

# Cerampic to star in seminar next week

The Cerampic — a new kind of ceramic imaging device — will be discussed at a seminar April 5 at Sandia Laboratories when invited representatives of government and military agencies and industrial firms meet to get a firsthand look at the new development.

The Cerampic is a thin, round, translucent disk of ceramic material about 1 1/2 inches in diameter. A standard photographic negative can be placed against the Cerampic, a voltage applied to the device, and a positive image of the negative projected onto a screen. The image will remain within the Cerampic until it is electrically "erased."

It is this memory characteristic of the Cerampic which is its most important feature, according to Willis Smith and Cecil Land (both 5113), developers of the Cerampic. Possible applications include compact computer and facsimile image display devices, photo reproduction process equipment, and a device which would provide a means for verification of documents between distant points.

The concept of picture transmission using a radio channel has been the subject of much discussion by communications specialists. Television is relatively expensive and requires high-frequency waves which, because they travel in straight lines, need relay stations to compensate for the curvature of the earth. Other techniques, developed especially for sending documents and still photos, are either slow or lack high resolution.

The Cerampic has unique features which could eliminate these problems, according to the Sandia scientists. The Cerampic has high resolution (up to 40 line-pairs per millimeter) and it can be used to store, transmit and receive images over a variety of telephone and narrow band AM or FM channels.

The WALL STREET JOURNAL, which reported the original Sandia development, called attention to the Cerampic as a "promising" substitute for existing techniques of transmitting photographs and printed matter by facsimile or "wirephoto." The device will make possible large-screen wall displays of photographs, documents, or computer graphics. The Cerampic has the advantage of memory in that the image remains on the material as long as desired and does not have to be repeatedly "refreshed" as does the television type of computer display screen.

Technical description of the device is available in the Feb. 15 issue of APPLIED PHYSICS LETTERS and the March issue of ELECTRO-OPTICAL SYSTEMS DESIGN. In addition the American Physical Society has recognized the potential of the device in a recent special press release.

Jay Snelling has built a portable display unit which Willis and Cecil are using to demonstrate the device to Sandia development organizations. "The Cerampic offers many advantages in electro-optical systems," Cecil says, "or in applications where electrical control is needed for an optical storage or display device." •dg



IT WAS ten years ago that this group listened attentively as then President Schwartz talked about Sandia with visitors Senator Anderson, AEC Chairman Seaborg, and President Kennedy. The Senator remains close to the nuclear weapons program and Saturday next, the 8th of April, is being observed as Senator Anderson Day. Focal point of observance will be at Los Alamos where a parade and other events are planned. The public is invited.

## LAB NEWS

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MARCH 30, 1972

SANDIA LABORATORIES • ALBUQUERQUE NM • LIVERMORE CALIF. • TONOPAH NEV



PORTABLE DISPLAY UNIT for the Cerampic invention is demonstrated by (l to r) Cecil Land, Jay Snelling and Willis Smith (all 5113). Model is Esther Perea (1410).

# Afterthoughts

Writing, The Great Clarifier--One sad aspect of the ascendancy of visual media such as TV may be found in the decline of the skill of writing. I don't mean high-flown literary writing--just simple exposition. Most high school and college students are barely literate, and this is too bad. Because an unappreciated virtue of writing is that in the act of putting words on paper you are induced to think about what you really do think about the subject. Unlike spoken discourse, which tends to ramble, writing imposes economy--you're more likely to focus on the essential and to skip the extraneous. In short, writing clarifies, and clarity is surely the soul of intelligent expression.

\* \* \*

Something To Think About--"A man is not idle because he is absorbed in thought. There is a visible labor and there is an invisible labor." Victor Hugo

\* \* \*

Coming Up--In LAB NEWS, next month, a big and somewhat ingenious push to get you into a car pool (or maybe ride a bike). We've got to do something about our worsening smog. None of us moved to Albuquerque to escape blue skies and sunshine. But every time we drive our cars we're fouling our own nest--so put yourself in a responsive frame of mind, ok? •js

# Speakers

B.L. Gregory (1933), "Design and Analysis of Semiconductor Devices and Integrated Circuits." Lectures at UCLA and UC Berkeley, Jan.-Feb. 1972.

E.P. EerNisse (5112), "Ion Implantation -- A Variety of Uses," Seminar at the Univ. of Colorado, March 6, Boulder.

R.C. Beckmann (1221) and R.D. Andreas (1222), "Feasibility of an IRCM System Utilizing a Radar Missile Approach Detector and Flare Decoy," IRIS Symposium on Infrared Countermeasures, March 20-21, Naval Missile Center, Point Mugu, Calif.

R.L. Park (5331) and J.E. Houston (5332), "L-Shell, Soft-X-Ray Appearance Potential Spectra of the 3d Transition Metals"; A.R. DuCharme (5331) and R.L. Gerlach (5332), "Total Cross Sections for K and L Shell Ionization of Surface Atoms"; G.E. Laramore (5151), "Determination of the Geometrical Structures of Adsorbed Monolayers from Energy Averaged LEED Intensity Profiles"; S.T. Picraux (5111), "Backscattering and Microprobe Studies of Sn:GaAs Interfaces"; R.G. Musket (8313) and W. Bauer (8334), "Determination of Oxygen Surface Densities from Proton-Induced X-Rays," 32nd Annual Conference on Physical Electronics, March 20-22, Albuquerque.

N.J. Magnani (5531), "The Effects of the Environment on the Cracking Behavior of Selected Uranium Alloys," 1972 NACE Technical Program on Corrosion/72, March 20-24, St. Louis, Mo.

G.J. Kominiak and D.M. Mattox (both 5332), "Properties of rf Sputter-Deposited Glass Films"; D.H. Loescher, W.H. Leighton and C.T. Fuller (all 5153), "A Shutter System for Control of Evaporation Rate"; R.E. Cuthrell and D.W. Tipping (both 5331), "The Effect of Stearic Acid on the Electrical Conductance of Gold Contacts"; R.O. Woods (9226), "Vacuum Measurements from a Moving Vehicle; A High-Altitude Atmospheric Densitometer," 8th Annual Symposium of the N.M. Chapter of the American Vacuum Society, March 23-24, Albuquerque.

## Events Calendar

**April 1** — Spring Corn Dances, various Pueblos; dances usually cover three days.

**April 2** — N.M. Mt. Club, South Peak of Sandias, meet at Blue Cross Bldg., 8 a.m.

**April 5-9** — "The King and I," Albuquerque Civic Light Opera, Popejoy Hall, 8:15 p.m.

**April 8** — N.M. Mt. Club, Jemez Red Rocks, Gulf Mart, 8:30 a.m.

**April 10** — "Ballet Folklorica Mexicana," Popejoy Hall, 8:15 p.m.

**April 12** — UNM Orchestra and Chorus in Concert, Popejoy Hall, 8:15 p.m.

**April 13** — ASUNM Lecture Series: Adele Davis, Student Union Ballroom, 8 p.m.

## Credit Union Reporter

By Bill Bristol, General Manager

### Home Improvements

Now is the time of year that many of us begin thinking about remodeling the house, and the first question that most of us must consider is, "How do I pay for it?" If you can pay cash, fine. This is still the best route to take. You avoid interest and keep your debts down. But, if you can't pay cash, then your Credit Union can help.

