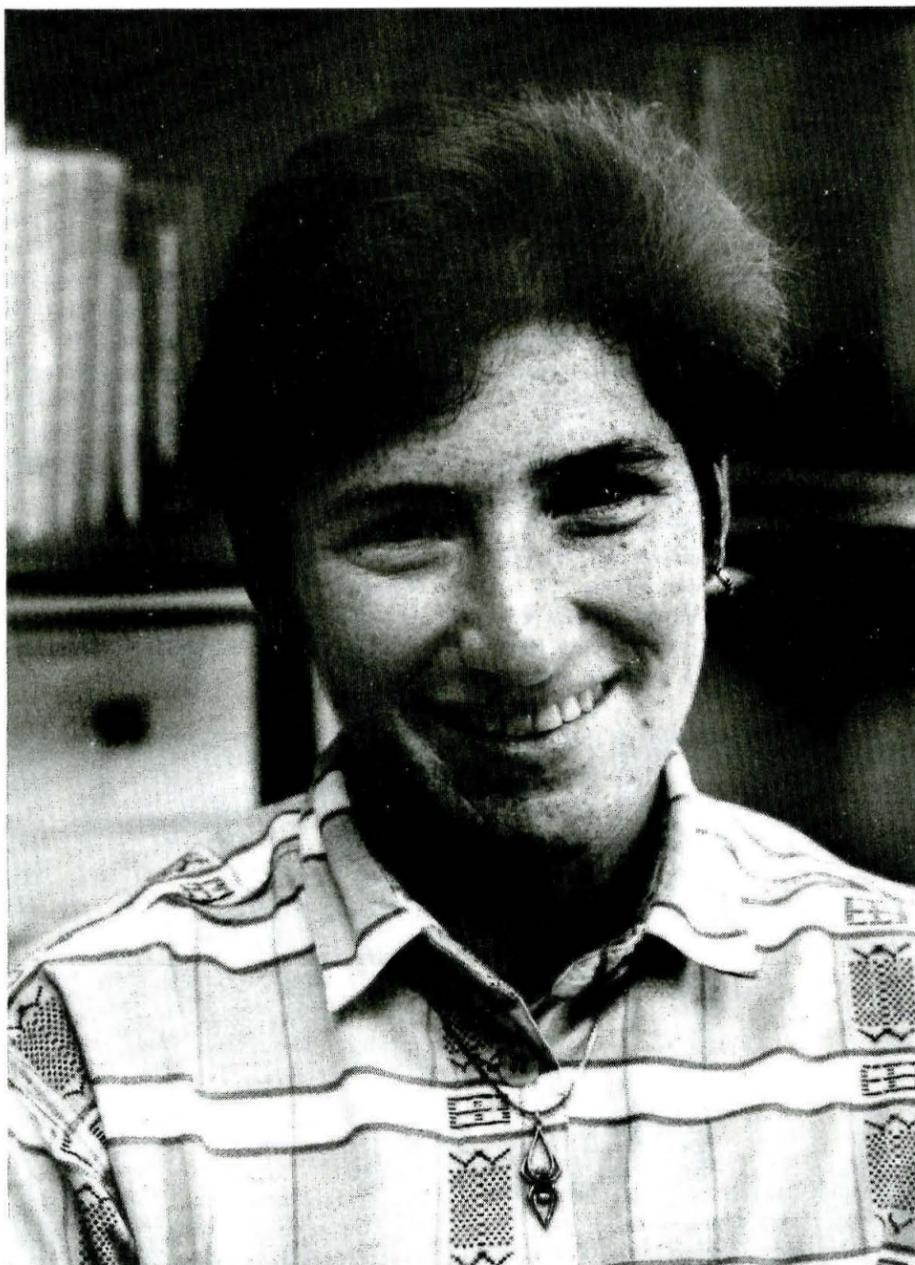


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"I had very inspirational teachers at Caltech. Viewing them as role models made me think, 'I wonder if I could do that.'"



Julia Kornfield— from frosh to prof

By Winifred Veronda

Last winter Julia Kornfield (BS '83, MS '84) became the first female who earned her bachelor's degree here to join the faculty. Enthusiastic and dynamic, she is here as an assistant professor of chemical engineering, conducting research in polymer physics. She was named a Presidential Young Investigator for 1990. Professor Kornfield was born in Oakland and grew up in the Bay Area. Below, she talks about everything from "glomming" problems at Caltech to how it feels to be a new prof at the Institute.

When did you decide to go into science?

Actually, I decided to go into science after I came to Caltech. I wanted to come here because Caltech is small and very intense. As I think about it, so am I. There's probably some parallelism

there that really appeals to me. I started out with a double major in literature and chemical engineering. It was probably about my sophomore year that I decided I wanted to be a professor (that says something about how I admire the faculty members here), and it had become clear that I was much better at science than at writing. So I figured, "Go with your strength." I came up one class short in literature and one short in chemical engineering, so I got my degree in chemistry.

When you were young, did you receive much encouragement to go into science?

Yes and no. My father is a surgeon. He got me interested in scientific things by taking me on rounds at Stanford and showing me slides of disgusting things

like X-rays of cancerous lungs and injuries people had received in automobile accidents. But he was unhappy that I chose Caltech, and he wasn't particularly happy when I decided to go to grad school. Now he's very proud of me, but he wasn't particularly encouraging along the way.

