

# CALTECH NEWS

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PUBLISHED FOR ALUMNI AND FRIENDS OF THE CALIFORNIA INSTITUTE OF TECHNOLOGY

## Job hunting: this year there's no easy catch

College students all over the country are having a tough time getting jobs these days, and Caltech graduates aren't an exception—any more.

Donald S. Clark, Caltech's director of placements since 1935, says this is the worst job market he has seen since the depression in the 1930's—and he doesn't expect any improvement next year. As recently as 1968, a majority of all Caltech graduates, regardless of degree, received at least one job offer, and a few students received up to eight. Now the competition is so rough that only the exceptional individuals are even being considered.

A recent survey conducted by the College Placement Council at 140 colleges and universities reports that offers to those with the Bachelors degrees are down 61 percent; Masters offers have decreased 12 percent; and Doctoral bids have declined 78 percent.

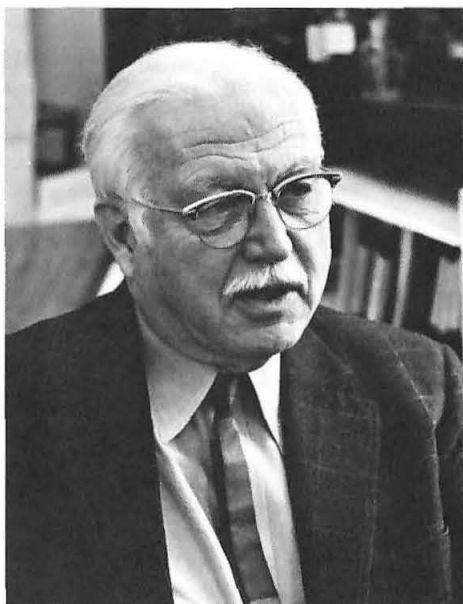
Survey results also indicate that schools like Caltech specializing in science and engineering have been the hardest hit. At the Bachelor's level, job offers for technical students declined 66 percent, compared to 48 percent for liberal arts students. The decline at the Master's level was entirely on the technical side, and for those holding Doctor's degrees, only chemical engineers received more than 20 offers—and they got only 24.

At Caltech's Placement Office, the situation is characterized by a 41 percent decrease in the number of organizations—chiefly aerospace, missile, and rocket device industries—interviewing on campus. In addition, the rising layoff rate in technical areas of employment has increased alumni requests for placement assistance. About 100 Caltech alumni are now listed as unemployed, and another 100 have registered for placement assistance with the fear of pending layoffs.

To help Caltech students in their search for positions, the Placement Office is conducting a series of four seminars this month on "How to Approach Getting a Job." The seminars, to be held April 13, 15, 20, and 22, will feature personnel experts from industry and government who will counsel students on such subjects as interview preparation and writing resumés and letters of transmittal.

ALUMNI  
SEMINAR DAY  
PREVIEW

see page 3



Sterling H. Emerson



Arie J. Haagen-Smit



Linus Pauling

## Three eminent professors retire

Three Caltech faculty members—Sterling Emerson, Linus Pauling, and Arie Haagen-Smit—have been named emeritus professors.

Sterling H. Emerson, noted for his investigations of complex genetic phenomena in living organisms and a member of Caltech's faculty for 43 years, is now professor of genetics, emeritus. A graduate of Cornell University of 1922, Emerson received his AM from the University of Michigan in 1924, and his PhD there in 1928; he then came to Caltech as assistant professor of genetics.

Emerson's research has included the study of genetic recombination—a process that is responsible for the generation of endless varieties of new kinds of plants and animals from preexisting hereditary variations. For his early experiments with this process, known as "crossing over," Emerson used the fruit fly, *Drosophila*, to study how two like chromosomes come together and recombine with one another.

More recently, he turned to fungi for the study of genetic recombination and another related process called gene conversion, in which tiny bits of one gene molecule are exchanged for bits from another gene. Emerson is building mathematical models to help explain gene conversion patterns that he and his associates have observed in fungi.

Emerson has also conducted studies of how organisms are able to build up hereditary resistance to drugs and antibiotics. Using the bread mold, *Neurospora*, and the drug sulfanilamide, Emerson was able to breed a new strain of *Neurospora* that not only was resistant to the drug, but actually required it to survive. Emerson's explanation of the mold's behavior has made a significant contribution to the development of a multiple drug or multiple antibiotic attack, which has become an important mode of therapy in controlling infectious diseases.

