representatives of industry, and scientists from the United Kingdom Atomic Energy Authority.

Sandia's work in assessing human errors is the outgrowth of a "situation" approach to human reliability, as opposed to the "zero defects" program favored in some industries. "Under this approach, we study a work situation to uncover design features which appear to foster human errors or accidents," Mr. Swain says. "Using existing error rate data for items of similar design, we make estimates of probable human error rates to justify design changes."

At both meetings there was interest in how human error data could be collected at nuclear reactor plants during simulated emergency or special operations as well as during routine operations. Such data has proved valuable in pinpointing areas where redesign is needed to minimize possibility of severe or catastrophic accidents in unusual situations.

Deaths



J. Hadady

Jasper Hadady, a model and instrument maker in Machine Shop Division 4253, died Oct. 13 after a long illness. He was 48.

He had worked at Sandia since July 1954.

Survivors include his widow, two daughters and a son.

* * *

Daniel V. Lotz, a staff member in Product Acceptance Division II 7414, died suddenly Oct. 12. He was 58.

He had been with Sandia since August 1952.

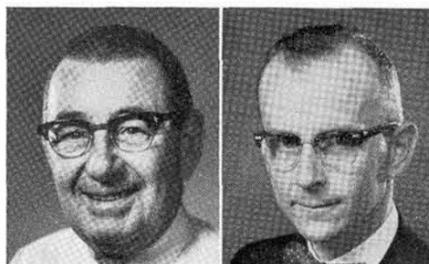
Survivors include his widow, two daughters and a son.

* * *

Theodore M. Gemberling, Attorney 6040, died Oct. 27. He was 42.

He had worked as an attorney in the General Attorney, Secretary and Treasurer's organization 6000 since joining Sandia in September 1961.

Survivors include his widow and four sons.



D. V. Lotz

T. M. Gemberling



VOCATIONAL GUIDANCE INSTITUTE, future and past, engages attention of (l to r) B. B. Patten, Director of Guidance and Counseling for Albuquerque Public Schools, Richard D. Marshall, Washington representative of Plans For Progress, and Bill Funk, manager of Employment Department 3250. Aim of the Institute, sponsored by Plans For Progress companies and Albuquerque Human Resources Council, is improved knowledge of business and industrial practices among counselors, administrators and teachers so as to enable them to better counsel young people.

Service Awards

20 Years



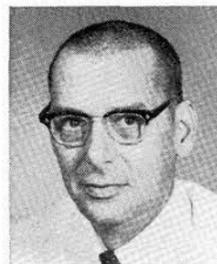
K. E. Bricker
2490



Harold Christenson
4642



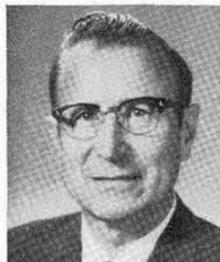
Rosalie Crawford
1



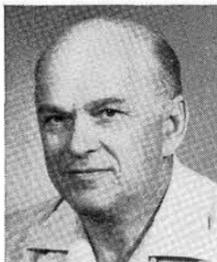
L. V. Day
7215



J. C. Eckhart
9220



E. F. Ehrman
2634



A. F. Fink
9235



M. W. Hancock
3454



Jerry Olguin
4642



E. C. Pace
4370



W. H. Shively
4514



J. A. Silva
2633

15 Years



Betty Baros
3428



R. V. Pass
7213

10 Years

Nov. 1-14

R. F. Casper 1521, G. C. Shelton 1642, E. C. Hawn 4221, J. R. Wheelock 8171, W. J. Young 8223, E. H. Dopking 8233, C. E. Shinneman 8333, Ruperto Jaramillo 4574, A. E. McCarthy 5114.

Dorothy H. Raper 7631, C. H. Turnbull 8321, R. L. Clarkson 8252, J. C. Garcia 4642, R. L. Levesque 7226, P. W. Benson 7352, Maxine Stephenson 7631.

