

CALTECH NEWS

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ASCIT president Bob Fisher talks with Phyllis Anwyl (left) and Sharon Long, two of 32 women undergraduates admitted for the fall semester. Thirty are incoming freshmen and two are sophomores. The girls are living in refurbished rooms in Blacker and Dabney Houses.

Tech welcomes frosh with new orientation

Orientation procedures for new students at Caltech had a thorough remodeling this year. Instead of being spirited away to the San Bernardino Mountains for New Student Camp shortly after they arrived on campus, the class of '74 stayed right here for a three-day introduction to the Institute, to each other, and to southern California.

For the 30 women and 190 men in the freshman class, the Thursday-through-Saturday (September 24-26) orientation was mandatory. The transfer students (two sophomore women, nine sophomore

men, and eight junior men) were also invited.

David Wood, associate dean of students; Peter Miller, director of admissions; and David Smith, master of student houses, presided over assemblies on the Athenaeum lawn. President Brown, dean of students Robert A. Huttenback, and ASCIT president Bob Fisher welcomed the newcomers to Caltech. Talks on student life at the Institute were given by Lyman Bonner, director of student relations; Ian Hunter, Institute psychologist, and ASCIT vice president Leonidas Guibas.

The first two days were filled with campus tours, lunch in various student houses, informal discussion groups liberally larded with faculty members, and seminars in which professors discussed their research activities. Forty-two upper-class counselors shepherded the freshmen.

On Friday afternoon the president and Mrs. Brown held their second annual swim and pizza party around the Caltech pool. There was a theater party in Beckman Auditorium that evening.

On Saturday the alumni association offered the new students a variety of optional bus tours around southern California: to the Corona del Mar marine laboratory, the Hale Observatory at Palomar, the beach, or explorations into Los Angeles and Hollywood.

National Clean Air Car Race winds up on Caltech's Olive Walk

This was the summer of the Clean Air Car Race at Caltech. What originated as a simple cross-country race between two electric-powered cars in 1968 turned into a nationwide competition this year.

Organized by students of Caltech and MIT—the original cross-country racers—this year's Clean Air Car Race was open to students of any college who thought they had an answer to pollution emissions.

Harold Gordon, Caltech graduate student in biology, was the western coordinator of the race. Other Caltech students on the organizing committee were John Stricklin, Blair Folsom, Charles Seiter, Jim Swindell, Norm Pendegraft, Joe Davis, Howard Stover, and Marendra Gupta.

More of a rally than a race, the stated objectives were (1) to assess vehicle technology, (2) to determine emission characteristics, (3) to publish technical papers, and (4) to create public awareness.

More than 90 entries originally signed up for the competition, but only 44 cars from 37 institutions qualified for the start of the race at the MIT campus in Cambridge, Mass. Among the qualifiers were two cars powered by natural gas and driven by Caltech students Mike Lineberry, Alan Coltri, Jim Henry, Joe Lyvers, Greg Kandel, and Dave Viano.

The race was run in seven one-day legs. The cars left MIT on Monday, August 24, and stopped the first night in Toronto, Canada. The other overnight stops on the 3,600-mile trip were at Ann

Arbor, Michigan; Champaign, Illinois; Oklahoma City, Oklahoma; Odessa, Texas; and Tucson, Arizona. The final leg of the trip took the entrants from Tucson to the Caltech campus in Pasadena.

Caltech president Harold Brown and Mrs. Brown, along with Alumni Association president William Freed and Rose Bowl Queen Pamela Tedesco, were in the crowd of spectators and TV cameramen greeting the cars as they crossed the finish line next to the Winnett Student Center on Sunday evening, August 30.

A car driven by students from the University of California at Berkeley was the first to finish the final leg from Tucson to Pasadena at 4:45 p.m. President and Mrs. Brown were still waiting when the two Caltech cars, held up by an overheated support truck, finished three hours later.

After two days of testing and a procession to the Pasadena City Hall (where the mayor greeted the drivers and proclaimed "Low Pollution Day") the winners of the 1970 Clean Air Car Race were

Continued on page 3



Drivers of Georgia Tech's entry in the Clean Air Car Race, among the first to cross the finish line at Caltech, get a warm welcome from Harold Gordon, western coordinator of the race.

