CALTECH NEWS

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Mariner 9 blasts into Mars orbit

Project manager Dan Schneiderman (foreground) watches monitor intently with his JPL colleagues during crucial firing of rocket engine that put Mariner 9 into orbit around Mars.

A hush fell over the scientists, engineers, and newsmen crowding the Mariner 9 mission control center at Caltech's Jet Propulsion Lab Saturday, November 13. All eyes were fixed on the monitors that would tell if Mariner's small rocket engine, untested before in space, would fire the 15.3 minutes necessary to achieve man's first orbit of another planet.

At 4.33 p.m., project manager Dan Schneiderman signaled that the engine had shut off precisely on schedule, 44 million miles away. Mariner 9 was in orbit around Mars.

Another critical period followed when Mariner 9 was aimed toward the sun to receive the rays necessary to charge its batteries and then disappeared behind Mars for 36 minutes.

When Mariner reappeared Schneiderman reached for the champagne and a cheer went up as scientist Al Hibbs, '45, announced to newsmen, "The spacecraft looks good. The orbit looks good. Everything looks good."

After a 248-million mile journey that began with a launch from Cape Kennedy on May 30, Mariner 9 joined Phobos and Deimos, the moons of Mars, on their appointed rounds. Although the NASA mission is scheduled for 90 days of transmis-

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Alumni seek 100% support for Caltech development

"Every Caltech alumnus can be proud of our record of support to the current development program," said J. Benjamin Earl, '44, chairman of Caltech's Alumni Development Committee. "I hope we can achieve 100 percent alumni participation by this time next year."

So far alumni have contributed $2,281,485 in outright gifts and an additional $1,218,881 in trust funds since the current development program began in 1967. When the gifts of alumni trustees are added, Earl said the total alumni contribution nears $9,000,000.

"This averages out to over $600 per donor—$120 annually—for the outright gifts alone," he states. "When the trust and trustee gifts are added, the averages really skyrocket.

"All of this has been done with 3,478 alumni donors, 31 percent of all alumni, participating. If the other 7,633 noncontributing alumni will match the gifts of those who have supported Caltech so far," Earl said, "we can all take great pride in having supported the Institute at one of the most critical periods in its history."

Decreasing government support for fellowships, a depressed economy that makes foundation and corporate gifts harder to come by, higher costs, and the unexpected urgency for new construction caused by the earthquake this year have all combined to put unforeseen strains on the Institute budget.

"This makes every dollar contributed by alumni even more critical in maintaining Caltech's position of excellence as a private institution of research and learning," Earl said. "I think it is clear to everyone who believes in Caltech that now is the time to step forward and be counted."

Earl believes that many alumni will take advantage of year-end tax deductions to make their gift to Caltech before the end of the year.

"It is my understanding that, under certain circumstances, a gift this year may be more advantageous to the donor from a tax standpoint than a gift made in 1972," Earl said. "If you are contemplating a gift in 1972, it would be wise to check with your tax adviser on how to get the maximum benefit of tax deductions."

Earl also pointed out that Caltech has several people on its staff trained in the area of planned giving who can provide information for any alumnus who has questions on how to plan a gift.

Brown reports on earthquake

History repeated itself last month when Caltech president Harold Brown made public the report of the Los Angeles County Earthquake Commission in a press conference in the Trustees' room of Millikan Library.

Brown, chairman of the commission that investigated the February 9 San Fernando earthquake, pointed out that he was following in the footsteps of Caltech's first leader, Robert Millikan, who was chairman of the last county earthquake commission that reported on the Long Beach earthquake in 1933.

Adding to to the continuity of the two commissions was the fact that Caltech professor Romeo Martel, vice chairman of the 1933 commission, was the father of professor Hardy Martel, Brown's executive assistant, who served as an alternate member of the 1970 commission.

Other Caltech faculty members serving as members or alternate members of this year's county earthquake commission included George Housner, professor of civil engineering; Charles Richter, professor emeritus of seismology; Clarence Allen, professor of geology and geophysics; and Donald Hudson, professor of mechanical engineering and applied mechanics.

Also serving as a consultant to the commission was Caltech president emeritus Lee DuBridge.

In releasing the report, Brown said he hoped that it would be as effective in

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New opportunities open for chemical engineers

A growing number of fields requiring control of chemical change will provide increased opportunities for chemical engineers in the 1980's. But the engineers will have to recognize these opportunities and adjust their educational preparation to meet the new industrial needs.

This was the message of William Corcoran, Caltech professor of chemical engineering and vice president for institute relations, who delivered the prestigious annual Phillips Petroleum Lecture in Chemical Engineering at Oklahoma State University in Stillwater, Oklahoma, last month.

Speaking on the topic "Who Tends the Store—Chemical Change, 1980," Corcoran said he did not agree with the conclusion of a recent Labor Department study that there would be fewer jobs for a time than there will be graduates in chemical engineering.

Continued on page 3

Undergrads receive Clark award

George Nicolaides and Steve Watkins, two Caltech undergraduates, are the 1971 co-winners of the Donald S. Clark Award for their outstanding qualities of leadership and academic performance.

At a special dinner in the Athenaeum on October 27, Francis H. Clauser, chairman of the division of engineering and applied science, presented Nicolaides and Watkins with the awards, named for Donald S. Clark (BS '29, MS '30, PhD '34), professor of physical metallurgy and director of placements, who served as secretary of the Caltech Alumni Association for more than 26 years. The award carries a cash prize of $500 for each student.

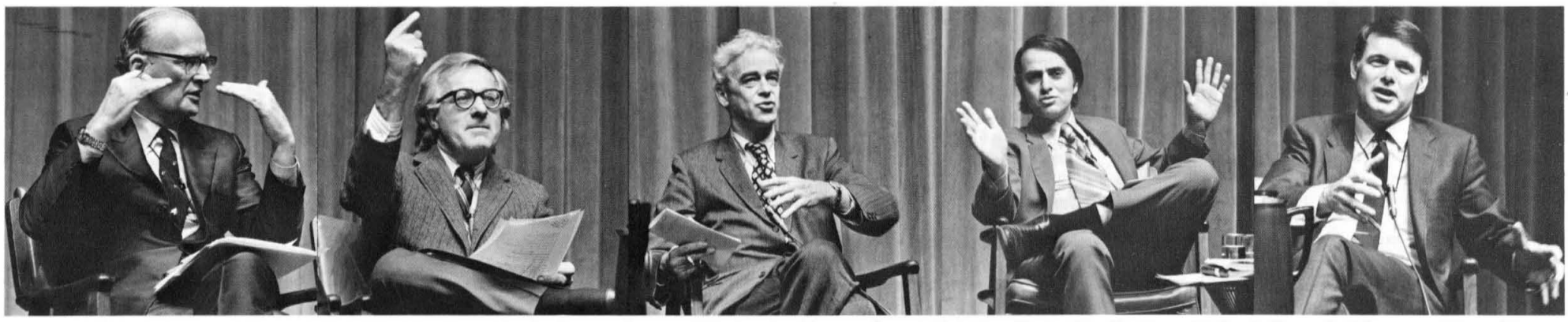
Nicolaides, a senior in chemical engineering, has been a member of the Board of Control, the Student's Advisory Committee, the Associated Student's Executive Committee, and president of the Caltech Student Chapter of the American Institute of Chemical Engineers. He has participated in chemical research at the Institute and received an award in recognition of a paper he presented at the student session of the 161st National American Chemical Society meeting in April of this year.

Watkins, a junior in chemical engineering and applied science who is studying environmental problems, is only the second student ever to be elected ASCIT president in his sophomore year. He is a representative to the Faculty Board, has participated in Caltech's secondary school education program, plays in a rock music band for local schools, and has lettered twice in varsity track. Watkins was head of the campus ecology section until elected student body president last spring.

Those at the award dinner included Dr. and Mrs. Clauser; Dr. Clark; assistant placements director William F. Nash and Mrs. Nash; alumni secretary Raymond L. Heacock; alumni vice president Arthur Spaulding and Mrs. Spaulding; Reuben Moulton, president of the Alumni Association; and former president Craig Elliott and Mrs. Elliott. Also attending the dinner were Nicolaides' adviser John Seinfeld, associate professor of chemical engineering, and Mrs. Seinfeld; and Watkins' adviser, Jack McKee, professor of environmental engineering science.

The Donald S. Clark Award fund was established six years ago by the Alumni Association. Nominations for the awards are made by a committee of the Undergraduate Academic Standards and Honors Committee.

Donald S. Clark, professor of metallurgy and former secretary of the Alumni Association, is flanked by Steve Watkins (left) and George Nicolaides, co-winners of the 1971 Clark Award.



Participating in panel on "Mars and the Mind of Man" at Ramo Auditorium on the eve of Mariner 9 orbit were (from left) Arthur Clarke, Ray Bradbury, Walter Sullivan, Carl Sagan, and Bruce Murray.

Life on Mars—science or fiction?

"Mars and the Mind of Man" was the topic of a classic confrontation held in Caltech's Ramo Auditorium on the eve of Mariner's rendezvous with Mars.