W. E. Chandler 8243, Mary Harrison 3131, D. L. Trapp 7217, R. D. Chapman 7321, J. A. Enlow 7324.

Better Yet—Walk

Winter Conditions Require Car Care

Winter approaches, even in Albuquerque!

And so too does the need for safe driving techniques and preventive maintenance on your vehicle.

The American Automobile Association offers the following safety and maintenance checklist. Give it your attention before bad weather arrives.

WINTER TUNE-UP. Have the engine tuned to insure smooth starting and running without stalling in cold weather. Slow starting places a heavy drain on the battery, when its power output is already lower because of the cold.

ANTIFREEZE. Have the cooling system flushed, checked for leaks and refilled with the proper amount of antifreeze.

TIRES. If you live in the mountains, think about installing snow tires—before the first snow falls.

CHAINS. Always carry a pair of reinforced tire chains of proper size and in good repair. Know how to put them on.

DEFROSTER. Make sure this unit functions properly to keep the windshield

clear, especially in the morning when heavy frost coats all windows. Know how to adjust the heater to keep down interior fogging.

SCRAPER AND SPRAY DEICER. Your badge is not a scraper. Buy one with a long handle and keep it in the car with a can of spray deicer.

WINDSHIELD WIPERS. Be sure the wiper blades are in good condition and that there is adequate arm pressure to sweep off heavy, wet snow and sleet.

BRAKES. Brakes should be properly adjusted and relined if necessary.

MUFFLER. Check the muffler and exhaust system for leaks.

LIGHTS. Be certain headlights, stop lights, tail lights, and turn signals are functioning properly.

SEAT BELTS. Install and use seat belts. Seat belts are doubly important when icy roads and possible skid conditions exist.

Sandians Help on Social Welfare Problems

Several Sandians participated this week in the New Mexico Conference of Social Welfare which was held in Albuquerque. Discussions and workshops centered around the problems of developing needed services, use of private citizens to augment social agency manpower needs, and financial administration.

At the general session this morning, J. Robert Garcia spoke on "Equal Opportunity—An Impossible Dream?" He is manager of Equal Employment Opportunity Special Assignment Department 3260 and works closely with other executives in industry and in other parts of the Bell System in support of the Plans for Progress Program.

During the meeting on volunteer agencies serving community needs, R. A. Matthews (3464) discussed the Suicide Crisis Center which he helped to organize.

Members of the group's executive committee include Harry E. Kinney (1222) and Nigel S. Hey (3431).

Prominent Theologian Gives Noon Lectures

Dr. Eric Rust, professor of Christian Philosophy at the Southern Baptist Theological Seminary, Louisville, Ky., will give a series of lectures dealing with science and religion beginning Monday, Nov. 4, at noon.

The five-day lecture series, sponsored by employees who are members of the Hoffmantown Baptist Church—not by Sandia Laboratories itself—will be neither sectarian nor evangelistic in nature. The lectures will be similar in content to a book Dr. Rust recently wrote entitled "Science and Faith: Towards a Theological Understanding of Nature."

The lectures, to be given in Bldg. 815, include:

Monday—"Two Languages — Scientific Fact and Religious Affirmations."

Tuesday—"Creation by Evolution."

Wednesday—"The Incarnation and God-Talk."

Thursday—"Two Perspectives on Man."

Friday—"The Unfinished Universe — A Cosmic Hope."

Dr. Rust, who holds advanced degrees in both science and theology, has studied, taught and lectured in England and the United States.

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SANDIA LAB NEWS

NOVEMBER 1, 1968

SHOPPING CENTER

CLASSIFIED ADVERTISING

Deadline: Friday noon prior to week of publication unless changed by holiday. A maximum of 125 ads will be accepted for each issue.

