

LAB NEWS

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MAY 8, 1970

SANDIA LABORATORIES • ALBUQUERQUE NEW MEXICO & LIVERMORE CALIFORNIA

Sandia Laboratories Develops First Transparent Ceramic

An AEC patent application has been filed for an improved electrooptic ceramic which can be used to generate black and white and color images. Gene Haertling (2317) has developed the ceramic.

The new material — the first transparent ferroelectric ceramic ever produced — is expected to remove many of the technical problems which have delayed application of ferroelectric ceramics to memory and display devices similar to those used in computer systems.

Ferroelectric ceramics previously used to generate displays and store information in response to electrical pulses had several drawbacks which limited early application.

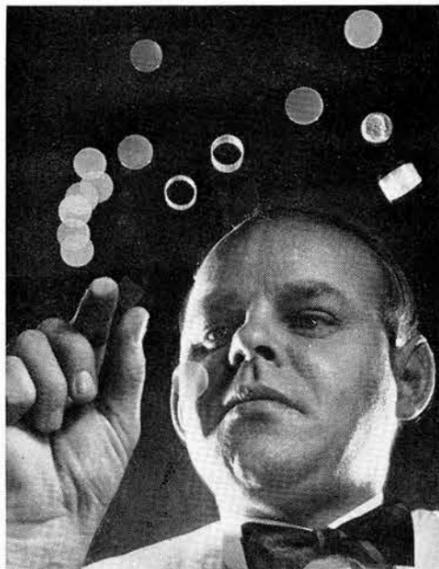
Key to production of the new ceramic was the substitution of the oxide of the rare earth metal lanthanum for some of the components already used in earlier ferroelectric ceramics.

Major applications of ferroelectric ceramics require deposition of electrodes on the ceramic surface and positioning the material between crossed polarizers. The desired optical effects are produced by applying the correct electrical field to the electrooptic cells between electrodes. These effects remain even after the field is removed, giving the material a true "memory" capability.

When adapted as a memory or display device, the ceramic contains many rows of tiny, separately-spaced dots or information cells — rather like the grid of dots which makes up the image in a newspaper photograph. Thus color images, such as numbers, letters or graphs, are made up of many such information cells which are individually "commanded" to transmit a given color.

In black and white displays and in memories, these cells transmit varying intensities of light, thereby appearing as different shades of grey. The image display may be viewed directly or projected like a photographic slide. It becomes an electronic "memory" when small light-sensitive detectors are attached to each information cell. The detector converts the light to an electrical signal — the brighter the light, the stronger the signal — which can be interpreted as a number or symbol for computer use.

The ceramic also may be used to vary the intensity of a light beam (much as a crystal is used to amplitude-modulate an



INVENTOR Gene Haertling (2317) displays samples of new transparent ferroelectric ceramic. The ceramic — made of lanthanum, lead, zirconium and titanium — is being developed for use in electrooptic display information storage devices.

"AM" radio signal) or to turn the light beam on and off like a camera shutter.

The new material (PLZT — made up of lead, lanthanum, zirconium and titanium) differs from the earlier material — lead zirconate-lead titanate — in three major aspects:

—Because it is more transparent, it will produce black-white contrasts of as much as 1000 to 1, and a complete range of colors. Contrasts on the earlier, translucent material were limited to about 100-1, and there was difficulty in achieving black, blue and violet display cells.

—It is more versatile, being a class of three ceramic types which are particularly useful as (a) memories and optical displays; (b) light modulators which produce a linear response to an applied electric field; and (c) high-sensitivity light modulators which have a quadratic response to an applied field.

—It may be changed from an electro-optically active state to a neutral state by electrical means. Previously this could be done only by raising the material's temperature above a certain level.

Gene has been division supervisor of the Active Ceramics Materials Division since 1965. He joined Sandia in 1961 and has been doing materials research in applied research organizations since that time. He previously was a co-inventor with Cecil Land (5153) of a ceramic electrical memory device.

The latest invention was described by Gene and Cecil in papers read at the annual meeting and exposition of the American Ceramic Society this past week.

Dean Irvin Named As USAR School Commandant

Dean Irvin (3121) has been named commandant of the 4153rd U.S. Army Reserve School located at Sandia Base.

Dean, a reserve colonel, replaces Col. Leonard Keeling Jr., who is retiring.

The school provides basic, advanced and command and general staff college courses for Reserve and Guard officers. National security management courses for key executives in military and civilian life are also sponsored, as well as a non-commissioned officer's academy.

Sandia Rocket Series Underway at Kauai

A series of rocket launches is now underway from Barking Sands Launch Facility on Kauai. The series, which will continue through June 11, is part of Sandia's continuing program of upper atmosphere research.

The tests involve high altitude experiments of Sandia, Los Alamos Scientific Laboratory and Lawrence Radiation Laboratory.

Three of the rockets, tentatively scheduled to be fired during the early evening hours, will produce luminous clouds which may be observed by residents throughout the Islands.

The clouds will be formed by the release of barium from the rockets' nose cones. Initially, clouds will be of a light green color but will promptly generate a reddish-hued subsidiary cloud caused by ionization of the barium by the sunlight at high altitude. Sandia is responsible for instrumentation, telemetry and rocket systems in addition to range support for the launches. Test director at the site is Al Hutters, supervisor of Sandia's Test Operations Division 9222.

Interest Now of Interest

5% Return Plus Other Goodies Make Savings Bonds Good Deal

May is "Rally 'Round the Flag Month." In a few days you'll receive a pamphlet that tells why it's plain good sense to save regularly through the Savings Bonds Payroll Deduction Plan.

If you're not saving through this plan now, think about it. It's one of the surest ways to build up a bundle. When you're saving through the Payroll Savings Plan, your money is set aside before you see your pay check, making this part of your thrift program steady and automatic.

Interest on bonds now, up to five percent, is subject to federal income taxes, but reporting of bond interest may be deferred until bonds are cashed or mature.

Thus, tax savings may be realized when bonds are bought for retirement purposes. A retirement plan to give you a tax break would work this way:

- (1) Purchase "E" bonds during working years,
- (2) Cash the bonds after retirement.
- (3) Report interest as income on federal tax return.

Income is usually lower after retirement, and with double tax exemption after age 65, taxes on the interest are greatly reduced or eliminated entirely.

Here are a few more reasons why purchase of Savings Bonds through payroll deduction makes good sense:

—There is no safer investment in the world than U.S. Savings Bonds. Savings Bonds are impervious to market fluctuations, and both principal and interest are fully guaranteed. Savings Bonds are replaced free if lost, stolen or destroyed, with no loss of accumulated interest.

—Savings Bonds are a source of ready cash in the event of financial crisis. They can be redeemed without charge for their purchase price, plus any accumulated interest, anytime after two months from issuance.

—Savings Bonds are an ideal way to save for specific goals—building a new home, a new car, a college fund, or retirement. In addition, investing in Savings Bonds is investing in America's security and economic growth.

Since 1941, Americans in all walks of life have purchased more than \$176 billion in E and H Bonds. Since that time, about \$125 billion in savings and accumulated interest have been withdrawn and put back into local economies. Americans still hold some \$51 billion in bonds as a reservoir against future want or emergency.

Eighty-three percent of Sandians now participate. If you aren't enrolled, think about it seriously. Give your own fiscal health a boost and your country's as well.



BIG FIVE — that's what Savings Bonds interest rate has risen to. Vicki Vivian (4335) urges you to increase your allotment or to sign up during May, Savings Bonds month.

