



FRANKIE ROBINSON, star first-baseman for the Cincinnati Reds, demonstrates his batting stance to his brother, Sylvester Grisby (8121-3), and Mrs. Grisby at Livermore Laboratory. Frankie was in the Bay Area for a series with the San Francisco Giants.

Dr. von Braun Credits Sandia Jupiter Missile Program Work

Sandia-developed chaff rockets have been used in support of a Jupiter missile test at Cape Canaveral, according to a letter to the President of Sandia Corporation from Wernher von Braun of the Army Ballistic Agency.

Dr. von Braun, who is director of the agency's Development Operations Division, expressed appreciation for the cooperation and assistance of Sandia personnel who were responsible for the establishment of the Army's Deacon-Arrow Meteorological Rocket Program.

The rockets were developed by Sandia Corporation for use in Operation Hardtack in the Pacific to measure upper atmosphere winds. Radar can track "chaff" (light-weight strips of aluminum) which may be ejected from the rocket at desired height.

The letter from Dr. von Braun stated: "Over the past few months, within a limited budget, we have endeavored to make operational the Deacon-Arrow Meteorological Rocket System developed by your company. Recently the first of these rockets were used in support of a Jupiter missile test and the Deacon-Arrow Rocket performed its mission entirely satisfactorily. I feel our program was successful because of the excellent cooperation and working relations extended by your company to our project personnel."

Dr. von Braun went on to specifically acknowledge the efforts of Kenneth Crowder (5143), Harold Vaughn (5141), William Walker (5143), Charles Force (5141), Hermann Wente (5141) and L. B. Smith (5111) and to express general appreciation to other Sandia personnel

who assisted those named.

The chaff rocket program at Sandia Laboratory was started in December 1957. Even after the successful use of the rockets in the Pacific "Hardtack" series of nuclear tests the program was continued due to their use in research studies of winds at 200,000 to 300,000 ft. altitudes. In connection with these studies more than 65 chaff rockets have been launched at Sandia's Tonopah Ballistics Range in Nevada.

The rocket is two-stage with the six-inch diameter portion called the Deacon and the three-inch diameter stage called the Arrow. The chaff ejection nose fits over the Arrow.

During a joint meeting of the American Meteorological Society and the American Rocket Society in El Paso last October, the Sandia-developed rocket was discussed by L. B. Smith in a technical paper. Although the Army was already sending test rockets up before and after every missile shot, Sandia Corporation was asked to provide information and hardware on its development. Later Mr. Wente, Mr. Walker and Mr. Crowder assisted at Cape Canaveral during the first firing.

During development parts were fabricated in Sandia Shops. Since the development is complete, manufacture of most of the parts for the Deacon-Arrow rocket is sub-contracted to commercial firms, however the parts are assembled here. The rocket's cost is approximately \$3,000 each and reliability of 93 per cent has been achieved.

Paper on Sandia Reactor To Be Read at Nuclear Technology Conference

"The Sandia Engineering Reactor Facility—A Facility for Radiation Environmental Testing" will be presented at the Third Industrial Nuclear Technological Conference in Chicago Sept. 22-24.

The technical paper, written by John Colp and A. W. Snyder of the Radiation Effects Division 1626, describes Sandia's reactor facility now under construction in Area III. It is scheduled for completion in January 1961.

A. Y. Pope Will Present Paper In Europe to NATO Group

A technical paper, based on the design of the pilot model of a high temperature hypersonic wind tunnel under construction at Sandia, will be presented by A. Y. Pope in Marseilles, France, during a meeting next month.

The Advisory Group for Aeronautical Research and Development, composed of NATO country representatives, invited the Supersonic Tunnel Association to hold a five-day joint meeting to discuss advancements and problems.

Technical papers will be delivered by 26 Americans, followed by brief discussions. After the meeting, members of the American group will visit wind tunnel facilities in four other European countries.

According to Mr. Pope, manager of Sandia's Aerodynamics Department, the paper he will present is based on the activities of personnel of both the Experimental and Design Aerodynamics Divisions.

The pilot model, with a test section five inches in diameter, was designed to operate at Mach 3-9 at temperatures up to 2500° F. Its primary purpose is to prove some unique features of the 18-inch hypersonic tunnel.



A. Y. Pope

personnel tunnel.

In addition, the pilot model will provide a research facility for early work in calibrating total temperature probes and for evaluating heat-transfer gauges, pressure transducers, water-cooled strain gauge balances, and other instrumentation for use in the 18-inch tunnel.



John Taylor and Frederic W. deLacy—welcoming the new Coronado Club manager—



published every other Friday for the employees of sandia corporation, contractor to the atomic energy commission

VOL. 11, NO. 17 ALBUQUERQUE, NEW MEXICO AUGUST 21, 1959

Journal of American Statistical Association Carries Article by Two Sandia Scientists

An article by two Sandia scientists appeared in a recent issue of the Journal of the American Statistical Association.

"Correlation Between Sample Means and Sample Ranges" in the June issue of the publication is the work of Bernard Ostle, Statistics Section 1592-1 supervisor, and George P. Steck, supervisor of Quality Assurance Procedures Division 5511.

The article has application in statistical quality control techniques. Correlation between the mean and the range is investigated for sampling from symmetric and asymmetric populations. It is shown that when the sampling is from any symmetric population with finite variance, the correlation is zero. However, zero correlation does not imply symmetry. The information is useful in interpretation of patterns of variation exhibited by production control charts.

Mr. Steck has been with Sandia Corporation since 1955. He has taught at the University of California, Department of Mathematics and Physics. He has had technical articles published in Annals of Mathematical Statistics and University of California Publications in Statistics.

He earned his A.B. degree from

Two Educators Are To Speak Before Sandia Colloquium

"Comments on the Geneva Test Ban Conferences" is the title of a talk to be presented at a Sandia Corporation Research Seminar on Tuesday, Aug. 25. Speaker will be Professor Kenneth Watson, University of Wisconsin.

The Seminar will begin at 1:15 p.m. in the theater building, 815. Tickets will not be required to attend, Craig Hudson (5111), Research Colloquium chairman, reports.

A Colloquium meeting is scheduled on Thursday, Aug. 27. Dr. Nicholas Kurti of Oxford University will present "Theories and Applications of Very Low Temperatures." The meeting will begin at 9:30 a.m. in Bldg. 815.



