



VISITING Sandia Corporation's Sphere of Science recently visited W. G. Duvall, Director of Personnel and Labor Relations, Western Electric Company; R. B. Powell, Vice President, Personnel, 3000; and D. S. Tarbox, Director of Security and Industrial Relations, 3200. Mr. Duvall visited Sandia Corporation May 30-31 for indoctrination in Sandia's personnel and labor relations policies. He also took part in a tour of Sandia's laboratory facilities.

Sandia Lab Employees Are Awarded Degrees by St. Joseph's College May 30

G. C. Dacey to Speak To IRE Group on Electron Devices

G. C. Dacey, Vice President Research, 5000, will speak before the IRE professional group on Electron Devices on June 18 at 8 p.m. in the hospitality room of the Albuquerque National Bank, East Central Branch.

Mr. Dacey's subject will be "Electron Devices in Europe." Anyone interested in the subject is invited to attend. No reservations are necessary. For further information contact Cecil Land (5132), ext. 20173.

Associate of Arts Degree Is Awarded George W. Perkins

George W. Perkins (8234-1) has received his Associate of Arts degree at Diablo Valley College in Concordia, Calif. His major was in business administration.

George attended classes three nights a week for the past three years under the GI Bill. In that time he maintained a 3.61 average, graduating with honors. He has been employed at Livermore Laboratory for five years.

Two Sandians received Bachelor's degrees during commencement exercises at St. Joseph's College May 30.

Mary Lou Werner of Library Section 3421-1 received her Bachelor of Arts degree in English. She attended St. Joseph's for five years to earn this degree. During the past year she has taken courses under Sandia's Educational Aids Program. Mary Lou has been at Sandia since March 1956.

Leo P. Apodaca of Scheduling Section 2641-1 completed work for his Bachelor's degree in Business Administration. Since he is presently with the Test Group in the Pacific, Leo's father, Salomon L. Apodaca (4221-5), received the diploma in his behalf. Completion of this college work represents eight years of attending courses at night. He has been employed by Sandia Corporation since August 1948.

Emergency Almanac Going Into Booklet Racks Next Week

Sandia Laboratory booklet racks during the coming week will feature "Family Emergency Almanac." This pamphlet covers the most common hazards in normal activities and risk situations facing families. It can be used as a guide to life-saving action.

More Than One Hundred Sandians on Duty at AEC's Nevada Test Site

While a Sandia Corporation contingent continues its activities at Operation Dominic in the Pacific testing area, other Sandians are hard at work on test projects and associated support activities at the Nevada Test Site.

"Personnel from Sandia and Livermore Laboratories are involved in a heavy work program at NTS," P. D. Seward of Field Support Section 2643-3 commented recently. "Their activities are comprehensive in scope and are being carried out on a continuing basis."

Test group director for Sandia's activities is J. C. Eckhart (7250). Alternate directors are B. C. Benjamin (7251) and A. J. Max (7254). Deputy test group director is C. L. Gomel (7256).

Sandia project leaders and projects include: R. G. Oliveira (7251),

Safety Seismic Network; E. S. Ames (7251), Special Measurements; F. Shoemaker (7254), Microbarograph Studies, and C. E. Ingersoll (7254), Hydrodynamic Measurements. Other project leaders are R. K. Petersen (8133), R. J. Burton, F. B. Collins, L. F. Brady, E. L. Jenkins, and G. W. Duffield (all 7254), H. H. Cole (8133), and W. R. Long (8132).

Over one hundred Sandia personnel have been assigned, or are currently assigned to Sandia activities at NTS. Support for the projects is being provided by personnel in the following fields: Engineering and Construction, supervised by W. E. Cordek (7256); Administration and Logistics, A. R. Verardo (2643); Plans and operations, P. D. Seward (2643); and Photographic Support by personnel of Technical Photography Division 7244 and Photographic Section 8122-1.



T. B. Cook Named New Director Of 5400 Org.

Thomas B. Cook, Jr., Manager of Nuclear Burst Physics Department 5110 for the past three years, was appointed Director of Nuclear Burst Physics and Mathematical Research 5400, effective June 1.

The 5400 organization will be comprised of Nuclear Burst Physics Department 5400 (formerly 5110) and Mathematical Research Department 5420.

Mr. Cook has been with the Nuclear Burst organization since he joined Sandia as a staff member in August 1951. He was promoted to section supervisor in November 1955, and became division supervisor in August 1956.

Prior to coming to New Mexico, he held several fellowships at Vanderbilt University in Nashville, Tenn. He received his PhD degree in Physics from Vanderbilt in 1951, and his Master's in 1949. His BS degree is from Western Kentucky State College.

Mr. Cook is a member of Sigma Xi, honorary research society; the American Association of Physics Teachers; and is a Fellow of the American Physical Society.

He served two years in the Navy as an electronics instructor during World War II.

He is at present a consultant to the Director of Defense Research and Engineering, the Scientific Advisory Board of the Air Force, to Aerospace Corporation, and to Defense Atomic Support Agency.

R. S. Cox Will Lead Management Group In New York City

One of the American Management Association workshop seminars to be held in New York City June 20-22 will be led by Robert S. Cox, supervisor of Accounting Methods Division 4113.

Mr. Cox and Ernest A. Taylor of Imperial Oil Ltd., Toronto, Canada, will conduct the session on "Selecting, Controlling and Evaluating Systems and Procedures Projects and Programs."

Included will be discussion of shaping the systems programs, planning specific projects, controlling the systems program, evaluating systems projects, and problems and benefits of planning, control and review. The workshop will conclude with a discussion of attendees' experience, problems, and plans.

The AMA workshop seminars are designed for small groups of operating executives. The intensive, guided discussions are within specific management areas.

Surplus Equipment to Be Auctioned By AEC Includes Cars, Trucks

A number of vehicles and other surplus equipment will be auctioned off to the highest bidder Saturday, June 23, starting at 1 p.m. at the area adjacent to the Sandia Laboratory Salvage Yard.

Each item of surplus property is offered for sale on an "as is" and "where is" basis. Bidders are urged to inspect the property prior to bidding.

The sale is open to the public although prospective purchasers must register beforehand and sign a copy of the sales conditions. Identification cards will be given prospective purchasers at the time of registration.

Payment will be made to the auctioneer and may be in the form of cash, cashier's check, certified check, or money order.

Any bidder who is an employee of the AEC or any of its cost-type contractors must declare that he has not participated in the seller's determination to dispose of the property, in preparation of the material for sale, in determining the method of the sale, and has

not acquired information not generally available to the public regarding usage, condition, quality, or value of the property.

Included in the sale are: 1957 Ford 6 four-door sedan; two 1958 half-ton Ford 6 pickups; four 1958 Ford 8 sedan delivery; five 1958 half-ton Chevrolet 6 carryalls; 1958 Ford 6 four-door Country Sedan station wagon; six 1956 half-ton Chevrolet 6 pickups; five 1956 half-ton Chevrolet 6 carryalls; three 1956 one-ton Ford 6 stake trucks; two 1956 Chevrolet 6 four-door sedans; and 1957 Ford 6 four-door, eight-passenger station wagon.

Group 2 includes two Truckster gasoline motor scooters and a one-ton, two-wheel U.S. Quartermaster Model trailer.

Group 3 is comprised of six forklifts, both gasoline and electric, ranging from 6000 to 8000 lb.

Included in the 18 items which make up Group 4 are a vault cabinet, cooling tower, diesel generator, electric hoist, arc lamp, two electric trolleys, several machines, a telephone control switchboard, space heaters, and welder's bench.

AEC Plans Remodeling Of Bldg. 828 for Use by 1400 Org.

Bids are scheduled to be opened June 19 for modification of Bldg. 828, the Atomic Energy Commission has announced.

The building will be remodeled to house component development laboratories and offices for Divisions 1414, 1422, 1431, and 1432. In addition, a drafting support area will be provided for organizations 4424 and 4413-3. A specifications and catalog library will be operated in the building by 3421-1.

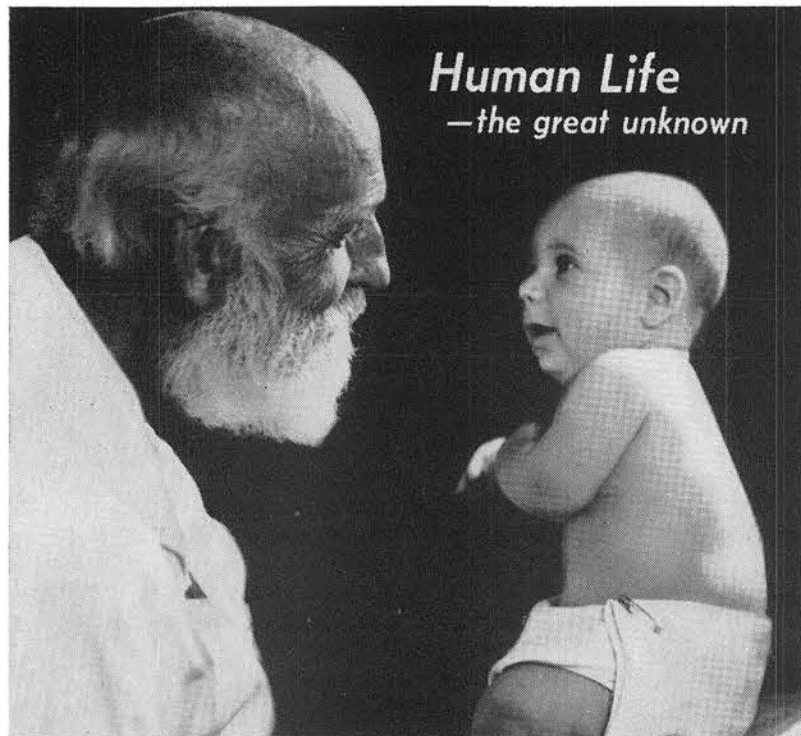
Modifications will include removal and additions of partitions, flooring and ceiling work, painting, removal and rewiring of the electrical system, rework of heating, and ventilating and piping systems work.

Plant Engineering project engineer is Murl B. Moore (4543-3). Work is expected to be completed within 90 days after the AEC notifies the contractor to proceed.



A NOSTALGIC TOUCH of Tonopah is the "Buckeye Bar" trailer at the Sandia installation at Kauai, Hawaii. Assembled before the "Buckeye Bar" are (1 to r) Don MacKenzie (7132), William

Walker (7133), Don Johnson (7134), Hermann Wente (7131), Floyd Forsythe (7132), Walter Haskell (7133), Bruce Barth (7133), and Don Rigali (7132). All are in Aero- & Thermodynamics Dept.



Editorial Comment

Human Life—The Great Unknown

How much do we know about human life? Not nearly enough. The great promise of youth so often is not realized. So much of what happens between birth and maturity depends upon factors we do not fully understand.

