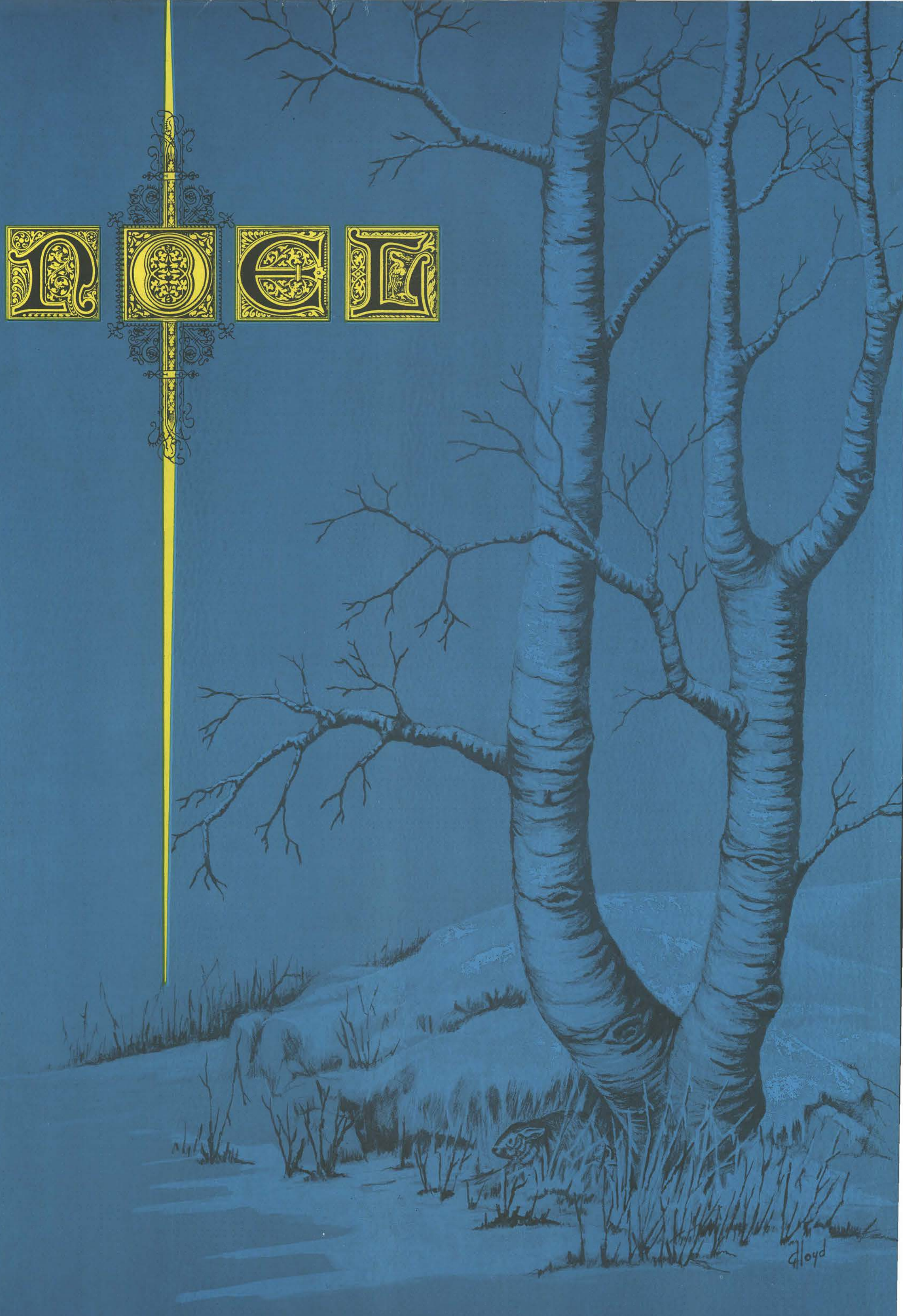

Sandia Lab News

December 20, 1963

Editorial Comment

Reflect Upon Your Blessings

We at Sandia, fortunate enough to be able to take up the task of making Christmas happy for those who have little, should reflect on our blessings.

Charles Dickens advised this thought back about 1833 when he wrote **A Christmas Dinner** under the pen name of "Boz."

"Reflect upon your present blessings — of which every man has many — not on your past misfortunes, of which all men have some. Fill your glass again, with a merry face and a contented heart. Our life on it, but your Christmas shall be merry, and your new year a happy one."

Now there's no good purpose gained in broadcasting blessings. Each man has his own, they are his, they have particular values to him. Our blessings are personal property and need carry no signs of neon to increase their worth. That each man knows and values his blessings is enough.

Christmas gives us other opportunities, too. Dickens lists some of them.

"There seems a magic in the very name of Christmas. Petty jealousies and discords are forgotten; social feelings awake in bosoms to which they have long been strangers; father and son, or brother and sister, who have met and passed with averted gaze, or a look of cold recognition, for months before proffer and return the cordial embrace, and bury past animosities in present happiness . . . Would that Christmas lasted the whole year through (as it ought), and that the prejudices and passions which deform our better nature were never called into action among those to whom they should ever be strangers."

Dickens, the man who so well sensed the special nature of Christmas, asks, "Who can be insensible to the outpourings of good feeling, and the honest interchange of affectionate attachment which abound at this season of the year."

To you and your families the **Sandia Lab News** extends season's greetings accompanied with the hope that the spirit Dickens found at Christmastime be extended throughout the year.

The Best Christmas Gift You Get May Be One of These Safety Tips

Are you planning to invite the fire department to your house this Christmas?

If not, here are a few reminders compiled by Safety Engineering and Environmental Health Division 8242 for the protection of you and your family during this holiday season.

Keep your tree out of doors until just before Christmas. When you do bring it in, set it up in a cool part of the house, away from heaters and fireplaces. Stand it in water to retard drying.

Decorations should be glass or metal, or other fire-proof material. Cotton or paper and some plastics should not be used unless they have been flame-proofed. (If in doubt, a good idea is to test a sample with a match.)

Electric trains should be kept a safe distance from the Christmas tree.

Electric lighting should be inspected to make sure that all wire and sockets are in good condition. Sets with frayed wiring should be discarded. If you plan to buy a new set of lights, look for one with Underwriters Laboratory seal of approval.

Switches for decorative lighting should be kept a safe distance from the tree to allow access in case of fire.

Tree lights should not be left on when no one is home.

Inspect the tree at frequent intervals to see if needles near lights have started to turn brown. If so, change the position of the lights.

When needles start falling, the tree should be taken down and discarded outdoors.

Gift wrappings present a fire hazard and should be thrown out after they have served their purpose.

If metal trees are your preference, don't string them with electric lights, since this can easily cause a short circuit. Instead, colored flood lights are safer and provide a more beautiful effect.

Make sure that decorative lighting does not overload electrical circuits. Wiring and electrical equipment used out of doors should be designed for that purpose.

Notes from Tonopah:

The Tonopah Test Range annual Christmas party was held Dec. 13 with more than 100 persons in attendance. Included were Sandia Corporation, FSI, and REECO employees and their guests.

The buffet dinner was followed by entertainment, skits by employees, and dancing.

Test Range employees are continuing their custom of donating food to needy families in the Tonopah area in lieu of exchanging Christmas cards with other workers seen daily.

Sympathy is extended to J. W. Dillon, who recently transfered to Tonopah Test Range Division 7221, on the death of his father, Dec. 16.

Seasonal Holidays

Employees are reminded that the last four hours of the standard daily schedule on Dec. 24 will be absence-with-pay time. In addition, employees will be excused one hour before normal quitting time on Dec. 31.

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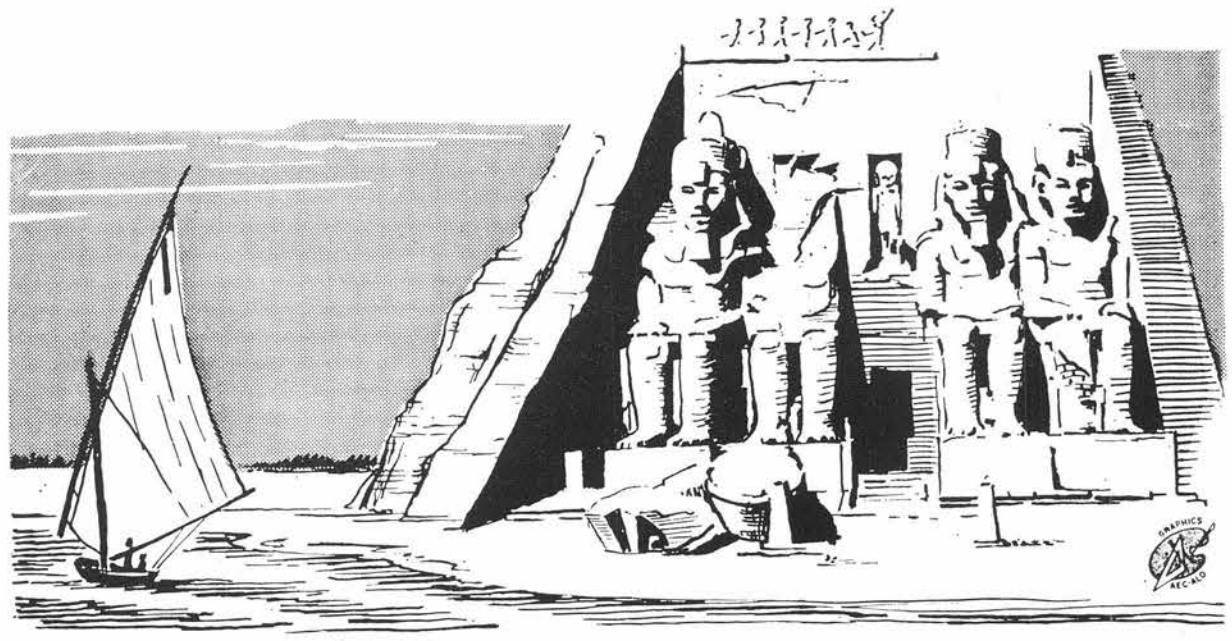


The Best Kept Secret

The following account of "The Best Kept Secret" was written by Alfred H. Miller, Information Security Branch of AEC/ALO.

For 6000 years, the pyramids of Egypt have excited the wonder and admiration of the world. Emptied of their treasures, their gleaming limestone sheaths stripped away to adorn the villas of king and Caliph, their lonely grandeur remains undiminished.

As engineering feats, they are without peer. The Pyramid of Cheops, for example, is 467 ft. high and each of the sides of its base is 736 ft. long. Containing enough stone to build a road 18 ft. wide, a foot thick and 2000 miles long, it is composed of thousands of blocks, many weighing more than a ton, each of which was measured and cut independently of the others, dragged in from different sites, and assembled without further modification.

The clearance between the limestone blocks used to surface the structure is 1/10,000th of an in.—they fit one another so well that the seams are difficult to detect with the naked eye—and keep in mind, those tolerances were achieved with hand tools!

These huge mountains of stone, the most complex tombs ever created, were designed for one purpose: To protect the bodies and treasures of the Pharaohs, thus assuring their immortality.

For hundreds of years, grave robbers had desecrated the tombs of the dead kings. In desperation, the Egyptians conceived the pyramids as the ultimate in protection. The exact location of the crypts was a closely guarded secret, restricted to only a few priests and engineers. Slaves who labored on them were usually murdered; the outside entrances were hidden by balanced stone blocks; inside, the crypts were artfully concealed within a labyrinth of passageways featuring blind passages and pitfalls.

Despite such precautions, the pyramids were, if you'll pardon the expression, the most monumental failures known to Man. Modern archaeologists agree that most were penetrated by looters a few years after they were sealed. In fact, by 1300 B.C., there was hardly a royal tomb in the vicinity of Thebes which had not been violated.

Evidently, it wasn't easy to keep secrets in those days, either.

Ironically, one secret was kept—the identity of the grave robbers. From time immemorial, those elusive will-o-the-wisps had plagued the Nile Valley. Occasionally, a member of the Court or one of the Guard was executed for having collaborated with them but few of the thieves were ever caught.

The Egyptians were convinced that they were fighting a well-organized conspiracy, but thousands of years were to pass before their suspicions were verified. During that interval, the appearance of rare and valuable Egyptian antiques in European markets from time to time, alerted the authorities in Cairo that the spoilers were as busy as ever.

Not until 1881 was the mystery solved: At that time, a member of the staff of the Cairo Museum, posing as a European tourist, was approached by an Arab named Abd-el-Rasul, who offered to sell some ancient statuary. Once the sale had been made, Rasul was arrested and charged with the illegal sale of antiquities.

During the subsequent trial, one of the witnesses finally broke down and confessed the truth: Practically every member of the village of Kurna was a grave robber, as their fathers had been before them for as long as anyone could remember. Such a formidable dynasty of thieves has never been known to exist anywhere in the world, before or since.

Most remarkable of all, those unlettered sons of the desert had preserved their secret since the first royal tomb had been desecrated, countless generations before!