Bernard Ostle and George P. Steck
"Correlation Between Sample Means and Sample Ranges"

the University of California in 1945, M.S. degree in 1947 from the California Institute of Technology, and his PhD in statistics from the University of California in 1955.

Mr. Ostle has been with Sandia since 1955. Previously he had taught at the University of Minnesota, Iowa State College and at Montana State College where he was also Director of the Statistical Laboratory.

He is the author of a textbook, Statistics in Research, and his

technical articles have appeared in Advances in Food Research and Industrial Quality Control.

Mr. Ostle is a member of the American Society for Quality Control, American Statistical Association, Operations Research Society and Institute of Mathematical Statistics.

A graduate of the University of British Columbia he holds a B.A. and M.A. degree from that school. His PhD degree was earned in 1949 from Iowa State College.

New Manager of Coronado Club Has Long Experience As Food Supervisor

Frederic W. deLacy will take over the reins of the Coronado Club managership for Anderson-Dunham Co., concessionaires, beginning next week.

He will replace John Taylor who has held the position for the past five years. Mr. Taylor is returning to Anderson-Dunham Co. headquarters in Del Mar, Calif., to become comptroller for the company.

Commenting on his term as club manager, Mr. Taylor said, "During the past five years I've seen the club program grow and

expand. Club membership has increased as well as club activities. The in-plant food service volume has also expanded.

"I have enjoyed my stay in Albuquerque and have known many wonderful friends. I will be back occasionally for visits."

Mr. deLacy comes to Albuquerque from the Anderson-Dunham Co. in California. He was recently employed by Harry Curland Catering Co. as food manager for the Los Angeles and Hollywood Park turf clubs, a position he held for 13 years.

INFLATION COST

the people of **NEW MEXICO**

\$777,500,000

1947-1955

OR 8.3

TIMES MORE THAN WAS SPENT FOR
SCHOOLS
(CAPITAL OUTLAY, '47-'59)

OR 15.7

TIMES MORE THAN
HOSPITALS
(TOTAL ASSETS, 1957)

OR 1.7

TIMES ESTIMATED COST
HIGHWAYS
(INTERSTATE & DEFENSE)

OR 1.3 TIMES TOTAL OF ALL THREE!

SOURCE: National Assoc. of Manufacturers, Stanford Research Institute, Western Highway Inst., America Hospital Assn., Inst. for Social Science Research (Freeman), NEA.

Congratulations

Born to:
 Mr. and Mrs. Donovan B. Browning (1331) a son, Robert Michael, on July 23.
 Mr. and Mrs. Dave Byrne (5141-1) a daughter, Victoria Marie, on Aug. 3.
 Mr. and Mrs. Bill Pumphrey (5143) a daughter, Mary Susan, on Aug. 5.
 Mr. and Mrs. J. C. Eckhart (5250) a daughter, Audrey Lucille, on Aug. 6.
 Mr. and Mrs. S. L. Johnson (5544) a son, Jonathan Mark, on July 27.
 Mr. and Mrs. R. A. Govig (2544) a son, Todd Alyn, on Aug. 10.
 Mr. and Mrs. D. W. Rockwell (1313) a son, Rex William, on Aug. 11.
 Mr. and Mrs. Roy M. Tidwell (5231) a son, David Mathew, on July 31.
 Mr. and Mrs. Dean B. List (5231) a son, Mark Vernon, on July 29.
 Mr. and Mrs. Gabriel Chavez (2232) a daughter, Dolores M., on Aug. 12.
 Mr. and Mrs. Gene Guerin (2221-2) a daughter, Stephanie Carmel, on July 16.
 Mr. and Mrs. Ed Carpenter (4411-6) a daughter, Brenda Louise, on Aug. 9.
 Mr. and Mrs. Dick Jones (4412) a son, Van Allen, on Aug. 13.
 Mr. and Mrs. Bernardo Gallejos (4212) a son, Anthony Michael, on Aug. 1.
 Mr. and Mrs. John R. Ames (1423-3) a son, Michael John, on July 31.
 Mr. and Mrs. Henry A. Stuckert (1423-4) a son, Henry Michael.
 Mr. and Mrs. Ralph O. Work (1432-2) a daughter, on Aug. 6.
 Mr. and Mrs. M. L. Merritt (5130) a daughter, Jeannine Karen, on Aug. 9.



Carmen Montoya (5131)

Weddings and Engagements

Maxine Elliott (3452) and David Kessel (1621) will be married



Maxine Elliott

Oct. 4 at the Bethel Methodist Church in Moline, Ill.

Maxine has been at Sandia since last November and her fiance has worked here a year.

Two Livermore Laboratory employees, Joan L. Kincaid (8212-2) and Holman V. "Val" Peterson (8213-2), were married Aug. 1 in Carson City, Nevada. After a short honeymoon at Lake Tahoe they moved into their new home at 613 South S Street.

Joan has been employed since Feb. 24, 1959, and Val, who transferred to Livermore in February, has been with the Corporation since 1948.

October 17 has been set as the wedding date for Joan Holland (AEC) and Bill Jacoby (5131). The ceremony will take place at St. Charles Catholic Church in Albuquerque.

Bill has been with Sandia Corporation about a year.

Bowlers Needed

Sandia Base major bowling league has an opening for one more team.

The league is a 865 maximum scratch league and bowls on Wednesdays at San Mateo Lanes. Any team that would like to join the league may contact Gene Daniels (4413-2) at ext. 52164.

New Daughter

The George E. Byards (8232-2) family has a new addition, an 11-year-old blonde named Linda. They also have a 16-year-old daughter, Shirley Jene.

Take a Memo, Please

Here's a maxim to remember:
four-wheel brakes are useless
without foresighted drivers.

