



ONLY 600 MILES from the Arctic Circle, Fort Churchill was the frozen scene of the recent Caribou I project. Sandians fired two rockets into the "northern lights" to aid a Los Alamos Scientific Laboratory study of the region of the auroral spectrum. Temperatures at the site ranged from zero to 50 below.

Frigid Sandia Assignment

Caribou I Project Allows Man to Study Spectacular Aurora Borealis

A small group of Sandians fired two rockets, carrying Los Alamos Scientific Laboratory instruments, into the glowing northern sky beyond remote and frigid Fort Churchill on Canada's Hudson Bay recently. Under investigation was the aurora borealis or "northern lights" and a region of the auroral spectrum which is beyond visible light.

The first Nike-Tomahawk was fired at 11 p.m. Feb. 18 and second went up Mar. 6 at 1:30 a.m. The project, called Caribou I, was conducted by personnel of LASL, Sandia Laboratory, and Johns Hopkins University.

Orville Howard of Upper Atmosphere Projects Department was the Sandia project leader. Participating were Carl Cianciabella, Paul Goen, Lester Luehring, and Thomas Shishman of the department, and Charles Taft of Engineering and Research Support Division.

The Sandia group's role included the engineering required to integrate the LASL Spectrometer-Photometers into the Nike-Tomahawk rocket system, developed by Sandia for high altitude research. Sandia handled the logistics of shipping 7000 lbs. of equipment by charter plane to Fort Churchill, and performed the launch operations of the rockets. Sandia designed the telemetering system which transmitted data from the instruments to the ground. Data is being reduced now by Sandia's computing organization and will be delivered to LASL when complete.

Project Director for Caribou I was Herman Hoerlin, LASL J-10, with Hamilton Peek as alternate. Collaborating on the pro-

ject was Professor William Fastie of Johns Hopkins University, a LASL consultant and a veteran of previous expeditions to the far North.

Half a minute or so before the first Nike-Tomahawk went up on Feb. 18, Professor Fastie sent up a NASA Aerobee rocket to rendezvous with the LASL-Sandia instrumentation packet. Its instruments read a different part of the aurora spectrum. Some 60 miles in space, the instruments measured the "color" of the auroral light, its intensity, duration, and location.

At apogee, the high point of the trajectory, the instruments also recorded the dim "night glow" emitted by atomic nitrogen and oxygen above the auroral region, and the "glow" of the irradiated hydrogen gas from interplanetary space.

Auroras, and the disruption that accompany them, are symptomatic of activity on the surface of the sun. The sun is continuously boiling off hydrogen (protons and electrons) that shoots through space. This is the so-called "solar wind." When these atomic particles approach the earth—tra-

(Continued on Page 5)

AURORA BOREALIS lights up the Arctic sky above Fort Churchill. Los Alamos Scientific Laboratory instruments, carried to 60 miles altitude by Sandia rockets, measured the "color" of the auroral light, its intensity, duration, and location. Also recorded were the dim "night glow" emitted by atomic nitrogen and oxygen above the auroral region and the "glow" of irradiated hydrogen gas from interplanetary space.



SAFETY STATISTIC—Marge Bell adds a special statistic to the Livermore Laboratory safety scoreboard, commemorating the attainment on Mar. 4 of one million man-hours without a disabling injury. Actual no-lost-time manhours at the end of that workday were 1,004,534 for the period that began Aug. 18, 1964. This achievement makes the Laboratory eligible for its fourth National Safety Council Award of Merit.

Second Major Safety Award to Livermore Lab

E. W. Baldwin, manager of Administrative Services Department, recently accepted a safety award plaque on behalf of Livermore Laboratory.

The presentation was made at the industrial awards dinner of the 13th Annual California Safety Congress and Exhibits, in San Francisco, Feb. 18, which highlighted the two-day Congress, sponsored each year by the San Francisco and Eastbay Chapters of the National Safety Council.

Sandia received the plaque as a major award winner in the 1964 Business and Industry Safety Contest. The award was made for attaining the lowest accident frequency rate in the 1,200,000 to 2,000,000 man-hours-worked group.

In two years of participation, this was the second major award presented to the Laboratory for its safety achievement in accident prevention.

Livermore News Now Appearing in Sandia Lab Issue of Paper

A section of the Lab News, probably new to some readers, appears in this issue.

Devoted to information from Sandia's Livermore Laboratory, the section is on Page 3 of this issue and will appear regularly in future issues. Previously, this news had been in only those copies of the paper distributed at Livermore Laboratory.

The articles are written at Livermore Laboratory by members of Administrative Systems, Classification and Public Information Division. Livermore photography is done by the Photography Section at Livermore Laboratory.

Sandia Papers to Be Presented at Physical Society Meeting

Some 11 technical papers, written by members of Sandia's Physical Sciences Research Department and Radiation Physics Department, will be presented during the American Physical Society Meeting in Kansas City, Mo., Mar. 24-27.

The authors and their papers are: Albert Narath, "Magnetic Properties of $\text{FeCl}_2 \cdot 2\text{H}_2\text{O}$ "; W. J. O'Sullivan, "Chlorine NMR in $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$ "; B. L. Gregory, "Injection Stimulated Vacancy in P Type Silicon at 76° K"; H. J. Stein, "Electron Bombardment Damage and Annealing of P-Type Silicon"; R. G. Kepler and A. C. Switendick, "Triplet Excitons in Thin Anthracene Crystals."

G. W. Arnold, "The Crystal Orientation Dependence of the Decrease of Recombination Radiation in GaAs with Electron Bombardment"; D. K. Brice, "Resonant Phonon Scattering by Interstitials in Si and Ge"; A. R. Sattler, "The Average Ionization Produced in a Silicon Lattice by Monoenergetic Neutrons as a Function of Incident Neutron Energy" and "Channeling of Protons as a Function of Incident Angle in the (110) Plane in Silicon and Germanium"; F. L. Vook, "Thermal Conductivity of Electron Irradiated Germanium"; and Ruth E. Whan, "Compositions of Oxygen Defect Complexes in Irradiated Germanium."



(Editorial Comment)

Those Tired Old Letters

The recent efforts of the **Lab News** to turn writers in the direction of clarity have brought some interesting comments.

One comes from a reader worried about stereotypes and threadbare expressions in letters he receives. He presented us with a list of 65 tired old expressions, common to letters, but not in keeping with today's trend of writing in a vital and forceful manner.

Here are a few examples:

Above. As in "the above policy." (Say, "this policy of" or "the policy above.")

Enclosed please find. Use the simpler, more natural, "enclosed is."

Hereby. As in "We hereby acknowledge the receipt of your letter." (Say, "Thank you for your letter.")

Hesitate. As in "Do not hesitate to write us." (Say, "Please write us.")

Previous to and subsequent to. Pompous and much overworked. Also, incorrect when used as verbs. "Before" and "after" are much more natural.

Recent date. As in "Your letter of recent date." (Say, "As in your letter of Mar. 1." Use specific date.)

Thanking you in advance. Discourteous and unnecessary. If you ask a favor, ordinary courtesy requires that you write a note of thanks after the favor has been granted.

Party. Do not use "party" in business writing when you mean person or man. However, the word "party" is accepted as good and appropriate in legal writing.

There are other hackneyed expressions he'd like to see avoided (and we concur):

by return mail	take pleasure
contents noted	this is to inform you
in re	wish to say
beg to inform	pursuant to our conversation
attached hereto	in reply wish to state

The idea is, our contributor points out, we should be striving in our writing to be natural for this means we are being clear.

Why all this need for clarity in writing? Jim Fife, who with Bill Carstens is now teaching a course in report writing for staff members in the 3000 organization, reminds us of "Murphy's Law—If something can go wrong, it probably will."

Sandia Speakers

W. E. Warren of Atomic Interactions Research Division and Prof. T. P. Mitchell of Cornell University, "Singular Loading in a Notched Half-Plane." IBM General Products Division, Feb. 9, Endicott, N. Y. Professor Mitchell made the presentation.

R. N. Reed of Employment Division, "Pre-Employment Practices at Sandia Corporation," New Mexico Personnel Association, Jan. 21, Albuquerque.

C. E. Land of Electro Physics Research Division, "Transistor Oscillators Employing Piezoelectric Ceramic Feedback Networks," Institute of Electrical and Electronics Engineers' International Convention, Mar. 22-25, New York City.

A. C. Littleford of Reliability and Engineering Design Practices Division, "An Effective Design Analysis Program," Fourth Annual Quality Control and Reliability Conference, sponsored by the Long Island Section of ASQC, Mar. 20, Hempstead, N. Y.

J. E. Schirber of Electron Structure of Solids Division, "The Effect of Pressure on the Fermi Surface," Physics Colloquium, Mar. 22, Iowa State University, Ames, Ia.

R. M. Lacey of Measurement of Materials Properties Division, "Response of Materials at Intermediated Strain Rates," Fifth International Symposium on High Speed Testing, Mar. 8, Boston, Mass.

Sympathy

To M. Ruth Simpson (9231) for the death of her brother in Carmi, Ill., on Feb. 25.

To Silviano Chacon (4574) for the death of his father in Espanola, N. M., on Feb. 23.

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MARCH 12, 1965

Weather Experts Give Reasons for Area's Peculiar Climatic Pattern

Weather and weather forecasting are subjects ridden with clichés, proverbs, and old wives' tales. Perhaps one of the favorite sayings of Albuquerque residents is: "If you don't like the weather, wait a few minutes—it will change!"

Conditions are not as capricious as they might seem. Sandia meteorologists Bob Gentzler, Cliff Olson, and Tim Raftery, who provide forecasting service on Albuquerque, Holloman AFB, Livermore, Tonopah Test Range, etc., for Field Testing and other Sandia organizations, maintain that geographic features and established storm patterns fairly well account for the city's climate.