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
8. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

FOR SALE

CARS & TRUCKS

- '63 VOLKS sedan, \$750; '61 Cadillac HT, \$550, both below book, 2829 Virginia NE, Price, 299-6265.
- '67 BUICK Sportwagon, 500 miles of warranty, AC, disc brakes, AM-FM radio, Schmieder, 299-2352 after 6.
- '65 PONTIAC Star Chief, AC, PB, PS, Kez Kar Kamper, \$2395, Riedeau, 256-2380.
- '68 VW sedan, R&H, dark blue, under 7500 miles, Renninger, 299-3433.
- '67 MUSTANG convertible, V8, PS, AT, power top, 15,000 miles, Dickinson, 265-5167.
- '66 ENGLISH FORD Cortina GT, one owner, 30,000 miles, R&H, 4-sp. Stark, 296-4971.
- '59 4-WD Chevy 1-ton panel truck, Lewis, 299-2322.
- '63 VW sunroof w/completely overhauled engine, radio, 4 new tires, \$800 or best offer, Brammer, 265-8194.
- '68 CANARO, 327 4-sp., PS, AC, low mileage, \$1000 below list price, will trade for Travellor or carryall, Taylor, 296-5665.
- '64 RAMBLER Classic 550, 25,000 miles, R&H, 00, \$795 or best offer, Elder, 268-7479.
- '53 PONTIAC, recent valve job, \$100, Martin, 299-2649.
- '61 LAND RDVER, 4-wd station wagon, 7-passenger, sun roof, heater, 35,000 miles, Gross, 255-7327.
- '60 PLYMOUTH VS, stick, R&H, \$250, Zimmerman, 299-8469.
- '62 CHEVY station wagon, 6-passenger, retail \$690, sell for \$425, Moore, 299-3758.

'61 CHEV 9-passenger station wagon, air, PS, PB, luggage rack, \$550, Clement, 298-4994.

1964 FORD GALAXIE 500 XL convertible, PS, PB, automatic, air conditioning, power bucket seats, four new fiberglass tires, sliding steering wheel, wire wheel covers, excellent mechanical and physical condition, powder blue, white top, \$950, Barber, 255-5401.

'67 RENAULT RIO, Michelin X tires, over 30 mpg in town, \$1100 or make offer, Phipps, 299-3151.

REAL ESTATE

HOUSE, 3-bdr., 2 bath, lg. shop bldg., well, 2 acres, Los Pinos Subdivision, \$29,700, Foster, 282-3112.

UNUSUAL: exposed beams, flagstone FR, 2 fireplaces, lg. rec. rm., 3 bdr., 1 1/2 baths, extras, close-in location, \$24,350, Hill, 268-1420.

3-BDR., 1 1/2 bath, dbl. garage, AC, hw floors, carpeted, drapes, landscaped, NE Heights, Wade, 299-2232.

SALE OR TRADE: 240 acres mountain land near Golden, N.M. Reed, 299-7425.

1334 MARRON CIR. NE, 2-bdr. den, walled yard, lawn, \$11,500 total, \$800 down plus closing, balance FHA approx. \$95/mo. Stark, 299-5953.

GLENWOOD HILLS, 4-bdr., custom brick rancher, view, built-ins, fireplace, landscaped, sprinklers, fence, lg. lot, dbl. garage, 13333 Sunset Canyon, Hull, 298-8506.

MISCELLANEOUS

8' DOUBLE fluorescent light fixture; camp table & stools, camp stove; bathroom sink; 150 radio & TV tubes, Bascom, 299-9044, 299-1662, 255-4772.

REGISTERED Weimaraners out of champion sire, field winning bitch, Fulton, 299-2733.

BABY CRIB & mattress, \$15; play pen, \$3; Heathkit intercoms, \$35; light meter, \$3; practice bow, \$6 (40 lb.), Stuart, 265-7315.

WORK TABLE, 3'x6', heavy & sturdy, \$15, Ashworth, 296-2855.