For smaller jobs involving several hundred dollars, unsecured loans can usually be arranged. For larger projects the Credit Union offers FHA Title I property improvement loans. Under Title I you can borrow up to \$5000 on an individual home. Maximum term of such a loan is five years at the Annual Percentage Rate of 8.4 percent. You can use Title I loans for most improvements, be they do-it-yourself or done under contract. The loans can even cover dishwashers, refrigerators, freezers and stoves if they are built in and not free standing. Title I Regulations have recently been changed making carpeting an eligible improvement in most cases.

Another feature of the Title I loan is that you seldom need any security other than your signature on the note. All in all if the improvements you plan to make are eligible under Title I and amount to \$5000 or less, this type of loan is by far the cheapest way to go. A word of caution: contrary to what you may have heard, all Title I rates are *not* the same. Only the maximum rate is fixed by the federal government, and this ranges from 8.8 percent to 10.6 percent depending on the amount and term of the loan. If you plan to work through a contractor or dealer and he offers to arrange financing for you, check the rate. We have every reason to believe your Credit Union has the lowest Title I rate in the nation.

If the improvements you plan to make are



not eligible under the Title I program, or if they exceed \$5000 the Credit Union can probably arrange a second mortgage loan for you at the Annual Percentage Rate of 9.6 percent. These loans cover just about anything you want to do in the way of improvements. However, they are restricted to owner-occupied residential property. The maximum term again is five years, and the combined total of first and second mortgages may not exceed 75 percent of the appraised value of the property after the improvements.

In any event, we feel the Credit Union has the answer to that first question, "How do I pay for it?", and we welcome the opportunity to discuss your improvement plans with you. Give us a call, or stop by the office to see one of our loan interviewers anytime between 8 and 2.

\* \* \*

### A Reminder

In the March 3 issue of LAB NEWS we announced that beginning with the first quarter of 1972, dividends would be credited at the close of business on the last day of the dividend period. Statements covering the first quarter will be sent out within the next two weeks and will show two dividend credits: one on Jan. 1, covering the last quarter of 1971; and one on March 31, covering the first quarter of 1972.

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### SANDIA LABORATORIES

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as does norma taylor while

bill lasker takes/makes pictures

&

in livermore lorena schneider does all

# Touring Northern California

Lake County offers a variety of scenery and outdoor recreation areas where one can visit historic towns and mountain and lake resorts. To reach Lake County from the Bay Area, take Interstate 680 to Vallejo and follow Highway 29 to Middletown or take Highway 101 north, then east on Route 175.

Additional information, including available facilities, may be obtained from Public Relations Division 8235.

A. Big Borax Lake. Site of borax discovery in 1856; first borax operation in this country and one of few mines operating today.

B. Cache Creek Indian Burial Ground. Area rich in Indian lore and artifacts ranging from calcite beads to obsidian arrow and spearheads.

C. Clear Lake. Largest lake in California; fresh water fishing, boating, water skiing, and camping.

D. Clear Lake State Park. Indian nature trail, native plant nature trail, and water plant life trail; haven for wildlife, waterfowl, and birds who use the area as a refuge and nesting place; campsites, picnic grounds.

E. Cow Mountain, Boggs Mountain, and Mendocino National Forest. Areas provide thousands of acres of land for open hunting.

F. Kelseyville. Lake County's oldest settlement; pioneer cemetery; historical church, tavern, and court; famous for fruit, known as "Bartlett pear capitol of the West."

G. Lakeport. Lake County museum houses collection of Indian artifacts (open 1-4 p.m. daily except Sundays and holidays); 100-year-old historic courthouse and square; Farmers' Museum at entrance to Lake County Fairgrounds features diversified display of early equipment used by pioneer settlers.

H. Lower Lake. Boating and fishing, especially black bass; smallest jail in U.S.A. and several other buildings dating back before 1860's; old school house built in 1877.

I. Mt. Konocti. 3000-foot mountain of volcanic origin steeped in superstition from Indian legends — visible remains of Indian villages or campsites around its base.

J. Seigler Hot Springs Resort (two miles west of Lower Lake). Variety of mineral springs in area; a good place to search for Lake County diamonds — a crystal clear quartz.

K. Sulphur Bank Quicksilver Mine. Hot springs located underground with thermal power operations in progress — jets of steam can possibly be observed.