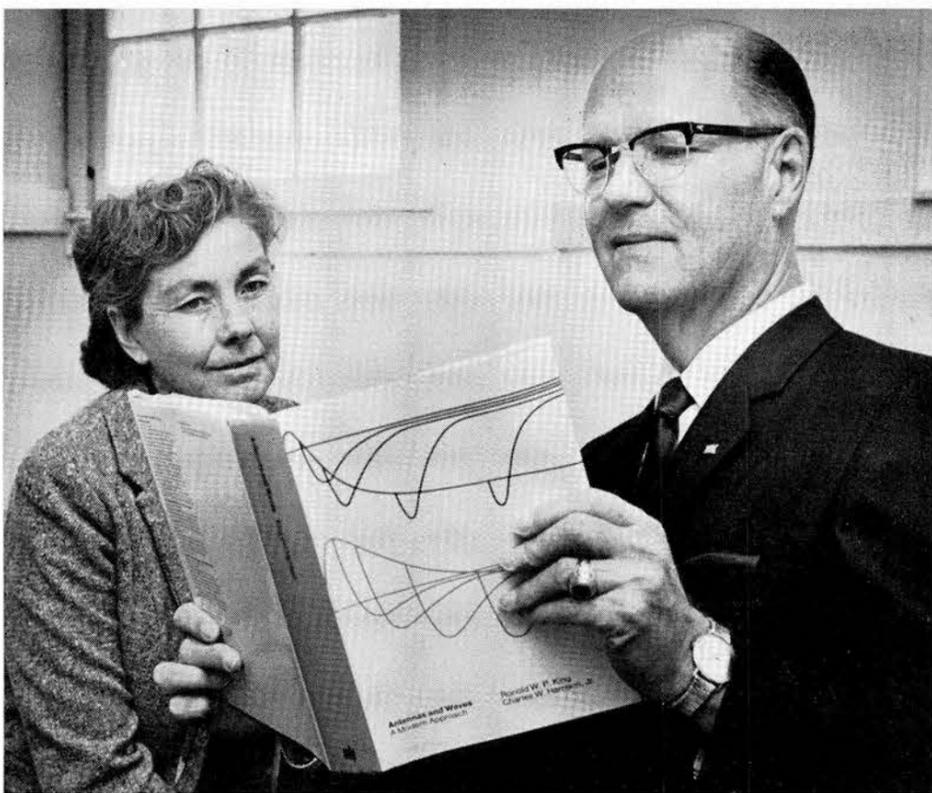
Sandia Consultant Honored

The National Academy of Sciences' first George P. Merrill medal was awarded April 27 in Washington, D.C., to Dr. Klaus Keil, director of the UNM Institute of Meteoritics and a Sandia consultant.

The award, which carries a \$1000 cash stipend, was presented for Dr. Keil's mineralogical investigation of meteorites. During his investigations over the past several years, he has found four new mineral compounds, including two from the Apollo 11 lunar sample.



CHAIRMAN of the Equal Employment Opportunity Commission, William Brown (center), was in Albuquerque in late April and addressed a gathering at the Coronado Club. Among those present were (l to r) H. C. Donnelly, manager AEC/ALO; Ray Powell, vice president 3000; Mr. Brown; Vincente Ximenes, member of EEOC Washington; and Tom Robles, director of EEOC Albuquerque office.



HAPPY DAY: Recently published "Antennas and Waves: A Modern Approach" represents an impressive amount of work by author Charles Harrison (2625) and editor Dorothy Mann (3411), who prepared the index and nomenclature list and reviewed the final copy of the 800-page book.

Harrison-King Are Co-Authors Of AEC Sponsored Antenna Book

Long in preparation, the lengthy, technical book, "Antennas and Waves: A Modern Approach" by Charles Harrison (2625) and Ronold King of Harvard University (a Sandia consultant), is now in print.

This is the first book at Sandia Laboratories to be sponsored in toto by the AEC. It was printed by Massachusetts Institute of Technology Press after considerable graphics work by Sandia and the AEC Division of Technical Information Extension

at Oak Ridge, Tenn. The book contains some 800 pages, including numerical tables of selected properties of antennas, graphs, and diagrams.

The book discusses the general theory of electromagnetic radiation in its mathematical and physical aspects and provides solutions to problems of interest in the nuclear and space age. Much of its content derives from antenna research performed by the authors at Sandia.

Speakers

B. T. Kenna (5525), "Studies in Fast Neutron Activation Analysis," Second Oak Ridge Associated Universities Conference on the Use of Small Accelerators for Teaching and Research, March 23-25, Oak Ridge.

G. P. Steck (1723), "Confidence Regions for F with Minimum Expected Area," Central Regional Meeting of the Institute of Mathematical Statistics, April 8-10, Dallas.

Marjorie Ready (3321-1), "Coronary Care," UNM School of Nursing, Albuquerque.

W. W. Allison (3351), "Safe Use of Rupture Discs," American Society of Safety Engineers, March 20, Albuquerque.

H. C. Walling (7342), "Impulse Loading of Rings with Magnetically Accelerated Flyer Plates"; K. J. Touryan (9340), "High Temperature Simulation Techniques and Facilities at Sandia Laboratories"; D. C. Bickel, W. B. Leisher, and M. G. Vigil (all 7343), "A Method for Predicting Forcing Functions for Structures Being Tested in a Shock Tube"; M. B. Gens (1543), "The Rail Transport Environment" 16th Annual Meeting of the Institute of Environmental Sciences, April 12-16, Boston.

R. E. Knutson (2631), "Thick-Film Hybrid Microelectronics," Los Alamos Scientific Laboratory, March 26.

G. W. Barr (5162), "The Influence of a Supersonic Flow Field on the Elastic Stability of Cylindrical Shells," AIAA Struc-

tural Dynamics and Aeroelasticity Specialties Conference, April 16-17, New Orleans.

S. E. Nykanen (2625), "Performance of Communication Systems Using the Turin Multipath Channel Model," Spring 1970 Meeting of the U.S. National Committee, International Scientific Radio Union, April 16-19, Washington, D. C.

R. K. Quinn (5154), "Vapor Transport Growth of Rhenium VI Oxide Single Crystals"; R. J. Baughman (5154), "Crystal Growth of KVO₃," Southwestern and Rocky Mountain Division, American Association for the Advancement of Science and New Mexico Academy of Science, April 22-24, Las Vegas, N.M.

H. M. Dodd, Jr. (7320), "T-Trail Transport Empennage Loads in Continuous Atmospheric Turbulence"; G. W. Barr (5162), "An Elastic-Plastic Material Model for a General Anisotropic Strain-Hardening Material"; M. J. Forrestal (1223), W. E. Alzheimer (1541), and D. B. Longcope (1222), "Transient Response of a Cylindrical Shell Containing an Orthotropic Core," AIAA/ASME 11th Structures, Structural Dynamics, and Materials Conference, April 22-24, Denver.

E. J. McGuire (5234), "L-Shell Auger Transition Rates, Coster-Kronig Rates and Fluorescent Yields for 11-Z-36," American Physical Society, April 27-30, Washington, D.C.

H. D. Fisher (1541), "Dynamic Buckling of Elastic Plastic Shallow Arches," ASCE Conference, April 10, Portland.

P. J. Chen (1721), "Growth and Decay of Shock Waves in Non-Linear Viscoelastic Materials," Theoretical Division Seminar, April 13, Los Alamos.

T. A. Allen (4221), "Processing Prototype PC Boards at Sandia Laboratories," Institute of Printed Circuits, April 15, Miami Beach, Fla.

Albert Narath (5100), "NMR and the Electronic Structure of Transition Metals, Alloys and Intermetallic Compounds," National Bureau of Standards, April 16, Washington, D.C.; Stanford University, May 21, Palo Alto; University of Utah, May 28, Salt Lake City.