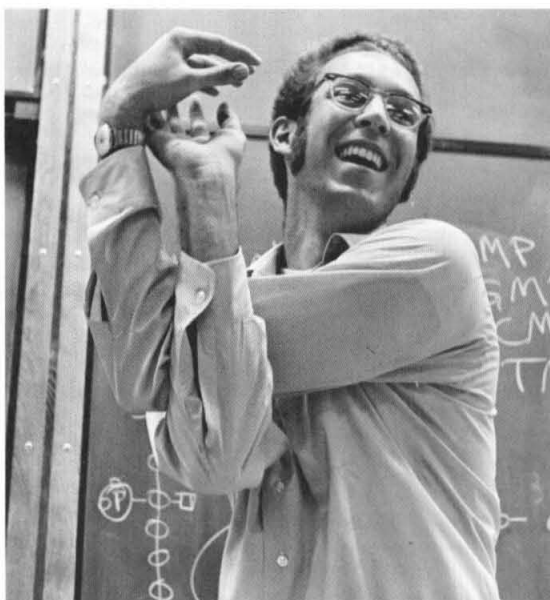
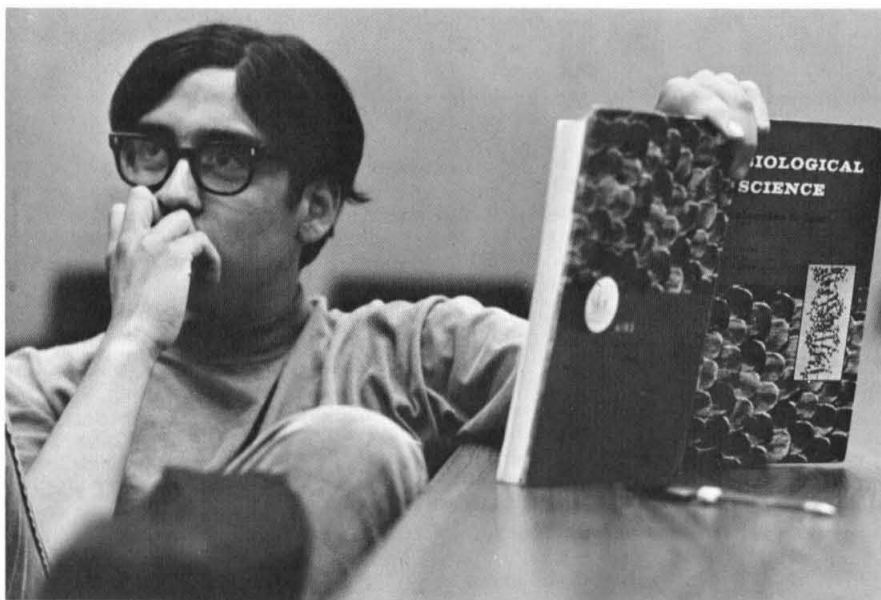
Professors named for four chairs

Bing Professor of Behavioral Biology

James Olds is the first holder of the chair in behavioral biology given by Peter Bing, M.D., and his mother, Mrs. Anna Bing Arnold, through the Bing Foundation.

Olds' discovery of self-reinforcing brain centers has contributed to the understanding of the physiology of motivation, learning, and memory. He has also contributed productive theories and ideas about how the brain processes, analyzes, and stores information, and about how it makes decisions. His current experiments constitute a new attack on the locus and mechanisms of learning and memory storage in the brain.

Continued on page 2



Institute establishes new chairs

Continued from page 1

Institute Professor of Physics

William A. Fowler has been named to the first Institute Professorship, awarded by Caltech to give special honor to outstanding members of the faculty.

A pioneer in investigating the nature of nuclear forces of the light chemical elements, Fowler developed the idea that nuclear processes make the stars shine, and that chemical elements in stars evolve from the light to the heavier elements.

Fowler has also made contributions to current knowledge of nuclear forces and reaction rates, nuclear spectroscopy, and the structure of light nuclei. His current research centers on the general relativistic effects in quasar and pulsar models.