1/32 SCALE LOTUS FORD, Ferrari slot racer set, 27" track, lap counter timer, bridge set, \$12, Lambert, 344-9012.

AKC REG. Shetland Sheep dog puppies; regulation size pool table; Epiphone electrical guitar & Fender Bassman speaker/amplifier, Lumpkin, 299-9179.

FRIGIDAIRE REFRIGERATOR, "Cold Pantry" model, cost \$475, sell for \$125, Zachmann, 299-6871.

HEATH MOD WA-P2 preamp w/power supply; knight FM tuner 40 watt; Garrard record changer mod. RC 80, all for \$75, Miller, 255-2577.

HW-12 with HP-13, HP-23, need cash or 2-meter FM gear, Geister, 877-4748.

TYPEWRITER, portable Signature 510, w/case, \$55, Moss, 298-2643.

12 GAUGE PUMP shotgun, Ithaca model 37 w/case & cleaning rod, \$65, Lathrop, 298-8638.

BLACK miniature poodles, 2 mos. old, training started, \$35 ea, Burkhardt, 282-3960 after 6.

MIRRORS, extension, for pickup, includes brackets, pair for \$7, Dollahan, 299-8107.

'66 BSA 650 cc cycle, \$650, bought new '3'67; 30.06 Springfield sport stock, \$35, Schulze, 299-0152.

SUZUKI MODEL T-200 motorcycle, 3 mos. old, 1200 miles, 4000-mile warranty, \$125 under list, \$475, Jercinovic, 255-8027.

3 BIRD CAGE/stand combination, \$3-\$5 each; Sear's twin brush floor scrubber/polisher \$15, Caffey, 255-1062.

BOXER, registered female, 16 mos. Garrison, 256-7267.

CARVED light green Oriental jade pendant, Rick, 344-1089 between 5:30 & 7:30.

REGISTERED Quarter Horse mare; Palomino gelding, Houston, 842-9049.

ANTIQUES: condition fair—Empire (circa 1830) large mahogany chest of drawers, dresser, dining table, sideboard, chairs, bed; also trunks etc. Pierce, 268-2122.

TYPEWRITER, Underwood portable w/case, standard keyboard, Savitt, 268-0158.

EAZ LIFT leveling trailer hitch w/Kelsey Hays controller, \$50, Mahaffey, 265-0798.

WOOD FRONT screen door, 36x80 w/grill & hardware, \$5, Hauer, 298-3624.

GALAXY 300 transceiver & AC supply, \$200; Johnson matchbox, \$20, Johnson filter, \$5; 1KW linear amp, \$75, Snyder, 268-0679 after 6.

HO TRAILER SET: 75 ft. track, 4 switches, 3 engines, 10 cars, 2 power packs, accessories, \$60, Armstrong, 255-8862.

ACCORDIAN, \$300, Vetter, 255-3959.

1-WHEEL LUGGAGE trailer, hitch & spare tire, plywood box 4'w x 1 1/2'd x 5 1/2'l, & cover, \$35, Roberts, 255-9527.

TWO STEEL sash windows, 69" x 63", 53" x 38"; 36" solid door front; 35 1/2" new screen door, all for \$30, Redic, 268-8444 after 6.

4-TRACK stereo tapes, Rock'n Roll for teenagers, Ventures, Johnny Rivers, Rolling Stones, etc., \$2.50 ea, 8 for \$15, Shock, 877-3728.

NORWEGIAN ELKHOUND, AKC reg. puppies, champion sire, weaned, healthy, whelped Sept. 8, Church, 268-3590.

SMALL MARE, 10 hands high, 8 yrs. old, \$50, Treon, 282-3835.

AIRLIFT SHOCKS for '65 or '66 Chev., \$15; 4 HD army cots w/mattress, \$8 per set, all four \$25, Harlow, 299-1495.

REDFIELD 4X scope w/Buehler rings, base for M70Win; new RCBS 30-06 dies; 30-06 GI ammo; Arpus C-5, Westfahl, 298-5087.