Through knowledge, our lives have been made more meaningful in many ways. Science has greatly reduced the impact of disease. Research has made us more productive, more capable of coping with our environment.

And today man can dream of moving beyond familiar patterns of scientific endeavor. Our minds can reach out for knowledge of life that will give us greater control of our destiny and permit human beings to realize their greatest potential.

Today there is being conducted a campaign to build the Salk Institute of Biological Studies. The Institute is being built to give full scope to the creative powers of those scientists who are eager to explore the challenge that lies in the fundamental nature of science itself. In this laboratory, eminent scientists from the world over will apply their imaginations and knowledge to questions that bear on the future of mankind.

The common goal of a better world demands that scientists and public work together, as they did in the problem of solving polio. The Institute, which will have Dr. Jonas Salk as director, is an opportunity for all Americans to join science in this momentous quest into the science of life.

Welcome Newcomers

May 21-June 1

Albuquerque		Utah	
Glen D. Casey	4574	James D. Dudley, Provo	5132
*Lorraine E. Cook	3126	Paul D. Wilcox, Midvale	1314
Rachel O. Duncan	3126		
*Leno Jo. Houser	3126	Returned from Leave	
Warren G. Medley	4574	Joel S. Gilbert, Norman, Okla.	2532
R. Rae Sprague	4135	Glendon D. Self, Stillwater, Okla.	2561
Adefina Wade	3126	Marilyn J. Taylor, Albuquerque	3126
Dorothy E. Welch	3126	Joanne F. Wiesch, Albuquerque	3423
Cindy L. Williams	3452		
Florida		Temporary Summer Hires	
Calvin J. Nash, Orlando	3311	*Roger F. Dashen, Pasadena, Calif.	5111
Iowa		*Goebel Davis, Jr., Albuquerque	1314
Charles A. Goblen, Ames	5322	Jerome G. Doidge, Ames, Ia.	5132
		*Raymond P. Lutz, Jr., Ames, Ia.	4111

Arms Quality Control of King Charles I Researched in Depth by Sandia Engineer

On a day in June 1631, Charles Stuart, King of England, entered a commission in the Chancery Patent Rolls on the subject of arms and armor, and containing orders in regard to patterns.

Two years ago, L. E. Snodgrass of Quality Control Division 2561 began a personal research project for a proposed paper on quality control in early firearms. "My search for material brought me into contact with Dr. F. A. Carten of the Office of the Chief of Ordnance in Washington, D. C.," he explained recently. "Dr. Carten sent me a photostatic copy of the commission of Charles I, which is regarded as one of the earliest recorded references to quality and to control of specifications for arms manufacture."

Mr. Snodgrass recognized the significance of the commission, and its relation to work in quality



FRAMED facsimiles of coat of arms of King Charles I of England (1600-1649) and commission regarding quality control of arms and armor were researched by L. E. Snodgrass (2561). Cynthia Kelly (3113-1) reproduced the coat of arms and commission with tinted ink, pen, and parchment materials.

ished the art work, the parchment was carefully matted and framed."

On May 14, Mr. Snodgrass presented the framed display to the local section of the American Society for Quality Control, along with a paper discussing the history and quality significance of the commission. On May 24, the display was presented at a national convention of the ASQC in Cincinnati, Ohio. It will remain at ASQC National Headquarters.



Cynthia Kelly
—drew coat-of-arms—

control at Sandia Corporation, and the interest it would hold for those in the QC profession. He undertook development of a plaque for suitably mark this proclamation for ASQC.

Standardize Characteristics

"The document represents a determination by royal decree to standardize on certain characteristics in arms design and fabrication, and to seek quality and uniformity through better controls," Mr. Snodgrass said. "The parallels between Charles' concern with quality control and our own at Sandia hardly need pointing out."

This extract is from a period we might call the threshold of quality arms manufacture to specification—a period with industrial concerns resembling those of today—a time when necessity pressed hard and organization in manufacturing began to emerge from the tangled affairs of the day.

The History and English departments of the University of New Mexico furnished Mr. Snodgrass with help in translating and verifying the archaic and highly-legal phrasing of the original commission into a modern version. In the rare books section of the UNM Library, he was shown an original book written by Charles I which contained the King's seal. The College of Arms in London provided information about the Stuart's family crest.

"At this point, I contacted Cynthia Kelly (3113-1), and persuaded her to accept the task of reproducing, with pen and ink, the crest, the original version of the commission, and a modern translation," Mr. Snodgrass continued.

Supplies from England

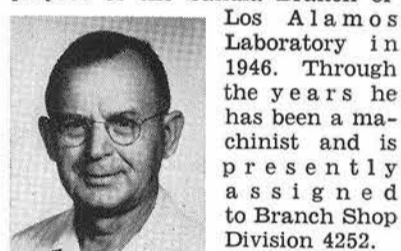
Cynthia did the job in her spare time at home. She obtained materials from a London firm that supplies the delicately-tinted inks used in drawing up crests, coats of arms, and other heraldic devices. She used parchment. Upon it she placed the intricately-detailed coat of arms of Charles Stuart, and below the coat of arms, the original and translated versions of the commission.

"Cynthia did a beautiful job," Mr. Snodgrass said. "After she finished

"The research and preparation for our reproduction of the commission was a fascinating experience," Mr. Snodgrass concluded. "Many people provided invaluable help. The commission serves to put an interesting historical perspective not only upon Sandia's concern with quality control, but with the concern of any modern industry."

Jeme Wolintz to Retire June 30

Jeme Wolintz, who will retire June 30, was one of the early employees of the Sandia Branch of



Los Alamos Laboratory in 1946. Through the years he has been a machinist and is presently assigned to Branch Shop Division 4252.

Mr. and Mrs. Wolintz will continue to make their home at 620 Charles Pl. NW; however, they plan considerable travel. "We'll be free to go where we like and stay as long as we like," Mr. Wolintz notes.

In the offing are a trip to Louisiana to visit Mrs. Wolintz's family and probably another to the West Coast. Mr. Wolintz enjoys fishing, boating, and spectator sports. "In fact," he says, "sometimes I like to drive to the mountains and just sit and look at the scenery."

Sympathy

To P. J. Krogdahl (7532) for the death of his father-in-law in Oklahoma May 20.

To Francis Shea (4553-1) for the death of his father recently.

To Jacob E. Young, Jr. (4253-3) for the death of his father.



Mary Kay Dunn (3126-5)

Take a Memo, Please

Seat belts can save you serious, and often disabling, injury. Don't say it's a good idea to have them, get them!



REPRESENTATIVES of integrated contractors for the AEC, attending Test Equipment Symposium at Sandia Laboratory May 23-24, included (l to r) Paul F. Brown, General Electric Company; Malcolm R. Easterday, Bendix Corporation, Kansas City; L. J. Paddison, Director of Product Test

Equipment Development, 2400; A. J. Thompson, Union Carbide Company, Oak Ridge; and William C. Kraft, Manager of Component Test Equipment Development Department 2450. The meeting covered general information on acceptance of test equipment as well as data on other topics.

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Deadline: Friday noon of the week prior to publication.

WALTER W. WESTMAN to supervisor of Engineering Design Practices and Reliability Division 2442, System Test Equipment Development Department.



Walt has been with Sandia Corporation eight years and has been a section supervisor for the past eight years.

He came to Albuquerque from the University of Washington where he received a BS degree in electrical engineering.

His previous experience includes six years in communication maintenance at Kodiak, Alaska, for what is now the Federal Aviation Agency, and six years with the Boeing Company in Seattle.

During World War II, Walt served two years with the Navy in the South Pacific.

He is a member of Tau Beta Pi, engineering honorary; Sigma Xi, scientific honorary; the Institute of Radio Engineers; and is a registered professional engineer in New Mexico.

WILBUR V. MCGUIRE to supervisor of Drafting Division 8114, Livermore Laboratory.



"Bill" joined Albuquerque in 1952, where he was assigned to the drafting organization. In February 1957 he was promoted to supervisor of a drafting section. Last summer, Bill transferred to Livermore Laboratory where he has been supervisor of Tool and Gage Design Drafting Section 8114-4.

Before coming to Sandia, Bill worked for five years as a drafting designer for Pullman Standard in Chicago. Before that, he worked two years for Barnes and Reincke Engineering Company in Chicago, and for three years at Allis Chalmers in Milwaukee.

A registered professional engineer in New Mexico, Bill attended night classes at Northwestern University and the University of New Mexico, concentrating his studies in math and mechanical engineering.

During World War II Bill served three years in the Navy as a pilot on carrier-based planes, mainly in the Pacific.

EDMUND G. FRANZAK to supervisor of Applied Solid State Section 7223-2, Advanced Development Division.



Ed has been with Sandia Corporation about four years in addition to temporary employment during the summers of 1958 and 1960. During his first year at Sandia he was assigned to the 1300 organization. Since then Ed has worked entirely for Physical Sciences Research Department 5150 in solid state theoretical physics and research in electron-phonon interactions.

He received his PhD in theoretical physics and MS in physics from Northwestern University. He also has a MS degree in electrical engineering from the University of New Mexico. His BS degree in electrical engineering was from Fournier Institute, LeMONT, Ill.

Prior to re-joining Sandia in July 1961, Ed taught theoretical physics at the University of Missouri for a year and a half.

He is a member of the American Physical Society and the following honorary societies: Sigma Xi, Phi Kappa Phi, and Kappa Mu Epsilon.

BYRON F. MURPHEY to manager of Nuclear Burst Physics Department 5410.



Byron first came to Sandia in 1949 to work in the Weapons Effects organization and was promoted to division supervisor before he left in 1953. He returned in 1958 and was promoted to supervisor of Underground Physics Division a year later. In May 1961 he was laterally transferred to Applied Research Division 5132.

From 1953-58 Byron was leader of a physics section of the central research department of Minnesota Mining and Manufacturing Company in St. Paul, Minn.

Previously he also had worked four years as a physicist for the Naval Ordnance Laboratory in Washington, D. C.

Byron received both his PhD and Master's degrees in physics from the University of Minnesota. His Bachelor's degree, with a double major in physics and mathematics, is from the University of Montana.

He is a member of the American Physical Society, American Association of Physics Teachers, and Sigma Xi, honorary research society.

A. L. ANDERSON to supervisor of Product Tester Section II, 2451-2, Component Test Equipment Development Department.



"Andy" has been at Sandia for 10 years and has been assigned to either Component Test Equipment Development Department or

to Systems Development Department.

Before coming to Sandia, Andy worked two years as an electrical engineer for Corn Belt Power Co-op in Humboldt, Ia., and for a brief period in the same capacity with an engineering and construction firm in Des Moines, Ia. He also taught high school for two years in Randall, Ia.

Andy received his BS degree in electrical engineering from South Dakota State College.

He served three years in the Army Signal Corps.

ROBERT K. VOKES to supervisor of Operations Section I, 3451-2, Electronic Data Processing Department.



Bob has been at Sandia since November 1956 and has worked in the same department the entire time.

