



LAB NEWS

VOL. 23, NO. 14

JULY 16, 1971

SANDIA LABORATORIES • ALBUQUERQUE NM • LIVERMORE CALIF • TONOPAH NEV

Spores Under Influence Reluctant Reproducers

A Sandia Laboratories biochemist has found that alcohol will arrest the development of bacterial spores, even when used in far smaller quantities than were previously believed to produce this effect.

While it is widely known that alcohol will kill vegetative microorganisms, presumably by breaking down their cell wall structure, it was considered relatively ineffective against spores.

Studies conducted by Ralph Trujillo (1742) showed that 100 percent de-activation of spores has been observed with the addition of only 0.003 percent octyl alcohol (octanol). The extent of spore germination is dependent upon the concentration of alcohol present in

the germinating medium. This inhibition is reversible since removal of the alcohol from the spore environment allows germination to proceed.

Main promise of this aspect of the research project conducted by Sandia's Planetary Quarantine Department for NASA is that, if one can discover why alcohol inhibits germination, it may be possible to find a chemical substitute that would kill the spore.

Along with that specific goal, the findings are particularly exciting because they could be applied to other fields.

With additional research, the phenomenon could conceivably be used for such things as



DILUTION of a bacterial spore suspension is carried out by Ralph Trujillo in Planetary Quarantine Department's laminar-flow clean room.

preserving milk for long periods of time. Milk spoils in part because of the activation of the spores it contains. Even when refrigerated, cold temperatures merely reduce the speed of spore germination. Following the normal

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THE CERTAIN SMILE that says "well, I made it" is justified for these Sandians, recipients of degrees from UNM and U. of A. Course work was completed under various Sandia educational programs. Other Sandians receiving

degrees, not pictured, are Wayne Rigby - BS, Bob Courtney - BS, Bob Dosch - PhD, Fred York - BS, Paul Bonaparte - MS, Bob Perryman - MS, Jim McCreight - BUS, Jim Gover - PhD, Bernard Kayate - BS, and Jeffrey Conn - MA.

Vista New Mexico

What's In A Name?— 'New Mexico' and the 'Jornada del Muerto'

By Ruben Cobos,
Associate Prof. of Spanish &
Southwestern Hispanic Folklore, UNM

Most New Mexicans, asked how the state got its name, would probably say "Well, Mexico was there to the south and the Spanish explorers drifting northward thought it appropriate to dub the place 'New Mexico,' just as other explorers came up with 'New England,' 'New York,' etc."

Sounds plausible, but there is one hitch. That which we now call Mexico was actually called "New Spain" (Nueva Espana) by the early Spaniards. Not until 1822 did the Republic of Mexico receive its present name, while New Mexico was already referred to as "Nueva Mexico" by the middle of the 1500's. Historians now believe that explorers in New Spain thought that if they came north from Mexico City some seven hundred leagues or so, they might find another Mexico City as large and as rich as the Mexico City of the Aztecs.

So "New Mexico" was largely born out of wishful thinking. When Coronado came north in 1540 in search of the seven cities of Cibola, the name was not then current. But by 1550, 10 years later, "Nueva Mexico" (pronounced Noo-eh-bah Meh-sheé-koh) was on the lips of explorers such as Espejo, Rodriguez, Chamuscado and others.

The naming of the *Jornada del Muerto* (Journey of the Dead Man) tends more to the romantic.

The forbidding name is given to an appropriately forbidding expanse of desert 80 miles long by 25 miles wide, lying east of the Rio Grande and extending north from present-day Hot Springs to the vicinity of San Antonio. This is the dreaded *Jornada del Muerto* whose arid, trackless reaches took the lives of many early pioneers. The story of its romantic name starts in the late 1700's with a young musician who directed the cathedral choir in Santa Fe. His name was Peter Gruber.

Peter was reputed to have the finest choir north of the city of Chihuahua, a choir that he had personally organized and trained. He and his choir practiced often, especially for Lent and Christmas, or when the Bishop or the Inquisitor was scheduled for a visit in the capital. The latter was an officer of the Inquisition, an ecclesiastical tribunal set up to ferret out heresy and not noted for any nice

regard for the rights of the accused.

It seems that young Gruber got into trouble with the Inquisitor when a female member of his choir reported him to that dread institution. The story is told that Peter had suggested to the unmarried girls in his group that they could easily find out whom they would marry by simply holding a match firmly between their teeth and concentrating on the object of their affections. Upon leaving the cathedral they would meet their future husbands!

It seems likely that the girl who turned Peter in did not get the beau of her heart's desire and decided to teach Peter a lesson.

In the investigation which followed, the choir director was accused of witchcraft. Since the Inquisitor would probably have had the young man burned at the stake, young Gruber fled south toward New Spain and friends who would protect him. Settlers along the old Camino Real east of the Sandias later testified to having seen a traveler resembling Peter heading south. They reported his asking for food and water and that he was acting strangely.

Some time later, a caravan heading north from Guadalupe de El Paso discovered the remains of a white man who had either died of thirst or had somehow been killed.

Gruber never turned up and the body that was found was never identified definitely as that of the missing choir director, but to this day that expanse of desert remains known as the *Jornada del Muerto* — the Journey of the Dead Man.

Continued from Page One

SPORES

pasteurization of milk to kill the vegetative bacteria, a small amount of alcohol could possibly be added to inhibit germination of spores.

In the Sandia studies, experiments demonstrated a direct interrelationship between the weight of the alcohol molecule and efficiency of germination inhibition. Methanol, for example, is a light-weight alcohol molecule with only one carbon atom. A two percent concentration of methanol is required for 100 percent inhibition of spore germination. However, only 0.003 percent concentration of octanol, which has a chain of eight carbon atoms, is required to obtain the same results.

The tests, which were mostly conducted with *Bacillus subtilis* var. *Niger*, followed the discovery that spores of this species would fail to germinate if they were not dried before being put in a nutritive medium. Thus, if they carried some of the alcohol in which they were stored, the spores would remain in a dormant stage even after being put in the nutritive medium.

If the ethanol was allowed to evaporate before the spores were put in the medium, germination would follow. This process of spore germination can be observed by changes in optical density of the spore as a function of time.