FULL SIZE VIOLIN, Cejelsky, \$175 w/2 bows & case, Kindschi, 256-0531.

MOTORCYCLE, BSA Goldstar 500cc single, \$365, Shunmy, 265-1620.

CAR TOP luggage carrier, weatherproof, lockable, \$9, Summer, 299-1912.

PLAYER PIANO, working condition, speckled enamel finish, new bench, 12 rolls, \$300, McEwen, 268-1440.

SKI BOOTS, size 9 narrow, Wagner, 268-7868.

MOTORCYCLE, BSA 441 Shooting Star, \$800, Chacon, 4301 Hilton NE.

STARCRaft fold-out tent camper; Early American sofa; 2 TV sets, Sykes, 296-4545.

TOP CARRIER for VW sedan, 1 mo. old, used once, cost \$21, sell for \$15, Campbell, 268-8445.

BROWN TWEED SOFA bed, reversible cushions (2), \$80, MacPherson, 268-8925.

125CC DUCOTTI motor scooter, less than 10,000, \$125; set of 14" Ford mag wheels, \$35, Houghton, 299-3386.

TRANS-OCEANIC Zenith all transistor radio, \$85; 24" x 36" x 80" metal cabinet, \$15; yellow wash basin, \$5; utility cart, \$10, Aaron, 296-6822.

14' FIBERGLASS BOAT, 40hp electric start engine, trailer, accessories, \$795, Grab, 299-0015.

BEDROOM SUITE: chest, dresser, bed, spring, mattress, \$40; 110-lb. barbells, \$12.50, Shelton, 298-6524 after 5:30.

24" BOY'S and 20" girl's bikes, \$11 or trade for 26" boy's English, Frauenglass, 345-0119.

GARAGE SALE: crystal, clothing, almost new piano, tools, toys, refrig., TV, Nov. 1 & 2, Patrick, 1412 Field NE.

LEFT-HANDED Kenneth Smith golf clubs, 5 woods, \$70; 8 irons, 3 through wedge, \$80; shotgun, Lefever nitro special, 20-gauge dbl. barrel, \$90, Leonard, 299-4684.

REGISTERED 3-yr.-old Hereford bull & 7 six-month-old white faced calves, Causey, 299-0089.

FURNITURE, appliances, other household items, moving next week, all items must be sold, prices negotiable, Edwards, 877-2799 or 242-1587.

GUITAR, classical, model 002 Pimentel, \$150, Mata, 898-3377.

FOR RENT

MOUNTAIN BUNGALOW, Sandia Park, 1-bdr., 2-car garage, fireplace, partially furnished, water & butane heat provided, borders National Forest, \$80/mo. Carnicom, 282-3421 after 6:30.

WANTED

BABY SITTING in my home weekday & some evenings, backyard fenced in, lunch provided, have girl 18 months, Steigerwald, 242-8758.

CHILD'S doll house, preferably wooden; inexpensive electric train set, both must be in good condition, Muir, 296-2252.

GIRL'S 20" or 24" bicycle in good condition, Garcia, 256-7606.

PEKINESE stud service (registered); also, have 2-yr. old blond registered (5 generations) can trade service, Raper, 268-2373.

TO BUY HOUSE—living room, foyer, 3-bdr., den, dbl. garage, fireplace, centrally located between downtown & Winrock, Candelaria, 877-3738.

ROOMMATE to share mountain home in Sandia Park, for details call Seal, 282-5204.

'66 or '67 2-seat station wagon, Plymouth, Ford, or Chevy, power steering required, small engine, stick shift preferred, Leeman, 299-9149 after 6.

BABY SITTING by reliable Jr. high school girl, in NE Heights, weekends only, Downs, 299-1537.

TO RENT furnished 2-bdr. house by Dec. 1, Diem, 256-1305.

OLD REFRIGERATOR, need not function, I'll pick up, Parsont, 299-1621.