Lee A. DuBridge Professor of Astrophysics

Jesse L. Greenstein is the new Lee A. DuBridge Professor of Astrophysics. This chair is funded by gifts of The Associates of the California Institute of Technology and named in honor of Lee DuBridge, president of the Institute from 1946 to 1968.

Greenstein is expert in the discovery of peculiar stars and the study of their composition from their spectra. In collaboration with Caltech physicists he developed the now accepted theory connecting differences in the compositions of stars with the nuclear energy-producing processes occurring in their interiors. At Palomar he has studied the spectra of low-luminosity white dwarf stars, with particular reference to the final stages of cooling and fading of stars.

Albert Billings Ruddock Professor of Biology

Max Delbruck has been appointed to a chair given in honor of Albert Ruddock, chairman of the Institute's Board of Trustees from 1954 to 1961, and a member of the board from 1938 until his death last July.

Delbruck, winner of the 1969 Nobel Prize in physiology and medicine, was honored for his discoveries concerning the replication mechanism and genetic structure of viruses that set the foundation for molecular genetics. Since that time his research interests have shifted to sensory physiology. Using sporangiophores of the fungus *Phycomyces* as a model system, Delbruck has studied stimulus transduction in order to clarify the molecular nature of the primary transducer processes of sense organs.

Research highlights student summer work

Campus activities this summer included two programs continued from last year and one brand-new one. Carried over were the ASCIT Research Center pollution project and the high school science project. Internships in community action were awarded to three students in a new venture that was sponsored by the Institute and the Caltech YMCA.

Forty-five students from Caltech and 18 other colleges were on campus to do research on air pollution, working under a \$45,000 grant from the National Science Foundation. Air pollution studies have maintained a top priority in ASCIT Research Center activities since the center was started in 1967. To date, the air pollution project has provided summer work for more than 120 students and has received grants totaling \$250,000.

Most of its research this summer was tied into the Clean Air Car Race. Groups made studies of internal combustion engines powered by "clean" gasoline and by natural gas. They also studied electric cars, gas turbine engines, and steam cars. One group made a study of mass transit alternatives to private transportation, and another considered social factors and possible social changes involved in the control of air pollution.

The second summer of the high school science project enabled 26 Pasadena ninth graders to use Caltech laboratories and the talents of faculty and graduate students. Sixteen attended a morning course in high school biology at Blair High School and spent the afternoon at Caltech in small tutoring groups run by four graduate students. The other ten worked in laboratories with a faculty member or a graduate student.

The students were chosen by Lee Browne, Caltech director of secondary school relations, from the applications submitted. Those who attended Blair were selected as students who could profit from formal instruction, indicated by their interest and their junior high school records. They completed the course in seven weeks and received ten units of high school credit. Half of them had attended the summer program last year.

Those chosen for laboratory work at Caltech were students who had already proved themselves capable of self-directed activities either in previous work at the Institute or in junior high school.

Bob Brackenberry '70, George Bosworth '72, and Arvind Vermani '71, worked 12 weeks in a pilot program designed to strengthen Caltech's ties with the Pasadena community. The trio spent a portion of their time in Northwest Pasadena in voter registration activities. They also became acquainted with Pasadena civic leaders and business, industry, and political figures, and have set up a file of individuals and organizations for the benefit of Caltech community members who may need such information. They will maintain a community information office on campus during the fall.