The research study was reported in a recent article in *Applied Microbiology*, a publication of the American Society for Microbiology.

The project is being conducted as part of the Planetary Quarantine Department's work under a contract with the Planetary Programs Division, Office of Space Science and Applications, NASA.



INVENTOR Ralph Johnson displays his newly-patented device for measuring fast neutron fluences.

Ralph Johnson Invents Fast Neutron Detector

A patent for a method and apparatus for measuring fast neutron fluence has been awarded to Ralph Johnson, supervisor of Electrical Transport Division 5134. The patent is assigned to the AEC.

The device patented is a cadmium sulphide crystalline semiconductor detector which, following bombardment with fast neutrons, changes its electrical conductivity due to radioactive decay processes. Among other things, radioisotopes are produced by the neutron bombardment. The radioisotopes decay by beta emission (i.e. emission of high energy electrons). These high energy electrons, which produce ionization within the body of the detector, change the conductivity. By relating the time following the bombardment and the rate of radioisotope decay to the changes in conductivity of the detector, the neutron fluence in terms of the total number of neutrons per square centimeter can be determined.

Detectors utilizing these phenomena are operative following exposure to the neutron environment. Thus, transient gamma radiation effects are not significant and effects associated with radiation damage can be minimized by annealing the detectors before measuring electrical charges.

The detectors are small, lightweight, and low power devices that need not be recovered following neutron exposure. In addition to this advantage, the new detector has a wider range — from 10^{11} to 10^{17} neutrons/cm² — than is available in presently used semiconductor-neutron detectors.

Ralph has been at Sandia almost six years. He earned his PhD in physics from Kansas State University in 1963 and served on active duty in the Air Force at the Air Force Weapons Laboratory, KAFB, before joining Sandia.

Congratulations

Mr. and Mrs. Fred James (9214), a daughter, Julie Kristine, April 29,

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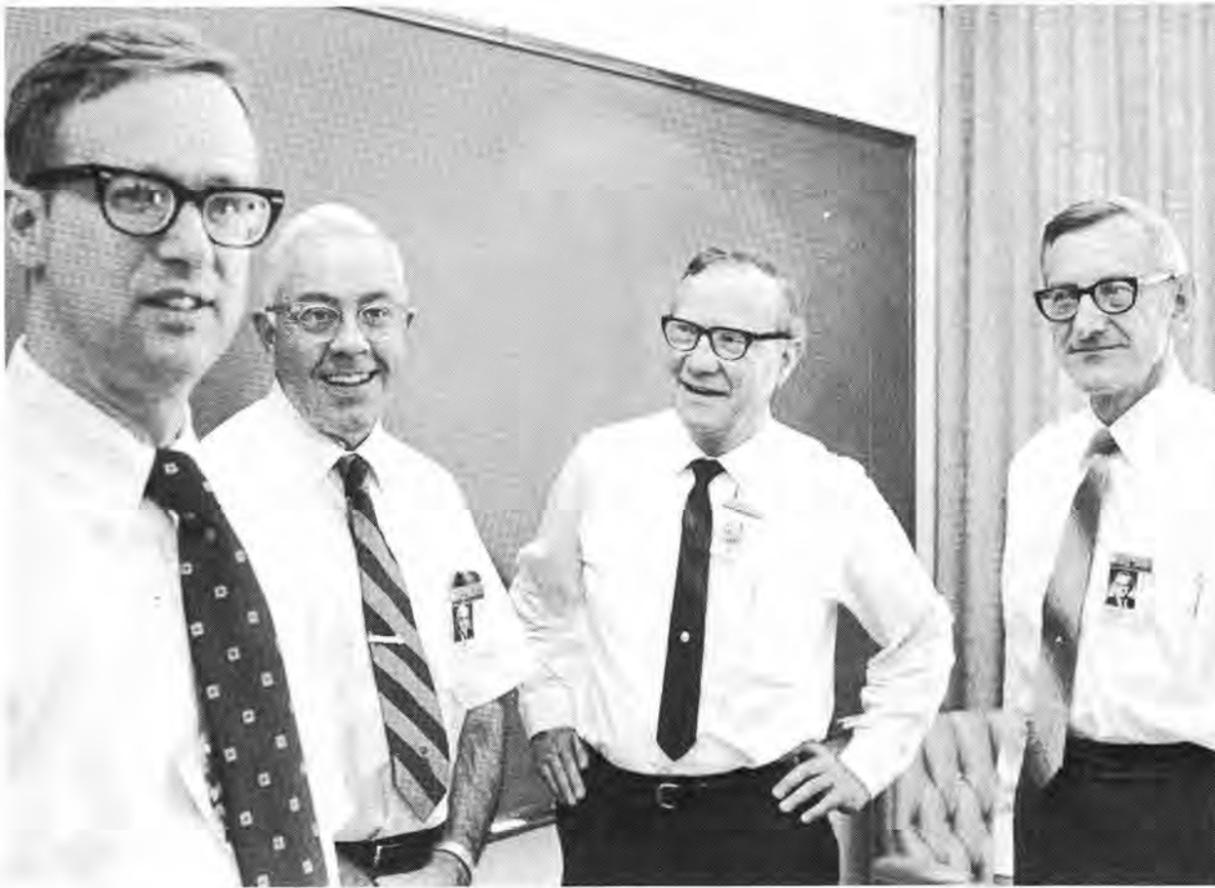
Editorial offices in Albuquerque, N.M.
Area 505 264-1053
ZIP 87115

In Livermore Area 415 455-2111

John Shunny is Editor, Don Graham, Ass't. Editor

Matt Connors & Lorena Schneider
Staff Writers in Livermore

Bill Laskar, Photographer
Norma Taylor/All The Rest



LIVERMORE VISITORS — Three recently appointed Sandia Laboratories executives visited Livermore recently for briefings on operations and technical programs: Bob Kraay, Executive Vice President (3), right; and from left, Klaus Bowers, Managing Director of Component Development (10) and Al Clogston, Vice President of Research (5000). Hilt De Selm, Director of Staff Services 8200, chats with the visitors.