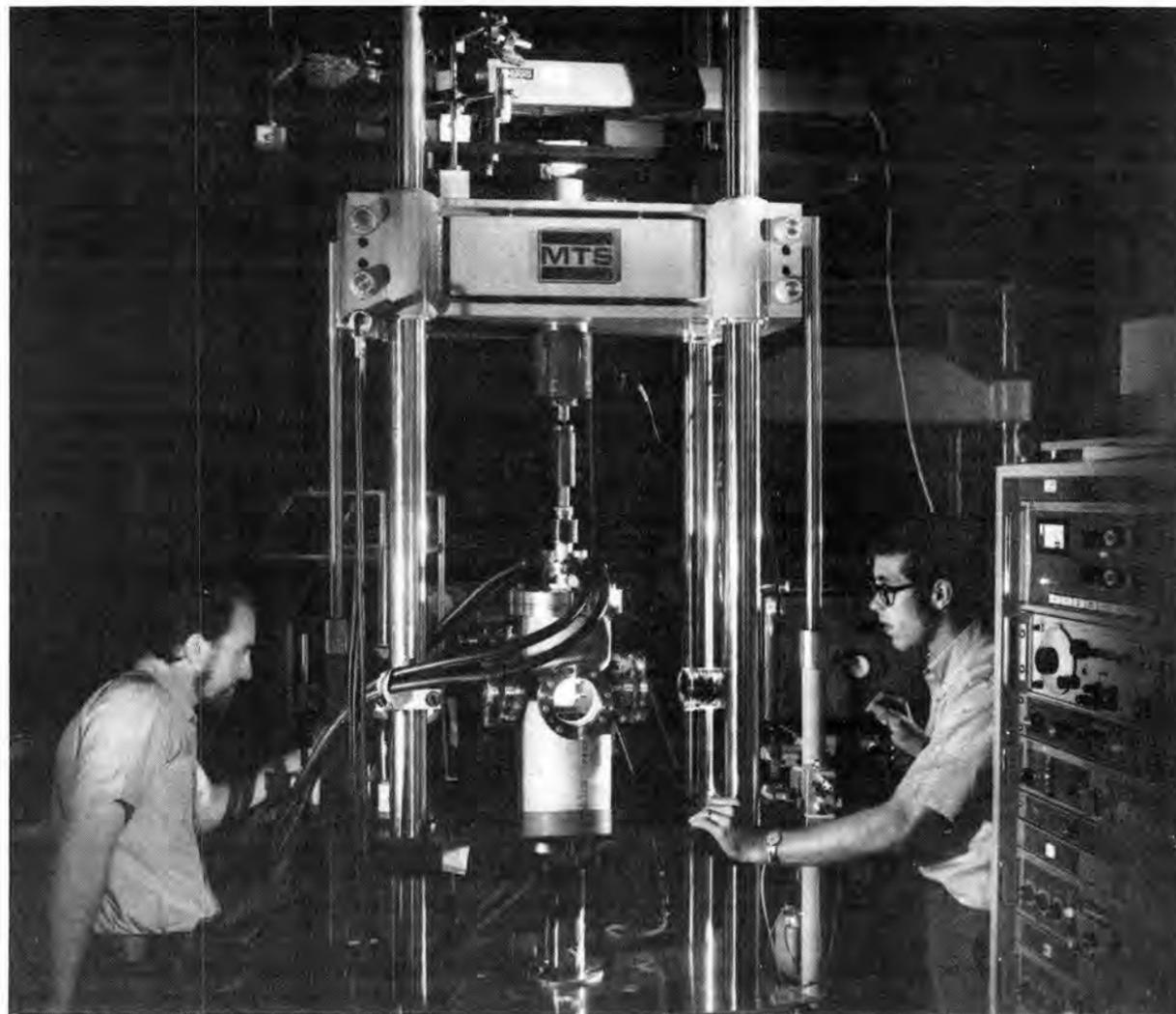


# LIVERMORE NEWS

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LIVERMORE LABORATORIES

MARCH 30, 1972



**BIAXIAL MEASUREMENTS AT 3000°** — An experiment to determine mechanical properties of a hollow graphite cylinder resistively heated to 3000°F is observed glowing in the chamber by Ralph Thompson, left, and Mel Callabresi of Sandia Livermore's Experimental Mechanics Division 8414. Using laser backlighting and two optical extensometers, dimensional changes produced by biaxial loading (internal pressure and axial force) are automatically measured and recorded.

## Ecology lecture series underway

Roger Everett (8351) spoke recently on "Valley Bikeways" as part of the 1972 Livermore/Amador Valley Ecology Center Lecture Series. The remaining lectures, which are held at 7:30 p.m. in the Amador Valley High School multipurpose room include: April 6, "The Pet Population Problem," April 13, "Human Population Problem," April 27, "Recycling Wastes" and May 4, "Open Space and Land Use."

## Speakers

Jim Swisher (8313) and M.N. Read (Bell Laboratories), "Thermodynamic Properties and Electrical Conductivity of Ta<sub>3</sub>N<sub>5</sub> and TaON," annual meeting of American Institute of Metallurgical Engineers, Feb. 22, San Francisco. Published in METALLURGICAL TRANSACTIONS, Vol. 3 (Feb. 1972).

## Author

Jim Shelby (8331), "Helium Migration in Natural and Synthetic Vitreous Silica," February 1972 issue JOURNAL OF AMERICAN CERAMIC SOCIETY.

## Don Warne awarded PhD degree in EE

Don Warne (8131) received a PhD degree in electrical engineering from Oregon State University. His thesis was entitled, "Characterization of the Radiation of the Exploding Wire by Analysis of the Radiant Spectrum."



Joining Sandia in 1967, Don designed firing systems in the electrical sub-systems organization for two years. He then transferred to his present position where he performs systems analysis in the Preliminary Systems Division.

Don has an aeronautical engineering degree from Northrop Institute of Technology and BS and MS degrees in mechanical engineering from the University of Washington.

## Sympathy

To Hugh Odell (8231) for the death of his father in Albuquerque, Feb. 29.

# Model making takes model talents



Modified Strypi Model

Building scale models of upper atmosphere rockets may sound like something a Sandian would do for a hobby, but some people do it on company time. Officially, they're machinists in the Shop Division (7142) of the Mechanical Department, but when the Aerodynamics Projects Department (5620) needs models, the machinists become craftsmen, even artists.

Detailed specs (down to 1/10,000 inch) are of course provided by the responsible engineer and the draftsman but Section Supervisors Jim Hay (7142-1), Ed Peterson (7142-2) and Roger Johnson (7142-3) agree that going from blueprint to finished model demands far more than recipe following.

"Most installations have only one or two people who can build a model that's just right technically and looks right too," says Roger. "But almost all our people can turn out really fine-looking work that does the job in the wind tunnel."

Doing the job in the tunnel means that each model must do more than simply resemble the rocket. Because the model may experience hypersonic conditions (up to Mach 12) in the wind tunnel, it must be constructed from materials which can survive the heat created by friction. Thus, most models are made of aluminum, or occasionally, stainless steel. Even so, models carry the scars of their wind tunnel experiences.

Often the various components can be fabricated separately and then carefully joined to make the finished product. But occasionally the job demands "carving" a complete rocket, fins and all, from a solid block of metal. This process involves special templates to guide the contour operations on the metal cutting lathes and, for compound angles, sine bars and sine plates in conjunction with milling machines. Success means that there are absolutely no joints or seams which could affect the aerodynamic tests in the tunnel.

The people in the shops do a good job, so

good, in fact, that the models were in some demand as paper weights and desk ornaments once they had served their purpose. But recently, the management involved has recognized that the models have more than a utilitarian value. No longer will they go to whoever grabs them first. Instead they're being collected for a permanent display of the craft of the model makers. •bh

## Sandia co-sponsors underground nuclear test measurement meeting

The Defense Nuclear Agency and Sandia Laboratories co-sponsored the Underground Nuclear Test Measurements Symposium II, held at Stanford Research Institute, Menlo Park, Calif., March 21-22. Joe Wistor, supervisor of Measurements Development Division II 9116, served as co-chairman of the meeting along with Capt. G.P. Crotwell of DNA.

This meeting was the second of three symposia on the techniques and understanding of materials response, structural response, and internal electromagnetic pulse measurements as related to underground nuclear testing.

Sandia speakers at the technical sessions included: M.R. Birnbaum (8352), "Structural Response to Sudden Heating," T.J. Flanagan (9116), "Making Strain Measurements in an Intense Gamma and Neutron Environment," R.P. Reed (9116), "The Thermocouple Temperature-Position Diagram — A Tool for Thermoelectric Circuit Analysis," D.G. Palmer (9126) and T.J. Flanagan, "Configuration, Shielding and Grounding of Cables Exposed to Gamma-Neutron Radiation," and F.M. Raymond (9126), "The Case for Data Translation Near the Transducer."



IF YOU'VE wondered about the new flag flying above Bldg. 800, this is it — the POSEIDON Flag, awarded to the Labs for "... significant contributions in design and development for the POSEIDON Re-entry Body." Navy Commander Robert Stinner made the award. Next to him are Robert Peurifoy (1220), Chris Dalton (1213), Gene Ives (1226), and President Hornbeck.