Linus Pauling, recipient of the Nobel Prize in Chemistry in 1954 and of the

Nobel Peace Prize in 1962, has been named professor of chemistry, emeritus, after 49 years of almost continuous association with Caltech.

A graduate of Oregon State College in 1922, Pauling received his PhD from Caltech in 1925 following graduate work under Arthur Amos Noyes. He became assistant professor of chemistry at Caltech in 1927 and full professor in 1931—the same year he was named the first winner of the American Chemistry Society's Award in Pure Chemistry.

In 1937 Pauling succeeded Noyes as division chairman and director of the Crellin and Gates Laboratories—positions he held until 1958. He continued his research and teaching at Caltech until 1964 when he became Research Associate in Chemistry. Since then he has also been a member of the staff of the Center for Democratic Institutions in Santa Barbara, and a professor of chemistry—first at the University of California at San Diego, then at Stanford University.

Pauling's work in chemistry has extended into experimental and theoretical physics in one direction, and into biology and medicine in the other. Until 1933,

his experimental work comprised the determination of the structures of crystals and of gas molecules, and his theoretical work included the discovery of basic principles concerning the nature of the chemical bond and the structure of molecules.

After 1933, Pauling turned to the problem of the structure of proteins. Through studies of amino acids of simple peptides and other simple substances related to proteins, he and his co-workers were able to predict the detailed structure of several proteins, including those found in bone, muscle, and red blood cells. One outcome of this work was the demonstration that sickle cell anemia is a molecular disease.

Arie Jan Haagen-Smit, pioneer in smog research and a member of Caltech's biology faculty for 34 years, has become professor of bio-organic chemistry, emeritus.

A native of Utrecht, Holland, Haagen-Smit received his AB, AM, and PhD from the university there, and then joined its faculty. His work on the isolation and synthesis of plant hormones gave him an

*Continued on page 2*

## NASA chief James Fletcher to speak at commencement

James C. Fletcher, PhD '48 and new head of the National Aeronautics and Space Administration, will be Caltech's 1971 commencement speaker on June 11. Fletcher, who received his PhD in physics, joined NASA last month.

Fletcher's career in the space sciences includes positions as director of the theory and analysis laboratory of Hughes Aircraft Company from 1948 to 1954, and director of Ramo-Wooldridge Corporation's Space Technology Laboratories until 1958, where he worked on development of the intercontinental ballistic

missile, the Thor intermediate range missile, and the first space probe, Pioneer IV. He was systems vice president for Aerojet-General Corporation and president of Aerojet's subsidiary Space-General Corporation until 1964 when he resigned to become president of the University of Utah.

Fletcher was elected to the National Academy of Engineering in April 1970 and, in October 1966, was one of the first recipients of a Caltech Distinguished Alumni Award.





**Cheers!** Board of Trustees Chairman Arnold O. Beckman (right) toasts fellow trustee and alumnus Simon Ramo on the opening of the 435-seat Ramo Auditorium in the new Baxter Hall of the Humanities and Social Sciences. Fittingly, after this ceremony, Ramo made another contribution—he gave the first talk in a new seminar series on systems engineering.

## Earthquake engineers

# Back to where it all began

When Mette Sozen, a structural engineer on the faculty of the University of Illinois, heard the news about the San Fernando earthquake on the morning of February 9, he cancelled everything on his calendar for the next few days and boarded the first plane for Los Angeles. He was the first of hundreds of visitors who streamed into the Thomas Engineering Laboratory to see Caltech's earthquake engineering men—George Housner, Donald Hudson, Paul Jennings, and Wilfred Iwan.

If it had not been for the seriousness of the event that brought them here, the week that followed the quake might have seemed like Homecoming, because earthquake engineers the world over are a group in which everybody knows everybody else. Sozen, for instance, knows Housner and Jennings well because the three of them formed an earthquake inspection team for the National Academy of Engineering after the 1967 earthquake in Caracas, Venezuela.

Many of the visitors were men who had received their training in earthquake engineering at Caltech under the direction of the late Romeo Martel, a member of the Caltech faculty for 42 years before his retirement in 1960. Martel built his life around earthquake engineering after seeing the devastating results of the Japanese earthquake of 1923. George

Housner, professor of civil engineering and applied mechanics (PhD '41), and Donald Hudson, professor of mechanical engineering and applied mechanics (PhD '42), became—with Romeo Martel—the nucleus of ever expanding work.