Damp TV Baptism

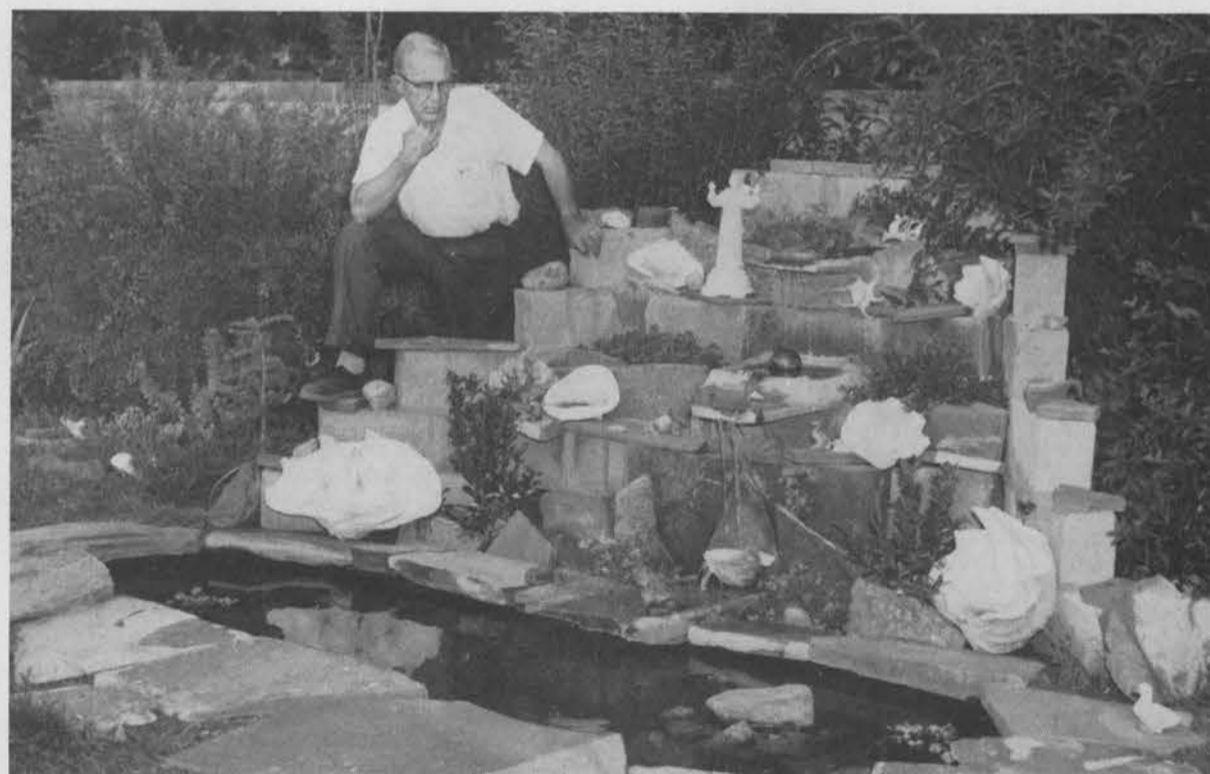
"Bal" Campbell (4320) made a damp debut on television recently to publicize the Sandia Base charity benefit carnival. Just before his cue on "The Morning Report" a member of the crew on the set reached over his head for a cup of coffee and spilled the whole thing on Bal. Fortunately his suit was dark enough that the stains did not show on TV but he doesn't recommend the routine as a means of relaxing tense program participants.

Sympathy

To Dee Jaramillo (1320) for the death of her father in Albuquerque, Aug. 9.

To George Ison (3441) for the death of his mother recently.

To Ciriaco Herrera (4574) for the death of his mother-in-law in Magdalena, N. Mex., Aug. 13.



COOL SOUNDS of splashing water add to the attractiveness of this fish pond built by S. A. McCollum (5215) in his backyard. Sea shells ob-

tained in the South Pacific are displayed along with plaster frogs and ducks. Recirculating pump provides constant flow of water for fish in pond.

New Home Owners

Jolene Stillwell (4423-2) and family have moved into a new home at 2909 Wisconsin NE.

There's also a new address for Hal Widdows (5141-2) and family, now at 1024 Luthy Circle NE.

Howard Romme (4152) and his family are settled in a new home at 9817 Leyendecker Rd. NE.

Sept. 1 has been chosen by Stewart E. Whitcomb (5131) for moving into his now home at 432 Sierra SE.

Wedding Anniversary

Mr. and Mrs. Alcadio M. Romero (2722) celebrated their 20th wedding anniversary on Aug. 19.

Get Well Wishes

R. K. Crawford (4232-2) was en route to Texas for a vacation when he suffered an attack of appendicitis. He was returned to an Albuquerque hospital for an emergency operation.

Friends in 2723-3 and 2713 extend wishes for a quick recovery to Howard Sloane, who is convalescing at home from a recent illness.

Hopes for a fast recovery are passed along to Marie Terry (5231), who underwent major surgery recently.

Wishes for a speedy recovery are extended to Georgia Howard (5251), who is recovering at home from a recent illness.

Get well wishes are extended to Winston French (4252-3), who has been hospitalized.

Rebel Riders Horse Show

The South Valley Rebel Riders will hold their fourth and last open horse show of the year on Sunday, Aug. 23, at 1 p.m. at their arena on south U. S. Highway 85, opposite Adobe Acres.

Everyone is welcome to attend as a spectator or a participant. Advance entry fees for each class are 35 cents for members and 50 cents for non-members. There is no charge for admission to the grounds.

For further information call Betty Tatum, CH 2-9021.

Inflation May Ruin You . . .

Inflation will destroy the United States unless it is stopped! This is not an extravagant statement. It has authority behind it. This authority is an expert on the destruction of nations.

Nikita Khrushchev boasts that "American capitalism will be destroyed without a war." He has inflation in mind as one of the weapons we'll use against ourselves.

In eight years (1947-1955) inflation has cost the citizens of New Mexico more than \$777 million. These figures have been compiled by the National Association of Manufacturers. Lack of availability of reliable figures for the past four years makes it impossible to compile how many additional millions have been lost.

The serious trend toward inflation began in 1947. Except for a few leveling off periods, it has shown an increase every year since.

The figure mentioned in the chart accompanying this article, \$777,500,000, was obtained by subtracting for each year between 1947 and 1955 the difference between personal spendable income in terms of the current year's dollars and personal spendable income in terms of 1947 dollars. The difference between these two amounts represents the year-by-year loss to inflation by residents of this state.

But, serious as it is, inflation can be stopped. Here's how:

1. Live within your income.

Be choosy: buy only what you need; don't overburden your budget with credit purchases. Lower demand will help bring prices down.

2. Put out the finest work you can — all the time.

If every producer in the country works more effectively the result is more production at lower cost. This means lower prices and more dollar savings. All that brings true prosperity, not inflation which might look like prosperity.

3. Put part of your income into savings.

If you don't have one, start a savings program. Set a savings goal and strive to achieve it through savings accounts, life insurance or U. S. Savings Bonds.