"The mountains to the east are the biggest factor in Albuquerque's weather. They effectively protect us from the winter storm track which originates in Canada or the Arctic and flows down the Ohio Valley and into Kansas and Texas," Tim explained. "A storm front has to be deep and dense to spill over this mountain barrier (last week's storm was an example) or it has to be pointed toward one of the canyons to funnel through there."

Even when a storm does push across the mountains, Albuquerque may not receive snow. Cliff noted, "The lifting action may cause condensation (in the form of snow in the mountains) and the clouds may be dried out by the time they reach Albuquerque."

If the city were situated on the east side of the mountains, its weather would be similar to that at Tucumcari: more wind, more moist air, and more severe temperatures.

The most precipitation in Albuquerque results from an upper air mass moving in from the Gulf of Mexico, the Gulf of California, or, in winter, from the South Pacific. When there is a low pressure area centered about 20,000 ft. over Nevada, Arizona, and California, the upper air mass will move around it in a counter-clockwise direction, spilling moisture on the fringe states, such as New Mexico.

Since warm air can hold more moisture than cold air, the city's heaviest snowfalls occur when temperatures are at 25-34°F.



GUIDING their vehicle over rocky stretches of Baja California highway was a chore shared by Charlie Mauck and his three companions.

Jaunt to Mexico Short on Time But Long on Abundant Troubles

High on the list of incidents that can spoil a vacation trip are (1) car trouble, (2) loss of money, and (3) illness. No one was ill on Charlie Mauck's trip to Baja California; members of the party didn't lose their money, they gave it away; but car troubles more than made up for the difference.

The jaunt was originally planned for 23-25 days. The travelers were a petroleum geology professor from the University of New Mexico, two Forest Service plant pathologists, and Charlie, an engineer in Mechanical Support Division.

Things went well from Mexicali to their first night's camp in the Juarez Mountains until the temperature dropped to the lowest level in 15 years. They thawed out a couple days at an early-day resort ranch in the Sierra San Pedro Martir mountains, then pressed on.

From El Aguajito to San Luis (ranches, not villages although they are named on maps of the area) it took the adventurers

10 hours to drive 62 miles. Granite outcroppings made the going particularly slow and in most places they couldn't bypass the road with their four-wheel drive vehicle because of the abundance of Spanish sabre cactus, which can slash tires.

Six miles beyond Laguna Chapala (another ranch about 350 miles south of the border) the vehicle collapsed on the side of an arroyo. The men spent the night on a narrow ledge and in the morning started itemizing the ailments: five flat tires, two broken springs, and two leaking fuel tanks. They hiked back to Chapala where the elderly "patrón" gave them shelter and food.

"There was no electricity, telephone, or radio-telephone at the ranch. The patrón provided us with beds and an oil lamp in a separate hogan," Charlie said. "Although we stayed there three days, he wouldn't let us pay for our keep or work on the ranch."

Their rescue involved one 38-mile truck ride eastward, then an overnight haul on a fish truck from San Luis Gonzago to San Felipe. "The driver had six giant sea turtles and a dozen large sea bass in the back of the truck. The 100-mile trip took 12 hours and it was fortunate we were in the cab as the driver fell asleep at the wheel three times and we had to grab the wheel. Once beside a 1500-ft. drop," Charlie recalled.

At San Felipe their car was pieced together and suitable tires were located. "On Christmas morning a house exploded in flames in town and a baby was burned to death. We were so impressed by the spontaneous aid given by the people—who were extremely poor themselves—that we also contributed extra food and clothes, and money," he said.

The men returned to their homes before expected and the vacation could hardly be called "a success," but they were extremely impressed by the kindness shown to them in their plight and are getting together several boxes of clothing and shoes to send to the people of Laguna Chapala.

SANDIA CORPORATION

LAB NEWS



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Many See Laboratory for First Time

Large Turnout, High Interest Makes Family Day Successful

"Let's see where daddy works!" This and similar expressions from youngsters during Livermore Laboratory's Family Day were proof of the success of the occasion. It was around this theme that Family Day was planned. It was the first chance most Sandia families had to step beyond the guard post and enter the technical area of Livermore Laboratory. And families came, bringing with them a sincere interest in "where daddy works."

More than 2500 employees and family members attended Family Day—an increase of 1000 over the number originally anticipated. Many families were waiting at the gate at 10 a.m. when it opened, and the last family was admitted a scant 10

minutes before the gate closed at 3 p.m. An early morning rain gave a freshness that added to the success of the event. The sun emerged bright and clear just before the gates opened.

Family Day preparations began many months ago, but did not reach full swing until the day before the event. On that day, shops, laboratories, offices, and storage spaces almost glittered from cleaning. Due to the efforts of the Security and Safety Divisions, and to the willing cooperation of visiting families, there was nothing to mar the pleasantness of the day.

The success of Family Day reflected the general enthusiasm of employees throughout the laboratory.



FAMILY DAY BEGAN — Hostesses Bernie Marx and Ann Ritchie await the first Family Day guests.



EMPLOYEES AND THEIR FAMILIES arrived at a steady rate during the five hours the Laboratory was open.



TICKET PINNING—To comply with security requirements, all guests were tagged. Hostesses provided safety pins and helped with the pinning. Souvenir maps highlighting some of the Family Day displays were distributed.



BUS SERVICE was provided to the Area 8 environmental test facility from the rear of the Administration Building. Visitors were allowed to leisurely tour the Laboratory, stopping wherever they wished.

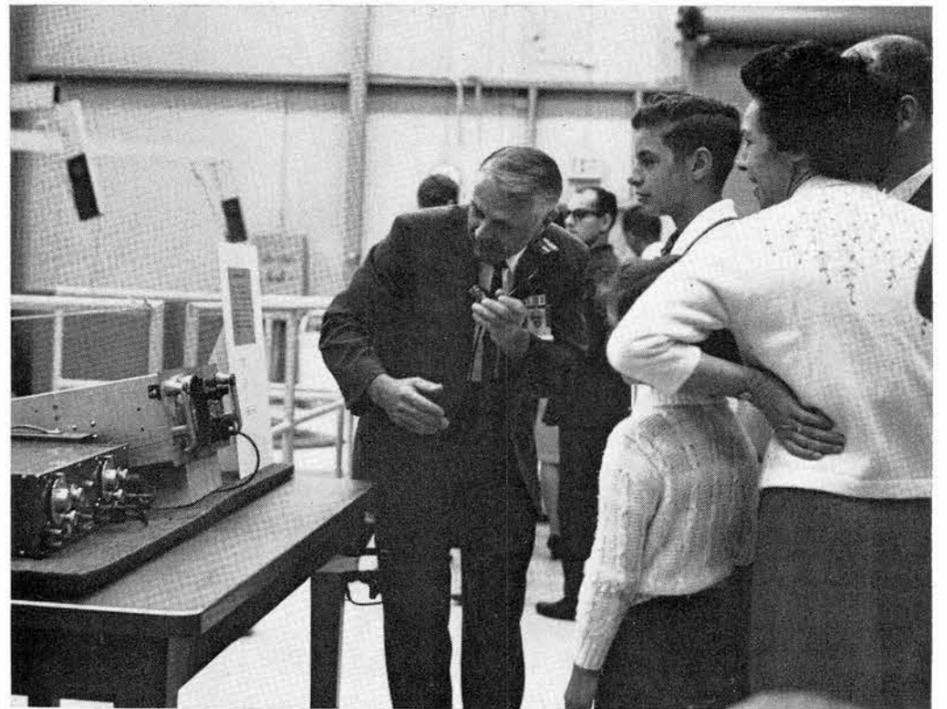


OPERATION OF THE TAPE-CONTROLLED MILL—Machine tools in the Building 913 Model Shop drew large audiences. Of particular interest was the demonstration of precision milling.

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FASCINATION—A young visitor is shown what her pulse beat looks like on an oscilloscope by Family Day host Howard Reed.



VISIBLE SOUND WAVES—Host Dave Hillyer shows the effect of sound waves on an oscilloscope. A telephone was attached to a vibration table that responded to voice impulses and a scope was attached to the vibration table. The table was compared to a radio speaker that vibrates to produce the sound. Visitors speaking into the telephone could see the "shape" of their voice and the effect of voice waves on the vibration table.



THE ENGINEER'S TOOL—Jim Mesnard, another Family Day host, demonstrated a new transistorized calculator used by some engineers at SCLL.

WHEN THE DAY IS OVER—The first real break came after 3 p.m., the close of Family Day. Hostesses Barbara Whitlow and Billie Titus take time for coffee after the last guest has departed.



Rutherford And The Atomic Nucleus

— by C. C. Hudson —

This article is a continuation of the story of Ernest Rutherford (1871-1937), a native of New Zealand, who first disclosed to the world that the atom consisted of a heavy charged nucleus surrounded by negative charge. It is hard to exaggerate the importance of this discovery. All of present-day chemistry, nuclear science, and electronics is based indirectly on it. This installment of the Ernest Rutherford story tells of later portions of his life and works with students who became famous due to their accomplishments — and Rutherford's guidance.

Part II

In 1907 Rutherford moved to the University of Manchester. Brilliant young aspiring physicists now came to study with him: Hans Geiger, Ernest Marsden, Charles Darwin, Niels Bohr, H. G. J. Mosely, and many others.

He had given Marsden the task of determining if alpha particles could be scattered through large angles. The idea of scattering one particle off another in order to learn something about their properties was new to physics, and was apparently due to Geiger, who, in 1908, was allowing alpha particles to be scattered by thin foils of metal. There do not appear to be any records of how this work got started, or why; when we are able to pick up the story, Rutherford was aware of small angle scattering, but did not believe large angle scattering possible. He was just testing young Marsden.

In a scattering experiment, a very narrow beam of particles is directed toward an extremely thin foil of some pure metal. It is wise to do the experiment in a vacuum so the effects of air can be eliminated. The projectiles (alpha particles) largely pass through the foil without changing course, because they can be deflected only by collisions with atomic nuclei. The nuclei occupy very little space. The foil appears solid to the eye and touch because of the atomic electrons. When a projectile comes close to a nucleus, it can be deflected in any direction, even backwards. None of this, of course, was known to Rutherford.