J. F. Muir (9341), "Transpiration Cooling," Oklahoma State University Heat Transfer and Fluid Mechanics Seminar, April 9, Stillwater.

R. A. Graham (5132), "Taking the Pulse of an Impact," Air Force Weapons Lab, April 6, Kirtland AFB; "Measurements of Stress Profiles in Shock Loaded Solids," University of New Mexico, April 7, 16, and 21.

Baja Idyll

Sailing Sandians Cross Gulf Of California In Small Boat

The ocean it is not. The Gulf of California is only about 65 miles across, from the mainland of Mexico to Baja California. But to a trio of Sandians, the Gulf was formidable from the deck of a 22-foot Ventura sailboat.

The Sandians — Roger Eaton (9341), Larry Rollstin (9324), and Bob Croll (9322) — recently spent a week sailing from Bahia Kino across to Bahia San Francisquito and back in Roger's boat. Along the way they explored some barren islands, saw a school of whales, a lot of porpoises, about 200 seals, and only one other human being.

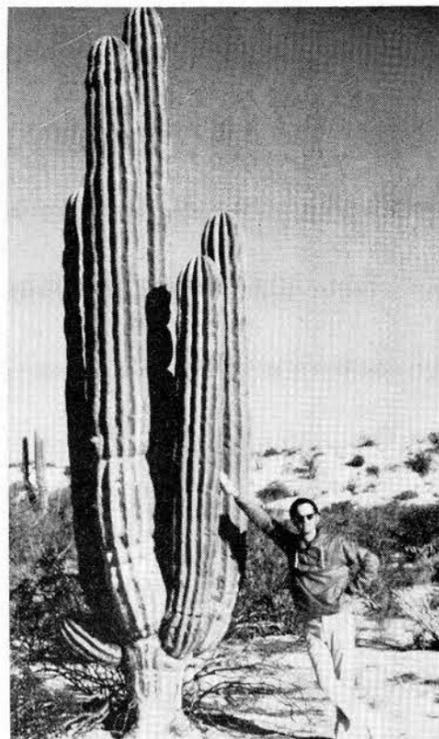
"We ran into some rain (practically unheard of in this area) and some six-foot waves," Roger says, "so it got rough a few times. Most of the time, though, we had smooth sailing and quiet anchorages."

A lot of planning went into the trip — careful selection of supplies, storing sufficient water, charting the course and anchorages, assembling a first aid kit and rounding up a citizen's band radio.

"We were prepared for everything except the cold water," Roger says. "It was too cold for swimming. And we didn't catch a single fish. Other than that, it was a great trip."



GULF OF CALIFORNIA looks mighty formidable to Larry Rollstin (9324) and Bob Croll (9322) from the deck of a 22-ft. sailboat.



ROGER EATON (9341) does the classic tourist pose beside a giant Baja California cactus.

Sympathy

To James Fesler (4152) for the death of his mother in Washington.

To Roger Abbott (7250-P) for the death of his father April 9 in Minot, N.D.

To Ethel Lonner (7531) for the death of her sister on April 9.

To Marion Tucker (4131-1) for the death of his wife in Houston, Texas.

To Dora Dyer (6021) for the death of her mother April 16 in Nevada.

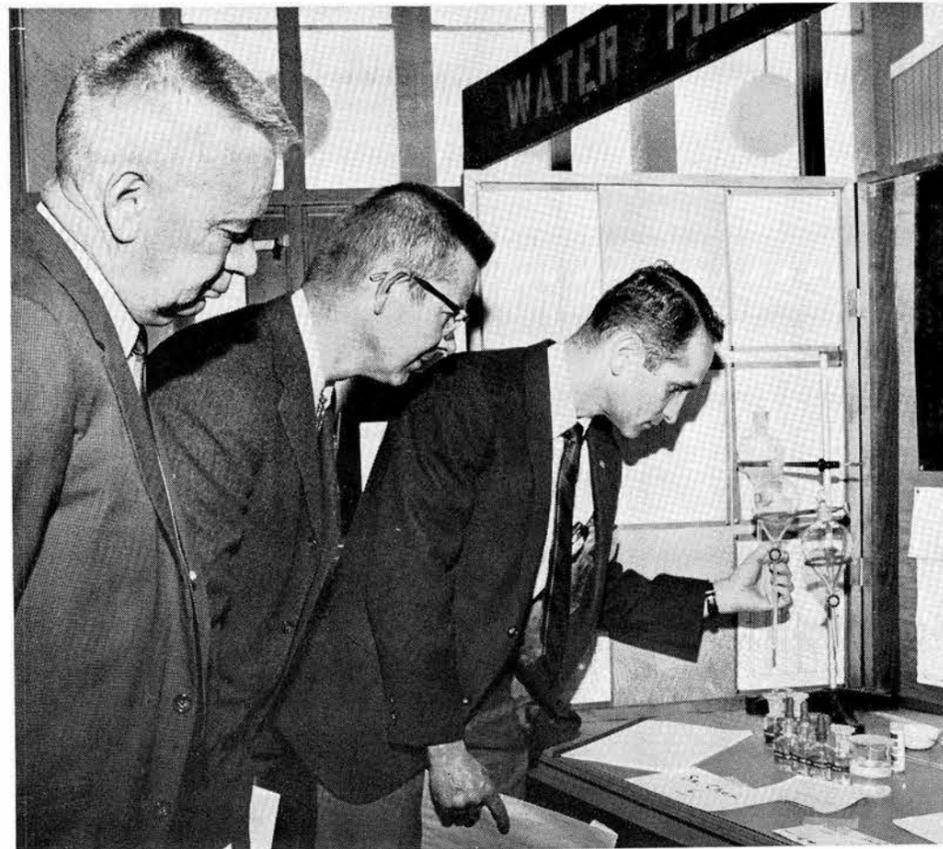
To Woodrow Littrell (3524) for the death of his mother-in-law in Albuquerque, April 21.

To Larry Avila (3520) for the death of his mother-in-law in El Paso, April 20.

To Roy Hassebroek (formerly 7632) for the death of his wife in Albuquerque, April 22.

To Harry Kinney (1222) for the death of his father in Albuquerque, April 27.

To Ken Hessel (7261) for the death of his father in West, Texas on April 21.



EIGHTEEN Sandians recently served as judges for the 11th Annual Northwestern New Mexico Regional Science Fair. Looking over a chemistry exhibit on water pollution are (l to r) Ben Seely (5421), Buzz Milton (5333), and Sam Levy (2343).

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LIVERMORE NEWS

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"EARTH DAY" AT LIVERMORE—Among Sandians who joined in the national observance of Earth Day were these who chose to show their concern for the environment by walking to work. Early in the morning, this group was seen heading east from Livermore en route to the Laboratory.

Take Note

Gary Brummond (8322) and Bob Shaefer (8172) have been appointed to the Livermore Beautification Committee by the City Council. The 11-member committee is responsible for beautification efforts in the local area.

Two Sandians were recently elected officers of the Livermore Valley Charter Chapter of the American Business Women's Association — Mary Monser and Nancy Martin (both 8253) will serve as treasurer and recording secretary, respectively, for the upcoming year.

Dick Ballard (8212) shot a low net score of 67 to win the first place trophy in the Sandia Employees Golf Club tournament played at Sky West Golf Course in Hayward April 11. Tied for second place with scores of 71 were Bill Landt (8139) and Glen Funk (8172). Smokey Maxwell (8123) was closest to the pin in the hole-in-one contest.