My mom was a housewife while I was growing up. Now she's a chef, recently returned from service at the U.S. Embassy in Australia. She's the kind of person who would love me if I were driving a truck. So she was very supportive in general, but not specifically about science. I do know that having excellent teachers in science and math—and this goes back to elementary school—made a big difference. And I had very inspirational teachers at Caltech. Viewing them as role models made me think, "I wonder if I could do that."

It's unusual for someone to think about coming to Caltech and majoring in literature.

There are excellent professors in literature here. I really enjoyed their classes. When I hear talk about not having humanities faculty at Caltech, I think "that would be tragic." I'm proud Caltech is willing to seek out really good humanities professors. Of course, Caltech offers the kind of intellectual environment that is great for studying—period!

What activities were you in?

Quite a few, actually. I was a member of Lloyd House, and of the house social team. I ran cross country and played volleyball and soccer. I was a member of the Caltech Y Excomm, I sang in the Women's Glee Club, and was editor of the TQFR [Teaching Quality Feedback Report]. I was a member of the Excomm of the Organization for Women at Caltech. I highly recommend that undergraduate women get involved with OWC so they can meet staff women, female graduate students, and faculty women as well. It's a great organization. I benefited from it a great deal. I really enjoyed the diversity of people

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CALTECH IN THE NEWS

•When the great actors of the decade are mentioned does the name Mark Adler, who portrayed King Arthur in TACIT's *Camelot*, come to mind? Well it did to many readers of the *Pasadena Weekly* who, as a part of the paper's survey on the "Best of '90," voted Adler, PhD '90, second place in the best local actor category. The third place winner was William Christopher from *MASH*. The first place winner? Kevin Costner.

•Spectacular material failures, such as when an airplane fuselage fractures, can lead to catastrophic consequences. The cracks that cause these failures move so quickly that laboratory methods couldn't capture their progress. But now two new methods for measuring crack propagation have been developed by Ares Rosakis, associate professor of aeronautics and applied mechanics. The July issue of *R & D* magazine reports that the first method uses 20-nanosecond-long laser pulses which are forced slightly out of phase as the optically flat test material breaks. The second method, developed with Alan Zehnder (MS '83, PhD '87), now at Cornell University, measures the transient temperature changes at the crack's tip with indium-antimonide infrared detectors.

•"Competing Against Time," the report of the board of inquiry on the 1989 Loma Prieta earthquake, was submitted to California Governor George Deukmejian reports the *Alameda Time Star*. The board, headed by George Housner, the Braun Professor of Engineering Emeritus, found that the collapse of freeways and bridges in the earthquake could have been predicted if the state had made thorough studies of the structures. The board also found that many other highway structures pose similar hazards during powerful earthquakes. Noting the state department of transportation lacked the money for such studies, the board recommended that seismic safety studies and earthquake research should be a "paramount concern" to state legislators.

•The most detailed photograph ever of DNA, shown on the cover of *Nature* magazine on July 19, was taken by graduate students Michael Youngquist and Robert Driscoll in the lab of John Baldeschieler, professor of chemistry. The photograph, reconstructed by scanning tunneling microscope data, shows a double-helical DNA magnified approximately 25 million times.

Leroy Hood honored for contributions

Leroy Hood (BS '60, PhD '68), the Ethel Wilson Bowles and Robert Bowles Professor of Biology at Caltech, has been honored with an award from the American College of Physicians (ACP) for "outstanding work in science as related to medicine." The prize, which includes a bronze medal, certificate, and \$250, was presented to Hood at the ACP's 71st annual session in Chicago. Hood is director of the Center for the Development of an Integrated Protein and Nucleic Acid Biotechnology, established last year by the National Science Foundation.

Caltech receives three fellowships from Drown Foundation

Caltech has received a \$93,000 grant for three postdoctoral fellowships in molecular neurobiology from the Joseph Drown Foundation. The young scientists receiving Drown Postdoctoral Fellowships will be important members of well-established research teams investigating the structure and activity of the nervous system.

Molecular neuroscience begins with investigations of the fundamental characteristics of how cells in the nervous system function. Scientists in this field are studying how some ten trillion neural connections are made among one hundred billion neurons at the developmental level of nerve interaction. They are also investigating how information flows from cell to cell throughout the nervous system.

Advances in molecular neurobiology hold potential for therapeutic approaches to nervous, mental, and cardiovascular disorders, and to cystic fibrosis. These advances promise to provide insight into many diseases that drastically impair the quality of life, such as neural degenerative diseases and neurological conditions associated with aging.

Since the donor's death in 1982, the Joseph Drown Foundation has continued to support those areas of philanthropy that interested Mr. Drown. A student loan fund was established in his name at Caltech several years ago and has been periodically augmented. The Joseph Drown Foundation has also awarded more than \$500,000 to Caltech in recent years for the support of neuroscience research.

Harry Gray named ARCS 1990 Man of Science

Harry Gray has been named the recipient of the 1990 Man of Science Award by the ARCS (Achievement Rewards for College Scientists) Foundation, Inc., Los Angeles Chapter, in recognition of his outstanding contributions to the fields of bioinorganic chemistry and inorganic photochemistry. Gray is the Arnold O. Beckman Professor of Chemistry at Caltech and director of Caltech's Beckman Institute, an interdisciplinary research center for the study of problems at the frontiers of chemistry and biology.