Previously he was a salesman for National Cash Register Company in Albuquerque for five years. Prior to that he worked a year for an air conditioning firm here as a salesman and later as office manager.

Bob received a Bachelor's degree in business administration from the University of New Mexico.

He served four years in the Navy, some of the time in the Philippines.

DAVID H. ANDERSON to supervisor of Applied Research Division 5132, Physical Research Department.



Dave has been assigned to Division 5132 since he came to Sandia in February 1959. He has been doing research on internal fields and ferroelectric crystals.

Previously he received a PhD degree in physical chemistry from the University of Illinois, an MS in physical chemistry from Harvard University, and a BS degree in chemistry from Northwestern University.

Dave is a member of the American Physical Society and the American Chemical Society and the following honorary societies: Sigma Xi, Phi Lambda Upsilon, and Phi Kappa Phi.



TOUR of Nevada Test Site facilities and locations on May 18-19 was attended by (l to r) G. P. Stobie (7255), C. S. Selvage (7164), B. C. Benjamin (7251), G. C. Dacey (5000), J. W. Easley (5300), R. S. Claassen (5100), and T. B. Cook (5400). They are shown in front of the Project Rover Maintenance and Disassembly Building.

Sandia Officials Visit Nevada Test Site

On May 18, twelve Sandia Corporation personnel inspected facilities of the Nevada Test Site's Frenchman's Flat and Area 16. On May 19 they went to Area 400, Yucca Flat, and NTS Area 3.

Attending were G. C. Dacey, Vice President, Research, 5000; R. S. Claassen, Director of Physical Research, 5100; J. W. Easley, Director of Radiation Physics, 5300; and T. B. Cook, Director of Nuclear Burst Physics and Mathematical Research, 5400.

Also attending to answer questions were B. C. Benjamin (7251), C. L. Gomel (7256), D. G. Palmer (7251-2), R. W. Frame (7251-2), and T. J. Flanagan (7251-2).

G. P. Stobie (7255) conducted the visit to Area 400. Accompanying the group were B. C. Benjamin (7251), C. S. Selvage (7164), and A. D. Thornbrough (7251-1).



F. M. Smits

F. M. Smits Heads Radiation Physics Department 5310

On May 17, F. M. Smits became manager of Radiation Physics Department 5310. He comes to Sandia from Bell Telephone Laboratory's Semiconductor Device Laboratory.

Mr. Smits' initial work at Bell Labs involved purity diffusion in semiconductors. He later supervised a group engaged in exploratory device development, and he worked on evaluation of solar cells for space applications with particular emphasis on expected radiation damage in the Van Allen radiation belt.

He received the PhD degree in nuclear physics from the University of Freiburg, Germany, in 1950. From 1950-54, he worked as a research associate at the University of Freiburg. In 1954, he began his career at Bell Labs.

He is a member of the American Physical Society.

Monitoring Subject

W. F. Jemison (1422-3) will speak on "Sterilization—An Example of Reliability Improvement Through Monitoring" at the Aerospace Transportation Conference in Denver, Colo., June 17-23.

Young Jan Patrick Enthusiastic About Programming Theoretical Research

A sweeping view of Tech Area I and the Sandia Mountains is visible from Rm. 370 in the new Research Bldg. 806. "I like it," 25-year-old Jan Parick says. "I feel on top of the world."

Her job in Research Division II 5152 is programming scientific problems of solid-state theoretical physics for solution by Sandia's CDC 1604 computer. This requires an intimate knowledge of mathematics and the logic of high speed computers, a far cry from the little nine-year-old girl who used to come home crying that arithmetic was too hard.

"My father set me straight," Jan says. "He patiently explained the decimal system and, after that I enjoyed math."

She attended the University of New Mexico on an academic scholarship and was graduated with a BS degree in mathematics in 1959. Active in student affairs as a student senator, sorority scholastic chairman, class secretary-treasurer, and member of the pep

club, Jan still made the Dean's list of honor students.

Interest and Energy

Now she brings the same kind of interest and energy to her job at Sandia. Her work begins with a theoretical statement of equation from one of the research physicists in the Division. With the physicist she discusses the general approach to computer solution. Sometimes she uses the Tech Library or consults with a research mathematician of Division 5426 to decide which of various methods might be best suited for the problem.

The next step is to "flow-chart" the program. This is mapping out the logical strategy for computer use. "When the flow-charting is finished, I usually discuss the computer storage allotments, inputs, output forms, etc., with the theorist," Jan says. "From the finished flow-chart I proceed to code the problem in symbolic language. The coded program is then punched on cards and sent to

the computer to be assembled into basic machine language."

The assembled program, now in the form of binary punched cards, is ready for checkout. "It is very seldom that a program of any complexity runs correctly the first time it goes on the computer," Jan says. "After each run, I get a 'dump'—a number-picture of what was going on in the machine when my program stopped. With a little detective work, I can hunt down and correct the bugs until the answers I get coincide with hand calculations."

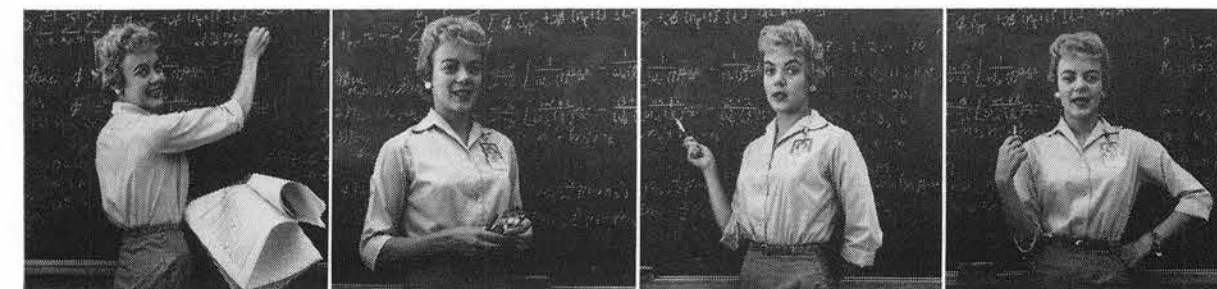
Final Data Analysis

When checkout is complete, the program goes into production. Jan inputs all the variable quantities of the problem and begins to collect data for analysis. Some programs run as long as 15 hours on the computer.

"With the results obtained I begin the final data analysis," Jan says. "This may involve compiling charts or graphs and perhaps drawing other information which the physicist can use in his research. More often than not the results of one program can be used as input for another."

Jan is not unique at Sandia. Among the 40 programmers who prepare work for Sandia Lab computers, 16 are women.

"Still," she says, "I feel special. Programming is relatively a new occupation for women. I hope to improve my programming standards and to learn enough mathematics and physics to perform more complex analysis and contribute some work of real worth to research."



JAN PATRICK (5152), scientific computer programmer: "There is really much more to programming than coding algebraic equations for the computer. Perhaps the diversity in activities is

responsible for my enthusiasm for the job. I hope to learn enough mathematics and physics to do more complex analysis and contribute some original work of worth to Sandia Corporation research."

Legal Matters, Patents, Finances Are All Concerns of Organization 6000

The organization of F. C. Childs, General Attorney, Secretary, and Treasurer 6000, has four main lines of effort: general legal and patent matters, finances, and Secretary of the Company.

General Legal

In explaining the general legal work, Mr. Childs pointed out that a variety of authorities and influences govern Sandia Corporation's activities.

Sandia Corporation is chartered under Delaware law as a business corporation. In view of its employment of more than 7800 people, the multi-state location of these people and company activities, and the federal nature and funding of company operations, the Corporation is subject to numerous federal, state, and local government laws and regulations.

Sandia is party to many contracts, each of which establishes legal rights and obligations that must be respected. Foremost among these is the Sandia-Western Electric Company Prime Contract with the Atomic Energy Commission.

"Precepts of fair dealing and public responsibility are important with respect to all these company undertakings," Mr. Childs said, "as it is management's intention to adhere to the highest standards of ethical business practice."

In general, the mission of Sandia's attorneys — Mr. Childs, R. A. Ledogar (6030), and T. M. Gemberling (6041) — is threefold:

To advise about requirements of applicable laws, regulations, contracts, ethical standards, and other authorities.

To assist in casting company operations so as to satisfy the governing requirements and to be effective for the company purpose involved.

To counsel upon the legal and business aspects of such company matters as any company representative may bring to their attention.

"To carry out this mission," Mr. Childs said, "we keep currently aware of developments in the law and regulations that bear upon the company's operations. For this reason we subscribe to more than a dozen legal and legislative services.

"Perhaps the most significant federal law for Sandia is the Atomic Energy Act of 1954 and the extensive regulations made effective by the AEC under that law," Mr. Childs continued.

"We try to keep well informed about what is going on in the company," he said. "In that connection, the meetings and briefings for the small staff are particularly helpful. Mr. Ledogar and I are members of the Employee Review Committee and either Mr. Ledogar or Mr. Gemberling attend the meetings of the Editorial Committee.

"We get information from company instructions and releases that are issued. In some cases, of course, we participate in the preparation of these items. We pick up a good deal of information by virtue of being part of the company organization and associating with other employees. This is an advantage that accrues to house counsel that would be largely unavailable to an outside law firm that represented the company's interest.

"Finally, we get much of our knowledge of Company undertakings from the study of matters presented to us for advice or other action. Sandia Corporation Instruction 1151 establishes some broad guidelines concerning the matters to be referred for legal consideration or approval."

Daily Problems

The problems that come to the attorneys daily are of many different kinds. They may involve analysis and interpretations of the Prime Contract, AEC regulations, the Atomic Energy Act, and Fed-



SUCCESSOR F. C. Childs, left, as General Attorney, Secretary and Treasurer, July 1 will be F. C. Cheston, right, presently Attorney for Western Electric Company. Mr. Childs, who has headed the 6000 organization since July 1959, has accepted the position of General Attorney, Secretary and Treasurer of Bellcomm, Inc.

eral laws respecting wages, hours or working conditions, including nondiscrimination in employment. They may be concerned with the application of state and local laws respecting sales, use, franchise or other taxes; unemployment benefits, workmen's compensation, registration and licensing of radiation sources, and the like.

Sandia attorneys provide study and advice about employee benefits, terminations, garnishments, tax levies, subpoenas, and complaints. There's a considerable quantity of activity rooted in the company's purchasing operations.

"We spend much time drafting, reviewing, and revising letters, contracts, memoranda and other writings for use both inside and outside the company," Mr. Childs said.

No jurisdictions are established for any of the three lawyers with respect to the matters he is to handle. It is the intention that the interesting and routine matters be distributed relatively evenly. In theory all matters come first to the General Attorney who makes the distribution.

"In practice, of course, as one attorney gets involved in a subject any problems related to it tend to be referred to him," Mr. Childs said.