Caltech was once the only earthquake engineering center, but no longer. There are now two others in California—at UC Berkeley and UCLA. Donald Hudson spent six months in India helping to set up a center there, and Caltech engineers also cooperated in organizing earthquake engineering laboratories in Peru, Argentina, Chile, and Canada.

Hudson and Housner, and later Paul Jennings and Wilfred Iwan, Caltech professors of applied mechanics, have participated in earthquake engineering courses at a number of American universities, and Jennings recently spent a term lecturing at the University of Canterbury in New Zealand. Former students of these engineers are now doing earthquake engineering at the Universities of Hawaii and Michigan, and at Montana State. Members of the latest crop of advanced students are about to take off for their home countries of Mexico, Nigeria, Norway, and New Zealand.

One ironic outcome of this last quake was a personal loss to Housner—a box of glass slides of the 1923 Tokyo quake, given to him by Romeo Martel.

## Sloan fellowships

Thomas A. Tombrello Jr., associate professor of physics, and Edward C. Stone Jr., assistant professor of physics, have been awarded Alfred P. Sloan Foundation research fellowships.

Tombrello and Stone are among 77 young scientists who were selected for outstanding research potential on the basis of nominations by senior colleagues who are familiar with their work.

Tombrello is currently involved in a cooperative venture with the low temperature physics group in the Kellogg Radiation Laboratory to test the feasibility of building a superconducting linear accelerator for accelerating heavy ion beams. He is also working on the application of nuclear physics to solid state and astrophysical problems.

Stone's research is in the general field of cosmic rays. He is involved with several satellite and balloon-borne experiments for NASA. The experiments are designed to provide information on the origin of cosmic rays, their propagation in space, and their interaction with the earth's magnetic field.

## Placement Assistance To Caltech Alumni

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  
☐ A form indicating a desire to keep watch of opportunities although I am not contemplating a change.

Name .....

Degree(s) ..... Year(s) .....

Address .....

.....

## DIVISION REPORTS

### Biology

Eric H. Davidson is now at the Institute as associate professor of biology. His field of research is the molecular biology of animal development, and he is author, with Roy J. Britten, of a far-reaching theory of gene regulation in higher organisms. The theory is designed to explain how specific groups of genes are activated in an orderly and progressive way in the course of embryonic development. In his experimental work, Davidson uses the eggs of amphibians and marine invertebrates.

Davidson graduated from the University of Pennsylvania in 1958 and received his PhD from Rockefeller University in 1963. He remained at Rockefeller as research associate and then as assistant professor until he came to Caltech. His appointment fills the gap left in the biology division by the death of Albert Tyler in 1968.

Davidson's research collaborator, Roy J. Britten, will be on leave from the Department of Terrestrial Magnetism of the Carnegie Institution of Washington during the summer of 1971 to join Caltech's biology division as visiting associate.

### Humanities

In the first volume of the new *Munger Africana Library Notes*, published for the first time at Caltech in March, Edouard Maunick, a black Mauritian poet, tells about his ancestry, how he was affected by various racial feelings of his family and community, and the eventual influence upon him of Malagasy, West Indian, and African poets.

The *Notes* are the result of joint efforts of eight African scholars at the Institute: Edwin S. Munger, editor of the *Notes* and professor of political geography; Robert

Bates, assistant professor of political science; Margaret Rouse Bates, research assistant in political science; Kenneth Frederick, assistant professor of economics; Robert Huttenback, acting chairman of the division of humanities and social sciences and professor of history; and Robert Oliver, associate professor of economics.

Subsequent topics set for publication in 1971 are: "South Africa; Three Visitors Report"; "Choiseul Papers, Unpublished MS in 1761"; "How South Black African Visitors View the U.S."; "Current Politics in Ghana"; and "Walking 300 Miles with Guerillas through the Bush of Eastern Angola."

Most of the material will be generated from the library and from work in progress at Caltech by faculty, distinguished visitors, and research assistants. Subscriptions are \$10 a year, though prices of individual issues vary.

### Physics

The Outer Planet Missions, NASA's space experiment that is slated later in this decade to send space probes past the outer planets of the solar system—Jupiter, Saturn, Uranus, Neptune, and Pluto—and then out into space, is surely one of the most dramatic experiments yet planned. Numerous cosmic ray groups in this country have been competing for space for their experiments on the probe, and NASA has responded by forming a large study group, including all the major groups.