Laurent awarded international grant

Gilles J. Laurent, assistant professor of biology and computation and neural systems, is one of four international scientific collaborators who have been awarded one of 29 "Human Frontier Science Program" grants given worldwide this year. The grant will provide support for three years. The other three collaborators are at the University of Cambridge, the University of Berlin, and the University of Hokkaido at Sapporo, Japan. Malcolm Burrows, professor of neuroscience in Cambridge, is the chief administrator of the grant.

The four collaborators are conducting research on related subjects concerning the neural basis of behavior, with the studies ranging from the function of single neurons to the study of behavior itself, using insects as model systems. Laurent is working on the cellular aspects of insect behavior.

Papanastassiou elected AGU Fellow

Dimitri Papanastassiou (BS '65, PhD '70), senior research associate in geochemistry at Caltech, has been elected a Fellow of the American Geophysical Union, an honor reserved for scientists who "have attained acknowledged eminence in a branch of geophysics." The number of AGU Fellows elected each year is limited to less than one percent of the organization's total membership.

Three elected to American Philo- sophical Society

Three members of the Caltech faculty have been elected members of the American Philosophical Society, the nation's oldest and perhaps most prestigious learned society. They are Don L. Anderson, the Eleanor and John R. McMillan Professor of Geophysics and director of the Seismological Laboratory from 1967 to 1989; Edward B. Lewis, the Thomas Hunt Morgan Professor of Biology, Emeritus; and Rudolph A. Marcus, the Arthur Amos Noyes Professor of Chemistry.

The country's first learned society, the APS grew from Benjamin Franklin's 1743 "proposal" to establish a scientific society. Philosophy meant knowledge then, and the society sought promotion of useful knowledge. Currently, the APS has 665 members, 13 of whom are from Caltech. Among the former members are 12 U.S. presidents, John James Audubon, Marie Curie, Charles Darwin, Thomas Edison, Albert Einstein, Alexander von Humboldt, Benjamin Rush, George C. Marshall, and John Wesley Powell.

TACIT returns to restored house

After months of renovation, the theater arts (TACIT) house at 300 Holliston Avenue that was partially gutted by fire in February 1989 has been restored. In September, TACIT finished moving its remaining possessions from five different storage sheds into its renewed headquarters.

"We've been painted, plastered, plumbed, tiled, and roofed," says TACIT director Shirley Marneus.

Marneus, who continues to mourn the destruction of many irreplaceable items in the fire, is looking ahead to the academic year's first production—Tom Stoppard's *Rosencrantz and Guildenstern Are Dead*, which will be presented this October under the direction of physics graduate student Todd Brun.

Kornfield

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that I met through these activities. I did a lot, and I would recommend that to any student. I think I was a bit overextended, but my grades were okay. I managed to graduate with honor.

Did you receive any awards?

I received the Haagen-Smit Award to the outstanding junior chemistry student. I believe that's all.

Was "glomming" a problem for you? (Ed. note: Glomming is done by male students who hang around female students, seeking their support and sympathy.)

In the beginning, but I developed coping mechanisms. This was difficult, though, because it made me somewhat callous. It's hard, having to push people away and say, "Hey, I have to take care of my own life too, you know," and, "You're the tenth guy today who's wanted to cry on my shoulder. Sorry. Get out." It's easier to make decisions about how much time you'll spend with sports or cooking, than it is to say no to somebody who clearly wants you to talk to him.

It's expected here that the female students will do all the caretaking. But men need to face the fact that they have to help each other, too. I'm sure that, if men look inside themselves, they can be just as caring as women can. It's not that they aren't concerned about their classmates. But they're programmed to only look to women for support. And in an environment like this, there just aren't enough women to support themselves and everyone else.

Did you ever have any regrets about coming to Caltech?

No, but as an alumna I've done recruiting for admissions, and I'm cautious about recommending Caltech because of the number of students I saw who really suffered. I was lucky enough to be in the upper half of the class somewhere. But the students who were in the lower 30 percent probably felt miserable most of the time.

I feel it's a disadvantage to be at Caltech if you're going to be in that bracket, because if you were at Stanford you'd be at the top of the class. And unless you can hack the pain of being toward the bottom and still go on to make a successful career, I don't think you should come here.

What do you tell the students who you think should not apply?

It's usually enough to tell them what the admission requirements are and what the class composition is. That intimidates most of the people who feel they could not make the top half, without the need to say anything more. I think one of the things that's really important for Caltech to do is to provide a transition for freshmen who realize they're really struggling, to help them transfer to another good college. It's important for the students on the lower rung here to realize that they are still very good. They should go to a place where they can have that perspective about themselves, instead of staying here where they kind of wither.

What teachers do you feel were especially influential?

I'm going to get into trouble here because I can't name everybody that I'd

tininess when he died.

In my freshman year I also took Professor Ray Owen's introductory biology course. He is so attentive and so encouraging that students naturally gravitate to him. I was no exception, and he remains one of my role models as a teacher and mentor. In chemical engineering, two of my favorite professors, Greg Stephanopoulos and Eric Herbolzheimer, aren't here any more. Another favorite is George Gavalas. He teaches a great sophomore thermodynamics class.

I know the professors who are really inspirational put in a lot of extra time. I definitely want to develop into one of those because I really appreciate what they did for me when I was here.

You went to Stanford for your PhD. How was it, being at Stanford after six years at Caltech?



Graduate students Axel Kratel (seated), Guen-Chang Chung, and Kannan Ragaramanujom share a laugh with Kornfield in her lab.

like to mention, but the first name that leaps to mind is Professor Peter Dervan, who teaches an outstanding organic chemistry class.