'45 class holds 25th reunion at Homecoming, Oct. 23-24

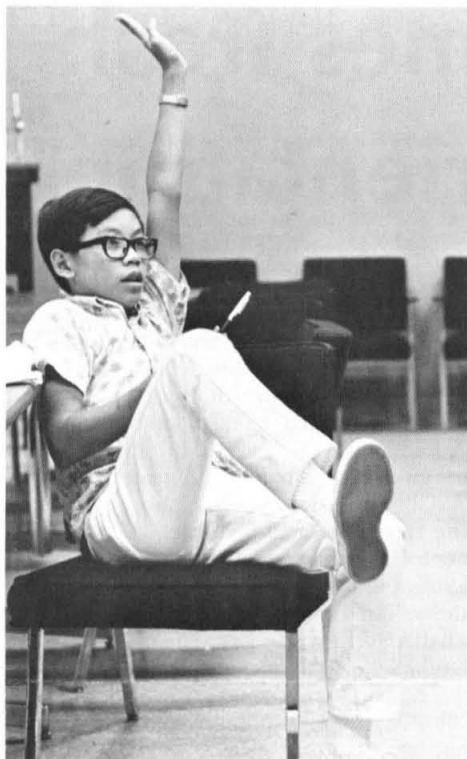
The twenty-fifth reunion of the class of 1945 and Caltech's third annual Alumni Homecoming are scheduled for Friday and Saturday, October 23 and 24.

Activities on Friday begin at noon at Brookside Park with a golf and tennis tournament for all interested alumni. Players are invited to stay at Brookside in the evening for a no-host cocktail party at 5 p.m. and dinner at 7 p.m. (\$6.00 per person).

For the members of the class of '45 there will also be a campus tour at 3 p.m., followed by a no-host cocktail party in the Athenaeum at 5 p.m. and dinner at

6:30. Slides and movies of the class of '45 will be shown after dinner.

Saturday's Homecoming activities include three home athletic events, a picnic, and a post-game cocktail party. At 10 a.m. Caltech will play Occidental College in soccer, and at 10:30 the varsity water polo team plays an alumni team—a first for Homecoming. Following the picnic, where beer and soft drinks will be provided—with alumni and their families bringing their own lunches—the Caltech football team will meet the UC Riverside frosh at 1:30. All alumni are invited for cocktails in the Athenaeum after the game.



Summer high school project

Daily two-hour classes at Caltech this summer concentrated on molecular biology but were aimed at getting students excited about learning subjects taught in the regular Pasadena high school curriculum. Above right, Bill Beranek, one of the four graduate student teachers, is describing a double helix. ("We got into more biology than we ever anticipated," he says. "We're all chemists—so that was exciting for us too.")

Tutors used the lecture method of teaching but encouraged open discussion and lots of questions. After school, students had a chance to meet informally for swimming, tennis, basketball, and an occasional movie.

Leading experts to discuss environment at conference

Leading scientists, technologists, social scientists, and humanists will take part in a conference on "Technological Change and the Human Environment" to be held October 19-21 in Beckman Auditorium. It is the third of four conferences sponsored by Caltech's Industrial Associates this year to discuss ways of solving social problems through science and technology.

James J. Morgan, Caltech professor of environmental engineering, who organized the conference, says he hopes it will help catalyze the development of activities in the environmental and social sciences at the Institute. Participants in the conference will base their papers on one of three basic questions: What is happening in the human environment now? Where are we heading? What can we—and what should we—do?

Caltech professors who will give papers at the conference are Jack McKee ("State of the Art: Technology for Control of Water Pollution"), A. J. Haagen-Smit

("State of the Art: Technology for Control of Air Pollution"), Sheldon Friedlander ("Environmental Forecasting"), Norman Brooks ("Flow of Energy and the Environment"), Harrison Brown ("Flow of Materials and the Environment"), and Roger Noll ("Institutions and Techniques for Managing Environmental Quality").

Experts from outside the Institute include Robert Dorfman, professor of economics at Harvard University; Thomas F. Malone, meteorologist from the University of Connecticut; Emmanuel Mesthene, director of the Program on Technology and Society at Harvard; Harvey Perloff, urban designer from UCLA; Clifford Russell, staff member of Resources for the Future; and Frederick Smith, ecologist now teaching at Harvard's graduate school of design.

Constantinos Doxiadas, the Greek urban planner, will give the only public lecture on Tuesday night, October 20, in Beckman: "Urban System of the Future."

Caltech pays final tribute to Ruddock

Albert Billings Ruddock, chairman emeritus of the Caltech board of trustees, died on July 24 at the age of 84. A memorial service was held at Beckman Auditorium on July 31 with tributes from President Harold Brown; Arnold O. Beckman, chairman of the board of trustees; attorney Herbert L. Hahn, a trustee; Robert Huttenback, dean of students; and Robert Sharp, professor of geology.

