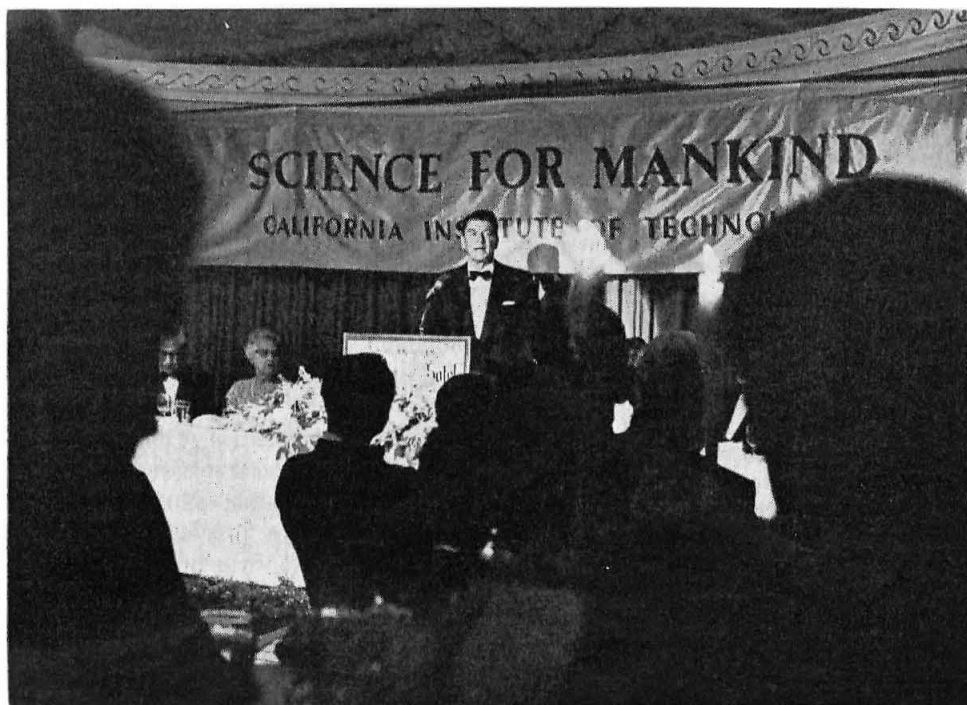


CALTECH NEWS



PUBLISHED FOR ALUMNI OF THE CALIFORNIA INSTITUTE OF TECHNOLOGY

VOLUME 1 / NUMBER 5 / NOVEMBER 1967 • PASADENA, CALIFORNIA



Governor Ronald Reagan, talking at a dinner marking the beginning of Caltech's development campaign, reminds the audience of its responsibility to private higher education.

Reagan Wows Kickoff Dinner Guests, Warns Against Misuse of Science and Engineering

Some 800 friends of Caltech were officially introduced to the Institute's "Science for Mankind" development campaign at a dinner in Los Angeles's Ambassador Hotel on November 8. Principal speaker at the event was California Governor Ronald Reagan.

Dr. DuBridge explained to the group that, because Caltech is important to both the nation and the state, it was appropriate that either the President or the Governor be invited to speak. "It would have been interesting, he said in introducing Mr. Reagan, "to have had both."

The Governor preceded his remarks by announcing that Caltech was assured of a new building for the humanities and social sciences as a result of a gift of \$2.8 million—one of the largest ever received by Caltech—from Mrs. Delia B. Baxter of Atherton, California. It will be named the Donald E. Baxter, MD, Hall of Humanities and Social

Sciences in honor of Mrs. Baxter's late husband, a distinguished physician and leader in the development of high-quality production of solutions for mass intravenous therapy and of associated medical equipment.

In his speech the Governor, while agreeing that we need more science and engineering because they can solve problems and be used to elevate man, warned that

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83 Alumni Get the Word, Start Ringing Doorbells

Caltech alumni have been put on the books to meet a five-year campaign goal of \$2 million, about 2.5 percent of the over-all goal of \$85.4 million. However, success to date and the opinions of some leading alumni indicate that Caltech alumni may be able to raise \$3 to \$5 million in that time. (Major gifts—more than \$100,000—will be recorded as alumni contributions, but will not be credited toward fulfillment of the \$2 million goal.) In charge of the volunteer organization charged with raising the money is Ruben Mettler, '44, PhD '49, president of TRW Systems. Backing up Mettler are assistant chairmen William Nash Jr., '38, PhD '42, vice president of C F Braun Inc., and Richard Schuster Jr., '46, '49, executive director for Caltech's Industrial Associates.

Doing the actual dirty work will be 83 area chairmen (47 in California) who are assigned the task of arranging for personal solicitation of every alumnus in their geographical areas. The area chairmen, who have by now recruited fellow alumni in their areas to help make the individual contacts, converged on Pasadena last September 8 and 9 for a two-day session of instructions, background, and pep talks.

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Got a Spare \$64 Million? Use It To Finish Off Caltech's \$85 Million Development Campaign

The magic number for the next five years is 85,400,000—the number of dollars that Caltech must raise to underwrite its "Science for Mankind" program. The development campaign is the end-result of long-range plans made by division chairmen and key faculty about three years ago. The board of trustees was advised two years ago of what facilities and finances would be needed to implement the plans; the trustees, after considerable soul-searching and analysis of the figures, agreed to take on the job of raising the money. In the time since, the trustees, with the help of Institute personnel and some alumni, have been setting up the complex organization needed to support such a large campaign (about five times as large as the Caltech campaign of 1958). Formal announcement of the campaign was made by Arnold O. Beckman, chairman of Caltech's board of trustees, and Caltech President Lee A. DuBridge at a press conference on November 2.

The \$85 million contains about \$73 million in "new" money; the rest represents money that Caltech would have been raising for the next five years had there been no development campaign. The total is divided into three broad categories: physical facilities (\$26.6 million for new buildings, \$4.7 million for rehabilitation), endowment for faculty positions (\$19.4 million—to include 15 or more new professorial chairs at no less than \$750,000 each), and current funds to support research and study (\$34.7 million).

Buildings (and the private gifts needed for each) are:

- Astrophysics (\$2.2 million—subscribed)
- Geophysics and planetary sciences (\$2.5 million)
- Chemical physics (\$2.2 million—subscribed)
- Graduate residences (\$2.4 million)

- Behavioral biology (\$2.2 million—subscribed)
- Engineering (\$1.9 million)
- Radio astronomy (\$450,000—subscribed)
- Palomar 60-inch telescope dome (\$250,000—subscribed)
- Humanities and social sciences (\$2.8 million—subscribed)
- Applied mathematics (\$1.6 million)
- Cyclotron building (\$1.7 million)
- Business operations (\$2.4 million)
- Physical education (\$1.2 million)

Trustee Simon Ramo, PhD '36, is the national chairman of the campaign. He has formed a "Committee of 100" assigned to work in the major-gift sector comprising gifts from foundations, corporations, non-alumni, alumni, and parents. The alumni phase of the campaign is being directed by Ruben Mettler, '44, PhD '49. [See story in Col. 2] The Institute staff (some 30 people) backing up these efforts is headed by H. Russell Bintzer, Caltech vice president for development.

The job facing Caltech, which has after all only about 10,000 alumni, is immense. Moreover, three other California universities have just completed massive fund drives: Stanford, \$100 million; USC, \$106 million; and Pomona, \$86 million.

"But," according to Dr. Beckman, "the point was we were not planning a campaign fund to try to get the easiest time to raise money. We had to raise money when the money was needed, and that time was now. So, whether it is going to be tough or easy, we're going to have to raise it." He adds that "this campaign is based solely on the recommendation and request of the faculty. The faculty has said we need money for this or that, and

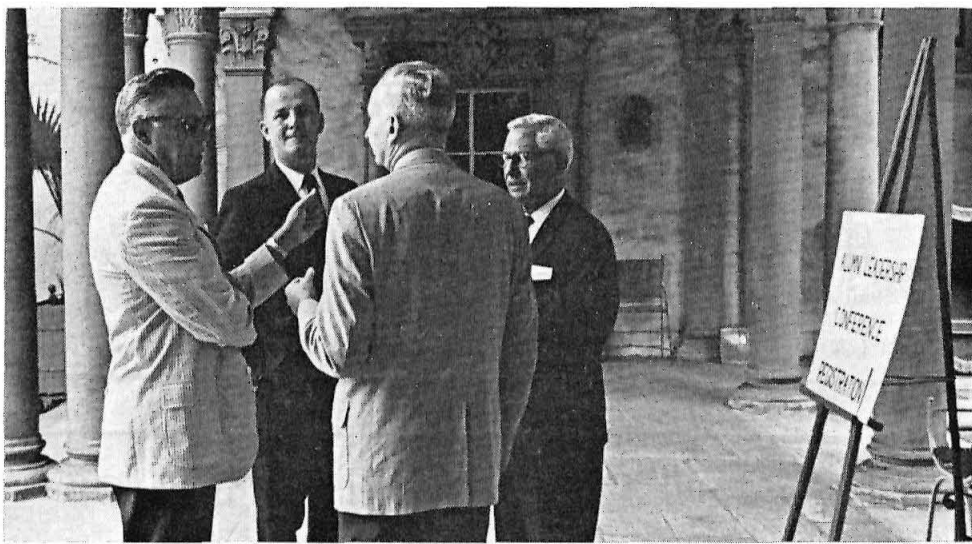
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Caltech President Lee A. DuBridge and Trustee Chairman Arnold O. Beckman announce the "Science for Mankind" development campaign to the press on November 2.



At the alumni leadership conference on September 8: (left to right) H. Russell Bintzer, Caltech vice president for development; Rube Mettler, alumni phase chairman; Simon Ramo, campaign national chairman; and Lee A. DuBridge.

Alumni Meeting: Why and Wherefore of the Fund Drive

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President DuBridge explained to them that the development campaign grew out of "all the possibilities, all the opportunities, all the exciting things that the division chairmen and their key faculty people were proposing and suggesting." He added that it had been very difficult to sort them out and that the \$85 million amount represented a careful winnowing of many people's plans.

Many of the new areas of work will be interdisciplinary—a continuation and expansion of much work already in progress. Because, said Dr. DuBridge, he and others are "firmly convinced that the scientific and engineering work which has been going on here and in similar institutions around the world has had an important effect upon the welfare of mankind, we are calling our new development program 'Science for Mankind.' Let me make it clear that this label was used for an economy of words so necessary in visual communications. It in no sense implies any lessening of our emphasis on engineering. We believe that new discoveries in physics, astronomy, chemistry, biology, and mechanical, civil, and electrical engineering will eventually contribute potentially to the welfare, prosperity, and happier lives of all people. But we would like to focus a little more attention on society. While we believe that science and technology can benefit mankind, we want to focus our attention on how to make it more truly, more actively, and more fruitfully of real benefit to people. This is why we ask you to participate in the 'Science for Mankind' program."

Dr. DuBridge outlined the work that the trustees will be doing as their part of the campaign. He then reminded the alumni group that two alumni had already "done their part by making gifts totalling well over \$4 million. If we add to this the several million dollars which the other alumni are going to raise, we will have a very handsome alumni fund emerging from this campaign."

National chairman Simon Ramo, PhD '36, explained that the campaign is "a heck of a good plan. It is system-oriented; that is, it takes into account what Caltech ought to be, and ought to do, as well as the opportunities on the frontiers of science and technology. Moreover, it is a plan that will continue to provide for this nation, and for society at large, the rather special things that Caltech has been."

Dr. Ramo recognized the need throughout the nation for more brain power being devoted to "the social side of life." Caltech, he said, will join in that work, but

will be able—because of the combination of factors that characterize Caltech—to make a unique contribution.

One point that he made was echoed by later speakers: that "the way to make Caltech more subject to federal control is for the private sources of support to be lacking. If private support is not forthcoming, the private schools will simply be shifted into the category of federal schools, at which time higher education will be a totally government-run operation."

Arnold Beckman passed on to the area chairmen some of his experience from the 1958 campaign. He stressed the importance of alumni participation—both for the sense of belonging that it gives the contributing alumnus and for the importance with which non-alumni donors view such participation. In 1958, he said, "we had 7,600 alumni; 3,600 contributed to the campaign. That means that 52.5 percent of the alumni didn't give one dollar to Caltech. Moreover, in a survey of alumni support in 1965 of 899 universities, Caltech alumni were ranked 65th in average gift per alumnus—only \$54. I think that's a pretty shameful record. I would suggest that one of the goals this year should be 100 percent participation by the alumni."

The following day the meeting got down to the nitty gritty of getting hold of the alumnus's money. Out came the inside boys who have been helping organize this campaign while running Caltech's normal fund-raising operations for the last few years. Vice president for development H. Russell Bintzer, who came to Caltech from Carnegie Institute of Technology in the summer of 1966, introduced development personnel from four "giving areas": corporations, foundations, special gifts, and deferred giving. They, in turn, discussed their particular functions, primarily to acquaint the area chairmen with the kinds of support that they could draw on within Caltech.

Alumni-phase chairman Rube Mettler took the opportunity to make his face-to-faces solicitations of the 83 captive area chairmen for contributions to the campaign. (Arnold Beckman had already jolted them the evening before by suggesting that they each give twice as much as they had been considering.) Mettler explained his blatant intrusion of the matter into the midst of the meeting by pointing out that he had been solicited a few days before by his boss, Simon Ramo.

In spite of having the bite put on them, the assembled alumni left for home with apparently high spirits—and a determination to let other alumni share in the joys of giving to Caltech.

Progress to Date? Great! Nearly 25 Percent In

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the trustees are firmly convinced of those needs and dedicated to raising the money that they require."

As of the middle of November, more than \$21 million (just short of 25 percent) of the goal had been raised. That included \$4,722,812 in gifts greater than \$100,000 from Caltech alumni, and \$616,000, or 31 percent of the goal of \$2 million, for alumni gifts of less than \$100,000.

Major gifts for buildings already given or pledged are:

- ▶ \$2.2 million from an alumnus (who prefers to remain anonymous) for a laboratory of chemical physics, to be named in honor of A. A. Noyes. Construction of this building is nearly complete.
- ▶ \$2.8 million from Mrs. Delia B. Baxter for the Donald E. Baxter, MD, Hall of Humanities and Social Sciences, in memory of her husband.
- ▶ \$2.2 million from Dr. and Mrs. Arnold O. Beckman for a laboratory of behavioral biology.
- ▶ \$450,000 from Caltech trustee Earle M. Jorgensen and Mrs. Jorgensen for a laboratory and living quarters for the Owens Valley Radio Observatory.
- ▶ \$2.8 million provided by Caltech trustee Seeley Mudd for an astrophysics laboratory to be built in conjunction with a building funded by the Carnegie Institution of Washington to house the offices and headquarters for the Mt. Wilson and Palomar Observatories.
- ▶ \$250,000 from the Oscar G. Mayer family for a building to house a new 60-inch telescope at Palomar Observatory.

Other major gifts received include: IBM Corporation—\$1 million, for building program.

Braun Trust—\$500,000.

Aerojet-General Corporation—\$500,000, for Clark B. Millikan professorship in the aeronautical sciences.

Thomas J. Watson Jr. (Caltech trustee)—\$500,000.

Alfred P. Sloan Foundation—\$400,000, humanities and social sciences.

Boswell Foundation—\$400,000.

Robert E. and May Wright Foundation—\$310,228, research in medical science.

Simon Ramo (Caltech alumnus and trustee)—\$250,000, auditorium for the new humanities and social sciences building.

TRW Incorporated—\$250,000, research in social sciences and Industrial Associates.

Mr. and Mrs. Louis E. Nohl (Caltech trustee)—\$250,000.

Crown Zellerbach Corporation—\$125,000, scholarships and Industrial Relations Center.

Reed O. Hunt (Caltech trustee)—\$125,000.

Leonard F. McCollum (Caltech trustee)—\$225,000, humanities and social sciences.

Southern California Edison—\$200,000, Industrial Associates and earthquake research.

Rockefeller Foundation—\$200,000, for humanities and social sciences.

Carnegie Corporation—\$200,000, research on information processing in nervous systems.

Stuart Family Foundation—\$150,000.

Northrop Corporation—\$130,000, Industrial Associates and Caltech Associates.

Bing Fund—\$125,000.

Norman Chandler (Caltech trustee)—\$100,000.

Martin Marietta Corporation—\$100,000, for Industrial Associates and unrestricted.

Pfaffinger Foundation—\$100,000.

Alumni Queries #2: Why Should I Give Again?