Something that was really great was the way freshman physics was run; all the sections were led by professors. There I got in touch with Professor Jerry Pine, who's really an inspirational teacher and a live wire, and that led to my doing a SURF [Summer Undergraduate Research Fellowship] with him. His recitation section grew to overflowing, and he encouraged me to transfer into a much smaller section led by a rather intimidating professor, Max Delbrück. Studying in Professor Delbrück's section turned out to be a wonderful, inspiring experience. He forced us to show each other our solutions at the board without our notes, and was very harsh when we disappointed him. But he could be very warm and funny. At that time he was facing death with great courage, and I felt a terrible sense of sadness and emp-

In my graduate class in chemical engineering, the students were from the best schools. Because they were admitted to Stanford, I'm sure they were at the top in their colleges and universities, and I bet they were as smart as I was. But they were struggling in the classroom at Stanford, and I was having the experience for the first time of completing every problem on the problem sets and getting 100s on the exams. I had spare time to play rugby and soccer and lift weights and do cycling. And I took some humanities classes. I was shocked at how easy it seemed there after having been here. When I was a student here, we always heard people saying, "You'll see after you leave here. You'll find out that you got training that was really ahead of the rest." And I would say, "Oh, baloney. You guys are just egomaniacs; you think Caltech is so great. I'm sure Berkeley and MIT are just as good."

But then you go out and you discover that what they said was true. I

don't want to sound like a snob, but I was extremely well prepared by Caltech, and I'm eternally grateful.

What made you decide to come back to Caltech?

It was an extremely hard decision. Caltech is a really great place, but I didn't know if I'd be happy here. Among other things, I worshiped the faculty so I figured there was no way I could be good enough to measure up to them, and I thought I'd constantly feel under terrible pressure. I almost persuaded myself not to come. I guess what eventually did convince me to come back was that I knew how well Caltech takes care of its faculty. Now that I've been here a few months, I see that it is even better than I realized.

The most obvious advantage to coming here is the quality of the graduate students, compared even to those at a place like Stanford, which is a really, really good place. But Caltech admits a smaller class and we get the very top of the student pool. So the graduate students here are better than those at Stanford or MIT or any other first-rate school.

That fact was the overriding factor that convinced me to come back to Caltech, in spite of my fears. Then, after getting here, I found that the faculty really treat you with respect and confidence. You get the feeling, "They believe in me and they've been around awhile."

Over the past few months their attitude has built my confidence up to where I think, "Well, I may not get tenure, but I'm not going to worry about it every night. So I'll just keep working at it and we'll see how it turns out." So it's not as stressful as I thought it would be.

What's your research area?

I'm working in polymer physics. Polymers are large chain-like molecules that we use in a huge variety of things like counter tops, compact disks, and the casings of your tape cassettes, and my computer. The aspect that I'm most interested in is how the molecular motions within a polymer will affect how it flows during processing and what kinds of properties it has when something has been made out of it, how the microstructure is affected by processing, and how that controls the macroscopic properties of some article that we've made.

Do you have any graduate students?

I'm so lucky! I have three graduate students! For only having been here since January, that's terrific! Two of them are first-year chemical engineering graduate students, and one is a second-year physics graduate student. They're really bright and motivated, so I'm off to a

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FRIENDS

An update on sponsored research

Every year, Caltech is the beneficiary of many millions of dollars in federal funds to support research and development. This crucial funding makes up 46 percent of the Institute's total budget in the 1990 fiscal year.

The most recent year for which National Science Foundation statistics on federal agency obligations (money allocated) to institutions of higher education are available is 1988. That year Caltech was the beneficiary of obligations of \$70,489,000. Funds came from a cluster of agencies, with the NSF leading the contingent of benefactors.

For 1988, NSF was the source of \$24,991,000, or roughly 35 percent of all federal funding obligations to Caltech. The other agencies which listed obligations to the Institute include the Department of Health and Human Services, largely through the National Institutes of Health (\$15,294,000), the Department of Defense (\$11,235,000), NASA (\$7,893,000), the Department of Energy (\$9,124,000), the Department of the Interior (\$1,448,000), the Environmental Protection Agency (\$423,000), and the Department of Commerce (\$90,000).

The largest award for this fiscal year is \$4,175,000 from the Department of Energy to support high-energy physics research under the direction of Barry C. Barish, professor of physics. These funds are in the form of an ongoing contract. Second largest is a \$3,430,000 grant for Leroy E. Hood, the Ethel Wilson Bowles and Robert Bowles Professor of Biology, and director of the Center for the Development of an Integrated Protein and Nucleic Acid Biotechnology, one of 11 NSF Science and Technology Centers in the country.

Hot research topics vary as the years go by, and funding tends to follow trends. Among the big winners in 1990 are biotechnology, particularly research related to the mapping of the human genome, and ultra-high-speed computing, particularly parallel processing. "Superconductivity is another topic that's being funded well," says Earl Freise, director of sponsored research. New materials research is also a funding priority, although Caltech's breadth in this field is limited.

Freise finds that the political climate under the Bush administration has not

changed significantly from that of the Reagan years. "The key words that we hear have to do with keeping the U.S. competitive and at the leading edge in science and technology," he says. "I don't think Bush has changed any of that. This is exemplified by the fact that he's pushing the space station and he's supportive of the superconducting supercollider, as well as the project to map the human genome. All these projects are continuing under this administration."