Professor Rochus Vogt, best known at Caltech for his courage in single-handedly delivering Physics 2 lectures to large hostile audiences, has been named team leader of this study group. Vogt's research focuses upon the astrophysical aspects of cosmic radiation; currently, he and Edward Stone, assistant professor of physics, are designing ionization chambers to detect extremely heavy nuclei in cosmic rays for the HEAO satellite that will be launched in 1975. Vogt received his SM from the University of Chicago in 1957 and his PhD there in 1961, then joined the Caltech faculty the following year.

The physics department was fortunate to suffer almost no damage during the Great Earthquake on February 9, except for the physics library in Millikan, which ended up on the floor—along with most of the other books in Millikan. The principal damage occurred in Kellogg Radiation Lab, where the 3 Mev Van de Graff accelerator suffered a rather spectacular mishap. A porcelain insulator inside the pressurized tank cracked, admitting high pressure nitrogen to the vacuum system. Among other results, a large bellows was torn apart, and most of the oil from the vacuum pump ended up dispersed through the accelerator room. The largest accelerator, the 12 Mev tandem Van de Graff in the basement adjacent to Sloan Lab, suffered only minor and temporary dislocations, and was back in operation in a few hours.

## Retiring professors

*Continued from page 1*

international reputation among plant biologists. He lectured at Harvard University in 1936, and became an associate professor in Caltech's biology division in 1937.

At Caltech, Haagen-Smit continued investigating the structure, determination, and synthesis of naturally occurring compounds of essential oils. From that work he turned to studies of the chemical constituents of flavors of foods such as onion, grape, and pineapple. In recognition of his work in oils and flavors, he was given the Fritzsche Award of the American Chemical Society in 1950.

After 1948, Haagen-Smit applied micro-analytical techniques that he had developed for his flavor studies to the chemical analysis of smog. Through his experiments with samples of condensed air, he ascertained that smog contained aldehydes, acids, and organic peroxides—the products of incomplete combustion and the causes of eye irritation. In 1949 he published his conclusion that the organic material released into the air—mostly hydrocarbons—was oxidized through the combined actions of oxides of nitrogen and sunlight to become photochemical smog.

The discovery of the previously unrecognized pollutants opened up a whole new field of air pollution research and development of air quality control regulations. As a result of Haagen-Smit's work, California leads the nation in the study and control of pollution sources.

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## CALTECH NEWS

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# SEMINAR DAY — something for everyone

The 34th annual Alumni Seminar Day, Caltech's largest alumni event, will be held on Saturday, May 15, when an array of 12 outstanding faculty members will present a series of lectures to bring alumni and their guests up to date on the latest developments in research and education at the Institute.

Lecture sessions begin at 9:30 a.m.—after alumni have registered in Dabney Garden—and continue until 5:30 p.m. Presentation of the Distinguished Alumni Awards, recognizing alumni for high achievement in science, engineering, business, industry, or public service, will precede an address by guest speaker, Lee DuBridge, president emeritus, at the 2:00 p.m. General Session in Beckman Auditorium.

During the lunch break, alumni will have a chance to see a color film of the 1969 Mariner Mars Mission at 12:45 and 1:15 p.m. in Ramo Hall in the new Baxter Hall of the Humanities. Photographs and accelerograph records of the San Fernando earthquake of February 9 will be on display in Room 110 Thomas throughout the day. Alumni may also visit an exhibition of The Hiroshima Panels—paintings by Japanese artists Iri and Toshi Maruki, on display in the new Baxter art gallery.

The day will wind up with a no-host cocktail party and dinner at the Athenaeum, capped by the annual Home Concert of the Caltech Glee Club at 8:30 p.m. in Beckman Auditorium.

Caltech faculty will offer the following seminars:

## SAN FERNANDO EARTHQUAKE—FEBRUARY 9TH, 1971

Clarence R. Allen

Professor of Geology and Geophysics

All recent California earthquakes have proved to be surprising to seismologists, geologists, and engineers. The San Fernando earthquake certainly was no exception. Of particular interest was the surface faulting in San Fernando and Sylmar, which caused more structural damage than was at first appreciated. Likewise, the unique distribution of aftershock activity is intriguing and not fully understood. Many important lessons to Californians have already been learned from this earthquake, and some of these will be illustrated and summarized.