4. Make yourself heard in government.

Demand more thrift in local, state and federal government. Demand fewer services which add to deficit spending programs of the government. Encourage the officials of your governments to spend your money wisely, and to live within its income. Tell your governmental representatives to fight inflation.

Nautical Salvage

Ralph Richards (8141-1) and Matt Oliver (8163-1) are in the midst of a lusty debate over maritime salvage rights. It seems Matt's cabin cruiser went kaput recently and Ralph had to tow him in with his cruiser. Ever since Ralph has been joyfully claiming salvage rights while Matt has stoutly insisted he's not liable because it all happened only 25 feet from shore. Bob Finlayson (8143), who was water-skiing at the time and had to swim in, isn't saying a thing.

Welcome Back

Department 4250 welcomes back Bob Lachance (4253-1) after an extended illness.

Friends in Department 5310 are glad to see Mac McKeever (5313) back after an illness of two weeks.

Do-It-Yourself Victim

Anthony Toya, teller in Financial Division 6021, is recuperating at home from injuries suffered in an accident. He was repairing the roof of his home when the handle came loose on a bucket of melted tar he was carrying up a ladder. As the bucket fell the hot tar splashed up in his face. Tony was hospitalized for five days.

SANDIA LAB NEWS

The Sandia Lab News is an official publication of the Sandia Corporation, Albuquerque, N. M.
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 Editor: Robert S. Gillespie

Donald E. Graham, Cherry L. Burns, June Leonard
 William A. Jenkins, Livermore Laboratory, Livermore, Calif.

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Sandia Evening School to Offer 54 Classes During Fall-1959 Semester

Catalogues for the fall session of Sandia Corporation Evening School will be distributed on the booklet racks about Sept. 1. General Training and Education Division 3132 conducts the Sandia Evening School, offering a record 54 courses this fall.

Course in Key Punch Operating Offered at St. Joseph College

A course for IBM key punch operators will be taught for the first time this fall at St. Joseph College on the Rio Grande by three Sandia women.

The instructors will be Joan Adkins (3452-3), Josephine Ryan (4132-3) and Dorothy Saiz (4132-3).

Classes will start Sept. 1 with two months of study required to complete the 60 hour course. The three-hour sessions (7-10 p.m.) will be held on Monday, Wednesdays and Fridays one week and Tuesdays and Thursdays alternating weeks.

Students must pass an entrance test for the class. Tuition for the course is \$150.

An innovation will be courses conducted specially for second shift employees. Courses are free to all Corporation employees, but textbooks must be purchased by the student.

Evening school classes will begin Sept. 14 and continue 16 weeks. Enrollment, starting Sept. 1, may be accomplished by filling out the enrollment cards contained in the booklets and sending them to Division 3132.

Classes for employees are presented evenings on Sandia premises with Corporation employees as instructors. This semester two courses are being offered at the Albuquerque High School.

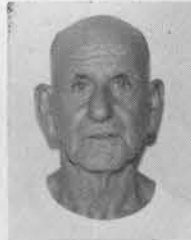
Division 3132 personnel are available to answer questions or provide counselling for employees desiring to enroll in Sandia's Evening School or in evening courses offered by Albuquerque public schools. Employees may call ext. 47255.

James H. Hall to Retire After Nine Years at Salton Sea

A familiar face will be missing at Salton Sea after Aug. 31 with the retirement of James H. Hall (4581-2).

Mr. Hall is a utility equipment operator and has been with the Corporation at the California installation since December 1950.

He and his wife will continue to live in Westmorland at 645 Western Ave. (P. O. Box 144) and Mr. Hall plans to be a farm equipment salesman. Their son, James Jr., is a security sergeant at Salton Sea.



Mr. Hall

J. V. Hunt Plans To Retire From Sandia August 31

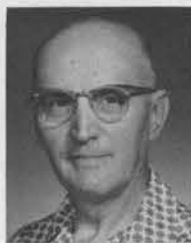
J. Verlin Hunt will retire from Sandia Corporation Aug. 31 after 12 years.

After joining Sandia Corporation he set up the plating shop, started Sandia's foundry and was a section supervisor of that section. He is now in Mechanical Services Section 4211-3.

Mr. Hunt and his wife, Ruth (4211-1), live in the Montecello subdivision of Tijeras Canyon (Rt. 5, Box 5448). Eight years ago their house was set amid the mesquite and boulders. Now, under Mr. Hunt's "green thumb", flowers, shrubs and trees almost surround their home.

Mr. Hunt plans to spend much of his time gardening and "there are always those jobs around the house I have been putting off."

They have three grown children.



Mr. Hunt

Curtain Opens

Sandia Employee Visiting Russia With Group of Technical Librarians

Right about now Ruth Farley (3421-1) is somewhere in Russia.

Even though she is away from her job in Sandia's Technical Library Division, she'll be in a variety of technical libraries during her vacation.

Ruth is on a two week librarians' tour of Soviet libraries. The itinerary includes stops in Leningrad, Moscow and Kiev.

Before leaving last Friday Ruth said, "I'm especially looking forward to a visit to the All Union Institute of Scientific and Technical Information in Moscow. This is one of the largest institutes of its kind and employs about 3,300 persons in preparing abstracts and translations of technical articles."

The group of 25 Americans with whom Ruth will tour includes librarians from the University of California, Redstone Arsenal and Library of Congress as well as representatives from public libraries and children's libraries.

To make the experience more worthwhile, Ruth has been studying Russian in recent months through a course at Kirtland AFB and from Marcel Weinreich, Sandia translator.

Ruth will spend two weeks in western Europe visiting Vienna, Venice, Florence, Rome, Naples, Lucerne, and Paris before returning to Sandia.

Volunteer Deputy Sheriff L. D. O'Neal Always 'On Call' for Police Work

When Lloyd O'Neal (3447) returns to his home in Sandia Park after a day as TSSR for Quality Assurance 5500, he never knows whether he will be able to turn in early for a good night's sleep or not.

Lloyd is a Deputy Sheriff with the Bernalillo County Sheriff's Department and "on call" continually. For the past six years he has spent many sleepless nights helping with road blocks during flood emergencies or patrolling the highway in Tijeras Canyon during heavy traffic weekends.

The job began for Lloyd when the people of Sandia Park petitioned the Sheriff's Department for some kind of police protection so Lloyd volunteered to "do what he could."