Bruce Held of Environmental Health and Medical Services Division 8263 will participate in a day long conference on "The Environment — A Search for the Answers," on Saturday, May 16. The conference will be held in the Pittsburg High School Auditorium. Morning discussions will concern environment legislation now under consideration. Participants include U.S. Representative Jerome Waldie, State Senators John Nejedley and Nicholas Petris, and California Assemblyman John Knox. Afternoon panelists include Bruce who is a member of the State Environmental Study Council; John Maga, executive officer of California's Air Resources Board; James Kenny and Edward McHugh from the Bay Area Air Pollution Control District; and Ernest Starkman, a member of the technical committee of the State's Air Resources Board. The conference is open to the public.

Bird-Watchers' Special

Touring Northern California

Spring is nesting season at the rookery on the Audubon Canyon Ranch, where on the shores of Polinas Lagoon in Marin County great blue herons and egrets court, mate, and raise their young. Visitors to the ranch may study the birds, hike in the woods, and picnic.

The ranch is located on State Route One, three miles north of Stinson Beach, and is identified by a sign and white frame house. The driveway runs past the house to a parking area beyond. In the nearby barn, a display explains and illustrates the natural and human history of the area, as well as the habits of the big birds.

Ideal conditions exist here for the breeding of herons and egrets. They build their nests on the tops of redwood trees, where the eggs and fledglings are safe. About a quarter of a mile away are their feeding grounds, the tidal mudflats of the lagoon.

Audubon Ranch is open weekends and holidays from 10 a.m. to 4 p.m., through July 5. A map of the ranch trails is available when registering with the Audubon Society member on duty. The most popu-

lar trail leads to Henderson Overlook, which has a good view down into the nests. Telescopes are available for closeup looks. In addition, there are the Bert Harwell Trail — a short, nature walk in the Garden Club of America Canyon, and the three-mile Martin Griffin Trail — a loop hike around Audubon Canyon.

No admission is charged at Audubon Ranch, but donations may be made to purchase additional land and to help fight the dangers threatening the survival of the herons and egrets. There is a possibility that the lagoon will be turned into a small-boat harbor, and there could be further timber cutting in the watershed. There are also some signs of pesticide poisoning in the bird colony, such as nest failures and thin eggshells.

Death



Ruth Brockett died suddenly last month at the age of 61. She was a recent Sandia retiree.

She had worked at Sandia Laboratories Livermore since February 1961 primarily as a department secretary in advanced systems and technical information organizations.

Survivors include her mother, a nephew, and two half brothers.

Sympathy

To Ralph Cozine (8162) for the death of his father-in-law in Manhattan, Kan., March 20.

To Helen Bond (8129) for the death of her sister in Mammoth Lake, Calif., March 23.

To Su Chiu (8352) for the death of his father in Taiwan, March 27.

Congratulations

John Benapfl (8322-2) and Kathryn Mueller married in Livermore, March 21.

Mr. and Mrs. Cal Feemster (8311), a son, Richard William, March 30.

Authors

W. E. Warren (1721), "Two Singular Integrals," Vol. 11, No. 3, SIAM REVIEW.

P. J. Chen (1721), "On the Growth of One-Dimensional Shock Waves in Materials with Memory," Vol. 36, No. 1, ARCHIVE FOR RATIONAL MECHANICS AND ANALYSIS.

L. R. Edwards (5132), "Seebeck Coefficients of Lutetium Single Crystals," Vol. 188, No. 3, PHYSICAL REVIEW.

N. C. Anderholm (1224), "Laser-Generated Stress Waves," Vol. 16, No. 3, APPLIED PHYSICS LETTERS.

D. K. Brice (5111), "Ion Implantation Depth Distributions: Energy Deposition into Atomic Processes and Ion Locations," Vol. 16, No. 3, APPLIED PHYSICS LETTERS.

K. L. Brower and J. A. Borders (both 5111), "Electron Paramagnetic Resonance of Ion-Implanted Donors in Silicon," Vol. 16, No. 4, APPLIED PHYSICS LETTERS.

R. J. Chaffin (2623) and E. P. EerNisse (5112), "A Poor Man's TRAPATT Oscillator," Vol. 58, No. 1, PROCEEDINGS OF THE IEEE.

A. F. Witte (7324), "Realistic Vibration Tests," Vol. 17, No. 2, INSTRUMENTATION TECHNOLOGY.

C. E. Land (5153) and Richard Holland (former Sandian), "Electrooptic Effects in Ferroelectric Ceramics," Vol. 7, No. 2, IEEE SPECTRUM.

P. S. Peercy, E. D. Jones, J. C. Bushnell (all 5114), and G. W. Gobeli (5110), "Ultrafast Rise Time Laser-Induced Stress Waves," Vol. 16, No. 3, APPLIED PHYSICS LETTERS.

R. L. Gerlach (5331), J. E. Houston (5332), and R. L. Park (5331), "Ionization Spectroscopy of Surfaces," Vol. 16, No. 4, APPLIED PHYSICS LETTERS.

L. S. Nelson (5224), S. R. Skaggs (former Sandian), and N. L. Richardson (5224), "Spheroidization of Refractory Oxides with a Carbon Dioxide Laser," Vol.

53, No. 2, JOURNAL OF THE AMERICAN CERAMIC SOCIETY.

R. K. Quinn (5154) and J. J. Lagowski (University of Texas), "Electrolysis of Liquid Ammonia Solutions of Aluminum (III) Iodide and Magnesium (II) Chloride," Vol. 9, page 414, ORGANIC CHEMISTRY.

M. J. Forrestal (1223) and W. E. Alzheimer (1544), "Elastic Waves in Thick-Walled Cylinders," April issue, JOURNAL OF THE ENGINEERING MECHANICS DIVISION, ASCE.

S. D. Holmes (4222), "Silver Plating on Beryllium Copper (Sporadic Adhesion Problems)," March issue, PLATING MAGAZINE.

R. G. Webster and A. D. Swain (both 1642), "Human Factors Inputs to Large-Scale Field Tests," October 1969, Air Force Human Resources Laboratory Technical Report 69-6.

R. Y. Lee (8325), "On Uniform Simplification of Linear Differential Equation in a Full Neighborhood of a Turning Point," Vol. 27, No. 3, JOURNAL OF MATHEMATICAL ANALYSIS AND APPLICATION.

R. C. Hughes (5114), "ESR to TMPD-TCNQ: Spin Excitations of the Heisenberg Regular Linear Chain," April issue, JOURNAL OF CHEMICAL PHYSICS.

R. E. McCallum (7452), "Detection of Shifts in the Values of Saturated Standard Cells Used as References," Vol. IM-18, No. 4, IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT.

D. K. Brice (5111), "Ion Implantation Depth Distributions: Energy Deposition into Atomic Processes and Ion Locations," Vol. 16, page 103, APPLIED PHYSICS LETTERS.

H. J. Stein, F. L. Vook, and J. A. Borders (all 5111), "Depth Distribution of Divacancies in 400 keV O⁺ Ion-Implanted Silicon," Vol. 16, page 106, APPLIED PHYSICS LETTERS.

K. L. Brower, F. L. Vook and J. A. Borders (all 5111), "Depth Distribution of EPR Centers in 400 keV O⁺ Ion-Implanted Silicon," Vol. 16, page 108, APPLIED PHYSICS LETTERS.

R. J. Thompson (1722) and L. F. Shampine (University of New Mexico), "Difference Methods for Nonlinear First-Order Hyperbolic Systems of Equations," January issue, MATHEMATICS OF COMPUTATION.

D. C. Wallace (5151), "Dependence of

Phonon Frequencies on the Pseudopotential Form Factor for Aluminum," Vol. 187, No. 3, PHYSICAL REVIEW.

C. W. Peterson (9341), "An Experimental Study of Laminar Hypersonic Blunt Cone Wakes," December issue, ASTRONAUTICA ACTA.