## Retiring



Hazel Smeltzer (7542)



Loren File (7111)

## Swain gets to England — too late

"Dining by candlelight has its romantic charm, but lecturing by candlelight is fraught with problems. For one thing no one can see your notes on the blackboard." Or so says Alan Swain (1644), who ought to know.

He recently returned from England after leading an otherwise highly successful series of two-day seminars, some of which coincided with the power strike that blacked out much of the country.

Alan's topic was "Error-Cause Removal," an approach to reducing errors and defects in a production situation. One of the key features in this approach is that the worker is himself involved in the design of the product, its tooling, the necessary graphics, the work operation, and the work environment. Because of this involvement and because of the emphasis given to psychological and social needs, Error-Cause Removal programs serve to increase job satisfaction as well as quality of output, and to reduce absenteeism and other manifestations of job dissatisfaction.

Sounds great . . . but there was this strike, see. "I should have scheduled my tour a month earlier," says Alan, tongue firmly in cheek, "and the program could have been adopted by the power people in time to have kept England's lights on."

A more complete discussion of Error-Cause Removal is provided by Alan's book, "Design Techniques for Improving Human Performance in Production." But perhaps the more effective presentation of the subject (if a journey to England — he may return — seems a bit inconvenient) occurs in Sandia's out-of-hours course entitled Human Factors Engineering. It's taught by Swain, Henry Guttman, and Lynn Rigby, all of 1644.



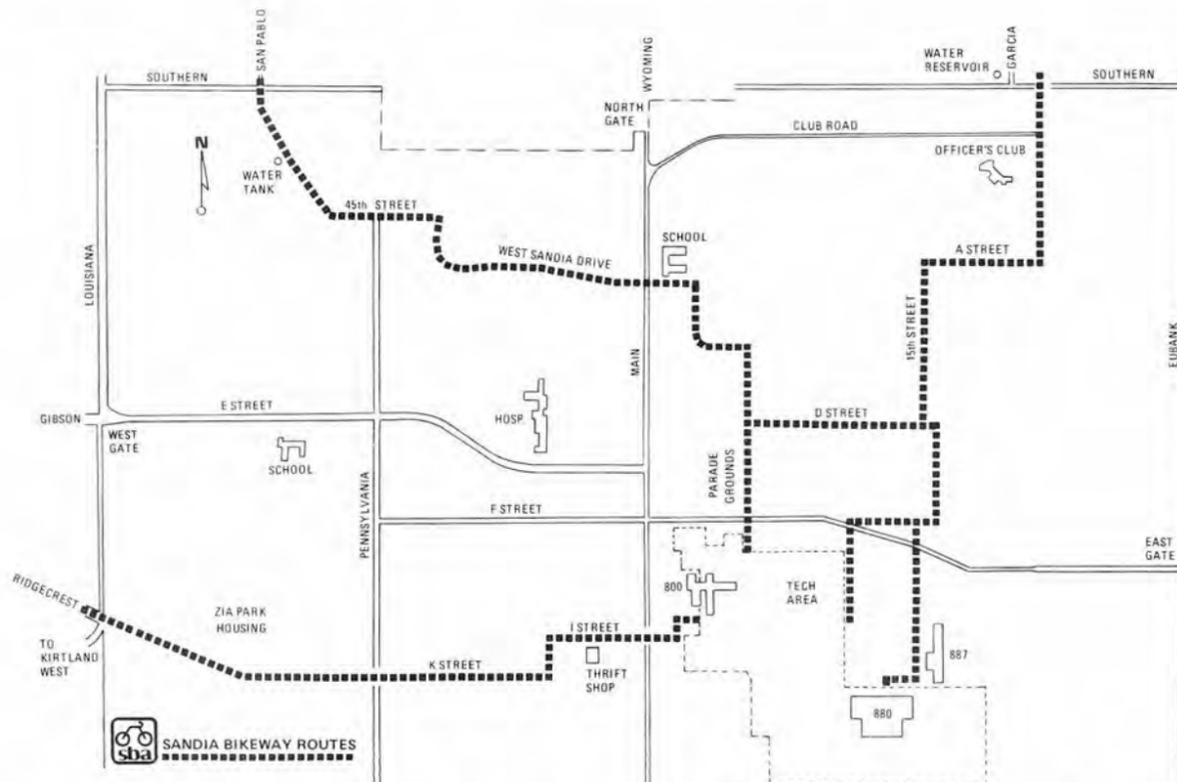
Dick Miner (7657)



Fonzo Cossell (4512)



"Who Asked That Question?"



HOW TO STAY ALIVE and Well Though Riding A Bike During Rush Hours on Sandia Base is the title of this map developed by the Sandia Bicycle Ass'n. Dotted lines show traffic-free routes. Note two bicycle exits through Base fence at NE and NW corners. SBA currently is preparing off-Base maps showing optimum bike routes to different areas of city.





Jim Davis — 4614



Irving Auerbach — 5628 15

# MILEPOSTS

LAB NEWS March 1972



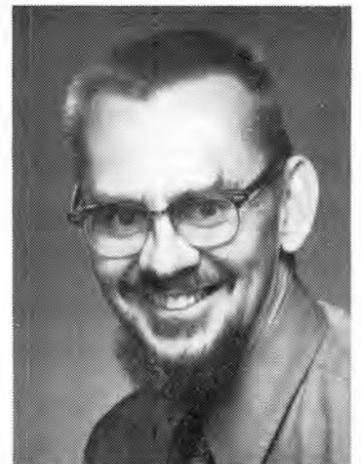
John Pearce — 8250 20



Dale Young — 5422 20



Beresford Gilkes — 7545 10



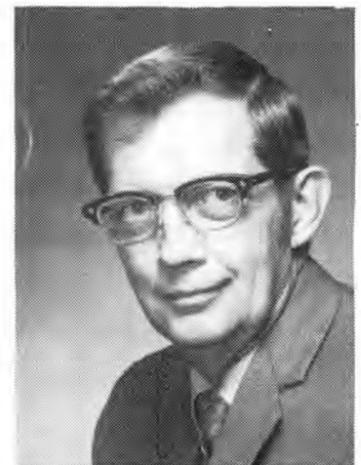
Paul Field — 1325 20



Art Verardo — 9242 20



Clifford Elson — 7452 10



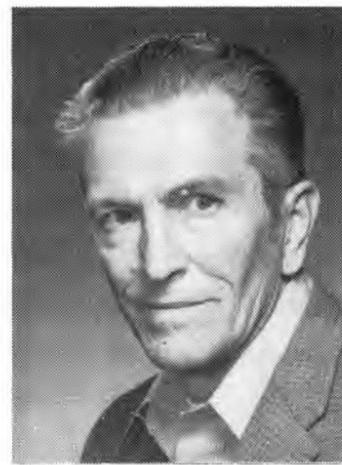
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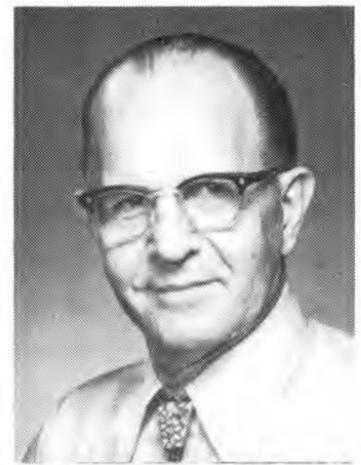
Joseph Doyle — 3513 15