Massive stone blocks, hidden entrances, blind passages, armed guards — even murder — none of these had protected the secrets of the Pharaohs for very long. Yet, an untutored group of Bedouins maintained their masquerade for centuries with nobody the wiser.

How? Why did they succeed where so many others, before and since, have failed? Perhaps because their livelihood, as well as their lives, depended on their silence.

Know anyone in that position today?

Employees Give $168,835 to ECP Agencies in Past Year

With the mailing of checks last week to participating agencies, the Employees' Contribution Plan wrapped up the 1963 pledge period with a total of $168,835 given by Sandia Laboratory employees. This month a new pledge period starts which will continue through next November.

Only remaining business this year for the ECP Committee is distribution of the Reserve Fund of $1675. The committee is considering requests from member agencies prior to making the distribution. In the past, the Reserve Fund has been used for emergency needs of member agencies.

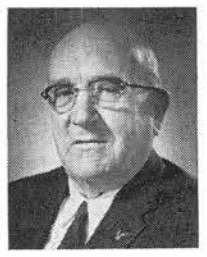
As the year-end figures were compiled, the following distribution had been made:

	November	Total For Year
United Community Fund	$10,212	$130,940
American Cancer Society	654	8,529
Bernalillo County Heart Association	537	6,952
National Arthritis and Rheumatism Foundation	209	2,705
Albuquerque Association for Mental Health	131	1,680
New Mexico Society for Chippled Children and Adults	524	6,700
National Multiple Sclerosis Society	92	1,203
Albuquerque Association for Retarded Children	196	2,574
Cerebral Palsy Association of Bernalillo County	275	3,531
Muscular Dystrophy Association of America	131	1,675
Reserve Fund	131	1,675

In addition to the above listing, $670 was collected at the beginning of the 1963 drive which was earmarked by the donors to specific agencies.

Pioneer New Mexico Family Member Will Retire From Sandia This Month

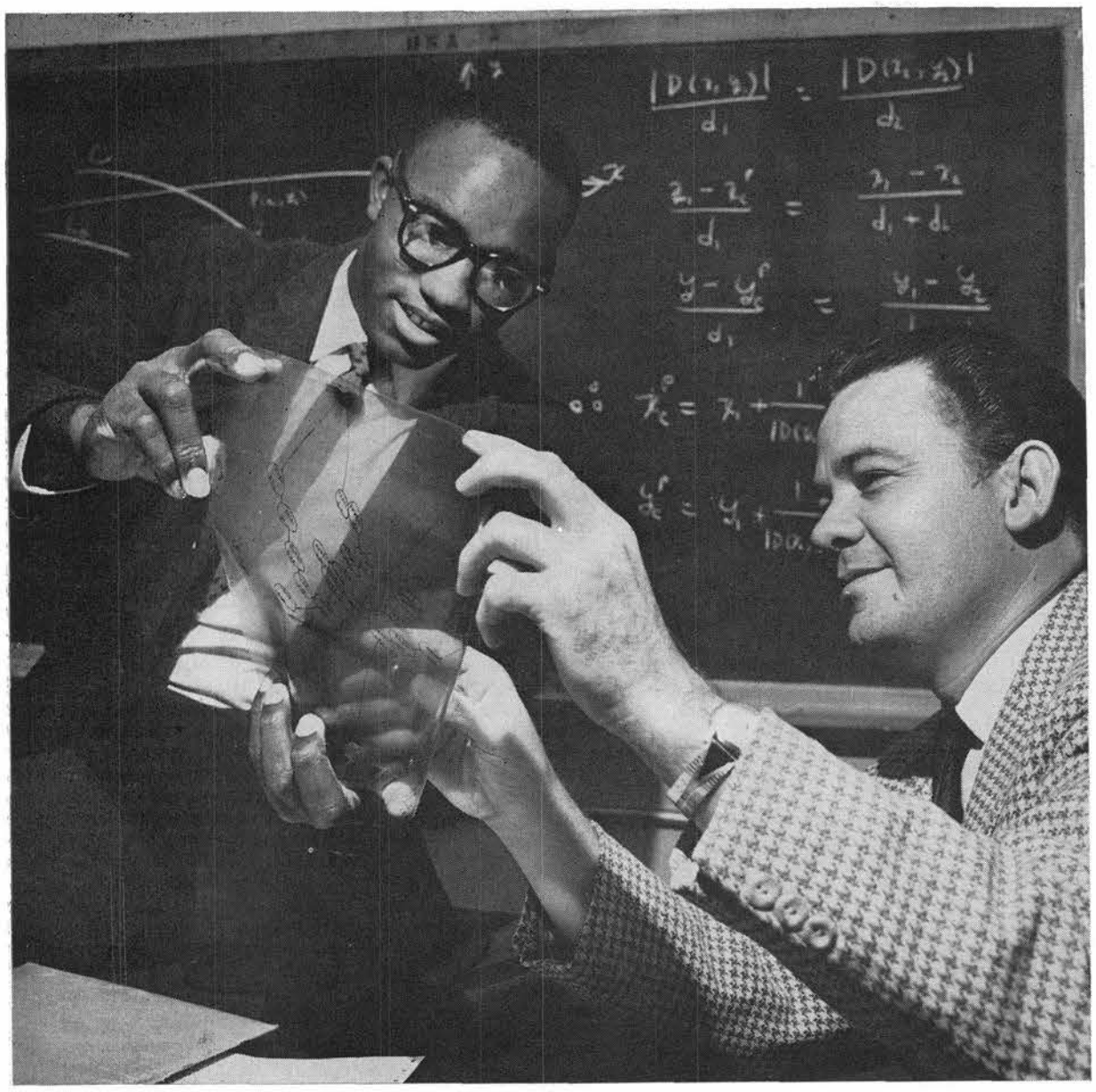
Fred T. Crocker will retire at the end of December after nearly 13 years at Sandia Laboratory. He is a mechanical assembler in Section 4511-2.



One thing is sure, Mr. Crocker and his wife intend to stay in Albuquerque; their home is at 315 Nara Vista Rd. NW. "I don't know of any place where you would find a better climate and better people," Mr. Crocker explains. They have a married daughter here, and a married son in California. The Crockers will visit their son later and also travel extensively in Canada.

Mr. Crocker's family settled in the Cimarron area nearly 100 years ago. "I worked in the mines when I was young but was only interested in gold. Now I'm a prospector and rockhound," he said. He has polishing and cutting equipment and makes bolo ties, tie clasps, and other types of jewelry. Through loaning his rock collection to neighborhood youngsters, he has interested many of them in the hobby.

Mr. Crocker is also active in the World War I Veterans organization.



NEW TECHNIQUE — Craig Jones (7622) and Harvey Ivy (7241), right, have developed a new mathematical method to determine high altitude wind data from photographs of sodium vapor clouds injected into the atmosphere from 200,000 to 500,000 ft. by rockets. The data is for Aerospace Physics Division 5414.

Livermore Laboratory Works Million Man-Hours Safely

Livermore Laboratory has set another million man-hour safety record, it was announced recently by G. L. Rhodes (8242). Actually the Laboratory employees topped the million mark by over 107,000 man hours, thus qualifying for an Award of Merit from both the AEC and the National Safety Council.

The Laboratory reached this milestone, the fourth since it was established, Nov. 26. At that time the Safety organization forwarded the information to the AEC and the National Safety Council.

The last Award of Merit was presented in May 1963 for 1,101,-540 man hours without a disabling injury. So far, Laboratory employees have earned four of these awards from both the AEC and the Council. This includes the rare Award of Honor presented by the AEC in May 1960 for an unbroken stretch of over three million man hours without a disabling injury.

Important Deadlines Nearing for Sandians Taking University Courses

There are several important dates in January for Sandia Laboratory employees attending either the University of New Mexico or College of St. Joseph.

January 1 is deadline for degree applications for both schools.

The deadline for Educational Aids Program applications is Jan. 20 for College of St. Joseph and Jan. 27 for UNM. Applications should be returned to Section 3131-2.

January 27 is the registration date for College of St. Joseph, with classes beginning the following day.

Registration at UNM is Feb. 3 and 4 with spring semester classes starting Feb. 5.

A number of courses are being offered by College of St. Joseph at Kirtland AFB (Bldg. T-211). Included are: English I "Freshman Composition"; Speech I "Fundamentals of Speech"; Physics 51L "General Physics"; Mathematics 31 "College Algebra"; Business 45 "Management"; Psychology 35 "General Psychology"; Political Science 50 "American Government"; Biology 1L "General Botany";

History I "Western Civilization"; Economics 40 "Principles of Economics I"; Mathematics 10 "Intermediate Algebra"; Accounting 10 "Principles of Accounting"; Typing 15 "Beginning Typewriting"; Language Spanish I "Elementary Spanish"; Sociology 10 "Principles of Sociology"; Chemistry 1L "General Chemistry"; and Math 60 "Introduction to Computers."

For additional information on these classes contact Major M. J. Ihrig, Chief, Education & Training Branch, Military Personnel Division, Kirtland AFB.

Anemometer on 50-mile pole?

Mathematicians Find Precise Way to Measure Upper Winds

With some degree of accuracy, how do you measure winds above 50 miles altitude?

This question is part of a study of the upper atmosphere being conducted by Aerospace Physics Division 5414. A basic problem in the SAND program (Sampling Aerospace Nuclear Debris), it is also a factor in the investigation of atmospheric particle transport, particle diffusion, and mixing mechanisms.

One of the few techniques of determining upper atmospheric winds — that of injecting sodium vapor clouds into the region with rockets — was given a boost recently by two Sandia Laboratory mathematicians who developed a method of determining the cloud position in relation to an XYZ Cartesian coordinate system from photographs of the sodium vapor trails.

Craig Jones of Data Reduction Programming Division 7622 and Harvey Ivy of Test Data Division 7241 developed the new technique after partial success with other methods.

Cannot Triangulate

"It would be a simple XYZ triangulation problem," Craig Jones says, "if it were possible to visually determine corresponding points on the vapor trail on at least two different photographs taken by cameras at different positions. Generally, there is no accurate way that the same point can be seen because the strong shears, or layers, of winds at this altitude turn the cloud into a twisting irregular spiral. We have suggested that a method be developed to eject the sodium in puffs from the rockets, and perhaps this can be done."

The sodium was injected into the atmosphere by rockets launched from Barking Sands on Kauai in the Hawaiian Islands during May and June. Camera stations were located on the islands of Kauai, Maui, and Hawaii in an XYZ Cartesian coordinate system with origin at the Kauai station and positive Y axis directed north, positive X axis directed east. In addition to the photographs of the sodium clouds, the cameras also recorded the stars from their fixed stations.

By establishing known lines of sight from the cameras to the stars, accurate fixed reference points could be established on the photographs. On each single photograph, the cloud could be accurately located. The problem then was to find corresponding points on photographs of the same cloud taken at the same time from the other stations.

Partial Answer

"An iterative (repetitive) process provided a partial answer," Harvey Ivy explains. "By making educated guesses using the lines of sight from the stars and the radar track of the rocket, we could arbitrarily designate points of the cloud image in two photographs as corresponding points. With the computer, enough calculations could be made until the guesses reached an acceptable value."

The twisted nature of the sodium cloud caused the iterative techniques to fail and also a plane-line intersection method. This latter technique failed because the assumption that each point on the photograph of the cloud corresponded to a single point of the actual cloud failed to hold. The cloud might parallel a line of sight or one of the spirals might appear to be a large loop from one photograph and a very tight, barely visible loop on another photograph. A failure would occur when either of these instances was encountered.

Simply stated, the final solution involves projecting an actual line of sight from one camera onto the image photo of the second camera. This line of sight intersects the cloud image on the second photograph. The intersection point is calculated and a line of sight is determined from the second camera which corresponds uniquely with a known line of sight from the first camera. The intersection of these lines of sight determines a point on the sodium cloud. Using the point of intersection of these lines of sight and time data, the wind velocity, altitude, and direction was computed.

30-Second Intervals

The photographs were taken simultaneously every 30 seconds by the camera stations. The sodium vapor clouds were visible from 15 to 25 minutes. Data from photographs of 11 rocket launches are being reduced. The resulting computer output, in the form of graphs is now being provided to Division 5414.

Larry Smith, who heads this Division 5414 project, comments that the method and the data have proved extremely useful.

"We know now," he said, "that winds up to 350 mph are encountered in the atmosphere between 200,000 to 500,000 ft. We know that the winds change velocity and direction in rather thin layers, which accounts for the twisting spirals of the clouds. Although the density of the atmosphere at 60 miles up is approximately 10 million times less than at sea level, there is still enough particulate density in the winds to make them a considerable factor in the dispersal of foreign particles injected into this region."

One of the aims of the SAND program is to determine the amount of nuclear debris in the upper atmosphere and to calculate its dispersal over the globe.

Rocket Firings

The rockets launched by Sandia Corporation last summer were synchronized with other rocket firings of sodium vapor into the upper atmosphere from various locations around the world. It was part of a cooperative international effort, coordinated by the National Aeronautics and Space Administration, to gather global data about upper atmosphere winds. This data is still being correlated and reduced, according to Larry Smith. Hopefully, Sandia's contribution will be significant.