Model of Atom

The model of the atom then in fashion was that due to J. J. Thomson. He quite naturally made negative charges the major elements and spread enough positive charge through a sphere the size of an atom to obtain electrical neutrality. The sizes of atoms were known from kinetic studies of gases. With Thomson's model, the scattering foil would have been composed of relatively large but penetrable spheres. A projectile could be deflected only slightly from its course by a collision with such an atom, and it was this small angle scattering with which Rutherford was familiar. He had not thought through the consequences of large angle scattering. When Marsden, with Geiger's assistance, observed it, Rutherford was incredulous. Then when the experiments had been verified, he knew the Thomson model must be incorrect, and set about inventing a model that would give large angle scattering.

During February 1911, Rutherford communicated a brief account of his theory to the Manchester Literary and Philosophical Society, where it attracted little attention. A full account was published during the year in the Philosophical Magazine, but again its importance was not appreciated. In it Rutherford describes first the consequences of scattering from Thomson's model of the atom. Only by large numbers of collisions can one in principle expect large angle scattering to occur, and he showed that the probability of a suitable number of collisions occurring in a thin foil was far too small to account for the numbers of particles that were observed to be scattered through large angles. Then he made a suggestion that changed science.

"Consider an atom which contains a charge $\pm Ne$ at its center," he wrote, "surrounded by a sphere of electrification containing a charge $\pm Ne$ supposedly uniformly distributed throughout a sphere of



radius R ." The quantity e was the unit charge on the electrified particle discovered by J. J. Thomson; N was the number of such charges, which later became the atomic number, the basis of the periodic table of the elements. At that writing, he was not sure whether the nucleus was positively or negatively charged. But the theory was strongly supported by a sound, concise mathematical formalism.

Confirm Theory

Two years later, Geiger and Marsden, working under Rutherford, confirmed the theory. They very thoroughly investigated variations in scattering with angle, thickness, and atomic weight of scattering material and velocity of the incident alpha particles. In the introduction to their paper they wrote: "All the measurements have been carried out by observing the scintillations due to the scattered alpha particles on a zinc sulphide screen, and during the course of the experiments, over 100,000 scintillations have been counted. It may be mentioned in anticipation that the results of our investigation are in good agreement with the theoretical deductions of Prof. Rutherford."

The new model set the pace for future research, but it was slow starting. Two years later, Bohr, one of Rutherford's students, formulated a theory for the cloud of negative charge which surrounded the nucleus. A second of Rutherford's students, the tragic H. G. J. Mosely who lost his life in the early part of World War I, formulated the theory of the production of x-ray spectra and re-designed the periodic table of the elements. And by 1919, Rutherford had succeeded in causing an alpha particle to penetrate a nucleus, thereby causing the first nuclear reaction and initiating the study of artificial radioactivity.

The work of Geiger and Marsden and in fact of all other researchers in nuclear physics until 1925 depended upon the tedious task of counting light pulses (through a microscope) caused by alpha particles impinging upon a fluorescent screen. This technique is now entirely outmoded, but to get the flavor of research at those times, we should consider briefly the tedious and difficult task it presented. The last of Rutherford's assistants, Osgood and Hirst, have thoughtfully left an account of the process.

The Experiment

"During the years 1923-25, Rutherford and Chadwick carried out their experimental observations according to a fixed schedule, two sessions per week, from 4 to about 6 or 6:30 p.m. . . . Promptly at 4 o'clock, then, on those days, leaving our own researches, we went along the stone-flagged ground floor of the Cavendish (laboratory) . . . into Rutherford's own research room. Always it was closely shuttered with not the tiniest pencil of light coming in at the edges of the windows. . . .

"When the whole crew was assembled, all the electric lights were put out and Chadwick lit on old fashioned fish-tail gas burner near the door, adjusting the flame to be precisely $\frac{1}{4}$ in. high. This faint illumination was just enough, after 10 or 15 minutes, to let our eyes focus on prominent objects in the room, but not bright enough to make out details. Then while for 10 or 15 minutes we mingled tea and conversation, our eyes became adjusted to the faintness of the light and we were ready to begin counting. . . .

"Intense concentration was necessary and one was quite useless if out of sorts or overtired. . . . Chadwick and Rutherford always had a good idea of the order of magnitude of the counts to be expected in any particular experiment. Occasionally the number of scintillations far exceeded expectations, sometimes increasing

until the screen looked like the sky during a display of fireworks, and the ominous word went round: 'contamination!' When contamination set in, it was usually necessary to abandon the planned experiment or make a drastic modification. . . .

"For us, the assistants, the abiding memory is of the honor we felt in being asked to take part, and of the chance it gave us during those intimate counting sessions to observe the great at work."

In 1919, Rutherford moved to Cambridge to take over the chair of physics just vacated by Thomson. He still had many years of work ahead of him, but now he acted less as an active researcher and more as the director of a laboratory.

Under his guidance, although he himself had never liked nor trusted complex laboratory machinery, the age of mechanization began with the development of electronic high speed counting techniques (using Geiger's tube that Rutherford had helped design) and of high energy accelerators (the Cockcroft-Walton machine), which led directly into the age of modern nuclear physics. The neutron was discovered by Chadwick in 1932. But Rutherford's main contributions had been made at Manchester, and the events of the Cavendish years were less personal achievements.

Ernest Rutherford died rather unexpectedly in October 1937 after an operation for an intestinal block. He was 66 years old, a large man and by that time quite heavy. He was an incessant pipe smoker, which may have contributed to the heart failure that took his life. During his later years, he achieved wide recognition not only as a scientist, but as a technical advisor to the British government, where he was known personally by many.

Rutherford loved to talk and apparently never refused to give a lecture on science. At one of these lectures, usually delivered with great caution, he was so bold as to declare that nuclear energy would never be harnessed by man. He did not live to see his prophecy contradicted, but the indications began to appear soon after Chadwick's discovery of the neutron.

Rutherford lived for physics and threw his great energy into exhausting laboratory work, often through the night. He was not a religious man. Although he never took a stand against religion or a belief in God, neither did he assert himself for them. His last words were to bequeath funds to a college.

In addition to his honorary degrees, he received many awards: The Nobel Prize for Chemistry in 1908, the Rumford Medal, Bernard Medal, Copley Medal, Franklin Medal, Albert Medal, Faraday Medal, Order of Merit, and many other prizes. He was honorary member of 16 learned societies and foreign associate of 14 others. Ernest Rutherford became a great man most probably because of his singleness of purpose, clear-headedness, and drive.

Supervisory Appointment



ROBERT E. GAEDERT to supervisor of Administrative Assistant Division (5000), Technical Information Department.

Bob has been an administrative assistant since he came to Sandia four years ago. He was

first assigned to Physical Sciences Research Department, but has been with Nuclear Burst Physics and Mathematical Research organization since it was formed in June 1962.

Previously Bob received his BS degree in business from Emporia State College (Kan.) and his MS in business administration from Arizona State University. He is a member of the American Management Association and Pi Omega Pi, honorary business society.

Bob served four years in the Air Force, stationed half the time in London.

F. E. Abbott to Take New Position With AEC/ALO

Frank E. Abbott has been appointed Director of the Requirements and Facilities Division AEC/ALO, effective Mar. 15. He has been Assistant Area Manager for Administration and Security in the AEC's Sandia Area Office in Albuquerque since July 1961.

The Requirements and Facilities Division is one of four divisions that report to Don Johnstone, Assistant Manager for Plans and Budget. Mr. Abbott succeeds Don I. Wortman, who recently transferred to the newly-established Office of Economic Opportunity in Washington, D. C.

Mr. Abbott joined the AEC as Chief of the General Ledger Section, Finance Division, ALO, in February 1952. In March 1958, he transferred to the Sandia Area Office as Chief of the Administrative Branch.

Mr. Abbott was employed by the U. S. Treasury Department in Denver, Colo., from January 1937 until 1939, when he transferred to the regional office of the Farm Security Administration (later Farmer's Home Administration), also in Denver. He held accounting positions of increasing responsibility in this organization and was Chief of the Program Accounting Section when he transferred to the AEC in Albuquerque.

Receive Bids for Storage Building

An Albuquerque contractor, Edwin F. Cillessen, is apparent low bidder for construction of a storage addition to Bldg. 864 in Tech Area I.

Cillessen's bid of \$47,527 was the lowest of eight received by the Atomic Energy Commission Albuquerque Operations Office last month.

Project engineer R. G. Piper, Plant Engineering Department, said the job includes construction of a 3050-sq.-ft. concrete frame building to be occupied by the Static and Centrifuge Section, Environmental Research and Operations Department.

Deaths . . .



Joseph J. Roof, who retired from Sandia Corporation in 1961, died Feb. 22.

He had been an Albuquerque resident for 21 years and was employed by Sandia in December 1950. His work was in Stocks and Material Control Division.

Survivors include his widow, and a sister and nephew in New York.



Dorothy White, secretary of Design Information Processing Department, died Feb. 22 after a brief illness.

Miss White had been with Sandia more than 12 years.

Interment was at Sunset Memorial Park, Albuquerque.

Survivors include two brothers: Vernon E. White of Albuquerque, and Cyril A. White of Phoenix, Ariz.



Wallace C. Nott, who retired from Sandia in July 1963, died Mar. 3 after a lengthy illness.

While at Sandia, Mr. Nott worked in Vouchering Division.

Survivors include his widow, two sisters, and four stepchildren.

Burial was the National Cemetery in Santa Fe.

Seek Apprentices for Two Programs Starting at Sandia Lab This Fall

Interviews are underway for two Sandia apprenticeship programs starting this fall.

Employees interested in the four-year program for machinists and electronic technicians should apply by stopping in Personnel Division II, at Bldg. 832 or by calling 264-5868. Deadline is May 1.