WHEELBARROW, contractor type; also snow shoes, Tiefa, 299-2763.

SHOP MANUAL for '66 CT200 Honda trail 90, Cleveland, 298-0218.

HOME in country for purebred Briard dog; 1-yr. old, big, energetic, free to understanding, indulgent dog lover, Shunmy, 265-1155.

TRADE alfalfa hay for car-top boat or outboard motor, Schafer, 898-0132.

LOST AND FOUND

LOST—Turquoise stone set in silver ring, Rx glasses w/black frames, bi-focal Rx glasses, turquoise & silver pierced earring, pr. brown leather gloves, LOST AND FOUND, tel. 264-2757, Bldg. 610.

FOUND—Sheffers eversharp, turquoise & gold head necklace, cuff link, Rx bi-focal glasses, single key, LOST AND FOUND, tel. 264-2757, Bldg. 610.



ROARING TWENTIES PARTY tomorrow night at the Coronado Club will feature special entertainment and dance routines by this group of Sanado women. In foreground are, from left, Mmes. O. B. Tjelt-

weed, N. E. Corlis and L. E. Larson. Perched on the get-away car are (l to r) Mmes. E. E. Ives, G. D. Horne, B. J. Petterson, M. M. Newsom, J. M. DeMontmollin, G. E. Syme, H. J. Filusch and J. A. Rhodes.

Retired



William M. Phillips, a field representative in Quality Operations Division 2491, retired Oct. 31. He joined Sandia in September 1954 in the receiving and inspection organization, and transferred to his present position in 1958. Mr. Phillips acted as a field representative to a number of local suppliers. Before coming to Sandia he worked 20 years with the Hughes Tool Company in Houston.

Mr. and Mrs. Phillips plan to sell their home in Albuquerque and return to Texas to build houses and develop property they own. Eventually they may make their permanent retirement home in Albuquerque because of the fine climate.

The Phillips have made extensive travel plans following Bill's retirement. They will visit Hawaii, Mexico, Canada and Ireland. "I've worked all my life for this," Bill says. "We are really going to have a lot of fun."



Ernest H. Bowman, a staff member in Electronic Development Division 2622, retired yesterday after more than 16 years at Sandia. He joined the company in March 1952 and has worked with the electronics

group for about 10 years. Before coming to Sandia, he worked for Rathen Manufacturing Company in Massachusetts as supervisor of field engineers.

Mr. and Mrs. Bowman's retirement plans are indefinite. They are considering making their home on the west coast. They own a residential lot in Pismo Beach but are as yet undecided about building there.

Mr. Bowman says they will travel to see more of this country. His other interests include fishing and sailboating.

Coronado Club Activities

Dixieland Allstars Will Play for Roaring 20s Party Tomorrow

McCosky's Dixieland Allstars—one of the swingiest groups in Albuquerque—will set the pace for the Roaring Twenties Masquerade Party tomorrow night at the Coronado Club. Special entertainment, including a chorus line of dollies from the Sanado Club, will add to the festivities while the Club's kitchen staff wheels out New York sirloin steaks. Prizes will be awarded for the best masks.

A social hour beginning at 6 p.m. will start things out right with dinner following at 7. Entertainment begins at 8:30 and McCosky will break things up starting about 9 p.m. with dancing.

Social Hours

Tonight, the Club has booked Elton Travis and the Swinging Westernairs for a special four-hour social hour. The group will make happy music from 6 until 10 p.m. while the Club's famous southern fried chicken buffet is spread. Pat Reich and piano will entertain with a sing-along in the main lounge from 9 until 12.

On Friday, Nov. 8, the Rhythm Masters will play for dancing while the Mexican food buffet is served.

The Aristocrats will hold the bandstand

on Friday, Nov. 15. The seafood buffet will be served.

The buffets cost \$1.25 for adults, \$1 for kids.