▶ From what I understand of the Institute, it is a wealthy institution, having more than enough supporters for virtually any need. Why should I, a struggling alumnus, be asked to contribute?◀

In my local Baskin-Robbins ice cream store there is a sign that says: "There is hardly anything in this world that can't be made a little cheaper and be sold for a little less . . ."

The same is true of education, and every alumnus should ask himself why he chose Caltech in preference to one of the more than 2,000 other institutions available to him. Caltech hasn't lived long enough to generate the "old school tie" tradition. The Institute certainly isn't located central to our geography. And tuition and other student costs are hardly on the poverty level. So another reason must underlie the choice made each year by some 1,000 or more applicants. The chances are overwhelmingly that the *quality* offered by Caltech is the deciding factor.

Quality is expensive—in ice cream, automobiles, homes, golf clubs, liquor, and higher education.

Caltech does receive a lot of help each year, and it does have a lot of supporters. But to assume that Caltech has more money or supporters than are needed would be a grave mistake.

The plain fact is that each year Caltech will need \$15 to \$20 million in gifts and grants just to maintain its present position in the educational community. And the gift of every alumnus is important to help make up this total.

And one more thing: More and more "other" supporters are scrutinizing the help being given a school by its immediate family in order to gauge the degree of

their own assistance. The attitude seems to be something like this: If the alumni and trustees don't consider Caltech worthy and needful of their support, why should an "outsider" pour money in?

▶ Many of us understood that the development program 10 years ago was a "once in a lifetime obligation." Why is this new major program needed only 10 years later?◀

There are two things wrong about the "once in a lifetime obligation" phrase: the words "lifetime" and "obligation."

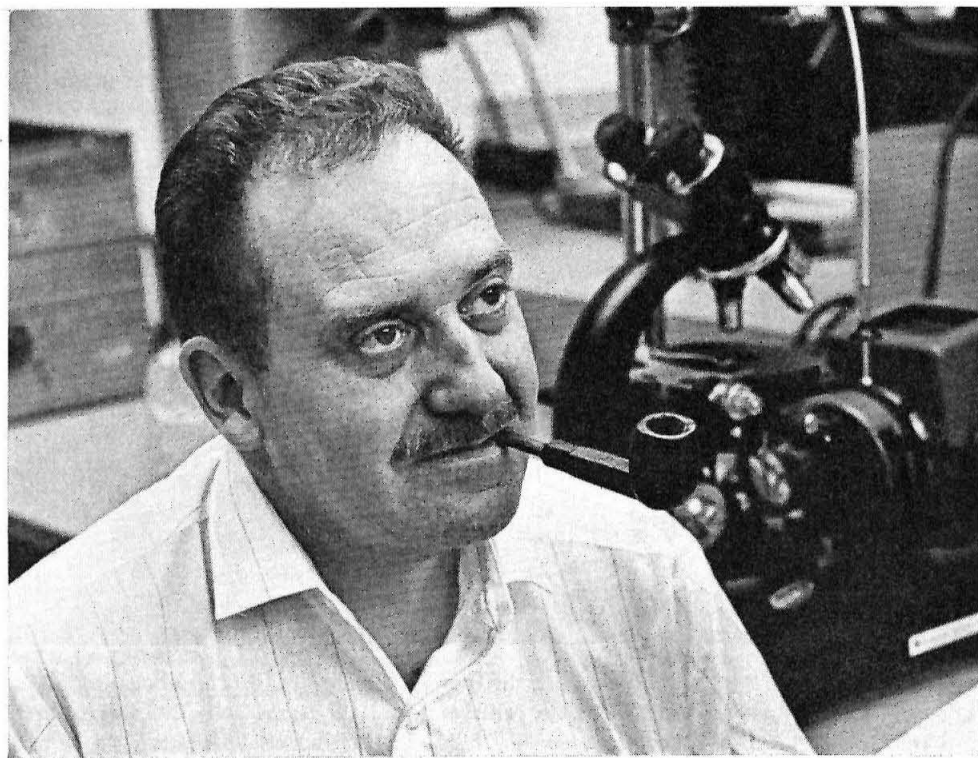
Whose lifetime is involved in the phrase—Caltech's? The alumnus aged 25? The alumnus aged 75? No one could expect that never again would Caltech need help in its lifetime! Perhaps the alumnus aged 75 (10 years ago) could fairly assume that his lifetime would pass without his receiving any further requests from Caltech. But can any alumnus with a life expectancy of 15 or more years make the same assumption any more than he can assume that his personal income and financial obligations will remain static?

And the opportunity to advance the quality of the institution from which he received a degree is hardly an *obligation*—lifetime or otherwise. Rather, it is a chance to demonstrate his belief in and appreciation for his Caltech education.

It's too bad that the "once in a lifetime" phrase ever crept into the literature or statements of 10 years ago. As long as Caltech strives to stay in the forefront of teaching and research, help will always be needed from any and all persons and organizations who believe that a few institutions must adhere to and set the pace for quality education.

—H. Russell Bintzer

Caltech vice president for development



Ray Owen, chairman of the division of biology

Biology Is Getting Its Feelers Into Chemistry, Engineering, and--Hang On--the Social Sciences

Ray Owen is a distinguished geneticist now in his 21st year at Caltech and his 7th year as chairman of the division of biology. He followed a tough act; his predecessor, George Beadle, won the Nobel Prize while he held the job and left to become chancellor of the University of Chicago. Dr. Owen hints that he would be content just to get back to research. His disclosure of the exciting things happening today in biology at Caltech goes a long way towards explaining why.

Q: How many undergraduates come to Caltech intending to be biologists?

A: Very few. I was on the admissions committee for about 10 or 12 years, and I doubt that over that period I saw more than half a dozen high school students who planned to come to Caltech to major in biology. I don't think that situation has changed very much, but we end up with a reasonable number of undergraduate majors—31 this year, compared with 49 in chemistry and 18 in geology. Our number of majors has approximately doubled in the last five years.

The number of graduate students has been increasing too; there are currently 70 of them in the division. With 23 faculty of professorial rank, it figures out to between three and four grad students per professor. Many of the graduate students had undergraduate majors in fields other than biology, particularly chemistry, physics, or mathematics.

Q: How many undergraduates stay at Caltech for graduate work in biology?

A: Very, very few. We encourage our undergraduate majors to go elsewhere, although they're students we would very much like to keep because they've had ex-

perience that can be grown on chemically defined media, and their biochemistry and genetics.

Physiology, especially neurophysiology—dealing with the way the nervous system functions—is in the hands of several people. Felix Strumwasser uses electrophysiological techniques to investigate learning and memory in the sea hare. He also works with the phenomenon of biological clocks and rhythms, and hibernation in mammals.

Genetics continues to be an important activity in the division, with viruses, molds, insects, and animals used as tools. Work continues in immunology, especially the biochemical basis of antibody formation and the nature of immunological memory.

Psychobiology, the biological bases of behavior, is a very important and exciting area of research being conducted by Roger Sperry. Another field is development—how the individual develops from the fertilized egg, how the cells making up the complex, multicellular, mature individual come to function differently, to do special jobs in the organism. These studies are being approached by several members of the faculty from many viewpoints, especially biochemical and biophysical, and from the direction of experimental embryology by Albert Tyler.

Q: What do you see as the coming areas of concentration?

A: We expect activities to continue in molecular and cellular biology, especially with regard to the problem of development and deviations from normal development in health and disease.

We hope to expand the divisional program in behavioral biology, intensifying our studies of the nervous system, the chemistry of the nervous system's development, perhaps the effects of drugs on behavior, and the biochemical and physiological bases for these drug effects. We will work on the establishment of the "wiring diagram" in the nervous system and extend the program in psychobiology into the area of more specifically psychological investigations. The psychological extensions will probably be by way of experimental and physiological psychology.

We also hope to concentrate on trying to decipher what has been called the "brain code." This is one of the great mysteries in biology today and one whose solution may throw light on important aspects of human behavior. Specifically, the field we're thinking about is called the

"cerebral correlates of perception"—the kinds of measurable events occurring in the brain that can be correlated with perception of things and events in the human environment.

We're developing a very distinguished emphasis in the field of behavioral genetics, where Seymour Benzer is studying the inheritance of behavior. He's working with *Drosophila*, in collaboration with E. B. Lewis, inducing single gene mutations and observing behavioral effects. It's already evident that this is likely to be a fruitful way of dissecting out unit processes in behavior, much as was done before for biochemistry.

Q: Will biology facilities be increased as a result of the development campaign?

A: We expect the addition of a new, 80,000-square-foot biology building on Beckman Mall by the end of 1970. A gift has been given by Arnold Beckman in the amount of \$2¼ million to provide the private sector of funding for that building. We're in the process of preparing an application for a federal grant that will supplement Dr. Beckman's gift. The building as contemplated will provide about one-third more space for biology, which now occupies Kerckhoff, Alles, and part of Church, which we share with chemistry.

Q: How do you decide where biology stops and chemistry begins?

A: We really don't. Intimate interaction between biology and chemistry is a matter of history and current status at Caltech. Along their marginal areas they get so intermingled that one doesn't distinguish a border.

This is even evident physically. Go down to the sub-basement of Church, for example. You'll find Jerry Vinograd, who has a joint appointment in chemistry and biology, working with graduate students and research fellows, some of whom are in chemistry and some in biology. And Vино-

The extension of behavioral biology into experimental and physiological psychology is the bridge to the social sciences.

grad is associated on the one side with Norm Davidson, a chemist who is doing work very closely related to his, and with Giuseppe Attardi, a biologist also engaged in closely related studies.

Q: Isn't work in biosystems another kind of interdisciplinary work?

A: Yes, although the "mix" is on the whole somewhat less intimate than that of biology and chemistry. Neurobiologists and electrical engineers—quite different in their backgrounds and vocabularies—work together on common problems. This program, in the computing center, has been working well and has made some important contributions to understanding how the nervous system—especially with regard to insect responses to things that are perceived through their eyes—is set up in terms of wiring diagrams.

Derek Fender's program, which deals with the very fine movements of the human eye and how they function to increase the acuity of vision, is another example of a fruitful interdisciplinary approach. We expect our program in neurophysiology and applied science to continue to develop.

Q: Hallett Smith, chairman of the division of humanities and social sciences, when interviewed a few months ago for Caltech News, mentioned some possible interdivisional work with biology. Can you tell us more about what that will be?

A: The Institute is becoming more and more conscious of the obligations of scientists and engineers to try to have their work produce the best possible kinds and

amounts of effects on society. As someone has said, "We have come more and more to realize that although science is ethically neutral in its methods and operations, its effects are not by any means so."

We in biology view the extension of our program in behavioral biology into the fields of experimental and physiological psychology as the beginning of a bridge to the social sciences. We hope very much that there will develop in the division of humanities and social sciences a concern with social psychology and the behavior of people in small groups and as individuals that will provide for the same kind of

There may be some advantage to a turnover of division chairmen. Not too often, but for terms on the order of mine.

intimacy of interaction as exists now for chemistry and biology. Then you won't really be able to draw a line between the psychology under investigation in biology and that in social sciences.

Q: We talk frequently about the selective work being done at Caltech. What are some of the major areas of biology that Caltech DOESN'T work in?

A: Traditionally we have never tried to be strong in the more descriptive aspects of biology—things like identifying the names of various kinds of plants and animals, describing how plants and animals are distributed in nature, and describing their structure (except that since anatomy has extended into the field of very fine structure by way of the electron microscope, we're doing a lot more of it).

Another kind of restriction is in the field of physiology, the study of function. At most universities there is a large department of physiology. Caltech does have physiology because we do study function of animals and human beings extensively, but our physiology is almost exclusively concerned with the nervous system.

Q: Do you, as division chairman, have time to continue your own research?

A: During the seven years I've been division chairman I've been able to maintain a small research program supported by the AEC. By having a couple of good post-doctoral fellows and a good technician, I've had a place where I could at least go for coffee a couple of times a day and talk about what was going on. I could have ideas about what might be done, and I could at least participate in a research activity, although I do practically nothing at the bench myself. So, although most of my time has been spent in administrative work and in outside government work, particularly as a consultant for government agencies, I do feel that I've been able to keep abreast of my field.

The problem of being able to continue some kind of research activity is important for some division chairmen. I came here the same year as George Beadle. Within about three or four months I saw him go through the experience of recognizing that he couldn't be actively involved in bench-level research and be division chairman at the same time. And I saw him give up research, very unselfishly, very firmly. I don't think it's realistic for a division chairman to conduct a large and very responsible research enterprise. I do think it's possible to keep alive on the job.

For several of us the idea of returning to the life of a professor—teaching, more time for research—is attractive. I think there may be some advantage to a turnover of division chairmen. Not too often, but for terms on the order of the one that I've been in. ■

We expect a new biology building on Beckman Mall by the end of 1970.

actly the kind of training we think is best for graduate work. But it's in their interest to go somewhere else to get exposed to new ideas and personalities.

Q: What are the major areas of work in biology at Caltech now?

A: They include molecular biology; biochemistry; biophysics; work with viruses, including viruses that cause cancer in animals; work with cells grown in culture, including human cells; work with molds that

Yes, Virginia, There Is Another Way To Live Life On A College Campus. Girls and Humanities Help

The day Caltech turns co-ed and boosts the number of humanities majors should be the day bluebirds sing on the Olive Walk and all student complaining stops. Such is the impression garnered from reports of seven undergraduates who visited eastern campuses last spring.

The trip came about as result of an encounter between Provost Robert Bacher and Robert Huttenback, professor of history and master of student houses. Dr. Huttenback had suggested to the provost that the master should be able to do something to change the atmosphere of Caltech's student houses. He also tossed in the reminder that "doing something" generally means money.

That same evening Dr. Bacher told the master he had obtained \$2500 for him to "do something" with.

The windfall came at a time when restlessness over student house environment was seemingly at a new high. Some of the students with the most leadership qualities were reacting to their environment by moving off campus.

The three main reasons impelling off-campus moves were noise, anti-intellectual atmosphere, and the fact that one could live cheaper and better off campus.

Dr. Huttenback hastens to qualify the emigration as on the small side numerically. In fact, one of his basic concerns is that too few students dislike their surroundings enough to change them.

"Our students are not sufficiently critical of their environment," Dr. Huttenback says. "The things they gripe about are pragmatic: the food's bad, the bed's hard, they don't like the lamp. But they won't ever bother to analyze the less physical aspects of their life. Most of them think everything's just fine and operate on the twin axes of conformity and intolerance. You're tolerant of your neighbor's barbarity and noise, but if he does something like play the violin, you make fun of that."

However, last spring he felt that there were enough activists around to improve certain situations in the houses, given half a chance. This led to his decision on how to spend the Bacher bonanza.

Those who wanted changes had no bases of comparison. So why not send a student from each house to visit some other cam-

pus to find out how the other half lives?

He made up a list of eastern colleges whose academic standings compared with Caltech's and whose housing situations might also give some basis for comparison and points for discussion.

The houses chose their own representatives. The seven who went East were:

Dick Wright, '68, an engineering major from Midland, Texas (and Fleming House president).

Terry Bruns, '68, a geophysics major from La Puente, California (Ruddock).

Chris Dede, '69, an English and chemistry major from Milwaukee (Ricketts).

Jim Woodhead, '68, a geophysics major from Walnut Creek, California (Lloyd).

Bill Hocker, '70, a physics major from Richmond, Virginia (Blacker).

Greg Lutz, '69, a mathematics major from Longview, Washington (Dabney).

Dennis Schneringer, '69, a geology major from Houston (Page).

All seven visited Harvard and Yale. Lutz, Wright, and Bruns went to Wesleyan and Swarthmore. Dede and Woodhead visited Bowdoin and Rice, and Hocker and Schneringer visited Amherst and Williams.

Although the group found an impersonality at Harvard that was a little chilling, they were impressed by the fact that campus living was considered an integral part of a Harvard man's education.

The Harvard houses seemed too large for the Caltech visitors' taste, but they were impressed with the suite systems, which they felt worked out well both for parties and for discussion areas. Also in the plus column were the subsidization of the houses by the university, certain grants to make it possible to bring to individual houses good lecturers and other cultural attractions, and a normalizing social environment due to the proximity of Radcliffe.

Otherwise, as Dick Wright said: "I felt the name has gained control of the university."

Bill Hocker had the impression that the presence of a professor as the master in each Harvard house tended to bring impetus and university support to a wide range of activities.

The seven thought Yale makes much better use of its assets than Harvard and



Photo by Leigh Wiener

Lunch at Caltech. At Swarthmore one of the touring Caltech students appreciated "the inviting qualities of the dining pavillion, the grills, and the new dorms 'actually being planned rather than being thrown together according to the familiar hospital formula.'"

found Yale students much more warm and open than their Harvard counterparts. They liked the fact that there are many small student groups at Yale who gather to promote among themselves honesty of thought and expression and mutual- and self-comprehension.