Applicants must be high school or equivalent graduates between the ages of 18 and 30. Candidates who served in the armed forces may be 30 plus the length of military service, up to five years.

The programs provide for about 8000 hours of on-the-job and classroom training, leading to journeyman status for successful participants.

On-the-job training in the shops will be given in-hours under qualified instructors. Apprentices will be rotated by schedule within the general organization so they are subjected to various required training operations.

Shop theory classes will be conducted during working hours in the laboratory or classroom.

In addition to the in-hours training, a number of related academic subjects must be completed in out-of-hours classroom sessions. They encompass such areas as mathematics, mechanical drawing, shop theory, physics, metallurgy, and plastics.

Continued from Page One . . .

Caribou I Project

vel time is about 40 hours on the average—they meet the earth's magnetic field. Since they are electrically charged, they are guided toward the earth's two magnetic poles. Although some of the particles are trapped in the outer natural belt that surrounds the earth, most leak into the atmosphere and particularly in the auroral zones where the magnetic "pull" is strongest.

The particles emit no light themselves but generate radiation when they strike atomic and molecular particles in the earth's atmosphere. Most of the auroral light is created by collisions at altitudes of 100 kilometers or more, when some of the particle energy of motion is transmitted to nitrogen and oxygen atoms in the air and the resulting excitation energy appears as various forms of light, either visible or in the infra-red and ultra-violet portions of the spectrum.

However, strangely enough, the velocities of the particles that collide with air are higher than theory predicts. This leads to the postulation of the existence of an accelerating mechanism of an unknown nature within the uppermost reaches of the earth's atmosphere, posing one of the most interesting unsolved auroral problems.

To LASL scientists—responsible for the development of detectors for the Vela Nuclear Burst Detection satellites—the aurora is a phenomena for upper atmospheric research which cannot be duplicated in the laboratory.

Much of the auroral zone is over water, but Fort Churchill, 600 miles south of the Arctic Circle, is a large and permanent scientific establishment. It is an international auroral research station, open to

any member of the North Atlantic Treaty Organization, operated jointly by the U. S. Air Force and the Canadian government.

Mid-winter weather at Fort Churchill varies from miserable to impossible. The temperature averages 30 below zero, dropping to 50 below on occasion, and rarely warms to zero even at mid-day.

Special "heat shields" were required to protect the Sandia rockets from the cold while they were on launchers. Les Luehring and Tom Shishman were responsible for the mechanical design of the rocket payload assemblies and for the vehicle preparation. Orville Howard, Carl Cianciabella and Paul Goen were responsible for the rocket's airborne instrumentation and ground support equipment.

At Sandia Laboratory, Leo Doyal of Test Data Division is responsible for data reduction. Certain data from the LASL instrumentation are being reduced at Los Alamos.

Much of the success of the Caribou I operation is attributed to the support given by other Sandia organizations including the efforts of the draftsmen, electronic fabricators, and packaging personnel who assisted in preparation of equipment for the project.

INSIDE ROCKET LAUNCH facilities at Fort Churchill, Les Luehring works on the rocket launcher mechanism for one of the Sandia Nike-Tomahawk rockets, slung underneath. Below is an employee of Pan American Airways which operates the Fort Churchill facilities. White object at left is part of the "jacket" which provided warmth to the rocket after it was raised into position.



JOURNEYMAN MACHINISTS—Ceremonies held in the office of R. J. Hansen, Director of Development Shops (left), marked the completion of apprenticeship training for James A. Jordan and Thomas L. Cleveland, second and third from the left. Through extraordinary effort and aptitude the two men completed the four-year apprenticeship course in three-and-one-half years. At right is K. R. Dickerson, supervisor of Apprentice Machine Section.

Sandia Authors

Robert D. Seeley and George W. Dyckes, both of Elastomers, Molding and Foams Division, "Determination of Effective Crosslink Density in Silicone Rubber," Vol. 9, pp. 151-158 (1965), **Journal of Applied Polymer Science.**

C. E. Jackson and P. C. Montoya, both of Weapon Systems Development Department II, and B. P. Neumon of Electronic Components Division, "A Breakthrough in Electrical Contact Design," March issue, **Product Engineering.**

Paul B. Bailey of Applied Mathematics Division and G. Milton Wing (formerly of Sandia), "Some Recent Developments in Invariant Imbedding with Applications," February issue, **Journal of Mathematical Physics.**

C. E. Spencer and E. L. Jacobs, both of Electronic Devices Department, "The Lead Activation Technique for High Energy Neutron Measurement Detector Theory, Construction, and Operation," April issue, **Review of Scientific Instruments.**

G. E. Ingram of Dynamic Stress Research Division, "Application of Charged Coaxial Cables to the Measurement of Projectile Velocity and Impact Time in a Compressed Gas Gun," April issue, **Review of Scientific Instruments.**

D. L. Smith of Materials Research Division, "A New Structure for Tetracobalt Dodecacarbonyl," Feb. 15 issue, **Journal of Chemical Physics.**

J. E. McDonald and J. G. Eberhart, both of Inorganic Materials Science Division, "Adhesion in Aluminum Oxide-Metal Systems," March issue, **Transactions of the Metallurgical Society of AIME.**

G. H. Bradley of Advanced Program Planning and E. M. Hodges of Surveys and Support Division, "The Quality Survey in Quality Assurance Operations," April issue, **Industrial Quality Control.**

Thomas D. Harrison Commended for Work With NCO Academy



A retired Air Force officer in the Sandia Quality Control Department has been commended for his part in the Systems Command Noncommissioned Officers Academy at Kirtland Air Force Base.

Recipient of the commendation was Thomas D. Harrison, Quality Control Engineering Division, who for 10 years has given a one-hour talk on the code of conduct to each class at the academy. The talk utilizes Mr. Harrison's experiences in a Communist prison camp to draw a sharp distinction between life in a free environment and life in a slave country.

The communique from Gen. B. A. Schriever, Commander of the Air Force Systems Command in Washington, D.C., said in part: "Our academy is presently enjoying a high degree of prestige. As an active participant throughout most of the academy's history, you have contributed immeasurably to this success."

"I am pleased to have you as one of our associates. For Air Force Systems Command, I thank you for the contribution you have made toward the successful accomplishment of our mission."

Mr. Harrison, a retired lieutenant colonel, is an honorary graduate of the NCO academy, which completed its 10th year of operation last month.

Sandia Lab Fire Loss for Last Year Totals Only \$279

Sandia Laboratory suffered a fire loss of \$279 in four minor fires during 1964, according to T. A. Rosenwald, Plant Engineering Department fire inspector. Although none of the fires was serious, Ted points out that the hazard of fire at Sandia is constant, and a continuing alertness on the part of all employees is necessary.

On Mar. 27 of last year, a relay switch in an annealing furnace in the Scientific Glass Shop in Bldg. 839 shorted and caused a \$20 fire loss.

The wooden supports beneath an exhaust fan on Bldg. 6630 caught fire on June 12 with a resulting \$200 loss.

On Sept. 1, a \$49 fire loss occurred in Bldg. 834 when four connections on a transformer fuse holder shorted out.

A spark from a capacitor bank in Bldg. 808 caused a \$10 fire loss on Sept. 15. The spark jumped to a cardboard box causing a small blaze which damaged part of the contents of the box.

"Considering the total value of the Laboratory and the kind of operations conducted by Sandia, a fire loss of \$279 is a good record for the year," Ted says, "however, the fact that we had four fires is a reminder to constantly practice fire prevention."

Spring Dance

The Sandia Dance Committee has chartered a "floating ballroom" for a moonlight cruise-dance around San Francisco Bay, Friday evening Apr. 23. Capacity must be limited to 350 persons. Tickets, at \$2.50 each, will be available Mar. 15 on a first-come, first-served basis from Dance Committee chairman Mike Ferrario and the following: Doris Guntrum (Bldg. 911), Mack Wells (Bldg. 912), Vivian Lenz (Bldg. 913), Barbara Netherton (Bldg. 914), and Brenda Redenbaugh (Bldg. 916). Details will be given in the next issue of the Lab News.



NATIONAL PRESIDENT of the American Society for Quality Control, R. L. Fiachetti, center, visited Sandia Laboratory's Sphere of Science Feb. 23. He spoke at a meeting of the local ASQC chapter that evening. At left is Wilbert A. Sherman of Quality Assurance Program Development and Reports Division, local program chairman, and at right is R. L. King, Spartan Electronics, local chapter president. Mr. Fiachetti is Special Assistant to the Director of Quality Control, North American Aviation, Downey, Calif.

Naval Reservists Taking Two-Week Cruise To West Indies

A Navy destroyer carrying six Sandia Corporation employees will glide from the docks at Galveston, Tex., Sunday to begin a two-week Naval Reserve training cruise to the West Indies.

Aboard will be 20-22 men of Naval Reserve Surface Division 8-106-M in Albuquerque, commanded by Lt. Cmdr. H. M. Willis of Sandia Systems Programming and Administration Department.

Other company men taking part in the exercise are Lt. Don Tipton, Flight Systems Division; CPO Bill Jackson, Machine Shop Division; PO1 Rod Golding, Special Materials Division; PO1 Walt Meyers, Machine Shop Division; and PO2 Joe Montoya, Operations Division.

Their participation in the operations is made possible under Sandia's military leave policy. In addition to being granted the time off, the men will receive an allowance payment which will make up the difference between their regular Sandia and their military income.

En route to their port of call at Montego Bay, Jamaica, Mr. Golding will be promoted to chief petty officer. Comments Mr. Willis: "I'll be sure he gets a proper wetting down."

GSA EXECUTIVE SPEAKS — Ken Phillips of Denver, regional director of the General Services Administration, discussed "Material Management" with supervisors under C. J. McGarr, Director of Service Operations, at the Western Skies Hotel Mar. 4 and again Mar. 9. In addition to relating his own job experiences, Mr. Phillips detailed GSA operations similar to those employed at Sandia. The GSA provides a centrally directed system for procurement and distribution of personal property for the Federal Government.