Police work comes naturally to Lloyd. He worked with the Sheriff's Department in Caddo Parrish, La., for several years and served with Army Intelligence during World War II. One of his assignments with Sandia was to help train the first civilian guard force for the Laboratory. In the early days of the Lab, military police manned the gates of the Tech Area. Lloyd took the new civilian guards through an extensive classroom and range training program prior to the switchover.

As a Deputy Sheriff, Lloyd wears a uniform during his duty hours and patrols in his special Studebaker Power Hawk with police lights and siren under the hood. Lloyd gets a real satisfaction from contributing his efforts to the enforcement of law and order. The one part of his volunteer job that he does not enjoy is manning a road block.

He remembers one particular road block when an armed robbery had been committed in Albuquerque and one man had been killed. "You stop every car," Lloyd says, "and you never know what to expect. You have to assume that



Lloyd O'Neal
—Volunteer Bernalillo County Deputy Sheriff—

each car might carry the men you're looking for. If it does, you are openly exposed to gunfire from probably desperate men. After a few hours, you get edgy. After a night of this, you're beat."

Coronado Club Swimming Team Closes Season Winning Five Meets, Losing One

Coronado Club swimming team completed a successful season last week-end. The team has won all except one of the six official meets.

The swimmers are coached by Bob Martin and his assistant, John McLay (1420).

More than 100 youngsters turned out for pre-season team trials. From those 50 were chosen, ranging in age from 10 years up.

During the Rocky Mountain AAU meet in Denver, the Coronado Club girls team was rated second in the nation in the 200 meter three star relay event. Team members are Peggy Marshall, Phyllis and Sandy Williams, and Judy Harrison.

L. C. Garcia Completes 11 Years at Sandia; Retires August 31

Leandro C. Garcia will retire Aug. 31 after working for Sandia Laboratory nearly 11 years.

Since he has been a night-shift janitor (4574) the entire period, Mr. Garcia figures he may have a little difficulty getting used to sleeping nights instead of working.

He plans to do a little gardening and also hopes to do some fishing.

Mr. and Mrs. Garcia and their daughter live at 1513 Walter SE.



Mr. Garcia

On Guard Duty

C. E. Sandy and Charles Barnes (1432) have been attending the New Mexico National Guard Encampment at Fort Bliss, Tex., for the past two weeks.



SANDIA PHOTOGRAPHERS (from left) Bill Laskar, Dick Hodges and Bob Hall (all 3462-1) were honored by the Professional Photographers Association during national convention in Los Angeles recently when prints by the trio were selected for exhibition.

68 in Three Months

Sandia Technical Papers Sent To AEC Information Service

During the past three months 68 technical papers written by Sandia Corporation engineers and scientists have been submitted to the AEC's Technical Information Service at Oak Ridge, Tenn., for the Civilian Application Program.

The papers are given standard distribution throughout the AEC complex and made available to the public through the Office of Technical Services, Department of Commerce, Washington 25, D.C.

As Sandia technical papers are prepared, the Lab News reports presentation or publication. Among the papers mentioned above are the following that have not been previously reported:

"Resilient Cushioning Materials," L. T. Wilson (1282); "Underground Mining with Nuclear Explosives," R. S. Smith (4421); "Analytical Characteristics of Aircraft," A. R. Iacchetti (5242); "Type and Quantity of Data Available at Sandia Corporation on Pulse Radar Return from the Ground," C. H. Bidwell (1454) and C. S. Williams (1454).

"Relative Cratering Efficiency of Nuclear Exposives," L. J. Vortman (5112); "Crater Studies—Desert Alluvium," B. F. Murphey (5112); "Shear Strength of Simply Supported Prestressed Concrete Beams Having Web Reinforcement," R. E. Holt (4543); "The Theory and Design of the Triggered Spark Gap," T. J. Williams (1457).

"Impact Physics — A Sandia Corporation Bibliography," R. A. Graham (5132); "Radiation Effects Testing at the Los Alamos Godiva II Facility," L. P. Zipprich (1626); "Transistors Applied to an Operational FM-FM Telemetry System," C. B. McCampbell (5232). "Temperature Measurements on

High Speed Missiles," G. E. Reis (5223); "Precision Weighing with Commercial Platform Scales," E. T. Gay (1651); "A Miniaturized Aided-Tracking Control," R. L. Shaum (5222); "Complementary Roles of Destructive and Non-Destructive Testing in Development Program," D. W. Ballard (2541), C. E. Bild (1620) and A. F. Cone (5510).

"Note on Satellite Density Observations," J. W. Reed (5111); "Operations Research and Systems Analysis," M. J. Norris (5121); "Random Motion Vibration Testing," J. C. Jordan (1611); "Use of the Action Integral in EW Studies," G. W. Anderson (5131); "Large Exploding Wires—Correlation to Small Wires and Pause Time Versus Length Dependency," F. W. Neilson (5133) and E. C. Cnare (5131); "The Electrical Behavior of Fine Wires Exploded by a Coaxial Cable Discharge System," T. J. Tucker (5132); "A Survey of Infrared Radiation," G. W. Rolloson (5221).

Now It's Football—Officials Needed For Coming Season

With the second Sandia Corporation Flag Football season scheduled to get underway early in September, Services and Benefits Section 3122-1 has issued the call for officials.

Any employee interested in officiating at flag football games is urged to contact George Banos (3122-1), ext. 29157.

The league will be organized after organizational representatives have been announced. Teams will be organized within superintendencies.

AEC-SC Golf Tourney To Be Played Sept. 12 On University Course

Second annual AEC-Sandia Corporation handicap golf tournament is scheduled Sept. 12, according to C. C. Fornero (3153), Sandia chairman. The tournament will be started at the University of New Mexico course from 10 a.m. until noon.

Sandia Corporation and AEC employees are eligible to compete. Mr. Fornero urges captains of Corporation golf leagues to canvass their teams and submit entries to him or to Services and Benefits Section 3122-1, ext. 29157. Mr. Fornero may be reached by calling ext. 36259.

The best diving prospect is Bruce McLay, who has only been beaten twice in three years.

"Support of the team by the members' parents has been terrific," according to Coach Martin. "During officiating clinics held around town this summer about 80 per cent of those present have been Sandia people."

The team is hoping to participate again this year in the Southwest AAU Championships in El Paso, which it won in 1958.

Throughout the summer Bob Martin has also given swimming instruction to 320 beginners. Of these 102 have already passed their swimming exam.