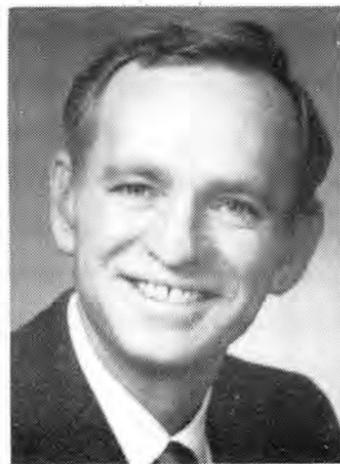
Frances Hale — 7631 25



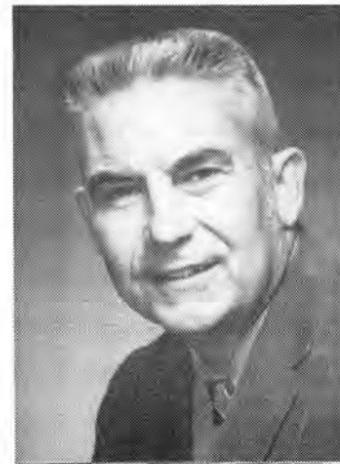
Fred Edwards — 9217 20



Frank Batchelor — 5165 20



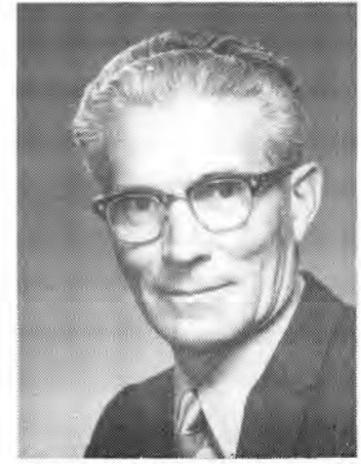
Carl Holmes — 8411 15



Edward Brass — 5413 15



Mel Petersen — 7511 20



Thomas Brooks — 4541 20



John Crawford — 1410 10



J. R. Wimborough — 8161 20



George Skinner — 7544



Bill Biergiel — 8431 10



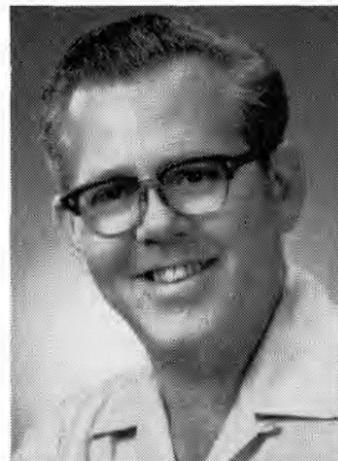
Lorena Schneider — 8235 20



Chuck Thomas — 8139 15



Bruce Affeldt — 8421 10



Del Houser — 8421 10



Dick Watkins — 8323 20



Clara Blasyk — 4136 20



Betty Pajari — 8430 10



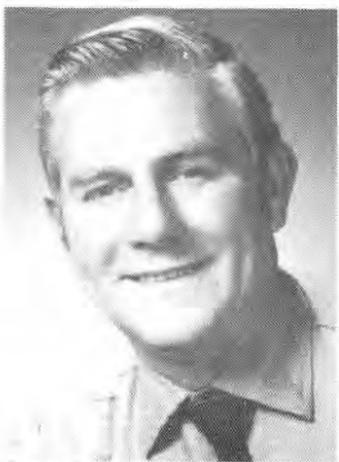
Shawkeet Hindi — 7542 15



J. Ed Healey — 8183 15



Ralph Hamilton — 3520 15



Art Kellom — 8413 15



Tom Mickey — 7154 15

**A  
Visit  
to the  
New  
Indian  
School**



THERE'S a handsome new school across the river north of U of A — the Southwestern Indian Polytechnic Institute — giving training to over 500 Indians in drafting, electronics, optical technology, business, and many other subjects. Here Institute Superintendent John Peterson directs President Hornbeck's attention to one of the new buildings.



Dramatic architecture and natural setting are a far cry from drabness of earlier schools of this type.



Pres. Hornbeck and Ted Sherwin (3160) meet Asst. Superintendent Jack Anderson.



Dick Bice (3000) and student in electronics lab.



Bob Kraay (3) and young Indian observe lens grinding array.



Curriculum is strong on electronics, radio/TV, and telecommunications.



**BOB JAMES STRIKES AGAIN** — Note resignation in posture of pins as Bob James (5428) heads for another 300 game. He rolled one perfect game in the City Tournament on March 5, another in league play on March 10. Properly modest, Bob says he's proudest of his 742 series and his team's 1230 pins on the 10th.

## Authors

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R.E. Palmer (5214), "Exponential Dependence of

## IEEE symposium on ion implantation scheduled April 6

A one-day technical symposium — "Ion Implantation — What Can It Do For You?" — sponsored by the Albuquerque Section of IEEE, will be held at Sandia's Theater Bldg. 815, 9 a.m. to 4 p.m. on April 6.

Errol EerNisse (5112), conference chairman, says that the symposium is designed to acquaint local members and other interested persons with several applications of ion implantation, including use of this technique in semiconductor device fabrication.

Topics range from simulation of radiation damage in metals used in nuclear reactors to fabrication of magnetic bubble and optical waveguide devices. Invited speakers from Sandia Labs include: S.T. Picraux (5111), "Channeling Phenomena and Its Uses in Semiconductor Lattice Studies," F.L. Vook (5110), "Rutherford Backscattering for Thin Film Analysis," W. Beezhold (5112), "Simulation of Radiation Damage in Metals," and W. Bauer (8331) and R.G. Musket (8313), "Near-Surface Compositional Studies Using Proton Bombardment X-Ray Production."



**CONFERENCE CHAIRMAN, Errol EerNisse (5512), right, discusses an ion accelerator sample chamber with Wendland Beezhold (5112), invited speaker.**

the Drude-Tail Anomaly in Sodium," Letters to the Editor, Vol. 62, No. 1, *JOURNAL OF THE OPTICAL SOCIETY OF AMERICA*.

W.E. Alzheimer (1517), "Flyer Plate Loading of Circular Rings," Vol. 12, No. 3, *AIAA JOURNAL*.

P.B. Higgins (9321), "A Fast-Rise Light Source for Detonating Sensitive Explosives," Vol. 11, No. 1, *APPLIED OPTICS*.

B.D. McLaughlin (5531), L.L. Stephenson (5531) and C.J. Miglionico (5522), "Technical Note: Influence of Aging Time and Temperature on the Susceptibility of Gamma-Quenched U-5 wt% Nb Alloy to SCC," Vol. 28, No. 1, *CORROSION*.