Of the matters currently receiving the attention of Sandia's attorneys, the following are perhaps of principal interest:

The preparation and negotiation of two instruments of understanding with the AEC covering Sandia's operation of the new Engineering Reactor Facility (5000) and the Nuclear Aerospace Safety undertaking (7000); advice and assistance concerning a proposed agreement affecting Sandia's use of the Pacific Missile Range (7000); registration and licensing of radiation sources at Livermore under a new California law (8000); the legality and advisability of Sandia's participation with other integrated contractors in various technical associations (2000); and the extension and modification of the Technical Development Program Agreement with the University of New Mexico (3000).

Other current matters are the preparation of new forms of contract for use by the Purchasing organization (4000); assistance at a trial in District Court, Bernalillo County, of a Workmen's Compensation case; and several claims by suppliers for reimbursement of

costs under circumstances where the right to reimbursement is not clear.

Approximately 50 per cent of the general legal activity concerns the Company's purchasing operations and its purchasing orders. There is a daily volume of effort related to approval of purchase orders and analysis, advice and other action concerning problems that arise in the course of negotiation and performance of purchase orders.

Patent Manager Function

The cornerstone of the Patent Manager activity is found in the requirement of the Prime Contract that all inventions or discoveries made or conceived by Sandia employees or Bell System employees on loan to Sandia or performing work for Sandia must be disclosed in complete detail to the Commission.

The Commission alone has the power to determine whether a patent application shall be filed in any case and to determine who shall have title to and rights under any patent that may issue, subject to a reservation of royalty free licenses to Bell System companies covering public service communication equipment.

"In a laboratory employing more than 3200 technical personnel," R. M. Betz, Sandia Corporation's Patent Manager, 6010, said, "hundreds of inventive ideas are generated every year."

Information Review

For this reason, Gene C. Newlin, supervisor of Invention Reports Division 6011, continually reviews and examines Sandia Corporation technical information, technical reports, and public information releases. In addition, Mr. Newlin periodically talks with heads of line organizations working in specialized technical fields and discusses possibly patentable developments.

"What we are looking for," said Mr. Newlin, "are devices, processes, and compositions which provide an unusual solution into problems or which have important new capabilities."

"Proof of the earliest date of the concept of an invention is extremely important when applying for a patent. The best way to establish the date of invention is by a written record in an engineer's notebook which has been properly signed, dated, and witnessed," Mr. Betz continued.

When an engineer or scientist has an idea he feels may be of



DISCUSSING patent considerations of a new electrical connector are Gene C. Newlin, 6011 supervisor, and Cecil E. Land (5132).

patent interest, he completes and forwards a Record of Invention Form. "At Livermore," Mr. Newlin said, "these forms are channeled through Neil Givens (8233-1) who performs liaison function in many phases of our work."

Working from this form, Patent Department personnel examine the disclosure in the light of "prior art"—Is this really a new discovery in the particular field of technology?

Broad Knowledge Needed

Answering this question requires knowledge of many scientific fields. The Patent Department checks the disclosure against various references, periodicals, and publications. They also discuss the disclosure with other engineers and scientists.

If the decision is made that the idea may be patentable, Mr. Newlin will prepare the material for submission to the AEC/ALO Patent Attorney. The AEC then decides whether or not patent applications should be prepared on this material. This is a highly technical specialty in which Department 6010 furnishes assistance to the AEC.

The Patent Department activity extends to negotiating patent licenses and technical information agreements as required by suppliers.

Department 6010 also initiates requests to the AEC to furnish Corporation employees with representative patents in a particular field of technology. The Department takes action in connection with possible infringement of patent or other proprietary rights by Sandia Corporation or its suppliers.

Other activities include the review of agreements negotiated with consultants to Sandia Corporation, the establishment of pro-

cedures respecting the use of copyrighted subject matter, and the maintenance of a section of the Corporate File.

Financial Department

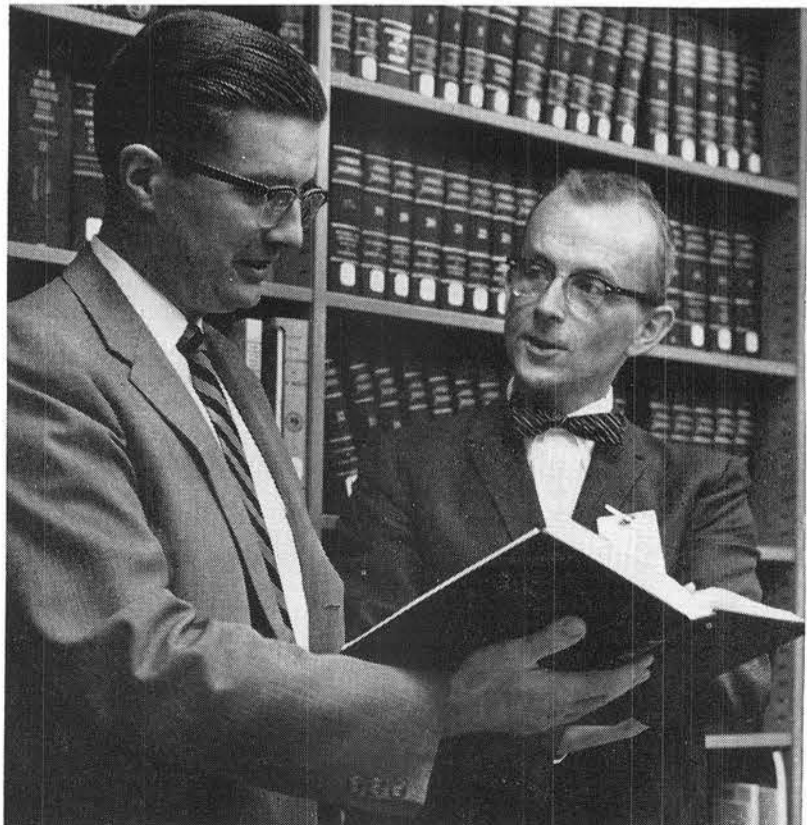
The office of Treasurer involves responsibility for payment, collection, and management of Company funds and it is Financial Department 6020 that handles the work and details of these matters.

"The most effective control management can have in business," Charles Olajos said, "is in the disbursement and collection of money." The Assistant Treasurer and Financial Department 6020, headed by Mr. Olajos, performs these two functions for Sandia Corporation.

Sandia's operating funds come from the AEC. Funds are requested for a four or five week period and the request is submitted by Department 6020 about one week before the first weekly remittance is needed. Vouchering, Payroll, and Accounting organizations prepare estimates for the fund requisitioning and Department 6020 uses these, plus the current bank balances, in compiling the request to the AEC.

Since Department 6020 is the only organization with normal disbursement authority, it maintains the bank accounts of the Corporation. Livermore Laboratory has an account in Livermore and disburses funds for minor procurements and for emergency or special payments to employees.

About 40 per cent of Sandia's disbursements go to Sandia's suppliers. "Before making the payments to suppliers," Mr. Olajos said, "we check to determine that credit requirements have been met



SHARING GENERAL LEGAL duties with the General Attorney are R. A. Ledogar (6040), left, and T. M. Gemberling (6041).

Eye Care, Do You?

Time, Effort Spent in Care Of Vision Is Worthwhile

Seeing involves such an automatic process that we seldom are conscious of the effort and energy it requires.

For example, having read this far in the Lab News your eyes may have begun to tire. If so, try this simple therapy: Look up from the page and glance about the room. Focus your vision on some distant point; then return to the page and resume reading.

Our eyes sometimes tire while reading for a sustained period of time. Often this is because our involvement with the reading matter causes us to be stingy in regard to restful "eyebreaks." An occasional looking away from our work or reading can provide our eyes without enough relaxation and rest to ward off eyestrain.

The movements of each eye are controlled by six delicate muscles. These same tiny eye muscles maintain the synchronization of one eye with the other. A weakness in any of the 12 muscles can bring about an imbalance to eye synchronization causing a distorted image to be produced. In effort to overcome this imbalance, people sometimes attempt, by squinting, to force the image into focus. Their efforts frequently result in eyestrain.

Much imbalance may be corrected by glasses properly prescribed and fitted. More severe cases of muscle imbalance may be alleviated through surgery.

Most problems of eyestrain result from reading or close work. Very little eyestrain occurs in distant vision. Eyestrain may also result from other causes.

If seeing becomes more difficult and vision becomes blurred you may need glasses. Eyes can become strained when conditions of nearsightedness, farsightedness, astigmatism, or other refractive errors are not corrected. One cause of eyestrain that may not come as good news is reading while traveling in a moving car. The motion of the vehicle produces a constant variation of the distance from eye to book, plus a varying intensity of light, adding an enormous burden to normal eye functioning.

Another cause of eyestrain is glare. Any source of light that causes discomfort or interferes with vision should be avoided. Sunlight reflecting from glossy paper can prove irritating to the eyes.

Can eyestrain permanently injure the eyes? Although many people feel that it can, ophthalmologists generally share the opinion that eyestrain will not produce any organic change in the eye. Continued aggravation of a strained condition can cause such severe symptoms, headache and nausea that the person would be forced to rest his eyes.

But the possibility that eyestrain can permanently damage the eyes is doubtful.

The Use of Sunglasses

In the summer we don our sunglasses to protect us from the direct rays of the sun and from glare reflected from sand and water. The use of tinted glasses helps relieve the wearer from annoying squinting or other eye discomfort.

Although sunglasses afford glare protection, we should avoid looking directly into the sun. The rays of the sun are so strong that none of the variety of commercially marketed sunglasses adequately can protect the eyes from possible damage.

Sometimes we overdo our use of sunglasses. Some persons wear sunglasses while driving at night to cut down glare from approaching headlights. Sunglasses or other tinted glasses should not be used for night driving since they reduce the total light transmitted to the eye, thus making it more difficult to see. Colored or tinted

automobile windshields may present the same hazard.

Is Television Harmful?

Television viewers may ask, "Will watching television harm my eyes?" It does not seem likely that television itself will cause eye harm. It can bring on symptoms of eyestrain if we watch the screen too long, too often or sit too close. These symptoms are more apt to occur if the viewer is in need of glasses, has a muscle imbalance, or some other potential cause of eyestrain.

The person having normal vision or corrected defects will not develop eyestrain from television if his viewing is not excessive and is tempered by common sense.

How can we assure the health of our eyes? There are several basic rules to promote eye hygiene.

Cleanliness is basic to good eye care. Infections are readily transmitted from one person to another by dirty hands, towels, or clothing. Any dirt or foreign body lodged in the eye should be removed by a physician.

Sleep, rest, and proper diet are necessary for healthy vision. When the body tires, so do the eyes.

Adequate lighting is required while reading. Proper illumination will help prevent eyestrain and nervous exhaustion. The U. S. Public Health Service suggests using a reading light of 100 watts, placed three feet in back and to one side of the reader.