In the meantime, Sandia's research into the particulate composition of the upper atmosphere has been given a useful technique for measuring forces acting in the region.

Dec. 30 Moon Eclipse Gives Camera Fans Chance to Click

In the early hours of morning on Monday, Dec. 30, somnambulists, astronomers, and interested casual observers will be able to watch a total eclipse of the moon. That is, if there is not a cloud cover.

Beginning at 1:25 a.m., the first part of the shadow of the earth will touch the rim of the moon. It will slowly move across the face of the moon until it is totally blacked out at approximately 3:27 a.m.

The earth's shadow will consist of a lighter outer area called the penumbra. The surface of the moon will still be visible as this part of the shadow moves across. The inner shadow, or umbra, is completely black and will obscure all surface details, although the black sphere of the moon can still be seen.

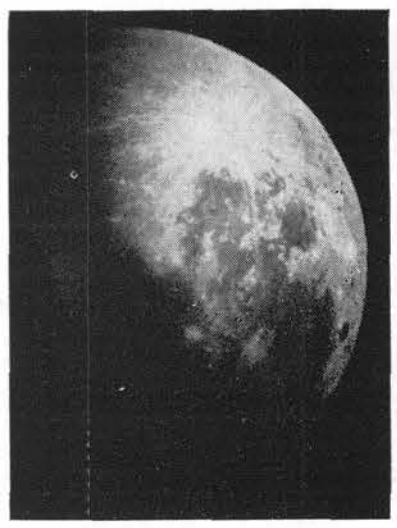
The totality of the eclipse will end at about 4:46 a.m. and the edge of the umbra will continue its journey across the moon's face. Last contact will be shortly before moonset at 6:59 a.m.

The moon will be high in the Southwest over Albuquerque and, if the sky is clear, an excellent view of the eclipse will be possible. An eclipse of the moon occurs twice each year and can occur as many as seven times. The last time a moon eclipse was visible in Albuquerque was on Aug. 25, 1961. At that time, Robert L. Hughes of Optical Development Section 7224-1 made a series of color transparencies using Sandia's 24-in. equatorial telescope located on the East Mesa. The reproductions here were made from a black and white copy negative of the original color photos.

Photographers interested in photographing the moon eclipse can use the following settings as a guide, but should make additional exposures at various settings, since the light value of moon eclipses varies considerably.

A suggested guide for black and white photography using ASA 160 film and a diaphram setting of f/8 is as follows:

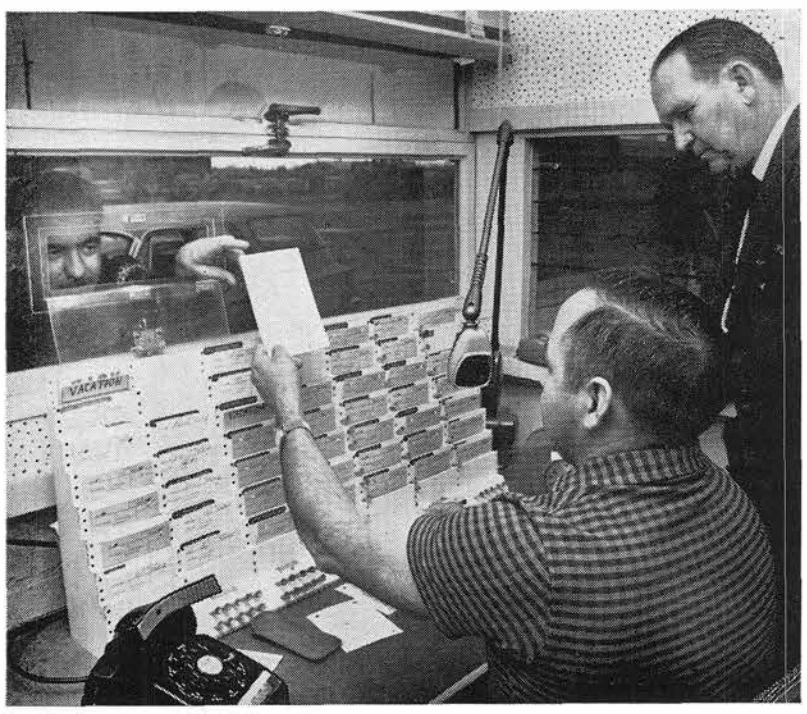
Uneclipsed full moon	1/500
Moon deep in penumbra	1/250
Moon 1/10 to ½ in umbra	1/15
Moon ¾ in umbra to totality	3
Totality begins	4
Mid totality	16



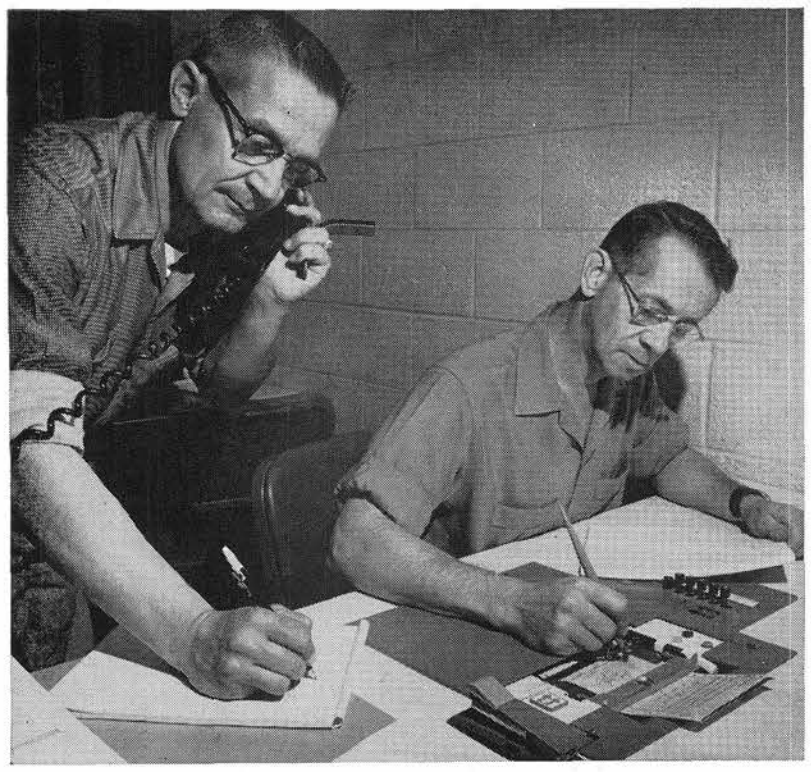
MOON ECLIPSE will occur in the early morning of Monday, Dec. 30. These views of a similar occurrence were taken Aug. 25, 1961, by Robert L. Hughes (7224) using Sandia's 24-in. equatorial telescope. Moon eclipses occur at least twice a year but are not always visible in Albuquerque. The Dec. 30 event should be visible high in the sky.

Versatility, Originality Needed in Support Tasks

THESE WELDERS, sealing a transportainer for Field Test use, are typical of the tradesmen included in Plant Maintenance Department 4510. There is an increasing demand for such skills due to added facilities.



MOTOR POOL DISPATCHER George Pacheco is handing a dispatch ticket to driver, Phil Contreras (both 4573), while their department manager, Robert Findlay, looks on. The dispatch center has an average of 7500 phone calls and 20,000 radio transmissions per month.



TELECON DESK in Bldg. 887 receives calls from throughout the Laboratory for maintenance and repair jobs. Leroy Peterson is taking a trouble call while Ralph Ambrose writes an order for the required work. Both men are in Coordinating and Construction Control Section 4542-3.

Another in the series of articles describing work of Sandia Corporation's general organizations appears here. This article concerns Plant Engineering and Maintenance Organization 4500.

Plant Engineering and Maintenance Organization 4500 has basically a support function, but due to Sandia Laboratory's research and development activities, versatility and originality are frequently requirements for fulfilling a wide variety of requests.

This support function may include designing and constructing a complex facility, providing a skilled craftsman to help set up a test, maintaining environmental chambers or precision tools, or furnishing adequate electrical power and utilities to the many R&D laboratories.

Robert E. Hopper has been director of 4500 since 1956, and has been associated with Sandia's Plant Engineering and Maintenance organization since it was created in 1948. He brought to Albuquerque previous experience as a structural and design engineer, including design of AEC facilities at Oak Ridge, Tenn., and Hanford, Wash.

"We make every effort to provide the best support for the R&D technical effort," Mr. Hopper said. "In addition, we must improve our efficiency through new methods, and continually work to provide new facilities as well as upgrade existing buildings and facilities."

In a sense, Plant Engineering Department 4540 is where it all begins. Headed by H. H. Pastorius, this department has nearly 100 members, including architects, and civil, mechanical, and industrial engineers, who carry a new structure from the thought stage to completion—ready for occupancy and use.

The Planning Division, R. M. Officer, supervisor, is responsible for planning future buildings and facilities, modifying existing facilities, and preparing the construction budget for Sandia Corporation (including Livermore Laboratory and Tonopah Test Range). Budgeting normally precedes construction by at least two years. Last September data sheets and internal approvals were obtained for items to be included in the FY 1966 construction budget.

After review, the AEC will present the requests to the Bureau of Budget in October 1964 for consideration by Congress. Authorization of funds would normally be received in October 1965 for FY 1966 construction. Mr. Hopper noted, "We have been informed by the AEC that our data sheets are the most complete of any received in the ALO complex. This is due to the excellent cooperation given us by Sandia Corporation organizations in preparing the justifications."

Planning for Sandia-type of construction (often one-of-a-kind buildings or facilities) requires considerable coordination between the using organization and members of the Design Division to turn ideas and concepts into a structure that will be economically feasible, and with enough flexibility to be adaptable for future use.

During the period from FY 1962 through FY 1964 construction projects, which have been approved or are in process of approval, have totaled $20-million.

The Planning Division prepares layouts for occupancy of new buildings, and changes in existing buildings. All layouts are prepared with scaled-down, adhesive-backed templates on grid sheets to reduce drafting time and allow for easy adaptation.

Several years ago the division organized a "Short Order Group," made up of mechanical, electrical, and architectural designers. The group specializes in jobs requiring no more than two to four days of engineering time. Normally, projects assigned here are completed in less than four weeks and may include projects needing immediate attention due to safety, security, or emergency reasons.

E. H. Craven, supervisor of Design Division 4543, and his staff of structural, mechanical, and electrical engineers, handle design of major projects. This is where the Plant Engineering organization differs drastically from a production-type operation where equipment and functions are inclined to remain static. The engineers are accustomed to designing flexibility into their projects with the expectation of future changes in facility requirements.

Designs are often complicated by critical environmental requirements. For example, they must hold to one per cent relative humidity in research labs. In standards labs they hold to 68° ± 1/40°F. at 45 per cent relative humidity. Perhaps a structure is so closely integrated with the test equipment (such as the new underground 25-ft. centrifuge) that a customized building to meet special requirements is the only answer.

Designs range from a major facility such as Sandia's Engineering Reactor Facility to designing a small portable cart for placing test samples in the vacuum sphere. Department Manager Harry Pastorius states, "Our engineers must not only keep abreast of advanced technology in a variety of fields, but they must also be resourceful enough to temper new ideas with proven and practical past experience."

In cases where the contract is let to an outside architectural engineer after members of Design Division prepare proposals and criteria, the Sandians must check engineering details and calculations, and provide overall coordination.

Members of Sam Johnson's Inspection, Administrative and Coordinating Division 4542 assist the project engineers in fulfilling this responsibility. The construction inspectors make certain that the engineer's plans and specifications are carried out in accordance with the contract and that safe working practices are being followed. Their on-the-spot decisions and experience in expediting help the contractor to meet completion dates. Since there may be as many as 100 contracts underway at one time, the six construction inspectors are busy!

Sandia's fire protection program is one of continuing inspection and training. All buildings are inspected every three months, and fire protection devices such as sprinkler systems and fire detection systems, are designed into all new construction and modifications. The inspectors conduct extinguisher training programs for security inspectors and building fire captains. Particular emphasis is given to the increasing use of explosive and flammable materials. Sandia's fire loss in 1963, through November, was $607.

Mechanical inspectors are responsible for safety and maintenance inspection of many types of electrical and mechanical equipment, including some 400 hoists and cranes, static-free rooms, elevators, and lightning protectors.

This division also prepares and controls the equipment and annual expense budgets and negotiates all Corporation lease and use agreements involving land or facilities.

Perhaps the best known activity of 4542 is the Telecon desk, operated by Ralph Ambrose and Leroy Peterson. They expedite work orders requiring little or no engineering. The time interval between receipt of the call and completion of the order by the Maintenance Department averages four days. The previous formal written requests averaged 26 days to completion.

From January to June of this year the Telecon desk received an average of 862 orders per month (not counting trouble and maintenance calls). In the past two months that figure has jumped to 1121, and in one day alone during November, there were 120 requests called in. More than 50 per cent of the scheduled work by the Maintenance trades now comes from the Telecon desk.