Greg Lutz found his stay there the most enjoyable two days of his sophomore year, saying: "I believe the reason was that I had for the first time a chance to enter conversations in the 'humanities mode' of communication with people of my age and intellectual ability. When one has lived for a long time among people who use the 'scientist mode' of communication, one loses sight of what is lacking in conversations with his fellows. In my opinion, what the scientists lack is aesthetic sensibility in a very broad sense. By this I mean ability to appreciate anything other than truth, scientific inquiry, rigor, and logical structures. They are largely incompetent at deciding what they themselves enjoy or consider beautiful."

The humane spirit they found at Yale they also felt at Amherst.

The Amherst atmosphere impressed Hocker and Schneringer immensely, although they found the housing system a hodgepodge that looked completely unsuitable for providing a good college environment. In spite of this, "the amazing thing about Amherst College," Hocker said, "is that it had the superior environment of all the colleges we visited."

Hocker and Schneringer found the students to be the same general type as those at Caltech. The drastic difference was, they say, that the Amherst students were highly developed in their interests and related easily with other people. "They were in many respects 'the well-rounded Caltech student,'" Hocker said.

They ascribed much of this ambient atmosphere to Amherst's location in the "Four Colleges" area, which includes Smith, Mount Holyoke, and the University of Massachusetts. At Amherst, unlike Caltech, they feel the students have a chance of realizing themselves more fully.

Wright, Lutz, and Bruns were unanimous in their impressions of Wesleyan, putting it at the bottom of the list, and comparing its bad points with those they say they live with at Caltech. Dick Wright said: "Wesleyan houses have noise, cramped living quarters, inadequate social facilities, rush week, and animalized meals. (When a Fleming House president comments on behavior at meals, you know it's bad.)"

They attribute the situation mainly to its isolation from (a) girls, (b) any vital surrounding community, and (c) an ad-

ministration not sufficiently interested in the students.

Swarthmore elicited a panegyric from the same three. It impressed them as the school that has everything. It is co-educational; it has a beautiful, eye-filling campus; and, according to Lutz, "my overpowering impression was that Swarthmore is a place where human values are held in very high regard." Wright found the administration "refreshingly frank and warm." He also appreciated the inviting qualities of the dining pavillion, the grills, and the new dorms "actually being planned rather than being thrown together according to the familiar hospital formula."

The visitors to Rice were impressed by a vitality of house spirit which all feel is lacking at Caltech. This was in spite of there being many Caltech-type students there. They suggested that perhaps Rice students aren't told they're supposed to be misfits with the regularity they say they've heard it at Caltech. Some of the seven believe that the much-discussed apathy in Caltech houses is a millstone handed down from upperclassmen to freshmen.

As a result of their visits to the other campuses, the seven would like to see girls and more humanities students at Caltech, both of which they would expect to help make the atmosphere more like that of the outside world.

They would like to see the student houses made more comfortable, with some rearranging toward greater privacy. They all mentioned the noise factor and wistfully wished for carpeting on the floors, not only to cut down noise, but for its aesthetic qualities. And if carpeting should ever be put down, they ask to have tasteful colors chosen by someone who knows what he's about so that they won't wind up with "a sickly green."

Has anything concrete come out of the trips? Dr. Huttenback thinks so. In the first place, he commends the houses' choice of students to make the trip.

"They have acted as catalysts. And at least the trip has resulted in continuing debate, to a degree."

When Hocker returned, he made some inroads, evidently, in trying to arrange Blacker residents according to mutual interests. Woodhead received Huttenback's permission to paint a mural in Lloyd house.

The expenses of the trip didn't eat up all of the \$2500. With the remainder, new paintings were purchased for some of the houses.

Dr. Huttenback thinks the impact of the seven students' impressions have sent out some mild shock waves, and as one example he cites 18 students attending the Y's first sensitivity conference of the year, with

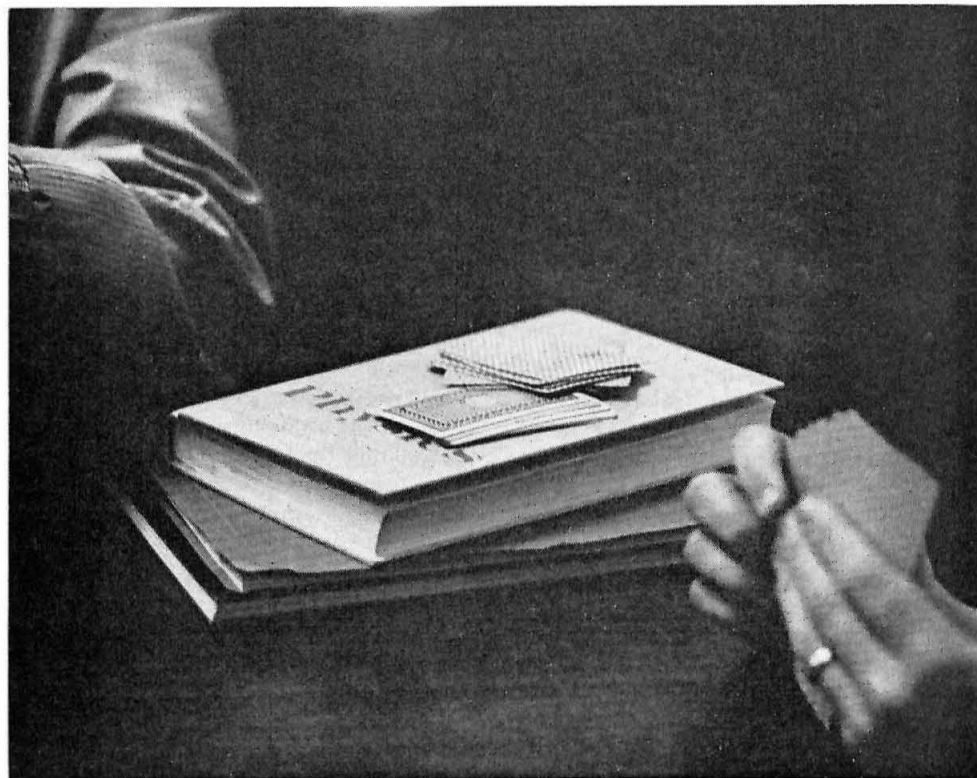


Photo by Leigh Wiener

Dr. Huttenback received an additional \$10,000 for the master's fund this year "... to raise the tone of the house environment. One of the first expenditures will be for a good piano, which will float, yearly, to whichever house shelters the good pianists."

more wanting to attend the next ones, and some talk of individual encounter groups in the houses.

In a step toward homogenizing house groups, five sophomores, with official blessing, have moved into Braun and Marx grad houses. They were reported to savor the quiet atmosphere and the kitchenettes.

From now on, undergrads and grads can mix it up, providing there is room in the chosen house and they have official permission.

To nourish the tender green shoots that have sprouted so far, Dr. Huttenback asked for and received an added \$10,000 for the master's fund this year to spend on items that it is hoped will do a little to raise the tone of the house environment. One of the first expenditures will be for a good piano, which will float, yearly, to whichever house shelters the good pianists.

Non-seniors must now sign a year's housing contract in advance, a requirement designed to prevent most moving off campus. Last spring's announcement of this new policy brought forth predictable screams from a segment of the student body. However, other students and Dr. Huttenback believe that if students are required to live in the houses all year, they will be more inclined to take a positive attitude toward changing aspects they don't like.

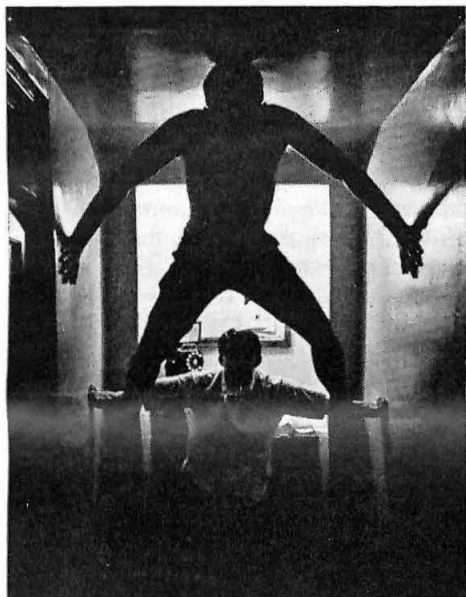


Photo by J. R. Eyerman

"You're tolerant of your neighbor's barbarity and noise, but if he does something like play the violin, you make fun of that."

Dr. Huttenback does not think a great deal can be done with the present situation until certain basic factors change. These include a less homogeneous student body, a reorganization of the student house financial structure, and a conceptual change in the master's job so that he can exert more intellectual and educational influence and have little or nothing to do with disciplinary matters.

"There aren't enough people who want things changed," he added, "although I think there are more faculty now than there used to be who are concerned. In fact, I think there's been more change in the faculty than there has in the students."

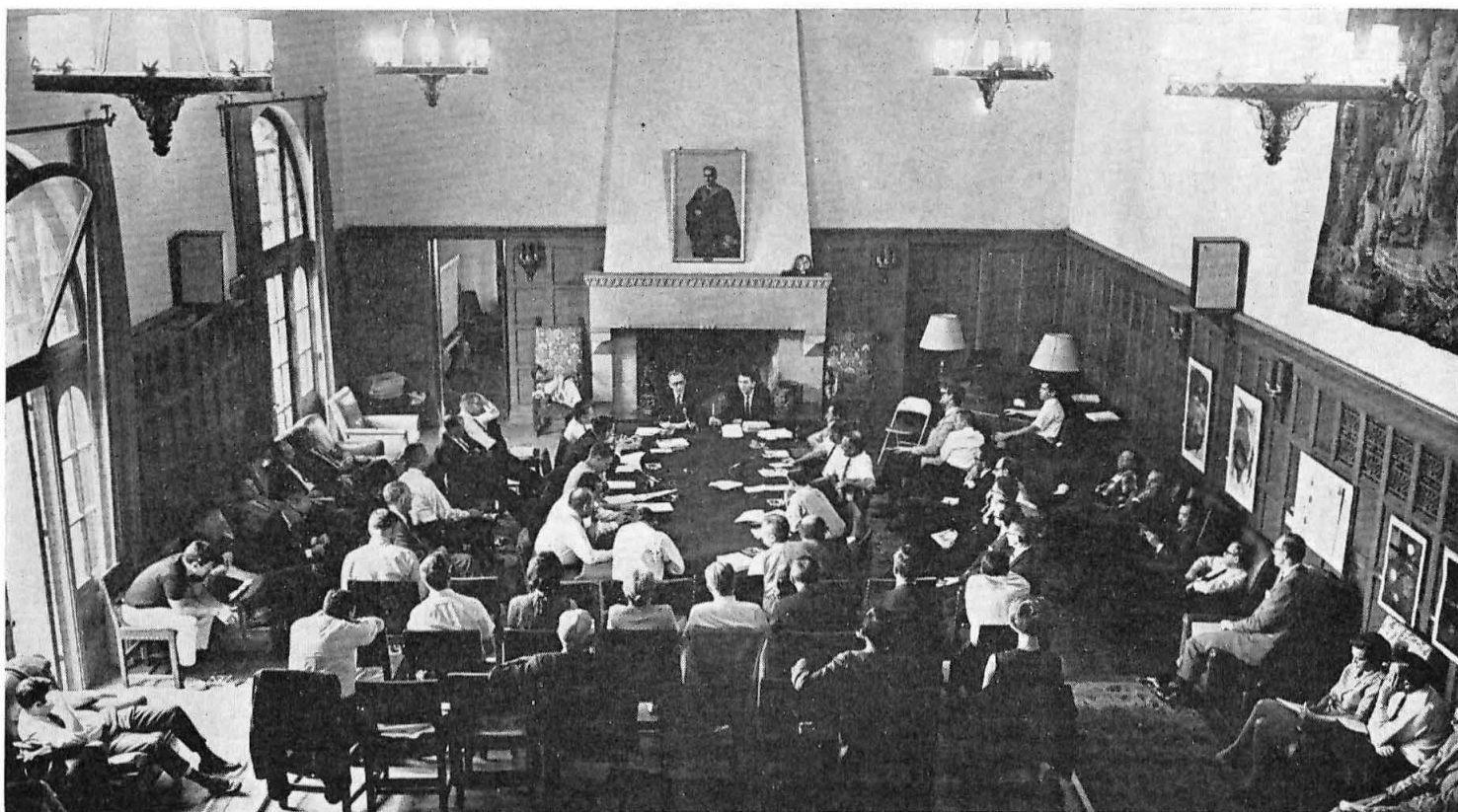
He says he is a little pessimistic about the level of student contribution to change, adding that "the kids are too damn' conservative."

He believes an important reason for this is that "they are the products of our fat cat society, with a motto of 'Keep your nose clean, and you've got it made.' They don't like to get involved; the value of their degree means a great deal. The rewards of our middle class society are made just for them."

Huttenback paraphrased a remark made by Dr. John K. Galbreath of Harvard.

"Let us be sure that the tranquillity is not of the desert and that we are not living in the peace of the tomb."

"A little bit we are around here, I suspect," commented Huttenback.



THE AMERICAN Universities Field Staff held its annual conference, this year on "Science and Social Change," in Caltech's Dabney Lounge on October 19 and 20. Caltech is one of 12 universities supporting the AUFSS, which maintains experts in various parts of the world who return periodically to lecture at member campuses. Proceedings of the conference will be published sometime next year.

More Reagan: Private Support Can Prevent Government Encroachment on Education

Continued from page 1

"we need to match science and engineering with skill in applying them for the good of society." He congratulated Caltech for recognizing this problem in planning its "Science for Mankind" program.

The Governor said he accepted the need for government—particularly at the federal level—to participate in science and engineering research, but warned that such involvement must be watched to protect the independence of the schools accepting government funds. "The federal government now spends about \$4 billion a year on college campuses, and half of it goes for government-sponsored research. I think all of us should ponder the figure and its impact upon the many private colleges and universities whose backs are now, financially, to the wall. They will crave this kind of support. Very likely, they will seek it. But how many of them can accept it and still hold on to their integrity?"

He admitted that "a precious few, such as Caltech, may be able to do it indefinitely." But he warned that although Caltech does not depend on government funds to pursue its research activities, "it is money and, considering the desperate need for money among even the most staunch and dedicated seats of learning, it is not going to be lightly rejected."

Mr. Reagan then raised what he considered to be an equally important problem—the lack of private support for education. He noted that "too many who would like to and could do something about guaranteeing independence from government

control over research, who are in a position to make generous private grants, don't get around to it. They may even use much time and energy decrying the steady, increasing encroachment of government control upon more and more facets of our lives, while at the same time allowing, defaultingly, the federal government to do exactly that."

He said that in addition to making financial contributions to private universities, people should "press for new ideas for the federal government's action to aid in providing superior incentives for private giving—for instance, tax credits for certain college expenses and better tax incentives for sponsorship of basic research in the colleges and universities."

The Governor's speech was enthusiastically received by the audience, who gave him four standing ovations during the evening. At the conclusion of the affair, Dr.

DuBridge took a moment to point out that Caltech's "Court of Man" was now complete with the gift of the Baxter Hall of Humanities and Social Sciences. The other two buildings in that complex are already-existing Beckman Auditorium and, as a result of another gift by Arnold Beckman of \$2.2 million, Beckman Laboratory of Behavioral Biology.

For All You Alumni Authors—A Painless Way To Give

On the assumption that little acorns make big oaks, a Caltech alumnus has suggested a way some fellow alumni might add to the development fund.

Robert A. Becker, '37, PhD '41, director of the space physics laboratory of the Aerospace Corporation, Los Angeles, is also the author of a book, *Introduction to Theoretical Mechanics*, widely used on the college level.

In a letter to President Lee A. DuBridge, Dr. Becker suggested that all alumni authors give to the development fund those royalties from their books which are sold through the Caltech bookstore.

"In any one case the amount would probably be trivial, but might be non-trivial if we all did it," said Dr. Becker.

According to Vernon Rohe, Caltech bookstore manager, the Becker book is widely used as a reference work and has had a continuing sale over the years since its publication in 1954.

CALTECH NEWS

Vol. 1, No. 5

November 1967

Issued six times yearly, in February, April, June, July, September, and November. Published by the California Institute of Technology (with the cooperation of the Caltech Alumni Association), 1201 East California Blvd., Pasadena, Calif. 91109.

Second-class postage paid at Pasadena, California.