Good Reading Habits

To derive the greatest benefit from the illumination and assure restful reading, attention should be given to a good reading position. The reading matter should be held 14 inches from the eyes at an angle of from 45 to 70 degrees from the horizontal. A book should be at a sufficient height to keep all sections of the page equi-distant from the eyes.

If your work requires you to handle chemicals or combustible materials, you can minimize the danger of accident by wearing goggles or safety glasses.

Early in their development, children should be taught good eye care and reading habits. Young children and adolescents often enjoy reading while sprawled upon the living room floor. This practice should be discouraged by parents because it frequently brings the printed matter too close to the child's eyes.

Particular eye care is needed as children progress in school and study requirements increase.

Well Worth the Trouble

To those who have adequate vision, proper eye hygiene can go far to prevent eye problems which handicap work, cause accidents, or even lead to blindness. Sufficient rest and diet, proper lighting, and occasional "eye-breaks" can help keep eyes healthy. But proper eye care alone is not enough. Periodic eye examinations can prolong eye health by detecting early symptoms of strain, reduction of visual acuity, or the beginning of some eye disease.

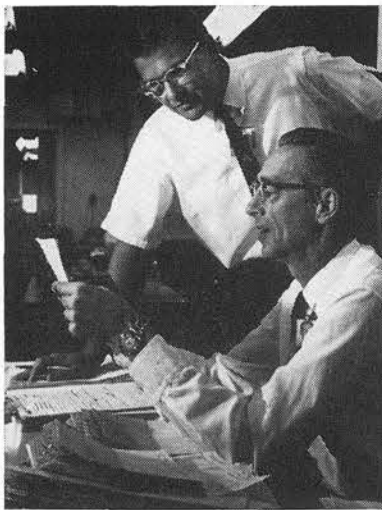
The time and effort necessary to care for our eyes is a small expenditure to protect one of the most precious of all human possessions.

Trailer Owners Plan Three-Day Outing In Nearby Arizona

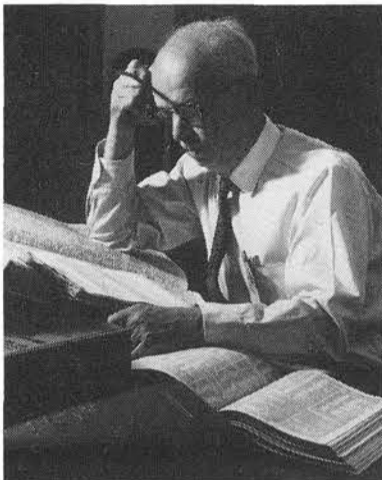
A number of Sandians are planning to participate in the Thunderbird Travel Trailer Club's rally in Springerville, Ariz., June 14-17.

There will be fishing in both lake and stream within minutes of the campgrounds and group activities for adults and children.

Among Sandians planning to participate are J. C. Wardlow (7124) and Mary Mayginnis (4253). All trailer or camper owners are invited.



CREDIT AUDITORS Dick Chapman (standing) and Ted Swanson (reviewing payments) to be made by Sandia Corporation. They check to see that proper pay conditions are met before mailing out the checks.



FINANCIAL REFERENCES are used here by Frank Martin as an aid in evaluating the financial position of a potential Sandia Corporation supplier.

and this is the case at Sandia. There are usually no more than three or four Board and Executive Committee meetings and one Stockholders meeting a year.

The Corporate File is the repository of many important Company records and it is maintained jointly by organizations 6000 and 6010. The actual work of organizing and maintaining the file is carried out by a member of the secretarial staff, who doubles as Corporate File clerk.

Since the Secretary is the official custodian of the minutes of the Stockholders and Directors meetings, it is he that makes and executes sworn certificates in response to requirements of law and business concerning actions taken at the meetings and the status and authority of Sandia's officers and directors.

Mr. Childs has headed the 6000 organization since July 1959. Recently he resigned to become General Attorney, Secretary and Treasurer of Bellcomm, Inc., a new jointly-owned Western Electric and AT&T subsidiary established to provide systems planning support for NASA's Office of Manned Space Flight. Mr. Childs' resignation will become effective June 30.

Succeeding Mr. Childs as Sandia's General Attorney, Secretary and Treasurer will be F. C. Cheston, Jr., presently Attorney for Western Electric Company.

correspondence or discussions with the debtor to secure payment or to clarify any questionable items. The auditors process all incoming checks to verify that the payment and records are correct.

Funds Disbursement

Ordinarily, all checks issued by the Corporation are signed by Mr. Olajos, Mr. Catt, or James E. Birchfiel, supervisor of Cash and Paymaster Section 6021-1.

"This can lead to writer's cramp," Mr. Birchfiel said, "but fortunately most payroll checks can be stamped with facsimile signatures by a machine. All other checks must be signed by hand."

Before any check is signed, it is checked for accuracy along with the payment authorization. The same kind of accuracy is used in all of the cash disbursements made by the tellers in the organization.

Primarily, the cash disbursed by the tellers is for authorized travel of Sandia employees. Petty cash vouchers are also re-deemed at the teller's window. The organization purchases airline tickets and provides messengers who pick up the tickets from the airlines.

The 6021-1 messengers take all Sandia deposits to local banks and deliver the lists of employee pay which the banks accredit to the proper accounts.

"All these activities and the SC forms which regulate them provide the management control necessary for an efficient and effective 'clearing house' for all receipts and payments of the Corporation," Mr. Olajos said.

Secretary Function

The By-Laws of the Company charge the Secretary with several functions. These are preparing and keeping the minutes of Stockholders, Directors, and Executive Committee meetings; giving notice of all meetings; notifying officers and directors of their election; having custody of the corporate seal and affixing it to documents in appropriate cases, attesting by signature on contracts and other instruments to the genuineness of the signature of the Company officer or representative who executed the document, and maintaining certain of the corporate records.

Traditionally corporate Secretaries have been involved in preparing material (resolutions, back-up data, etc.) for use at meetings of the Board and Stockholders



SANDIA TELLERS disburse authorized cash advances for travel and for petty cash vouchers. The tellers are from left Tony Toya, Jessie Hodges, and Frank Comiskey, all of Section 6021-1.

and that the payee is properly designated."

Credit Auditing

A vital function of Department 6020 is credit auditing which is handled by three credit auditors.

"Sandia Corporation has to be particular about firms with which it does business," said H. V. Catt, supervisor of Finance Division 6021. "Our purpose is to minimize the risk of loss which might result from the failure of others to meet their obligations to the Corporation."

"Perhaps the most important reason for financial analysis of our suppliers," Mr. Catt continued, "is to form an opinion on whether a supplier has the financial ability to perform a contemplated contract. Decisions of this kind are the Financial organization's contribution to the goal of obtaining goods and services as planned and possible prevention of loss through contractor's default."

The three credit auditors evaluate the financial position of all Sandia suppliers as well as investigate new suppliers as requested by the Purchasing organization. Standard sources, such as Dun and Bradstreet information, are used as aids in this evaluation as well as financial publications such as the Wall Street Journal, Moody's, and the Financial Chronicle.

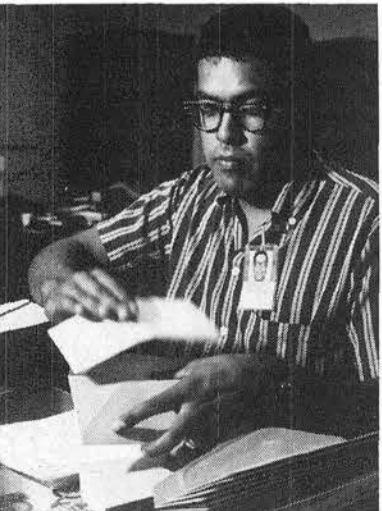
"If sufficient information is not available from these standard sources," Mr. Catt said, "then we ask the Purchasing organization to request it directly from the supplier."

The auditors maintain a financial file on more than 2000 suppliers, plus quick-reference cards on these and many other suppliers. Some 1500 requests are filed annually with Dun and Bradstreet for information about new and continuing suppliers.

The credit auditors continually scan financial publications for information on mergers, consolidations, bankruptcies, or other changes of structure of a Sandia supplier. This information is added to the files daily.

Reports containing the Financial organization's ratings of some of the suppliers are periodically issued for guidance of the Purchasing organization.

When money is due Sandia from suppliers or employees, the Financial organization has responsibility for collecting it. This involves



SANDIA CORPORATION checks and remittance advice forms are stuffed in envelopes by Roberto A. Costales.

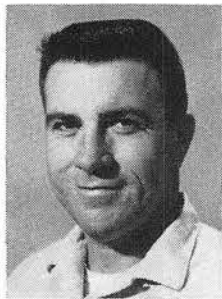


JIM BIRCHFIEL runs Corporation checks through a machine for facsimile signature.

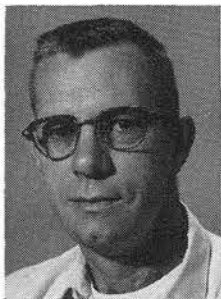


SARAH LONG totals Sandia Corporation checks cleared by banks in reconciling Corporation's books with statements.

Service Awards 15 Year Pins



Robert D. Becker
4253
June 9, 1947



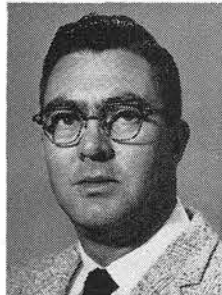
Joseph B. Langdon
4221
June 9, 1947



Aubrey H. Perry
3462
June 9, 1947



Cedric H. Senter
1424
June 16, 1947



R. E. Womelsdoff
3311
June 19, 1947

Rascals Win Top Honor in Bowling Tourney at Club

The Rascals of the Missile League took the championship of the First Annual Sandia Laboratory Bowling tournament. Eight league championship teams competed in the Coronado Club tourney. The Rascals rolled a three-game high score of 2897 to walk off with the traveling trophy.

Members of the Rascals are J. E. Suazo (7133), G. W. Krause (2541), W. G. Vander Laan (2541), R. E. Henderson (2532), R. J. Dayhoff (7134), and K. R. Jones (4411).

Long-Time Errant Schenectady Book Returned to Home

How time passes! Sandia Lab's Technical Library (3421-1) recently called in all of its books on loan to one organization in order to make necessary repairs and re-catalog some of the volumes.

One of the returned books bore the stamp of the Schenectady County Public Library in Schenectady, N. Y. A quick check disclosed that the Tech Library had not borrowed the book. The book was wrapped and mailed to the New York library.

The return mail brought a letter from the circulation department head at the Schenectady library. The book had been missing since 1949! Probable fine: (if anyone knew who owes it) about \$130.