LIVERMORE NEWS

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San Francisco Bay's Future SLL Colloquium Subject, July 23

The future of San Francisco Bay will be the subject of a colloquium to be held at Sandia Laboratories Livermore, Friday, July 23.

Joseph Bodovitz, executive director of the San Francisco Bay Conservation and Development Commission, will discuss plans for the Bay which have been proposed to the California legislature. The Commission was established after concern was voiced by the public over the dangers of piecemeal filling of the Bay.

Graduating from Northwestern University in 1951, Mr. Bodovitz was a Naval officer from 1952 to 1955. He received his master's degree in journalism from Columbia University in 1956, and became a reporter for the SAN FRANCISCO EXAMINER from 1956 until 1962 specializing in city and regional planning, urban renewal and local government. From 1962 to 1965, he was associate executive director of the San Francisco Planning and Urban Renewal Association and has been a member of the Development Commission since 1965.

Tickets are required for admission. M.A. Pound (8236) is host.

Sympathy

To Rodger Page (8332), on the death of his brother in the Pacific, in an aircraft mishap, June 13.

Take Note

The Mount Diablo Section of the American Institute of Aeronautics and Astronautics recently elected new officers for 1971-1972. Roger Everett (8351) will serve as chairman; Glen Otey (8157), vice chairman; Jerry Dow (LRL) secretary; and Billy Sanders (8175), treasurer.

* * * *

Hartmut Spetzler of Materials Division 8311 and Don Anderson of the Seismological Laboratory at the California Institute of Technology co-authored a technical article entitled, "Partial Melting and the Low-Velocity Zone," which appeared in a recent issue of the JOURNAL OF PHYSICS OF EARTH AND PLANETARY INTERIORS.

* * * *

Ralph Morrison (8157) and Alan Skinrod (8172) took the first place trophy with a low net score of 62 in the recent Sandia Employees Golf Club "best ball, two-man team" tournament played at Skywest Golf Course in Hayward. John Lindman and Chet Tarne (both 9125) finished second with a score of 64. In the "fewest putts" feature of the tournament, Gene Springer (8323) placed first, and Don Skinrod (8323) was closest to the pin in the hole-in-one contest.

Sandian Digs Indian Relics

But how do you know that you have an archeological find?

"I knew from the partly exposed material and its shape that the object was of archeological value," was Dan Dewhirst's reply.

"I've been exposed to looking for things such as this all my life," says Dan. "I'm inquisitive by nature. My father mined gold many years ago; my brother's hobby — and he takes it seriously — is prospecting for and assaying ore samples. Before joining Sandia, I worked with an archeologist who told me about his world-wide travel experiences in the field."

That's how Dan, a mechanical inspector in Special Machining and Support Shop Section (8271-2), made an outstanding find of a classic granite mortar and pestle scientists believe was used by the Tubatulabal Indians (Pinon People) to grind grain, seeds and tobacco. He discovered the relic while vacationing at his mobile home in Lake Isabella, Calif., some 40 miles northeast of Bakersfield. The area is known to be the site of an ancient Indian village, and students from three California colleges are excavating artifacts there under the supervision of the Fresno State College Archeology Department.

"I reported my find to archeologist Darrel Johns. As assistant project director of the excavation work, he had the mortar and pestle unearthed. The mortar was 11 inches high with a 12-inch diameter; the pestle was 15-1/2 inches long with a 2-1/2 inch diameter. After the college laboratory analyzes them, they will be displayed in a local museum."

Discussing the find with Lynne Mounday, director of the project and an anthropologist from Fresno State College, Dan learned that the area near his find was a major fishing and hunting village for a large group of Tubatulabal Indians (Shoshonean people of the upper Kern River Valley). They lived there as early as 1200 to 1400 AD. From diggings, scientists hope to determine the living patterns and economy of the Tubatulabals.



MORTAR AND PESTLE used by the Tubatulabal Indians to grind grain, seeds and tobacco rests between Dan Dewhirst (8271-2), left, and archeologist Darrell Johns. Dan's find — near Lake Isabella, Calif.—was unearthed in the area of an Indian village which existed over 500 years ago.



"EL JEFE!" Don Weldon, supervisor of Medical Administration Division 3341, was named Boss of the Year by the Sando Chapter of the American Business Women's Association. Wanda Cupp, left, and Lillian McCullar (both 3341) nominated Don. He has requested this informal reenactment of his coronation be held at least once a month during his reign just to remind everyone that he is "the Boss."



CREDIT UNION'S Becky Popp displays a copy of its new brochure. The book is full of current information and answers most of the questions you may have about the Credit Union. Copies are available at the Credit Union.

Authors

J.A. Panitz (5331), "Wide Aperture Channel Plate Electron Multipliers for Mass Spectrometer Applications," Vol. 42, No. 5, REVIEW OF SCIENTIFIC INSTRUMENTS.

P.C. Lysne (5132), "Determination of High-Pressure Equations of State by Shock-Loading Porous Specimens," Vol. 42, No. 5, JOURNAL OF APPLIED PHYSICS.

A. Narath (50) and H.T. Weaver (5154), "Nuclear Magnetic Resonance in Dilute Palladium and Platinum Alloys," Pt. II, 1971 Conference Proceedings, JOURNAL DE PHYSIQUE.

P. B. Bailey and P. J. Chen (both 1721), "On the Local and Global Behavior of Acceleration Waves," Vol. 41, No. 2, ARCHIVE FOR RATIONAL MECHANICS AND ANALYSIS.

W. R. Hoover (5314) and R. W. Hertzberg (Lehigh Univ.), "The Mechanical Response of the Ni-Ni₃Nb Eutectic Composite: Part I. Monotonic Behavior," and "The Mechanical Response of the Ni-Ni₃Nb Eutectic Composite: Part II. Cyclic Behavior," Vol. 2, No. 5, METALLURGICAL TRANSACTIONS.

J.H. Graham (7624) and R.N. Horton (5427), "Note on Determining the Measure of Coincidence of Segments of A Given Conic," Vol. 3, No. 3, COMPUTER AIDED DESIGN.