The team comprised of men 17 years and over is considered one of the best in the Southwest. It includes: All American Bob Reed from the University of Iowa, who competes only in the free style sprint; Dick Weick, another All American from Texas A&M who has been beaten only once in 15 meets; Dave Harrington (1626) from the Carnegie Tech swimming team, and John Sollenberger, who placed third recently in the national 100-meter backstroke event at Tempe, Ariz.

One of the most promising juniors is Bob O'Bryan, 14, who has won every race he has competed in this summer.

Supervisory Appointments

ROBERT R. HARNAR to supervisor of Weapon Evaluation Section B, 5522-2, Quality Engineering Department.

Bob has worked in the Quality Assurance organization during his entire eight years at Sandia.

Previously he was assistant editor for a machine design magazine in Cleveland. Bob also worked in the Cleveland diesel division of General Motors.

Both his Bachelor's and Master's degrees in mechanical engineering were obtained at Case Institute of Technology. Bob is a member of Tau Beta Pi, engineering honorary, and is a registered professional engineer in Ohio and New Mexico.

During World War II Bob served three years in the Navy submarine service, part of the time in the South Pacific.

BYRON F. MURPHEY to supervisor of Nuclear Burst Simulation Division 5112, Nuclear Burst Department.

Originally Byron came to Sandia Laboratory 10 years ago and became supervisor of Burst Studies Division (now 5111) in 1951. He terminated in August 1953 and returned to Sandia a year ago.

In the interim he was physics section leader for Minnesota Mining and Manufacturing Company, St. Paul.

Byron's background also includes four and a half years with the Naval Ordnance Laboratory, Washington, D. C., as a physicist in development and field testing of mine location equipment. From 1946-48 he held a junior research fellowship from the National Institute of Health, Bethesda, Maryland, while attending graduate school.

Byron holds a Bachelor's degree in physics from Montana State University, and Master's and Doctor's degrees in physics from the University of Minnesota. He is a member of the American Association of Physics Teachers, a fellow of the American Physical Society, and a member of Sigma Xi and Pi Mu Epsilon, honorary societies.



8200 SUPERVISORS at Livermore present a leather-bound memory book to Charles W. Campbell before his return to Albuquerque as

Vice President Administration, 4000. The book is replete with pictures of the Livermore valley and the San Francisco Bay Area.

Sandia Authors Prepare Papers for Midwest Conference at U. of Texas

Dr. E. A. Ripperger, Sandia consultant from the University of Texas working this summer in Applied Sciences Division, is co-author of two technical papers which will be presented Sept. 9-11 at the Midwestern Conference on Fluid and Solid Mechanics. The conference will be held at the University of Texas.

"A Comparison of Surface Strains to Average Strains in Longitudinal Wave Propagation" was written in collaboration with R. A. Graham (5132).

This paper compares surface strain measurements of stress waves propagating in a cylindrical aluminum bar with average strain measurements obtained from a quartz crystal sandwiched in the bar.

Compare Results

The authors compare experimental results in a qualitative way with theoretical predictions based

Anti-Vandalism Drive In National Forests Is Launched by Citizens

Sandia Corporation employees with a yen for the out-of-doors are joining in a nationwide crusade.

The crusade: The curbing of vandalism in national parks and forests.

Photographs of acts of vandalism are sought as a part of the campaign. They will be reproduced and used in educational programs of picnickers and campers. Send them to Mrs. Julian N. Robarge, 19024 15th Avenue NW, Seattle 77, Wash.

Lovers of the great outdoors, and there are many of them among your fellow workers, urge all persons using national parks and forests to take care of the facilities, keep grounds litter free and encourage others to do the same.

on the work of Pochhammer-Cree and Davies. The theoretical predictions are found to be qualitatively correct.

The second paper, "Strain Rate Effects on Stress-Strain Characteristics of Aluminum and Copper," was written by Dr. Ripperger with Dr. J. W. Turnbow of the University of Texas staff. The authors discuss in the paper the problem of obtaining suitable data of the type required for applying the Malvern strain-rate theory to studies of plastic wave propagation.

The authors perfected an experimental technique designed to overcome some of the difficulties encountered by previous investigators and report results obtained by this technique.

Bannister Paper

Also presented at the Conference will be a technical paper by J. R. Bannister (5150).

Mr. Bannister's paper is a study of dust particles in blast waves and effects on dynamic pressure gauges. It describes a study of accelerating air with suspended particles of a density comparable to the air itself traveling at various speeds within the air flow.

The study led to the construction of specialized dust gauges which have been successfully tested and used in the field.

Using a dust tube, particle drag coefficients for simple aerodynamic shapes were examined and results are reported in the paper.

European Tour

Lorena Schneider (8100) flew to New York last week (Aug. 10) on the first leg of a nine-week vacation tour of Europe. In New York she boarded the French liner FLANDRE, which sailed Aug. 12 for England. She also plans to visit Holland, Germany, Switzerland, Austria, Italy, and France, returning to New York on Oct. 3.

D. B. Owen Writes Foreword to New NBS Publication

D. B. Owen (5125) has written a foreword to a new publication of the National Bureau of Standards, U.S. Department of Commerce. Title of the book is "Tables of the Bivariate Normal Distribution Function and Related Functions." It is a part of a series on applied mathematics.



D. B. Owen

Mr. Owen is the author of several published articles and technical papers dealing with aspects of statistics. He is supervisor of Sandia's Statistical Division of the Systems Analysis Department 5120.

He has been with Sandia for five years coming here from the Statistical Laboratory of Purdue University. He taught mathematics at the University of Washington six years prior to the Purdue position.

He holds PhD, Master's and Bachelor's degrees in mathematics from the University of Washington.

LRL Family Day

The Lawrence Radiation Laboratory extended an invitation to Livermore Laboratory employees to attend a Family Day Aug. 8, marking the opening of the new Mechanical and Electronics Engineering buildings at LRL. Exhibits and equipment were displayed.

It's Time to Register For League Bowling at Coronado Club Alleys

Bowling teams for the Coronado Club league—both adults and juniors—are being organized for the coming season.

Registration for the junior league bowlers will be held Saturday, Aug. 29, at the club at 9 a.m. on a first come, first serve basis. The age limits are 10-15.