A look at IDEP

Exchange of Test Information is Key to Saving Taxpayers' Money

Principal speakers at the Third National Interservice Data Exchange Program (IDEP) conference Mar. 16-18 will include Congressman Roman C. Pucinski (Ill.), Presidential Assistant William T. Knox, Col. O. C. Griffith of the Department of Defense, and A. W. Hadley, Reliability Director of the Martin Company, Orlando, Fla.

The conference, devoted to interchanging test and reliability information on component parts in weapon, missile and space systems, is expected to draw 175 representatives of the armed forces, government agencies, defense contractors, and laboratories throughout the country. Conference sessions are scheduled at the Western Skies.

Congressman Pucinski, who is chairman of the Special Sub-Committee on National Research Data Processing and Information Retrieval Center, will be the luncheon speaker Mar. 17.

Mr. Knox, Technical Assistant to the Director of Science and Technology, Executive Office of the President of the United States, will deliver the conference keynote address Mar. 17.

Col. Griffith, Deputy Director of the Office of Technical Data and Standardization Policy, Department of Defense, will speak at the conference dinner Mar. 17. Mr. Hadley, manager of Reliability, Test and Evaluation Engineering for the Martin Company, will speak at a luncheon Mar. 16.

E. H. Draper, Sandia Corporation Vice President, will deliver the welcoming message.

W. W. Westman, supervisor of Test Equipment Reliability and Engineering Design Practices Division, is arrangements chairman for the conference. Mr. Westman is a member of the IDEP Contractor Advisory Board, which is sponsoring the conference along with IDEP offices of the Army, Navy, and Air Force. Theme of the conference is "Conservation of Men-Money-Time."

Avoids Duplicate Testing

The IDEP program is designed to avoid repetition of costly tests of commercial items used in government programs. Most

Russian Atomic Energy Films to Be Shown at Sandia Laboratory

Sandia Laboratory employees will have an opportunity from Mar. 23-Apr. 7 to view 22 Russian technical films screened last year at the Third United Nations International Conference on the Peaceful Uses of Atomic Energy in Geneva, Switzerland.

The films are on loan from AEC/ Washington and will be shown during the noon hour in Bldg. 815 and the 180 briefing room of Bldg. 892. Each showing (which includes two to four films) lasts approximately 40 minutes. Benefits and Services Division arranged the schedule.

Following is the schedule and a brief description of each film.

Bldg. 815, Mar. 23; Bldg. 892, Apr. 7

"On the Don River"—construction and

installation of the Novovoronezh Nuclear Power Station, including reactor shielding, containment vessel, core, fuel rods, control room, etc.

"Byeloyarsk Nuclear Power Station"—first atomic power station, built in 1954, is compared with this new station, under construction, with its super-heated steam.

Bldg. 815, Mar. 24; Bldg. 892, Mar. 23

"Transportable Nuclear Power Plant: TES-3"—construction and operation of a low-power transportable nuclear power station, the first of its type in the USSR.

"Portable Nuclear Power Plant—Arbus"—design, construction, and operation of the organic-moderated and cooled portable nuclear power plant which will operate for two years without refueling.

"Direct Conversion Reactor"—construction, installation, testing and operation of a small high-temperature reactor operating with fast neutrons and a thermoelectric converter.

Bldg. 815, Mar. 26; Bldg. 892, Mar. 24

"Atomic Leader"—a technical tour of the Lenin, the USSR's nuclear-powered icebreaker.

"Atomic Ice Breaker"—the USSR's nuclear-powered icebreaker, the Lenin, in action against ice 20 ft. thick. Brief views of the ship's three nuclear reactors.

Bldg. 815, Mar. 29; Bldg. 892, Mar. 26

"SM-2 Research Reactor"—construction and operation of a powerful research reactor used for the production of radioisotopes and for studies of the effect of neutron flux on various materials.

"Fast Pulsed Reactor"—how revolving discs with inserts of uranium operate in this reactor at the Neutron Physics Laboratory.

"Radioactive Isotopes in Chemistry"—Russian work on applications of radiation chemistry to industrial processes.

Bldg. 815, Mar. 31; Bldg. 892, Mar. 29

"Hot Material Testing Laboratory"—irradiated samples and fuel elements are followed through a variety of tests at the USSR's new Nuclear Research Center in Siberia.

"High Frequency Stabilization of Plasma"—in the Sukhumi Technical Institute, Russian scientists seek ways of increasing the temperature of plasma in studies of the controlled thermonuclear process.

"Plasma Diagnostics"—a series of techniques for determining the properties of plasma—part of the USSR's research in the field of controlled thermonuclear reactions.

Bldg. 815, Apr. 2; Bldg. 892, Mar. 31

"Thermonuclear Installations"—scientists at work at the Kurchatov Institute, Moscow, studying the confinement and heating of plasma.

"Plasma Is Posing"—research at Sukhumi Technical Institute in controlled thermonuclear processes including experiments with gases in hexagonal and circular discharge chambers.

"Erevan Nuclear Center"—a nuclear research center for high energy physics studies using cosmic rays and accelerators. Shown are an intensive study of bubble and spark chamber pictures, and photographs of certain phenomena observed only through cosmic rays.

Bldg. 815, Apr. 5; Bldg. 892, Apr. 2

"New Research Nuclear Center of the USSR"—a brief tour of this new center in Siberia including research reactors, a portable nuclear power plant, Hot Material Testing Laboratory, radio-chemical testing of nuclear fuels, neutron physics, and measuring instruments laboratory.

"Siberian Center of Nuclear Research"—work on plasma physics (controlled thermonuclear research) and high energy physics (particle accelerators, spark chambers, etc.).

Bldg. 815, Apr. 7; Bldg. 892, Apr. 5

"Propane Bubble Chambers"—equipment and operations in the bubble chambers of the Joint Institute of Nuclear Research. Animation follows researchers in study of the phenomena connected with the interaction of sub-atomic particles.

"Production of Element-102"—a study of the formation of Element 102, the heaviest known isotope.

"Discovery of Proton Radioactivity"—three types of decay of the nuclei are depicted by charts and animation.

"The Aim is Life: Radiation Therapy"—the fight against malignant tumors in the human body at the Institute of Radiology of the USSR Academy of Medical Science is depicted by a display of instruments and other devices with protective shielding.

of the 164 participating companies are prime or major sub-contractors engaged in missile, space, and related programs. Like Sandia Corporation, the agencies are parts "users" rather than parts manufacturers or vendors.

As participating agencies perform tests on items, an IDEP summary form is completed along with the regular test report. These summaries, and microfilmed copies of the complete report, are distributed throughout the IDEP system. It is designed so that a minimum of centralized effort will trigger the greatest beneficial action. Special report compilation is not required of the contractor. The only effort over normal parts test reporting is the preparation of a standard one-page Summary Sheet Form for each submittal.

At Sandia Laboratory the IDEP reports are maintained by the Specifications Branch Library in Bldg. 828 where a microfilm reader-printer is available. A call to Hugh Howe of Technical Libraries Division, tel. 264-6539, will bring an IDEP report to any Sandian needing it. Hugh also handles distribution of the reports, and requests to be placed on the mailing list should be directed to her.

Much Data Received

The average participating contractor receives about 100 times as much data as he contributes, and although this may not always apply precisely to his required performance and environment, it can point out deficiencies to investigate, or allow a much shorter test to verify the results of others. The IDEP system allows a standard four-drawer file to hold, in microfilm-summary card form, the complete text of every part test submitted by more than 160 contractors during the past two years.

"These reports are extremely valuable to Sandia," Mr. Westman says. He cites a recent example where spending more than \$12,000 was avoided by A. C. Littleford of Test Equipment Reliability and Engineering Design Practices Division. Test and evaluation was needed of several "families" of potentiometers required for use in Sandia test equipment design. By using IDEP reports of tests conducted by other agencies, Art was able to eliminate much of planned testing.

More Information

"As Sandia becomes better acquainted with IDEP, more and more of the information will be utilized here," Mr. Westman says. He is the Contractor Data Coordinator of the IDEP program at Sandia Laboratory and keeps current on the IDEP distribution. L. F. Parman, manager of Technical Libraries Department, is Alternate Contractor Data Coordinator for Sandia.

"The IDEP files, with more than two years of data collected, are becoming more useful to Sandia," Mr. Westman says. "The summary sheets are getting wide distribution throughout the Laboratory and our project people are making good use of them. In years to come, the nation-wide program should save taxpayers millions of dollars."

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LAB NEWS

MARCH 12, 1965



Livermore Laboratory to Host March Meeting of ASTME

"Numerical Control Application" is the theme for the Mar. 17 meeting of the Golden Gate Chapter, American Society of Tool and Manufacturing Engineers (ASTME). Livermore Laboratory will be host to the technical portion of the meeting.

The meeting will convene at 6:30 p. m., with a welcome from C. H. DeSelm, Director of Staff Services. Presentations on Numerical Control Applications will be made by Sandians Jack Foster, Jay Gilson, and Bill Schmedding, followed by demonstrations of the Orthomat (automatic drafting machine) in Bldg. 912, the LASER interferometer in the Metrology Lab, Bldg. 913, and some of the numerically controlled machine tools in the shop.

At 8:30 the group will adjourn to the LRL cafeteria for dinner and installation of new officers. About 100 people are expected to attend.

This is the second rotational meeting of

the Golden Gate Chapter, held at a different manufacturer's plant each month. The last meeting was at the General Motors Assembly Plant in Fremont.

Program arrangements have been made by Al Alford, and equipment demonstrations have been arranged by members of Manufacturing and Shop Liaison Division.