The largest organization in 4500 is the Plant Maintenance Department, R. D. Flaxbart, manager. The department has skilled craftsmen organized along the lines of like crafts in a section or division. Bill Elskes is supervisor for the Electrical, Refrigeration and Air Conditioning Division; Dave Hake heads the Millwright and Machine Service Division; Max Roberson is in charge of the Carpentry and Painting Division, which includes carpenters, boxmakers, cabinet makers, painters, masons, locksmiths, and roofers.

Since 1958, floor space at Sandia Laboratory has increased 29 per cent; utility requirements are up 54 per cent. There are 200 major buildings with utility systems and complex equipment. More facilities and new equipment mean more demands for service and maintenance. Some of the equipment has made it necessary for the tradesmen to broaden their knowledge through "out-of-hours" courses, trade schools, or training by equipment manufacturers.

This is particularly true in the fields of electronic, electromagnetic, and hydraulic controls. During the same years, Maintenance Department personnel has increased by seven per cent —an indication of the importance of working effectively and using new methods to keep pace with Sandia's growth.

One of these methods is a central hard-wire telemetering system to monitor environmental conditions in major buildings and equipment operation in Area I. The first unit of the Central Monitoring Control was installed less than three years ago. The system functions from a transducer at the point of measurement through an analog to digital translator. From there the signal is transmitted through a telephone line to Bldg. 887 where it can be visually read or printed on cards for later analysis.

With this equipment it is possible to locate breakdowns, monitor test apparatus (such as that found in Bldg. 860 or 802), and start or stop mechanical equipment on a 24-hour-a-day basis. The system monitors temperature, pressure, RPM, electrical loads, etc., with an alarm system that calls the operator's attention to conditions exceeding tolerance.

It should be noted that due to tight environmental controls and specialized processes, Sandia has more standby power equipment than is normally required in a production-type operation.

Building 887 contains a number of complete shop facilities to back up the Corporation's field operations. In general, Sandia's trades personnel have technical knowledge and versatility far above normal requirements. The electrical shop rewinds motors, and repairs power equipment. Fully-equipped carpentry and boxmaking shops make special shipping crates, custom cases to protect valuable instruments and gauges, and other specialty items.

During the past two years, one of the busiest areas has been the Millwright Section. These men are called upon to position and level new equipment, and move existing machines. Certified welders are also included in this group.

Painting is an area in which the use of the latest equipment has made a great difference. New paint guns, used to paint some of the larger buildings with open ceilings, work with hydraulic instead of air pressure, virtually eliminating over-spraying and fogging. The guns can spray up to 1½ gallons of paint per minute. Used with the equipment is a paint which dries al-

# of 4500

most instantly, eliminating most of the need for masking and drop cloths.

The Pipefitting and Plant Operation Division (Walt Martin, supervisor) is responsible for maintaining the four boilers (each with a capacity of 50,000 lbs. of steam per hour) used to heat Sandia Base buildings. A fifth boiler will be constructed during FY 1964, which would have a capacity of 100,000 lbs. per hour. Maintenance of this facility has included rebricking the roof of three of the boilers—a job requiring scaffolding inside the three-story-high boilers. The pipefitters and sheet metal workers in this division work with stainless steel, PVC, and pyrex as often as they do copper and galvanized iron. They may also be asked to modify existing equipment to exceed the manufacturer's intended use.

The Office Equipment and Repair Division services approximately 2500 pieces of equipment including electric typewriters, adding machines, calculators, duplicating machines, etc. This division, supervised by Joe Hickey, also orders this type of equipment as well as office furniture.

Plant Maintenance operates a complete shop in Area III for general maintenance and work order activity for Area III, the reactor site, and Coyote Canyon. These men, working under L. D. Chapman (4518 supervisor), also provide support to test operations such as helping position a rocket motor in preparation for a sled test, and setting concrete targets in place.

Robert Findlay is manager of Transportation and Services Department 4570 which consists of three divisions: the Motor Pool Division, headed by Stan Brooks; the Janitor Service Division, headed by Lloyd Wilson; and the Labor Support and Grounds Maintenance Division, Elmo Whitmore, supervisor.

The motor pool has about 300 road vehicles and over 500 other pieces of equipment such as cranes, forklifts, and generators. The vehicles travel over three million miles per year, and for many years the motor pool has had the lowest operating cost per mile of any similar group in the AEC-ALO complex. The dispatch center handles an average of 7500 phone calls and 20,000 radio transmissions per month.

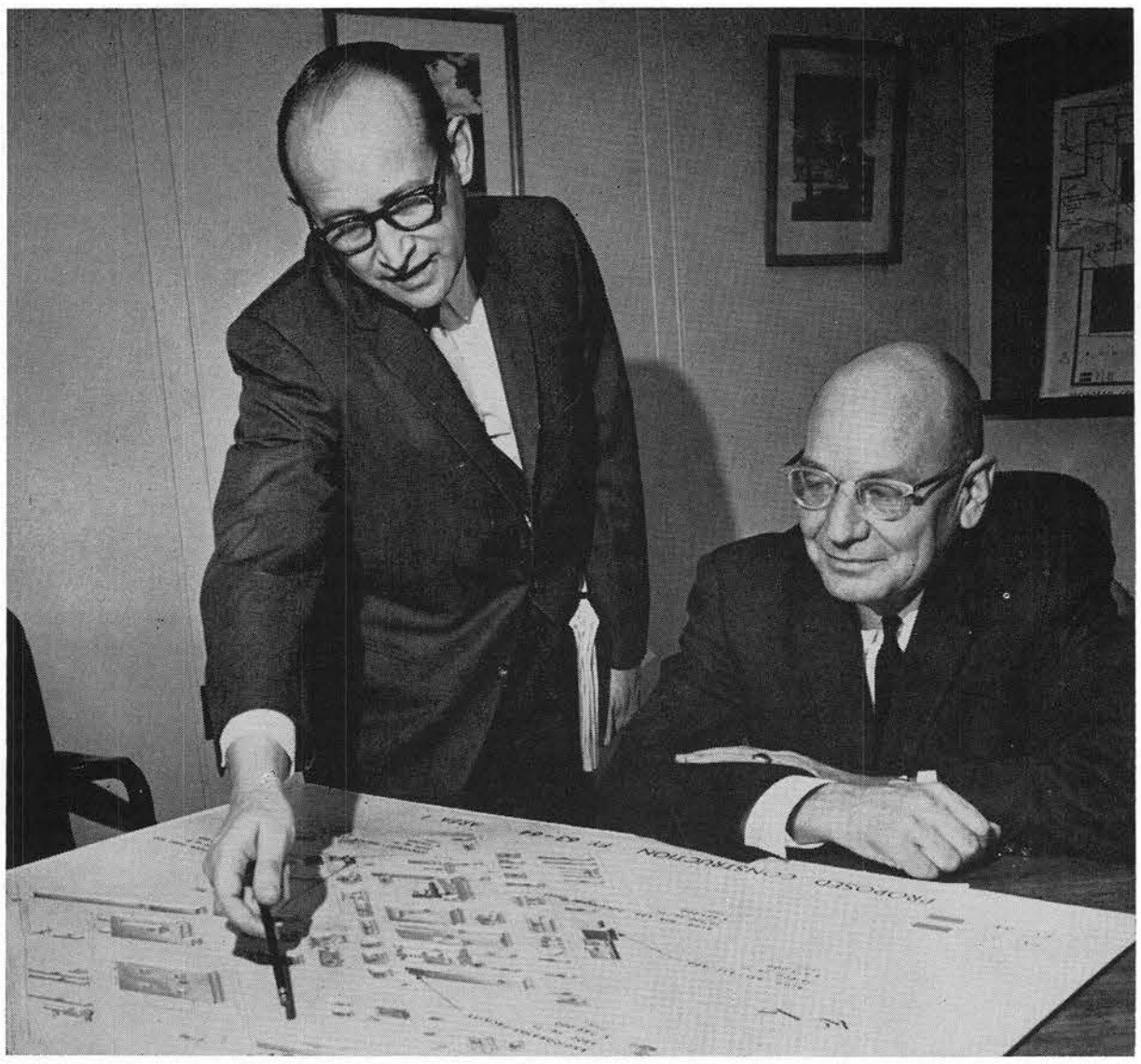
Heavy mobile equipment (cranes, graders, and bulldozers) is used in direct support of R&D activities. Graders from the motor pool maintain 75 miles of dirt roads in Area III and other outlying areas.

Modernization in motor pool operation has included the installation of 12 hydraulic lifts in the mechanics' bay, and an automatic tire changer which will remove a tire in six seconds. Such labor-saving equipment invariably results in overall improvement in safety as well as employee efficiency.

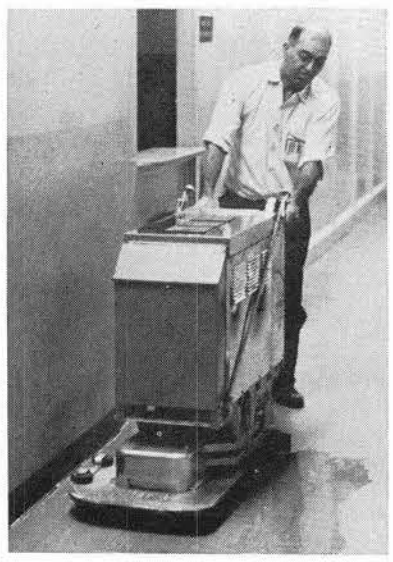
Sandia's janitor force sweeps and cleans 1,300,000 sq. ft. per day, and strips, cleans and waxes another 140,000 sq. ft. per month. This is possible through the use of the latest labor saving devices and new products. Most janitorial services are performed at night to avoid interference with daytime activities. Workers in 4574 also clean and relamp all light fixtures in Sandia Laboratory buildings. Since January 1962 this has involved 16,000 fixtures with 55,000 lamps.

The labor support group assembles and delivers all new furniture and assists in office moves and desk rearrangements, and the ground maintenance crew is responsible for the care of over 500 trees, 800 shrubs, and 90,000 sq. ft. of lawn.

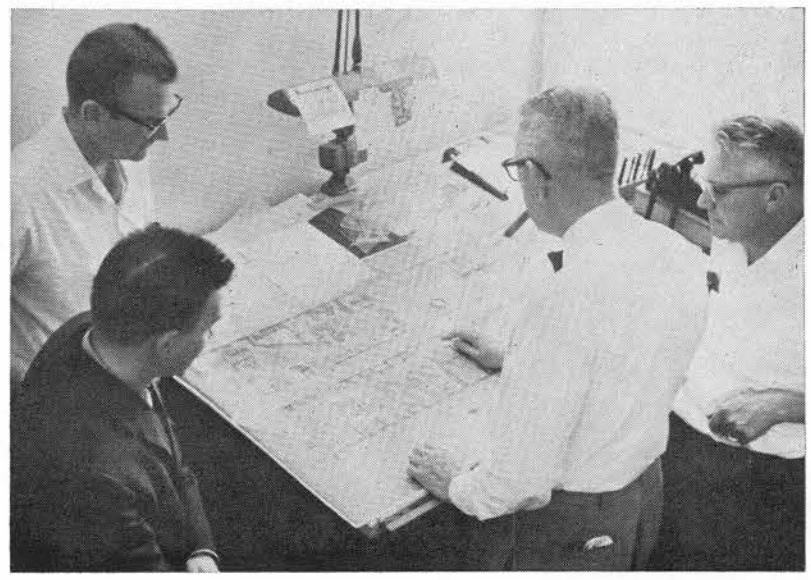
The Plant Engineering and Maintenance organization is the architect and consultant in continuing to construct and improve the facilities which play an integral part in accomplishing Sandia's programs. In addition, the organization acts as the landlord who sweeps and maintains the premises occupied by Sandia Laboratory.