10 Year Pins

John Bashaw 3242, Robert Chappell 8234, R. L. Peurifoy, Jr. 1310, W. S. Taylor 2411, H. S. Wallis 2331, J. W. Wistor 7251, Edna J. Bierner 4131, R. L. Champion 7163, W. V. Elrod 1414, H. L. Myers 7312, Ben Petterson, Jr. 7215, J. R. Sundberg 2313, Johnnie E. Johnson 7000, A. E. Winblad 1322, W. R. Barton 7131, Olivia V. Geffe 4630, Nicanor Gonzales 4512, Theo J. Lang 3126, R. K. Leahy 4622, J. D. Manweiler 7146, W. C. Nott 4135, Elio Cultreri 3211, A. R. Engquist 1431, W. B. Ballard 2541, J. A. Beyerler 7251, W. H. Cross 7311, R. E. Fair 4576, C. E. Ingersoll 7254, B. R. Snelling 4251, W. F. Stinnett 2563, G. R. Zahm 4253, J. C. Abeyta 2642, B. L. Barth 7133, L. B. Hobbs 1414, A. M. Imrsek 7322, R. G. Tant 4252, H. T. Bowman 8234, E. G. Kadlec 7124, E. E. Lister 4253, W. V. McGuire 8114, H. H. Passmore 7246.

Supper Club Open From 6 p.m. to 2 a.m. Fridays, Saturdays

Officials of the Coronado Club have announced that La Granada Supper Club will be open Friday and Saturday nights in June except the 16th, from 6 p.m. to 2 a.m.

Regular Coronado Club prices are in effect at the supper club. The club offers table service, and meal prices range from \$1.95 to \$4.50.

Live music and entertainment will be offered nightly at 10:15 p.m. and 12:15 a.m. for supper club dinner and lounge guests.

Congratulations

Mr. and Mrs. John W. Windsor (7312-3) a son, Jeffrey Nelson, on May 19.

Mr. and Mrs. C. W. Slack (7246) a daughter, Sheryl Ann, on May 24.

Mr. and Mrs. John Brane (4413) a daughter, Stephanie Joan, on May 19.

Mr. and Mrs. Pedro Ortega (4212-2) a son, Richard, on May 20.



SCENIC SEATTLE—Seattle World's Fair grounds take form in the shadow of the towering (600-ft.-high) Space Needle, a scant mile north of downtown Seattle. This panoramic view by Seattle POST-INTELLIGENCER photographer John Val-

lentyne shows the natural wonderland of Seattle and the Puget Sound country. Cascade Mountains in distance are peaked by 14,411-ft. Mount Rainier, while Elliott Bay comes up to the front door of city. Key to major Fair buildings is in next photo.

Sandia Meteorologist Reports on Possible World's Fair Weather

Planning to visit the World's Fair in Seattle this summer? If so, perhaps you have wondered what the weather will be like. For the information of travelers, Tim Raftery of "Sandia's Forecast Service" (7243-1) offers the following long-range averages which he compiled in a couple hours of homework the other day:

	June	July	Aug.	Sept.
Temperatures °F.				
Avg. Daily High	58	59	60	59
Avg. Daily Low	50	52	52	50
Record High	84	88	78	80
Record Low	43	44	45	40
Avg. Rainfall (in.)	2.58	1.99	2.01	3.64
Relative Humidity (per cent)				
Daytime	85	88	90	87
Wind, Avg. Speed (knots)	9	8	8	10
Per Cent Possible Sunshine	46	47	44	47
Avg. Number Days:				
Clear	4	6	5	7
Partly Cloudy	8	8	8	7
Cloudy	18	17	18	16

From the above tabulation it is obvious that the climate in the Seattle area is quite different from that of Albuquerque. It is not uncommon for the mornings to be overcast with a fine mist or drizzle, then during the forenoon the clouds will burn off leaving a beautiful sunny day. Evenings may be raw and damp. A light topcoat or an all-weather coat should be taken on your trip.

Venture Into Century 21 Awaits World's Fair Visitors

When Seattle (and the rest of the Country) opened the World's Fair it was a step into Century 21.

Front and center at the Fair—just 50 yards from the spectacular 600-ft. Space Needle, tallest structure west of the Mississippi—is the Bell System exhibit, "Communications—Key to Universal Understanding." Occupying a prime location in the "World of Industry" complex, this \$175,000 building offers some 10 million Fair visitors a provocative glimpse into communications of tomorrow.

The exhibit has been carefully designed to tie in with the Fair's "Man in the Space Age" theme. A demonstration of how communications satellites will be used in transoceanic calling is a highlight of the 23-minute tour of telephony.

The major exhibit is located in a huge amphitheater of the building. Floating screens and a large hemisphere tell the story of man's progress in communications—from his basic need to communicate to the contributions of the Bell System and a look into the future including communications satellites and the role of the maser.

In the east wing, visitors see the technology section displayed on four graduated levels that channel spectators from the first to second floor.

Above the amphitheater is a display of Bell System telephone equipment and services that serve business and industry.

In the west wing are working models of the wireless telephone and the Picture-Phone for the future. There's also an audience participation show, "Place the Phone."

Behind-the-scenes communications at the Fair is another story. To serve both visitors and staff, the newest Bell operating company installed a \$400,000 telephone system—approximately 1750 telephones and about 950 central office lines. Included are cordless telephones especially designed for use in the revolving restaurant atop the Space Needle.

The Century 21 Security Department switchboard is also special: it's push-button operated and monitors all 50 of its lines continuously to make sure they are all in working order. It's essential that any line out of order be spotted and repaired immediately since these emergency lines serve strategically located telephones around the Fair grounds.

The Fair itself is certainly spectacular. For many visitors, the excitement begins 1.2 miles away—when they board the Monorail in downtown Seattle for the whirlwind 95-second ride to Century 21.

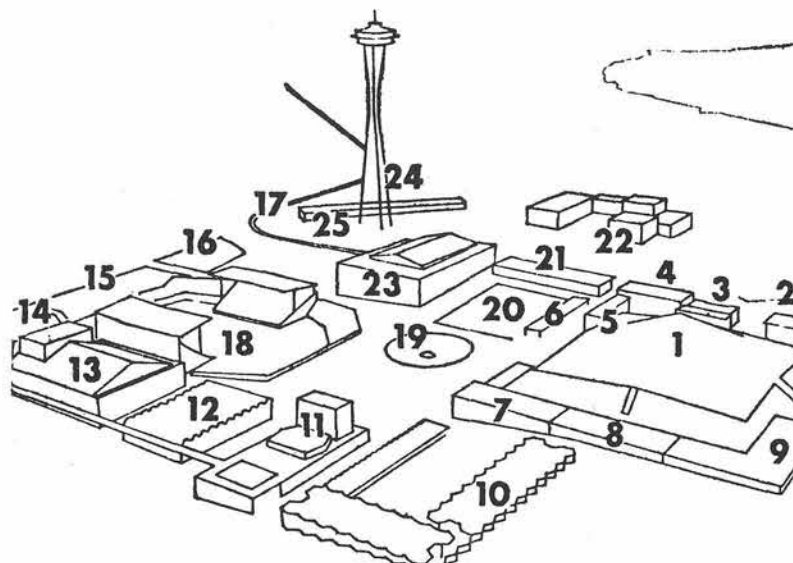
In the Coliseum, a "bubbleator" lifts them to an ingenious "floating city" to see the homes, offices, cars and schools of the next century. A simulated "rocket ride" a billion light years past the Moon and Mars into remote galaxies of outer space highlight a tour of the mammoth U.S. Science Pavilion.

Other attractions include the Gayway, largest amusement zone ever created for a World's Fair; a \$20-million fine arts exhibit; a continuous panorama of music, dance and drama featuring the world's finest artists ranging from London's Old Vic Theatre to popular entertainers like Nat "King" Cole and Benny Goodman. "My Fair Lady" and "The Unsinkable Molly Brown" are just two of the Broadway shows that play Seattle.

A glimpse into Century 21 and the best of 1962 are in store for Seattle visitors this year. It is a vacation into time and space—enhanced by the scenic splendors of the Pacific Northwest.



ANNUAL FRED J. GIVEN memorial golf tournament winners are shown above receiving trophies from Noble Johnson (left), supervisor of Services and Benefits Division 3122. In center is Walt J. Green (7145) who won the big trophy with a low gross of 69. At right is Ron E. Garin (4412), low net winner with 60. The tournament was played May 19 at Los Altos. Participants numbered 112.



BY MATCHING numbers on this sketch with Seattle in aerial photo of fairgrounds, you can identify features of Seattle World's Fair. They are (1) Washington State Coliseum (2) National Aeronautics and Space Administration exhibit (3) Republic of China exhibit (4) British Pavilion (5) Post Office (6) Boulevards of the World (both sides of street) (7) Canadian exhibit (8) Mexican exhibit (9) European Economic Community exhibit (10) Foreign exhibits (11) Playhouse (12) Fine Arts Pavilion (13) Opera House, with arena hidden by it at left (14) Show Street (15) International Plaza (16) Gayway (17) Monorail (18) Stadium (19) Fountain (20) Plaza of States (21) Domestic exhibits (22) United States Science Pavilion (23) Food Circus (24) Space Needle (25) Fashion Pavilion and domestic exhibits of many and varied subjects.



CLOSE VIEW of one of the Stovers' densely-packed beds shows several varieties of cacti and one delicate blossom on a "hedgehog" cactus. Round plant at center left, is a "barrelhead" cactus.



THREE YEARS of hunting has paid off in this Cliff and Lida Stover. They have more than unique cacti garden in the back yard of 2000 varieties of cacti arranged in neat beds.

Cactus Fancier Prowls State For Specimens—Finds Friends

Clifford M. and Lida Stover walk very carefully in the back yard of their home. They have to. Some 2000 cacti are back there.

"We don't mind a bit," Cliff (7223) says. "We think they're beautiful and we've learned to treat them with respect." His wife works in 3126.

The unique cactus garden began about three years ago when Lida suggested that a few of the prickly plants might look nice in a corner of the yard. Cliff agreed and they took a drive to find some cacti.

"It turned out to be so much fun," Cliff says, "that we have spent about every summer weekend out in the hills looking for cactus plants." The project converted their entire back yard into a cactus and rock garden. Hundreds of small plants hang in individual pots on racks along the wall. Larger cactus, surrounded by more smaller cacti, grow in beds between the brick walls.

"Most people think cactus grows

on the desert," Cliff says. "Some do, of course, but more are found in the mountain areas growing under trees, and around rocks, well camouflaged."

Cacti is transplanting easily. The trick is in digging and transporting. A 75-lb. barbed cactus with its vicious curved needles becomes a good-sized project to dig up from its natural setting and move to a back yard. All of the Stover's cacti have been transplanted. Although the plants produce thousands of seeds, growth is notoriously slow. A plant the size of a fist might be 10 years old. Cliff estimates that some of his larger cacti might be 60 years old.

"We learned the hard way, how to handle them," Cliff says. "Now we use thick leather gloves and try to move them by grasping the root system. We put the heavy ones on a canvas sling between us."

"Cacti beat grass any day," Cliff says. "The plants need little care, little water."