L. V. Rigby (1644), "The Nature of Work Motivation," May issue, ASQC TRANSACTIONS, 25th Annual Technical Conference.

A. R. Ducharme (5331) and H. T. Weaver (5154), "A Pseudopotential Theory for Self-Diffusion in Cubic Metals," Vol. 9, No. 11, SOLID STATE COMMUNICATIONS.

N. S. Gillis (5151) and T. R. Koehler (IBM), "Anharmonic Interactions in Aluminum. II," Vol. 3, No. 10, PHYSICAL REVIEW B.

J. E. Houston (5332) and R. L. Park (5331), "LEED from Statistical Step Models," Vol. 26, No. 1, SURFACE SCIENCE.

G. E. Laramore (5151) and C. B. Duke (Univ. of Illinois), "Quantum Field Theory of Inelastic Diffraction. I. Low Order Perturbation Theory," and "Quantum Field Theory of Inelastic Diffraction. II. Two-Step Inelastic Diffraction," Vol. 3, No. 10, PHYSICAL REVIEW B.

Take Note

Emma Hollingsworth, supervisor of Secretarial Services Division 3256, will be a seminar leader at an American Management Association sponsored meeting on "Managing the Secretarial and Stenographic Services Function." The meeting will be held in San Francisco, Aug. 11-13.

* * * *

Sandia Laboratories parents may register their 4- and 5-year-olds for the next term at the Sandia Base Kindergarten on Thursday, Aug. 5, at 8:30 a.m. The class for 4-year-olds will meet Monday through Friday from 9 to 11:30 a.m. Two classes — from 9 to 11:30 a.m. and from 1 to 3:30 p.m. — will be conducted for 5-year-olds. Registration fee is \$10 and the monthly cost is \$23. Call 256-0413 for further information.



FRANK GRAHAM, an auditor in 4121, was recently promoted to the rank of Commander in the Naval Reserve and, at about the same time, assumed command of Albuquerque's Naval Reserve Surface Division. The 185-man Division has been a consistent winner in Reserve competitions. Frank's service dates back to WW II.

Albuquerque Parks Band Seeking New Members

Dave Judd (9311) is president of the Albuquerque Parks and Recreation Band, a volunteer service group that plays for various public functions in the city, including a Fourth of July concert at the Coronado Club.

Dave and his fellow musicians — including Sandians Don Fitchhorn (7616), Jon Reuscher (5222), James Hunter (5622), Larry Posey (5226), L.D. Watkins (9424) and retirees Clyde Howard and Carl Zimmerman — play for the sheer pleasure of creating music with a compatible group.

"Most of us," Dave says, "played instruments in high school and college bands. Music became a big part of our lives and we want to continue the activity. Unless you are a professional, there are few opportunities for this. The Parks Band fills a real need."

The band is seeking additional members. No auditions are required. If you want to play and if you can make it to rehearsals, you're in. The group rehearses on Monday evenings at Wilson Junior High School. For more information call Dave at 282-3346.



MOBILE TELEVISION control room within this motor van needs only a 220 outlet to be in business. George Skinner and Hugh Taylor (both 7544) operate the video tape equipment inside the van.



TV Station on Wheels

Video Tape Proves Effective Media for Technical Information

More and more Sandians are seeing themselves on TV these days.

It's not national television but, rather, the meeting of a technical communications need at the Laboratories.

Bob Colgan, supervisor of Motion Picture and Video Services Division 7544, racked up the score at the end of fiscal year '71 and reports that the group produced 88 video tapes. The subjects were technical lectures, weapons colloquia, some classroom lectures and various briefings. The number is significant because the medium of video tape is relatively new in the Labs communication programs. Four years ago, only nine tapes were produced at Sandia.

"We have a unique capability in our mobile television control room," Bob says. "It's contained in a van that enables us to go to any location and plug in. We string cables inside a building and our two cameramen can film a speaker, a meeting, an experiment or

even tests in Coyote Canyon. The tape is recorded and edited as it's shot. Instant playback is available and, if we need to reshoot, we can do it immediately."

The tapes are compatible with equipment used by BTL, Western Electric and throughout the AEC complex and are easily carried for showing elsewhere. Duplicate tapes can also be made. And Sandia's Theatre Bldg. 815 is equipped with TV sets on which the video tapes can be shown.

Video tape has also proven useful in a couple of unique applications. Holograms (laser-beam photography) are used in some non-destructive tests at Sandia but focus is difficult in such applications. The video camera and monitor were used during the test to locate the exact plane of focus of the fringes and the image. In another application, a video tape of the dispersal of a gaseous cloud was copied frame-by-frame by still camera to gain additional data.

"Video tape is less expensive than standard motion picture production," Colgan says, "and is rapidly produced. It has proved to be an efficient and effective way to record, store and show technical information."

Inter-Tribal Indian Ceremonial Marks 50th

Lots of New Mexicans put off going to the Inter-Tribal Indian Ceremonial in Gallup, figuring they can always go next year. But this year has special significance for the Ceremonial. Founded in 1922 in Gallup when the town was an isolated village near the Navajo and Zuni reservations, the unique Ceremonial Association completes a half century of existence with its 1971 exposition Aug. 12 through 15.

The 50th anniversary is made more significant, as it marks the final exposition to be held on the grounds where it originated. The area is about to be overrun by Interstate 40 highway.

Daily parades, rodeos, and dances are chief features of the Ceremonial. Indian rodeos bear about as much resemblance to the show biz rodeos more commonly seen as straight bourbon does to Koolaid. If you haven't been to a Ceremonial yet — make this your year to go.

Events Calendar

July 18 — Cienaga Canyon Trail, N.M. Mountain Club. Leader: Mary Day, 296-7643.

July 20 — "Geology of the Sandia Mountains." July 27, "Human History of the Sandia Mountains." Forest Service Natural History Lecture, UNM Anthropology Hall, 7 p.m.

July 23 and 28 — "La Grande-Duchesse de Gerolstein," July 24 - "The Magic Flute," July 30 - "The Marriage of Figaro," Santa Fe Opera.

July 25-26 — Corn Dances, Taos and Acoma Pueblos.

July 26 — Laguna Pueblo harvest dances and fiesta, Seama, N.M.; Santa Ana Pueblo annual fiesta.

July 31 — Cole Spring Trail, N.M. Mountain Club. Leader Frank Horvath, 344-1197.