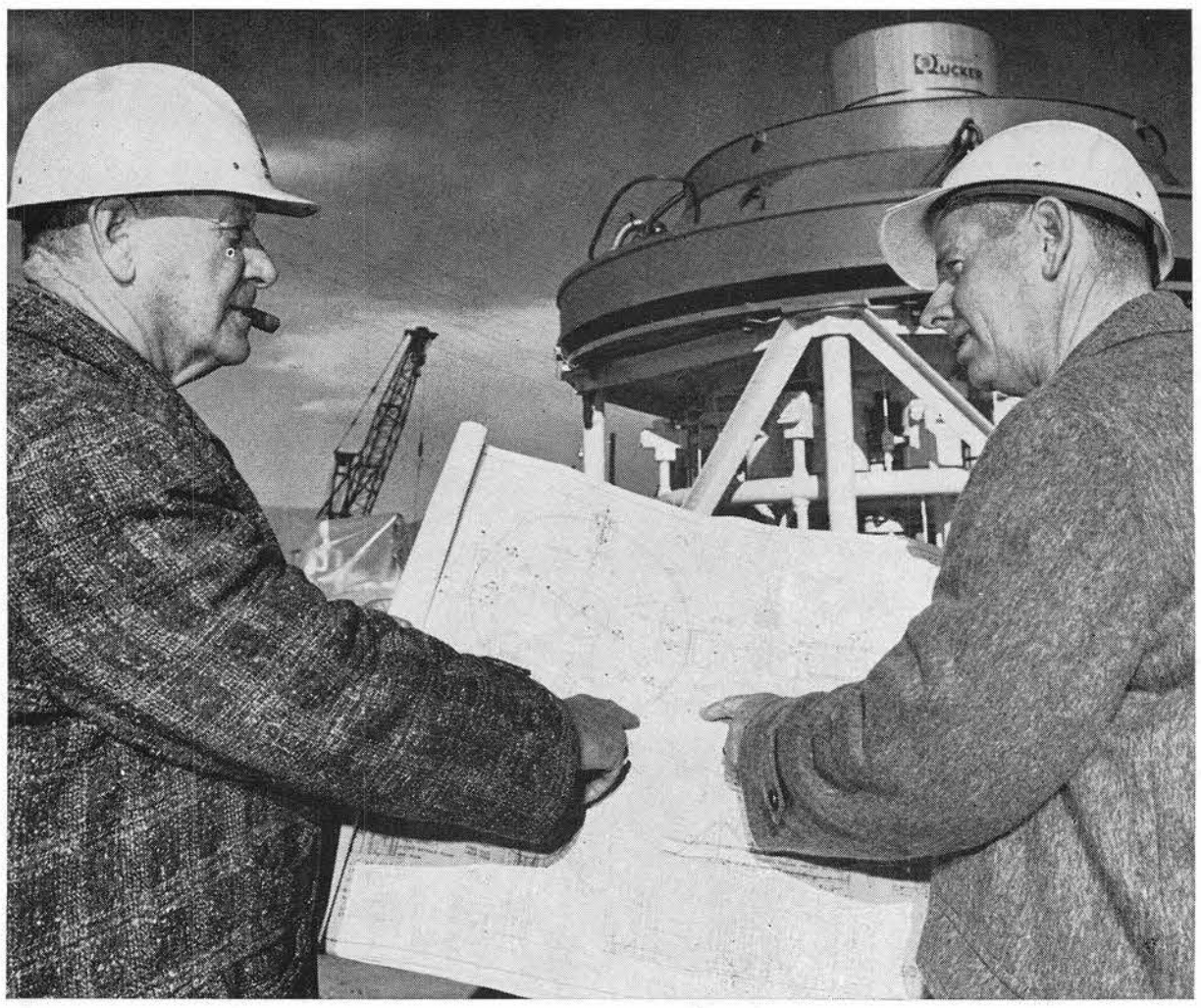
PROPOSED CONSTRUCTION at Sandia Laboratory for FY 1963-64 calls for an explanation by Harry Pastorius (left), Plant Engineering Department manager, to R. E. Hopper, Director of the 4500 organization.



AUTOMATIC SCRUBBING MACHINES and additional modern equipment enable Sam Salazar and other men in Janitor Service Division 4574 to care for large areas of floor space in Tech Area I.



MAKING SPACE layouts for new construction and relocating offices in existing buildings are among the duties of members of Layout Section 4541-3. Shown here "moving" partitions are (l to r) D. G. Letbetter, supervisor L. J. Wehby, H. P. Baecker, and C. R. Sandin.



CONSTRUCTION of the new 25-ft. centrifuge in Area III has been a major activity of Plant Engineering Department 4540. Rotating mechanism (in background) was being lowered as Jack Meister, inspector for the contractor, (left) discussed plans with plant inspector R. R. Boyd. Project engineer was R. G. Piper.

Asst. Area Manager F. E. Abbott Earns Performance Award

Frank E. Abbott, Assistant Area Manager for Administration and Security at the Atomic Energy Commission's Sandia Area Office, has been presented the Commission's High Quality Performance Award.

Mr. Abbott, a federal service employee for some 25 years, is a native of Denver. He has been associated with the AEC since 1952.

A 1937 graduate of the University of Denver, Mr. Abbott began his long government service career that year with the U. S. Treasury in Denver, and later transferred to the U. S. Department of Agriculture in the same city.

After nearly two years of service with the Army's Second Armored Division during World War II, Mr. Abbott returned to Denver for an additional USDA assignment before joining the AEC in Albuquerque as a section chief in the Finance Division.

Mr. Abbott has been Assistant Manager at the Sandia Area Office since July 1961.

Sandia Authors

Current or forthcoming articles by Sandia authors in technical journals include the following:

J. C. O'Neal (2411-1), "The Standards Laboratory—A Unique Structural Design Problem," November issue, **The Instrument Society of America Journal.**

W. E. Warren (5153), "A Transient Axisymmetric Thermoelastic Problem for the Hollow Sphere," November issue, the **American Institute of Aeronautics and Astronautics Journal.**

A. T. Fromhold (5151), "A Proposed Method for Observing the Effect of Electric Fields on Oxidation," Nov. 9 issue, **Nature** (published in England).

K. J. Touryan (7421), "Transient Temperature Variation in a Thermally Orthotropic Cylindrical Shell," December issue, the **American Institute of Aeronautics and Astronautics Journal.**

O. E. Smith (5153), "Improved High-Voltage Spark Gap, Requiring Zero Energy to Trigger," January issue, **Review of Scientific Instruments.**

Bruno Morosin (5152) and E. J. Graeber (1122), "A Reinvestigation of the Crystal Structure of $CoCl_2 2H_2 0$," November issue, Short Communications Section of **Acta Crystallographica** (published in Denmark).

C. W. Harrison Writes Number of Articles For IEEE Transactions

The name of C. W. Harrison, Jr. (1425), is becoming well known to readers of the **IEEE Transactions on Antennas and Propagation.** His recent contributions include the following articles:

July issue, "Monopole with Inductive Loading" and "On the Radar Cross Section of Rods, Tubes, and Strips of Finite Conductivity," which was co-authored by R. O. Heinz, who is on leave from Sandia Corporation.

September issue, "Missile with Attached Umbilical Cable as a Receiving Antenna."

November issue, "Radio Frequency Leakage into Missiles," which was co-authored by R. H. Duncan, Professor of Physics and Electrical Engineering at New Mexico State University, and "The Radian Effective Half-Length of Cylindrical Antennas Less than 1.3 Wavelengths Long."

The May 1964 issue will contain still another article by Mr. Harrison—"Transient Electromagnetic Field Propagation Through Infinite Sheets, into Spherical Shells, and into Hollow Cylinders."

I. H. Patterson Retires To Small Farm Near Espanola, New Mexico

Ira H. Patterson, a machine cleaner in Machine Shop Division 4253, retired at the end of November after nearly seven years at Sandia Laboratory.

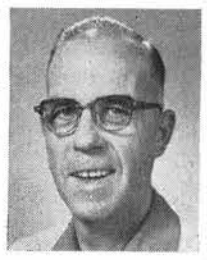
Mr. Patterson started laying the groundwork for his retirement days about a year ago. He and his wife returned to central Texas, where they owned a farm, and decided the weather was "too hot" there. Shortly afterwards, they purchased an acre of land near the Espanola airport in New Mexico.

In past months, Mr. Patterson has planted 20 fruit trees, and has built a house—it still needs trim work and paint.

"We both are rock hounds and like living in a small town. The climate and scenery are wonderful, and we are close to fishing and recreation areas," he added. Helping the Pattersons get acquainted are ex-neighbors from Texas whom they hadn't seen in nearly 30 years.

The Pattersons' address is Fairview P.O. Box 531, Espanola, N.M.

W. E. Brookshire Died Dec. 11



Wayne E. Brookshire, a staff assistant in Materials Deformation Section 1124-2, died Dec. 11 after a lengthy illness. He was 53.

Mr. Brookshire observed his 15th year service anniversary with Sandia Corporation last September.

Survivors include his widow, a brother in Pomona, Calif., and a brother and sister in Kansas City, Kan.

Sympathy

To Esther D. Donaldson (7241) for the recent death of her sister.

To Doris Mortenson (7141/3126) for the recent death of her father-in-law.

To H. J. Stein (5312) for the death of his mother in Oklahoma, Dec. 5.

To Naomi Bennett (4213) for the death of her mother in Marion, Ind., Dec. 9.

To Tom Laney (7241-3) for the recent death of his father-in-law.

To T. D. Sullivan (2543-3) for the death of his mother in Wisconsin Dec. 1.

To J. L. Hickey (4516) for the recent death of his brother in New York.

To Loy A. Robinson (4513-2) for the death of his father-in-law in Albuquerque, Dec. 7.

Supervisory Appointment

CECIL E. JORDAN to supervisor of Security Standards Division 3243, Security Standards and Operations Department.

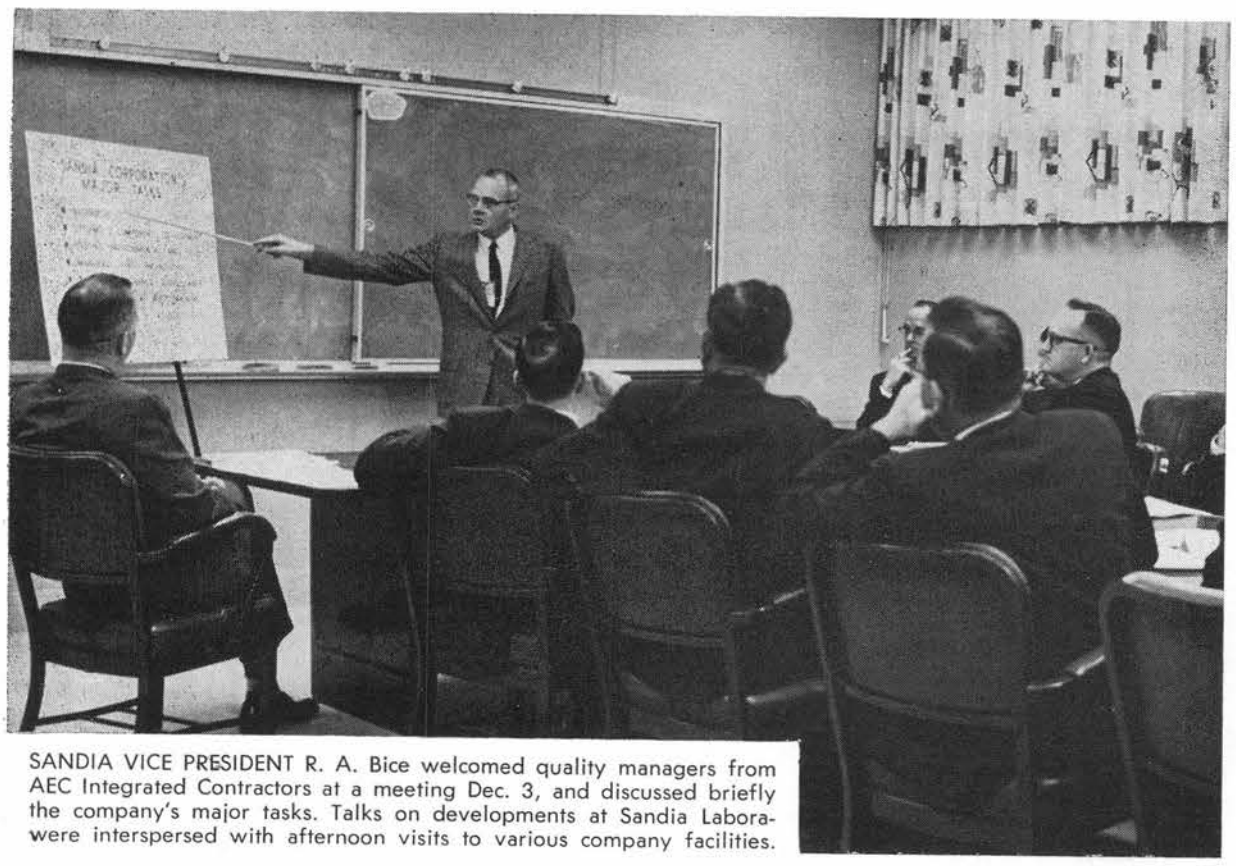
Cecil has been at Sandia 12 years and has been a section supervisor since 1953. His assignments have been in auditing, program scheduling, business methods, labor relations, and security.

Before coming to Sandia he was a Special Agent for the Federal Bureau of Investigation for three years, serving in Washington, D.C., Cleveland, O., and Albuquerque. He also was with International Business Machines Corporation for three years in a sales position in the Electric Accounting Machines Division.

Cecil has a BSC degree from the University of Notre Dame with a major in accounting, an LLB degree from the same school, and has taken graduate work at Harvard Business School.

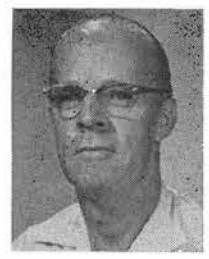
He is a member of the American Bar Association, Indiana State Bar Association, New Mexico State Bar Association, and has been admitted to practice before the Federal Courts in the Judicial District of New Mexico and the U.S. Supreme Court.

He is in the Navy Ready Reserve and is commanding officer of the Navy Supply Company 8-12.