IRE Elects A. B. Church As President

Allen B. Church (1431-1) has been elected chairman of the Albuquerque-Los Alamos Section of the Institute of Engineers.

Thomas L. Pace (7223-2) was elected secretary.

Other newly-elected officers include Floyd H. Jean, Dikewood Corporation, vice-chairman; and Edward L. Amonette, Aztec Enterprises, treasurer. Both are former Sandia Corporation employees. Speaker at the meeting was M. A. Van Dilla, Los Alamos Scientific Laboratory, who discussed "Experiments to Measure Gamma Radiation of the Lunar Surface."

Rebel Night (Of All Things) At Club June 16

The charm and beauty of the Old South will be recreated at the Coronado Club during "Rebel Night" (monthly buffet) on Saturday, June 16.

There will be favors for all who attend including any Yankees who come to uphold the valor of the North.

The buffet, served from 6 to 8 p.m., will feature southern-style cooking including hominy grits, corn pone and hush puppies. Social hour prices will prevail 6:30-8 p.m.

Music for dancing from 9 till 1 will be supplied by Don Lesman's band.

Prices are \$2.60 per member, \$3.60 per guest.

SHOPPING CENTER

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CLASSIFIED ADVERTISING

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

RULES

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

FOR SALE

- DINING TABLE, solid cherry, butterfly drop leaf, w/8 chairs; curved china cabinet; blond bookcase-table; black record cabinet. Crosley, 255-7249.
- KABOB 'N GRILL, 8 rotisserie skewers, \$23; applique mural, Jade Empress, green and charcoal, 45"x100", \$7. Both brand new. Beck, DI 4-7647.
- COMMUNICATIONS RECEIVER, Hammarlund HQ-160, 540 kc to 31 mc, \$285. Nogle, AX 9-3863.
- 2-WHEEL TRAILER, 3'x6'x3' high, w/trailer hitch, must sell, \$15. Gallegos, CH 3-1826.
- 2 WOOL RUGS and pads, medium green, 12'x6'6", 9'x12', \$10 each; screen door, 3'x6'6", \$5. Stover, 1009 Indiana SE, AL 6-2439.
- AUTOMATIC WASHER, Hotpoint, \$15; RCA 17" console TV, \$25. Both in operating condition. Keever, 1501 Glorieta St. NE, AX 9-1334.
- 40" GE push button range w/warmer oven, timer, deep well, \$55 or swap for 4500 cfm cooler. McDowell, AX 9-6222.
- '55 PLYMOUTH, Belvedere, auto. trans., R&H, good tires, \$425. Benzing, AX 9-8601.
- ELECTRIC GUITAR w/amplifier, \$60; Harmony guitar, \$30; TV \$20; bar bell set, \$15; record player, \$10. Simpson, AX 9-2266.
- TUBELESS TIRE, 7:50x14, on green wheel, for '57 Chev. Tire and wheel \$14. Black, AX 9-3369.
- GE DISHWASHER, dinette; gas range; 3 pc. bedroom suite; 2 pc. sectional; 4 pc. Danish modern coach & chairs; Philco stereo. Reasonable. Bourne, 299-0788 after 6 p.m.
- GARAGE DOOR, single, rail type, w/hardware, door slightly bent, \$10. Langenhurst, 298-3595.
- GAS REFRIGERATOR, large, Servel, freezer across the top, \$65. Brown, DI 4-6831.

INDIAN RELICS: arrowheads, knives, scrapers, approximately 2500 to 3000 pieces. Also 14 ft. runabout boat with trailer. Cox, AL 6-1977.

'55 FORD, standard shift, V-8, 2-tone, good tires. Oberle, DI 4-0311.

STEEL GUITAR, solid body guitar and amplifier, \$75. Hannen, 265-0568 after 5 p.m.

DROP LEAF TABLE, mahogany, 6 chairs, pads and extra leaf; wooden high chair; swivel rocker; misc. antiques. Anderson, AX 9-2232.

WASHING MACHINE, automatic Kenmore. Wilson, AL 6-2630 after 5 p.m.

CLOTHES LINE, umbrella type, \$4.50; outside growler, checks any size armature; 6:70x15 wheel, \$4. Lopez, AX 9-0941 after 5 p.m.

HEALTHY PARAKEETS, two, with large cage, \$8.50. Swiss, AX 9-8755.

BY OWNER, brick 3 bdr, 1 1/2 bath, hw floors, walled yard, patio, sprinklers, \$14,800, no down Gl. Abbott, CH 7-2602.

TWO 7:60x15 ww tires, tubes, and wheels for late model Chevrolet. Also two truck mufflers for Chevrolet. Wilson, AX 8-0049.

BEAUTY REST mattress and box springs, clean, \$40 for set. Cashion, 242-3345.

MATCHED STEREO 3 speaker system, Fisher slimline, 18"x24"x53/4", \$50 each, \$95 pair; Warfedale in Karlon enclosure, walnut, 12"x18"x10", \$40 each, \$75 pair. Browning, AX 9-6384.

SOUND PROJECTOR, 16mm Bell & Howell; 9'x13' tent. Lasker, AX 9-1024.

PROVINCIAL WING-BACK couch, upholstered in aqua, brown and beige, \$85; dressmaker's form, fully adjustable, \$7. Galbreath, DI 4-4306.

'60 VOLKSWAGEN sedan, radio, WSW, \$1250. Moore, 1844 Greta NE.

AMERICANA ENCYCLOPEDIA, 37 volume, w/bookcase. Radman, AM 8-8970.

'56 FORD four-door Country Sedan, auto. trans, R&H, big engine. Bowen, AL 5-6759.

FIVE ACRES, Mesa Estates, 17 miles from Albuquerque, \$350 an acre, terms. McDermott, 298-4892.

HEATHKIT FM tuner, amplifier-preamp in two attractive matching cases, and 8" corner wall speaker, \$40. Hanson, AM 8-8352.

POWER MOWER, Savage self-propelled 20" rotary, Briggs & Stratton, 4-cycle, \$25 or trade. Converse, CH 2-6839 after 5:30 p.m.

GAS RANGE, 40" O'Keefe & Merritt, make offer. Myer, 833 Floretta Dr. NW, DI 4-8269.

SE, 3 BDR brick, basement den and shop, 1500 sq. ft., no down Gl. Monday, CH 7-9279 after 5 p.m.

NEXT DEADLINE FOR SHOPPING CENTER ADS Friday Noon, June 15

ARE YOU looking for togetherness? Here it is. Tandem bicycle, almost new, \$70. Smith, AX 9-6873.

35mm CAMERA, Canon model IIIA, shutter f 1 to 1/1000 sec. focal plane, Senner f 1.8, 50mm lens, \$75. Bentz, AM 8-8267.

ARCHERY SET, 65" handmade wood bow, 15 brass-tipped arrows, 25" long, \$7; mahogany lumber, rough, some pieces with small worm holes, approx. 35 bd. ft., \$10 for lot. Hill, CH 3-3493.

SCOPE, 2 3/4—5x Weaver model KV rifle scope, internally adjusting windage and elevation, \$30. Gubbels, 298-3528.

CAMP TRAILER, '59 Arrowhead, 15 ft., butane gas stove, ice box, etc. See to appreciate. Jojola, Isleta, TR 7-3977.

REDWOOD, louvred assembly for wall top, 3 panels each, 15 ft. long, will provide privacy for yard or patio. Winberg, 299-7388.

TWIN STROLLER, Peterson, collapsible, has basket, canopy, cushions for seats, \$15. Chuster, AX 9-1072.

24" BOY'S bicycle, \$10. Luikens, 3500 Dakota NE, AL 6-0437.

ROBERSON 3 BDR, den, 1 1/4 baths, Fiesta pool, sprinklers, AC, fireplace, landscaped, Gl or FHA. Proulx, AX 9-6066.

MOSSMAN 3 BDR, 1 1/2 bath, fireplace, hw floors, carpet, drapes, 4 1/2% loan, \$14,500. Behr, 3107 Dakota NE, 298-0262.

'61 HONDA Super Cub cycle, ideal for young boy, 1600 miles, new helmet included. Asking \$175. Landis, AM 8-8472.

SOLID OAK table, 4 plastic upholstered chairs, usable, \$15. File, 3031 Truman NE.

'59 RENAULT with 5000 mile '61 engine, rebuilt. Stripling, AX 9-3336.

AUTOMATIC WASHER, Philco 1960, \$50; Hotpoint dryer, 1958, 110/220v, \$40; Fedders refrigerative air conditioner, 110v, \$90. Nix, 298-4282.

STAUFFER slenderizing couch, \$100. Pope AL 5-6702.

ANTIQUA ROCKING chair; Early American sofa; high chair; crib and mattress; sterilizer; vaporizer; Rockabye. Carleton, 298-4217.

TWIN BEDS with Firmomatic mattress and box springs, dresser with beveled mirror, silver oak, \$225. Green, AL 6-7507.

BENCH DRILL press; welding equipment less tanks; soapbox racer wheels and one racer with wheels on it, half price. Barry, CH 2-7545.

BALCRAFTERS S27 VHF receiver and BC-2211 signal generator. Sell or trade for beam antenna. Stueber, AX 9-2414.

AUTOMATIC WASHER, Norge 1955, needs new timing motor, \$30. Reynolds, 299-7367.

PUPPIES, Miniature champion poodles, excellent pedigree, champion both lines, AKC registered. McGirk, AX 9-9264.

'55 PLYMOUTH station wagon, auto. trans, power steering and brakes, R&H, \$475. Kavet, AX 9-1793.

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

POWER MOWER, reel-type w/4 cycle engine; 16 ft. extension ladder, wood, round rung. Durkee, 298-1973.

'62 MONZA sp., white/aqua interior, 4 speed trans., 102hp engine, padded dash, tinted glass, R&H, loan value \$1700, total price \$2295. Carnicom, AX 9-9262.

MAYTAG AUTOMATIC washer, \$50. Burger, 299-8626.

\$500 BELOW appraisal, 3 bdr., family room, 1 1/2 baths, hw floors, pitched roof, FP, AC, new elementary, Jr. HS 1/2 block. Boling, AX 9-1346.

OUTBOARD MOTOR, Champion 5 hp, \$25. Bleakney, AL 5-8222.

JR. ENCYCLOPEDIA Britannica w/bookcase and year books, \$90. Woodley, AM 8-6871.

MOSSMAN blond brick, 3 bdr., fireplace, hw floors, screened patio w/bbq pit, partial basement, 80' frontage, sprinklers. Schneider, 3518 Dakota NE, AM 8-0679.

"MARBLE DUST"—approximately 100 bags of calcium carbonate used for finish coat of swimming pools. George Randle, Placitas.

NEAT 2 BDR house, walled, air conditioner, no qualifying, your terms. Qualle, 3513 Garcia NE, AM 8-2827.