July 31 - Aug. 1 — Pecos Lakes Clean-Up — Backpack, N.M. Mountain Club. Leader: Don Mattox, 296-4149. Reservations, deposit and details by July 23.

Recreation Notes

FUN & GAMES

The Sandia Labs Flag Football Association is in the process of forming teams for the 1971 season. Anyone interested in participating should contact Eric Jones (5214), tel. 264-8752.

* * * *

The New Mexico District 5 Little League baseball tournament, with competition from 15 little leagues in the Albuquerque area, will begin July 19 at the Mile High Little League fields, Juan Tabo and Lomas. A game is scheduled every night beginning at 7 p.m. except Sundays, and Friday, July 30. The championship game will be played on July 31, with the winning team going to Farmington for the State Tournament.

—Norma

We've Been Longing For This Confrontation

All you humans out there will take heart from this incident, related in a Bell System newsletter.

A corporation computer was programmed to report its own malfunctioning to a serviceman. The equipment went on the blink one night and called the serviceman's home phone number, as planned. What was not planned, however, was that the serviceman had moved.

The telephone company's computer responded with a recorded message saying the phone had been disconnected. The corporation computer broke the circuit and redialed the disconnected number. The telephone replied again with the recorded message. The contest of mechanical persistence continued throughout the night until business hours the next day when some kind human gently but firmly shut the thing down.



AMIGO Stephani Graham, daughter of Bob Graham (5132), administered oral vaccine in Honduras last summer. Dee Chavez (4154), in photo at right, helps her daughter Patti pack for her trip to Guatamala. Amigos de las Americas is a private program under which American teenagers give medical help to people of Central America.

Journey to Central America

Teenagers Find Rewarding Work in 'Amigos'

Almost 2000 miles from home, an Albuquerque teenage girl amputates the gangrenous finger of a small child in a Columbian jungle. She is the sole medically trained person around. Another Albuquerque girl, in similar circumstances in another Columbian village, helps the local tailor sew up a villager's gaping machete wound.

The youngsters were in Central America participating in a private program called Amigos de las Americas. They were part of a group of 24 from Albuquerque (351 nationally) who spent three weeks in remote villages of several Central American countries inoculating natives with standard vaccines.

The teenagers train all winter, several evenings a week, including emergency ward duty at local hospitals, preparing for the three weeks of intensive activity in a foreign country.

Currently 29 Albuquerque Amigos are in Central America or have just returned. Included are the teenage offspring of Lloyd Nelson (5324), Dee Chavez (4154), J. M. McKenzie (1933) and Si Upson (AEC).

Other Sandians are active in the program. Frank Bell (3234) and Bob Graham (5132) are both vice chairmen in the local Amigos organization and Frank is a national trustee. Edward Gallegos (4141) is treasurer. Members of the board include Frank Hudson (100), Tom Zudick (7545) and Si Upson (AEC).

For the youngsters participating in the



program, it is a significant experience. Through the weeks of study (Spanish as well as basic first aid), the teenagers get a thorough introduction to medicine and the associated concept of service. Work in the emergency rooms is enlightening but also a little bit frightening. Life and death suddenly become for real.

The work in the villages seems endless. One boy administered more than 1300 inoculations in two days. Conditions are usually primitive. The teenager has tremendous responsibilities, although he works with local government and medical people — if any exist. Then there is the complete *differentness* of the situation — the young person experiences cultural shock.

The program is entirely privately financed. The participant pays \$175. The rest of the \$500 cost of transportation and medicines is raised through community contributions.

Purpose of the program, according to Bob Graham whose daughter Stephani participated in the program for two years is, simply, to help the people of Central America and, at the same time, garner an unusual and educational experience.

"A teenager is rarely called upon to do real work in the true sense," Bob says. "Being an Amigo is an opportunity to help people in need and is vastly rewarding."

The New Breed: Pickers, Pullers & Shootout Men

The Bell System reports progress in the battle with coin phone thieves — "for the time being, at least." And their security people have developed a nomenclature for categories of thieves — "pickers," "pullers," and "shootout men." Right now the most frustrated coin thief is the picker — short for lock picker.

A well-practiced picker could open an old-style telephone lock in seconds. But new locks stop all but the most skilled picker, and these new locks are being further modified in the continuing effort to reduce losses.

The puller lacks the finesse of the picker. He uses a homemade device to yank the coin box door open. So the phone companies are installing stronger stuff in their coin boxes.

Shootout men fire soft-nosed bullets into coin phone locks.

The modus operandi of one other villainous type, not yet named, is characterized by a certain brutal elegance. He (or she) simply backs a truck up to the booth, connects a logging chain to phone and to truck, puts the truck in gear, and . . . well you know the rest. Of this breed, the Bell System reports merely that ". . . their tactics are the most difficult to deter."

Speakers

H.D. Sivinski (1740) and M.C. Reynolds (1742), "Synergistic Characteristics of Thermoradiation Sterilization," Planetary Meeting, June 17-July 2, Seattle, Wash.

D.P. Aeschliman (9342), "Heavy Particle Temperature and Velocity and Electron Density Measurements in a Supersonic, Arc-Heated Argon Flow," AIAA Fluid & Plasma Dynamics Conference, June 21-23, Palo Alto, Calif.

R.P. Reed (9116), "High Resolution Thermometry in the Biological Context — A Survey of Problems and Techniques," and "The Transient Thermal Response of Embedded Temperature Sensors of Various Configurations"; R.B. Foster, Jr. (7451), "A Procedure for Comparison Calibration of Platinum 10% Rhodium Versus Platinum Thermocouples," and "A Fixed Point Calibration Procedure for Precision Platinum Resistance Thermometers," Symposium on Temperature, June 21-24, Washington, D.C.