Editor: Bruce Abell, '62

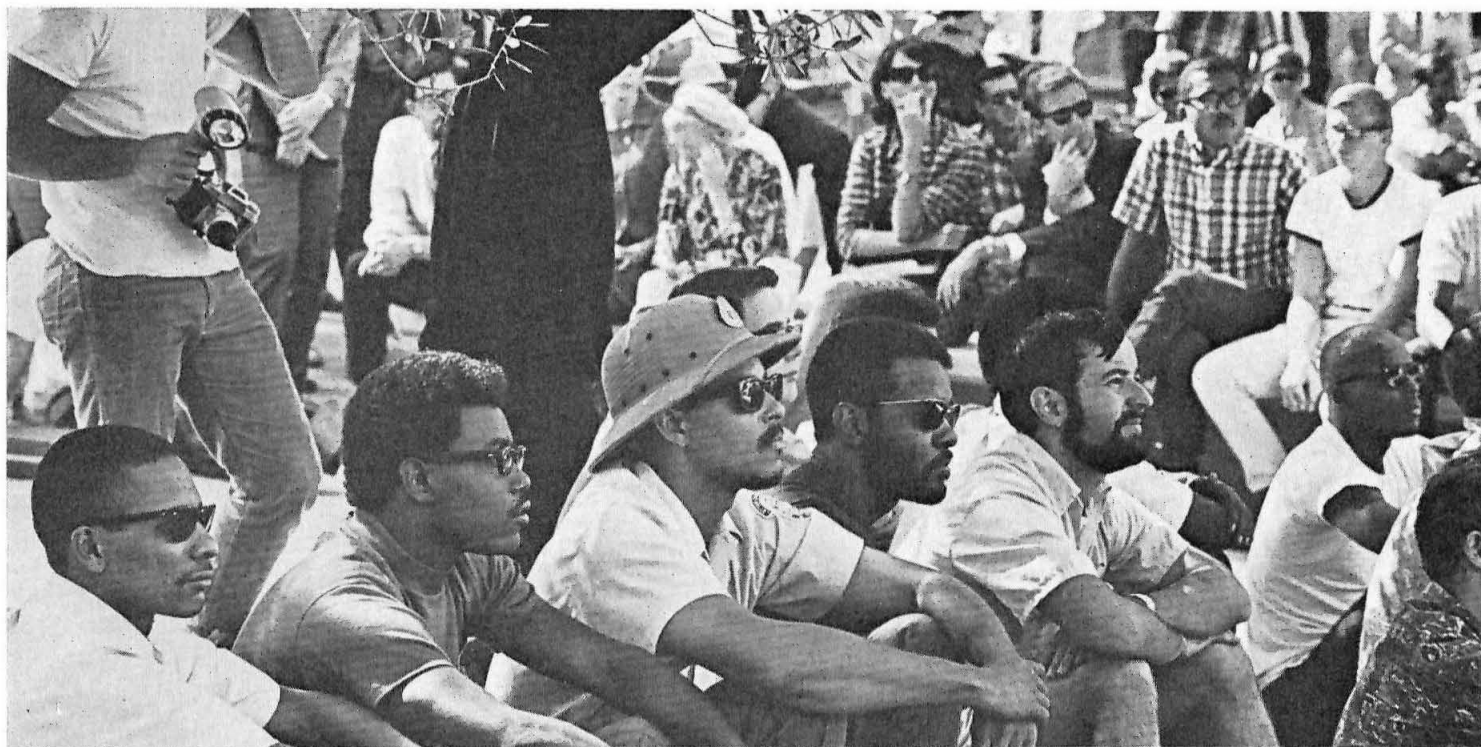
Associate Editor: Janet Lansburgh

Photographer: James McClanahan



CALTECH'S ARCH (above) and the old central shop (right) have come down—resisting to the last—to make way for a high-energy physics building, now under construction.





"Ghetto tutors" and Caltech students listen to grim prophecies from Tommy Jacquette of SLANT. Seated, left to right: Reginald Cobb (deputy court clerk in Pasadena), Lionel Larsuel (associate director of Westside Study Center and a Cal State student), Emanuel Leonard (post office employee), Donald Porter (Cal State student and Westside Study Center staff), David Mog (Caltech chemistry grad student), and James Forman Mtume (PCC student and member of US).

Caltech's YMCA Sponsors an Unlikely Confrontation: Young Men From the Black Ghetto Visit the Campus To Tell It Like It Is and Like It's Gonna Be

Caltech's YMCA got a unique, year-long program under way this fall with some unusual and volatile personal confrontations on campus. "The Ghetto and the City: Blight and Promise," a broad, educational experiment that is taking the place of the traditional "Leaders of America" this year, is designed to give Caltech students some insight into the complexities and frustrations of race relations in the United States.

The ghetto program is broken into four parts. The first was a kickoff—a chance to bring prominent speakers to campus to state positions and get the ball rolling. The second, and probably most controversial, part brought a group of 20 articulate, young men from the Pasadena and Los Angeles black communities to live with and "tutor" the Caltech undergraduates for four days.

The program began on October 16 when the ghetto residents arrived at 10:30 a.m. and California State Assemblyman Leon Ralph spoke at noon. The men from the ghetto returned home on October 19, but the kickoff will continue at least through November 30 when Cali-

fornia Senator Thomas Kuchel is scheduled to speak at 8:15 p.m. in Beckman Auditorium.

Burt Housman, Ex '50, YMCA associate secretary in his second year at Caltech, has acted as coordinator and organizer for the students planning the year's events. According to him, "The point of the program is to enable students who have some concern not only to deepen it, but to open the doors to the guys who aren't even thinking about it. This is a chance for a Caltech student that he might never have in his life—to have, living where he lives and eating where he eats, a black ghetto resident who has somehow managed to survive the public school system so he's articulate enough to have an exchange with the Caltech student."

Housman added that he thinks "a major discovery for Caltech students to make is that by and large their own attitudes are irrelevant. They may be personally treasured, valued, important elements of their experience, but to many black men the attitudes of the white man are something he couldn't care less about. He's the victim of discrimination; he wants to see the conditions change, and he can't wait for attitudes to change."

The three major speakers represented a broad range of the spectrum of young black people's thought. Assemblyman Ralph described how the black man sees his have-not role in a white society that does not seem to want him to have it any better. His message, and that echoed by the other speakers during the week and by the men from the ghetto, was that the black man is disillusioned with the white man's lack of concern—and that the black man's reaction will be increasing violence directed against society.

He warned that "America is at its most dangerous position since the Civil War. We are at the point where we must make some decisions; after this decade we may not be able to make them."

Mr. Ralph was far more moderate than many of the ghetto residents who arrived the same day. Of the 20, 7 were either members or affiliates of US, an extreme, black militant organization led by Ron Karenga of Los Angeles. Balancing them—to some extent—were 6 staff members

of Pasadena's Westside Study Center, a black community self-help, educational, and job-finding center with which many Caltech students and faculty have been working for several years.

All the "tutors" were high school graduates; 10 had gone to Pasadena's John Muir High School. Fifteen of them have attended or are attending college, primarily Pasadena City College or California State College at Los Angeles. All are under 30, and 16 are under 25.

"I believe that all white people are racists -- consciously or unconsciously."

They were paid by the YMCA to aggressively engage the Caltech students in an attempt to "tell it like it is." How well they did their job will take time to determine. It appeared that the process went more smoothly in one-to-one encounters than in the group "seminars," where the militants often monopolized the discussion with their very vocal antagonisms.

A big complaint of the visitors from the ghetto was that an aura of debate pervaded the discussions far too often, inhibiting what was supposed to be an exchange of information.

Sometime near the first of the year a group of Caltech students will return the visit, spending two or three days in the Pasadena ghetto to learn—to the extent they can—what the everyday problems encountered by residents are. The Y program will end with another series of speakers on campus, this time less prominent but perhaps more authoritative, suggesting ways to make full use of the resources of society to cope with problems of the ghetto.

Much of the Caltech community's contact with the ghetto has, for the last few years, been through the Westside Study Center. On Wednesday, October 18, A. Lionel Larsuel, co-founder and associate director of the Center, spoke to an Athenaeum luncheon about "A Pasadena Summer That Didn't Explode."

Larsuel claimed that it really did explode, but the white community didn't see it because buildings weren't burning

and there were no riots in the streets. As Ralph had done on Monday, he stated reasons why he and others felt the white establishment doesn't care about them. He included housing and school situations, as well as the lack of local jobs for Pasadena black people. One observer noted that Larsuel left the audience "genteely reeling."

The third speaker that week, Tommy Jacquette of Los Angeles' SLANT (Self-Leadership for All Nationalities Today), represented a curious mixture of militance and pragmatism. Speaking on "Violence and the Black Revolution," he asserted that the only thing the white society understands is violence. "You have been violent since the American Revolution up to today in Vietnam." He said that the civil rights movement was for middle class Negroes who are more middle class than the whites, and for the "crackers" down south who had to be taught by law that they should let a black man eat in a white restaurant. "But," he claimed, "it didn't get us a thing."

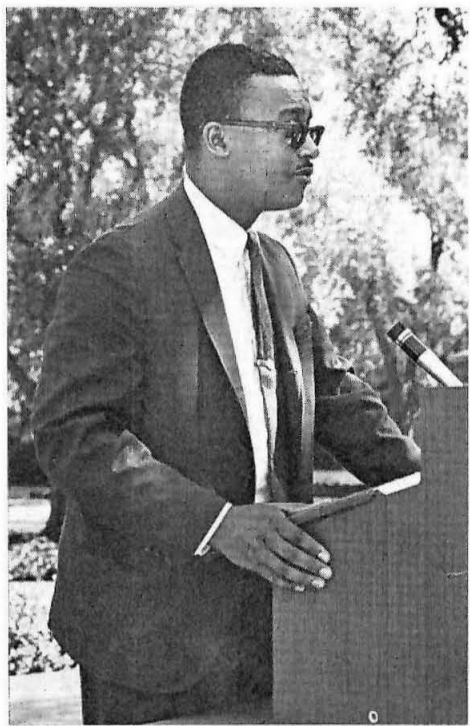
He castigated his predominantly white audience, saying, "You sit back and do nothing—oh, maybe you demonstrate a little, and then you think you've done something. Picketing and marching are no good. But you don't want to get violent because you have a vested interest in this country. I believe all white people are racists, consciously or unconsciously. The minute your material things are in jeopardy, you back away from violence. I am leery of the liberal hippy peacenik in this country. When Stokely Carmichael came on with Black Power, all the white liberals disappeared."

He warned that, "If you want to maintain the country, you have to become aware of what is going on and who is doing it. If you don't bring about a change, we will have to."

His program for whites, borrowed from Karenga's US (Jacquette was once part of Karenga's organization), is the militants' three-fold plan:

- Give us technical and financial aid.
- Don't tell us how to spend the aid.
- Form "united liberal clubs" and try to educate the thinking of other whites.

It was a week filled with events and dialog, and the Caltech community took



Assemblyman Leon Ralph: The U.S. is at its most dangerous position since the Civil War.



Lionel Larsuel, Westside Study Center: The white community doesn't care about us.

quite a verbal beating. There were a good many people who were angered by the accusations leveled at them and who were quick to deny the validity of the accusations. Others were unable to see any paths of compromise emerging from what seemed to be diametrically opposed fundamental premises.

Burt Housman explains that given the task of finding articulate young men, the sampling of young people was representative; the campus was surprised at the degree of militance only because so little is known in white communities about the young adults in the ghettos. He suggests that the general discomfort of white people when confronted by black is because "we're really caught in the most vicious luxury in America: supporting racist institutions without subscribing to the ideology of racism. You don't have to be prejudiced to discriminate."

This concept seemed to be the biggest hang-up in tutor-student discussions. Many of the blacks, including many of the moderates who are working to help the black people find a place in the white society, view the United States as racist—that is, discriminatory in spite of what the laws are. They tend to condemn, with differing fervor, the white person, particularly the "liberal," who tries to support the blacks' progress and drive for rights while remaining in and deriving comfort from the white society.

The extremes to which such condemnation can go were illustrated by positions taken by several members of US—"Caltech is a white, racist institution that epitomizes your [white society's] desire to annihilate the rest of the world with nuclear weapons."

"They were about the biggest bigots ever!"

Such a statement, made not in ignorance but in ideological agreement with the militant "line," apparently was meant to inflame the Caltech people and stimulate discussion. (It did.)

But it is significant in spite of its distortions. It means, even to ghetto people who would never come to such a conclusion themselves, that Caltech and the other "establishment" institutions are irrelevant to the particular problems of black people.

At the end of the week the YMCA sent questionnaires to the undergraduates in the student houses; 185 were filled out and returned (out of a possible 514). The form gave the students a chance to indicate the degree of their participation in the ghetto program and asked for their reactions to it and whether they would be interested in more ghetto-oriented activities. It also solicited their comments and reactions.

The response to the poll was both heartening and discouraging to the YMCA. While it showed that:

- ▶123 students thought the program was worthwhile.
- ▶85 said what they heard affected their views.
- ▶99 wanted more . . .

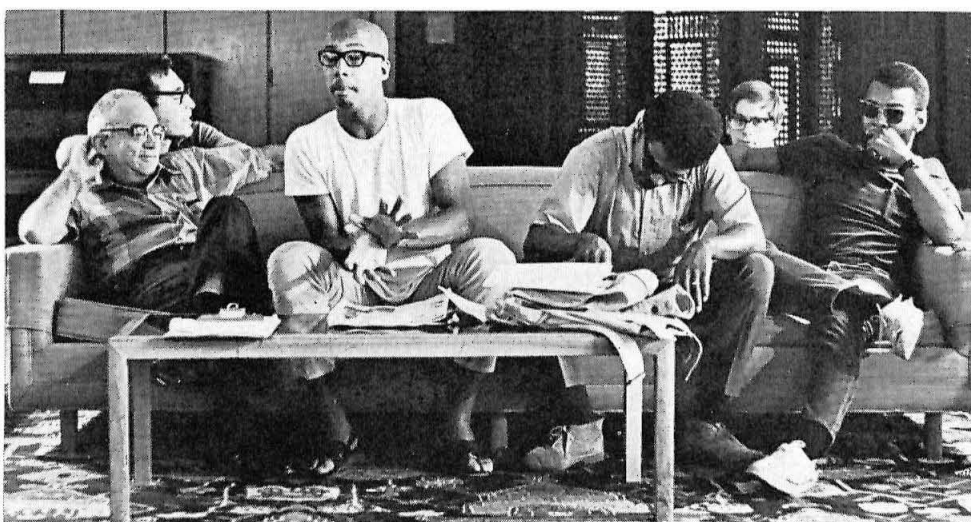
It also showed that:

- ▶54 students who took the trouble to fill out the form nevertheless admitted they were apathetic about the problems presented.
- ▶100 said their views weren't affected.
- ▶76 wanted no more of the program.

Some of the students' comments are:

"The militants may be deluded, but they are sure they are right, and it is necessary to understand them."

"I was surprised at the intelligence and ability for self-expression of both Mr.



Marcus Tandy Arifu (second from left, a telephone company employee and member of US), breaks the tension—briefly—during a discussion in Winnett Lounge marked by "verbal violence." Others on the sofa are Wes Hershey (Caltech YMCA executive secretary), Arthur Moore (Cal State student and Westside Study Center staff), and Donald Porter.

Ralph and Tommy Jacquette. They are honest. They don't seem to have much sense of practical politics though, especially Jacquette.

"I learned that ghetto life is not really a total yearning to escape. There is pride in living as a group and community with a sort of common heritage."

"I heard their viewpoints expressed by them personally. Also, the normal lack of exposure makes it harder to remember they're entirely like any other human."

"They all had the viewpoint that they were oppressed, and would not listen to reason. They were about the biggest bigots ever."

"They clarified the general feeling of the Negro community regarding the present power structure and what changes they feel are necessary. Most important was their explanation of the means Negroes were willing to employ to bring about the changes."

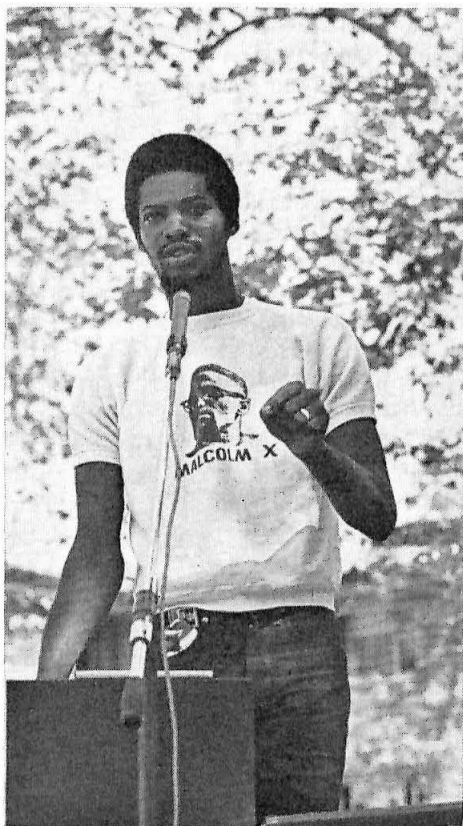
"They should have stayed longer."