At its regular meeting on September 14, the board of trustees unanimously passed a resolution expressing appreciation and esteem for Albert Ruddock as a friend and benefactor of the Institute, and conveying condolences to members of his family.

Ruddock was associated with Caltech for more than 40 years. He was one of the original 100 founders of the Associates and served as president of the organization from 1937 to 1944. In 1938 he was elected a trustee of Caltech and served as board chairman for seven years from 1954 to 1961. One of the undergraduate student houses was named for him, and an Albert Billings Ruddock professorship was established just this summer.

Associated with many southern Cali-



Albert Ruddock

fornia educational, cultural, business, and philanthropic institutions, Ruddock was also president of the Southwestern Development Company, an oil and gas exploration firm. He was formerly a diplomat, having served as secretary of the American embassies in Berlin and Brussels, with the American legation in Peking, and with the State Department in Washington.

Lindvall, Keighley retire after long Caltech careers

Frederick C. Lindvall, professor of electrical and mechanical engineering, becomes professor emeritus this month. Chairman of Caltech's division of engineering and applied science for 23 years, he retired as division head in 1968. Since then he has been on leave of absence as vice president of Deere & Company in Moline, Ill., and as a consultant for the President's Office of Science and Technology.

Lindvall received his bachelor's degree in railway engineering at the University of Illinois in 1924 and his PhD in electrical engineering at Caltech in 1928. He then joined the General Electric Company as an engineer. In 1930 he returned to Caltech as an instructor, became an assistant professor in 1931, associate professor in 1937, and full professor in 1942.

He was named division chairman in 1945 and guided the division through tremendous diversification over the next 20 years. His own research interests have been concentrated in the areas of vacuum switching, glow discharge phenomena, railway equipment, vibration and dynamics, and research management. He has been a prominent spokesman in engineering education and has traveled widely as a result of his work in this field.

Lindvall is a member of the National Academy of Engineering and of the National Research Council, and is a fellow of the American Society of Mechanical Engineers and the American Institute of Electrical and Electronic Engineers. He is also a recipient of the Lamme Award, given by the American Society for Engineering Education for distinguished teaching and research.

Geoffrey L. Keighley, 68-year-old research associate in biology, retired this summer after 40 years of teaching and research at the Institute. He has contributed to the understanding of protein synthesis, the effects of high altitude on people and animals, and to the isolation of the hormone erythropoietin which

stimulates the production of red blood cells in bone marrow.

Keighley recently collaborated with physicians from Los Angeles Childrens Hospital in the therapeutic use of erythropoietin, and spent this last summer at Jackson Laboratory at Bar Harbor, Maine, as a visiting investigator of the physiology of the hormone.

Born in Morecambe, England, Keighley graduated from the University of Toronto in 1926. He earned his MS and PhD degrees from Caltech and was appointed senior research fellow here in 1946. Keighley has served on the National Research Council subcommittee on nutrition and physiological stress in industry.

New administrative posts

Secondary school relations

Lee F. Browne, well-known Pasadena educator and high school science coordinator for the Pasadena city schools, is director of Caltech's new office of secondary school relations. He is working with the Institute's director of student relations, Lyman Bonner.

Browne has a special interest in developing methods of selecting and guiding students from minority groups. During the past year he has been working closely with Caltech on the junior high school science project. This program brought 24 ninth-grade students from diverse educational and cultural backgrounds to the campus in the summer of 1969, and was then continued through the school year with a weekly science laboratory at Washington Junior High School in Pasadena and Saturday morning sessions at Caltech.

During the coming year Browne will be helping faculty committees evaluate and improve Caltech's secondary school recruiting programs. He will also be concerned with pre-matriculation preparation for students who are not qualified for Caltech by the usual standards of grades and tests, but who show talent and motivation for studying science.

Browne, who has been teaching science since he was 15 years old, graduated from West Virginia State College, received his master's degree in general science from New York University, and has done additional work at Syracuse University. Before coming to California in 1955, he taught at Tuskegee Institute and at New York University, where he developed physical science demonstration techniques for teachers.