SANDIA VICE PRESIDENT R. A. Bice welcomed quality managers from AEC Integrated Contractors at a meeting Dec. 3, and discussed briefly the company's major tasks. Talks on developments at Sandia Laboratories were interspersed with afternoon visits to various company facilities.

B. F. Fuller to Retire From Sandia End of December

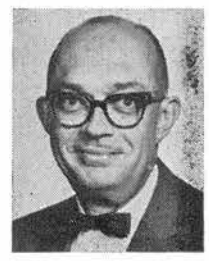


Benjamin F. Fuller, a Sandia employee for 14 years, will retire the end of December. He is a stock analyst in General Stores Division 4613.

Mr. Fuller and his wife plan to take a trip about every six months to visit the places that are of particular interest to them. Mount Rushmore in South Dakota is one of these. In April they expect to visit Fort Worth.

While in Albuquerque, Mr. Fuller will continue to bowl. His home at 1000 Chama NE is near two alleys. He also has acquired a renewed interest in golf and enjoys the challenge this sport offers. "Maybe my wife will join me on the golf links later," he hopefully adds.

J. E. Baylor Died At His Home Dec. 11



J. E. Baylor, manager of Safety Engineering Department 3210 for the past two and a half years, died suddenly in his home Dec. 11. He was 53.

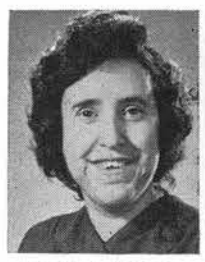
Mr. Baylor had been with Sandia Laboratory since 1951 and was associated with the Safety Engineering organization for eight of those years.

His previous experience included working as a safety engineer for the Corps of Engineers, Albuquerque District, and teaching mechanical engineering and safety engineering at both the University of New Mexico and the University of Denver.

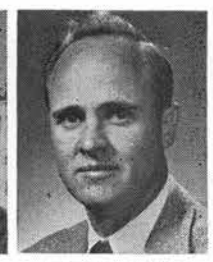
Survivors include his widow and two children: Cindy Ann, 14, and James E. II, 11.

Service Awards

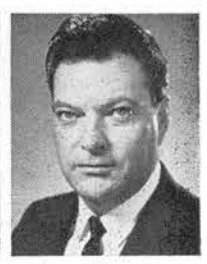
15 Years



Rosalie A. Gallegos
4611
Dec. 25, 1948



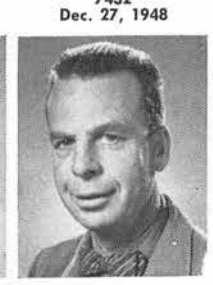
Emery L. Whitlow
7432
Dec. 27, 1948



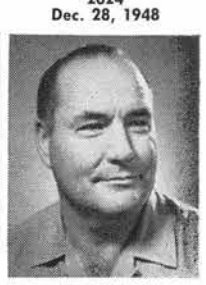
James B. Becker
2624
Dec. 28, 1948

Abraham L. Metzgar
4514
Dec. 28, 1948

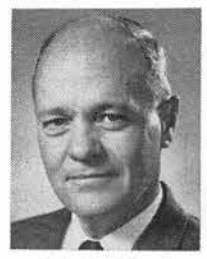
Joseph Pitti
4621
Dec. 29, 1948



Eugene L. Hansen
1413
Dec. 31, 1948

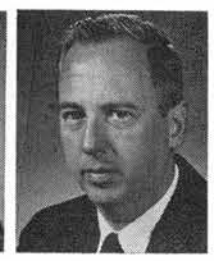


K. D. Stout
7223
Dec. 31, 1948

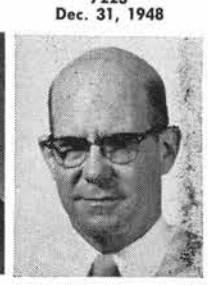


Robert T. Finnell
7418
Dec. 31, 1948

Jesse D. Wright, Jr.
7523
Dec. 31, 1948

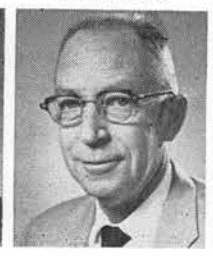


D. G. De Herder
2341
Jan. 4, 1949



George W. Walker
2343
Jan. 3, 1949

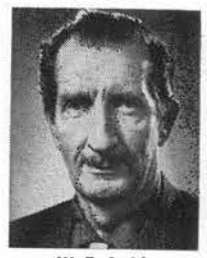
H. T. Killebrew
4511
Jan. 3, 1949



H. L. Calvery
4632
Jan. 3, 1949

Zachary R. Ortiz
5152
Jan. 3, 1949

Wilbur B. Sheaffer
7212
Jan. 3, 1949



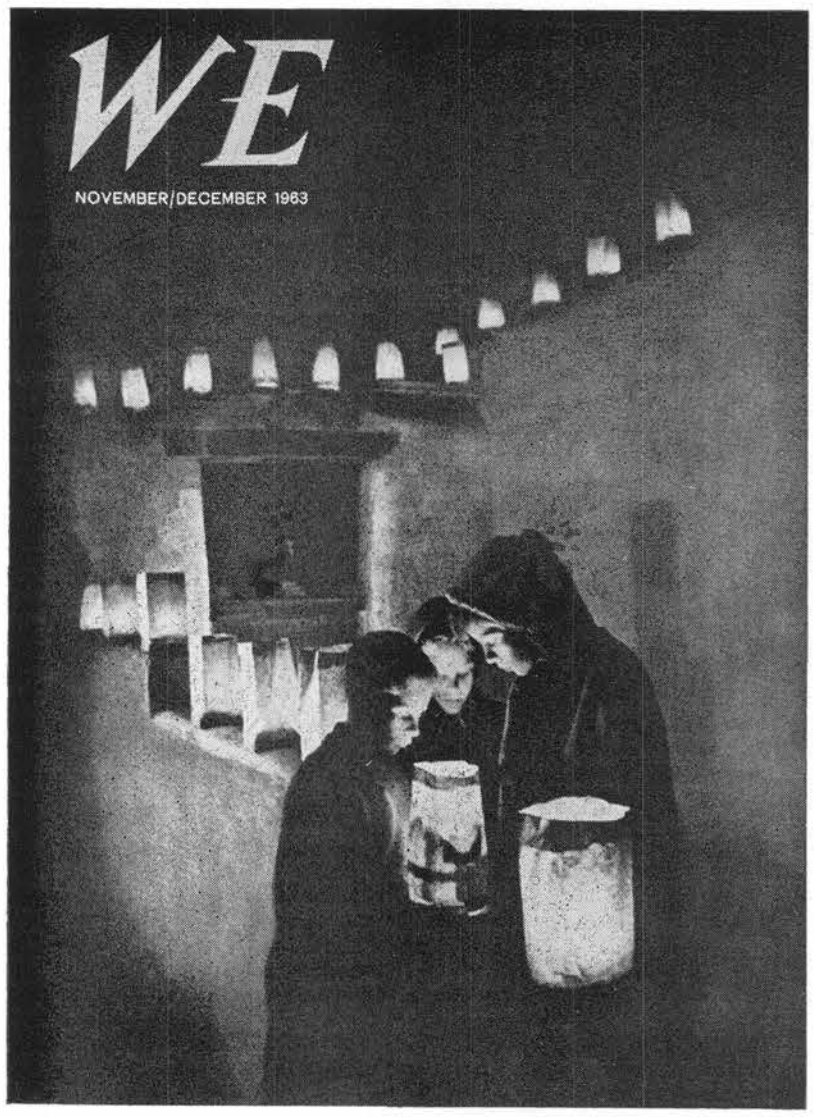
W. T. Smith
7213
Jan. 3 ,1949

E. E. Chestor
7522
Jan. 3, 1949

10 Year Pins

Jan. 1-31

August E. Binder, Jr. 1314, Myrtle P. Patterson 2321, C. E. Davidson 2621, Charles F. Maase 7511, Edward P. Quigley 2564, and



LUMINARIAS — long a Christmastime custom of the Southwest — will be seen in Albuquerque again this holiday season. One of the most impressive luminaria displays will be on Christmas Eve in the Los Altos area. The picture shown here was on the cover of WE Magazine, a publication for Western Electric Company employees. B. K. Laskar of the **Sandia Lab News** staff, photographed the luminarias.

Los Altos Luminarias Will Again Burn Christmas Eve

For the past 13 years, a group of Albuquerque neighbors, including several Sandia families, have pooled their efforts at Christmas to decorate the neighborhood. Residents of the area—Los Altos—have emphasized the use of luminarias, excluding all other types of outdoor decoration. The effect —reminiscent of decorations in the days before electricity—is charming.

This year, the Los Altos luminarias, photographed by B. K. Laskar (3142), appear in color on the cover of Western Electric Company's **WE Magazine.** The children in the photo are those of Mr. and Mrs. Jim Marsh (3414). Other Sandia families living in the area include those of C. J. McGarr (4600), Florencio Baca (4574), Gene Harling (3425), and Frank McCulloch (1112).

This year's display will consist of over 7000 luminarias, to be placed on the walls and walkways of the 31 traditional adobe homes in the area.

The residents of Los Altos have extended an invitation to the rest of the community to visit the display during the holiday season. To reach the area, go west on Central Ave. across the river to Coors Road, and turn south for ¾ mile; or drive out Bridge St. to Coors Road, then turn right. The entrance to the area is close at hand.

Biomedical Sciences Instrumentation Group To Meet in Albuquerque

Jack L. Mortley (7334-1) will serve as Host Committee Chairman for the Instrument Society of America's second National Biomedical Sciences Instrumentation Symposium, May 4-7.

The meeting will be hosted by the Albuquerque Section of ISA and will be held at the University of New Mexico.

The symposium theme will focus on opportunities for developing significant new biomedical instrumentation. Technical papers will be presented by leading researchers in the fields of biology, medicine, and instrumentation.

W. H. Kingsley Named To Assist Committee Of Hygiene Foundation

W. H. Kingsley, manager of Environmental Health Department 3310, was recently appointed to the staff of Dr. Lester Cralley, chairman, Engineering Committee of the Industrial Hygiene Foundation of America.

The IHF is a national association of industries for the advancement of healthful working conditions throughout industry and is associated with the Mellon Institute in Pittsburgh, Pa.

The committee's activities include publication and preparation of model codes for state guidance in such matters as air pollution; publications and developments from an engineering standpoint of the control of fumes and other factors affecting the working environment; and acting as a general sounding board for American industry in formulation of industrial health programs.

Mr. Kingsley is also active in the American Industrial Hygiene Association and Health Physics Society.

Employee Good Deeds Will Provide Christmas Joy for Many Youngsters

Sandia Laboratory organizations are winding up their collections of money, food, clothes, and toys for their part in "Operation Santa Claus."

The projects are arranged on an individual basis and replace the exchange of Christmas cards among employees who see each other frequently.

Al Hachigian (2313), chairman for Military Liaison organization's Shoes for Kids project, reports that $381 has been donated and that children from the Riverview Elementary School were fitted at a shoe store last Wednesday.

Children being cared for in foster homes will benefit from the project being organized by Alice Preist (4431-2). The first names and ages of 40 children were obtained from the Child Welfare Department. Gifts for the youngsters are being donated by members of Release Division 4433, and the four sections of Design Information Integrating Division 4431.

For the second year a "white elephant" auction was held during the noon hour on Dec. 16 and 17 by members of Classified Information Records Section 3428-3 and Information Distribution Section 3413-2. Employees donated items for the auction as well as used paperback books, which were also sold during the noon hour.

Proceeds will be used to purchase equipment for the Casa Linda School for Mentally Retarded Children (at 214 Truman NE). Chairman Dorthy Gray said, "Although this new school is privately operated, no child is ever turned away due to lack of funds." Helping Dorthy in the project are Ruth Redmond, Dottie Blalock, Emmalyn Massey, Jean Brownlow, Nita Tyler, Wilda Kamm, Marie Stone, and Alice Jarrell.

Boy Scouts Elect Harlan E. Lenander Manzano Chairman

Members of Manzano District of the Boy Scouts elected Harlan E. Lenander (2500) Chairman of the District. Other Sandians who were elected to serve for the coming year were Arnold E. Bentz (7413), vice chairman, and Robert W. DeVore (2630), District Commissioner.

Employee's Father Celebrates Hundredth Birthday Anniversary

Bonafacio Griego (4212-2) went to a birthday party Nov. 24, but it was a bit unusual. His father, Juan Jose Griego of Belen, was observing his 100th year. There were 30-40 close relatives on hand for the happy occasion.

Club Restaurant to Be Closed Noon Dec. 24

The Coronado Club Restaurant will not be open during the noon-hour, Tuesday, Dec. 24.

SHOPPING CENTER • SHOPPING CENTER • SHOPPING CENTER • SHOPPING CENTER • SHOPPING CENTER

CLASSIFIED ADVERTISING

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

RULES

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

FOR SALE

GIRL'S 24" blue bike w/basket, $20. Finley, 299-0739.