On one side were the aging myth-makers, Ray Bradbury ("Martian Chronicles") and Arthur Clarke ("2001") who have created visions of life on Mars in the imagination of a world-wide audience of science-fiction fans.

On the other side were the young pragmatic scientists—Bruce Murray, Caltech professor of planetary science, and Carl Sagan, professor of astronomy and director of the laboratory for planetary studies at Cornell University. Both are members of the Mariner 9 television team.

In the middle, serving as moderator, was the seasoned professional newsman, Walter Sullivan, science editor for "The New York Times."

Murray, who thought up the idea for the panel discussion, called it a tag team match, with he and Sagan destined to play the role of the heavies, the dispellers of the myths.

Stating flatly his belief that no life could exist on Mars, Murray said "Mars somehow has extended beyond the realm of science and so grabbed hold of man's emotions and thoughts that it actually has distorted scientific opinion about it."

Murray cited the sterilization procedures that will be taken for the Viking landing on Mars in 1974 as an example of a needless precaution made for a Mars that doesn't exist. He said it will probably be impossible to prove there is no life on Mars despite the evidence to the contrary.

"Scientists are at fault for misinterpreting the observations," Murray said. "The observations are going to have to beat us over the head to make us believe in spite of ourselves."

Although discounting the idea of finding life on Mars, Murray said the Mariner mission had great cultural value. "The Mariner is a monument to an idea," he said, "the idea of exploration."

Sagan, while agreeing with Murray that there was little chance of finding life on Mars, was not as willing as his Mariner colleague to dismiss the possibility.

He defended the sterilization precautions for vehicles landing on Mars saying, "You have to consider not only how likely an event is, but also how important it is. The product of the likelihood and the importance make sterilization necessary."

Sagan also pointed out that given the pictures of earth taken by the Apollo missions, it would be impossible to tell if there was life on our planet. While granting that the canals of Mars were a figment of man's imagination, he was not ready to rule out the possibility of life in some form on that planet.

Clarke, one of England's outstanding writers of real science, as well as science fiction, said that if life did exist on Mars we could expect it to be quite sophisticated and warned, "we should be careful. They are liable to have an appetite for carbon, oxygen, and meat.

"I still hope there is some form of life on Mars," he said, but emphasized the important point was that "the moon, Mars and beyond it is a benign environment to our technology.

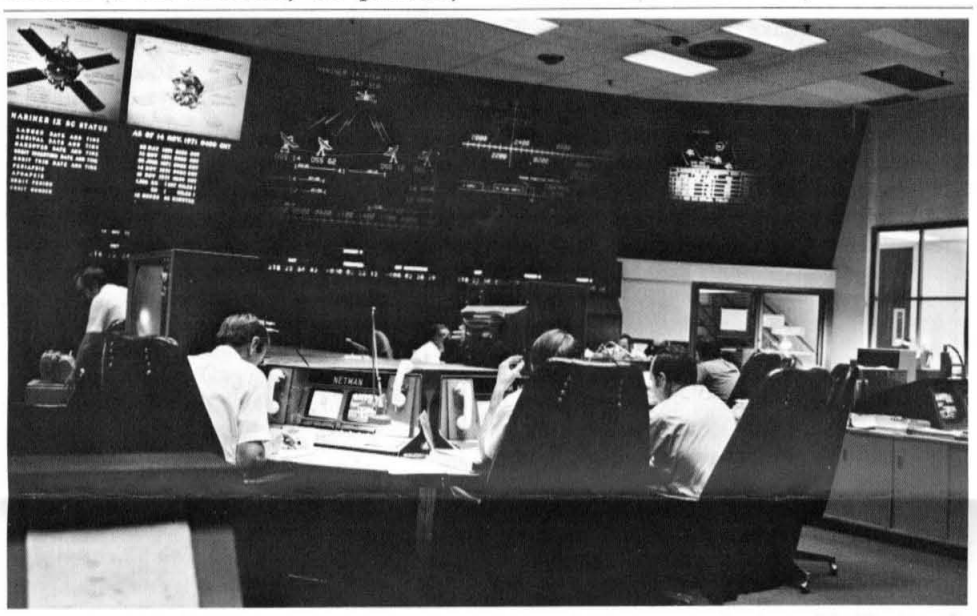
"The biological frontier might very well have moved beyond Mars to Jupiter, where I think all the action is.

"Whether there is life on Mars or not," Clarke predicted, "there may well be by the end of the century."

Bradbury received a resounding cheer when he said that he hoped when the dust storms cleared over Mars, pictures from Mariner 9 would reveal men carrying signs saying, "Bradbury is right."

But he was willing to accept the role of the mythmaker. "It is part of man to start with romance and build toward reality," he said, "in order to get the facts we have to first be excited enough to want to get the facts.

"We are in the business of finding the metaphor to excite the people to do the work so that we can live forever."



Controllers in JPL's Deep Space Network center maintain communication with Mariner 9.

Caltech scientists process information from Mariner 9

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sions from Mariner 9, the first man-made moon is expected to remain in orbit around Mars for 17 years.

Traveling in a loop that brings it within 800 miles of the surface of Mars, then up to a peak of 10,300 miles, Mariner 9 makes an orbit every 11.98 hours.

In the basic mission, two television cameras will take more than 5,000 pictures of Mars, mapping more than 70 percent of the planet's surface and repeatedly photographing areas of interest.

Three instruments, measuring invisible radiation from Mars in the ultraviolet and infrared, are providing information on the planet's surface (temperature, composition, and altitude profile) and on its atmosphere (composition, structure, temperature, and pressure).

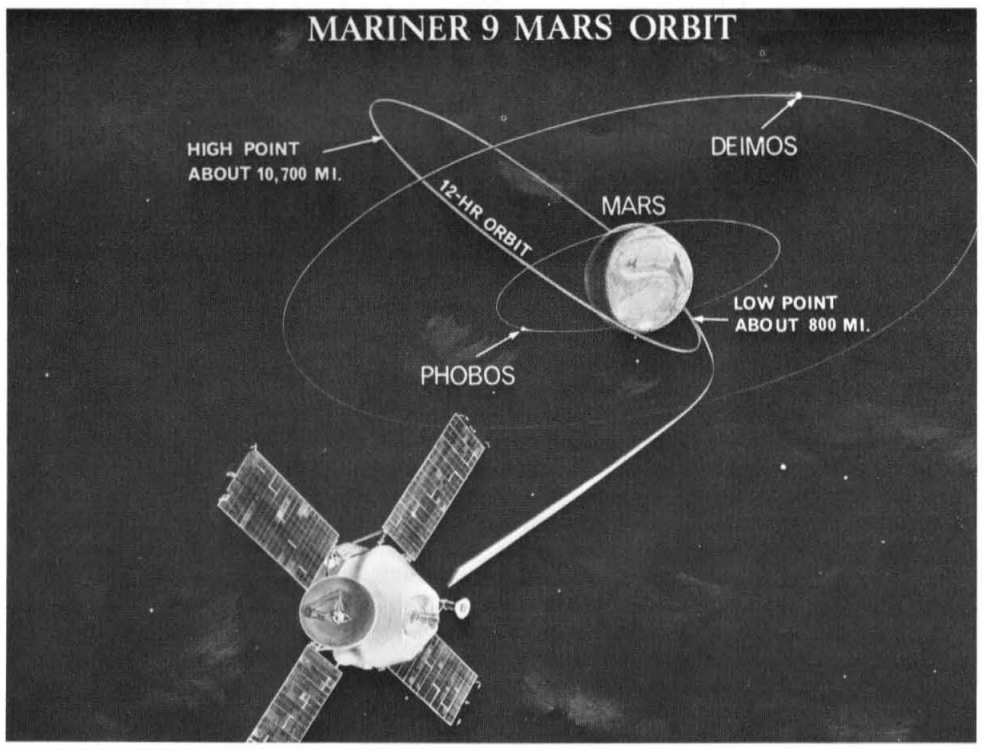
Caltech faculty members carrying out science experiments in the Mariner 9 mission include Bruce Murray, professor of planetary science; Robert Leighton, division chairman and professor of physics; Robert Sharp, professor of geology; Gerry Neugebauer, professor of physics; Guido Münch, professor of astrophysics and astronomy; and graduate student James Cutts.

An interesting aspect of the Mariner 9 mission is the agreement to share information with the Russians, who were sending two spacecraft to Mars. On the day Mariner 9 went into orbit, NASA telexed Moscow:

"Mariner 9 achieved the desired orbit about the planet Mars. Analysis of the trajectory shows that the ephemeris which was used in planning the orbit must be adjusted by 60 kilometers. Specific parameters of the orbit and the ephemeris correction have been published and will be transmitted to you on request.

"Mars appears brighter than expected by a factor of two. Surface features are almost entirely obscured, but the south polar cap can be seen because of its brightness. This is believed to be the result of a dust storm which covers the entire planet. Photographs from the two Mariner 9 cameras under a variety of lighting and viewing conditions have failed to resolve surface features with clarity.

"The infrared instruments appear to be seeing the surface, but interpretation of their results is complicated by effects of the dust storm. Ultraviolet rays detected by the ultraviolet spectrometer do not appear to have penetrated through the dust cloud."