G. W. Gobeli (5110), J. C. Bushnell, P. S. Peercy, and E. D. Jones (all 5114), "Observation of Neutrons Produced by Laser Irradiation of Lithium Deuteride," Vol. 188, No. 1, PHYSICAL REVIEW.



THEY'RE GONE! All those card catalogs in the technical library (behind Catherine Fifield) have been replaced by handy book catalogs arranged by author and permuted subject/titles. Monthly additions will supplement the annual reissue of the catalog.



INDIVIDUAL LOCK BOXES, just like at the post office, are a new wrinkle adopted by Sandia's Security organization. Each security inspector stores his pistol (empty and with chamber open) in his own box when off duty. Bob Crompton (3522) demonstrates. The new system, suggested by Walt Troy (3522), eliminates check-in and check-out procedure formerly used.



NEW CHAIRMAN of the Weapon Contractors Classification Committee, Frank Shearin (left) from Mound Laboratory, smilingly takes over duties from outgoing chairman Jim Marsh, head of Classification Division 3414. WCCC, which includes all integrated contractors, meets periodically to discuss nuclear weapons classification policies and problems.

Take Note

Two Sandians were recently elected officers of the new organization The New Mexico Obrero Chicano. Manuel Chavez (4151) was elected president and Martin Quintana (9411) was elected treasurer.

A master's thesis painting exhibition by Ken Miller of Technical Art Division 3417 will be on display at the University of New Mexico Art Museum through May 17. The museum is open from 10 a.m. to 5 p.m. Monday through Friday and from noon until 5 p.m. Sundays.

A home firearm safety course, especially for women, will be offered May 16 and 23 from 9-11 a.m. at the Coronado Club. Included will be information on storage of firearms and ammunition, and handling and cleaning of firearms. The course is

free and will be taught by Ken Romine (9511) and Larry Horner (7414). Call Larry at 264-2868 to register as the class will be limited to 50 persons.

"Piezoelectric Response of Shock-Loaded Quartz — Ten Years with the Right Model" will be presented by Robert Graham (5132) at the 5100 Staff Seminar Tuesday, May 12.

Paul Peercy (5114) will discuss "Raman Scattering in Solids: Sodium Trihydrogen Selenite and Semiconducting Cadmium Sulphide" at the meeting May 19.

The 5100 Staff Seminar meets Tuesday mornings at 8:30 in Rm. 201 of Bldg. 806.

Sandian's Son Exhibits Heroism in Vietnam

Jim Reed (9322) has double reason to be proud of his son Mike who recently returned from Vietnam. Mike received the Silver Star, the nation's third highest combat decoration, for "gallantry in action" while serving aboard a helicopter of the 1st Aviation Brigade. And while in Vietnam Mike organized a drive—with the aid of his mother and father—to supply toys, clothes, and money to an orphanage and leper colony.

The Silver Star Medal was presented during ceremonies recently at Sandia Base. According to the citation, Mike was riding on the last of five helicopters which were picking up troops near Vinh Long. When the zone came under intense fire, the first four choppers departed leaving three wounded soldiers on the ground. "Cpl. Reed leaped from the last helicopter and with complete disregard for his own safety, ran across the open rice paddy to their aid. He carried them one at a time back to the waiting helicopter through intense fire."

The unit Mike belonged to adopted an orphanage and leper colony. After it became apparent that essential supplies—clothing, food, tools, money, and toys—were not available, Mike enlisted the aid of his parents and organized a successful drive among Albuquerque churches to supply the needed items.

Mike is now a student at UNM.

Youth Symphony Plans Benefit Concert May 10

The Albuquerque Youth Symphony will play a concert Sunday, May 10 at 4 p.m. in UNM Popejoy Hall to raise funds for a trip to Chihuahua, Mexico, where they will present concerts June 6 and 7.

The symphony is made up of 83 students from the eight Albuquerque high schools and the Albuquerque Academy. The musicians are selected through audition each year. Rehearsals are held Saturday mornings. During the past three years, the symphony has performed for thousands of school children here and in other New Mexico communities.

Frank Bell (3000) was instrumental in helping to set up the Chihuahua visit and concerts. The symphony is directed by Dale Kemper and is jointly sponsored by the Albuquerque Public Schools and the University of New Mexico.

Adrenaline Beats STP

Randy King Racing Bikes at Speedway

Randy King (2452) races motorcycles. Since Speedway Park opened April 17 he has competed in the 250cc expert class. Last summer he was on the track just about every Friday night competing in the novice class.

"My bike was really a dog," Randy says, "I was learning the sport. Motorcycle racing is a ball—a kind of excitement that you can't get any place else."

Now with a new motorcycle (an Ameri-

can Eagle 250cc stripped to a bone lean 220 lbs. and modified to turn over at 10,000 rpm), Randy hopes to carry the winner's flag a few times.

To win a race, a driver must place at least fourth in a couple of preliminary heats before the main event. About 10 drivers compete in each heat. They average about 70 mph during 10 laps around the three-eighths mile track. The race is over in less than four minutes. Only the win-

ners of main events collect prize money—about \$20 for first place.

"But we don't do it to make money," Randy says. "You can make expenses if you are lucky. It's the thrill of those four minutes that count."

In addition to luck, the motorcycle racer needs skill. The track turns continuously to the left so the racer is continually leaning on his left leg. He wears a steel protective cap and bracket over his left boot and uses the left leg for support and balance as he lays into the turn.

The racing bikes have no brakes. This prevents panic stops and pile ups during a race. Instead, the driver uses motor compression and a kill button to slow his bike.

The driver wears a padded and reinforced leather suit and a helmet which covers his entire head during a race. He sees through a plexiglass port in the helmet.

"The race is a scramble," Randy says, "a fight all the way. The old adrenaline really pumps through your veins."

Other Sandians involved in motorcycle racing at Speedway include James Mason (2454), pit steward; Joe Abbin (2324), announcer; and Fred Gustke (7524) and Bob Holloway (7615), flagmen.



KING OF SPEED — Randy King, that is of 2452, is ready for racing season. His new American Eagle racing bike has been stripped to 220 lbs. and the two-stroke single cylinder engine is modified to gulp more air and pull 10,000 rpm. In photo at left, Randy wears protective leather suit and steel protective cap on his left boot.



Service Awards

20 Years



Burl Duncan
4151



Benjamin Mills
8183



Nancy Sanchez
3452



Brad Sanders
4251

15 Years



Avelina DuBois
7633



Jack LaFleur
2651



Lloyd Williams
7250

10 Years

Andrew Gross 8343, Charles McCarty 2652, Robert Lucas 7343, and Robert Altherr 4221.

Take Note

Players are still needed for Sandia's women's softball team, according to Donna Lewis (4333-1), manager. The team will compete in the city softball league, slow-pitch division. Any interested Sandia women should contact her at 264-5050, or contact Employee Services Division 3123, 264-7775.



HOME ON THE (TEST) RANGE—Above, cowboys working for the Southwestern Radiological Health Laboratory round up cattle used in effects studies associated with safety of nuclear testing. The U.S. Public Health Service's Bureau of Radiological Health livestock herd is grazed on the Nevada Test Site. The Laboratory also operates an experimental farm for the AEC at NTS. At right, cowboy-type takes aim with the official AEC branding iron. The AEC brand is registered in Nevada.



Promotions

John Patterson (4251) to Staff Assistant Technical
Dale Ahlstrom (8332) to Staff Associate Technical

Ion Implantation Papers Given at International Meet

Several papers describing research underway in Crystal Lattice Defects Research Division 5111 were presented at the International Conference on Ion Implantation in Semiconductors—Physics and Technology, held May 4-7 at Thousand Oaks, Calif.