Browne has also taught at Valley Junior College in San Fernando and at John Muir High School in Pasadena. He became a chemistry teacher and science department head at Pasadena's Blair High School when it opened in 1964, and has been science adviser for Pasadena's secondary schools since last February.

Development

Truman F. Clawson is the new director of development at Caltech. He comes to the Institute from the University of Alaska where for the past three years he was a special assistant to the president of the university, responsible for development and for coordination of activities among the university's six campuses. He

also directed the University of Alaska Press.

Clawson was executive director of the Alumni Association at the University of Utah from 1963 to 1965 and coordinated alumni activities with the university's development program.

A native of Utah, Clawson attended the University of Utah in Salt Lake City where he earned a BS degree in accounting and economics in 1953 and a doctor of jurisprudence degree in 1955. In 1956 Clawson opened and for the next ten years directed one of the state's largest travel services.

Placements

William F. Nash, alumnus of Caltech and former vice president of C F Braun & Co, has been appointed associate director of placements at the Institute. His primary responsibility will be to help PhD candidates find employment in industry.

Nash got his BS degree in mechanical engineering from Caltech in 1938, his MS in 1939, and his PhD in 1942. He became an instructor in physical metallurgy at Caltech in that year, then worked for the Naval Ordnance Test Station in Pasadena as head of the metallurgy section from 1945 to 1947. He retired from C F Braun in 1969 after a 22-year association.

Executive officer for physics

Jon Mathews, professor of theoretical physics, has been appointed executive officer for physics, in the division of physics, mathematics and astronomy. He is assisting the new division chairman, Robert Leighton, in the administration and planning of the Institute's physics program.

Mathews, whose field of research is theoretical elementary particle physics, graduated summa cum laude from Pomona College and joined the Caltech faculty in 1957 after earning his PhD here. He has been active in campus affairs and has served as chairman of the committees on graduate admissions in physics, and on scholarship and financial aid to students.

Wayne State wins clean air race

Continued from page 1

announced at a banquet at the Athenaeum on Wednesday night, September 2.

A car driven by Wayne State University was declared the over-all winner. Their "best solution to pollution" was a 1971 Ford Capri with a 302 cu. in. V-8 engine running on unleaded gas. To control emissions, the Wayne State team used an exhaust gas recirculation system with air injection and catalytic reactors that reduced nitrogen oxides, hydrocarbons, and carbon monoxide.

Other winners were: Worcester Polytechnic Institute and Stanford University in the Internal Combustion Engine class; MIT in the Turbine class; Cornell University in the Electric class; and Worcester Polytechnic Institute and the University of Toronto in the Hybrid Electric class.

Winners were determined by a complicated formula, $S = E(P + R)$, where S is the total race score, E is the pollution emission factor, and P and R are performance and elapsed race time scores.



Mort Jacobs, '28, president of the Southern California Gas Company, gets an inside account of the race from Caltech's Greg Kandel, Joe Lyvers, Mike Lineberry, Dave Viano.

PERSONALS

1926

DONALD P. MACFARLANE writes to say he and the former Mrs. Ione Belcher were married at Westminster Presbyterian Church in Pasadena on May 25. The Macfarlanes are now living in Pasadena, after a wedding trip to Mediapolis, Iowa.

1929

THOMAS H. EVANS, MS '30, dean of engineering at Fresno State College, returns to full-time teaching this year. He has been a dean for 20 years: at Colorado State University; at the Asian Institute of Technology, Bangkok, Thailand; and at Fresno State.

1933

JOHN R. PIERCE, MS '34, PhD '36, has received an honorary Doctor of Science degree from the University of Nevada for his "long and distinguished career in science." He is executive director of the research-communications sciences division at Bell Laboratories in Murray Hill, N.J.

1937

IRVING ASHKENAS, MS '38, MS '39, received the Mechanics and Control of Flight Award from the American Institute of Aeronautics and Astronautics in August. He is vice president of Systems Technology, Inc.

JOHN R. AUSTEN, formerly plant manager for the Joy Manufacturing Company in Buffalo, N.Y., now holds the same position for his company in Waxahachie, Texas.