Earthquake report calls for action

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bringing about action as the 1933 Long Beach report, which resulted in the first earthquake building code adopted by Los Angeles County.

Calling for the demolition of more than 20,000 unsafe buildings built before the 1933 code went into effect, Brown said that a combination of tax incentives and normal modernization needs could make possible the elimination of the unsafe structures by 1980.

Brown said, however, a major problem in getting action on a city, state, and federal level is the failure of most people to realize the potential danger to life of earthquakes.

Although the report did not present any method of predicting earthquakes, it did warn:

"There is reasonable expectation that before the end of the century an earthquake of much greater magnitude will occur in southern California. It can be expected to produce very strong shaking over the entire Los Angeles metropolitan area. This ground shaking probably will not exceed the intensity experienced in northern San Fernando Valley, but it may be almost as strong."

If city, county, and federal agencies will now act on the commission recommendations, the February 9 earthquake may have served some purpose. As the report stated:

"The earthquake did reveal certain weaknesses in engineering and construction practices, and in institutional and organizational arrangements. The commission believes that these weaknesses can be corrected by appropriate improvements in safety regulations, in building codes and in preparations for an emergency. Even though the earthquake brought tragedy to some, if it leads to the correction of these weaknesses, it will have brought a long-term benefit to all southern California."

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Lilly sponsors cancer seminars

A series of seminars on the biology of cancer, sponsored by Eli Lilly & Co. and presented jointly by Caltech and the Huntington Memorial Hospital of Pasadena, will be held at the Institute beginning on December 7. The seminars will continue through the academic year.

Designed as a means of communicating more closely with members of the medical community, the lectures have been arranged by Richard Russell, assistant professor of biology at Caltech, and Dr. Robert Pudenz of the Huntington's Institute of Medical Research.

The first speaker will be Karl E. Hellstrom, professor of pathology at the University of Washington medical school. His talk on "Blocking Antibodies in Cancer," will be presented at 4 p.m. in 119 Kerckhoff Laboratory.

General Electric supports engineering fellowships

The General Electric Foundation has awarded the California Institute of Technology a gift of $22,500 to support three graduate study grants of $7,500 each for 1971-72.

Henry M. Lawson, regional vice president of General Electric, came from San Francisco to present the GE gift to Caltech president Harold Brown and meet with professors who will be directing the research.

The GE grants will support graduate research and study at Caltech in three fields: solid state devices under the direction of Carver Mead, professor of electrical engineering; fluid flow under the direction of W. Duncan Rannie, Robert H. Goddard Professor of Jet Propulsion; and the Environmental Quality Laboratory under Lester Lees, professor of environmental engineering.

Faculty Honors

Harrison Brown

Harrison S. Brown, professor of geochemistry and of science and government, was elected president of an intergovernmental conference that assembled in Paris in October to review UNISIST, a proposed UNESCO-based program to improve the handling of world science information.

Representatives from more than 60 nations evaluated 22 recommendations for establishment of a world science information system that grew out of a four-year study undertaken in 1967 under the auspices of UNESCO and the International Council of Scientific Unions, the world's largest nongovernmental organization of scientists. Brown served as the Convenor of the UNISIST Central Committee which coordinated the research.

Dan Campbell

Dan H. Campbell, professor of immunochemistry, has been recognized by the California Museum of Science and Industry's Committee for Advance Science Training (CAST) for his work with young people in the field of biomedicine.

Campbell, internationally known for his research in allergens and skin-sensitizing antibodies, has trained many students who have gone on to distinguished careers in medicine and research.

George Hammond

George S. Hammond, chairman of the division of chemistry and chemical engineering and Arthur Amos Noyes Professor of Chemistry, is one of ten college professors selected for the 1971-72 E. Harris Harbison Awards for Gifted Teaching.

Presented by the Danforth Foundation of St. Louis on November 6, the award consists of a $10,000 grant to be used at the discretion of the recipient for furthering his academic career and interests. Hammond, who attended the awards dinner at Washington University in St. Louis with Mrs. Hammond, is active in science education on an international basis.

Winners of the E. Harris Harbison Awards are chosen annually by panels of educators who make their selection from nominations by colleagues, students, past award winners, and college and university presidents. Now in their tenth year, the awards not only recognize outstandingly gifted teachers, but also encourage greater public understanding of the art and importance of teaching. The program is named in honor of the late E. Harris Harbison, professor of history at Princeton University and a former trustee of the Danforth Foundation.

Edwin Munger

Edwin S. Munger, professor of political geography and noted Africanist, is the new president of the L. S. B. Leakey Foundation. A trustee of the United States-South African Exchange Program and editor of *The Munger Africana Library Notes*, Munger has been studying Africa south of the Sahara over 27 years.

The foundation, named in honor of anthropologist L. S. B. Leakey, supports studies of man, his origins, evolving nature and environmental future. With the Caltech faculty committee on programs, the Leakey Foundation co-sponsors public lectures in Beckman Auditorium by leading scientists connected with the organization.

Olga Todd

Olga Taussky Todd, professor of mathematics, is the winner of one of the annual Lester R. Ford Sr. awards of the American Mathematical Association.

The award, one of the most important in U. S. mathematical circles, recognizes outstanding articles published in the *American Mathematical Monthly*.

Olga Todd

Olga Todd received the award for her article, "Sums of Squares," which covers a wide mathematical survey of algebra, number theory, analysis, and topology. The article discusses very modern mathematical theories, links between older theories, and many aspects of her work in matrix theory and field theory. Dr. Todd, who joined the Institute in 1957, was promoted from research associate to professor of mathematics this fall.

Gerald Whitham

Gerald B. Whitham, member of Caltech's faculty since 1961, has been named executive officer for applied mathematics, a newly created post.

As executive officer Whitham will oversee admissions, student affairs, and curricula for students who choose applied math as their academic option. He will also work closely with all campus divisions on courses for students who require applied mathematics in support of their studies and research in the physical and life sciences and engineering.

Chemical engineers to face changes

Continued from page 1

The Labor Department report indicated only 1,600 jobs would be available for the 3,656 B.S. graduates from 136 schools in the U. S. each year during the 70's. Corcoran said he did not believe the authors of the report had adequate information on non-traditional needs for chemical engineers in such fields as biomedicine and pollution control where graduates are being placed.

"Chemical engineers still have not appropriately examined what their current and future job opportunities are," Corcoran added. "We have neither translated information to the government nor to ourselves as to our real opportunities.

"With an annual average of job openings in the 1970's of 73,40 per year for all engineers, the 1,600 chemical engineers obviously represent a very small fraction. In the best interests of our country, I believe that figure should at least be doubled."

Corcoran said there may be a slight decrease in the number of PhDs in chemical engineering required but he believes there will be an increase in the demand for chemical engineers with MS degrees.

Among the plans currently being considered for preparation of chemical engineers through 1980 are intensive programs in which a chemical engineering student could earn a BS in three years and an MS in four years.

High schools improve

"The curricula will be demanding and will be dependent upon excellent preparation in high school for the student who is to enter the university and study engineering," Corcoran said. "We cannot ignore the continuing high-quality developments in high schools and the need for exploitation of these developments in cutting down on the total time required in the university."

In looking to who tends the store relative to chemical change in 1980, Corcoran said, "We can note that we really will not be working in completely new areas but in areas of new emphasis.

"We always must educate people for breadth to allow them to enter areas of new emphasis, and we must avoid preparing them so narrowly that opportunities for them or benefits to the country are impaired rather than enhanced.

"When we examine the needs of society in areas such as pollution, water recovery and conservation, biomedicine, and food production, there are obviously requirements for all kinds of engineers and scientists. In each case, nevertheless, there is a common thread of control of chemical change."

In examining the control of chemical change in the 1970's, Corcoran said, "We cannot help but see the tremendous demands for new chemical knowledge and its systematic application to the solution of important economic and societal problems. There will be no way to solve properly those problems except by way of new and improved understanding of chemical change."

Demands for 1980

Corcoran listed some of the demands that will be made upon chemical engineering education to meet the needs of 1980.

'First," he said, "chemical engineering must seek some way to improve chemical education in the high school, even to the point of development of programs of applied chemistry in high school curricula. That would allow a student in the freshman year of college to move more rapidly into an understanding of the total goal of a chemical engineering program.

"Second, there needs to be more breadth in the undergraduate experience. One way that has been used in the past has been the use of a cooperative program.

"My hope is that these cooperative programs will be continued. My feeling is that they have gone downhill at some schools because of the lack of careful supervision of the work experience. There should be a reexamination of the values of the cooperative programs in order to improve the educational experience for the students.

"Another approach to breadth in the undergraduate experience is team teaching. More thought must be put into the development of better education by team teaching of courses such as thermodynamics, control, fluid mechanics, and even physics, math, and chemistry. Principles can be taught while exciting the students' interest by way of real examples from many varied and topical areas.

"Third, as a parallel avenue to the cooperative program, there should be more use of the opportunities for undergraduate research experience and academic experience.

"We have heard much in the past about research being overemphasized," Corcoran said, "but I believe that is mainly dust in the air from people who do not completely understand the nature of research as a path for the development of the personal discipline required to solve engineering problems.