"What a waste of time!"

"I had previously been sympathetic toward the Negro cause. I now believe that a majority of Negroes take advantage of injustices perpetrated on them as an alibi relieving them of responsibility for their actions."

"Found a most antagonistic and often rude attitude. There seemed less interest on the part of the guests I met in discussing problems than indicting the white race in this country on every conceivable count."

"They told me there was a ghetto, which I didn't know, not being from this



Tommy Jacquette, SLANT: The only thing the white society understands is violence.

area. They gave some reasons for its existence."

"One of the prevailing views of the ghetto tutors is that white people are wronging them by not immediately changing the system. They seem unaware of how difficult it is to alter social patterns and conditioned mores. They bear a grudge which is as racist as those people they criticize."

"I found the tutors to be resentful, hostile, and with little or nothing to say that was new to my limited knowledge. The ones I talked to seemed to resent the fact of me being white and behaved as though

Lady Doctors -- Just What the Doctor Won't Order, But Should. And That Goes for Scientists Too.

An international authority on nutrition and world health, visiting Caltech in October, used a well-aimed verbal bean shooter to potshot aspects of medical and technological education in the United States.

The shooter was Jean Mayer, professor of nutrition at Harvard, who gave a public seminar titled "Nutrition and Civilization."

Dr. Mayer is active in the Food and Agricultural and World Health Organizations of the United Nations and serves as a nutrition and health authority on several National Academy of Sciences committees. He is also the nutritionist for the United States Olympic team.

He looks askance at the United States' views of its technical assistance achievements in other countries. "Unless and until we see the actual problem we have, we won't be in a position to give any meaningful technical assistance abroad," he declared.

The basis of the problem, he believes, is the lack of proper academic underpinnings. Instead of turning out a necessary surplus of physicians, engineers, scientists, and teachers so that there are enough to send to underdeveloped countries, the United States is practicing a reverse course of action, Dr. Mayer said.

He gave as example the fact that we are absorbing half of Argentina's output of geological engineers, a quarter of Britain's output of physicists, "and what is much more serious, we are absorbing a very large percent of the engineering school output in Latin American countries that can't spare it."

The Harvard nutritionist was emphatic in his statement that it must be the universities who set the standards of what the nation and the world need today. They should not be set, he cautioned, by professional organizations or their members, "who are always inherently conservative, whether they be physicians or engineers."

He described a common attitude, in this respect, as: "The education I had must

I owe them something; I sure as hell don't."

"Coming from a smaller town with no real ghetto, I hadn't realized that ghettos are such a great problem—more important, I hadn't realized that ghettos are producing so many black militants."

"I wish the Y would quit bothering me."

"This sort of overemphasis on one particular problem of our society is not only depressing in its lack of originality, but childish in its tendency to extremes. Although I agree that we should be aware of the extremely important problems of the Negro, one has the tendency to want to eat with a spoon, not a shovel. I believe the YMCA is sadly misguided in its tacit approval of obviously irrational viewpoints (like that of SLANT), and also does not understand the principle of 'moderation in all things.'"

"I discovered and developed large respect for black nationalist movement, what the problems of being black in America are."

"I feel as most of the tutors felt, that most of the students will forget about what they heard."

"They are to a small extent a bunch of frustrated, ignorant, desperate, discouraged, angry, uncultured, semi-savages who want to beat the crap out of the whole world."

"It made me realize the frustrations of the ghetto and want to do something as a white."

have been wonderful, because look at the sort of guy I am now. I don't see any need for today's young people to be trained any differently than I was!"

Dr. Mayer also had much to say about the weaknesses of the nation's medical schools. One of the worst, he feels, is the fact that recruiting is almost entirely from the well-off middle class. He believes there is no real effort at recruiting the bright slum youngster into medicine.

He is a crusading advocate of more women in the profession, citing the superior incidence of women medical students in other countries: 25 percent in France, 18 percent in Britain, 55 percent in Russia, compared to the United States' 4 percent.

He said that American medicine needs more women precisely because they are different from men, and that a "Vive la difference!" attitude in medical schools would change the whole American medical concept for the better. He was not too flattering to the medical males.

"Too much of the motivation of men to go into medicine is a lone heroic one. They want to get the Nobel prize, or be one of the masters at the big general hospital, or make a lot of money. Exceptionally, they want to be a medical missionary and be a Dr. Schweitzer."

But women, he said, are basically interested in medical care and are perfectly willing to take over a great deal of the drudgery that needs to be done.

Dr. Mayer branded as myth the statement so often bandied about among and by the men: that there is no point in training women because they won't stay in a profession. He declared that anyone willing to study science surveys in this field would find it untrue.

He submitted the guess that women science and engineering graduate students at Caltech are often exposed to such thinking and observed that a survey among Caltech's women graduates would probably show that a high percentage stay in their professions.

Here Comes the Biggest Prank Yet--Blue Skies

More than 125 Caltech students are engrossed in the beginnings of a research project on the banishment of smog.

They expect the project to bring forth the creative energies not only of Caltech students but of some from colleges nationwide.

The project is the brain child of ASCIT president Joe Rhodes, who hopes to rev up some of his fellow students' attitudes—primarily into a super-awareness that scientists and engineers from now on have to face social, economic, and political facts of life every time they tackle a technological problem.

Rhodes declares that some of the apathy and restlessness of his fellows is due to a feeling of non-involvement in some of society's current and crucial problems.

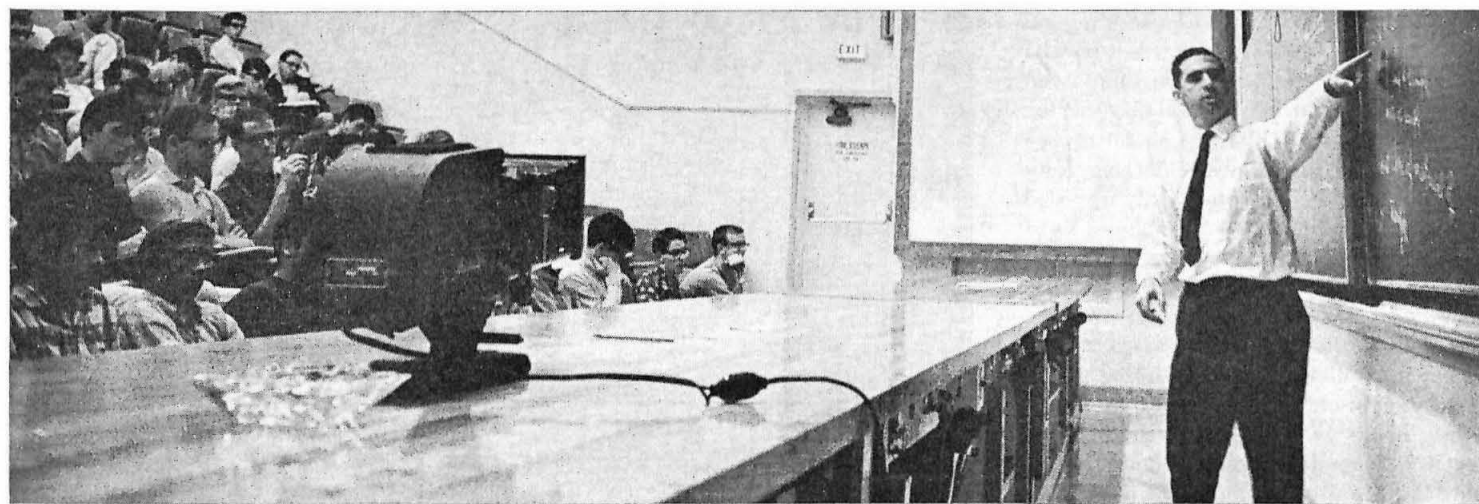
After a first meeting on campus in October to sound out student interest, five committees were formed to investigate research possibilities. In a November 2 meeting air pollution was chosen as the project. Students from Pitzer, Pomona, and UCLA were in attendance, in accord with the Caltech students' wish to reach outside their own campus for cooperation.

Last spring, and again in August, Rhodes visited student organizations on a number of eastern campuses and sounded out interest in joining the Caltech project. As a result a group called the East Coast Representatives will meet early in December to discuss further their participation in the Caltech project. The colleges represented are Harvard, Yale, Princeton, Radcliffe, Wellesley, Pembroke, Brown, Swarthmore, Haverford, Pennsylvania, Carnegie Tech, Barnard, Brandeis, and Cornell.

Plans are also under way to explore possibilities of students from other colleges coming to Caltech for work on the project on some kind of a credit basis.

Steve Pomeroy, a junior physics major, is financial director of the project. Pomeroy and Rhodes have been in discussion with various foundations and feel confident that funding for the project is forthcoming.

The Caltech group also plans to reach out into the ghetto sections of the Los Angeles and Pasadena areas and train technicians next summer to help work on the project. The only requisite, they say, is a



Aron Kuppermann

Photo by Karel Bauer

There's More Coffee Than Chemistry in Brazil, So Kuppermann Perks in U.S.

One might call Aron Kuppermann a man of many collisions.

At Caltech, as professor of chemical physics, he's working full throttle on his main area of research interest, the dynamics of molecular collisions.

At home in Altadena, one of southern California's most successfully integrated communities, Kuppermann works at heading off social collisions.

"We're active in a group called HIS—Housing Information Service—which is trying to help find homes for people, regardless of their racial or religious background," he explained.

When he said "we," Kuppermann meant himself and his wife, Roza. They have four children, Barry, 13; Miriam, 10; Nat, 9; and Sharon, 1; and are members of the Pasadena Jewish Temple.

Kuppermann, who joined the Caltech faculty in 1963, is a native of São Paulo, Brazil, but a US citizen since 1965. He got

ghetto resident's willingness to work and learn.

Rhodes says that it is not the feeling of the students that they can do away with smog, but rather that they will be able to do something positive toward its alleviation. He also thinks that the act of creating and developing a project such as this is an experience of considerable magnitude, and one that a student is not likely to receive elsewhere. ■

a chemical engineering degree in 1948 from the University of São Paulo and a civil engineering degree in 1952.

He might still have been in Brazil, where he was already an assistant professor of chemistry at the Aeronautic Technological Institute, if he hadn't wanted to learn more about chemical reactions. That meant graduate school and quantum chemistry, neither of which was much in abundance in Brazil.

So he left to study on scholarships in England and the United States, getting a PhD from Notre Dame in 1956. In the process, he says, "I developed a taste for the application of physics techniques to chemical problems. By the time I got my doctorate, I had been bitten by the research bug."

Despite the research bug's bite, however, Kuppermann finds plenty of time for teaching. He lectures one course for juniors in physical chemistry and, he explained, "I demoted myself to a teaching assistant to lecture first in freshman and now in sophomore physics. I wanted to have a better feeling for what the undergraduates were exposed to in their first two years of physics, and I wanted more intense and direct contact with them."

In addition to the undergraduate courses and his research, Kuppermann also works with nine graduate students and two post-doctoral fellows, and spends about a third of his time on half a dozen Institute committees (including chairmanship of the aca-

demical policies committee). "It's enough," he says, "to keep busy."

In his research, Kuppermann and his co-workers made the first direct measurement of the minimum energy required for a chemical reaction. The measurement will make it possible to gain new insight into chemical reactions, their rates, the energies required for them, and to learn at last whether bimolecular chemical reactions can be described by the laws of classical mechanics or if it is necessary to use quantum mechanics.

The key measurement was made by one of Kuppermann's graduate students, John M. White. The work disclosed that 0.33 of an electron volt of energy is required to initiate one of the simplest chemical reactions—splitting a hydrogen molecule and linking a deuterium atom with one of the hydrogens.

It's a long, intricate trail from a chemical engineering degree in Brazil to chemical physics at Caltech, and it raises the question of why he was a native of Brazil.

"My father emigrated from Poland to Brazil when he was a young man. My mother emigrated from Russia to the United States—and met my father when she traveled to Brazil to visit her own mother.

"In those days they were just beginning to change and strengthen immigration laws, and you went to the place you could get in," he explained.

This Brazilian background is reflected in one artifact the visitor notices in Kuppermann's office—a long, lethal-looking sword sitting conspicuously atop the file cabinets. He explained:

"I won the sword in Brazil as a prize for good aim in commanding a battery of cannons in my artillery training. I was a lieutenant in the Brazilian Army Reserve."

And, he added, the sword comes in handy at Caltech.

"I have an experiment going that should produce some good results. I asked a graduate student whether he would have those results in time for presentation at a meeting, and he was quite confident he would.

"I wasn't that confident, so I asked whether he would be willing to place his head on the block if he didn't have the results on time. He said he would, so I brought the sword down here to reinforce that idea." ■

American and Foreign Grad Students Get Chance To Pick Up Linguistic Savoir Faire

Last year Caltech graduate students were offered a new way of satisfying the doctoral language requirement. Instead of the traditional insistence on reading ability in two foreign languages, the Caltech alternative took the form of a streamlined two-year French course. Created by Paul Bowerman, associate professor of modern languages, and James Greenlee, assistant professor of French, it was designed to develop an ability to speak and understand, as well as to read and write.

According to Fredric Bohnenblust, dean of graduate studies, the alternative plan resulted from certain observations of today's world and tomorrow's probable world: that the increasing frequency of international meetings and of opportunities for foreign study call for more real language competence.

The course combines intensive class work and language laboratory sessions. Its mission is to give a science, mathematics, or engineering student a good enough knowledge of French to be valuable in his work. All unnecessary fluff is swept away, so that a student doesn't have to sweat over what happened to *la plume de ma tante*.

A German program, following the general outline of the French course, is under

way this year and had even more applicants than the 27 who enrolled in last year's elementary French course. A new faculty member, Eberhard Jobst, assistant professor of German who came from the University of Frankfurt, is teaching it.

Both Dr. Bowerman and Dr. Greenlee want to see the teaching techniques in all graduate language classes leave the learners with a certain sense of improvisation within the individual language structures.

This year, Dr. Greenlee's continuing second-year group has progressed from the language laboratory to sessions of stepped-up conversational interaction.

In their second-year work the students will acquire a general technical vocabulary, which will precede work on specialized vocabularies in individual fields.

Thus, the English-speaking graduate student now has three choices of ways of fulfilling the foreign language requirement: the traditional, the alternative, or special examinations for those who already possess a high proficiency in spoken French, German, or Russian.

Caltech's foreign graduate students were not forgotten last year when the language questions were roused around.

For some time Dr. Vito Vanoni's committee on foreign students and scholars had

been sympathetic to the plight of many of their brood whose command of English seemed better at first glance than it actually was. Their concern also included wives who, sometimes, knew less English than their spouses.

Last year the committee discovered Hunt Lewis, a Pasadenan who had studied, at USC and UCLA, the techniques of teaching English as a second language. Mr. Lewis agreed to conduct some experimental classes among the Caltech foreign students and their wives. Shortly after the notice went out, members of 14 nationalities signed up for the course.

It was meant primarily to give them a better speaking knowledge of English, although Mr. Lewis also offered assistance to those who wanted to turn out more lucid prose.

This year's classes are continuing with a few changes. The weekly sessions are two hours instead of one. Present plans call for use of the language lab a little later in the year. Also, the students have specifically requested Mr. Lewis to devote more time to idiomatic English conversation.

After all, when a new American friend tells you something is "so groovy you'll blow your mind," a fellow should be able to dig it. ■

Alumni Association membership brings:

- Engineering and Science magazine
- Triennial Alumni Directory
- Athenaeum membership privilege

The Soviet Union at 50--Finally Admitting That People Have the Right To Make Some Mistakes

In a November 8 seminar session that packed Dabney Lounge, members of the Caltech and Pasadena community heard Dr. Philip Mosely describe conditions in "The Soviet Union at Fifty."

Dr. Mosely is professor of international relations, director of the European Institute, and associate dean of the faculty of international affairs at Columbia University.

His observations were based on frequent and extended trips to the Soviet Union and a wide acquaintance among Russian people.

Dr. Mosely's description of Russia today carried some familiar parallels to conditions in the United States. Russia's increasing affluence, he reflected, includes the alienation of the young to older values. And although Russia is congratulating herself on her condition, Dr. Mosely says she has more problems than she cares to admit.