LEON HOROVITZ, formerly executive director of the Los Angeles County Heart Association, has resigned to accept the position of associate coordinator of California Regional Medical Programs, Area IV, at UCLA.

PAUL C. SCHAFFNER has been elected a senior vice president of Marsh and McLennan, Inc., international insurance brokers. He is currently a senior vice president of Marsh and McLennan, Inc., of California.

1942

ROBERT N. HALL, PhD '48, is one of the first recipients of a Coolidge Fellowship, recently established by the General Electric Research and Development Center in Schenectady, N.Y.

1945

DUANE McRUER, MS '48, president of Systems Technology, Inc., received the Mechanics and Control of Flight Award from the American Institute of Aeronautics and Astronautics in August.

1947

ROBERT K. RONEY, MS, PhD '50, formerly manager of Hughes Aircraft Company's space systems division, is now an assistant executive in a new space and communications operating group that is concerned with communications satellites.

1949

DALE D. RYDER, MS '50, a lieutenant colonel in the Air Force, received the Meritorious Service Medal upon his recent retirement. He last served as assistant deputy director for advance plans and technology for satellite programs in Los Angeles. He accrued 67 RF-4 Phantom reconnaissance missions during prior service in Vietnam.

1951

EUGENE N. PARKER, PhD, professor of physics and astrophysics at the University of Chicago, has been appointed chairman of the physics department.

1953

DAVID D. ELLIOTT, MS, PhD '59, has been appointed to the staff of the National Aeronautics and Space Council for a two-year term as scientific adviser. Elliott is currently head of the space radiation and atmospheric physics department of the Aerospace Corporation.

RICHARD W. FLYGARE, MS, ME '55, has been appointed deputy program manager of transportation systems for Sperry Rand Corporation's Univac Salt Lake City operations.

THOMAS STOCKEBRAND, formerly manager of process engineering for the Digital

Equipment Corporation, has been named communications engineering manager. He will be responsible for developing communications-oriented equipment based on the corporation's mini computer.

1956

WILLIAM H. HILDEMANN, PhD, has recently written a book, *Immunogenetics*, covering the interdisciplinary fields of tissue transplantation, cancer, and the genetic regulation of immune responsiveness. Hildemann is a professor and acting chairman of the department of medical microbiology and immunology at UCLA.

1957

CHARLES G. FULLERTON, MS '58, a major in the U.S. Air Force, has been decorated with the Meritorious Service Medal for his services as an astronaut in the flight crew division of the test operations directorate at NASA's Manned Orbiting Laboratory Systems Office in Los Angeles.

PETER M. MORETTI, MS '58, senior engineer with Westinghouse Electric's advanced reactor division, writes to say he is joining the School of Mechanical and Aerospace Engineering of Oklahoma State University in Stillwater as an assistant professor.



John R. Pierce, '33



Leon Horovitz, '37

1962

ROY S. JORDAN received his master's degree in mechanical engineering at the University of Santa Clara, California, on June 13, 1970.

1965

WARREN J. PEASCOE has joined the staff of Uniroyal, Inc.'s research center in Wayne, New Jersey. He received his PhD in chemistry from the University of Illinois.

1966

JAMES A. HALL, a process engineer for Esso Research in Whippany, N.J., begins two years of home mission service this fall in an urban ministry with the North Camden, N.J., Project of the Haddonfield, N.J., United Methodist Church.

1967

MRS. JEAN HEBB SWANK, PhD, has joined the faculty of Chicago State College as an assistant professor of physics.

1968

DAVID J. SHIRLEY has graduated at Sheppard AFB, Texas, from the Air Force data processing machine operator course. He is being assigned to Barksdale AFB, La.

1970

J. EDWIN BLAKEMORE, PhD, has joined Tennessee Eastman Company in Kingsport, Tennessee, as a chemical engineer in the research laboratories.

Obituaries

1928

MAXWELL F. BURKE in June 1970. Retired in 1968, Burke had been a civil engineer with the Los Angeles County Flood Control District since 1954.

1932

HERBERT S. ZUCKERMAN, on June 16. He was a professor of mathematics at the University of Washington, an institution he joined in 1939. He is survived by his wife.