How does Caltech rank in federal dollars received in comparison with other institutions? Among the top 100 schools, Caltech has ranked consistently among the top 20 or 30 in terms of federal funding. Most other schools which rank higher have much larger facilities and tend to be broader in scope than Caltech, i.e., state land-grant colleges with substantial funding for agricultural research or universities with large medical schools.

Over the years, the percentage of Caltech's budget coming from the federal government has remained relatively consistent, according to director of finance and controller Harold Bell. In 1976 and again in 1981, the percentage was 49 percent. In 1986, it was 43 percent, and in 1990, 46 percent. Federal support for Caltech has increased over the last 10 years in actual dollars, Freise notes, but in real dollars the amount is probably about the same.

Even if federal dollars for research funding should shrink, Freise feels that Caltech will always be in a stronger position than most universities, because of its reputation and the quality of its faculty. "Caltech gets 1 percent of all federal dollars expended for research. That's really quite good for an institution our size," he says. "The quality and aggressiveness of our faculty keeps us competitive. We'll continue to get a good share of the funds."

Annual report copies available

A limited number of copies of the Caltech 1988-89 annual report are available through the public relations office. Contact Debbie Bradbury, 1-71, Caltech, Pasadena, California 91125, or call (818) 356-3630.

Kieschnicks make gift of \$1 million

Caltech Trustee William F. Kieschnick and his wife, Keith, have made a \$1 million gift to Caltech for its upcoming fund-raising campaign, Caltech President Thomas E. Everhart has announced. The gift, in the form of a charitable trust, is unrestricted, and the funds may be used at the Institute's discretion.

"We are profoundly grateful for this generous leadership gift, which is especially timely as the Institute prepares to



begin its centennial year in 1991," said President Everhart.

The Kieschnicks have made their gift in anticipation of the Institute's campaign, which will be launched in March 1991 in conjunction with the Caltech centennial. "Keith and I believe strongly in giving unrestricted funds," said Kieschnick. "We are confident that the Institute will put our gift to the best possible use."

William Kieschnick is the retired president and chief executive officer of the Atlantic Richfield Company, a company he originally joined in 1947. He joined Caltech's Board of Trustees in 1982 and currently serves as vice chairman. From 1982 to 1985 he was a member of the Visiting Committee for the Division of Chemistry and Chemical Engineering, and in 1983 he delivered the first Ulric B. and Evelyn L. Bray Lecture at the Executive Forum. He is a member of the Trustee Campaign Executive Committee and of the Visiting Committee for the Division of Biology. He also serves as director of several corporations, as chairman of the East-West Institute Foundation in Hawaii, and as a trustee of the Los Angeles Museum of Contemporary Art.

Mrs. Kieschnick, a former trustee of Occidental College and member of the Accreditation Committee of Western Universities and Colleges, serves on the Board of Governors of the LA Music Center and is chairman of the Music Center's Blue Ribbon Support Group. She is also a trustee of the Saint John's Hospital Foundation.

Pacific Telesis grants \$200,000

A grant of \$200,000 has been made in anticipation of Caltech's campaign by the Pacific Telesis Foundation. The two-year grant will support four undergraduate scholarships and three graduate fellowships each year for students who are California residents.

These scholarships help fill a need at the Institute which was emphasized in last year's aims and needs study.

The Pacific Telesis Foundation, which is sponsored by the Pacific Telesis Group, a telecommunications company, gives grants to health, education, arts, and community groups in California and Nevada. Donald E. Guinn, a member of Caltech's Board of Trustees, is the company's CEO emeritus.

Gifts by will

Trusts and bequests provide welcome support to Caltech's operating and endowed funds. Recent gifts received by the Institute include:

Ernest Haywood Swift: \$1,780,792.07 has been distributed to Caltech from Dr. Swift's estate to set up a life income plan for his family. Upon termination, the remainder will be distributed to the Institute for the Ernest Swift Chemistry Fund. Dr. Swift was a long-time Caltech faculty member.

David Sheffet: Caltech has received \$98,897.54 from Mr. Sheffet's estate for the benefit of the Alumni Fund. Mr. Sheffet was a 1930 graduate of the Institute.

Maxey Pope Alles: A bequest in the amount of \$300,164.38 has been received from the estate of Mrs. Alles for the use of the Alles Laboratory of Molecular Biology. Mrs. Alles was the wife of Dr. Gordon Alles, Caltech faculty member for many years, who also left a bequest to the Institute.

Ewald W. Otto: Mr. Otto designated a portion of his residuary estate to be used to establish the Donald Otto Memorial Fund in memory of his son, Donald Otto, a 1948 Caltech graduate. The Institute recently received \$659,882.38.

For information about wording for bequests to the Institute, call the Office of Gift and Estate Planning (818) 356-2927.

Life after Caltech—how graduates fared in the 1990 job market

While only 28 to 35 percent of Caltech graduates with a BS degree seek and accept traditional career positions in industry, both Caltech alumni and industrial compensation specialists eagerly await the annual report compiled each summer by the Career Development Center. Most years, salary offers to Caltech graduates exceed the national average, and this year is no exception. The average offer increased just over six percent, from \$33,785 to \$35,848. This is higher than the average offers reported for any science or engineering discipline in the July 1990 salary survey of the College Placement Council.

Of the 192 BS degree graduates, 93 will be attending graduate school, 10 with National Science Foundation Fellowships. While most will be entering PhD and MS programs in science or engineering, seven will attend medical school and two, law school.