"In asking for further emphasis on undergraduate research, I am not asking that undergraduate research be the alpha and the omega. A goal would be to have at least one summer period in the undergraduate program devoted to research wherein the student would have a one-to-one relationship with a professor of his choice on the campus. In that period the student would have a greater opportunity to develop rapidly toward a real ability to think independently and clearly than by almost any other avenue of experience in his undergraduate years.

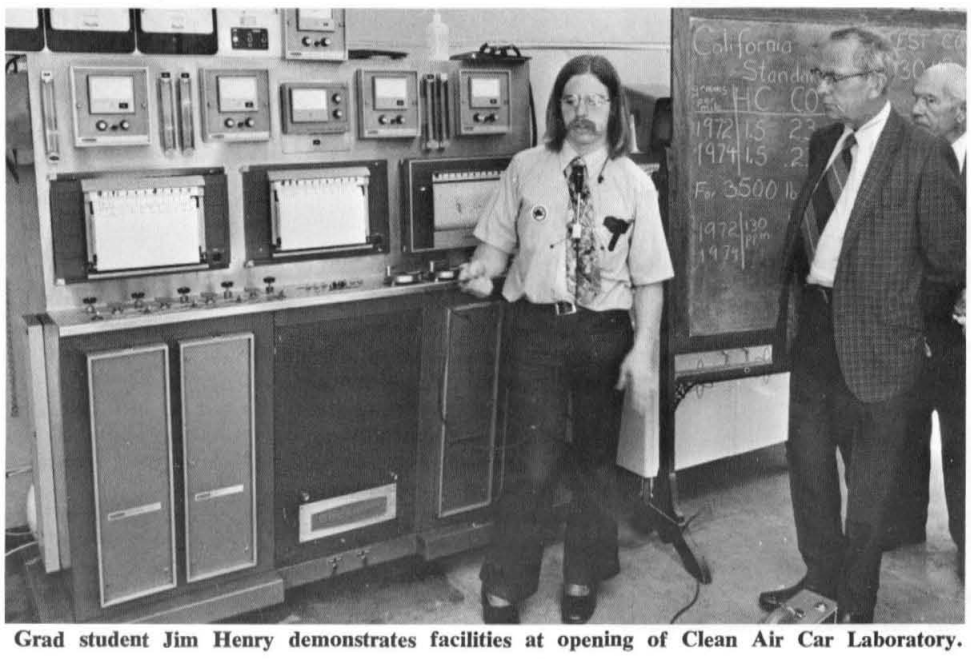
Emphasis on principles

"Fourth, there should be caution in the undergraduate program to avoid excess interdisciplinary education, herein defined as less quantitative work because of lesser demands on prerequisites.

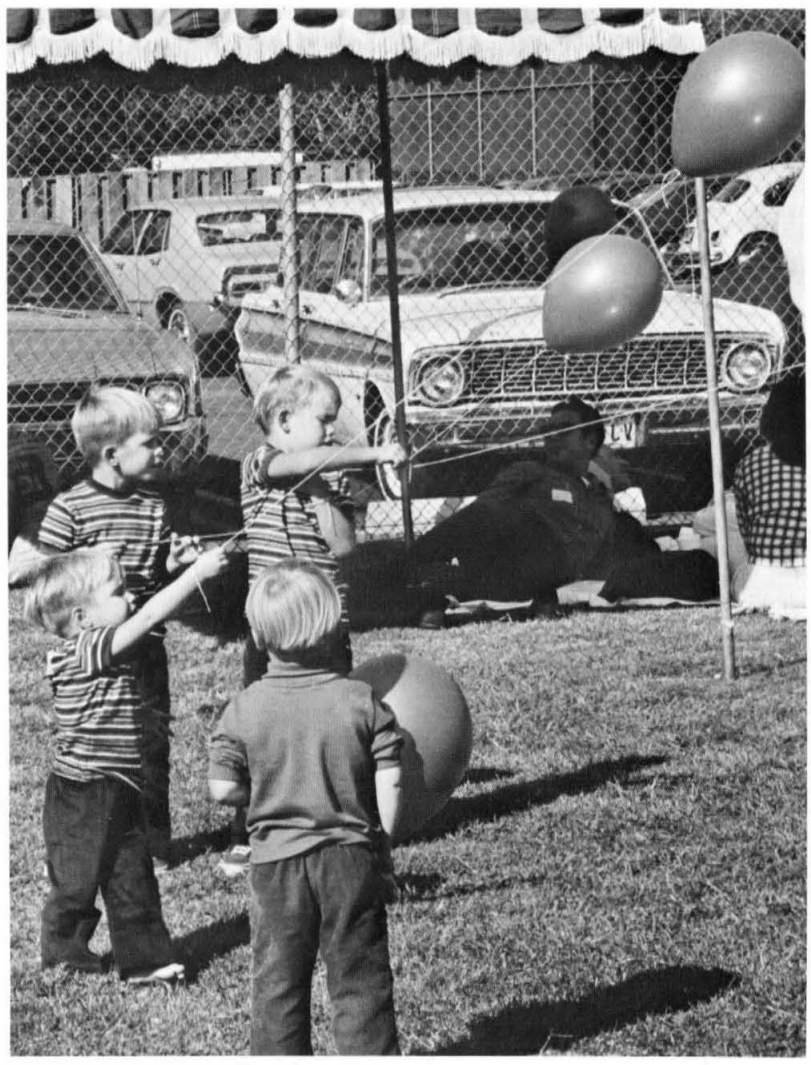
"I believe it is necessary that the student have opportunities to learn principles," Corcoran emphasized. "These can be taught in exciting style by use of quantitative problems selected from many applied fields. The student can thus be given an intensive, quantitative program with breadth of view without being forced into a program of a more qualitative structure.

"If a student chooses to work in biomedical engineering, there is no real problem in his taking appropriate courses in physiology, instrument control, etc., while at the same time studying basic ideas in chemistry, transport, and engineering design."

Clean Air Car Lab



Grad student Jim Henry demonstrates facilities at opening of Clean Air Car Laboratory.



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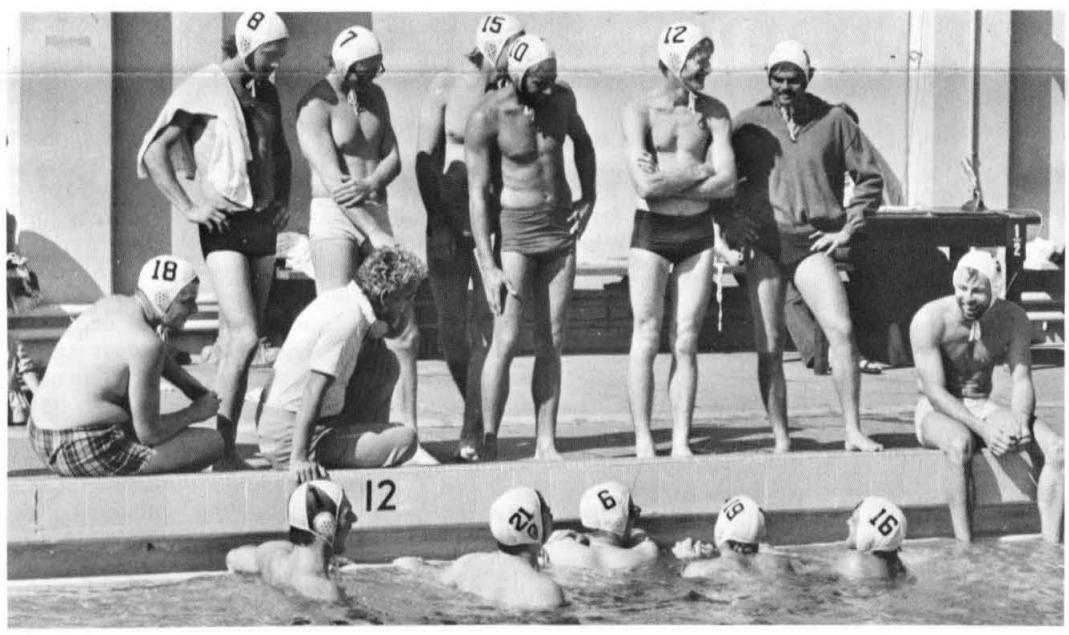

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A post-game cocktail party an
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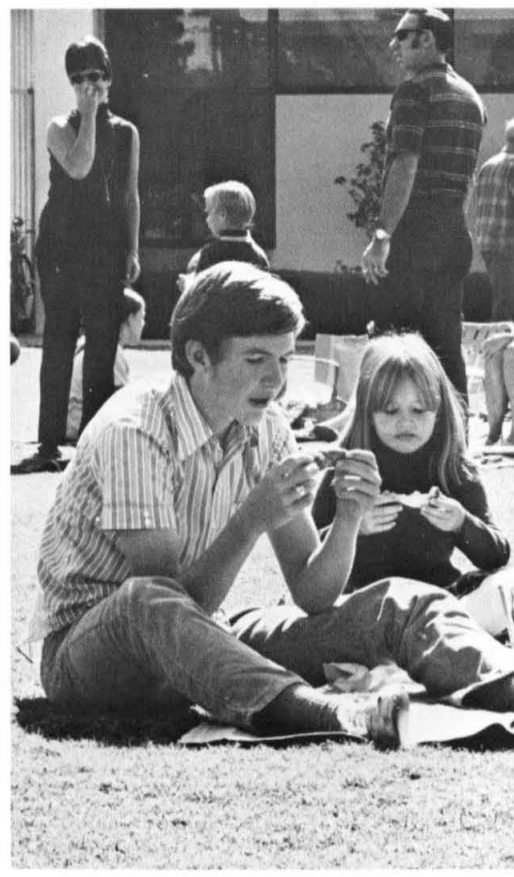