## THE DEVELOPING SCENE

James Bonner

Professor of Biology

It is Biology party line that develop-

ment—the process by which each of us starts as a single cell, the fertilized egg, and ends up the splendid many-celled thing we are—is all caused by turning on the right genes in the right places at the right time. For each of our trillion or so cells has the same genes; each has all of the genes required to make the whole creature. Control of gene action by each cell is central to development. We understand a lot, but not all, about it. This will be a progress report on the developing scene.

## ASTROCHEMISTRY

Peter M. Goldreich

Professor of Planetary Science and Astronomy

During the past few years radio astronomers have detected many complex molecules in interstellar gas clouds. Several common terrestrial molecules among them water, ammonia, carbon monoxide, and formaldehyde—have already been identified in interstellar space. Perhaps most startling of all is the fact that the hydroxyl (OH) and water (H<sub>2</sub>O) molecules emit as masers, while the formaldehyde (H<sub>2</sub>CO) molecule acts like an inverse maser. The lecture will describe the conditions under which these molecules form and are destroyed.

## MOVING PEOPLE IN MORGANTOWN

Albert R. Hibbs

Deputy Manager, Morgantown Project

Jet Propulsion Laboratory

Finding ways to cut down traffic congestion in cities is a major goal of the government's Urban Mass Transportation Administration. The "People-Mover" Project in Morgantown, West Virginia, is the first attempt to turn studies into reality, and Caltech's Jet Propulsion Laboratory has been assigned the job of managing the development of this new transportation system—a fleet of small electric-powered, computer-controlled cars carrying people on elevated guideways. This is the largest of several projects the laboratory has undertaken to apply the expertise of space engineering to "earthly" problems.

## CANCER AND MOLECULES

Leroy E. Hood

Assistant Professor of Biology

Most cancer cells have special molecules on their cell surfaces which differentiate them from normal cells.

We will explore the interplay between these "cancer molecules" and the host's immune system. This interaction offers exciting new possibilities to modern medicine for the early diagnosis and the treatment of human cancer.

## WHAT IS THE PRICE OF WISDOM?

Jenijoy LaBelle

Assistant Professor of English

Late in his career the great English poet-painter William Blake (1757-1827) designed and executed a series of 22 engravings illustrating the Book of Job. More importantly, these designs form a pictorial interpretation of Job of startling originality and insight. This vision and version of Job represents the summation of Blake's major concepts of innocence and experience, pride and wisdom, man and God.

## ENVIRONMENTAL POLLUTION AND THE HUMAN SOCIETY

Lester Lees

Professor of Environmental Engineering and Aeronautics

Lester Lees will discuss, among other things, environmental pollution and its impact on human society and the related planning involved in the over-all view of prevention. This includes the study of waste energy pollution and plant locations.

## THE FUTURE OF MICRO-ELECTRONICS

Carver A. Mead

Professor of Electrical Engineering

Microelectronics technology has moved rapidly toward increasingly complex logic arrays. Today standard integrated circuits contain the equivalent of 10,000 transistors. Thus, the organization of elements on the integrated circuit chip becomes more important to the efficiency of logic units than the individual components themselves. In the near future microelectronic circuits will be made even 100 times smaller. At this point, the "computer on a chip" will no longer be a dream but a hard physical reality.

## POLITICAL TURMOIL IN SUB-SAHARAN AFRICA

Edwin S. Munger

Professor of Geography

Invasion of Guinea with public hangings; reconstruction in Nigeria; calls for dialogue with South Africa by Ghana and the Ivory Coast; a coup in Uganda

with accusation against Israel related to charges of Muslim genocide in the southern Sudan; tension in Zambia and the Kaunda-Nixon debacle; sanctions in Rhodesia; and an electoral swing left in South Africa are a few examples of tension and turmoil in the past year.

## WHAT IT MEANS TO BE DAMMED

Thayer Scudder

Professor of Anthropology

Because of the contemporary construction of giant dams, hundreds of thousands of people are being forced to move from their homelands. Included are approximately 50,000 Gwembe Tonga who were resettled in the late 1950's in connection with the Kariba Dam Project on the Zambezi River. Scudder's illustrated talk will inform us about what has happened to these Central African people during the 12 years following their relocation.

## ONE DAY IN THE LIFE OF LOS ANGELES

John H. Seinfeld

Associate Professor of Chemical Engineering

The week began like any other in the late summer smog season in Los Angeles. But, the air was dead calm, the sunlight intense, and the inversion lower and more powerful than usual. Throughout the week, the air stiffened into a motionless clot of eye-burning haze. By the weekend, Los Angeles had experienced its first "killer" smog. An account of what happened during this hypothetical week will be presented.