One student has chosen to begin his own company, deferring for a year his plans to obtain a PhD in finance and economics. Another has decided to join a professional dance company. Still another student has received a Watson Fellowship to study the AIDS virus in Rwanda, Africa, and several other graduates have sought positions in other countries. One student will enter the Peace Corps, another plans to do volunteer work for an environmental action organization, and a physics major landed a position as a programmer with a Caltech alumnus in Switzerland.

Students who sought more usual positions in business and industry have accepted positions with excellent salaries in a variety of industries throughout the United States. Smaller companies, many founded by or already employing Caltech alumni, recruited in increasing numbers at Caltech this year. Salary offers for most 1990 graduates range from \$31,500 to \$50,000 per year, with an average of \$35,848. Graduates with a degree in engineering and applied science or electrical engineering received the highest offers, with three offers of \$50,000.

Graduates with a degree in biology are able to find challenging positions as research assistants if they choose to work before applying to graduate school, but salaries in this field still lag behind most other areas of science and engineering. Offers to graduates in biology were from \$23,000 to \$25,000.

As is usually the case, the majority of students graduating with an MS degree—95 of the 156—are continuing on for a PhD, 84 at Caltech and 11 at other institutions. Thirty-six students have accepted employment in industry and one is a captain/professor with the U.S. Army at West Point. Several graduates are working in environmental consulting companies, and two are seeking faculty positions in community colleges. Industrial salary offers range from \$36,500 to \$45,000 per year, with an average of \$40,085. This is about \$5,000 higher than the salaries reported by the College Placement Council.

Caltech awarded 148 PhD degrees in June. The career choices of Caltech PhD's are varied. Those with engineering degrees are quite competitive for both industrial research and assistant professor positions, but physicists and biologists need to have several years of postdoctoral experience before they can hope to land a tenure-track position. Many graduate students actively seek both academic and industrial research positions, and several are still deciding among their offers.

This year, 86 graduates accepted academic positions, 57 postdoctoral fellowships, and 27 tenure-track faculty posts. One Caltech couple has chosen to share a tenure-track academic position. Two international students are returning home to fulfill military obligations, and one PhD is attending medical school.

Salary offers at the doctoral level can vary quite dramatically, even with a general job category, and some industrial research laboratories are now offering time-limited positions which are similar to academic postdoctoral fellowships.

Salary offers for most postdoctoral research positions increased this year, and ranged from \$21,000 to \$36,000 per year, primarily in the areas of biology, physics, astronomy, and chemistry. Salary offers for tenure-track faculty positions ranged from \$31,000 to \$50,000, with 11 academic disciplines represented. Offers reported for positions in business and industry were also excellent, ranging from \$34,000 to \$65,000. The largest number of offers were in the areas of chemical engineering, chemistry, and electrical engineering, with at least one offer being reported in 10 other options.

Centennial events



With 1991 just a few months away, plans for the year-long centennial celebration moved into high gear over the summer. Divisions are planning special lectures relating to Caltech's past, present, and future—for example, a GALCIT reunion in January to honor Theodore von Kármán. This reunion will feature GALCIT talks in the morning and a GALCIT tour in the afternoon followed by an evening event. In February, a one-day symposium is planned to honor Linus Pauling on his 90th birthday. In early June, the Caltech Y plans to co-sponsor a one-day symposium on women in science.

A two-to-three-day major symposium entitled "Visions of a Sustainable World" will be held the week of October 27, 1991. There will be an informal workshop on campus with invited participants in November 1990 to structure the October symposium.

Plans for the fifth annual National Undergraduate Research Conference are well under way and will be hosted by the Institute in March, 1991. More than 1,000 students and 300 faculty members from schools around the country are expected to attend. SURF students will share their research in science, engineering, the humanities, music, dance, and art. Allan Bromley, assistant to President Bush for science and technology, will be one of the speakers. Eric Doehne from the Getty Conservation Institute will talk about the technology of art preservation, Evelyn Fox-Keller, director of women's studies and professor of rhetoric at UC Berkeley, will speak on women in science, and Leroy E. Hood, Caltech's Bowles Professor of Biology, has also agreed to speak. A panel on global warming is also anticipated as part of the program.

A wide variety of musical events will be featured in concert performances by the Caltech student Chamber Music, Jazz Band, and Wind Ensemble groups. Chamber music will feature musical events of 1891, and the Jazz Band, in a special program, will take a look at jazz over the last 100 years. A turn-of-the-century band concert performed by the Wind Ensemble group will focus on music and stage settings reminiscent of the early days of Caltech.

The 1991 Seminar Day and all-class reunion weekend beginning on May 16 promises many special events and activities. On the evening of May 17, the

Men's and Women's Glee Clubs, with the Caltech-Occidental Symphony Orchestra, will present their annual spring concert.

Construction of the Caltech float at Rosemont Pavilion is proceeding on schedule. In late August the float subcommittee began coordinating volunteer teams to place flowers on the float. In the fall, flowering seminars will be held for volunteers. Two teams of 30 people each will work for five days to complete the massive task. It's not too late to sign up, and anyone wanting to help with flowering can contact Lenore Freise in Institute Relations at 818-356-2188.