B.L. Butler, J.C. Tidmore (both 5313) and S.F. Duliere (5522), "X-Ray Analysis of Carbon Fiber-Pyroc Carbon Matrix Composites" and "The Relation Between Thermal Expansion and Preferred Orientation of Carbon Fibers"; Butler and Tidmore, "The Micromechanics of Modmore II Pyroc Carbon Composites"; H.M. Stoller (5310), J.L. Irwin (1225), G.F. Wright (9328), B. Granoff (5313) and J.H. Gieske (7362), "Properties of Flight-Tested CVD/Felt and CVD/FW Composites"; C.G. Murphy (7362), "Thermal Expansion Interferometry of Graphitized Filament Wound Cylinders"; and H.W. Schmitt (1225), "Carbon/Carbon Composites for Reentry Protection Systems"; L.S. Nelson (5324), "The Formation of Chaoite (White Carbon) on Various Solid Carbons with a Carbon Dioxide Laser," Conference on Carbon, Lehigh University, June 27-July 2, Bethlehem, Pa.

G.L. McVay (5154), "Pitfalls in Multi-Diffusion Coefficient Measurements," Gordon Conference on Ionic Transport Phenomena in Glass, Wayland Academy, June 27-July 2, Beaverdam, Wis.

W.D. Smith (5153) and S.G. Varnado (7211), "Use of Ferroelectric Ceramics for Electronic Frequency Selection in Dye Lasers"; C.E. Barnes (5112), "The Effect of Neutron Damage on the Electro-Luminescence Spectrum of Epitaxial GaAs Laser Diodes at 76°K"; E.P. EerNisse (5112), "Simultaneous Thin Film Stress and Mass Change Measurements Using Quartz Resonators," IEEE Device Research Conference, June 28-July 1, Ann Arbor, Mich.

Service Awards

July 16-29

25 Years

G. C. Hollowwa (7412), Ernest Arterburn (7143) and Walt Rosenberg (7630).

20 Years

Robert Summers (1813), Donald Coleman (3313), Robert Dawirs (9310), Clayton Erickson (9232), Tom Strome (1611), Nelson Weidman (7143), Jack Williams (9225), George Reis (5625), Marrian Salomon (1415), Elden Van Vickle (4511), John Souza (1226), Ellen Wood (4137), Mel McCutchan (3235), Arthur Becker (7132), Ben Fisher (8184), Raymond Humes (3520), Albert Martin (4542), Hermenes Chavez (4623) and Robert Evans (7433).

15 Years

Crissie Sanders (1922), William Brion (1812), Amos Alire (4513), Byron Hock (9483), Roy Lanes (9483), Austin Glover (7422), Roy Hanson (7434), Richard Case (9482), William Whitney (9125), Hermann Wente (5624), Ted Payne (8256), Howard Singleton (1514), Paul Souder (1532), Donald Robie (1333), Frank Taylor (7544), Phil Moya (7112), Douglas Bruce (5623), Harry Pike (1831), L. M. Milesosky (9482), Howard Perdue (9133) and Adela Cooke (3148).

10 Years

Donald Gould (1921), Bernie Vallejos (7545), Dorsey Bishop (9461), Lois Wade (7412), Gene Jeys (7652), William Parsons (4117) and Rodger Page (8332).

Sympathy

To Urbano Salas (4515) for the death of his sister on June 16.

To Luciano Molina (4515) for the death of his brother on June 20.

Let's See — 3 x 10¹² x 10¢ . . .

How many things in everyday life can you think of that amount to three trillion (3,000,000,000,000)? No, that's not the number of red lights you hit when you're late to work. But someone in the Bell System has calculated that since A.G.B. first uttered some words into his curious invention on June 2, 1875, the System network has handled an average of 1000 calls a second. As of the end of 1969, that brings the total number of calls to three trillion. And if that isn't a useful bit of information, well . . .

Hap Kindschi Severely Injured

A grinding auto accident near Cuba on July 2 caused injuries to three Sandians, one of them only two days following his retirement. The three are Fonzo Cossell (4512) and Ormand Williams (7152), both now released from hospital treatment, and Hap Kindschi, a former Motor Pool chauffeur familiar to many within the Labs. At this writing Hap is under intensive care in St. Joseph's Hospital. No visitors, but cards would be appropriate. The three men were on a fishing trip when the accident occurred.



LOUIS FLORES, a staff assistant in Devices Testing Division 9343, plays a wild organ with the Bourguet Brothers on weekends. The group has just recorded some of their favorite numbers, and Louis is shown here with the album. Contact him if you would like a copy.

• 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.

MISCELLANEOUS

PEK-A-POO pups, ready for homes July 15, \$25. Cover, 268-0921.
HOME movie outfit w/sound, 8mm Fairchild camera & projector w/accessories. Miller, 298-2659.
24" GIRL'S Schwinn bicycle, \$20; boy's Sear's Spyder bicycle, \$25; 16" bicycle needs chain, \$5. Goen, 268-7521.
AQHA REG. gelding; unreg. mare, gentle; both show animals. Grisom, Box 430, Moriarity, 832-4384.
PAIR heavy duty camper jacks. Newton, 255-2074.
MAPLE furniture: 2 beds, dining room suite w/6 chairs; hutch w/top shelves; other furniture items. Lewis, 299-7217.
'69 90cc KAWASAKI, \$175. Jeys, 299-4197.
2 REG. Black Angus bulls, 12 mos. old, tested. Shoemaker, 1-865-9809, Peralta.
'70 SUZUKI 120CAT trail bike, 4000 miles, make offer. Swier, 268-5703.
BOY'S back pack, welded alum. frame, canvas pack has 3 zippered pockets, pack usable separately, padded straps, \$11. Moore, 299-3758.
'68 120cc SUZUKI motorcycle, 1800 miles, \$150. Houghton, 1413 Guaymas Pl. NE, 299-3386.
N. GUAGE trains & buildings, 1 passenger & 1 freight train, 2 power packs, elec. switches, houses, factories, plenty of track, panel board, \$70. Newlin, 256-1605.
'71 KAWASAKI Mach III, customized, \$950. Shaffer, 242-6507.

'69 YAMAHA 175 Enduro; VW trailer hitch; VW bus rear window. King, 282-3186.

CABINET GRAND PIANO, \$175; Heathkit FM tuner, \$15; Heathkit stereo amplifier, \$25; Jensen speaker, \$25; sturdy baby things. Powell, 299-8877.

ALL STEEL pogo stick, will bounce 200-lb. man, \$4; 3-spd. record player, \$6. Guttman, 299-7031.