She is now the second biggest industrial country in the world, but she suffers from production imbalance. She has considerable unemployment, in contrast to the earlier days of the Soviet Union when officialdom boasted that everyone worked. She is also confronted by increasing pollution problems.

Since Stalin's death, Dr. Mosely has found, there is widespread evidence of the decline of what he calls "the garrison state mentality." As a corollary, the intellectual fields are expanding. The greatest patrons of the arts and literature in Russia, he pointed out, are the scientists. Reflecting the new freedom of expression found with the decline of Stalinism, the scientists are becoming outspoken in the philosophy that a man has the right to make mistakes.

Dr. Mosely expressed his surprise at the rapidity of Russia's de-Stalinization shift. Today, he maintained, many Russians feel free to speak their minds. They have told him that, even if they should be punished for it, the punishment has become so light that it is not a matter of too much concern.

Dr. Mosely put Russians into four general categories. First are the elderly group, who were educated before the terror of the early '30's and who were often educated outside of Russia. He says these people are concerned with teaching the young people the importance of intellectual exploration and discussion.

The second group are the old Stalinists, rigid and punitive in attitude, unable to adjust to the more recent relaxed atmosphere. He sees them as constantly weakened by pressures from more liberal elements and squeezed out of the remaining power spots.

The members of the third sector vividly remember World War II and carry a deep pride in Russia's role. Their wishes for their country's progress are positive. This generation of citizens between the ages of 30 and 45 approve the new liberal attitudes.

The fourth group, the young people below 30, have come along since Stalin died, and they do not understand or appreciate the principles of Stalinism.

Dr. Mosely expressed the wish that the United States could act with more flexibility toward Russia. He believes that American policy makers and citizens in general tend to accept one idea about Russia and believe in it far longer than it has validity. He cited as an example the fact that long after the Berlin crisis had abated, most Americans still thought their country and Russia were on a rapid collision course over it. He also cautioned that Americans should not believe their country will always be superior in its science and technology or that the balance of world power will always lie with

the United States. "There is too much tendency on our part always to assume that the scenario is already written," he said.

He hopes the United States will enlarge its contacts with the Soviet Union as fast as possible, and he scored Congress for throwing stumbling blocks in front of stepped-up world trade. He reminded his audience that Russia's industrial developers will have an increasingly strong hand in running that country. Trade, he pointed out, always benefits all countries involved. He said this country should become more nimble in its foreign policy formations.

In this area, he strongly advocated our working toward changing Red China's isolation. He does not believe that China wants war with us, declaring that the facts show China has always been extremely cautious in this direction. She has too many internal problems to cope with much else, he said. However, he stressed, we get hung up on a negative policy toward her because we are waiting for her to slip into what we think of as "a good pattern."

The longer we have a hand in her isolation, the worse our relations with her will become, he concluded, "because isolation feeds the paranoia of Communism." ■

Some Modest Proposals

Talk about going out with a bang! The faculty *ad hoc* committee on the freshman year, which presided over the introduction of pass-fail grading for freshmen in 1964, is finally ready to close up shop and disband. To ensure that they'll be remembered, the group submitted three proposals to the faculty board that are sure to keep things stirred up on campus for a while.

One proposal is that the freshman curriculum be eased a bit, reducing the unit load for the three basic courses (math, physics, and chemistry) to provide more time for variety in the freshman's life—either through elective courses or through other activities.

The second proposal, somewhat more touchy, was that in addition to the options already existing a "general studies" option be instituted. Such a program might appeal to two kinds of students: those who don't know what they want to do but plod through an option because they see no alternative, and those who want to get interdisciplinary preparation for future work.

The third suggestion, a blockbuster, is that women be admitted to undergraduate work at Caltech as soon as possible. The faculty began formal discussion of the measures on November 3. ■

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)

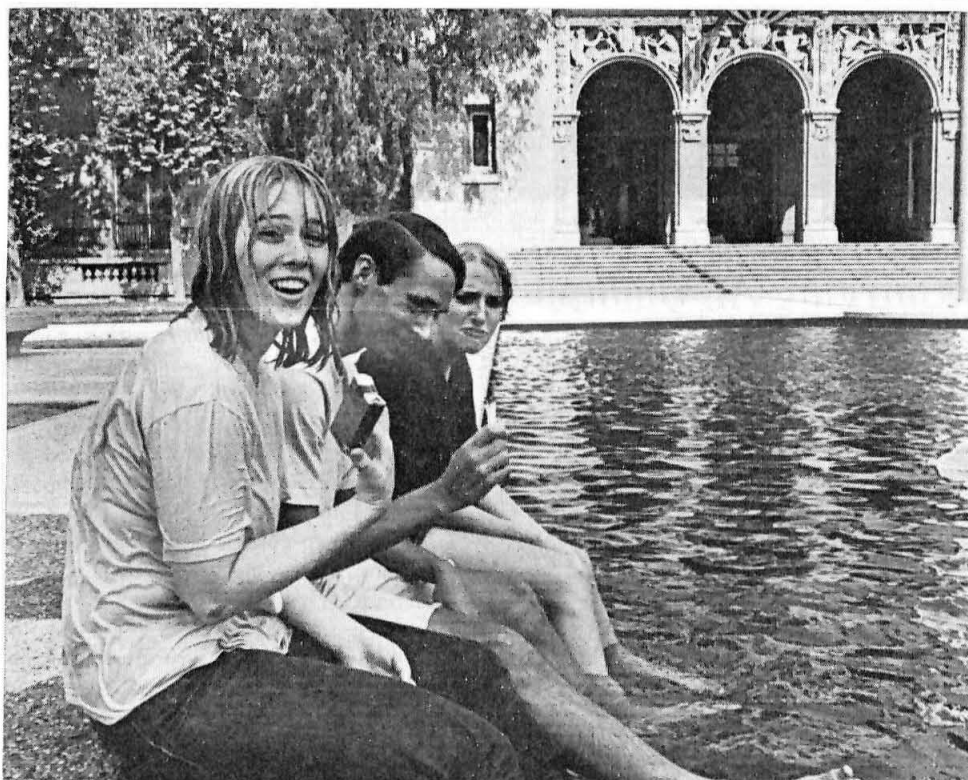
- ☐ An application for placement assistance
- ☐ A form indicating a desire to keep watch of opportunities although I am not contemplating a change.

Name

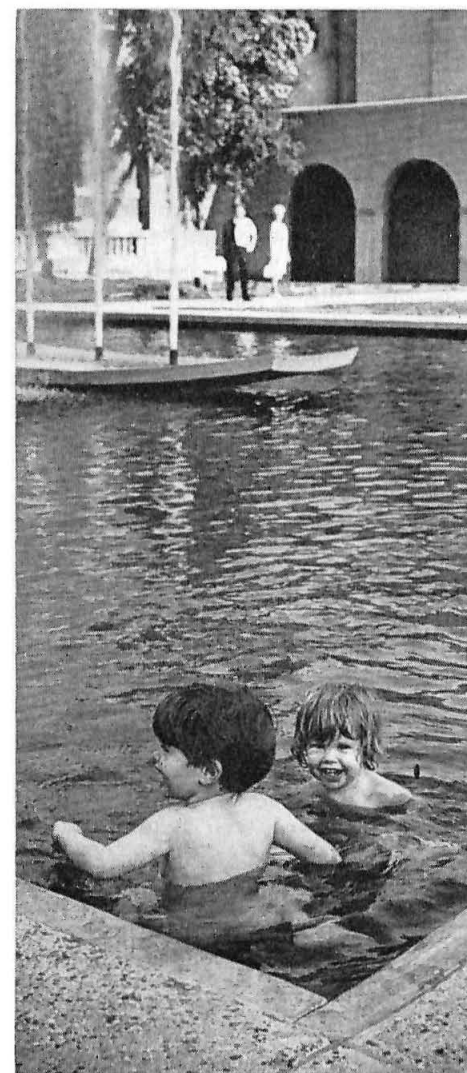
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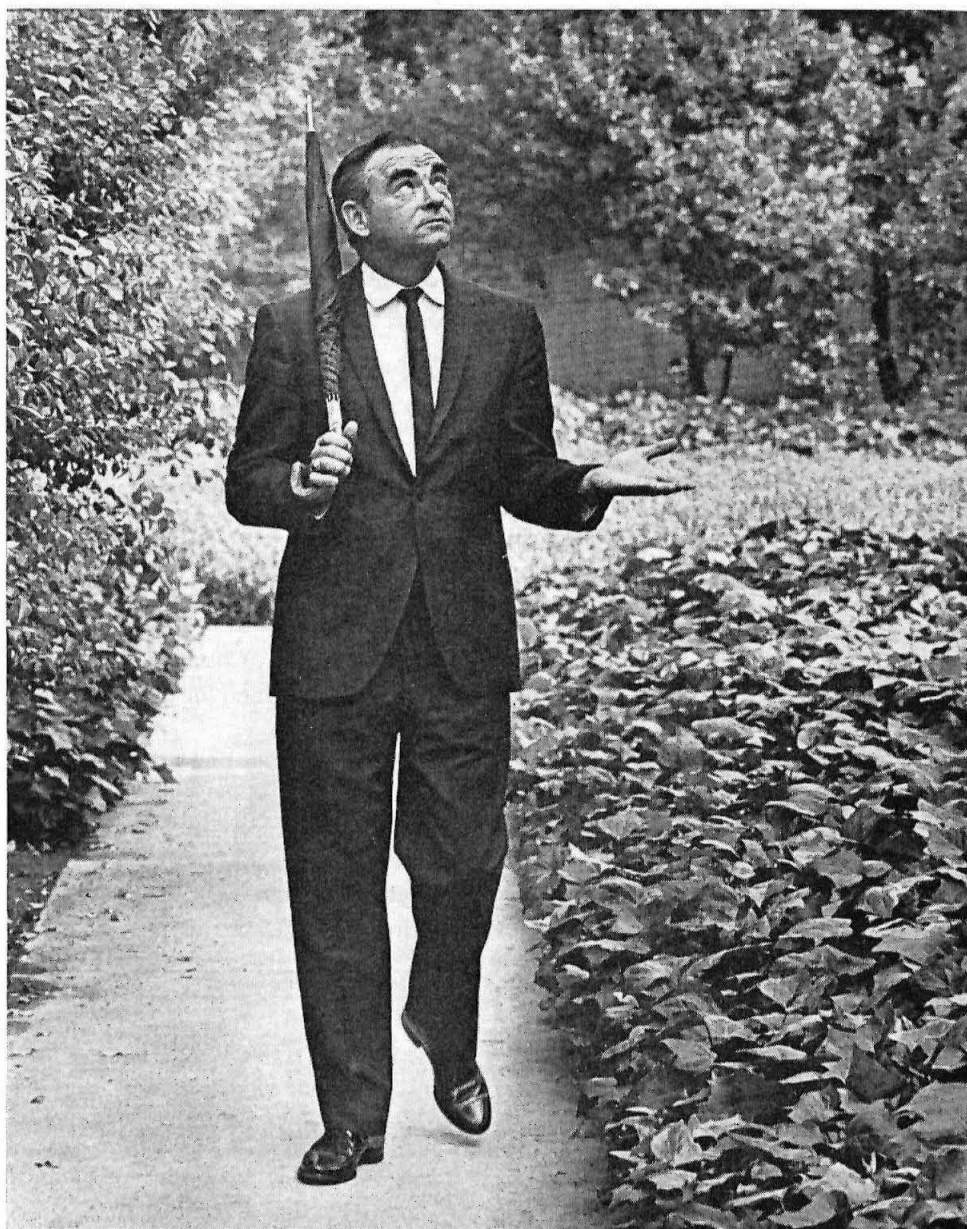
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THE REFLECTING pool in front of Millikan Library may soon have more users than the library. Among the water games participants this fall were: A trio (left) apparently trying to test experimental methods of keeping cigarettes dry while under water (they failed). A younger duo (below) who took delight (and their clothes off) in the biggest wading pool they ever saw. And the Caltech Sailing Club, which christened (left, below), with the assistance of starlet Manuela Thiess and an audience of hundreds, a new 16-foot boat in the Flying Dutchman Junior class. The vessel took quite a bow-beating (the bottle finally broke on the fourth try), but remained ship-shape. The boat was purchased by Caltech's athletic department, which also plans to buy several more for the club over the next five years. ■





Gordon Weir, '40

If Alumnus Gordon Weir Is Carrying An Umbrella You Might As Well Call Off Your Garden Party

To most people, talking about the weather is a tried-and-true, noncontroversial, social gambit used to break the ice with strangers.

Gordon Weir, '40, MS '41, expects his listeners to pay him when he discusses the weather. And his paying listeners include nearly every American motion picture and television studio, utility companies, contractors, growers, racetracks, and several hundred thousand ordinary folk all over southern California who tune in KNBC in Los Angeles each evening to see if the morrow will bring sun, rain, or smog.

Weir's wares have two outlets: one is National Weather Institute, a private consulting company he has been with for 21 years; the other is television, which he has been on and off since 1952.

He is the product of Caltech's program in meteorology, which ended some 15 years ago after an existence of about 20 years. It reached its peak during the war when the Air Force was trying to remedy its acute shortage of trained meteorologists. Weir, an undergraduate geologist, was in the first class of Air Force cadets getting masters degrees in meteorology at Caltech. In time the Corps' undersupply became an oversupply ("There was a time near the end of the war when at any airport you landed in Europe, the guy that took your bags was a transferred weatherman, and quite possibly from Caltech."), but Weir says that most of the 41 members of his class did pretty well, getting their own weather stations to run. He zoomed to the rank of major at the age of 23 and was in charge of the American half of Weather Central for the Mediterranean theatre.

After the war he returned to work with his teacher, Irving Krick, PhD '34, who had been running Caltech's meteorology program and who was the originator of

the private weather-forecasting business (Krick Weather Service) in the United States. Krick left soon after to found another company in Denver, and Weir remained in Los Angeles with the parent company, which became National Weather Institute, Inc.

The staple of that business was, and is, the film industry. The company provides all kinds of services, from one- to two-day forecasts for commercials to year-round multi-location forecasts for major movie producers. For example, Weir says, "A studio may call and say, 'We can get John Wayne for the month of April and can go to Albuquerque, Bishop, or Grand Junction.' We prepare an outlook for them telling where they'll stand to lose the least time in terms of weather. Universal Studios figure we save them about \$100,000 each year."

For seven and a half years at NBC he was an "outside package" on the longest continuously sponsored weather show in the country. (It ran 13 years, and one of his predecessors on that show was another Caltech man, Gene Bollay, MS '36.) When the sponsor finally dropped the program, mail poured into NBC, and Weir was soon back, this time as an inside man, part of the news department. His appearances now come as part of the regular news programs.

Weir's TV appearances total no more than five minutes a day, but they come as three minutes at 6:45 p.m. and two minutes at 11:00 p.m.

By the time he arrives at the studio in late afternoon, he has the data for the broadcast firmly in mind. He then just "does" his segment, preferring not to rely on cue cards, which involve their own hazards (such as being held upside down). Occasionally he may be asked to write a short script for a weather film strip sup-

plied by the network, or he may go out with a cameraman to do a weather-related report for the regular news show.

He admits that while meteorology has evolved considerably since he got out of school, the technique of forecasting isn't a whole lot better. "We can accurately predict things like winds at 50,000 feet, but on the ground we haven't changed much." And long-range forecasting, which is anything over a week, are still nasty words. Satellites haven't helped much; their eventual value won't show up for years, when things like heat balance and infrared radiation can be figured out. It's still at the stage where the best forecaster is the one with the most experience in a particular spot.

Los Angeles is not a weatherman's heaven, although Weir admits that "persistence" would be a statistically safe way to forecast for the area. That means predicting today's weather for tomorrow.

In the winter the Los Angeles area gets about a dozen days of rain. Predicting those is the big issue, because in a semi-arid region hillsides slide and plantings wash out. "We're in a fringe area, and storms die out as they get here. You sometimes have to wait until the storms turn the corner at Santa Barbara before you really can decide if they'll hold together long enough to give rain here."

He points out that, particularly in Los Angeles, people want to know what the weather is like "back home." He rarely gets letters about bad forecasts, but people often write asking why he didn't give the weather for some favorite place.

Some of his most exotic non-meteorological competition over the years has been from the sexy weather ladies. "Mary Beth Hughes used to do a show out here. Fascinating pictorially, but it didn't amount to much as far as the weather was concerned." He says that in Boston, where they have three or four weather shows, people watch the weather girl when weather is good. Then when the weather is really changing and they're concerned, they watch the professionals.