COLLIER'S ENCYCLOPEDIA set, 20 vols., plus year books, world atlas, and bookcase, \$75. Finlayson, AM 8-5966.

BABY CRIB, birch, w/mattress, \$15; blue Cosco high chair, \$8; sturdy toy box, \$3; expandable gate, \$1. Reynolds, AL 5-4263.

POWER MOWER, chrome dinette set, reasonable. Culley, AL 6-6308 after 5 p.m.

EVAPORATIVE COOLER, portable, room-size, w/stand, \$25. Dalton, AX 9-3024.

'58 PLYMOUTH Savoy, V-8, 4-dr. sedan, push-button drive, factory air, R&H, WSW's, low mileage, \$785. Beller, 268-2758.

FOR RENT

3 BDR, 1 1/2 bath, garage, covered patio, walled-in yard, option to buy, stove and refrigerator furnished, \$96 a month. Wolfe, AX 9-5308.

3 BDR Mesa Village, garage, stove, refrigerator, drapes, water paid, close to grade and grammar schools, shopping center. Stixrud, DI 4-7873.

3 BDR, 1 1/2 bath, attached garage, \$90 a month, 5204 Cherokee Rd. NE, trees, patio, semi-circle driveway, vacant 6/25/62. Stamm, 299-7851.

APT., 3 room and bath, gas and water paid, \$75. 6710 Acoma SE, apply at Apt. 3. Burtnett.

WANTED

RIDER from vicinity of Menaul and Morris to Gate 3 or 4. Gonzales, AX 9-7208.

SEVERAL CHILDREN to care for in my home, excellent references, NE heights. Murray, 299-4607.

HOME FOR two black kittens, one long hair and one short hair; housebroken. Sivinski, 299-6014.

CAR POOL members, vicinity of San Mateo and McArthur NE to Bldg. 802. Jacobs, DI 4-2534.

3-D PROJECTOR, screen and polaroid viewing glasses, 35mm. Moery, AX 9-3630.

TO TRADE regulation-size pool table w/balls, 4 cues, bridge and ball rack, for pick-up camper to fit Chev. 6'x8' bed. Hamilton, AM 8-1516 after 5 p.m.

RIDE FROM 200 Moon NE to Bldg. 802. Jean Jeffs, ext. 29269.

RIDE OR will join car pool, vicinity of Indian School Road and Girard NE to Bldg. 800/802. Miller AL 5-1324.

HOMES FOR kittens, 7 weeks old. Wade, 299-2050.

RIDE FROM Bldg. 802 to San Jacinto and Betts. Grimes, 299-5277.

HOME FOR one lovable, housebroken, fluffy, white female kitten. Schultz, AX 8-2731.

COPY OF BOOK "The Anniversary Reader's Digest Reader 1922-1952", copyright 1951. Brewster, AL 6-4094.

BOY TO ADOPT puppy, half airdale, half dog; five months old. Also have crop of fluffy kittens. Mattison, AL 6-3951.

LOST AND FOUND

LOST — grey/green raincoat; Shaeffer black pen with silver top; 10 year SC lapel pin; turquoise earring; pillow case with yellow roses; keys on ring with "B". Lost and Found, ext. 26149.

FOUND — lost and found, ext. 26149. Greenlet; prescription sun glasses with green lens and black frames; diamond Deb nail file; Delta Sigma Pi pledge manual. Lost and Found, ext. 26149.



ANN VAN CAMP (1122-2) placed 17th in a field of 49 cars which participated in recent Great Canyon National Sports Car Rally.

Sports Car Rally Is Not A Race But Calls for Skillful Precise Driving

"That girl handles her car smartly," said a fellow sports car buff, "said a fellow sports car buff for Ann Van Camp wheeled her Alfa-Romeo out of a Sandia parking lot.

Actually, Ann has been participating in sports car rallies for the past five years both here and in Indianapolis, and drove in the Great Canyon National Rally in Tucson, Ariz., recently.

During the week Ann can be found in Bldg. 805, wearing a white lab coat and working as a Staff Assistant on X-ray diffraction of materials in Analytical Section II, 1122-2. Weekends she might be anywhere behind the wheel of her snappy little white convertible. August 4 and 5 she'll be in Farmington for a rally in the Four Corners area.

"People can't understand why I'll drive 450 miles to Tucson to drive 500 miles in a two-day rally, then drive 450 miles home again," she said. It probably takes another sports car owner to come up with a suitable answer.

First Competition

The Tucson meet was Ann's first competition in a national rally. This fifth annual event, sponsored by the Sports Car Club of America, attracted 49 cars from Texas, Oklahoma, Missouri, California, Colorado, Utah, and New Mexico. Only four of the 18 national rallies this year will be held west of the Rocky Mountains.

Her car received a "marque" award for being first among other Alfa-Romeos entered. "On an over-all basis," she said, "we finished 17th in a field of 49."

A rally is not a race in the usual sense. It is an automotive test in which cars leave a starting point individually, at a carefully recorded time, and must follow a more or less complicated route. Parts of the route must be traveled within a specified period of time and there are check points along the way to see if the driver is "on schedule."

Ann was the driver and her navigator was Darrell Munson (1121). It was a long rally. They

started shortly after noon on Saturday, stopped for dinner around 6 p.m., then drove from 7:15 p.m. until midnight. Sunday there was an additional seven and a half hours of driving.

Ann recalled something like 27 check points (most of which required a stop), and about 127 speed changes, some less than a mile apart. "Our speed ranged from 22 mph to 63 1/2 mph," she said.

About a third of the roads on their route were gravelled and many had sharp dips for arroyos.

Use Slide Rule

Navigator Munson used an electric odometer, gauged to a hundredth of a mile, and a slide rule to determine how far they had driven and exactly how fast they had covered the known distance. "In national rallies, the navigator's equipment can get pretty fancy and expensive," Ann explained. "One Colorado couple was using six stop watches and three dual computers for their calculations."

Ann has also placed in local gymkanas sponsored by the Albuquerque Sports Car Club and the Rio Grande Region of Sports Car Club of America (she belongs to both). In Indianapolis she worked at numerous races as a timer and scorer. She has previously owned and driven in competition a Fiat 1200 Spider and a Mercedes-Benz 220.

Anyone interested in participating in sports car events is invited to contact Ann or W. J. Denison (7124), who is membership chairman for the Rio Grande Region of SCCA.

Spectrometer Talk

R. T. Meyer (5153) spoke on "Experimental Aspects of a Photolysis - Time - of - Flight Mass Spectrometer Apparatus" at the Bendix Mass Spectrometer Clinic held in connection with ASTM Committee E-14 meeting on Mass Spectrometry in New Orleans, La., June 6.

April 26 1962
Dear Corp.,
We liked the pictures of the rockets, the ones I liked were the two pictures of the Atlas.
The three girls in our room said you are training girls to study about rockets.
We hope you will let us see more of the pictures you let us see.
Here is a picture of the blue scout.
Timothy Neal

'Dear Sandia Corp.'

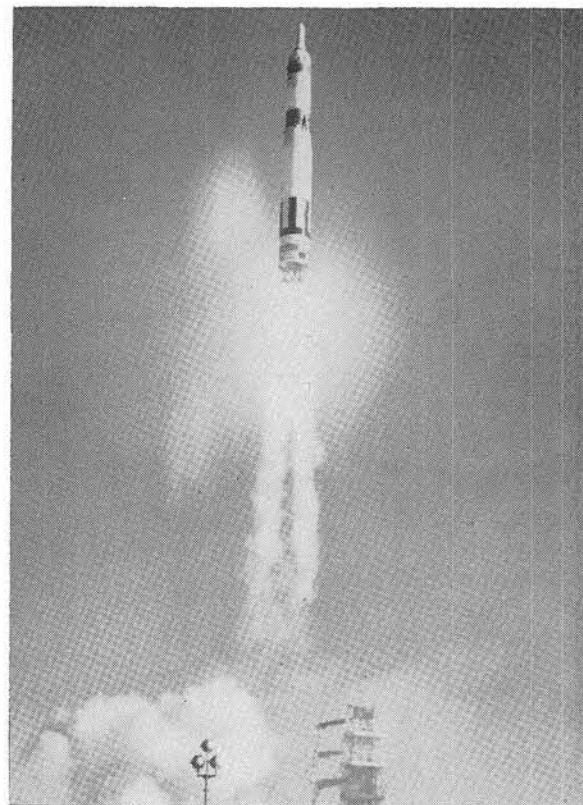
Space Travel Plans Told in 3rd Graders Thank-Yous

These are times that tickle the imagination. And they especially stimulate minds of youth. Visions of journeys to far-off galaxies have been held by man for years, but never have they been more vivid than in the minds of today's youngsters.

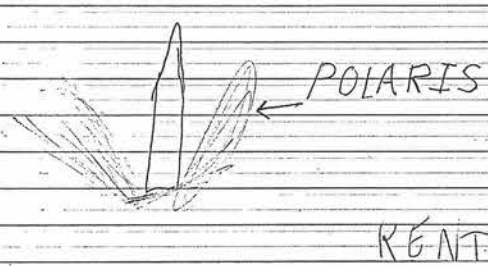
At the request of the third grade of Manzano Day School, Sandia Corporation provided a group of colored photographs of Cape Canaveral rocket firings. The result was a flurry of "Dear Sandia"

letters. Appreciation of the opportunity to see the rockets was the main theme, but personal desires, comments and rocket-preferences abounded. One youngster confided he was making a super rocket fuel. Told the formula, too.

Today's youngsters' talk of space travel is not a mere exercise in childhood imagination. Who knows, one of the authors of these letters may someday visit the moon—or beyond.



April 1962
Dear Sandia Corp.,
I liked the Atlas and the Polaris. But I liked the Atlas firing most of all. The Polaris firing was next too. The other firings were next too.
KENT



April 27 1962
Dear Sandia Corp.,
We all enjoyed the rocket pictures very much and I liked the Atlas best. When I grow up I am going to be a test pilot.
John Roberts

April 1962
Dear Sandia Corp.,
We liked the pictures of the rockets. I liked the Atlas and the Polaris and the Blue Scout and the Titon and the Redstone and the Minuteman. When I grow up I want to be a space pilot. I want to go to another universe in a rocketship and discover new planets.
Bill Westerfield

April 27/62
Dear Sandia Corp.,
We are very interested in space and aircraft. Some day I wish to go to the moon. But at times it gets very hot and at times it gets very cold. We like the pictures you sent us very much. I like the Atlas and the Thor and the Minuteman best.
Chuck Briggs
PS I am making a new super rocket fuel which is made of vinegar and baking soda and sulphur.

Sandia's Safety Record	
<p>Sandia Laboratory HAS WORKED 490,000 MAN HOURS OR 14 DAYS WITHOUT A DISABLING INJURY</p>	<p>Livermore Laboratory HAS WORKED 1,128,000 MAN HOURS OR 195 DAYS WITHOUT A DISABLING INJURY</p>