NEW, original accessories: S&W 9mm model 39, \$120, extra clip; .41 Mag. Model 57, 4" barrel, \$180. Snodgrass, 268-8820.

BOY'S 5-spd. Screamer bicycle, 20" rear, 16" front wheel, \$45. Hart, 256-2811.

WROUGHT IRON tool as featured in July '71 issue of POPULAR MECHANICS, tool \$79.95 plus \$20 worth of stock all for \$70. James, 255-8429.

'69 SUZUKI AS-100 cycle, geared down for trail, \$200; York B-flat trombone w/case & music stand, \$85. Folkins, 1-867-2825.

TRAVEL TRAILER, 17 1/2', self-contained w/refrig., shower, toilet, wall heater, fully insulated, sleeps 6, \$1800. Stirbis, 299-5363.

TWIN BED w/white headboard, \$20; girl's 26" bike, \$15; Mossrite 12-string solid-body guitar w/case; doll & crib. Swiss, 265-5346.

NEW 34" x 76 1/2" carved door, \$60; drafting table, 36" x 60" w/parallel, \$40. Norris, 255-0118.

MINI-BIKE, Rupp roadster, 4hp, torque converter, lights, \$175; Ducati minibike, \$100; spyder bicycle, 5-spd., \$50. Oberst, 299-1224.

DOUBLE BED, \$20; 4-dwr. chest w/mirror, \$10; 2 bedside tables, \$5 ea.; all antique white finish. Beard, 298-9441.

'70 YAMAHA 175cc Enduro dirt bike, w/accessories, 2800 miles, \$525. Kaiser, 296-5215.

16' x 54' HOUSEBOAT, screened porch, fireplace, carpeted deck, monomatic, 12V system, furnished, many extras, moored at Conchos

Lake, \$6700. Foster, 294-0379 or 298-9193.

TWO 14" VW wheels w/new 7.00-14 recap tires, \$24. Campbell, 268-8445.

UNUSED factory full capped retread tires, size 9.00-15, \$10 ea. Saavedra, 256-0333.

ELECTRONIC TREASURES: high voltage power supplies, receivers, teleorders & misc. equip., see and make offer. Wilson, 898-2371.

POODLE PUPPIES, AKC reg. Johnson, 298-7356.

SEAR'S 7' pool table, \$50; slot car track. Field, 345-1470.

FOOTBALL SHOES, YAFL approved, sizes 3 1/2 & 5, McGregor & Puma, \$5/pr. Martin, 299-6768.

KENMORE auto. washer & gas dryer, matched set, \$100 takes both. Hostetler, 256-3803.

FREE KITTENS for good home, 13 wks. old, mixed-breed, 2 males, 1 female, black and white. Moss, 265-5248.

TAPE RECORDER, port. in attache case, AVC 3 sources, many accessories, 1 yr. old. Crain, 299-1509.

HONDA 154cc, '63, \$150. Weber, 256-2998 after 5.

SUNFISH SAILBOAT w/car-top carrier, \$100; 23" Airline B&W TV, \$25. Thompson, 268-6026 after 5.

CAMPER-trailer awning, canvas, 9x9, \$25. Johnson, 255-5427.

TIRES, will fit 50cc to 100cc motorcycles, tubes, rims, spokes included, \$10. Phelps, 344-0441.

REAL ESTATE

1/2 ACRE Mountain property, fronts on private lake, backs up to National Forest, 2 hrs. from Albuquerque, O'Boyle, 256-1566.

3-BDR. HOUSE, pueblo modern on lg. wooded lot in valley, den w/fp, hw/floors, drapes, carpeting, etc. Hey, 243-7137.

3-BDR., corner lot, dbl. garage, pitched roof, refrig. AC, Collett

Park, Jackson, Manzano schools, city bus. Barth, 299-2668.

CAR & TRUCKS

'63 RAMBLER American, low mileage, OD, \$295. Roache, 268-4686.

'64 FORD XL 4-dr. HT, bucket seats, console hydromatic, AC, PS. Steele, 877-1225 after 5:30.

OLDER CAR, needs brakes. Shafer, 898-0132.

'65 SAAB sedan, 96-S, 3-cyl., no oil mixing, disk brakes, Michelins, \$510. Stark, 296-4971.

'63 VW sedan, AM-FM radio, 51,000 miles, \$600; enclosed luggage carrier for VW, \$25. Wente, 299-5274.

'65 FORD Falcon std. six, 50,000 miles, R&H, \$650. Stake, 299-9113.

'65 CHEVY El Camino, 6-cyl., 3-spd., R&H, \$700. Campbell, 268-8445.

'64 MERCURY station wagon, 9-passenger, \$695, AC, PS, PB, 390 engine, AT, R&H, luggage rack, power rear window. Dennis, 298-1323.

'63 1/2-TON GMC pickup. Chavez, 243-2525.

'70 MAVRICK, 12,300 miles, AT. Meekins, 298-6681.

'64 PONTIAC Catalina station wagon, one owner, heavy duty suspension, locking differential, radio, stick shift, retail book \$600, \$450. Taylor, 265-9387.

'57 CHEV. station wagon, 6-cyl., \$150. Mayhew, 296-2100 after 5.

'66 TRIUMPH Spitfire, red w/new white convert. top, has OD, \$900. Stanley, 296-7623.

'64 CORVAIR MONZA, 4-dr., R&H, rebuilt AT & carbs, 38,000 miles, \$325. Veneruso, 268-9283.

WANTED

SCHAUM'S outline series math books, willing to pay half price. Thompson, 268-6026.

WOMAN'S 5-spd. bicycle; pool table. Kepler, 298-5652.

ALTO SAXOPHONE. Wilson, 282-3225.

BOY'S 3-spd. Spyder bicycle, 20" wheels. Hollowwa, 255-6938.

WOODEN MEAT BLOCK not over 24" wide. Magnani, 299-8693.

7-QT. PRESSURE Canner, pt., qt. mason jars, 4-qt. hand-crank ice cream freezer; chain saw. Aeschliman, 298-7846.

BICYCLE, need 5- or 10-spd. in good condition for teenager, pay to \$100 if equipped. Tietz, 299-2763.