The Sandia contributions were: G. W. Arnold, "Preferential Etching of Ion Bombarded GaAs"; J. A. Borders, "EPR of Substitutional Group V Implants in Silicon"; H. J. Stein, "Electrically Active Defect Annealing in Neutron and in Ion-Damaged

Si"; D. K. Brice, "Spatial Distribution of Energy Deposited into Atomic Processes in Ion Implanted Silicon"; F. L. Vook and H. J. Stein, "Evidence for Vacancy Motion in Low Temperature Ion-Implanted Si"; and S. T. Picraux, "Low Temperature Channeling Measurements of Ion Implantation Lattice Disorder in Silicon."

Another paper, "Ion and Ion Fluence Dependence of Divacancy Production in Si," was co-authored by Stein, Vook, Brice, Borders, and Picraux.

Death



Jean Antoine, a staff assistant in Electro-Explosives Division 2315, died suddenly May 3. She was 43.

She had worked at Sandia Laboratories since July 1955.

Survivors include her husband and three children.

Congratulations

Mr. and Mrs. Herb Filusch (9228), a daughter, Lynn Michelle, April 7.

LAB NEWS

PAGE FIVE MAY 8, 1970



NEW APPOINTEES recently announced by AEC/ALO include Don Johnstone (left) as Special Assistant to the Manager until his retirement May 15; David Anthony as Assistant Manager for Plans and Budgets (replacing Mr. Johnstone); and John Burke (right) as Director of the Operational Safety Division.

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 Laboratories 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

MISCELLANEOUS

HORSES: 9 yr. old quarterhorse mare, \$150; 11 yr. old buckskin mare, \$85, call collect. Folkins, (1) 867-2825.

5 TIRES & wheels, 7:00x14 8-ply, Ford wheels, approx. 1200 miles on 4 tires, spare never used, \$125. Stuart, 299-9190.

24" BOY'S BIKE, Goodyear, \$10; 4 ea. baby moons for 15" rims, n.w., \$5. Vigil, 296-3590.

8 WEEK OLD AKC reg. miniature poodles. Sanchez, 298-3130.

60 AMP 220/110V temporary service trailer fuse box w/meter socket, \$30. Souder, 282-3121.

POODLES: Toys, black, cream, males; miniature silvers, male & female; puppies: guinea pig w/cage; TV's for parts. Johnson, 298-7356.

H.O. SCALE car race track, 8'x3 1/2', 20; size 5 thermal boots, \$5; 2 com'ce & traverse rods, both \$15. Houston, 299-3386.

TIRE, 6:40x15 w/5-lug wheel, \$7.50; trailer hitch w/2-in. ball, \$10. Tufts, 255-9663.

COLT .25 auto and Colt 1849 percussion revolver, trade for old hunting knives or old fancy daggers. Smitha, 299-1096.

LEFT-HANDED golf clubs; carpet for stairs, 27'x30', blue green; hand lawn mower. Smallwood, 296-2931.

16' GLEN L. KIT, hull completed, enough wood to finish deck, made to accommodate small black Chev. V8, best offer. Irving, 299-1969.

PAIR stereo speaker systems, E-V SP12B speakers, Marquis cabinet, cost \$275, sell \$125 for pair. Bagg, 298-4035.

14' FIBERGLASS BOAT, 44 HP Mercury motor w/tilt trailer, \$360 or best offer. Hofer, 344-8047.

KNOTTY PINE PLANKS, 1' by 10' by 1", re-sawn one side, 21 planks, \$19. Lenz, 298-3872.

TOY POODLES, silver, very small, excellent pedigree. Shipley, 298-2433.

CONTEMPORARY SOFA, tan upholstery, 81" long, \$60. Parisi, 8 a.m. to 11:30 a.m. only, 255-2933.

6' GLASS sliding doors & screen, \$40. Adent, 299-1905.

POWER rotary mower, \$25. Rush, 299-6091.

BOAT, 16' fiberglass, canvas cover, 50HP Evinrude, electric start, remote throttle & shift, trailer, good tires, new spare. Hock, 256-0276.

'70 SUZUKI X-6, 250cc motorcycle, 4300 miles, \$495. Bernard, 296-1385.

HABACHI or whetbarrow barbecues; Datsun moon hubcaps. Chandler, 296-3323.

SOFA BED, Foster Ideal, contemporary style, dk. blue, new mattress, \$50. Allen, 298-9437.

AUTHENTIC wagon wheels, all sizes, \$10. Hunter, 296-3751.

VW BUS luggage rack, \$12; red & white attached tent, \$15. Esterly, 296-9251.

DINING TABLE, blond oak, double pedestal, 2 18" drop leafs + 12" leaf, 6 matching chairs, 38"x36" closed, \$50; roller skates, woman's white, size 8, w/case, \$5. Porter, 299-7985.

PICKUP CAMPER, 8 1/2' overcab model, stove, oven, refrig., heater, jacks. Randall, 299-0372.

3-GAL. thermal water can, \$2.50; 2x5 folding picnic table, \$4.50; Sear's vacuum, attachments, power-mate cart, \$15; 11.5' x 16' carpet w/pad. Meyer, 344-3094.

BLONDE frosted wig w/case & styrofoam form. Erlanson, 296-7351.

ZENITH color TV, 23", \$175. Hill, 255-6538.

GOLF CLUBS, left hand & bag, wedge, woods 1, 2, & 3, irons 2-9, Spalding's best; tires, new, 5 ea., 6-95x14; oriental coffee table, 20x38x14". Browning, 299-6384.

SWIMMING POOL pump w/cartridge type filter w/stand, for pools up to 2600 gals., used 3 mos., \$28. Bassett, 898-1840.

MEXICAN COLONIAL: leather, rosewood sofa, armchairs, \$250; twin headboards, \$60; custom made in Talaquepaque, Mexico; walnut bed, dbl. dresser w/mirror, \$100. Ganzerla, 296-1211.

20" IVERSON UNICYCLE. Walla, 299-2209 after 5-30.

CAMP STOVE & lantern, gasoline operated. North, 265-2769.

BOY'S bicycle, 24", heavy duty tubes, kick stand, \$5. Stevens, 299-6086.

REMINGTON 700 rifle, cal. 30-06 w/4X scope, case, cleaning kit, \$120. Svensson, 344-7700.

SLIDE CAMERA, 35mm Petri w/f2.8 lens & inf. thru 1/300 second exposure, complete w/case & Weston lightmeter, \$25. Snelling, 268-5895.

CAMPER FRAME, 8' cab-over, windows & insulation included, a good start on a do-it-yourself camper. Crass, 299-3360.

BICYCLE, 24" boy's high rise handlebars, banana seat, \$15. Gutscher, 298-7203.

HORNET mini-bike, \$70; centrifugal water pump, 1/4 HP motor, \$20. Breckenridge, 298-0042.

GOLF CLUBS, 9 irons, 2 woods, golf bag, cart, \$50. Hopkins, 268-0885.

'66 SUZUKI 150cc, electric start, 5200 miles, \$250. Finley, 256-1169 after 6.

UPRIGHT PIANO, \$175; baby bed, \$10. Robnett, 299-9192.

ROYAL port. typewriter; 18" color TV. Preston, 344-4059.

TWO BOOKS for Triumph auto, both for \$3; starter, 12 volt, \$5; twin SU carburetors, \$10. Singleton, 299-1613.

CESSNA 140, all metal, 1750 TT, 260 SMOH, 85 continental, full electrical, nav & landing lights. Erdman, 298-3097.