## CONSEQUENCES OF CATASTROPHES—A STORY OF THE CANYONS OF THE COLORADO RIVER

Eugene M. Shoemaker

Professor of Geology  
Chairman of the Division of Geological and Planetary Sciences

In 1800 many geologists thought the features observed on the earth's surface had been formed during a series of great catastrophes. This view was replaced by the Doctrine of Uniformitarianism, which states that most surface features of the earth have been formed through the action of processes observable today. Although it is not implicit in this doctrine, the notion has grown that the erosion of the land surface occurs slowly, grain by grain. In recent years there has been a renewed appreciation of the role of catastrophe.

## African art exhibit opens in Baxter Hall

Caltech's brand new Donald E. Baxter, MD, Hall of the Humanities and Social Sciences won't have its official dedication until May 10, but on April 6 the Baxter Art Gallery opened with an exhibit of one of the country's most exciting collections of West African art.

The collection—consisting of more than 200 pieces of regional primitive art—belongs to Victor DuBois (right), an American Universities Field Staff member stationed on Africa's Ivory Coast, and a visiting lecturer at Caltech since 1964. An intriguing sample from the DuBois collection is the 50-year-old wooden Ashanti doll at the left. Dolls like this one are carried by Ghanaian women who believe that looking at "beings" with beautiful heads and long necks will help them bear beautiful children. The exhibit, sponsored by the Division of Humanities and Social Sciences and the Institute Art Program, will continue through April 30.



## Giving credit where it was due

Editors:

Thank you very much for the pictures and the article "A Lesson on China" in the March Caltech News.

However, the Caltech Chinese Student Association cannot take credit by itself for the China events held in February. A great deal of credit must go to the Caltech Y which co-sponsored all of the events, and to the Institute Art Committee which co-sponsored the art exhibit.

The Contemporary China Symposium was organized by the Y, and was co-sponsored by the Associated Students of Caltech, the Graduate Student Council, the Humanities Division, and the Office of Student Relations.

Victor Wei-Tou Ni  
President, Caltech Chinese Students Association



# PERSONALS

## 1923

JOSEPH R. ALCOCK writes, "I retired November 1, 1970, from the California Air Resources Board as an engineer in the air resources laboratory in Los Angeles. I transferred there from the County Air Pollution Control District when the state took over the laboratory July 1, 1963. After retiring, I spent a month driving through Mexico."

## 1941

CLAUD S. RUPERT has been inducted into the Society of Scholars at the Johns Hopkins University. The society honors former post-doctoral fellows at Johns Hopkins who have gained marked distinction in their academic or professional fields. Now a professor of genetics in the Southwest Institute for Advanced Studies, the Dallas branch of the University of Texas, he is engaged in studies of the photoreacting enzyme which he discovered while working in the department of biochemistry in the university's school of hygiene and public health.

## 1945

E. H. EDDY, MS, a retired colonel in the United States Army, is an associate professor, emeritus, at the General Motors Institute. He is living in San Antonio, Texas.

ALBERT R. HIBBS, PhD '55, senior staff scientist at JPL, has been named deputy project manager of the U.S. Department of Transportation's "People Mover" project at Morgantown, W.Va. The project will connect West Virginia University's two separate campuses, six miles apart, with a computer-operated transit system using cars riding on rubber tires on a largely elevated roadway. On March 6, Hibbs was married to Mrs. Marka Oliver Wilson in Pasadena. His son and daughter and her son and daughter were members of the wedding party.

## 1947

R. S. MacAlister writes to change his address from Tripoli, Libya, to London, and adds, "In Libya I was vice president and manager of operations and technology for Occidental Petroleum. In my new assignment I am project manager for a new North Sea oil venture."

## 1949

EMERSON W. SMITH, MS, is now general manager and vice president of Teleflex, Inc. in North Wales, Pa. He was director of engineering for North American Rockwell Corporation.

## 1950

WORTHIE DOYLE, PhD, writes that he is temporarily retired at home in Port Orchard, Wash., and that if any one within 30 miles of his home wishes to employ him part time, he's available. His experience is in applied math, particularly in signal and data processing.

## 1951

ROBERT F. CONNELLY is now manager of the industrial products division, international operations, for Wynn Oil Co.

FRED G. HAYOS JR., MS, writes, "After 20 years in aerospace I have been laid off and am now going into my own business—out of engineering. The name of my company is Radio-Telephone."