1971 Homecoming was...

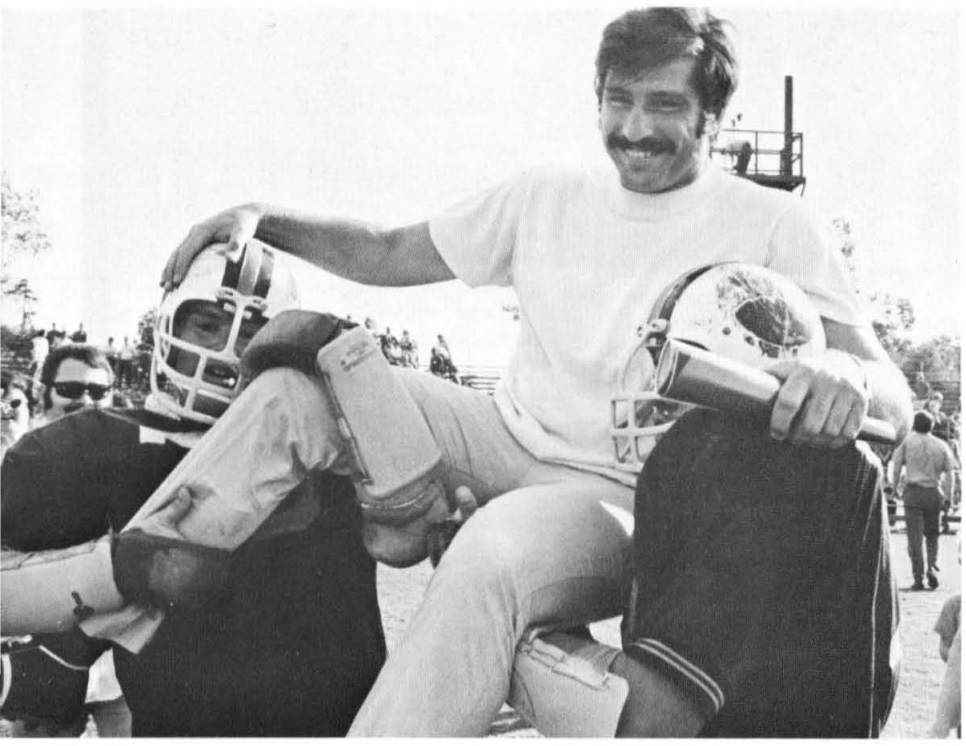
A record number of 475 Caltech alumni and their families turned out for the fourth annual alumni homecoming last month and were treated to a Saturday of rooting, playing, and partying under clear, sunny skies.

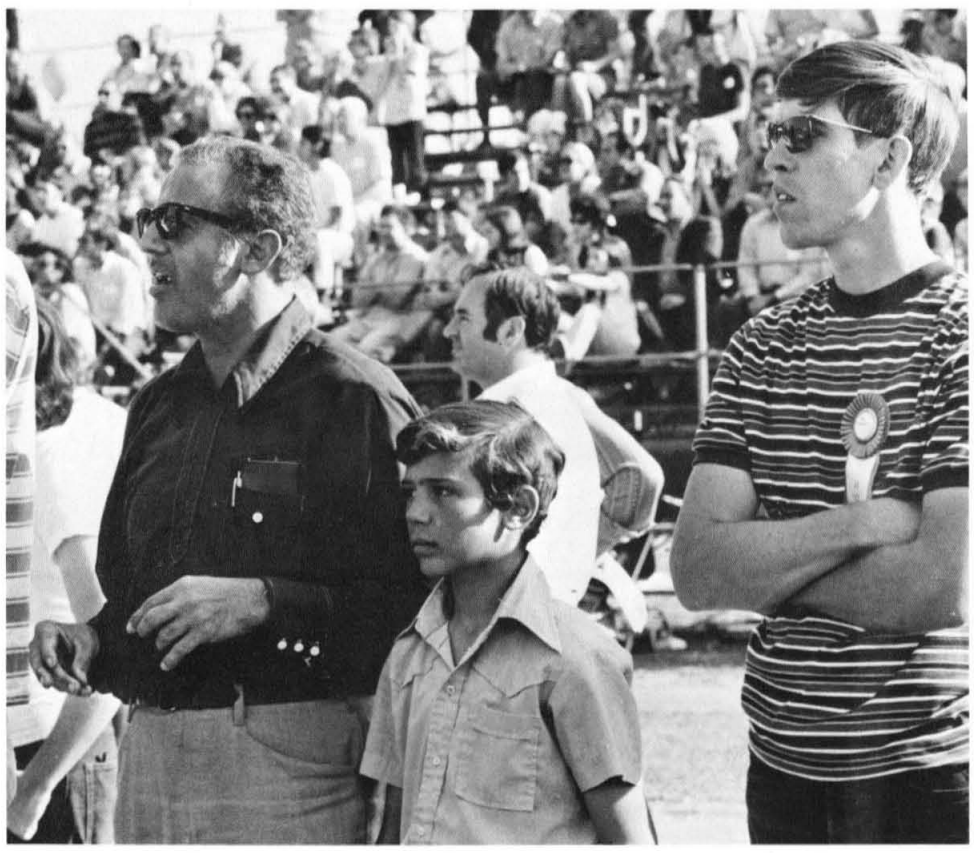
Starting at 10 a.m., the alumni rooters watched the varsity water polo team splash to a close win over a never-say-die alumni squad. A picnic on the sports field featured free beer, soft drinks, and a band concert. For the first time a special program was provided for the Sesame Street set with Hee Haw the Magic Clown dispensing balloons and displaying his magic rabbit.

The biggest moment of the day came in the closing seconds of the football game against UC Riverside's frosh when a long scoring pass gave the home team a 16-13 decision. It was the first Caltech homecoming victory in four years and also extended the varsity's winning streak to two games—the longest in eight years.

A post-game cocktail party and a student bonfire at the corner of Lake and Del Mar brought an end to a memorable day for the Caltech alumni and their families.

Doug Josephson '65, chairman of the 1971 homecoming committee, and his assistants, Guy Jackson '66 and Dick Burton '70, did a job that will be hard to top, but Jackson, who is chairman of the 1972 committee is already planning for the fifth homecoming.





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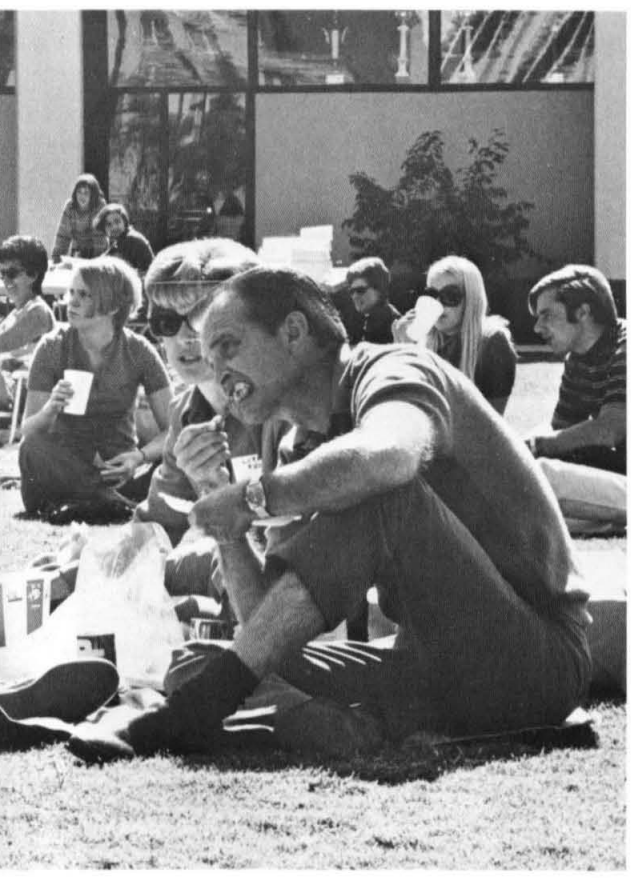
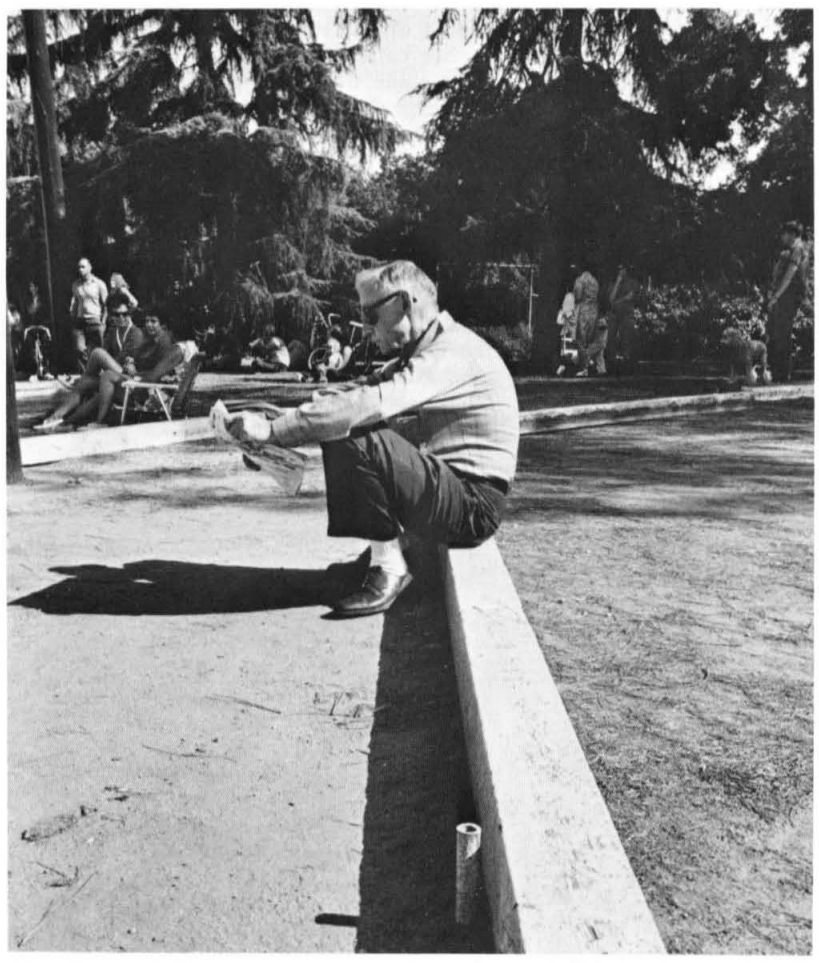
...partying