'68 BSA motorcycle, 250cc, 3000 miles, \$500; Goldspot air conditioner, ref. type, used short time, cools 4 rooms, \$35. Walters, 296-7918.

HORSES: 5-yr.-old grey Arabian gelding, \$500; 10-yr.-old gelding for young rider, \$150. Sharp, 867-2815.

OVAL kitchen table, marblized top, 1 leaf, 4 tangerine chairs, \$45. Touryan, 265-2284.

CLOCKS: small collection of rare & unusual ones, wall & mantle, woodworks, chimes, calendar, etc., primarily for collectors. Montgomery, 268-2960.

OSCILLOSCOPE RCA W0-33, 5 MHZ, 3" screen, very portable, \$50. Stoker, 299-7221.

ASTRONOMY MIRROR, 6" diam., 60" focal length, \$30; 30 lbs red Wonder rock aquarium gravel, \$3.50. Van Den Aryle, 265-0263.

MAN'S 2-pants suit, charcoal, summer weight, dacron polyester, Rockin'ham, size 38-40, 32L-33W, \$25. Easton, 256-7717.

FREE to good home, 10-wk. old Beagle puppy. McCutchan, 255-7215.

FREE KITTENS. Causey, 299-0089.

CARS AND TRUCKS

'60 CORVAIR, auto., white, \$175. Duda, 298-1790.

'67 DATSUN 1600 sports sedan, lt. blue convert., one owner, 21,500 miles, new tires & paint, \$1500. White, 256-2868.

'63 OLDS Super 88, tan & white, AT, PS, PB, \$700. Whitlow, 296-7249.

'63 FORD Galaxie 500, 2-dr., PS AT, V8, lt. blue, 61,000 miles, below retail, \$525. Longcope, 268-7382.

'55 CLASSIC THUNDERBIRD HT, AT, no power, rebuilt 292 engine, trans., brakes & suspension, \$1600. 313 Dartmouth Dr. SE. Dreier, 265-3100.

'63 BONNEVILLE convert., full power, bucket seats, AC, low mileage, no interest, best offer. Browne, 344-2986 or 344-9873.

'61 FALCON station wagon, AT, AC, tape deck, R&H, 8000 miles on engine & trans. overhaul, \$275. Huff, 898-2730.

'62 COMET 4-dr., \$100; Aristocrat travel trailer, '63, 13', sleeps 4, \$650. Kidd, 11008 Elvin NE, 299-0035.

'36 CHEV. 3-window sport coupe, rumble seat, restored w/many original new parts such as engine, fenders, knee action, etc. Brewer, 344-4619.

'58 RAMBLER 4-dr. sedan, rebuilt engine, std. trans. (needs work done), \$95 or best offer. Binder, 299-2937.

REAL ESTATE

NORTH VALLEY, 3-bdr., 1 1/4 baths, lg. kitchen, LR w/fp. garage, pool, 2 1/2 acre, 6 1/2% loan, \$24,000 total, \$2500 down. Faro, 344-3818.

4 ACRES or 8 ACRES, home site, \$3000/acre, Peralta area. Shuman, (1) 636-2618.

LOT, 75' frontage, 1 blk. off Los Altos School, all cleared, discount for cash, 1021 Glorietta NE. Cordova, 299-1652.

3-BDR., den, 1 1/4 baths, 1500 sq. ft., fireplace, AC, near bases, schools, shopping, \$17,900. McFall, 298-1552.

MOSSMAN 3-bdr., separate den, lg. lot, assume 6% loan, Stardust Skies, Muir, 296-2252.

9 ROOM HOUSE, University-Medical Arts area, all kitchen appliances built in, marble entry way, landscaped, plus many extras. Arquette, 842-8695.

HOUSE, 4-bdr., 1 1/4 baths, SW landscaping, 1700 ft., near schools, NE Heights, new roof, \$17,900, 4 1/2% loan. Shunmy, 265-1620.

3-BDR., 1 bath, carpet, near schools-shopping-Sandia, NE Heights, consider trade or contract, \$13,500. Workman, 298-8312.

WANTED

RIDE from vicinity of Constitution and Kirby to Area I. Widenhoefer, 298-2510.

10-SPEED BICYCLE. Westman, 255-6048.

USED 12V transistorized car radio in operating condition. Hanna, 299-1126.

RIDE, 8th & Coal to Bldg. 880, Gate 7 or 10. Romero, 242-2958.

GAS barbecue, preferably pole mounted w/rotisserie & cutting shelf; also want stud service of small male beagle. Chandler, 296-3323.

RIDE from 2830 Cardenas NE to Area I. Tuthill, 298-3382.

VERNIER or DIAL CALIPER, milling attachment for lathe. Laskar, 299-1024.

GOLF CLUBS for boy, left-handed, ladies size may do. Stevens, 299-6086.

2 OLD FASHIONED loud cowbells. Ewald, 255-4191 after 5.

SQUARE END aluminum canoe w/ or wo/ low horsepower motor. Wilson, 282-3225.

80-10M CW SSB transceiver, will sell 4-1000A KW amplifier, Heath scope xmtr & misc. ham. gear. Cave, 299-5066.

RIDE from vicinity of Louisiana & Menaul to 880. Calkins, 2613 Indiana NE, 256-0041.

HIGH QUALITY USED 4-track stereo tape deck. Stoker, 299-7221.

FOR RENT

TRAVEL TRAILER, 14' Teardrop, sleeps 6, butane range & light, \$35/week. Bentz, 299-3448.

GARAGE for rent near UNM, single car size, on alley, \$10 mo. Hueter, 242-1620.

LOST AND FOUND

LOST—Small round 14-k gold earring, clear safety glasses w/plastic frame, Rx sunglasses, gold button earrings, 2 keys on snap type clip, lg. square earring w/black stone in center, brown leather fur lined gloves. LOST AND FOUND, tel. 264-2757, Bldg. 832.

FOUND—15-yr. SC tie clasp (in Golf Mart). LOST AND FOUND, tel. 264-2757, Bldg. 832.

NEXT DEADLINE FOR SHOPPING CENTER ADS 12 NOON MAY 15



CLEVER HOAX, this picture shows what can be done by the completely unprincipled to suggest so-called spring sandstorm in Albuquerque. Note street lights appear to be on, flag seems to be straight out, air has obviously contrived murky appearance, and pedestrian looks like he's protecting his eyes. But Lab News was not taken in — it just couldn't happen here.

Bruce Van Domelen Elected Executive Of WINB Group

Bruce Van Domelen (2345), the Governor's Science Advisor, was elected to a one-year term on the executive committee of the Western Interstate Nuclear Board (WINB) during the group's recent meeting at Sandia.

Frank Young of Las Vegas, Nev., was elected chairman of the board and Milton Weilenmann of Salt Lake City, vice chairman.

This was WINB's first full-scale meeting and resulted in launching three major investigations on the impact of the nuclear age on the Western states.

The Board is sponsoring an analysis of the effect of nuclear and fissile fuel power plant locations on the environment; a similar study on the management of radioactive wastes; and a third study on the benefits of the use of nuclear explosives in development of natural resources.

Plans also call for an educational demonstration, "This Atomic World," to tour schools in the West.

WINB is financed by a \$10,000 a year appropriation from each of the 11 member states and is set up to provide an independent capability to assess nuclear development in these states.



"War On Poverty program? I've got one of the enemy for you!"