Adults interested in bowling are asked to contact the following league officers before Sept. 1:

Monday League, R. C. Lawwill, ext. 22162; Tuesday league, Arlene Held, ext. 37270; Wednesday League, Jim Reese, ext. 26141; Thursday League, Ed Wood, ext. 37248, and Friday League, R. H. Marmon, ext. 25150.

Livermore Lab Golfers Among RLRA Winners

Among the winners of a recent Radiation Laboratory Recreation Association sponsored golf tournament at Hillview Golf Course were five Livermore Laboratory employees.

Roy Wilcox (8114-1) was the Second Flight trophy winner with a net 66 and Mickey Rindone (8114-2) also placed with a net 67. Other winning players were Jack Bonetti (8234-1), Paul Stuart (8114-4), and Walt Dzugan (8212-1).

The next RLRA golfing event will be the annual golf championship tournament at Almaden Golf Course on Aug. 22.

King-Sized Do-It-Yourself Urge Results in 750 Square-Foot Den

Visualize building a den 14 feet wide and 54 feet long and you'll have some idea of what Bob Whitford (1625) has done with his leisure time the past two and a half years.

The size didn't seem so immense when Bob started the project, but 5,000 bricks later wife Martha, who is secretary to R. W. Henderson (1000), began to wonder about the expense of furnishing the huge room.

"The biggest job was pouring the concrete floor," Bob said. "Fortunately friends helped."

The walls are constructed of cement block, faced with brick on the outside and paneled with mahogany on the inside. The Whitford's 16-year-old son became quite experienced in mixing mortar.

When Bob finally got the roof up Albuquerque experienced its its record breaking Christmas week snowfall. Friends invited to enjoy an evening of fireside talk were busy emptying tin cans as the water drip, drip, dripped through the roof. Many repairs and one fall-off-the-roof later Martha helped Bob install the ceiling tiles. She also helped stain and varnish the panelling and made the curtains.

In addition to a large fireplace in the center of one wall, the den also features a barbecue with revolving spit at one end. The opposite end of the room has closets and a window seat with storage underneath. Furnishings will include two sofas, a ping pong table, dining set and hi-fi. Martha says of her builder husband, "I'm so proud of him."



BUILDER BOB WHITFORD relaxes in the large den, which he added onto his home. His wife, Martha, lounges beside the fireplace. Charlotte

Adair, wife of W. R. Adair (AEC), gives a neighborly look to the barbecue cooking area, which includes an electrically-turned spit and oven light.



Sandia Corporation Has Worked
34 Days
Without a Disabling Injury

HERE'S WHY...

Because Sandians know that even though the human body is remarkably efficient, awkward positions and misuse of muscles can result in acute pain. To prevent possible strains and dislocations, twisting and over-reaching should be avoided.

British Measuring Device Improved by Suggestion from Sandia

A modification of a British precision measuring device by Joe Moody (1651) greatly increased the range of the machine and has been adopted by the manufacturer.

Mr. Moody, supervisor of Length Measurements Section of the Physical Standards Division 1651, felt that Model 180 Interferometer which uses light beams to calibrate gauge blocks could be improved.

After discussing the problem with personnel of the U. S. Bureau of Standards and the manufacturer's representatives, the change was made.

The instrument had the limitation of being able to measure up to one inch only, however, it was extremely precise in making micro-measurements. By substituting a special cathodeless Mercury 198 lamp for the regular cold cathode Mercury 198 light source of the machine, the range of the instrument was increased to four inches.

Using this modification, the Interferometer has been reissued as Model 190 by the manufacturer.

No Monkey Business Here

Deadly Serious Animation Used in Training Movies Produced by Sandia Corporation

Out of an endless purple void a glowing orange speck becomes a thundering missile. Growing in size until it occupies the entire movie screen, the rocket ejects its nose cone and begins to tumble. The nose cone trajectory is followed to earth.

This sequence in a Sandia Corporation-produced military training film takes only five seconds. It took a technical illustrator some six weeks to prepare the 130 individual drawings that were "animated" to make up the scene.

Cartoons of Bugs Bunny or Mr. McGoo are commonplace. The technique of photographing drawings to make them move is called "animation" and it has become a useful tool in Sandia's military training films.

Animation is used to supplement live action, to depict areas or operations that cannot be photographed such as the missile sequence mentioned above. It also portrays simply and graphically complex mechanical movements.

Good for Emphasis

Using animation, artists can emphasize important points by "popping in" arrows, circles or captions. Diagrams of circuits can be made to function by animation

to show a series of events occurring in any order or time sequence required.

Abstract ideas can also be expressed by using animated symbols. An example would be animated atomic symbols to explain the working of a nuclear fission process.

Preparing animation for Sandia's military training films is a joint undertaking by Technical Training Division 5313, Technical Art Division 3463 and Motion Picture Division 3465.

Technical Training Division personnel prepare the movie script, decide the need and use of animation and work as producers and directors of the film.

Artists of Technical Art Division follow the script, confer with the directors and produce the hundreds of drawings necessary to depict the needed action.

Motion Picture Division provides the photographers and equipment to film and process the production.

Background Panel

Drawing a sequence of animation first calls for the artist to prepare a background panel or a set of backgrounds if needed. Then he starts drawing the action on



SCRIPT CONFERENCE on a technical training film is held by from left C. W. Allen (5313), script writer and technical advisor of the film, C. W. Johnson (5313), producer and director, and Bob Matthews (3465), who handles the animation photography.

sheets of clear plastic called "cells". The cells are fitted over the background panels and the artist begins the meticulous job of drawing pictures that move.

Any sort of movement is depicted step by step. If a man is to walk in the movie, the artist has to paint dozens of drawings moving the position of the legs, hands and body only a fraction of an inch in each cell.

The drawings are usually photographed a single "frame" at a time by the animation camera. When the film is run through the projector at the rate of 24 frames per second, the image on the screen appears to move. Sound effects and background music are added to accent the feeling of action in the movie.

Modest Budget

"We don't try for a 'Walt Disney' effect in our drawings," Wally Ives, Technical Art Division supervisor, says. "We make the drawings factual, informative, technically accurate and we produce them on a considerably smaller budget."

The important thing for the films, Wally says, is for them to accurately and completely communicate with the military audience which sees them. These men utilize the products of Sandia Corporation and the films are a necessary part of their training.



TECHNICAL TRAINING film director E. W. Kersten (5213) monitors a projected sequence of animation against the movie script. Purpose of the movies is to help train military personnel to operate Sandia-produced ordnance equipment.