C.H. Seager (5134) and others, "Conversion and Equilibrium Between F- and  $F_2$ -Centers in X-Irradiated  $KCl(I)$ ," Vol. 49, No. 2, *PHYSICA STATUS SOLIDI*.

T.P. Wright (5231), "Comments on Demonstration of Collisionless Interactions Between Interesting Ions in a Laser-Produced-Plasma Experiment," Vol. 28, No. 5, *PHYSICAL REVIEW LETTERS*.

George Jelinek (5324), "Properties of Crystalline Argon, Krypton, and Xenon Based Upon the Born and Huang Method of Homogeneous Deformations. III. The Low Temperature Limit," March 15 issue, *PHYSICAL REVIEW B*.



OSKAR MORGENSTERN, (left), currently Professor of Economics at New York University, was a familiar speaker at a Labs colloquium where he discussed the economics of the space shuttle. He is accompanied here by host Howard Stump (100).

\* \* \* \*

Major General Frank Camm succeeds Major General Edward Giller on July 1 as Assistant General Manager for Military Application in AEC. General Giller, who will be released from active duty on that date, has been named Assistant General Manager for National Security within the Commission.

\* \* \* \*

Newly-elected officers of the Coronado Ski Club are: Dave McVey (5626), president; Bob Neel (1534), vice president; Luke Stravasnik (1553), treasurer; and Paul Montoya (1517), secretary.

\* \* \* \*

### Sympathy

To Enid Morton (4151), on the death of her sister in Carlsbad.

To Mary O'Trimble (4623), on the death of her mother in Albuquerque, March 12.

To Edward Stout (9485) on the death of his sister in Albuquerque, March 19.

\* \* \* \*

### Death



Jimmie Schmedeman, secretary assigned to Division 7412, died March 10 after a long illness. She was 42.

She had worked at Sandia since March 1968.

Survivors include her husband Bobby (9343) and three children.

## Take Note

Couple of Saturdays ago, the Tijeras home of Pat Garcia, a materials handler in 4611, burned completely down. There was no insurance. Pat and his family need help. Almost anything can be used — they're starting from scratch. If you have clothing, aside from Pat and his wife there are two sons, 18 and 12, and two daughters, 19 and 20. Contact Julian Sanchez on ext. 4-1555 if you have something to donate. Truck pickup can be arranged for heavy items.

\* \* \* \*

Like to see a childproof pillbox? Or a disposable stock tank defroster? Or a "straight shooter" hand drill? And talk to the inventor of each?

Then wander down to the Student Union Bldg. (Rm. 250-C) at UNM on April 8-9 (9-5) and you can wonder at the many marvels on display at the Inventors Exhibition. Several Sandians are part of the Thunderbird Technical Group which is co-sponsoring the Exhibition along with the Chamber of Commerce, UNM's Technical Applications Center, and the Department of Development. It will cost you 50 cents if you're an adult, 25 cents if you're not. Or you can get in free by exhibiting your own invention. In that case, contact Al Goodman (5623) or Linus Phillips (1612) by April 5.

\* \* \* \*

Joe Meland (1932) scoutmaster for Troop 281, was recently awarded the Catholic Church's highest award for adult leadership in scouting — the St. George Award. The ceremony was held at Presbyterian Hospital where Joe is recovering from a severe heart attack suffered in January. He has been scoutmaster of the troop for about five years. Only three of the awards are made in the diocese and Joe is not Catholic. It is a singular honor, according to John Garcia (4518), a troop committeeman.

\* \* \* \*

Howard Romme (4142) is helping organize a reception honoring Glen Ream, principal of Albuquerque High School 1927-1959, to be held in the school gym from 2 to 5 p.m., Sunday, April 16. He urges all former students and friends of the principal to attend. Admission is a \$1 donation.

\* \* \* \*

Anyone interested in improving public speaking skills is invited to attend an eight-week course offered by the Kirtland Toastmasters Club 2065. The sessions will be held Wednesdays at 6:30 p.m. at the Kirtland Officers Club. For additional information, call Jerry Long (9111), ext. 8149.

\* \* \* \*

Arthur Clow, WE Executive VP and a member of Sandia's Board of Directors, was recently honored by the Army when it presented him with the Outstanding Civilian Service Award. Mr. Clow retires at the end of May.



DAVID CORDOVA (7131) was removing solder from a terminal and pulled the wire out. When he did, the molten solder splattered, striking one lens of his safety glasses. David is now a certified member of the Wise Owls, a group whose members' eyesight has been saved by virtue of safety glasses.



880 MOVES 'EM OUT — Purged paper heads for the landfill.



VIVIAN MONTOYA (3520) joins the security fashion parade in his earth-brown jump suit designed for comfort and rapid action.



SANTA FE OPERA THEATRE — Empty and quiet now, but filled with people and music this summer.

## The Santa Fe Opera and a fund drive

The Opera Association of New Mexico has announced the 1972 season of the Santa Fe Opera and simultaneously opened a two-for-one fund drive in cooperation with the Ford Foundation. The six-opera repertoire will open on July 7 with the comedy-filled hit of 1971, "La Grande-Duchesse de Gerolstein," by Jacques Offenbach. The following night, "Madame Butterfly" by Puc-

cini, last seen in Santa Fe in 1968, will be presented.

The "high reward" fund drive is led locally by Jim Renken (5231). In addition to seeking some \$486,000 in contributions to meet the season's regular expenditures, the Association has accepted Ford Foundation's two-for-one challenge. If the group can raise a separate \$335,000, the Foundation will contribute almost \$728,000. This million dollar fund would eliminate most of the indebtedness incurred in the aftermath of the fire that destroyed the company's theatre in 1967, and would establish the first working capital fund ever enjoyed by the Opera Association.

Summarizing his feelings about the Opera, Jim states, "I think people at Sandia are aware of the great value of the Santa Fe Opera, culturally and economically, to New Mexico, and I hope they will help us meet the financial goal of the Opera with the added support needed this year to be sure the Opera gets the full \$728,000 from the Ford Foundation."

In addition to Jim, Sandians who may be contacted about the season or the fund drive include: Ben Bader (1543), Joe (7411) and Dawn Calek (3), Dick Vivian (1611), Bill Paulus (9426 and Wendell Smith (3152). •bh

### Schedule of Performances:

*La Grande-Duchesse de Gerolstein*  
(French/English)

July 7, 15, 22, 28; Aug. 19, 26

*Madame Butterfly* (Italian)

July 8, 14; Aug. 2, 4, 24

*Don Giovanni*

July 21, 26, 29 (English); Aug. 10, 18 (Italian)

*Pelleas et Mélisande* (French)

Aug. 5, 11, 16

*Melusine* (English)

Aug. 17, 23

*Salome* (German)

Aug. 9, 16, 25

### Tennis Champs

Charlie Chavez (4337) won the singles event in the Sandia Labs Winter Tennis Tournament held last month. Bob Scipes (4123) was runner-up. Charlie and Bob also won the doubles with John McKiernan (1651) and Bob Clark (1913) the runners-up. Gary Carlson (5324) was tournament director. The spring tennis ladder will begin about May 1.