SANDIA LABORATORY ALL STARS participated in the recent Inter-Base Basketball tournament. The Sandians defeated Sandia Base 77-70 then lost two straight to drop out of contention. Kirland Air Force Base won the tourney. In the first row, l to r, are Russell Mitchell, Leo Chavez, Jim Sanchez, Dan Tebbs, Jim Hudson, and John Brane. In the second row are Pat Monahan, Jim Reid, Lou Sanders, Bob Gardner, Gene Lisotto, Joe Gallegos, and Dale McLachlan. Not shown are team members Don Smith, Terry Lubeck, and Art Sharpe.

Take Note . . .

Rod Golding, a Navy veteran of 18 years, was notified recently of his promotion to chief petty officer in the Naval Reserve.

The appointment becomes effective Tuesday.

Mr. Golding, who works in Ceramics and High Temperature Materials Division, has been attached to the Albuquerque Naval Reserve unit since February 1958. He is an instructor and leading division petty officer in Surface Division 8-106-M.

The unit is commanded by another Sandia man, Lt. Cmdr. H. M. Willis, Systems Programming and Administration Department.

A boatswain's mate, Mr. Golding is a veteran of 10 years active duty in the Navy. He served aboard transports and destroyers and with a special weapons unit at Sandia and Clarksville, Tenn.

Carpool riders at the Rocky Flats Division of Dow Chemical Co. in Golden, Colo., are playing a new game that saves members from forgetting their security badges. Drivers play guard; carpool riders simply aren't allowed in the car without a badge.

Frosted windshields and broken badges generally go hand-in-hand, and the Sandia Badge Office reports this season is no exception. Employees are reminded that the security badge is not a windshield icer-scraper and should not be used as such.

One of the world's greatest cellists, Gregor Piatigorsky, will present a musical program at Albuquerque's Civic Auditorium on Friday, Mar. 19, to benefit the Albuquerque Civic Symphony. Assistant pianist will be Ralph Berkowitz.

Tickets are available at local music stores.

The TDP Wives Club will meet Mar. 15 at 7:30 p.m. to hear Ralph Crowder, local nurseryman, speak on "How to Grow in New Mexico." The meeting will be held at American Savings and Loan Building, 2300 Louisiana NE. Further information or transportation may be obtained from club president Mrs. Donald Jelinek, tel. 298-2950.

Service Awards

15 Years



D. E. Rauch, Sr.
2551
Mar. 13, 1950



R. W. Hartenberger
4573
Mar. 13, 1950



John A. Blythe
4224
Mar. 14, 1950



James H. Hann
2531
Mar. 16, 1950



Donald J. Loehle
4611
Mar. 21, 1950



Anthony A. Repetti
1413
Mar. 23, 1950

10 Years

Mar. 13-26

Robert H. Newman 3463, Orlando Garcia 4516, William P. Roper 7215, William W. Parker 7261, Leonard J. Flesner 2132, Donald N. Cox 5323, and Mark A. Elich 2313.

Welcome Newcomers

Feb. 8 - Mar. 5

Albuquerque	
Jerry M. Freedman	1541
Douglas A. Lang	3142
Connecticut	
Waldemar A. Klikoff, Jr., New Haven	9311
Minnesota	
Jay L. Benson, St. Paul	5242

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LAB NEWS

MARCH 12, 1965

SHOPPING CENTER

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

RULES

1. Limit: 20 words
2. One ad per issue per person
3. Must be submitted in writing
4. Use home telephone numbers
5. For Sandia Corporation and AEC employees only
6. No commercial ads, please
7. Include name and organization
8. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

FOR SALE

ROLL-AWAY bed, 52", \$25; stroller, \$6. Heames 255-2291.

BELLEHAVEN, 4-bdr. and den, \$26,500; Coldspot freezer-refrigerator, \$85; 9' x 12' blue wool rug w/rubber pad, \$35; 26" electric fan, \$8. Van Dusen, 298-1091.

'49 FORD 3/4 ton pickup, recent overhaul, 4-speed, \$300. Liguori, 256-3613.

'51 CHEVROLET pickup, overload springs, 4-speed, 1958 GMC motor, 6-ply tires, \$300. Pohl, 344-8503.

WILL MOVE cabin to your lot within 50 miles, measures 288 sq. ft. with loft, main floor 12' x 16', \$995. Vilella, 255-7604.

MISC. ITEMS including tape recorder, barbells, aquariums, guitar. Best, 255-1250 or 247-3914 after 5:30.

BOWLING BALL, 12 lb., white bowling shoes, size 8. Ray, 255-5996.

ELECTRIC SAW, portable, Sunbeam, 6-in. universal blade, 2-in. cut, \$20. Fuller, 298-3643.

'58 PONTIAC hardtop 4-dr., V-8, AT, AC, R&H, seatbelts. Randall, 256-1853.

'59 FORD ranch wagon, 4-dr., rebuilt engine, new clutch, brakes, tires, seat covers, '65 license, \$495. Arnot, 242-5025.

ROBERSON, 3-bdr., den, fireplace, redecorated, built-ins, double garage, pitched roof, carpeting, draperies, landscaped, price reduced, \$18,500. FHA, Meyer, 298-4825.

'56 FORD Victoria HT, 295 hp, \$250. Guist, 299-9060.

2 ACRES Rio Grande Estates, \$1200; \$200 down, \$25 month. Butler, 255-7969.

4 TIRES, first line 6.95 x 14, new. Available about Mar. 15, \$60. Caskey, 256-9701.

TOY POODLE, male, 10 weeks old, champagne color. Shipley, 298-2433.

'53 OLDS, original owner, \$275. Johnson, 298-1011.

STEEL GUITAR, new, w/case and stand, \$90. Simon, 898-3275.

BONA ALLEN saddle, 15" padded seat, leather covered stirrups, \$80. Two bridles, \$15 and \$7. Taylor, 256-3774.

TRADE—9 x 9' umbrella tent w/floor, for 10 x 10 or larger umbrella tent. Arning, 256-9229.

PICKET FENCING, 400 linear ft. w/4 x 4 posts, 24" high when installed, 10c per ft. Bertrand, 268-4191.

UPRIGHT PIANO and baby buggy. Elbert, 9006 Cordova NE, 298-2204.

ENGAGEMENT and wedding ring set, 1/2 carat center stone, cost \$375, asking \$200; '57 Chevrolet; furniture. Chandler, 298-1114 or 255-8091.

'55 FORD ranch wagon, needs engine work, \$45. take 255-7923.

WARN HUBS for jeep front wheels, cost new \$69, take \$45. Iling, 299-7378.

BASSET PUPPY, seven months old, AKC registered, \$25. Wickham, 3501 Ross SE, after 5:30 weekdays, all day Saturday and Sunday.

HORSE TRAILER, can be modified to accommodate two horses, \$55. Pena, 898-0197.

ONE DRAWER desk, 20" x 40", \$10; 19" TV, light finish, swivel stand, \$40. Pope, 816 Val Verde SE, 255-6702.

ELECTRONIC FLASH, Braun F-60, needs repair, includes charger and spare battery. Miller, 255-7716.

REGISTERED 3/4 Arabian colt, son of National Top Ten Half-Arabian Champion Mare, Rassita, \$450, maple twin beds, \$35. Galbreath, 898-0644.

ANTIQUE VANITY, rose marble top and back, burl walnut w/large figured walnut framed mirror, \$95. Smitha, 299-1096.

TV 17" GE, \$40 or best offer. Hunter, 298-2909.

SWAN 406 control head; SW-12 power supply; model 400 transceiver; bandspringer w/heavy duty spring and mount. Silva, 298-8039.

CLEVELAND roller skates M#200, size 9; M-1 rifle Garand. Kurovski, 3212 La Veta NE.

'63 FORD Galaxie, 2-dr. sedan, R&H, \$1350. Wilson, 898-2371.

NEAR BASE, 3-bdr., family room, 1 1/4 bath, fireplace, hardwood floors, forced air heat, landscaped, \$16,900 FHA. Bemis, 268-6376.

PISTONS, valves, hyd. lifters, and cam for 283 Chevy; engine parts for PV 444 Volvo; child's tricycle and baby car bed. Wilson, 298-0049.

SEARS 18" reel-type power mower, 2 hp engine needs carburetor overhaul, tune-up and sharpening, \$35. Martin, 256-6785.

FORMAL, powder blue, w/hoop skirt, size 8, floor length, worn once, \$25. Spencer, 298-5061 after 5.

SWISS-MADE stop watch, measures in 10ths of seconds up to 15 mins., original price \$10, will sell for \$6. Weems, 268-1702.

FRIGI-KING air conditioner, complete, \$40; '57 (292) Ford standard transmission, misc. parts. Rankin, 344-6712.

SABER SAW attachment for 1/4" drill, blades and guide included, \$5. Henneke, 298-4232.

WURLITZER piano, must sell. Perkins, 268-0125.

'63 IMPALA SS, 327 engine, AT, ww, radio, PS, 23,000 miles, make offer. Riordan, 268-1132.

CABIN CRUISER, 23', sleeps four, 75hp Evinrude w/generator, drives 25 mph, \$1350. Meikle, 299-4640.

BABY CRIB and mattress, \$13; bathinette, aluminum frame, \$10; chest of drawers, \$8. Fite, 255-6943.

LANCIA Gran Turismo, 4-pass., 2500 cc, Weber carb., 4-speed, Pinin Farina body, blue w/blue and grey interior. Suttman, 299-6754.

'32 MODEL "B" Ford pickup, sell or trade on camper. Young, 837 Valencia Dr. SE, 255-8193

15' GLASSCO boat w/40hp Mercury motor, for skiing and fishing. Miziker, 268-2537 after 6.

HI FI equipment, Harmon Kardon Cit. II and Dynakit PAS-2, make offer. Phipps, 299-3151.

4-DR. Cadillac, factory air, all power, new tires, \$675. Browne, 344-9675.

TWO-WHEEL utility trailer; also bumper hitch fits any bumper. Cunningham, 299-2402.

'60 BUICK Le Sabre station wagon, R&H, \$1200; 1960 Volkswagen sedan, low mileage, \$850. Hankins, 299-9482.