SMOKING IS VERY DEBONAIR

AMERICAN CANCER SOCIETY

Events Calendar

- May 8-10—"Fantasy" and "Dutchman." Old Town Studio, for reservations tel. 242-4602.
- May 10—YWCA Mother's Day trip to the Barn Dinner Theater for dinner and matinee performance of "The Thousand Clowns." For information, tel. 247-8841.
- May 10—Albuquerque Youth Symphony concert, Popejoy Hall, 4 p.m.
- May 15-17—YWCA charter bus trip to Moab, Utah, Arches National Monument and Canyonlands National Park. For information tel. 247-8841.
- May 16-17—13th Annual Rio Grande White Water Races, 1 p.m., from Pilar to Taos - Rio Arriba County line. Spectators may view races from alongside U.S. 64.
- May 23-24—Annual rose show, Floriculture building, State Fair Grounds.

From U. of Chicago Squash Court to Sandia Labs:

AEC Histories Now On Sale

Two volumes relating the history of the U.S. Atomic Energy Commission can be purchased at discount prices through Employee Services Division 3123. The books are THE NEW WORLD, 1939/1946—VOL. I, by Richard Hewlet and Oscar Anderson, and ATOMIC SHIELD, 1947/1952—VOL. II, by Richard Hewlet and Francis Duncan.

The first book tells the story of the discovery of atomic energy. The pages convey the excitement of the scientists who discovered the nature of atomic fission; of the first self-sustaining fission reaction in an atomic pile at Univ. of Chicago; of the efforts to convince the government of its possibilities; of the race to produce a bomb before Nazi Germany produced one; of the delays, the frustrations, the misgivings, the false starts, and all the work that led to the ultimate achievement.

ATOMIC SHIELD is the comprehensive history of the development of atomic energy in the United States from the transfer of the government's atomic energy program to the AEC on Jan. 1, 1947, until end of 1952. The volume discusses the political struggle over the appointment of Chairman Lilienthal, the Berlin Blockade, efforts to build the nation's atomic stockpile, efforts to retain civilian control of atomic energy, negotiations for international control, the first Soviet detonation in 1949, the debate over development of the thermonuclear weapon, the impact of the Korean War on atomic energy policy and major research and administrative developments during the period. Sandia Laboratories figures prominently in this volume.

Copies of both books may be examined in the Library. Published by the Pennsylvania State University Press, they are available to Sandia employees at a range of discount prices depending upon the total number ordered by all employees.

	List Price	Discounted Prices	
		Maximum	Minimum
NEW WORLD	\$ 9.50	\$ 5.70	\$ 5.13
ATOMIC SHIELD	\$11.95	\$ 7.17	\$ 6.45
Boxed Set, Both Vols.	\$17.95	\$10.77	\$ 9.69

Procedure for Ordering

Complete the order blank (right), send to Employee Services Division 3123 or, in Livermore, to Public Relations Division 8216 before May 29. Do not include payment at this time. When all orders are in, Employee Services will then be able to compute the quantity discount and place the order with PSU Press. When the books are received, you will be contacted and payment can then be made.

Coronado Club Activities

Latin Fiesta May 16

The Coronado Club's Latin Fiesta explodes Saturday, May 16, at 6:30 p.m. with one free margarita for everybody. A tremendous Mexican food buffet will be spread from 7 to 8:30 p.m. Val de la O and his mariachi band will provide dinner music until Sol Chavez and the mighty Duke City Brass take over the bandstand for dancing from 9 p.m. to midnight.

Tickets are \$3.50 for members (\$4 for guests) and should be picked up by Monday, May 11.

Comedy Classic

The movie scheduled for Comedy Classic Night this month was going to be "International House" with W. C. Fields and Rudy Vallee. You saw it last month. The film service goofed. So on Thursday, May 14, you'll see "Mississippi" with W. C. Fields as a dirty old man, Bing Crosby as a college boy, and Joan Bennett as a teenager. That's right, "Mississippi" was originally scheduled last month.

Anyway, the evening starts with a happy hour at 7 p.m. and the film starts at 8 p.m. It's free to members.

Soul Session

Soul Sessions continue to draw capacity crowds so the Club has scheduled another one on Saturday, May 23. Same formula: Rod King and the Soul Knights play for dancing from 8:30 to 12:30 while happy hour prices are in effect all evening. It's free to members, 50 cents for guests.

Social Hours

Tonight Rex Elder makes the happy music while the southern fried chicken buffet is spread. Social hours start right after work on Friday evenings and special



prices are in effect until 9 p.m. The buffet is spread from 6 to 8 p.m. while the band plays for dancing from 6 to 9 p.m. Then the TGIF crowd moves to the main lounge for a sing-along with Pat Reich and piano until midnight. The buffet costs \$1.25 for adults, \$1 for kids.

On Friday, May 15, the Top Hats will play for dancing while the Club's famous chuckwagon roast beef is the buffet feature.

Tommy Kelly and the smiling Irishmen will play for dancing on Friday, May 22. The Mexican food buffet will be spread.

In the meantime, midweek social hours continue on Tuesday evenings from 5 to 8 p.m.

Teen Go Go

Something called "The Sight" will be wired into the bandstand tomorrow night from 7:30 to 10:30 for the monthly teenage dance. Member parents should pick up tickets (25 cents for members, 50 cents for guests) tonight.

Bridge

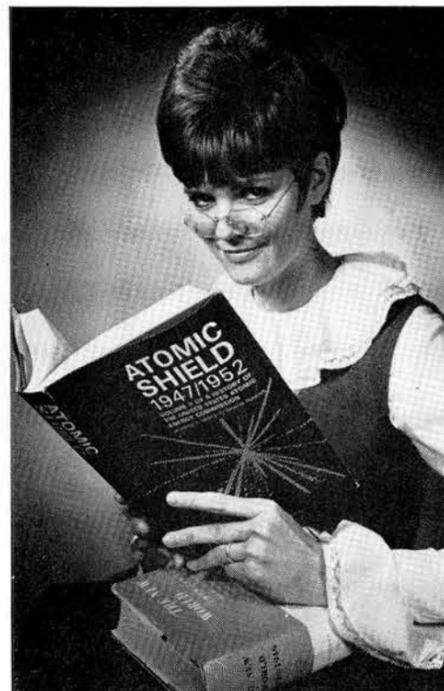
Coronado ladies bridge meets Thursday, May 21, at 1 p.m. Duplicate bridge meets Tuesdays at 7 p.m.

Sandian Writes Chapters for Landolt-Bornstein Series

The Landolt-Bornstein collection of numerical and physical data is a series of books suitable neither for browsing nor for textbook use, but the series is a "must" for any library associated with a solid-state research effort.

This important reference source, published in Germany, has come out with a new series covering crystal and solid-state physics. Robert Lefever, supervisor of Materials Research Division 5154, has contributed two chapters to Volume 4, which deals with magnetic and other properties of oxides and related compounds. This volume consists partly of updated material from the 1962 edition and partly of new material not previously available on compounds of the lanthanides and actinides.

The first Lefever chapter is "Fe Oxides and Fe-Ne-O Compounds"; the second chapter (which will appear in the near future) is "Fe²⁺-Fe³⁺ Spinels (Magnetite) and Fe²⁺-Fe³⁺ Spinels with Substitutions." Both chapters include an introductory discussion followed by data presented in the form of tables and figures.



AN AMUSING EQUATION? Mona Lisa smile by Elaine Bell (3256) appears to derive from AEC histories, "Atomic-Shield" and "The New World," now available to Sandians at discounted prices. See story for ordering information.

To: Employee Services Division 3123
Public Relations Division 8216
Re: Purchase of AEC Histories
Please order the following for me:

Number Desired

NEW WORLD (Vol. I)

ATOMIC SHIELD (Vol. II)

Boxed Set (Both Vols.)

I understand that payment based upon discounted prices listed left will be made by me upon receipt of the book(s).

Signature

(print name)

(Org.)

(telephone)