TECH ARTISTS Orin Pederson, left, and Bob Newman, center, discuss an animation sequence with Technical Art Division supervisor Wally Ives. Spread on the table are plastic "cells" that are photographed individually over background. Twenty-four cells make one second of film time.

Mountain Club Members to Go Where It's Cool

Cool, high mountain country will be the New Mexico Mountain Club's destination for the next two week-ends.

On Sunday members and guests will leave their cars at Sandia Crest and hike northward along the 10,000 ft. rim. The trail offers a panorama of the Rio Grande Valley and possible glimpse of big-horn sheep.

On Aug. 29 Ralph Holloway (1461) will lead a hike along one of the many scenic trails in the Pecos Wilderness area. The 20 mile drive up the Pecos river to Cowles, start of the hike, is one of the state's most scenic mountain roads.

All trips start from Nob Hill at 7 a.m.

Beginning Bowlers Needed

The Jewelette Bowling League is looking for beginners to play on their eight teams. The women will bowl Tuesday nights at the Coronado Club. Participants must be members of the Coronado Club. For further information call Arlene Held at ext. 37270.

An organizational meeting will be held Tuesday, Sept. 1, at 7:30 p.m. in La Cana room of the Coronado Club.

Political IQ Good But Proof Reading Ability Shows Slip

Sandia employees report they came through with flying colors when they took the examination on political acumen published last issue in the Lab News.

However, the Sandia Lab News proof readers flunked the test flat when they allowed a printer's error to remain. As any student of the government knows the line of succession for the office of President if the President dies or resigns is the Vice President and then the Secretary of State. Not the Speaker of the House, as our type gremlin had it.

Thorny Sabotage

Hank Welch (4512-2) heard a noise during the night while he was on a fishing trip at Platero dam on the Conejos River in Colorado. He thought it was probably a bear cub scratching itself on his car bumper. Flashlight inspection revealed only an "innocent" little porcupine sitting beside a tire.

Next morning Hank opened the hood to check on carburetor trouble. Lo, behold, the radiator hoses were chewed up and porcupine quills were sticking out of the radiator and battery. Hank patched, spliced and taped and finally was able to drive away.

Operators of a nearby lodge told him porcupines had done about \$1000 worth of damage to cars and trucks during the past year by eating the insulation off wires.

Welcome Sandia Corporation Newcomers

Aug. 3-14	
Albuquerque	
John F. Ayala	3464
Secundino Baca	4574
*F. Joanne Bauer	3461
Ronald G. Cheek	4413
Doris M. Cole	3126-6
Peggy J. Dangler	3126
Robert D. De Zeeuw	5151
Gregorita Esquivel	3126
Carole E. Hickman	3461
Patricia A. Hancock	3126
Jessie S. King	5142
Eugene A. Koenig	3452
Dorothy K. Krause	4581
Paul A. Luke	6021
Thomas M. Luna	4233
Elaine C. Prairie	3126
*Mary A. Sanchez	3423
Oren F. Stemple	4581
Walter A. Stark	5112
Ellwood A. Stevens, Jr.	4233
Nancy M. Vierling	2713
Lyle Wetherholt	3442
Indiana	
Julius R. Blum, Bloomington	5120
* Denotes Rehired	
Returned from Leave	
Gregorita Esquivel	3126
Leoma B. McMillan	3462
Rosemary A. Penn	3126
Horace M. Poterf	1423
Robert A. Costales	3464
Dorothy F. Gray	3126-1

At Livermore Laboratory, June 25-Aug. 6	
Arizona	
Jay J. Jost, Glendale	8223-1
California	
David M. Abrahams, Burlingame	8124-2
Judith A. Adams, Danville	8212-3
James F. Barham, Jr., Berkeley	8123-2
Tommy L. Bryant, Brentwood	8232-1
Kathryn H. Callow, Castro Valley	8223-3
Patricia A. Cole, Oakland	8212-3
Leopold F. Daniel, Oakland	8223-3
Daniel E. Dewhirst, Fresno	8223-4
Phyllis E. Earthman, Oakland	8212-3
Virginia G. Epps, Livermore	8232-1
Oliver A. Fick, Livermore	8223-2
Allen Foo, Hayward	8223-2
Shirley M. Heller, Hayward	8212-2
Regina L. Kamp, Livermore	8234-1
Lois J. Knudson, Livermore	8212-3
Marilyn C. Lorenson, Livermore	8212-2
Bonnie S. Mackey, Newark	8212-3
John M. Masterson, Roseville	8123-2
Rick E. Maxwell, Livermore	8232-1
James N. Mosley, Castro Valley	8123-1
Pasquale A. Portolese, Tracy	8232-1
Ronald L. Puckett, San Francisco	8114-3
Barbara A. Reitz, Livermore	8233-2
Esther D. Rickert, Livermore	8212-3
David Rierson, Livermore	8114-1
James F. Schon, San Bruno	8114-4
Henry L. Stratmann, Livermore	8224-1

Elizabeth A. Walker, Castro Valley	8212-3
Charles R. Walker, Livermore	8225-2
Mary M. Watkins, Livermore	8212-3
Louis A. Wright, Jr., Fresno	8122-1
Warren D. Zechmeister, Lodi	8114-4
Kansas	
Ralph D. Cozine, Manhattan	8153-2
New Jersey	
Robert F. Schaefer, Sayreville	8153-2
Ohio	
Charles M. Shanabarger, Toledo	8161-3
Gordon K. Van Gundia, Dayton	8152-2
Oregon	
Donald J. Bohrer, Corvallis	8152-2
Melvin E. Brown, Corvallis	8153-2
George R. Dunbar, Oregon City	8115-2
Hartley J. Jensen, Corvallis	8122-2
Elizabeth H. Juckeland, Klamath Falls	8121-1
Harold F. Norris, Jr., Corvallis	8121-2
Pennsylvania	
Theodore H. Thomas, Jr., Harrisburg	8116-1
Texas	
Glenn R. Herreid, Fort Worth	8122
Leslie R. Jones, Fort Worth	8122-1
Dusan M. Pegan, Arlington	8153-2
J. D. Porter, Fort Worth	8121-3
Washington	
David K. Dean, Pullman	8141-2
Robert F. Facer, Seattle	8141-2
Ronald L. Halley, Jr., Seattle	8116-1
Arnold S. Rivens, Seattle	8141-1
Gerald E. Strandin, Lynnwood	8121-2