INDIAN fireplace, beamed ceilings, brick floors in den and dining room, 2-bdr., for FHA appraisal. Church, 256-3960.

'58 VOLVO, new tires and battery, '65 plates, \$375. Tarbell, 256-1322.

SKI BOOTS, men's size 9, \$10. Pewe, 255-3518.

PENZEL clarinet, 4 years old, \$80 w/leather carrying case. Corlis, 298-7386.

'62 RAMBLER classic, 4-dr. station wagon, OD, 6 cyl., one owner, Holpp, 299-4809.

'52 PLYMOUTH 4-dr., R&H, \$125, or best offer. Rardin, 247-4839.

'63 FORD, 500 XL, 2-dr. HT 406, 4-sp., priced below blue book. Yuhas, 436 Georgia SE, #1.

'58 MERCEDES Benz 180 and 1960 Mercedes Benz 220S. Randle, 898-1490.

SHOP MANUAL for '63 Ford Galaxie and station wagon, \$5; tank-type vacuum cleaner, \$8. Want '55 Olds shop manual. Schulze, 242-8388.

CRIB w/mattress, \$10. Still, 298-3005.

CUSTOM HOME, 2100 sq. ft., near Coronado Center, 3-bdr., den, double garage, California patio cover, \$27,500. Cotton, 299-2237.

FREEZER, 3 cu. ft. chest type, Crosley, ideal for mountain cabin or trailer use, \$15 or trade for camper equipment. Myers, 298-2677.

LINEAR amplifier, 3000 volts at 500 mils, 80 through 10 meters, \$50. McClure, 268-0720 after 5:30.

KITCHEN TABLE w/4 chairs; 2 lamps; swivel rocker; tub chair. Paul, 256-6228.

DINETTE TABLE, tan, four matching chairs, \$30. Donham, 299-0028.

'60 DODGE Dart Pioneer, hardtop, V-8, \$550. Campbell, 255-9234.

HALLICRAFTER Model S107 6 band receiver, \$50 or best offer. Bordenave, 877-3972 after 3 p.m.

BED, mattress, and spring, \$40; crib, \$10; high-chair, \$5; dishwasher, \$60; mahogany breakfast, \$100. Reinman, 255-2520 evenings and weekends.

WESTINGHOUSE refrigerator, 12 cu. ft. gas range, 36", automatic oven, Tappan, Nichols, 247-2564.

BOSTON terrier puppies, six weeks old Apr. 1. Morris, 920 Kentucky SE, 256-0152.

ATLAS roadracing set (HO), complete; Scalectric slot track. Campbell, 299-4830 after 5.

WESTERN style den furniture, complete, \$80. Villane, 299-4034.

POODLES, miniature, AKC registered, black, six weeks old. Pavletich, 255-8377.

26" BOY'S Schwinn lightweight bicycle, thornproof tubes, \$20. Lowe, 299-7725.

'55 CHEVROLET Nomad wagon, V-8 engine 283, std. trans. with OD, \$275. Erni, 268-9452.

'61 CORVAIR Monza 900, white sidewall tires, R&H, ST, new paint, '63 engine. Smith, 877-9399.

1550 SQ. FT., 3-bdr., paneled den, 1 1/4 baths, many extras, near schools, park, bus, Eastdale shopping, wide lot, \$17,500. Van Deusen, 299-4328.

14' TOP FREEZER, Frigidaire, 3 yrs. old, \$150; studio couch, \$15. Hesse, 265-0406.

'57 CHEVY BELAIR 4-dr. sedan, V-8, ST, \$550. Price, 299-6265.

CAMPER, 10' Travel Queen, 1960 model w/ (optional) 1959 Chev. 3200 lb. pickup, 4 speed, total price, \$1600. Smart, 298-0987.

TWO CRIBS: assorted bedding, one playpen, and one convertible carbed-baby buggy. Johnson, 256-3473.

3-BDR., 1 1/4 bath, dining room, landscaped corner lot, large private patio and cabana, a/c, \$15,900, low down payment. Barham, 298-2553.

WASHER, Westinghouse automatic, front loading, 12-lb. load, 1 yr. old, cost \$200, sell for \$100. Williams, 242-3771 9-12 Sat.

26" English bicycle, new tires, fenders, \$25; 20-gal aquarium, filters, pump, heater, aerator, fish, lights, reflector, plants, \$45. Russell, 299-0159.

9' x 9' TENT, 8 MONTHS old, outside bows; 2-burner Coleman stove; 6' foam mattress, full size. Naumann, 298-3559.

GE PORTABLE dishwasher, formica top, \$100; round playpen, \$10; baby bathinette and basinette, each \$5. Doyle, 299-7567.

PEDIGREEE wire haired terrier, papers, 9 mos., tri-colored, Hutton, 255-7435.

'58 CHEVROLET 2-dr. sedan, 6-cyl., below NADA. Konick, 268-6409.

3-BDR., 1 1/2 bath, family rm., new carpeting, a/c, in Hoffmantown. Shrock, 299-6846.

'64 CHEV. IMPALA, super sport, PS, PB, R&H, AC, 2-dr. HT, below book, no trades. Matthews, 255-2751.

3-BDR., den w/fp, 1 1/4 baths, attached garage, landscaped, fenced front, walled back, near school, shopping, entertainment, \$16,000. Post, 298-0481.

WANTED

HOME FOR housebroken toy dachshund, tags, food, bed, included. Also need a home for long-haired grey cat. McCutchan, 255-7215.

SET OF barbells; chain saw that needs repair; parts for a TR-10. Pritchard, 268-9618.

RIDE from, or vicinity of, Alvarado Dr. and Haines NE to Bldg. 880. Fought, 265-0688.

PERSON to drive 1964 Chevrolet Impala to Beverly Hills, Calif. No charge for using car en route. Sundberg, 299-2177.

SMALL, used, electric concrete mixer; extension ladder; old axe; tow chain; clean, used, 2 x 6", 2 x 8" and 2 x 10" planks. Collins, 268-3612.

BABYSITTING IN MY HOME, games, stories, coloring, Princess Jeanne area. Hays, 299-5217.

PIANO or electric organ, for small church. Ray, 255-5996.

FOR RENT

UNIVERSITY area NE, duplex, 2-bdr., study and garage, \$90 month. Baca, 298-4212.

WOMAN to share apt. or house. Huston, 243-2563.

2-BDR HOUSE, Pacheco, 242-0102, 4913 Burton SE.

1-BDR, furnished, \$70; 2-bdr. basement apt, free utilities, \$80; 2-bdr furnished house, free utilities, available Apr. 1, couples only \$100. Chavez, 255-1585.

3-BDR TRAILER, 60 x 10' w/automatic washer, \$77 a month plus court space. Hulgan, 255-0220 after 5:30.

2-BDR HOUSE, \$70 per month. Morrissey, 3605 Glendale Rd. NW, 298-2459.

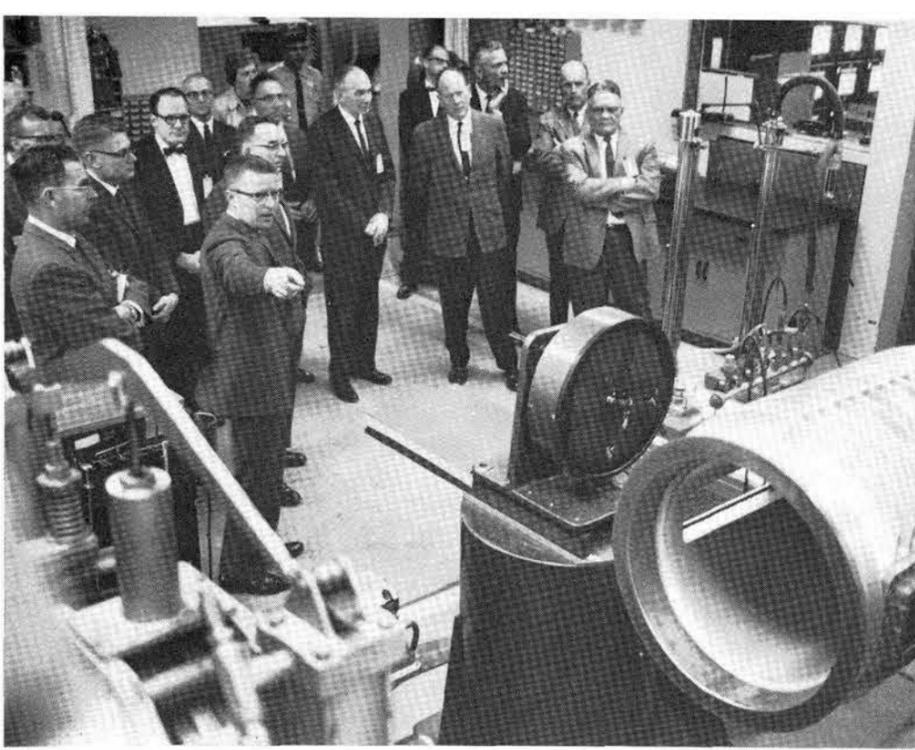
2-BDR, furnished apartment, water/sewer paid, \$80 month, two children acceptable, no pets. Vilella, 8322 Trumble SE, 255-7604.

FURNISHED HOUSE, SE near Bases, stores, bus; 3 bdr., carpeted, walled yard, garage, good heating, a/c, \$150. Campbell, 256-1015.

LOST AND FOUND

LOST—"Dynamics" textbook, copper trimmed ceramic earring, Frank Medico pipe, Spitfire car key, prescription glasses in tortoise frames, black patent walking shoes, man's dark brown leather fur-lined glove. LOST AND FOUND, 264-2757.

FOUND—Cigarette lighter, man's black overcoat and gloves, house and car keys, lady's black glove w/leather palm, pr. gold clip earrings, screw type orange drop earring. LOST AND FOUND, tel. 264-2757.