## 1953

GERALD A. COHEN, MS, previously with Philco-Ford's engineering and aeronautical division, is now president of Structures Research Associates in Newport Beach.

## 1956

HENRY J. NAWOJ, AE, left his post as lieutenant commander in the U.S. Navy to do graduate work at the University of California at Santa Barbara.

## 1957

THOMAS W. COOPER is now vice president for Colley Engineering. Prior to this, he worked as a program engineer for Sesler-Caffey, Inc., of Los Angeles.

## 1964

HARVEY W. BURDEN, AE, reports that he received his PhD (ME) at the University

Dear Sir:

I wish to protest strongly your foul-up of my current whereabouts [Caltech News, Vol. 5, No. 2]. I am not at the Chemical Abstracts Service. I am at the address to which you send my mail. I am employed as as assistant Professor at UC Riverside in the departments of Biology and Biochemistry.

There are two Robert L. Heaths of vintage 1961—one was a graduate in biology and the other (namely me) was an undergraduate in physics. Please, I beg of you, get them straight. I'm tired of his mail and losing my mail to him.  
Robert L. Heath, PhD '61, B.Sc. in Physics

*Sorry. The Alumni Office is now braced to deal fairly with all Robert L. Heaths. However, the other Robert L. Heath, EX '58-'63, has left his job at Brookhaven National Laboratories to work for Chemical Abstracts Service in Columbus, Ohio.*

of Pennsylvania in August 1969. A lieutenant commander in the United States Navy, he is a member of the professional staff of the Center for Naval Analyses.

## 1965

PIERRE YVES COMTE, MS, whose address is "La Tuilerie," Nimes (Gard), France, writes that he would be happy to meet any Caltech alumni who come to his area.

WILLIAM F. SATTERTHWAIT, formerly a teacher in the Arcadia, Calif., school district, is now head of the mathematics department for the Park School Corporation in Brookline, Mass.

## 1967

JOHN B. FOSTER writes to inform us of his activities since graduation. He says, "I attended graduate school at the University of California at Berkeley for two years, receiving an MA in biochemistry in 1969. I also attended the University of California at Santa Barbara for a short period last year, studying secondary education. Currently, I am teaching at the Valley of the Sun School for retarded children in Phoenix, fulfilling my military obligation as a conscientious objector."

## Obituaries

### 1928

JEAN E. JOUJON-ROCHE on March 5 of a heart attack, in Bakersfield. At Caltech he belonged to the Varsity Club with letters in football, basketball, and track; the Geology Club; Pi Kappa Sigma; and was president of the Gnome Club. A life member of the Alumni Association, he was president of the San Joaquin-Mojave Chapter for 1970-71. He was self-employed as a consulting geologist for the past five years, having retired from the Shell Oil Company in 1966 after 33 years of service. He is survived by his wife, Ruth, a son and daughter, and four grandchildren.

### 1932

WILLIAM H. BOWEN, MS, MS '38, on February 6. Bill Bowen started his career as a graduate student in mechanical engineering, in which he received his MS degree in 1932. During his graduate work and immediately after his degree he worked for Wladimir Zaikowsky, a research fellow who was engaged in a project 40 years ahead of its time, namely, the possibility of returning the crankcase fumes of an automobile engine through the intake system in order to make a more efficient engine.

At about this time, a new group in Aeronautics was formed through the gift of the Guggenheim Foundation Laboratory of Aeronautics and Bill switched from ME to Aero, where he continued until his retirement in 1967. He was first a research assistant and finally became Superintendent of the Guggenheim Aeronautical Laboratory

## Coming Events

Thursday-Friday, April 15-16 Beckman THE COMMITTEE, the original San Francisco satirical revue. 8:30 p.m. \$5.50-\$4.50-\$3.50.

Saturday, April 17, 8:30 p.m. Beckman OPUS BLUE . . . IS PINK, a program of contemporary pantomime, is performed by Claude Kipnis and his mime theater. \$5.50-\$4.50-\$3.50-\$2.50.

Sunday, April 18, 8:00 p.m. Ramo Hall TERRY RILEY, the composer, in the continuing ENCOUNTERS series of avant garde music. He will perform on a soprano saxophone, an electric organ, and with tape delay. \$3.50-\$3.00-\$2.00.