Do viewers appreciate his professionalism? He thinks the pros have made people more weather conscious and also a little more aware of why forecasts go kaput sometimes. "It's incredible, but nice little old ladies in Sierra Madre—I'm very big there for some reason—write in asking surprisingly intelligent questions for nonprofessionals."

"We in the American Meteorological Society have been trying to do away with the funny little man with the umbrella and black hat by issuing a seal of approval to professionals who meet certain requirements." Weir is on the radio-TV committee that rates the tapes of shows that applicants submit; there are about 50 approved forecasters in the country today. The networks are becoming increasingly aware of the audience's desire for expert weathermen too. All of NBC's owned-and-operated stations now have professionals doing the shows.

Fate decrees that a weatherman has to put up with almost as many inane quips, comments, and queries as a lady of pleasure. But there is one question that almost everyone eventually asks him—Is the climate changing?

"Climate certainly changes over a period of time; after all, the Vikings were raising grapes in Greenland where there's permafrost now. But our records are of such short duration that when you do get an apparent change you can't be sure it isn't just a wiggle on the curve. The first 50 years of this century, for example, there was a definite warming all over the world. No sooner had theorists come up with a reason than a cooling period started."

"But that doesn't mean I can predict con-

tinued cooling for the future. Every year there are new high and low temperatures for localities all over the world. Sometimes the weather patterns just shift for a little while, such as this summer when it seemed to shift north on the Pacific coast. We got touches of tropical weather, and further north they got our hot, dry weather. And because there is a heat balance over the earth, the east coast was cold all summer."

Which shows that at least yesterday's weather can be forecast with 100 percent accuracy. ■

Association Proposes Changes In Articles of Incorporation

The board of directors of Caltech's Alumni Association, following up suggestions of the alumni study group, has proposed changes in association articles of incorporation, fund-raising procedure, and *Engineering and Science* magazine management. All members of the association were notified of proposed changes in early November and requested to return ballots approving or disapproving them by the end of that month.

One by-law reflects a change in the purposes of the association. It specifies Caltech, not "higher education," as the primary institutional concern of the association; it emphasizes the importance of "strengthening ties and contacts between the Institute and its alumni"; and it adds a concern for promoting "relationships with students of the Institute for the mutual benefit of the Institute, the students, and the Alumni Association."

The board also proposed that the number of directors be increased from 12 to 16, effective in the spring of 1968. Along with the increase in members, the association intends to make the composition of the board more representative of the degree-composition of the alumni. (Presumably this means a greater representation of alumni who took degrees in science rather than engineering.)

Two other items were approved by the board of directors in September. One was to suspend the annual alumni fund solicitation for the duration of the five-year "Science for Mankind" development campaign. The other concerns *Engineering and Science* magazine, which has for many years been under the nominal direction of an alumni magazine council, headed by Richard C. Armstrong, '28, who has acted as publisher of *E&S* since 1950. In the future the board will be directly involved with the council, with one director serving on it along with three alumni (only one of whom shall also be a board member), two persons selected by the Institute, the editor of *E&S* (no vote), and the secretary of the association (no vote).

The new magazine council will concern itself with matters of the content, quality, and format of the magazine; will review the financial operations; and will review for the board any major editorial changes proposed for the magazine. It will be the aim of the association to make the magazine self-supporting through its advertising and subscription income.

The Alumni Association has appointed the following people to the council: chairman—Horace Baker, '35, engineering executive; alumnus (board member)—Martin Webster, '37, attorney; alumnus—Edward Neale, '46, advertising executive; and alumnus—Richard Armstrong, '28, physician. Other members are *E&S* editor Edward Hutchings Jr. and association secretary Donald S. Clark, '28. The Institute has not yet appointed its two members. ■

LIBRARY OPEN HOUSE
Dec. 6 3-5 p.m.
Alumni Invited

PERSONALS

1923

RICHMOND H. SKINNER is assistant director of Delaware State Civil Defense Planning. He fills his free time umpiring tennis tournaments and playing golf and bridge.

1925

ROBERT W. FULWIDER, senior partner in the Los Angeles law firm of Fulwider, Patton, Rieber, Lee, and Utecht, is a newly elected member of the council for the section of patent, trademark, and copyright law of the American Bar Association.

WILLIAM D. SELLERS, senior partner with the firm of Sellers and Brace, is the new chairman of the patent section of the California State Bar for 1967-68. He has been vice-chairman of the section for the past year.

1926

GEORGE E. CROCKER, who retired from the Pacific Telephone and Telegraph Company in Los Angeles in 1963, died in October 1966 in San Marcos, Calif.

1927

THOMAS S. SOUTHWICK, MS '29, after four years in Thailand, working for the World Meteorological Association, is now enjoying his second retirement traveling in Europe. He and his wife hope to eventually settle in Switzerland.

1928

RICHARD G. FOLSOM, MS '29, PhD '32, president of Rensselaer Polytechnic Institute, has been named chairman of the Governor's Electric Power Committee in New York. The committee defines new objectives for the state and recommends mechanisms for achieving those objectives.

1930

ROBERT I. STIRTON, PhD '34, after an early retirement from the Chevron Chemical Co., has accepted a position as vice president of Roger Williams Technical and Economic Services, Inc. of Princeton, N.J. He will remain in Berkeley, Calif., however, to open a Pacific coast office for the firm.

1934

G. FOSTER RUCKER, MS, district manager for Leeds and Northrup Co., in Cleveland, Ohio, has been elected vice president, District V, of the Instrument Society of America.

1937

PETER H. WYCKOFF, MS, is program director for weather modification for the National Science Foundation in Washington, D.C. He heads a program of research and evaluation of means of modifying weather.

1938

HENRY K. EVANS has moved to Washington, D.C., to open a new office for Wilbur Smith and Associates, transportation consulting engineers. Evans, a vice president of the firm, has been managing the San Francisco office for the past 11 years.

ROBERT C. McMASTER, MS, PhD '44, professor of welding engineering at Ohio State University in Columbus, has been designated a 1967-68 Regents' Professor by the Ohio General Assembly. This professorship recognizes outstanding service by faculty members at Ohio's state universities.

1939

CHARLES H. TOWNES, PhD, has been appointed professor-at-large at the University of California. Although this position allows him to participate in teaching and other activities at several campuses, he will be based at the physics department at Berkeley. He was formerly Institute professor at the Massachusetts Institute of Technology and is also a former provost at MIT. Townes was winner of the 1964 Nobel Prize in physics.

PHILIP S. DEVIRIAN, MS '40, has been appointed vice president of FMC Corporation's ordnance division. He will be in charge of the company's San Jose, Calif., and South Charleston, W.Va., ordnance plants and ordnance engineering activities.

1940

ROY E. MARQUARDT, MS '42, has resigned as chairman and member of the board of directors of the Marquardt Corporation of Van Nuys, Calif. Marquardt, who founded the firm, will continue as a technical consultant to the company but will spend most of his time on community activities.

1941

JAMES T. HARLAN JR. is on a one-year assignment for the Shell Chemical Company in its affiliated Royal Dutch Shell Plastics Laboratory in Delft, Holland. He will return to California in June 1968.

1942

FRED H. FELBERG, MS '45, is the new assistant laboratory director for plans and programs at Caltech's Jet Propulsion Laboratory in Pasadena. Formerly assistant laboratory director for technical divisions, Felberg will now be responsible for planning JPL's total program.

PAUL M. MADER, senior research chemist in the exploratory color laboratory of the Eastman Kodak Company in Rochester, N.Y., died in August at the age of 47.

1943

ROBERT P. LeVINE, president of the Penn-Dixie Cement Corporation of New York, died in August. He was 45. LeVine was an investment banker and underwriter before he and his partner assumed control of Penn-Dixie in April. He is survived by his wife, a daughter, and two sons.

PAUL R. SAUNDERS, PhD, is a new associate dean for education and research and professor of physiology at the University of Southern California School of Medicine. He has been professor and chairman of the department of biological sciences at USC for the past five years and is director of the new marine sciences program of the Allan Hancock Foundation.

1944

HOLT ASHLEY, AE, is professor of aeronautics and astronautics at Stanford University.

FRANK W. LEHAN, founder of Space-Electronics Corp. of California, was recently named assistant secretary of transportation for research and technology by President Johnson.

ROBERT J. PARKS, assistant laboratory director for flight projects at the Jet Propulsion Laboratory in Pasadena, is one of two JPL scientists to be awarded the 1967 Stuart Ballantine Medal of The Franklin Institute. This is presented to leading men in the physical sciences and engineering for outstanding achievement in the fields of communication and reconnaissance that employ electromagnetic radiation. Parks received the award in connection with his work on Mariner IV.

1945

FRED M. BRIGGS, a retired Navy commander, is the new campus engineer and superintendent of maintenance at the University of Redlands, Redlands, Calif. Until his retirement from the Navy in August, he was resident officer in charge of construction for Navy activities in the Los Angeles area and for the NASA facility at Seal Beach.

MERLE G. WAUGH is acting director of program control for the advanced manned missions program office at NASA headquarters in Washington, D.C.

1946

JOHN W. BARNES, a colonel in the U.S. Army, has been selected for promotion to brig-

adier general and will report to Vietnam as deputy senior advisor of I Corps. He was formerly with defense research and engineering at the Pentagon in Washington, D.C.

JAMES W. GLANVILLE, MS, ChE '48, a partner in the investment banking firm of Lehman Brothers in New York City, has been elected to the board of directors and the executive committee of the board of Pubco Petroleum Corporation of Albuquerque.

LAURENCE O. HAUPT JR., MS '47, is plant manager of Proctor & Gamble's toilet goods plant in Cincinnati, Ohio.

L. WAYNE MULLANE, MS, AE '47, was recently named executive vice president of Aerojet-General Corporation in El Monte, Calif. Mullane, who joined Aerojet in 1959, was group vice president until this promotion.

1947

WILLIAM C. COOLEY, MS, is president of Exotech Inc. of Bethesda, Md., a company specializing in pulsed water jet equipment at pressures over 100,000 psi, used for mining, rock tunneling, and excavation.

GEORGE C. KELLEY is working at the Oak Ridge National Laboratory in Tennessee, where he is in charge of DCX-2, an experiment in controlled thermonuclear research.

VINCENTE HIDALGO LIM JR., MS, is factory manager for Kenya Cannery Ltd., Thika, Kenya.

HENRY W. SCHROEDER is microwave marketing manager for Motorola Inc. in Phoenix.

1948

WILLIAM W. CARTER, MS, PhD '49, is assistant director (nuclear programs) for defense research and engineering at the Pentagon in Washington, D.C.

GLENN A. CHAFFEE is director and counseling psychologist for the metropolitan guidance center in Farmington, Mich.

KEITH HENDERSON, staff engineer at the Stanford Linear Accelerator Center, is the new state director of the California Society of Professional Engineers, San Francisco Peninsula chapter.

CHARLES O. JENISTA JR., MS, a lieutenant colonel in the U.S. Air Force, is a planning and programming officer in the space branch, concepts division, Aerospace Studies Institute at Maxwell Air Force Base, Alabama.

SOL MATT, MS, has been appointed manager of the business resources operation of the defense electronics division of the General Electric Company in New York. He joined General Electric in 1953 and served most recently as manager of advanced systems engineering at the division's aerospace electronics department in Utica.

DOUGLAS C. STRAIN, president and general manager of Electro Scientific Industries, Inc., Portland, Ore., is vice president-elect of the technology department of the Instrument Society of America. He begins his two-year term this month.

ROBERT ZACHARIAS, MS '49, was married in August to Melanie Schneider in Palos Verdes Estates, Calif. They are both employed at TRW Inc. in Redondo Beach, Calif.

1949

CHARLES H. ARRINGTON JR., PhD, is director of research, central research department of E. I. DuPont de Nemours & Co., in New York.

ALBERT H. CLANCY JR., AE, a rear admiral in the U.S. Navy, has been appointed Navy Deputy for the U.S. Air Force F-111 program (for which the Navy is developing engines) at Wright-Patterson AFB, Ohio.

DANIEL W. KING has moved to New York to assume duties as a vice president of Crum & Forster, management organization of the Crum & Forster Group of Insurance Companies. He has been general manager of their Pacific region and has been living in San Francisco since 1966.

1950

FLOYD B. HUMPHREY, PhD '56, associate professor of electrical engineering at Caltech, and his wife, Susan, write that their fourth child, George Parker, was born in September.

WILLIAM F. JONES, MS, a principal and chairman of the board of Gribaldo, Jacobs, Jones & Associates in San Francisco, was recently elected regional vice president, north, of the California Society of Professional Engineers.

ROBERT H. KORKECI, MS, PhD '54, is director of the hypersonic research laboratory, Aerospace Research Laboratories at Wright-Patterson AFB, Ohio. Prior to joining the Laboratories in 1964, he served as technical director of the von Karman Institute for Fluid Dynamics in Belgium.

RICHARD A. McKINNON was promoted to chief engineer, standard products division of the International Paper Company and transferred to Mobile, Ala., in August.

1952

RICHARD R. DICKINSON has transferred to Texaco's executive offices in New York as staff coordinator in strategic planning.

DAN L. LINDSLEY, PhD, is professor of biology at the University of California at San Diego. He has conducted genetic research at the Oak Ridge National Laboratory, Oak Ridge, Tenn., for the last 13 years, except for a year at the University of São Paulo, Brazil, and a year at the University of Rome, Italy.

1953

DUANE MARSHALL is now chief engineer at Analog Devices in Cambridge, Mass.

OLIVER R. PRICE is president of Ideal-Aerosmith, Inc. in Cheyenne, Wyo.

GERALD H. ROSS is chief engineer with Omark Industries Inc. in Portland, Ore.

CARL A. ROUSE, MS, PhD '56, will remain in Washington, D.C., for an additional year with the E. O. Hulburt Center for Space Research at the U.S. Naval Research Laboratory. He is the Laboratory's principal investigator on the problem of helium abundance in the solar photosphere.

RONALD H. WILLENS, MS '54, PhD '61, is now a member of the technical staff at the Bell Telephone Laboratories in Murray Hill, N.J.

1955

RONALD R. COCHRAN, staff engineer at the Stanford Linear Accelerator Center, has been elected director of professional relations by the San Francisco Peninsula chapter of the California Society of Professional Engineers.

HOMER H. HOWELL JR., MS, a lieutenant colonel in the U.S. Air Force, is currently assigned to the Air Force Space and Missile Systems Organization at Los Angeles Air Force Station, Calif., as deputy director of the Vela Nuclear Detection Satellite Program.

WILLIAM A. RANK, MS, a lieutenant colonel in the U.S. Army, was awarded the Chuong My Medal in Qui Nhon, Vietnam, in July. The award, presented by South Vietnamese Premier Nguyen Cao Ky, cites Rank for his work in improving the port facilities and the city of Qui Nhon.

OSCAR SEIDMAN, AE, is director of the weapons dynamics division of the research and technology directorate at the Naval Ordnance Systems Command Headquarters in Bethesda, Md.

1956

JERRY R. PIXTON, a major in the U.S. Air Force, is attending the Air Force Command and Staff College at Maxwell AFB, Ala.

ROY A. WHITEKER, PhD, professor of chemistry at Harvey Mudd College in Claremont, Calif., is on leave to the National Research Council of the National Academy of Sciences as associate director of the fellowship office.

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PERSONALS

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1957

HENRY J. STUMPF, MS, PhD '60, is an advisory engineer for the Westinghouse Astronuclear Laboratory in Pittsburgh, Pa.

WILLIAM G. WOODS, PhD, is a senior research chemist with the U.S. Borax Research Corporation in Anaheim, Calif.

1958

RICHARD L. VAN KIRK, a consultant in the management services department of Arthur Young & Co. of Los Angeles, is on temporary assignment in Seattle, Wash.

1959

WILLIAM K. CLARKSON, MS, has been appointed assistant department head of the electromechanical department at The Aerospace Corporation in El Segundo, Calif. He was previously manager of the systems integration section in the same department.

DAVID EDWARD FISHER, MS, is currently in the department of mathematics at Queen Mary College in London, England.

J. DAVID TEAL is assistant professor of physics at Tougaloo College, Tougaloo, Miss. He completed the work for his PhD degree at Harvard University in August.

JAIN-MIN WU, MS, PhD '65, and his wife, YING-CHU LIN WU, PhD '63, are teaching at the University of Tennessee Space Institute and living in Tullahoma, Tenn.

1960

LEROY E. HOOD is a senior investigator for the National Cancer Institute of the National Institutes of Health in Bethesda, Md.