1942

WILBUR D. CRATER, on August 5, of drowning, in Hawaii. A mechanical engineer, Crater had been with numerous engineering

firms in southern California. He held several patents and was a consultant to the U.S. Department of Transportation. He had retired in May from a position as general manager of the Glassco Instruments division of Kratos Co. He leaves his wife, Katherine, a son, and three daughters.

Membership in the Caltech Alumni Association (\$10 a year) brings:

- Engineering and Science magazine seven times a year
- Alumni Directory issued every three years
- Athenaeum membership privilege

Coming events

Friday & Saturday, Oct. 2 & 3, 8:30 p.m. Beckman

Matinee, Saturday, Oct. 3, 2:30 p.m. BAYANIAN PHILIPPINE DANCE COMPANY. Folk dances and music presented by the Columbia Artists Festivals Corp. \$6-5-4-3-2.

Saturday, Oct. 10, 8:30 p.m. Beckman ALEXANDER SLOBODYANIK, 26-year old prize-winning Soviet pianist, presented by S. Hurok. \$5-4-3-2.

Tuesday, Oct. 13, 8:30 p.m. Beckman GUY LOMBARDO AND HIS ROYAL CANADIANS. A special non-series band concert presented by Columbia Artists Management, Inc. \$6-5-4-3.

Wednesday, Oct. 14, 8 p.m. Beckman ENCOUNTER SERIES: Yvonne Loriod, French pianist and wife of composer Oliver Messiaen, performing his works. \$3.50, students \$2-1.

Friday & Saturday, Oct 16 & 17, 8:30 p.m. Beckman

LITTLE MURDERS, written by Jules Pfeiffer and performed by the Theater Now Troupe. \$5-4-3-2.

Sunday, Oct. 18, 3:30 p.m. Beckman GUARNERI QUINTET. A Coleman Chamber Concert performance of works by Haydn, Berg, and Dohnanyi. \$5-4-3.

Monday-Thursday, Oct. 19-21 Beckman "Technological Change and the Human Environment." Conference III of a series presented by Industrial Associates.

Monday, Oct. 19, 8:30 p.m. Beckman THE MODES OF SCIENCE. Lecture by George S. Hammond, Noyes Professor of Chemistry. Caltech Lecture Series. Free.

Friday & Saturday, Oct. 23 & 24. 25th Reunion for the Class of 1945. 3rd Annual Alumni Homecoming.

Monday, Oct. 26, 8:30 p.m. Beckman LUNAR ROCKS—ONE YEAR OF STUDY. Lecture by Arden L. Albee, professor of geology. Caltech Lecture Series. Free.

Tuesday, Oct. 27, 8:30 p.m. Beckman SILENT FILM SERIES. "King of Kings," one of Cecil B. de Mille's first Biblical epics. Series \$7-6, single \$2.50.

Friday, Oct. 30, 8:30 p.m. Beckman ARMCHAIR ADVENTURES: "Six Years Round the World" by Dwight Long. \$2.50, \$2.00.

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10 Casa Vieja, Orinda, Calif. 94563

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1329 Terrace Drive, Millbrae, Calif. 94030

Secretary-Treasurer

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2990 Cowper St., Palo Alto, Calif. 94306

Meetings: Engineers' Club, 16th floor, Hong Kong Bank Bldg., San Francisco. Informal luncheons every Thursday at 11:45 A.M. Contact Mr. Sigworth, 434-7700, Ext. 2918, on Thursday morning for reservations.

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Meetings: University Club, 1319 "K" St. Luncheon first Friday of each month at noon. Visiting alumni cordially invited—no reservation.

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The Caltech Placement Service may be of assistance to you in one of the following ways:
(1) Help you when you become unemployed or need to change employment.

(2) Inform you of possible opportunities from time to time.

This service is provided to alumni by the Institute. A fee or charge is not involved.

If you wish to avail yourself of this service, fill in and mail the following form:

To: Caltech Placement Service
California Institute of Technology
Pasadena, California 91109

Please send me: (Check one)

☐ An application for placement assistance

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Name

Degree(s) Year(s)

Address

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