Teen Go-Go

The Circuits will be plugged into the bandstand to spark the teen go-go scheduled Saturday, Nov. 16, from 7:30 until 10:30. Member parents should pick up tickets at the Club office.

Bridge

Duplicate bridge meets Mondays at 7 p.m. On Monday, Nov. 18, the group will hold an open pair championship tourney and a dinner meeting. For reservations, call 268-7605.

Ladies bridge meets at 1 p.m. Thursday, Nov. 7.

Aquatic Club

The Coronado Aquatic Club will open the winter swim program Nov. 1 at the Sandia Base pool.

Hours for the winter swim season will be Tuesdays from 4 to 6 p.m. and Wednesdays and Thursdays from 4:30 until 6:30 p.m. Coaches for the coming season will be Reed Barnitz and Lorie Goddard.

New swimmers are invited to join the group. Additional information is available from either Chuck Mills (4541), tel. 264-1958 or Frank Duggin (4312), tel. 264-1235.

Welcome . . . Newcomers

Oct. 14-25

Albuquerque	
Clyde P. Cano	4574
Charlotte Haynes	2491
E. Cleo Kerr	3126
William Kozlowski	4574
*Robert F. Thomas	4574
California	
Julian A. Lovato, Woodland Hills	7651
Anthony Mulac, Palo Alto	9342
Alan J. Toepfer, Inglewood	5242
Texas	
John E. Vogel, Houston	9422
* Retired	

Talk on Humor Set for Sanado Meeting Nov. 12



"In the Varicose Vein—The Anatomy of American Humor" is the title of a talk to be presented at a luncheon meeting of the Sanado Woman's Club Tuesday, Nov. 12. Speaker will be Keith Berwick, television performer, author, lecturer and historian.

The speaker holds a PhD degree from the University of Chicago and is a past editor of PACIFIC REVIEW. He has been on the history faculty of UCLA for the past eight years and is moderator of a top-rated TV show, "Speculation," in the Los Angeles area.

Reservations are due today and should be made by mail with Mrs. M. D. Perkins, 6704 Dodd Place N.E.

Continued from Page One

New Apprentice Program

tunity to develop their full potential," he says. "We should be able also to provide additional maintenance service to the Laboratories. Our workload is increasing because of the continuing addition of new buildings and equipment. The complexity of the equipment is increasing, and we are being asked to provide more and more support to technical programs. The new apprenticeship program should enable us to meet these challenges."

The new program is registered with the Bureau of Apprenticeship, United States Department of Labor, and the New Mexico Apprenticeship Council.

In a letter of congratulations to Jacob E. Young, Jr. (4253), president of the Metal Trades Council, B. A. Gritta, presi-

dent of the executive council of the AFL—CIO Metal Trades Department in Washington, D.C., said, in part:

"The Corporation and the Council are to be congratulated on their cooperative efforts which have been responsible for these fine new programs coming into being."

Congratulations

Mr. and Mrs. D. L. Allensworth (5133), a daughter, Stacey Lynn, Oct. 17.

Mr. and Mrs. J. W. Reichardt (2613), a daughter, Rachel Bea, Oct. 6.

Mr. and Mrs. J. A. Leonard (9521), a daughter, Jennifer Lee, Oct. 9.



VISITING SANDIA LABORATORIES for briefings on Oct. 16 were (l to r) Captain James G. Whiteaker, USN, member of Military Liaison Committee; Commissioner Francesco Costagliola, AEC; Major General Robert E. Coffin, USA, MLC member; Honorable Carl Walske, chairman, MLC; Brigadier General James A. Hebbeler, USA, MLC member;

Brigadier General Charles W. Lenfest, USAF, MLC member; and Vice Admiral Lloyd M. Mustin, USN, Director, DASA. Commissioner Costagliola was appointed by President Johnson on Sept. 20 and was making his first trip to Sandia Laboratories in that capacity.

SANDIA CORPORATION

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