Caltech's first soccer-style place kicker, John Rogers, attempts field goal that fell short against UC Riverside frosh, but he later booted successful conversions during the Engineers' homecoming victory.

Grid wins sparked fall sports scene

Caltech's football team put together its best season in 14 years with victories over the La Verne jayvees and UC Riverside frosh. The Beavers' 2-5 record was last surpassed in 1957, when they won four and lost three. Also, for the first time since that winning season, the Beavers scored at least once in every game.

Split end Gary Stormo, a senior and three-year veteran, gained more yards receiving than the rest of the team combined. Key parts of the Caltech line were Russ Pinizzotto and Bruce Johnson, both seniors. Juniors John Morton and Steve Bisset led the team in the rushing department. The remaining senior, Lee Morris, and junior Bob Bales shared the quarterbacking duties.

The other fall sports did not fare as well. Soccer and water polo both suffered loss of personnel due to graduation, and finished well below their above-.500 seasons last year. The soccer team had but one victory, its first ever against Claremont-Harvey Mudd. The water polo squad won two conference games, both against Pomona, and defeated the Caltech alumni in the annual homecoming game. Steve Sheffield, an all-conference player last year, led the team with over 60 goals.

The cross country squad was composed mainly of freshmen and finished sixth, with only one victory over La Verne, the conference's newest member. Greg Griffin and Scott Matthews, both freshmen, should be top runners in the conference in the next few years.

Gavin Claypool, '75

Student views

Page House takes honors for Interhouse achievement

The Interhouse Dance came and went Saturday, November 13, leaving in its wake large quantities of wooden frames, empty punch bottles, and ruined GPA's. Everyone agreed that it was the finest Interhouse in the past three years, and every house except Dabney participated.

As usual, there wasn't much dancing. Only Page and Lloyd had bands, while Ruddock had square dancing. The other houses limited their efforts to showy displays and effects.

The Page House White Horse and Railroad Co., Inc. had the best technical achievement—a spur line that ran through two alleys into the lounge. The gravity-powered car reached a maximum of 25 mph before depositing its riders in the Company's papier-mache mine which featured an almost bottomless pit, indoor waterfalls, and a punch-spouting skull.

Lloyd House's lounge and dining room were transformed into a New Orleans night club complete with jazz band and an ample bar that was the downfall of several students. It proved a popular place for students with dates to rest and for those without dates to get smashed.

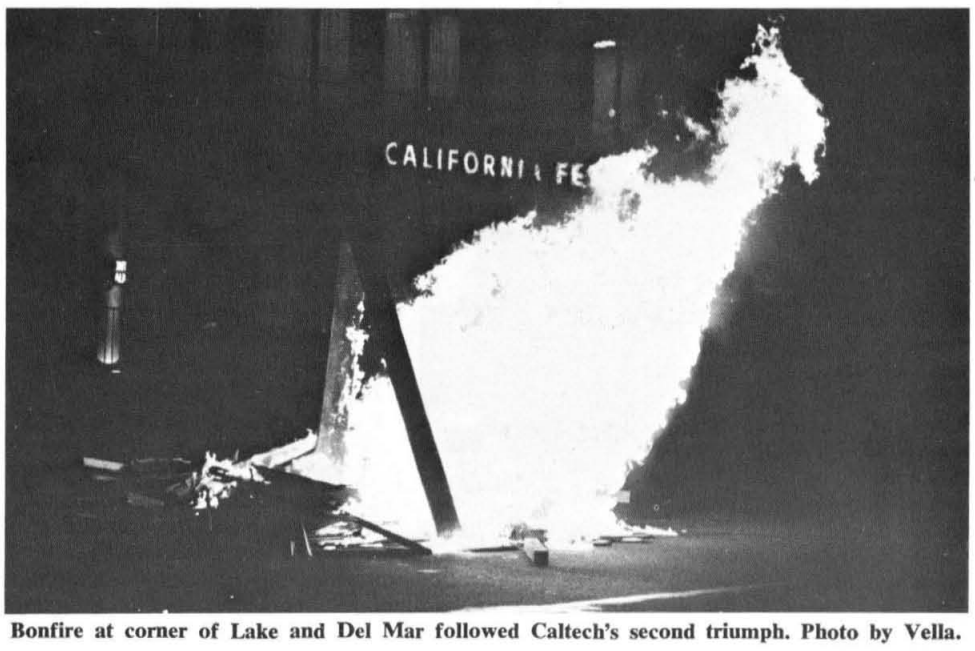
Ruddock went "country" and turned its courtyard into a barnyard complete with waterwheel, outhouse, and some random animals stolen from the biology department. Inside the "barn," in the house dining room, a professional square dance caller attempted to teach Techers and their dates the rudiments of barn dancing through trial and error—mostly the latter. Although the movements were not very elegant, everyone had a lot of fun.

Ricketts, tongue firmly in cheek, became the last outpost of 100 percent Americanism north of San Marino. The flag-raising ceremony awed many of the frosh parents (Saturday was also Parents' Day), who couldn't believe that this was the House that their children had told them about. Tragedy struck late Saturday night when a drunken Flem tore the

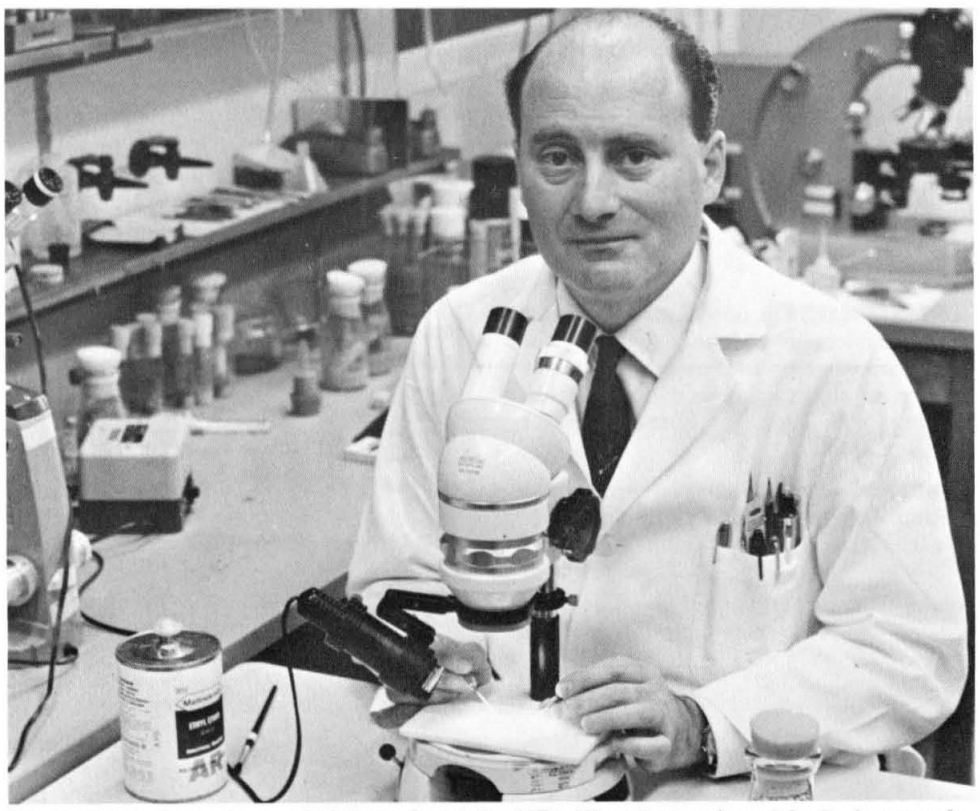
Continued on page 7

End John Steubs caught pass and ran for winning touchdown in closing seconds against Riverside.