'60 CUSHMAN EAGLE motor scooter, turquoise, w/extras, make offer. Schafer, 299-4634 after 5 p.m.

'59 FORD Fairlane 500, a/c, automatic transmission, PS, 4-dr., radio, $1160. Edrington, 265-0044.

WESTINGHOUSE 9 pound washing machine, 3 yrs. old, $125 or best offer. Nelson, 855-4424.

'63 FORD, 9 passenger, Country Squire, 390, factory air, PS PB, other extras, $3150. Chandler, 256-6415.

7' SKIS, Cubco bindings, aluminum poles, boots, size 9½, boot tree, all for $37.50, or individually. Arthur, AX 9-7044.

HEATHKIT AM-FM tuner and preamp., both kits still in original box; 50-watt Heathkit Amp. completed, never used, make offer. Johnson, AX 9-7044.

HEATER, ELECTRIC, 110 volt, 1320 watts, new cost $12.95, sell for $9. Hurley, 256-0746.

TRAIN, twin diesel Lionel, 275 watt dual transformer, cattle loader, remote control switches, decouplers, semaphores, track, make offer. Blaine, 299-1036.

PORTABLE TV, $60; 16mm movie camera, magazine type, $45; '54 Cadillac sedan, one owner, $475; dropleaf tables; chiffoniers. Hueter, 242-1620.

STANELLI ACCORDION, $1000 when new, sell for $250, cash or piano. Hanna, AM 8-1595.

12LP4A RCA picture tube. Argyle, 268-2239.

TWO ½-ton refrigerated air conditioners, $50 each; 6 aluminum awnings, 48" wide, $10 each. Foster, 268-1284.

'55 FORD 4-dr., standard transmission. Moya, 3709 Rio Grande NW, DI 4-4132.

AKC registered beagle puppies, male and female, 8 weeks old and weaned by Christmas. Baca, 877-1405 after 4 p.m.

FIELD SNARE DRUM w/strap, $40. Clement, AX 8-0240.

UNICYCLE, $15. Adams, 265-0683.

'49 CHEV. DELUXE, $150. Cannon, 299-4592.

'59 TRIUMPH TR-10, 4-dr. sedan, $260; Viking Ranger transmitter, 65 watts, all bands, $150. Cummings, 298-6042.

250-GAL. BUTANE TANK, $115. Norcott, TO 5-7789.

SCOOTER, large push with foot type, $4; adjustable dress form, $6. Duvall, 299-8744.

TWO "Rest Aire" twin box springs and mattresses, complete w/legs, all for $40. Kerstetter, AX 9-3766 after 5:30 p.m.

MALE "PEKE" pedigreed, $25. Little, 255-7864.

4" SHOPMASTER JOINTER w/stand and motor, $40; Quickset privacy door locks, $2 each. Ligouri, 256-3613.

.22 RUGER PISTOL, $24. Klett, DI 4-9021.

'46 JEEP, Warne hubs, cloth top. Averill, 255-9357 after 6 p.m.

EASY washer-dryer combination, 2 yrs. old, recently overhauled, $100. Orth, 313 Erbbe NE, after 5 p.m.

LIONEL TRAIN SET, complete w/trestle set, used once, $20. Dain, 255-7236 after 5 p.m.

BICYCLE, boy's 10-speed, $40; baby crib, std. size, $15. England, 299-0464.

CHILD'S PIANO, Ely Mellotone, 21" high, 13" wide, 21" long, 18" keyboard, 30 keys, bench included, $4; child's electric stove. Worden, AL 6-9594.

HOUSE between North and West gates, 3-bdr., carport, see at 8100 San Joaquin SE, $10,000. Carrillo, 268-1275.

ROLL heavy weight poultry fencing, 165' x 5' high, Ward's price, $19, sell for $14. Stamm, 264-5738.

SMITH CORONA Silent portable typewriter, elite type; Kay electric guitar, w/case, dual magnetic pickup. Reis, 268-7964.

O'KEEFE & MERRITT gas range, grill, broiler, $40; ice skates, ages 3-4 yrs., $9; exhaust fan, new, $21. Orendorff, AM 8-9753.

'53 DESOTO V8, 4-dr., stick shift, OD, $100. Schuetz, 282-3486.

'59 DODGE WAGON, take over payments, $46/mo., bal. $689, take older car for equity. Dailey, 344-8880.

115 VOLT POWER PLANT, 4-cylinder engine, 3600 watt, w/6-volt starting system. Bluett, 282-3686.

'55 FORD sta. wag., new paint, $250. Oliver, 299-8853.

LARGE TRAIN SET AND TABLE, extra track and switches, 4 trains. Willers, 243-7494.

NEXT DEADLINE FOR SHOPPING CENTER ADS Thursday Noon, Dec. 26

19" PACKARD BELL TV-radio-record player console, mahogany, new picture tube; 19" Magnovox portable w/stand, new tube; Pedaltrim exercycle; bowling ball and bag. Merrell, 299-0348 after 6 p.m.

FIESTA DRESSES, white w/red and silver, pink w/silver, white and turquoise w/silver; trucks, hook and ladder, dump and van, and toy cannon. Meyers, 268-0533.

TV, blond, GE 21", $75; bed, gray hardwood, bookcase headboard, springs and mattress included, $50. Thorp, 298-6030.

HAM RECEIVER, late model Heathkit Mohawk w/SSB. Kroth, 521 Texas SE.

'61 TEMPEST WAGON, standard shift, will take trade; Hi-Fi component cabinet, oiled walnut, $50. Suttman, AX 9-6754.

TYPEWRITER, Remington Noiseless, office, $40; Relaxicizor, $40; feeding table, $10, bathinette, $10. Mandell, AX 9-4158.

3-BDR MANKIN, 1¾ bath, carpeting, evap. cooler, forced air heat, walled back yard, VA loan, make offer. Perkins, 299-0177.

IRONER, Kenmore deluxe automatic, dual heat control, speed control, folding clothes rack, 1750 watts, $47.50 delivered in Albuquerque. Mattox, 268-5554.

'54 CHEVROLET Belaire 2-dr. sedan, stick shift, has been hit in rear end, as is $150. Joseph, 299-6989.

TIRE CHAINS, Sear's heavy duty V-bar, 7.00-15 - 8:00-14, used one-half mile on snow, $9. Taylor, 256-3774.

FACTORY HARDTOP for Austin Healy 3000 four seat model. Schultz, 298-2731.

'57 FORD Fairlane V8, R&H, AT, $350. Gabaldon, AM 8-8679 after 5:30 p.m.

PIANO, upright, walnut, $125. Whitlow, 244-1991.

TV, 20" Silvertone table model w/base, $25. Hunter, AX 9-1089.

CORNET, Olds super. Roberts, 299-7407.

SCHWINN 20" convertible type bicycle. Mills, 299-4752.

5-PIECE BREAKFAST SET, gray w/black wrought iron legs, table has extension leaf, $25. Wright, ext. 264-8242.

'61 VOLKSWAGEN MICROBUS, 24,000 mi., $1450. Class, 255-4952.

SERVEL GAS REFRIGERATOR, 8 cu. ft., $25. Stewart, 299-0061.

'57 CHEV. station wagon, V8, std. shift, factory air, R&H, $695. Cole, 308 Espejo NE, AX 8-5632.

RCA TV CONSOLE, 21" screen, limed oak cabinet, $25. Miller, 268-5992.

'53 PONTIAC Chieftain 4-dr., $75. Knauss, AX 9-5364.

'54 DODGE, HYD. R&H, $175 or best offer. Lopez, 299-0941.

BEGINNERS GUITARS: electric, $20; Silverton, $10; Stella, $7.50. Tatum, 877-0997.

GOSSIP BENCH, walnut finish, $5; dinette table, extra leaf, gray formica top, $10. Neff, 299-1413.

MAYTAG AUTOMATIC WASHER, $20; new deluxe frames for king-size bed, still in factory carton, $15. Everett, 298-3994.

TWIN LENS REFLEX CAMERA, $20; Ludwig school drum, $20; hand-tooled leather holster for single action revolver, $15. Laskar, 299-1024.

'61 AMERICAN RAMBLER 4-dr. sedan, OD, large motor, a/c, R&H, one owner; '61 Rambler Classic station wagon, 9-pass. auto. trans., R&H, 22,000 miles, make offer. Baca, 298-0721.

24" GIRL's Schwinn bicycle; set of barbell weights. Prutsman, 299-2555 after 3 p.m.

COTTON CARPETING, 35 sq. yds., dusty rose, and pad. Costello, 299-0563.

TOTE GOTE 1961, $225; '62 All State Cruisaire scooter w/back seat and speedometer, $250. Lucero, CH 3-7517.

GE AUTOMATIC WASHER; Admiral portable stereo player; child's Farmall pedal tractor; black wall plaques w/matching elec. clock; sell or trade. Oard, 247-9924 after 5:30 p.m.

3-BDR separate dining room, Bandelier school area, $13,500. Rudeau, 256-2380.

COUCH & CHAIR, $15, training wheels, $2.75; set of 4 small wheels, $1.50; accordion, 120 bass, $180. Bradshaw, 268-8708.

'57 CHEVROLET, black and white 4-dr. 210 model, V8, standard transmission, $595. Johnson, 298-7020.

GRUNDIG STEREO, six speakers, record changer, AM/FM, space/wiring for stereo tape recorder, current model, cost $540, sell $235. McIntire, 298-6145.

BOY'S 26" bicycle, completely reconditioned, HD tires and tubes, $20. Christy, 265-0247.

CAMERA Argus C-3 w/ever-ready case and flash attachment, $20. Vivian, 299-1785.

MANZANO HIGH SCHOOL JACKET, purple w/gray lining, new, never worn, size 18. Phillips, 1020 Morris St. NE, 298-0541.

FENDER STEEL GUITAR, complete w/case and amplifier, $70. Gustafson, AX 9-3270.

3 TRI-COLOR GUINEA PIGS, 6 wks., $1 ea., hutch also available. Marsh, CH 3-2767.

BARITONE SAXOPHONE, $70. Lathrop, 255-1901.

BUTANE CAMPING STOVE w/oven, $25; 7.60x16 tire chains, never used, $5; lead melting pot; Mall skill saw, $10; Stanley electric drill, $5. Reed, 299-1684.

3 MO. OLD COCKER, AKC registered, parti-colored—white w/tan, has all but final shot, must be sold because of allergy. Hansen, 256-0641.

DRAPES, pale green, lined, 85"x140", $20; '62 Philco 30' pushbutton electric range, $125. Smith, 256-0375.

'48 CHEVROLET 4-dr. w/R&H, spotlight. Claghorn, 298-2043.

BELOW FHA appraisal, 1117 Girard NE, 2 bdr., large living room. Bisbee, 268-3815 after 5 p.m.

'60 CHEVROLET station wagon, PS, white, 6-cyl., $1200. Huff, 256-9426.

'56 FORD Fairlane V8, auto. trans., R&H, new 292 T-bird engine, $345. Trybul, 298-3325.

WANTED

POWER TOOLS—jointer, drill press, and bandsaw, also need wood carving chisels. Suttman, AX 9-6754.

USED CHILD'S SWING SET at a reasonable price. Salazar, 255-1301 after 5 p.m.

TO TRADE 26" boy's bike, good condition for 26" girl's bike, same condition. Ray, 256-6453.

WILL BABYSIT for 2-4 yr. old week days, have 4-yr.-old girl. Perea, Amherst Dr., NE, AM 5-0861.

WOMAN to share 2-bdr. home w/den and fireplace, centrally located near Highland High, $47 month plus half utilities. Young, 256-9158.

SCOUTMASTER UNIFORM, size 17 shirt, size 36 pants, also need other accessories. Duvall, 299-8744.

EXCERCISING SIT-UP BOARD, reasonable. Hole, AL 5-5925.

TREADLE SEWING MACHINE, reasonable. Carpenter, AX 9-4312.

SHARE DRIVING to 892 or 880 from vicinity Carlisle-Girard; Constitution-Indian School Rd. Devor, 256-6541.

RIDE from vicinity of Girard and Constitution to Bldg. 847. Mickey, 255-8412.

MEN'S golf clubs, good condition, reasonable. Laumbach, 298-4917.

SKI BOOTS, used, size 11½ or 12. Martell. 299-0833.

RIDE or join car pool from NE Los Arboles and Gen. Chenault area to gates 1, 3, or 4. Bortniak, 299-8432.

FOR RENT

1-BDR. APT, furnished, carpet, pool, $75. Whitlow, 244-1991.

Leo Gutierrez
— Systems Development 8100 —

Leo Gutierrez Named Director At Livermore Lab

Leo Gutierrez was appointed Director of Systems Development 8100, effective Dec. 6, 1963. He succeeds W. J. Howard who has taken leave of absence from Sandia Corporation to accept appointment as Chairman of the Military Liaison Committee to the Atomic Energy Commission.

Mr. Gutierrez was promoted to manager of Preliminary Design Department 8140 in October 1958. He held that position until his transfer to manager of Test Department 8120 last June.