Survey tallies Caltech Rose Bowl games

Everybody knows Caltech used to play its home games in the Rose Bowl, but until recently, nobody knew how many had actually been played there. Some members of the Alumni Association's Student/Faculty/Alumni Relations Committee conducted a survey to find out. The survey team obtained their information from the *Big T* and the *California Tech*. The survey results indicated that at least 96 varsity and four freshman games were played in the Rose Bowl between 1923 and 1967. There may have been more, which could not be accounted for. The survey committee consisted of Ted Combs (BS '27), Don Wilkinson (BS '48), Tway Andrews (BS '44), David Holtz (BS '64), and Le Val Lund (BS '47).

Memorial fund for Bibi Jentoft-Nilsen

Caltech alumna Birgitta (Bibi) Jentoft-Nilsen was killed in a motorcycle accident on June 12 while vacationing in Alaska. A 1989 graduate in biology, Bibi contributed to many facets of student life. She participated in track and field and in soccer, and she was captain of the cross-country team. She played an active role in student government and served as president of Blacker House. In 1988 she was the winner of the Master's Cup for outstanding service to the undergraduate community.

A memorial fund has been set up by her mother, Lynette. Donations may be sent to the Bibi Jentoft-Nilsen Memorial Fund, Caltech, 105-40, Pasadena, California 91125.

Thirty years of commitment to the Annual Fund

G. Stanley Holditch (BS '48), chairman of annual giving, originally planned to attend his father's alma mater, Stanford, after high-school graduation. But attending a high-school science fair at Caltech changed his mind. "Caltech brought high-school students from throughout southern California to the campus for a day to show us the laboratories and the other things that were going on here," he says. "The personal attention and the small size of the classes won me over."

Holditch was born in Anaheim where his father, an engineer and a Stanford graduate, operated an irrigating water company that served northern Orange County. His mother earned her degree in education at UCLA and taught until she was married. Holditch and his brother went to high school in Placentia, in the midst of orange-growing country.

The future Annual Fund leader entered Caltech in 1940, and became a member of Fleming House. The years were rich ones for him, years during which he formed most of his enduring friendships. At the Institute, Holditch says, "I was in just about every activity." He was a member of the California Tech and the yearbook staff, he was a Beaver, an honor key holder, and he was school publicity manager. The Radio Club operated a campus radio station in those days, and Holditch became known across campus through his role as a disc jockey.

Holditch also lettered in football, playing some games in the Rose Bowl. "We'd be there with our crowd of two thousand spectators, and we had a harder time finding the crowd than we did the football team," he remarks.

After entering Caltech in 1940, Holditch took a four-year "vacation" between his sophomore and junior years to join the Air Corps. His brother, James E. Holditch (BS '48, MS '49) entered Caltech in 1942, and was in the artillery corps for two years, catching up to his brother and graduating the same year. In all, five members of Holditch's family graduated from Caltech, including three cousins.

Holditch returned to Caltech after the war with a career focus that had changed considerably while he was in the service. "I had initially pictured my future in research, but my work in the Air Corps convinced me that I was really more interested in management," he says.

So after he earned his degree in chemical engineering in 1948 he went into line management with Procter & Gamble, becoming what he terms an "industrial vagrant. I stayed with Procter & Gamble during my entire career but I moved from place to place

frequently, ending up at the headquarters in Cincinnati as a division manager." In the meantime, Holditch had worked in St. Louis, Chicago, Kansas City, Cincinnati, and New York, with temporary assignments in Dallas, Baltimore, and Quincy. The four Holditch children were all born in different states.



Holditch met his future wife, June Copeland, while he was at Caltech and she was a student at Pomona College. On their first official date they went to a formal dance, "much more the order of things in those days." The Holditches have three girls and a boy. Their oldest daughter is a professor at the University of North Carolina, Chapel Hill. Their second daughter, one of the first women graduates of Princeton, lives there with her husband who is a minister. The Holditch son, a physician, is also a graduate of Princeton, and is in practice in Cincinnati. The youngest Holditch daughter graduated from Duke and, until quite recently, worked as a nurse. The Holditches have six grandchildren.

When he can get away, (about twice a year) Holditch goes big-game fishing in Costa Rica, Panama, or Belize, often accompanied by a Caltech faculty member. As a second hobby, he writes books. His first book, published and in circulation, has to do with amusing incidents that happened on fishing trips. His second, to be published in December, is a collection of short stories featuring humorous incidents that happened during his business career.

Holditch's experience as an Annual Fund volunteer spans 30 years. He first became involved before the Science for Mankind Campaign, working first as a line volunteer and then as an area chairman. When he retired from Procter & Gamble in 1979 and moved back to

the West Coast, he started volunteering on campus, initially working two days a week in corporate relations. He switched to the Annual Fund in 1983. The Fund is divided into five divisions, and Holditch has been chairman of three of them, including the regional campaign and the two special gift campaigns. For the past two years he has been chairman of annual giving, directing the entire organization of 1,000 volunteers.

"This year during the campaign," says Holditch, "the focus will be on the centennial. We'll give the alumni an incentive to make exceptional gifts to commemorate this centennial celebration. The goal for the coming year is \$2.2 million." In 1989-90 the Fund collected \$2 million. Holditch explains that the dollar goal set by the Fund is based on a "capped figure," meaning that only the first \$25,000 of a personal gift is reported to the Fund. "For example, we have individual gifts that run as high as \$5 million, and we only take credit for the first \$25,000 of that total," he explains. "To receive a large gift one year and take credit for all of it would distort the total amount we could expect to receive another year."