Ricketts House answer to inflation was enlarged dollar bill which met tragic fate. Photo by Belsher.



Bonfire at corner of Lake and Del Mar followed Caltech's second triumph. Photo by Vella.



Seymour Benzer, professor of biology, shared the 1971 Albert Lasker Award for basic research.

Lasker award to Benzer

Seymour Benzer, professor of biology, is one of three distinguished biologists named for the Albert Lasker Award in Basic Medical Research for 1971.

The award, which carries a $10,000 honorarium, is shared by Stanford University's Charles Yanofsky and Sydney Brenner of the Medical Research Council Unit of Molecular Biology at Cambridge University.

The three biologists are honored for their individual studies on genes in viruses and bacteria, studies which are generally credited with establishing the foundations of the field of fine-structure genetics.

Benzer's experiments demonstrated that a single functional gene was not the indivisible unit of classical theory, but was capable of being split into hundreds of recombining elements that arranged themselves in linear or straight-line fashion as predicted in the famed Watson-Crick DNA molecule model.

By thus splitting and mapping the gene, Benzer helped shed new light on the genetic process as a continuous uninterrupted chain. This knowledge contributes substantially to our understanding of both normal and abnormal cellular events and provides insight into the molecular bases of many diseases. Benzer's findings are applicable in research into the causes of such genetic diseases as hemophilia and sickle cell anemia, and his work has led to improvement in the clinical basis of treating these and related diseases.

Since coming to Caltech in 1965, Benzer has shifted his scientific sights from fine-structure genetics to more integrative studies of development and behavior in the fruit fly, Drosophila.

The award was presented on November 11 at a luncheon in New York City, Benzer's birthplace.

CALENDAR

Saturday, Dec. 4, 8:30 p.m. Beckman
DEBU, sitarist, one of India's new, young composer-performers, with tabla and tamboura accompaniment. $5-4-3-2.

Monday, Dec. 6, 8:30 p.m. Beckman
PEOPLE, POWER & POLLUTION, a lecture by Lester Lees, director of Caltech's Environmental Quality Laboratory. Caltech Lecture Series. Free.

Thursday, Dec. 9, 8:30 p.m. Beckman
MARCEL MARCEAU. Event sold out.

Saturday, Dec. 11, 2:30 & 8:30 p.m. Beckman. *THE KING OF KINGS*, a special Christmas showing of the Cecil B. De Mille classic silent motion picture (1927), with special effects, both sound and visual, a choral repertoire by the Caltech Glee Club, and CHAUNCEY HAINES at the organ. General admission: $1.50, and for groups of 15 or more a special $1-per-ticket price is offered.

Sunday, Jan. 9, 8:15 p.m. Dabney Lounge
THE CONCERTANTE ENSEMBLE: Virginia Baker (violin), Thomas Osborn (clarinet and recorder), Delores Ackrich (cello), and Marilyn Scranton (piano) performing works by Telemann, Dahl, Mozart, and Messiaen in the second DABNEY LOUNGE CHAMBER MUSIC CONCERT. Free.

Monday, Jan. 10, 8:30 p.m. Beckman
CALTECH LECTURE SERIES: lecture to be announced. Free.

Nov. 30 through Jan. 14 Baxter Hall
VIEWPOINTS, an exhibition of photographs by SUSIE TRACY.

Saturday, Jan. 15, 11 a.m. & 2 p.m. Beckman. *CHILDREN'S SECOND ANNUAL SERIES OPENS: THE CIRCUS.* Clowns, acrobats, circus acts. Series: children-$5, adults-$7.50; single: children-$1.25, adults-$1.75. Adults not admitted without a child.

Fri. & Sat., Jan. 21 & 22, 8:30 p.m. Ramo
MARIE MARCHOWSKY THEATRE DANCE COMPANY in a program of modern dance. $4-3-2.

Sunday, Jan. 23, 3 p.m. & 8 p.m. Beckman
PASADENA SYMPHONY ORCHESTRA, conducted by Robert Cole, performing works by Haydn, Brahms, Stravinsky, and Ives. $4.00-2.50 ($1 for students).

Monday, Jan. 24, 8:30 p.m. Beckman
IMPLICATIONS OF RECENT RESEARCH ON DREAMS, lecture by Louis Breger, associate professor of psychology. Caltech Lecture Series. Free.

Friday, Jan. 28, 8:30 p.m. Beckman
JOHN LILL, pianist and winner of the 1970 Tchaikovsky competition. $5-4-3-2.

Interhouse festivities

Continued from page 6

ten-foot-long reproduction of a dollar bill that graced the south wall of Ricketts Courtyard. Fortunately, the house R. A. escorted him back to his own territory, saving him from slow torture and execution.

Blacker House became the Blacker Country Club for the night. The lounge was graced with a bar, a stuffed deer head, poker players, and some random troll who didn't know when to stop studying. A miniature golf course ran over, under, around, and through several alleys, and—in keeping with the mood—some very raunchy rhetoric was produced by those players who missed their putts.

Fleming, last but not least, flooded its courtyard again—not once but twice. Thursday, a support broke, and several thousand gallons of water spilled onto the Olive Walk. But the Flems were able to repair the damage in time for Saturday night's festivities. Inside the lounge Sheldon and the Schmucks performed with their own brand of musical ineptness, and the Fleming House Players produced "ATV-71C" or "Everybody Loves a Pakistani Prude."

All-in-all this year's Interhouse Dance was a very satisfying experience and a hopeful step towards reviving the old spirit of Interhouse.

Food riot averted

It is natural, in fact traditional, for college students to complain about food. But this year, with Canteen Corporation's takeover of Food Service, the quality of meals in the student houses reached a new low. The first few days of the term revealed amazing incompetence as badly cooked food was served late or not at all.

Suddenly "Food Service is a Riot" became a common joke; the *California Tech* printed an article on the etiquette of food riots; and the Interhouse Committee approved them in principal.

Under these circumstances, food service improved rapidly. The impending riots were averted, and today students can gleefully consume those favorite dishes of yesteryear: mule steak, hockey pucks, wharf rat, and spaghetti and golfballs.

Tradition dies

A tradition has died. It is no longer permissible to steal trophies during Interhouse Wars.

Peter Beckman, '74

Millikan open after hours to alumni members

Caltech alumni who belong to the Alumni Association can now use their membership cards for admission to Millikan Library after hours.

Following a decision made by the Faculty Library Committee on October 20, Director of Institute Libraries Harald Ostvold and Alumni Association President Rube Moulton announced that by showing either a lifetime or annual membership card to the attendant at the desk, alumni will be admitted into Millikan after 5 p.m. Monday through Friday and on weekends and holidays.

As in the past, however, any borrowing of publications by alumni who are not members of the campus community must continue to be through interlibrary loan channels.

"We are very pleased," said Moulton, "that the Institute has extended this privilege because it encourages alumni to use Caltech facilities and strengthens ties between alumni and the Institute."

Alumni dinner-lecture Jan. 24

"Implications of Recent Research on Dreams" is the subject of a special alumni dinner-Beckman Lecture program on January 24.

Louis Breger, associate professor of psychology at Caltech, will discuss findings from dream studies carried out in the years since the discovery of sleep-monitoring methods.

A no-host cocktail party will be held for alumni at 6:00 in the Athenaeum, followed by dinner at 6:30, and the lecture at 8:30.

This is the last of the Fall-Winter Caltech Lecture Series and a capacity audience is expected. To make sure that seats are available, alumni should return their reservation cards to the Alumni Office as soon as possible. The dinner-lecture program cost is $6.00 per person.

Reunion memories

Among the 75 alumni and their wives who turned out for the Class of 1940 reunion at the Athenaeum were (above, from left) Gil Van Dyke, Mrs. Jean Stevens, Jean Stevens, and Gordon Weir, weatherman for KNBC in Los Angeles. Meeting during the 25th reunion of the Class of 1946 were (below, from left) Ted Neale, Herb Roydon, John Tabler, and Roger Clapp.

PERSONALS

1925

ROBERT H. DALTON, MS '26, PhD '28, who retired in 1967 as associate director of chemical research at Corning Glass Works in New York, has been elected to life membership in the Franklin Institute. A native of New Zealand, Dalton was a recipient of the Franklin Institute's John Price Weatherhill Medal in 1953 for his contributions in the field of photosensitive glasses.

1928

W. MORTON JACOBS, president and chief executive officer of the Southern California Gas Co., has received the American Gas Association's highest honor, the Distinguished Service Award, for outstanding contributions to the natural gas industry. Jacobs, who is president of the Caltech Associates and a recipient of Caltech's 1971 Distinguished Alumni Service Award, was cited for his "foresight and fortitude in alerting the federal authorities and the nation to the necessity for stimulating the search for greater natural gas supplies." Jacobs was president of the Alumni Association in 1947.