VISIT SANDIA—Members of Governor Jack M. Campbell's Scientific Advisory Committee viewed Sandia Laboratory's wind tunnel facilities during a recent tour. R. C. Maydew, manager of Aero-Thermodynamics Department, points out features of the supersonic tunnel. Host for the tour was Sandia Vice President Glenn A. Fowler, a member of the Governor's committee.

Sandia Engineer Plays Role In Comedy 'The Mouse That Roared'

Gaynor Atkinson, an environmental test engineer in Planning and Functional Test Department, has been cast in a leading role for the Albuquerque Little Theater production of "The Mouse That Roared," which opens tonight.

Curtain time is 8:30 p. m. nightly through Mar. 21. There will be no performance Monday.

Mr. Atkinson, who appeared previously with the Little Theater group in "Roman Candle," will play the U. S. Secretary of State in the spoof of American foreign aid policy. The two-act farce evolves around the Fenwick army's invasion of New York, leaving plenty of openings for random potshots at royalty and U. S. handling of scientific weapons.

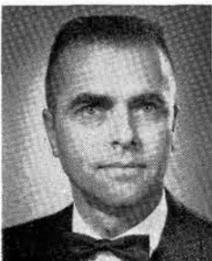
Two other Sandia men play important backstage roles in the play. They are technical director Dick Foster, Industrial Photographics Division, and art director Dick Strome, Technical Art Division.

In order to cope with production problems demanding 17 scenes, Dick Foster built an elaborate basic set and two associate portable sets which are wheeled on and off stage. His basic set is the stylish Fenwick throne room, done in floor-to-ceiling-length draperies.

Dick Strome designed armor for the invading troops, in addition to banners and the symbolic Fenwick eagle.

Admission to all performances in the theater building at 224 San Pasquale SW

W. B. Pepper Named To AIAA Committee On Deceleration



W. B. Pepper of Engineering Aerodynamics Division has been appointed to the Aerodynamic Deceleration Systems Technical Committee, recently established by the American Institute of Aeronautics and Astronautics.

AIAA defined the scope of the committee as "design and operation of aerodynamic deceleration systems, specifically including parachutes, inflatable structures, paratroopers, etc., for application to the aerodynamic deceleration of cargo, vehicles, and crew members."

The committee is comprised of a chairman and 17 members.

Mr. Pepper received his BS degree at the University of Minnesota and his MS at the University of Colorado, both in aeronautical engineering. At Sandia, he has worked in parachute development since coming here in January 1953. His membership in the Institute of Aeronautical Sciences dated back to 1944, and he was also a member of the American Rocket Society. In recent years, both technical organizations were combined to form AIAA.

Membership on the Aerodynamic Deceleration Systems Committee also includes a former Sandian, Robert F. Brodsky, now with Space General Corporation.

is by reservation only. Seats may be reserved by writing the theater or calling the box office from 9 a. m.-9 p. m. daily.

Ass'n of Accountants Plans 5th Anniversary Meeting for Mar. 18



The Albuquerque Chapter of the National Association of Accountants will hold its fifth anniversary meeting at the Coronado Club, Thursday, Mar. 18.

The featured speaker will be Donald J. Guth, comptroller for Collins Radio Company in Dallas and former National Vice President of NAA. His subject will be "Internal Auditing."

A social hour will start at 6:30 p.m., followed by dinner at 7, and meeting at 8. Additional information may be obtained from Fred Mitchell, special activities director for the local chapter.

Dinner Dance to Be Held at Coronado Club Tomorrow Evening

A Wine Fest Dinner Dance is the highlight of the Coronado Club calendar for the coming two weeks.

The special event tomorrow evening will start at 5 p.m. with an expert discussion of fine American wines (and samples) and from 6-8 p.m. there will be steak dinner served a la carte. Dancing to the music of the George Davis Orchestra will follow. Reservations for dinner are requested.

The regular Friday night buffet will feature seafood tonight and chuckwagon roast beef and shrimp on Mar. 19. Don Lesman's combo will play for dancing tonight and the Rhythm Masters will be on hand next Friday.

Coming Mar. 27—Fisherman's Wharf Night.

Congratulations

Mr. and Mrs. C. W. Boots (1134), a daughter, Gwendolyn Marie, Feb. 5.

Mr. and Mrs. J. V. Williams (5141), a daughter, Mary Jo, Feb. 15.

Mr. and Mrs. Norman Smith (4622), a daughter, Tami Lu, Feb. 20.

Mr. and Mrs. James C. Sanchez (4613), a son, James Timothy, Feb. 20.

Mr. and Mrs. D. C. Jones (9422), a son, Dron Corvell, Feb. 23.

Mr. and Mrs. Fred Leach (3413), a daughter, Sheryl Elizabeth, Feb. 21.

Mr. and Mrs. W. C. Thompson (1312), a daughter, Lisa Margaret, Feb. 27.

Mr. and Mrs. Richard A. Keen (2542), a son, Jonathan Howard, Feb. 23.

Mr. and Mrs. David M. Drumond (3154), a son, Pieter David, Feb. 26.

Purchasing Agents Association to See Sandia's Automated System

Forty-five members of the Purchasing Agents Association of New Mexico, a group dedicated to obtaining quality products on time at competitive prices, will be special guests of Sandia Tuesday.

The visitors and their guests will be welcomed in the Sphere of Science at 1:20 p. m. by K. S. Spoon, Sandia purchasing agent and one of the four charter members of the local purchasing agents chapter. Two of the other original members, Frank Manfredi of the University of New Mexico and J. L. Smith of the Public Service Company of New Mexico, also are expected. Mr. Smith is current president of the local association.

Other special guests expected to be on hand are J. Richard Brown of Dallas, Tex., editor of the organization's regional magazine, *The Southwestern Purchaser*, and Edgar Chew, purchasing agent for the City of El Paso, Tex.

Following Mr. Spoon's opening remarks, the visitors will be shown "The Sandia Story," and Jay W. Hughes, senior buyer, Contract and Purchase Service, will outline the Sandia automated purchasing system.

Computerized Techniques

The system, begun in 1959 to take the load off buyers who handled small repetitive purchases, allows Sandia buyers to spend more time on large one-time purchases. The computerized techniques employed by the company permit the buyer to seek a broad base of competition for its awards.

The system features annual price agreement contracts made in advance, without purchase obligations, for almost 15,000 General Stores stock items. In effect, the agreements say if Sandia buys a specific item within the next year's time, the company will buy it at a previously agreed upon price.

All information about the product to be contracted—be it electronic components, hardware for the shops, supplies for plant maintenance, or stationery for daily busi-

ness transactions—is punched on cards, converted to tape record, and then entered in the IBM 7090 computer.

Sandia then is ready to begin writing purchase orders for the material on contract.

Inventory Run

Each week thereafter, the inventory is run through the machine, new items which have fallen below the minimum stock level are picked up, and a purchase order is printed automatically under each contract by suppliers containing the particular item needed.

Mr. Hughes emphasizes that the machine does not do the buyer's job; it cannot think, it cannot select qualified sources, nor can it interview prospective suppliers. However, it does free the buyer from clerical tasks so he can do his work more efficiently.

After introductions, the purchasing agents will tour the purchasing operations of Bldg. 800, where they will be shown how Sandia contracts are formulated and how price agreements are written up. A visit to the IBM installation in Bldg. 880 will follow, where the visitors will be shown how automated purchase orders are written.

The group then will conduct its monthly meeting in the Holiday Inn at 6:30 p. m.

Affiliated with NAPA

The New Mexico association headquartered in Albuquerque is one of some 100 local groups in the USA affiliated with the National Association of Purchasing Agents, which celebrates its 50th anniversary in May. Nationwide, the NAPA has close to 17,000 members.

It provides a forum where purchasing agents can analyze mutual problems, exchange information, and become acquainted with other purchasing executives.

NAPA services available to its members include practical and authoritative information on purchasing policies and procedure, current trends in business and prices, and the influence of economic and political factors on business practice and problems.

Top NASA Executive to Speak Here At Cost Optimization Conference

A record attendance is expected for the Cost Optimization Conference Mar. 19 sponsored by the New Mexico Area Chapter of the American Institute of Industrial Engineers, reports Lee Toliver of Operations Planning and Quality Control Division, registration chairman for the one-day conference.

Largest turnout is expected at the banquet Friday evening, Lee says, to hear the talk by James E. Webb, Administrator, National Aeronautics and Space Administration (NASA). The banquet will be held at the Holiday Inn starting at 6:30 p.m.

Since two technical organizations have indicated their members will attend the banquet as a group, Lee urges all Sandians who are interested in attending to get their tickets early. It is not necessary to register for the conference to attend the banquet or the luncheon.

S. P. Schwartz, Sandia Corporation President, will be the luncheon speaker. He will discuss, "Industrial Engineering at an R&D Laboratory." The luncheon will be held at noon at the New Mexico Union Building. Registration begins at 8 a. m. Conference registration fee is \$18 and covers all activities. Banquet tickets are \$4 and the luncheon ticket costs \$2. Tickets are available from Lee, tel. 264-5709.

Conference chairman is Don Arquette of Electronic Development Division. Al Kaping of Purchasing Administration Division is program chairman for the conference. Jerry Ramsey of Value Engineering and Cost Reduction Division is president of the New Mexico Chapter of AIIE.

Medical No Longer Able to Handle Non-Job Problems

The Medical organization no longer is able to handle x-rays and laboratory procedures for non-job related problems.

Dr. S. P. Bliss, Medical Director, explained an increased workload forced a halt to the activities as of Mar. 1.

However, he said, the Medical Department will continue its practice of honoring requests from family doctors for various allergy injections.

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LAB NEWS

MARCH 12, 1965

Sandia's Safety Scoreboard

Sandia Laboratory:

25 DAYS

875,000 MAN HOURS

WITHOUT A

DISABLING INJURY

Livermore Laboratory:

202 DAYS

1,029,000 MAN HOURS

WITHOUT A

DISABLING INJURY