After joining Sandia in 1947 as an engineer in the environmental testing field, Mr. Gutierrez subsequently worked on the design of new weapon components and on aerodynamics studies. In 1952 he was promoted to supervisor of an electrical design division, later transferring to head a project division.

Mr. Gutierrez transferred to Livermore Laboratory as a test division supervisor in 1956. He later took over a project division there and was supervisor of the Preliminary Design Division at the time of his promotion to department manager.

He came to Sandia after receiving his Master's degree in electrical engineering at the University of New Mexico. Previously he served over three years in the Navy while in the V-12 program. He attended New Mexico State University for two years before entering the Navy. Mr. Gutierrez received his Bachelor's degree in electrical engineering from the University of New Mexico in 1944.

At Livermore he has been active in civic affairs and is currently serving as chairman of the Board of Directors of the Livermore Area Park and Recreation District. He is principal of the St. Michael's Parish High School of Religion and is a member of the sponsoring Confraternity of Christian Doctrine.

Welcome Newcomers

Dec. 2-13

Albuquerque
Eileen P. Jones 3126
Randall D. Kilmartin 3413
Frederick D. Leach 3413
Margaret Malley 3126
Jewell C. McDaniel 3126
Joetta C. Miller 4622
Joe E. Otero 3413
Kathleen E. Williams 3126

California
*James A. Cooper, East Palo Alto 1422
Robert G. Hickman, Albany 1121

Iowa
Lynn G. Wise, Early 5414

Missouri
Loren E. Heavirland, Kansas City 5136
Robert A. Lederer, Kansas City 7332
R. Bruce Nevin, Kansas City 7331

New Hampshire
George R. Dalphin, Hannover 3421

* Denotes rehired

Senate Confirms Appointment of W. J. Howard

The U.S. Senate on Dec. 6 confirmed the presidential appointment of W. J. Howard as chairman of the Military Liaison Committee to the Atomic Energy Commission. As such chairman he also serves as Assistant to the Secretary of Defense (Atomic Energy). He has been Director of Systems Development 8100 at Livermore Laboratory since 1956.

During the tenure of his federal employment, Mr. Howard will be on a leave of absence from Sandia Corporation. He has been associated with Sandia since 1946 and served as Manager of the Engineering Department at Sandia Laboratory before his transfer to Livermore Laboratory in 1956.

E. H. Draper Recovering In Long Beach Hospital Following Auto Accident

Latest reports from the Long Beach Community Hospital are that Eaton H. Draper, Vice President, Development, is recovering satisfactorily from multiple fractures suffered in an auto accident several weeks ago.

His family will be spending the holiday season with him in California.

It is hoped that Mr. Draper may be released from the hospital sometime in January and return to Albuquerque for convalescence at his home.

Congratulations

Mr. and Mrs. L. W. Newman (2313), a daughter, Julie Annette, Nov. 28.

Mr. and Mrs. James M. Hoffman (5413), a daughter, Nov. 30.

Mr. and Mrs. James L. Davis (4614), a daughter, Sheryl Jo, Dec. 2.

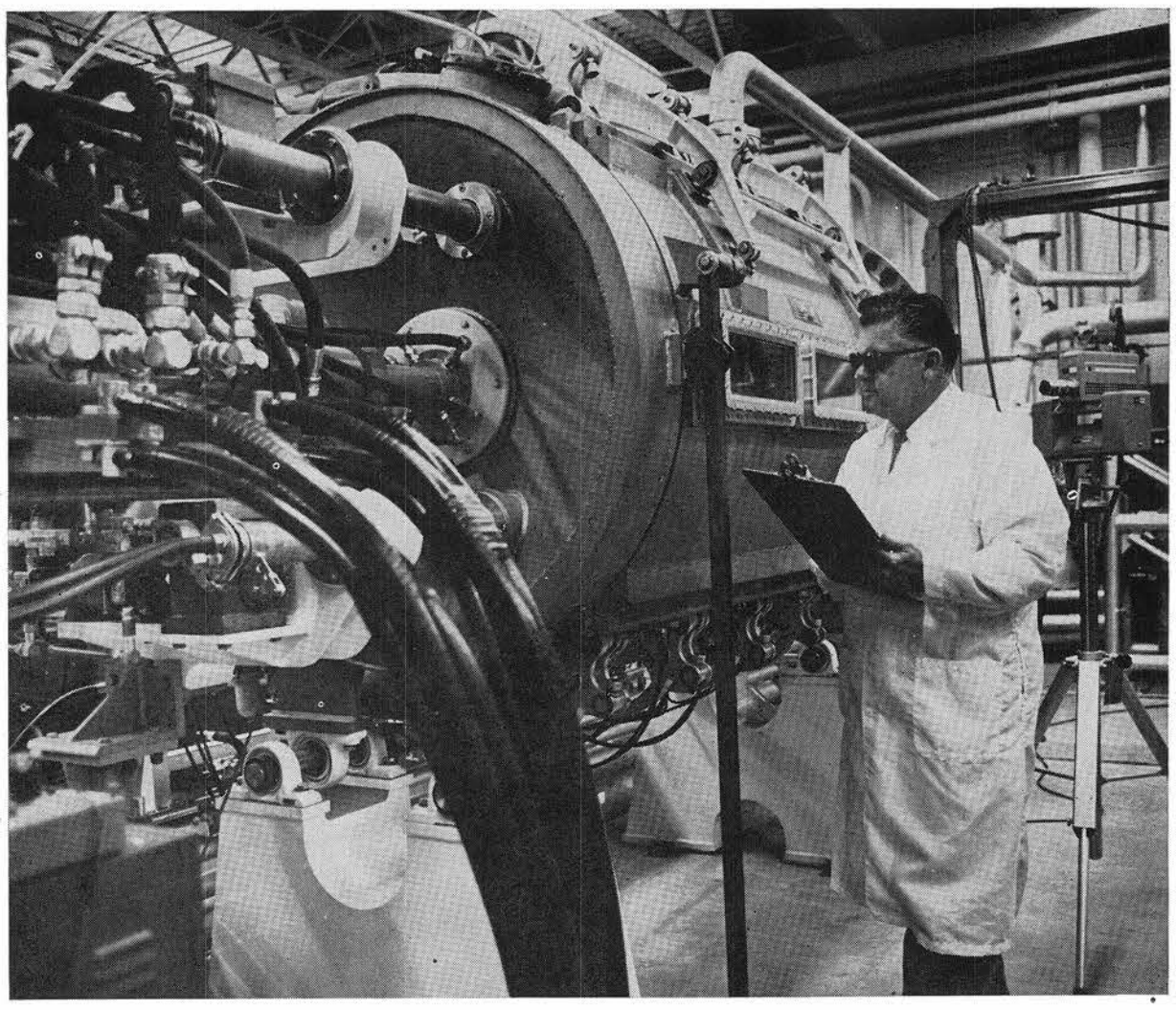
Lydia Trujillo (3126)

Take a Memo, Please

Safety has no quitting time. Carry safe work practices home with you.

Sandia's Safety Record

Sandia Laboratory	Livermore Laboratory
HAS WORKED	HAS WORKED
385,000 MAN HOURS	1,209,000 MAN HOURS
OR 11 DAYS	OR 235 DAYS
WITHOUT A	WITHOUT A
DISABLING INJURY	DISABLING INJURY



EXTREMELY HIGH TEMPERATURES and high velocities are simulated in the test chamber of one-megawatt plasma generator located in Aerophysics Section 7421-1 plasma laboratory. Mahlon G. Baker observes nozzle end of chamber. Extreme brightness of plasma normally requires goggle protection by the operator.

New Plasma Jet Can Produce, Maintain 20,000 Degree Heat

Personnel of Aerophysics Section 7421-1, supervised by M. D. Bennett, have been conducting a series of initial shakedown tests of a one-megawatt (one million watt) plasma jet system installed in Sandia's plasma laboratory. The laboratory also houses a 120-kilowatt generator and a 240-kilowatt generator.

"Plasma is generated when an electric arc is passed through a gas," Mr. Bennett explains. "It consists of the charged particles that carry the current across the gap between the electrodes. These particles are a mixture of electrons, ions, and atoms colliding with each other and generating radiant energy."

The plasma generator can be used to produce and maintain temperatures as high as 20,000 degrees F. for periods long enough to conduct most experiments.

The first tests to be run on the one-mw generator will consist of a series of configuration experiments involving ASP devices (Aerodynamic Source of Power) and plasma diagnostic probes. A limited number of tests of SNAP configurations (Systems for Nuclear Auxiliary Power) will be conducted in the new plasma system and it will be used for other tests requiring extremely high temperatures, simulated high altitudes, and simulated high velocities.

Gives Flexibility

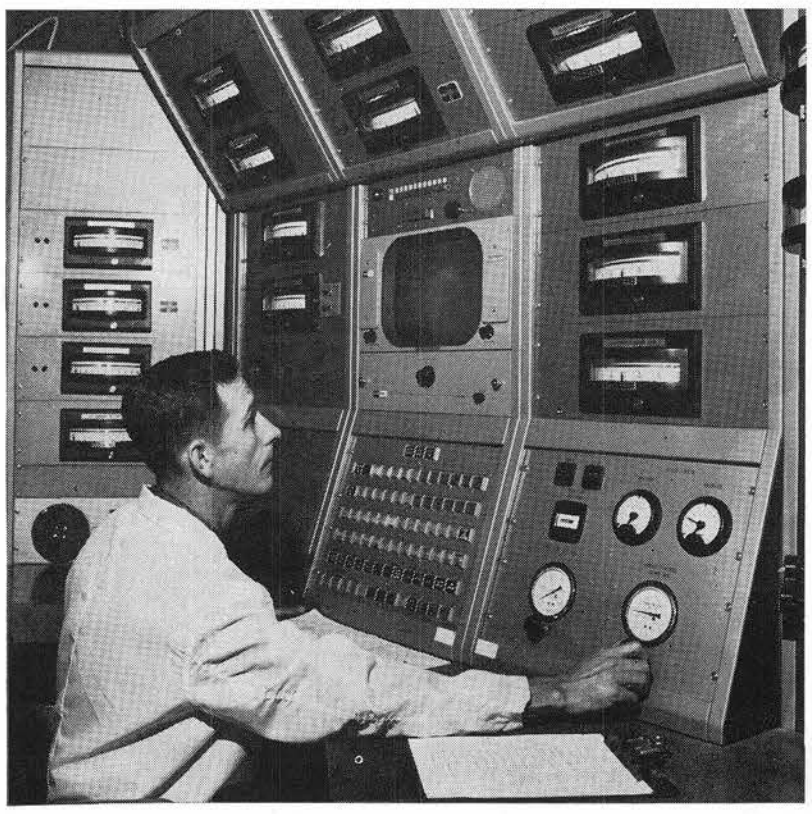
The one-mw generator was designed specifically as a research and development instrument with maximum flexibility. Basic components of the system include the plasma jet generator, a direct current power supply consisting of 20 selenium rectifiers, a 250-psi water cooling supply, a convergent-divergent nozzle, and the test chamber.

"The generator operates with a power range of 500 kilowatts to one megawatt," Mr. Bennett continues. "It incorporates an automatic ignition system which permits push-button ignition without any significant damage to the electrodes."

Simulates Reentry

The facility operates with argon or nitrogen as working fluids (which produce plasma in the presence of an electric arc). The convergent-divergent nozzle is used to expand the plasma jet to supersonic speeds. The test chamber surrounding the plasma nozzle is used to simulate pressure altitudes from sea level to 100,000 ft. Thus, the facility can be used to simulate conditions similar to those encountered by a vehicle reentering the earth's atmosphere.

In tunnel experiments a partial vacuum is created in the test chamber to increase the velocity of the high-temperature plasma stream. The Mach numbers produced in such tests are low supersonic values, but since temperatures are high, extremely high velocities can be simulated.



CONTROL CONSOLE at Plasma Laboratory is manned by Jesse V. Williams of Aerophysics Section 7421-1. Console operator can observe test chamber operations by means of closed-circuit television.

Two Disabling Injuries Sustained by Sandia Laboratory Employees

Two accidents last week marred Sandia Laboratory's safety record.

An employee was returning from the Nevada Test Site to Mercury, Nev., when his AEC vehicle was hit head-on by a private automobile. The employee suffered fractures of the right leg, left ankle, left foot, jaw, and nose. He received deep cuts in his chin and left hand.

He was taken by ambulance to a Las Vegas, Nev., hospital for treatment. He was later moved by air ambulance to an Albuquerque hospital where he is still recuperating.

The other driver received a citation for reckless driving.

The following day, Friday, Dec. 6, an employee was applying a protective coating to the metal roof of Bldg. 889 in the Salvage Yard area. The employee started to slip and was not able to recover his balance. He slid to the edge of the roof and jumped to the ground rather than risk a free fall. He landed on his feet from the 13-ft., 8-in. drop and suffered a fracture of the right heel.

He was taken by Sandia Laboratory ambulance to the Medical Department 3320 for treatment. He was later transferred to a local hospital. He is now at home recovering.

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