WORK WANTED

CHRIS, teenage boy, Morningside & Marquette area, lawns and odd jobs. Hollowwa, 255-6938.

KAY, age 15, NW Valley, would like baby sitting. Johnson, 247-8634.

UNM music major available to provide piano lessons at his home, \$4/hr. O'Neill, 255-6355.

GEOLOGY graduate needs 6 weeks work, land surveying, mineral identification or exploration, general construction, etc., Don Adams, 256-7265.

VACATION CARE for your yard and pets, call Miller, Field & Hancock, 344-1019 or 345-1470.

MARCELLA, age 22, full time or vacation baby sitting, lt. house-keeping, tutoring, references. Levine, 255-7601.

LOST AND FOUND

LOST — Rx glasses w/black frames in brown case, 2 ladies' turquoise rings, woman's black frame glasses in case lost near Coronado Club. LOST AND FOUND, tel. 264-2757, Bldg. 832.

FOUND — Rx sun glasses w/Jones Opticians case, Rx glasses w/brown frames, tan sun glass case, pierced diamond-set heart-shaped silver earring. LOST AND FOUND, tel. 264-2757, Bldg. 832.

Stage Show and Movie Tomorrow

Locally, Ron and Mary Kay Day are celebrities to the kids. Through their many appearances at schools, fairs and on television the Day's puppets such as Big Red or Dracula have their own fans. Ron and Mary Kay have prepared a great new show for tomorrow night's appearance at the Coronado Club.

Yolanda Adent, clever girl who conducts the Friday night sing-alongs in the main lounge, will also entertain at tomorrow night's show. Yolanda, assisted by her own youngsters, will conduct a sing-along for the kids (and parents too.)

The movie will be a Laurel and Hardy classic called "Below Zero." Stan and Ollie play a couple of down-and-out musicians who blunder into some hilarious situations. And a couple of chapters of the Creeping Phantom serial will be shown also.

The fun starts about 7 p.m. Happy hour prices will be in effect and super sandwiches will be available. Admission is free to members and families.

* * * *

TONIGHT the Club's famous chuckwagon roast beef will be the Happy Hour buffet feature while Frank Chewiwie holds the bandstand. The TGIF crowd gathers right after work on Fridays and enjoys special prices 'til 9 p.m. A lot of the troops are meeting their families in the twin pool patio area at 5 p.m. and enjoying the long summer evenings. It's ok to take plastic glasses and buffet trays outside.

* * * *

SOMETHING SPECIAL in the way of a Happy Hour is scheduled next Friday, July 23. The 20-voice Fiesta Singers will present a variety show starting at 8 p.m. It will include choral numbers, solos, dances and entertainment in conjunction with the band, the Top Hats. Special prices will be in effect

from 5 until 10 p.m. The southern fried chicken buffet will be spread from 6 to 8 p.m. and the band will play for dancing from 6 to 10 p.m. with time out for the show. It should be a good evening.

* * * *

SOMETHING DIFFERENT in the way of dance music is planned for Friday, July 30. The Country Express will be wired into the bandstand to play a lot of sagebrush shuffle music. All you westerners take note. This is a good group. Baked ham will be the buffet feature.

* * * *

SOMETHING ELSE is the way some people describe comic Jeffrey Eden. This clown appeared at the Club last year and broke up the troops with his fast moving audience participation show. His beautiful assistants also move fast. Eden will entertain at the Soul Session Saturday, July 31. Freeman Lacey and the Mark IV will be on the bandstand. The event is scheduled from 8:30 to 12:30 and admission is free to members. Happy Hour prices will prevail.

* * * *

BOWLING for the Coronado Club mixed league will be held on Monday nights at 6:30 p.m. at San Mateo Lanes for the 1971-72 season. Anyone wishing to join the group should contact Yale Knox (3155), president, ext. 3602; or Jim Courtin (7415), secretary, ext. 5340.

* * * *

ANNUAL MEETING of the Coronado Club membership is scheduled Monday, Aug. 2, at 8 p.m. The nominating committee, headed by Jake Gonzales (7143), has submitted the names of Chet Fornero (4337), Dick Coughenour (4115), and Pete Gallegos (1333) as candidates for reelection to the board of directors and those of Shirley Dean (50), John Wheeler (3251) and John Malmstrom (AEC) as candidates. In addition to election of board members, the meeting will include presentation of annual reports. Free refreshments will be served at the close of business.



MARIA TIXIER (3256)

DON'T BE A BONEHEAD DRIVE SAFELY



Mazatlan Trip Firm; Coronado Club Announces Other Travel Plans

Registration opens today for two trips in the Coronado Club travel program, according to Chet Fornero (4337), Club travel director.

The first one is a charter bus trip to Lubbock, Tex., Sept. 17 - 19 to attend the Lobo-Texas Tech football game. The \$49.50 cost includes transportation, ticket to the game, cocktail parties and two nights at the Ramada Inn in Lubbock. For single room occupancy, the cost is \$59 per person. A \$25 deposit at the Club office will hold reservations until Sept. 1, when total payment is due. Guests of Coronado Club members may make this trip.

Mazatlan, a repeat trip by popular request, is the destination of Coronado Club travelers Oct. 2 - 9. The \$198.50 cost includes the works, Chet says, everything but lunches.

The group will stay at the luxurious Playa Mazatlan Hotel with its two dining rooms, private beach, swimming pool, lounges and ballroom. Two special events — a cocktail party and a Fiesta night — are included in the

package. The cost for singles is \$211. Price of the package is based on 95 persons making the trip. A \$50 per person deposit will hold reservations. Balance of the fee is due Sept. 1. Only Coronado Club members and their immediate family are eligible.

Chet reports that he is working on several other tours and would like those interested to write to him with suggestions and include the number of potential travelers.

Under consideration is a trip to Portugal-Morocco-Spain tentatively planned for October 1971 or June 1972. This 15-day trip would include transportation, hotels and, for the most part, two meals per day. Cost is estimated at \$700 per person based on a group of 15 or more persons.

Another possible trip is a charter flight (170 persons) to Rome for one week and London for another week in January 1972. Some tours would be included as well as all hotels and some meals. Estimated cost is \$550 per person.