1931

JOHN R. McMILLAN, president of Reserve Oil and Gas Co. in Los Angeles and president of The Caltech Associates from 1968 to 1970, was one of three men to receive the Society of Petroleum Engineers' (SPE) Distinguished Service Award for 1971 at the annual fall meeting in New Orleans last month. McMillan, honored for his 23 years of service to the SPE and the Institute of Mining, Metallurgical, and Petroleum Engineers (AIME), has served as president of both organizations.

1935

RICHARD H. JAHNS, PhD '43, professor of geology and dean of Stanford University's School of Earth Sciences, spoke to the American Institute of Professional Geologists on "Natural Resources and Man's Environment" during the AIPG's eighth annual meeting in Denver, Colo., on October 8-9. Jahns is also president of the Geological Society of America.

1936

THEODORE C. VERMEULEN, MS '37, professor of chemical engineering at the University of California at Berkeley, received the 1971 William H. Walker Award of the American Institute of Chemical Engineers on November 29. Vermeulen, who was principal founder and first chairman of the chemical engineering department at Berkeley, has done extensive research in chemical recovery and purification methods. He is currently working on water desalination processes and is developing a computer model of pollutant spread adjacent to freeways. The Walker Award is given annually for outstanding contributions to chemical engineering literature.

1940

WILLIAM C. HOUSE, a member of the Alumni Association's board of directors and vice president of preliminary design for Aerojet General Corporation, has moved Aerojet's Surface Effects Ships division to Tacoma, Wash. House will continue to serve on Caltech's alumni board of directors.

Vermuelen, '36

Smith, '45

1945

DUDLEY B. SMITH, licensing coordinator for the Celanese Corp. in New York, has been awarded the Licensing Executives Society's newly coined LES Gold Medal for his world-wide contributions to licensing and to those who negotiate license agreements. Smith is a founding member and former president of the LES, a nonprofit society.

1946

JOHN R. JACOBSEN, MS, former manager of programming planning at the Ventura, Calif., division of Northrop Corporation, has been promoted to program manager for the company's Mark 30 underwater target system.

1947

WARREN S. TORGERSON, listed as "Address Unknown," has been found for Caltech alumni by WILLIAM R. BURNS, '45, vice president for operations at General Life of Wisconsin. Torgerson is chairman of the department of psychology at Johns Hopkins University in Baltimore.

1948

JULIUS S. BENDAT, MS, previously vice president and director of Digitek Corporation and president of Measurement Analysis Corporation, is the new director of environmental development for the Fund of the West, Inc., a subsidiary of Beverl, Hills Bancorp.

HAROLD S. JOHNSTON, PhD, professor of chemistry at the University of California at Berkeley, published a paper in the August 6 issue of *Science* magazine on "Reduction of Stratospheric Ozone by Nitrogen Oxide Catalysts from Supersonic Transport Exhaust."

1950

DONALD A. DOOLEY, MS, PhD '56, is the new vice president of the research and development division of System Development Corporation in Santa Monica, Calif. Dooley was previously with General Dynamics' Convair Aerospace division as vice president of the space shuttle program.

PHILIP ROSTEN is now marketing manager for Astrophysics Research Corporation in Los Angeles.

LEE R. SCHERER JR., AE, director of Apollo lunar exploration for NASA, has been named director of the agency's Flight Research Center at Edwards Air Force Base. A graduate of the Naval Academy in 1942, the retired Navy captain was assistant director for lunar programs and manager of the Lunar Orbiter project for NASA before directing scientific aspects of Apollo lunar exploration.

1952

JESSE L. WEIL writes that after seven years as associate professor of physics at the University of Kentucky, he is on sabbatical leave at the Rutherford High Energy Laboratory in England. Weil is looking for evidence of the production of super-heavy elements in the targets used for meson production in high energy accelerators. He and his wife, Esther, and their two girls live in Abingdon, just south of Oxford. Weil asks any members of his class or neighboring classes who visit England to get in touch with him.

1953

PAUL E. LANGDON JR., MS '54, an associate of Greeley and Hansen, Engineers, of Chicago, became a partner of the firm in September.

1956

SAMUEL R. PHILLIPS, MS '57, is now manager of electromechanical applications for Arkon Scientific Laboratories of Berkeley. He was previously vice president of engineering for the Penberthy division of Houdaille Industries, Inc., in Prophetstown, Ill. Sam and his wife, Mitzi, live in San Francisco.

HUBERT E. DUBB, formerly a patent solicitor for Corn Products Co. in Chicago, has joined Norman E. Reitz in San Jose as a partner in the firm of Reitz & Dubb for the practice of domestic and foreign patent, trademark, copyright, and unfair competition law.

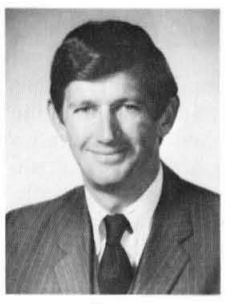
1958

NORMAN ELLETT is now manager of managment services in Morton Grove, Ill., for Baxter Laboratories, Inc., manufacturers of products in the hospital and health fields. Ellett was with Litton Industries, Inc., prior to joining Baxter.

MAURITZ J. KALLERUD has been named technical director for the Morton Salt Company in Chicago. He was employed previously as project manager for Garrett Research and Development Company before joining Morton Salt last year.

1968

ERNO S. DANIEL received his PhD at the end of summer from the University of California at San Diego following research in nuclear magnetic resonance. He is now enrolled at UCLA medical school studying for his MD degree.



Ellet, '58

Daniel, '68

1970

JAMES W. MEYER, PhD, recently joined Eastman Kodak as a senior chemist at the Kodak Research Laboratories in Rochester, N. Y. Meyer completed his undergraduate work in chemistry at the University of Wisconsin in 1966 and last year held a postdoctoral appointment at Stanford University for research in organometallic chemistry.

1971

STEVEN C. OFFEN, a second lieutenant commissioned in 1971 through the Air Force Reserve Officer Training Corps program, has entered U. S. Air Force pilot training at Columbus AFB, Miss.

THOMAS R. HEINZ, recipient of the Howard G. Vesper basketball trophy for 1971, is one of 125 students who began their studies in September at the University of Colorado School of Medicine, the largest class in the 88-year history of the school. Heinz graduated from Caltech in physics.

Obituaries

1921

FRED C. HENSON, EX, on July 6, in Pasadena. Since 1954 he had been owner and partner of the Fred C. Henson Co. in Pasadena, a custom scientific apparatus firm. Henson, who retired in 1966, leaves a son and two daughters.

ERNEST H. MINTIE, on September 23, in Los Angeles. A graduate of the Institute in mechanical engineering, Mintie was chairman of the board of the Mintie Corporation, a specialty maintenance corporation for industrial and commercial enterprises, located in Los Angeles.

1924

FREDERICK J. McCLUNG, on March 20, in Costa Mesa, Calif., of a heart attack. Formerly president of the M & M Broom Co. in Los Angeles, McClung retired in 1968 following a serious automobile accident. He is survived by his wife.

1929

KNOWLTON R. BIRGE, on October 31, 1970. A member of the American Institute of Electrical Engineers, Birge was an electrical engineer with the Ralph M. Parsons Co. in Los Angeles before retiring in 1965. He leaves two brothers, Elmer F. and Lysle D. Birge.

1931

ELLIS O. ERICKSON, MS, on July 9, 1969. Erickson, who received his BS degree in electrical engineering from the University of North Dakota in 1923, was working for the Federal Sign & Signal Corp. at the time of his death. He is survived by his wife, Mabel, and two daughters.

1933

E. RAY LOCKHART, MS '34, on September 30, in El Paso, Texas. A recipient of the Alumni Association's Distinguished Service Award in 1966, he was president and chairman of the board of the El Paso Electric Co. A native of Raton, N. M., Lockhart was active in many state and community affairs, including the Texas Atomic Energy Research Foundation and the El Paso Historical Society. He had been director and president of the El Paso Chamber of Commerce, chairman of the advisory council of the University of Texas at El Paso, and president of the Western Energy Supply and Transmission Association in 1968 and 1969. The Ex-Student's association of the University of Texas at El Paso has begun a Library Memorial Fund in Lockhart's name. He is survived by his wife, Alice, and two sons, George R. and William M. Lockhart.

1941

LEO F. DELSASSO, PhD, on July 22, on a trip in Germany. Delsasso joined the faculty at the University of California at Los Angeles in 1954 as assistant dean and associate professor of physics. He became assistant dean of the graduate division in 1957 and chairman of the physics department in 1962. Desasso was named professor emeritus in 1968. He leaves his wife, Mary, and two sisters, Emma and Martha.

1950

RICHARD M. HERMES, PhD, on September 28, 1969. Formerly with the IBM Corporation in San Jose, Hermes was a senior research engineer at the Stanford Research Institute in Menlo Park, Calif., at the time of his death. He received his BEE and MA degrees from the University of Santa Clara before coming to Caltech for graduate work in mechanical engineering.

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

Name .....

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

Address .....

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