DIMITRI M. MIHALAS, MS, PhD '64, has been named assistant professor of physics and astrophysics at the University of Colorado at Boulder. Prior to joining the CU faculty, he was assistant professor of astrophysics at Princeton University.

JOHN WILLIAM PORTER, MS, PhD '63, is assistant professor of aerospace engineering at the University of Texas at Austin and is a consultant for TRACOR, Inc.

1961

STEPHEN H. HECHLER is assistant professor of mathematics at Case Western Reserve University in Cleveland, Ohio.

RONALD E. ROLFE, PhD, a microbiologist conducting cancer research at St. Louis University School of Medicine, died of cancer in September. A memorial lectureship is being established in his name in the microbiology department at the university.

WARREN D. SMITH, MS, is a newly appointed professor of aerospace engineering at the Virginia Polytechnic Institute's College of Engineering in Blacksburg.

F. YATES SORRELL JR., MS, is assistant professor of aerospace engineering sciences at

the University of Colorado at Boulder. He was previously a research associate in the Joint Institute for Laboratory Astrophysics at CU.

ORTWIN A. WERSEL, a PhD candidate at Harvard University, died in July in Cambridge, Mass. He had been doing graduate work at Harvard since his graduation from Caltech, four years of it under a National Science Foundation Fellowship. He is survived by his wife, Gladys, and his parents.

1962

RICHARD BRANDT has completed work for his PhD degree at the University of Illinois and is now doing research in solid state physics at the Massachusetts Institute of Technology's Lincoln Laboratories in Lexington, Mass.

DAVID H. CLOSE, MS, PhD '65, a second lieutenant in the Quartermaster Corps of the U.S. Army, is on permanent assignment to Fort Lee, Va., where he is a systems analyst at the computer center.

GERALD W. CLOUGH is a systems analyst with the Oasis Oil Co. of Libya, Inc. and is living in Tripoli, Kingdom of Libya, North Africa.

CHARLES M. FLYNN JR. is a new assistant professor of chemistry at La Verne College, La Verne, Calif.

WILLIAM VERNE HASSENZAHN has joined the staff of the Los Alamos Scientific Laboratory in New Mexico to work in the medium-energy physics division.

OSORIO C. MEIRELLES, MS, is working for the Brazilian government in the communi-

cations office and teaching at the University of Brazil in Rio de Janeiro.

EDWARD S. MILLER was recently awarded a PhD degree in physics at Princeton University, Princeton, N.J.

MILTON E. MORRISON, MS, PhD '65, is on active duty with the U.S. Air Force, working at the Aerospace Research Laboratories at Wright-Patterson AFB, Ohio.

1963

THOMAS T. BOPP is assistant professor of chemistry at the University of Hawaii in Honolulu.

ROBERT CAUSEY received his PhD in logic and mathematics from the University of California at Berkeley this summer and is now assistant professor in the philosophy department of the University of Texas at Austin.

BRUCE W. CHESEBRO is at the Karolinska Institute in Sweden for a year and a half, doing research in immunology.

ROBERT W. GAMMON, MS, received his PhD in physics from Johns Hopkins University in Maryland in February and is now assistant professor of physics at The Catholic University of America in Washington, D.C.

LARRY E. RUFF has completed his PhD in economics at Stanford University and is assistant professor of economics at the University of California at San Diego.

1964

ROBERT F. CHRISTIE JR. was promoted in August to Army private pay grade E-2 upon completion of basic combat training at Fort Dix, N.J. As an outstanding trainee, he received the promotion two months earlier than is customary.

ALAN L. HOFFMAN, MS, a first lieutenant in the U.S. Army, has completed an ordnance officer course at the Army Ordnance School at Aberdeen Proving Ground, Md.

JOHN C. SWONSON JR., MS, a captain in the U.S. Air Force, has received the U.S. Air Force Commendation Medal for meritorious service as an information officer at Nha Trang AB, Vietnam.

1965

ROGER A. HAAS, MS, has been awarded a Daniel and Florence Guggenheim Fellowship for study at the Guggenheim Jet Propulsion Center at Caltech for the 1967-68 academic year. He is one of 12 young engineers in the U.S. and Canada to receive similar awards.

RICHARD A. HOUSE II, a first lieutenant in the U.S. Air Force, has received his MS degree in space physics from the Air Force Institute of Technology at Wright-Patterson AFB, Ohio. He is now assigned to the Aerospace Research Laboratories there as a research physicist in solid state physics.

1966

EDWARD H. PERRY, MS '67, has received a Daniel and Florence Guggenheim Fellowship for study at the Guggenheim Jet Propulsion Center at Caltech for the 1967-68 academic year.

WILLIAM K. TYLER, a private in the U.S. Army, has completed a four-week administration course at Ft. Leonard Wood, Mo., where he was trained in the preparation of military records and forms.

JERRY M. YUDELSON has completed a year's study in Aachen, Germany, as a Rotary Foundation Fellow and is now a graduate student in water resources at Harvard.

1967

STEWART R. DAVEY, a second lieutenant in the U.S. Air Force and a geodetic officer at Francis E. Warren AFB, Wyo., has been recognized for helping his unit win the U.S. Air Force Outstanding Unit Award. His unit was cited for accomplishing an extensive aerial photo mapping survey and related geodetic missions well ahead of schedule and at cost savings.

Address Unknown

The Institute has no record of the present addresses of these alumni. If you know the current addresses of any of these men, please contact the Alumni Office, Caltech.

1906 Norton, Frank E.	1935 Antz, Hans M. Beman, Ward W. Bertram, Edward A. Huang, Fun-Chang McNeal, Don
1907 Miller, James C.	
1911 Lewis, Stanley M.	
1921 Arnold, Jesse	1936 Chu, Dien-Yuen Meng, Chao-Ying Ohashi, George Y. Tan, Chia-chen Van Riper, Dale H.
1922 Cox, Edwin P. Garfield, Arthur J.	
1923 Neil, W. Harvey	1937 Burnight, Thomas R. Cheng, Ju-Yung Easton, Anthony Fan, Hsu T. Jones, Paul F. Lotzkar, Harry Maginnis, Jack Nojima, Noble Servet, Abdurrahim Shaw, Thomas N. Yin, Hung C.
1924 Carr, John Gridley, Horace V. Tracy, Willard H. Waldo, Cornelius T. Young, David R.	
1925 Waller, Conrad J.	1938 Goodman, Hyman D. Gross, Arthur G. Gutierrez, Arnulfo G. Kanemitsu, Sunao Li, Yuan Chuen Lowe, Frank C. Rhett, William Tsao, Chi-Cheng Wang, Tsun-Kuei Watson, James W. Woodbury, William W.
1926 Chang, Hung-Yuan Chase, Carl T. Huang, Y. H. Yang, Kai J.	
1927 Marsland, John E. Peterson, Frank F.	1939 Burns, Martin C. Dibble, Barry J. Green, William M. Griffiths, John R. Jackson, Andrew McB., Jr. Jones, Winthrop G. Liang, Carr C. C. Weinstein, Joseph Wilson, Harry D.
1928 Chou, Pei-Yuan Martin, Francis C. Wingfield, Baker	1940 Akman, M. Seyfi Batu, Buhtar Compton, Arthur M. Gentner, William E. Gibson, Arville C. Green, William J. Hsu, Chang-Pen Karubian, Ruhollah Y. King, James L. Lofoff, Adolph Menis, Luigi Tao, Shih C. Torrey, Preston C. Wang, Tsung-Su
1929 Briggs, Thomas H., Jr. Espinosa, Julius Nelson (now Nelson, Julius) Lynn, Laurence E. Robinson, True W.	1941 Clark, Morris R. Dieter, Darrell W. Easley, Samuel J. Geitz, Robert C. Harvey, Donald L. Hubbard, Jack M. Kuo, I. Cheng Robinson, Frederick G. Standridge, Clyde T. Vaughn, Richard Yui, En-Ying
1930 Chao, Chung-Yao Moyers, Frank N. Reynard, Willard G. White, Dudley	
1931 Hall, Marvin W. Ho, Tseng-Loh Oaks, Robert M. West, William T. Yoshioka, Carl K.	
1932 Schroder, L. D. Wong, David Y.	
1933 Downie, Arthur J. Koch, A. Arthur Larsen, William A. Michael, Edwin B. Muller, Jerome J. Murdoch, Keith Plank, Dick A. Rice, Winston R. Shappell, Maple D. Smith, Warren H.	
1934 Harshberger, John D. Liu, Yun P. Sargent, Marston C.	

1942 Emre, Orhan M. Go, Chong-Hu Ip, Ching-U Johnston, William C. Levin, Daniel Martinez, Victor H. Schauer, Eric H.	Rice, Jonathan F. Tseu, Payson S. Turkbas, Necat Yank, Frank A.	1954 Coughlin, John T., II Guebert, Wesley R. Jimenez, Herberto Rogers, Berdine H. Scott, Francis F.
1943 Angel, Edgar P. Brown, James M. Bryant, Eschol A. Burlington, William J. Colvin, James H. Eaton, Warren V., Jr. Gould, Jack E. Hamilton, William M. Hillyard, Roy L. Johnsen, Edwin G. Kane, Richard F. King, Edward G. Koch, Robert H. LaForge, Gene R. Leeds, William L. Leonard, James H. Ling, Shih-Sang Lundquist, Roland E. Mampell, Klaus McNeil, Raymond F. Missell, Joseph W. Mowery, Irl H., Jr. Nesley, William L. Neuschwander, Leo Z. O'Brien, Robert E. Patterson, Charles M. Pearson, John E. Rivers, Naim E. Roberts, Fred B. Rupert, James W., Jr. Scholz, Dan R. Shannon, Leslie A. Smitherman, Thomas B. Sweeney, William E. Tindle, Albert W., Jr. Vicente, Ernesto Waldrop, Nathan S. Walsh, Joseph R. Washington, Courtland L. Weis, William T.	1946 Allison, Charles W., Jr. Austin, Benjamin Behroon, Khosrow Bowen, Mark E. Brinkhaus, Harvey H. Burger, Glenn W. Chen, KeYuan Childers, Kenan C., Jr. Dethier, Bernard Dyson, Jerome P. Esner, David R. Foster, R. Bruce Freire, Luis E. Halvorson, George G. Hoffman, Charles C. Ingram, Wilbur A. Lewis, Frederick J. Maxwell, Frederick W. McConaughay, James W. Olsen, Leslie R. Prasad, K. V. Krishna Salbach, Carl K. Shepard, Elmer R. Sledge, Edward C. Smith, Harvey F. Srinivasan, Nateson Stephenson, Robert E. Tung, Yu-Sin Webb, Milton G.	1949 Albert, Joseph L. Barker, Edwin F., Jr. Bauman, John L., Jr. Baumann, Laurence I. Bottenberg, William R. Brown, John R. Bryan, Wharton W. Cheng, Che-Min Clendenning, Herbert C. Cooper, Harold D. Dantine, Walter A. Dodge, John A. Foster, Francis C. Galstan, Robert H. Hardy, Donald J. Heiman, Jarvin R. Krasin, Fred E. Lowrey, Richard O. MacKinnon, Neil A. McElligott, Richard H. Mitchell, Max O. Orme, Eric C. Parker, Dan M. Petty, Charles C. Ringness, William M. Saari, Albert E. Wilkening, John W. Yu, Sien-Chiue
1944 Alpan, Rasit H. Barriga, Francisco D. Bell, William E. Benjamin, Donald G. Berkant, Mehmet N. Birlik, Ertugrul Burch, Joseph E. Burke, William G. Cebeci, Ahmed Clendenen, Frank B. Cooke, Charles M. De Medeiros, Carlos A. Fu, Ch'enz Y. Harrison, Charles P. Hu, Ning Johnson, William M. Labanauskas, Paul J. Lennerts, Lester O. Onstad, Merrill E. Pi, Te-Hsien Ridlehuber, Jim M. Shults, Mayo G. Stanford, Harry W. Stein, Roberto L. Sullivan, Richard B. Sunalp, Halit Tanvildiz, R. S. Trimble, William M. Unayral, Mustafa A. Wadsworth, Joseph F., Jr. Wight, D. Roger Williams, Robert S. Wolf, Paul L. Wright, John J. Yik, George	1947 Asher, Roland S. Atencio, Adolfo J. Chung, Ta-San Clarke, Fredric B. Clements, Robert E. Clock, Raymond M. Collins, Hugh H. Dagnall, Brian D. Darling, Rodney O. Diack, James A. G. Hsu, Chi-Nan Huang, Ea-Qua Lane, James F. Leo, Fiorello R. Linton, William M. Manoukian, John Martin, Sidney T. McClellan, Thomas R. Molloy, Michael K. Moorehead, Basil E. A. Olson, Raymond L. Orr, John L. Page, Myron E. Ray, Kamallesh Rust, Clayton A. Sappington, Merrill H. Thompson, Russell A., Jr. Torgerson, Warren S. Wan, Pao K. Wellman, Alonzo H., Jr. Wimberly, Clifford M. Winters, Edward B., Jr. Ying, Lai-Chao	1950 Alexander, Joseph B. Bryan, William C. Denby-Wilkes, John (now Wilkes, John D.) Edelstein, Leonard Gimpel, Donald J. Li, Chung H. McDaniel, Edward F. McMillan, Robert Pao, Wen K. Paulson, Robert W. Schneider, William P. Tang, You-Chi Whitehill, Norris D.
1945 Ari, Victor A. Bunze, Harry F. Fanz, Martin C. Fox, Harrison W. Gibson, Charles E. Green, James B. Ho, Chung P. Jenkins, Robson P. Loo, Shih-Wei	1948 Agnew, Haddon W. Au, Yin-Ching Buhler, James L. Bunce, James A. Chu, Tao-Hung Chuang, Feng-Kau Clark, Albert R. Collins, Burgess F. Cotton, Mitchell L. Crawford, William D. Herold, Henry L. Holm, John D. Hsiao, Chien Hsieh, Chia L. Latson, Harvey H., Jr. Lawton, Elmore G. Leavenworth, Cameron D. Mason, Herman A. Oberman, Carl R. Oliver, Edward D. Rhynard, Wayne E. Sims, William E. Stein, Paul G. Swain, John S. Tang, Yu-Wei	1951 Arosemena, Ricardo M. Chong, Kwok-Ying Davison, Walter F. Goodell, Howard C. Hawk, Riddell L. Lafdjian, Jacob F. Li, Cheng-Wu Lo, Shih-Chun Padgett, Joseph E., Jr. Summers, Allan J.
1952 Abbott, John R. Arcoulis, Elias G. Bucy, Smith V. Harrison, Marvin E. Jauguey, Michel Lunday, Adrian C. Luo, Peilin Meyer, Robert F. Munson, Albert G., Jr. Primbs, Charles L. Pruett, Jeter A. Robieux, Jean Robison, William C. Roy, Nikhilesh Shelly, Thomas L. Sutton, Donald E. Wiberg, Edgar Wilson, Howard E. Woods, Joseph F. Zacha, Richard B.	1953 Alexander, Robert H. Dirickson, Luiz H. Fernandez, Caesar, Jr. Lennox, Stuart G. Peters, Alphonse P. Robkin, Morris A.	1955 Huber, William E. Moore, William T.
1956 Edwards, Robert W. Feige, Jacques Kelly, James L. Kontaratos, Antonios N. MacDuffie, Duncan E. Spence, William N. Tang, Chung-Liang Truong, Tran N.	1957 Heiser, William H. Howie, Archibald Savage, James C.	1958 Chang, Berken Dundzila, Antanas V. Knight, Harold G.
1959 Baekelandt, Victor Bailey, John S. Byun, Chai B. Cheng, Hung Guillemet, Michel P. Hemmingway, Richard E. Idriss, Izzat M. Monroe, Louis L. Roth, Stanley	1960 Banta, Brent Cauley, Joseph M. Lagarde, Jean B. Mizrahi, Maurice Pelton, Walter E. Sinoff, William A.	1961 Allen, Charles A. Dombey, Norman Kastan, Peter Lindner, Milton S. Luchitta, Ivo Pollack, Sanford P. Richter, Rolf Snively, Frank T.
1962 Davis, James I. Dorlhac, Jean-Pierre Dubois, Jean C. King, William C. O'Riordan, Padraic D. Otani, Bunso Wik, Dennis R.	1963 Hannon, Michael J. A. Woo, Ying-Bun (now Wu, John Y.)	1964 Delfosse, Claude M. Levine, Richard I. Radke, George E. Waits, Harold P.
1965 Aimelet, Bernard A. Brackett, George C. McCown, Rainer F. Mori, Hidehiko Wong, Felix S. H.	1966 Eris, Altan K. Feroz, Shaikat H. M. Urey, John C.	