• 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

- CHEST OF DRAWERS plus shelf top, \$25; powder table, \$20; French Provincial, antique white. Roberts, 255-9527.
- HIKING BOOTS, size 10, nearly new, take \$13 (half new price). Beardsley, 255-5313.
- SAILFISH, complete, \$50; one-wheel covered luggage trailer, \$50. Pope, 255-6702.
- '69 HONDA Minitrail 50cc, lights, horn, mirror. Oliveira, 298-0657.
- 16' FIBERGLASS BOAT w/70hp Merc., walkaround trailer, cover, all ski gear, \$950. Greenwood, 298-5268.
- '71 HOLIDAY TRAVELER, 27', center bath, rear bdr., 8' refrig., refrig. AC, two 90-hr. powercell batteries. Hallisey, 298-0626.
- COLOR TV, 23", \$175. Husa, 298-3335.
- ITALIAN fruitwood coffee table, imported marble top, approx. 5' long, 20" wide, half price \$60, totally unmarred. Newman, 256-3295.
- 24" BICYCLE, \$20; car refrigerator AC, \$20. Snyder, 268-0679.
- SEWING MACHINE, Sear's Kenmore, top of the line, has zig-zag plus many other extras. Gutscher, 298-7203.
- TRUCK TIRES: 6:50x16 6-ply, 3 ea., good tread on 2, never punctured, make offer; 30.06 Enfield Sport, scope, \$125 Schulze, 299-0152.
- OLD IRON floor safes, heavy steel doors, 1 combination & 1 key lock, size 24x15x15. \$65 & \$125. Smitha, 299-1096.
- EMPIRE TELESCOPE, 400 power, brand new, cost \$76, sell for \$50. Shaw, 268-7938.
- HAWKEYE Instamatic movie camera (new) super 8, \$18; reg. size box springs & mattress, both \$25. Villa, 298-0435 after 5.
- GIRL'S green stingray bike, 21", \$15. Jennings, 255-5950.
- '71 HUSKY 360cc 8-speed; Enduro, cross-country or trail machine, lights & speedometer included but not attached. Martin, 299-6768.
- PAIR of white lined drapes, 77"x 90" pleated width of each, turquoise & brown geometric design, clean. Reed, 299-7425.
- BUNDY CLARINET, B-flat, w/music stand, used only a few months. Barncord, 296-1889.
- ACOUSTIC GUITAR, \$20; guitar amp, 5 watt, 3 input, \$15; Apollo elec. bass guitar, \$85. Gray, 265-1883.
- BICYCLE, ladies lt. wt. Schwinn, blue, 3-sp., 26" wheels, thorn-proof tubes, 19" frame, rear carrier, \$40. Sims, 255-6967.
- REMINGTON .22 cal. auto. rifle w/scope, \$23.50. Moyer, 255-8807.
- 6' REDWOOD circular picnic table w/5 benches, \$40; Craftsman reel power mower, \$40; GE dryer, \$15; 12' Kirsch one-way curtain rods, \$7. Champion, 299-0163.
- LAWN MOWER, rotary 24", needs tuning up, \$7.50. Bartlett, 299-4861.
- STRING BASS, cover, Ampeg pickup, excellent tone & volume. Ezell, 268-4845.
- SKI BOOTS, Henke 4-buckle, men's size 9, \$10. Bruce, 299-2542.
- SAILBOAT, Finn, planing one-man olympic class by Newport, glass hull, North sail, trailer, \$895. Lindell, 298-8339.
- FIVE 14" Dodge wheels, 4 hubcaps, 7 tires, total for all \$25. Flowers, 282-3458.
- BATHROOM SINK, green, \$20. Berman, 296-5640.
- HIKING BOOTS, worn twice, size 4½ medium, women's brown suede, padded ankle, lace-up, "waffled" rubber sole, \$7.50. Swayze, 268-5222.
- MYNAH BIRD w/2 cages & couple of books on how to care for same, \$30. Roberts, 298-9163.
- SOFA, traditional styling, upholstered w/beige breathable vinyl, usable as is, however back should be reinforced eventually, \$40. Campbell, 256-1015.
- ALFA owners—change your own trans. oil to be sure the correct oil is used; 5 gal. can w/built-in pump & about 1 gal. of Shell Dextex 90 left, \$10. Eagle, 265-7128.
- KITCHEN dinette set, 4 chairs, \$25; GE stereo unit, compact, \$15. Magruder, 255-2078.
- LABRADOR retriever puppies, AKC reg., championship background, dew claws removed. Vollandort, 298-4574.
- '71 HONDA CT-70, \$240; '70 Steens minibike, \$250; '71 Maico MX 400cc, \$900. Chavez, 299-8194.
- CRAFTSMAN reel type power mower, 18" cut, 3 hp, self-propelled new grass catcher, \$45. Muir, 296-2252.
- '70 RECO tent trailer, stove, sink, built-in cabinets, 12' closed, 20' open. Kelly, 255-7226.
- MUNTZ TV, 12", new tubes & cord, excellent picture considering age, \$50. Abernathy, 268-2017.
- BOY'S spyder bike, 20", 3-sp., new tires, year only, \$15. Gammon, 268-1032.
- VICTOR adding machine, 10 key, heavy duty commercial adder, orig. cost. \$325; sell for \$60. Coughenour, 296-4146.
- HONDA 50, '66, new tags.; 1 ea. Bridgestone .H.T. nylon tire, 2:50x18, 4-ply rating. Wilkinson, 299-8327.
- TRAIL-A-BIKE brand motorcycle hauler, bolts to trailer hitch, taillight & tie-downs included, will accommodate 3" front wheel, \$30. Schkade, 247-3427.
- TRAIN TABLE, 4x8" plywood top, ruggedly constructed, \$10. Looney, 255-7349.
- '70 YAMAHA Endura, 250, 1900 miles, \$650. Jones, 298-3676.
- ORIG. EQUIP. RADIO, fits '66 & later model Tempest, recently repaired; ladies 3-sp. bicycle. Smith, 298-9092.
- FOUR-CYCLE engines, Briggs/Stratton, \$8; Clinton w/auto. clutch, \$10; both horiz. shaft. Patterson, 877-6037.
- CHAMBERS Dishwasher, \$20; Wards 24,000 BTU refrigerated window AC unit, used 1 year. Henderson, 255-1941.

### WANTED

HOME for Penn State Professor & family during summer employment at Sandia, 4-bdr. preferred, July to early Sept. Meyer, 264-8140.

14.5" wheel, 6-hole. Tucker, 877-1140.

APPROXIMATELY 250 ft. of chain link fencing, 5' high. James, 344-7854.

USED quilting frame, prefer adjustable. Bontrager, 282-3427 after 6.

HAND LAWN MOWER; box spring for twin bed. Peterson, 256-7514.

GOOD HOME for 2 male Sealpoint cats, both altered & declawed, affectionate pets, 2 yrs. old. Troy, 268-6865.