Monday, April 19, 8:30 p.m. Beckman THE COMMUNICATIONS GAP IN SCIENCE. Lecture by R. G. Bergman, assistant professor of chemistry. Caltech Lecture Series. Free.

Sunday, April 25, 8:15 p.m. Dabney CALIFORNIA STRING TRIO. Music by Mozart, Debussy, and Beethoven. Free.

Monday, April 26, 8:30 p.m. Beckman ISOTOPES, CLIMATE, AND ICE AGES. Lecture by Samuel Epstein, professor of geochemistry. Caltech Lecture Series. Free.

Tuesday, April 27, 8:00 p.m. Beckman TUESDAY NIGHT AT THE SILENT MOVIES. "The Great Comedians." Fields, Langdon, Keaton, Chaplin, Chase, Pollard. \$2.50, \$2.00—students.

Saturday, May 1 Beckman ANNABELLE BROOM, THE UNHAPPY WITCH, a musical play for children by Eleanor and Ray Harder, presented by the State Repertory Theater. 11:00 a.m. and 1:00 p.m. \$1.75—adults, \$1.25—children.

Saturday, May 1, 8:30 p.m. Beckman THE ROMEROS, four guitarists. \$6-5-4.

Sunday, May 2, 8:15 p.m. Dabney SHANLEY VIRTUOSI. Music by Bach, Ravel, Rachmaninoff, Rimsky-Korsakov, and Beethoven. Free.

Monday, May 3, 8:30 p.m. Beckman REFLECTIONS ON VENUS. Lecture by R. M. Goldstein, visiting associate professor of planetary science. Caltech Lecture Series. Free.

Wednesday, May 5 Baxter art gallery Opening: THE HIROSHIMA PANELS, an exhibit of paintings by Japanese artists, Iri and Toshi Maruki.

Saturday, May 8, 8:30 p.m. Beckman CALTECH BAND CONCERT. \$1.00, \$.50—students.

Sunday, May 9, 3:30 p.m. Beckman THE BORODIN QUARTET with Ljuba Elina, pianist. Coleman Chamber Concert. \$5-4-3-2.50.

(GALCIT). Not only did he help lay the groundwork for the laboratory which was to become one of the leaders in aeronautical research, but he also found time to take his Master's degree in this new field in 1938. Aeronautics at that time consisted of a small faculty, a few students, a research fellow or two, and a small supporting staff led by Bill Bowen. He remained an intimate part of the GALCIT family until his retirement, and his personal interest and contributions in its early days have become a significant part of the history of this organization.

PAUL G. BURMAN on February 12 of a heart attack. He was a staff and patent engineer in the research and development division of American Bosch Arma Corporation in Springfield, Mass.

### 1940

H. JACK WHITE on January 27. His wife, Barbara, writes, "This is to inform you of the death of my husband, H. Jack White, who graduated with a BSME degree in June 1940. Jack was killed in a multi-vehicle collision on fog-bound highway 99 near Bakersfield on January 27, 1971. He had worked the past 16 years with Aerojet-General in Sacramento—his previous employment having been with General Electric and Lockheed Corporations. Besides myself, Jack leaves a son, Steven, age 15, and a daughter, Cynthia, age 11."

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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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SAN DIEGO CHAPTER	
President	David B. Wilford '48 6581 Avenida Wilfredo, La Jolla, Calif. 92037

## Alumni Calendar

Wednesday, April 28  
WASHINGTON D.C. CHAPTER MEETING: William H. Pickering, director of the Jet Propulsion Laboratory, will be guest speaker at the 7:00 p.m. cocktail and dinner meeting in the International Club. Reservations (\$6 per person) should be made with Chapter Secretary John Cookson.

Saturday, May 1  
SAN DIEGO CHAPTER MEETING: Tour of the Palomar Observatory, followed by a picnic lunch. Contact Chapter President David Wilford.

SAN JOAQUIN-MOJAVE CHAPTER MEETING: A spring nature study and guided walking tour through Sequoia National Park, beginning at 9:00 a.m. Contact Chapter Secretary Bruce Robinson.

Saturday, May 15  
34th ANNUAL ALUMNI SEMINAR DAY. See story and program on page 3. Make reservations with the Alumni Office, 204 Throop Hall.

Wednesday, June 9  
ANNUAL ALUMNI DINNER: Reuben Mettler, Caltech trustee, will be the guest speaker. No-host cocktail party begins at 6:00 p.m. in the Athenaeum, followed by dinner at 7:00. Contact the Alumni Office.