USED ENGLISH SADDLE—prefer flat cutback style. Brewer, 344-3759.

### FOR RENT

½ ACRE SPACE for mobile home, Hill Acres, Bernalillo, \$45/mo. Shively, 867-5439.

FURNISHED home available Apr. 15 to June 7, low rent for home-sitting job. Adams, 264-1142.

### FOR SALE CARS & TRUCKS

'65 CHEVROLET Impala, V8, 4-dr. sedan, AC, AT. Kirchmeier, 344-5783, after 4.

'69 OPEL sta. wgn., AC, AT, radio, front disc brakes, \$1195. Schmierer, 299-2352.

'64 BUICK sta. wgn., \$600. Hoffman, 298-1431.

'62 PLYMOUTH 4-dr., 318 engine, std. trans., \$90. Konrad, 299-8994.

'66 CORVAIR, 4-dr., AT, 140 engine, \$350; '55 Ford pickup, 272

engine, 3-sp., \$195. Smith, 299-0082.

'49 CADILLAC 62 Series. Stewart, 296-4341 after 5.

'56 T-BIRD, new eng., trans, paint, rad, inf., trade for good truck, ¾ ton or \$1900 cash. Montoya, 242-7460.

'67 VW BUS, 9-passenger. Tessier, 296-1025.

'67 MGB convertible, \$1095 Stevens, 299-6086.

'62 CHEV. pickup, ½-ton, 8-ply tires, big 6 engine, \$495. Schneider, 296-2487 after 6.

'61 CHEVY convert., engine block cracked. Make offer. Hueter, 242-1620.

'69 CATALINA 2-dr. HT, AC, PB, PS. Buss, 298-1589.

'69 DATSUN 510 4-dr., turquoise, black interior, pushbutton radio, deluxe AC, new tires, \$1275. Cooper, 299-7157.

### FOR SALE REAL ESTATE

3-BDR. ROBERSON, 1¾ baths, Lg. kitchen-fr., hardwood, pitched roof, single garage w/camper space alongside, \$21,800. Murphy, 256-1130.

S. Piedras Dr. & Camino de La Sierra, 130'x140' R-1 corner, certified 1967 appraisal \$4600; \$5000, all assessments are paid. Scott, 296-6814.

MOUNTAIN HOME on 2.68 acres, 3-bdr., lg. den, 2380 sq. ft. plus dbl. garage, corral for horses, tack shed, excellent well. Nelson, 282-5203.

3-BDR., den, 1¾ bath, covered patio, dishwasher, range, drapes, carpeted, AC, cfa, FHA, VA or conv. refinancing. Gunckel, 299-3543.

### LOST AND FOUND

LOST — Car key to Chev. Blazer truck, brown jacket w/Rx sunglasses in pocket, reversible green jacket. LOST AND FOUND, tel. 264-2757, Bldg. 832

FOUND—Tie clip, gold loop earring LOST AND FOUND, tel. 264-2757, Bldg. 832.

# Kids egg roll Saturday; Roaring 20s set April 15



NOSTALGIA for all those good things like flappers, the Charleston, Model A Fords, and bathtub gin is part of the appeal of the Roaring 20's party set at the Club April 15. Other goodies include a bourbon taste, a steak dinner, and special entertainment by a chorus line of Sanado women. Helping advertise the event are, clockwise from front, Jo Crumley, Carol Larson, Linda Filusch, Roger Campbell (5411) and Pat Millsap.

THE MYSTIQUE of the Roaring 20's will be recreated at the Club on Saturday, April 15 with flappers, the Charleston, and sheiks — but no bathtub gin. How about Wild Turkey bourbon instead? Because sales are going so great at Club Happy Hours, a free bourbon taste is featured and a big prize will be given for the best Roaring 20's costume. In addition, a great steak dinner will

be served and the Top Hats will play for dancing.

The floor show may go down in history — a number of Sanado women will present a fantastic chorus line, a trio of teenage cuties called the Sophistikats will entertain, a mystery act called the Whistlers with out-asight costumes will perform, and (egad!) Max Newsom — a dead ringer for Valentino — will do his thing. If you don't know who Valentino was, well, it'd be a little hard to explain.

Tickets (\$3.75 for members, \$4.50 for guests) should be picked up right away. This will be a sellout.

\* \* \* \*

SANADO WOMEN will meet for their monthly sherry luncheon at 1:15 on Tuesday, April 11. Guest speaker will be Prof. Leo Kanowitz, UNM authority on women and the law. Reservations should be made with Mrs. D.S. Tarbox, 1305 Florida NE.

## SAFETY IS TEAM WORK



### Variable Annuity Unit Value

April .....	1.751
March .....	1.698
Average 1971 .....	1.628

DICK COUGHENOUR (4115), Coronado Club treasurer and a tough man with a nickel, will be the first man in line tonight when the fried shrimp (lots of it) buffet is spread for the Happy Hour buffet. It's the best buy in town at \$1.85, according to Chowhound Coughenour. Since tomorrow is a holiday and the Club will be closed, the TGIF crowd will celebrate tonight starting right after work. Special prices will be in effect until 10 p.m. Frank Chewiwie will make the happy music while Yolanda Adent holds the main lounge.

On Friday, April 7, the Country Express will play for dancing and the New Mexican buffet will be spread. A new group called the Saints will play for Happy Hour on Friday, April 14, and the buffet will feature Oriental food.

\* \* \* \*

SATURDAY, April 1, at 10 a.m. the patio area of the Club will be the scene of the annual Kids Egg Roll. For the little ones six and under there will be hundreds of eggs to find, prizes, games, and goodies. It's free to members' kids, but members only, please.

\* \* \* \*

"MUSIC MAN," a blockbuster movie of a few years back, will be the feature at Family Night Saturday, April 1. Stage show will be presented by "The Sandians" featuring that clever Yolanda Adent, Pete Gallegos, Ed Shoaf, Paul Metoyer and others. Happy Hour prices and super sandwiches will be available starting at 6 p.m. Admission is free and the show should start around 7 p.m.

## Club Announces Mazatlan Tour June 7-15

The Coronado Club announces another package tour to Mazatlan, Mexico, June 7-15.

"This tour differs from others in the past," Chet Fornero, Club president says, "in that it is a group tour rather than charter which means guests who are not members of the Club can go."

The \$249 cost per person includes round trip transportation from the Club parking lot through all the stages of the trip and back plus all baggage handling, lodging and breakfast and dinner throughout the trip, two nights in Torreon and six nights at the luxurious Playa Mazatlan hotel in Mazatlan, a cocktail party and a "Fiesta Night" with extravagant entertainment, dinner, and cocktails throughout the evening.

"Mazatlan has been the most popular trip we've ever run," Chet says, "and this one has been booked to answer the many requests to repeat it and provide for guests and relatives who were not eligible before."

There are 45 spaces available on this trip. Deposits (\$50) are being taken now at the Club office. Total payment is due April 21. Cost for singles is \$263. If this package sells quickly, another tour can be booked for a group of 45 for June 9-17.