Holditch says he feels it's important to support the Annual Fund because "I have a very strong feeling that Caltech is important to the nation maintaining its competitiveness in the worldwide economy. The basic research done here is vitally important in keeping us in a world leadership position, and the Fund supports this research in several ways. The gifts are unrestricted and can be used wherever they are most needed. They give the president the ability to provide seed money for some projects that are still in the conceptual stage. The Fund pays for student aid, faculty programs, and research projects.

"Another important reason for supporting the Fund is that when we demonstrate strong alumni backing for Caltech, that makes foundations and corporations much more receptive to giving their support. Our participation in the Fund runs well above 40 percent, and that's very substantial compared to many other schools."

Holditch attributes the Fund's success to "the fact that we have a top-notch staff and their efforts, their innovations, and their creativity are important. Also crucial is the fact that the small size of our school has been very beneficial in creating closeness and loyalty to Caltech among the alumni. With the loyalty and closeness we have, we are sure to be successful."

New student statistics

A total of 203 freshmen, including 51 women, 10 African Americans, 9 Hispanics, and 3 Native Americans, are expected to enter Caltech this fall. Last year's freshman class of 215 included 63 women, 2 African Americans, 8 Hispanics, and no Native Americans. This is the second largest number of women to enroll at the Institute. Women will constitute 25 percent of the class, compared with 30 percent last year.

Joining the freshmen are 12 transfer students and 20 students from the 3-2 program, which enables students at certain liberal-arts colleges to follow a prescribed course for three years and then to transfer into the third year of an engineering option at Caltech.

"This is certainly a good group with a gratifying increase in the number of underrepresented minority students," says Dan Langdale, director of admissions. "We get our share of the best young people in the world."

A total of 271 graduate students were expected to enter Caltech in September, compared with 266 in 1989.

The freshman class is academically as impressive as ever, with mathematics SAT scores in the top 2 percent in the nation and verbal SAT scores in the top 3 percent.

In geographic diversity, the freshman class is similar to that entering last year. Of the students, 29 percent are from California, 15 percent from the far West, 16 percent from the Midwest, 20 percent from the South, 15 percent from the Northeast, and 5 percent from foreign countries.

The admissions office has been actively recruiting minority students for the past several years. The office sends an initial mailing to all students whose names appear on a list of students who scored well on the preliminary SAT. Minority students who do not respond to that first mailing are sent an application and a special letter encouraging them to apply. Minority students who are admitted get a phone call from a Caltech student who answers any questions and serves as a friendly contact.

The Institute received 1,850 applications this year and admitted 499 students. "We would like to have 2,000 applicants next year," Langdale says. "As the pool expands, we're getting more applications from students who typically apply to prestige schools with more diverse programs than ours—schools like Princeton, Stanford, and Harvard."

Among this year's entering graduate students, 111 are in engineering, 148 are in the sciences, and 12 are in social science. Sixty-three are women: 18 in engineering; 40 in science, and five in social science. Among the 123 students from overseas, 55 are in engineering, 63 in science, and five in social science.



Special Gifts II chairman and Golden Beaver Society member Gordon McClure and E. Ted Grinthal, region 12 chairman and Second Century Society member, talk with SURF student Alfredo Morales about how gifts to Caltech help SURF.

HONOR ROLL

Caltech takes this opportunity to thank those alumni who gave to the Golden Beaver Society (gifts of \$1,000 or more), the Five Hundred Society (gifts of \$500 to \$999), and the Second Century Society (gifts of \$250 to \$499), during the 1989-90 Annual Fund drive. Contributions at these levels represent an extraordinary commitment to the Institute and exemplify the importance alumni place on the continued success of the work being done at Caltech.

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George Asakawa
Boris Auksmann
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Horace W. Baker
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Key volunteers for the Annual Fund meet each year to plan fund-raising strategies. From left (bottom row): Reinaldo Gutierrez, Bob Talbot, Bud Mittenthal, Ray Cromley, E. Ted Grinthal, Kirk Dawson; (middle row): Fred Thiele, Clay Smith, Arch Corriher, David Sams, Gary Tanigawa; (top row): John Deniston, David Ritchie, Ben Burke, Ed Seidman, Mike Stefanko.

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Thomas C. Stockebrand
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Frank Streightoff
William Studier
C. V. Sturdevant
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Alvin V. Tollestrup
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John R. Woolson
Bruce A. Worcester
Robert M. Worlock
Harvey W. Wright
Richard B. Wright
Steven J. Wright
George A. Yankura
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1989/90 Five Hundred Society Members

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Leonard S. Alpert
Lawrence J. Altman
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J. M. Andres
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Arunas P. Barkus
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Bruce W. Benjamin
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Leroy J. Fisher
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Frank R. Johnson
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Abner Kaplan
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Stuart R. Keller

1989/90 Second Century Society Members

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Total gifts to the Annual Fund \$2,055,599

Total trusts and bequests from alumni \$1,225,614

Total alumni contributions to the Institute \$4,258,512

Kornfield

Continued from page 3

great start. And I love working with them. That's my favorite part of my job.

How do you like teaching?

So far I've taught a junior level core class in chemical engineering, and I was one of four professors teaching a freshman-level laboratory class in chemical engineering. I think I'll like teaching better after I build up my self-confidence. Last quarter, I felt very self-conscious every time I went up to the board. I take teaching very seriously because I want to be good at it, and that made me all the more nervous. I got really positive feedback at the end of the quarter, so I think I'll go in with more confidence next time.

Do you feel the opportunities for women on the faculty are equal to those for men?

I don't know. Right now, the opportunities may be better for women. They treat me very well here.

What do you mean, they treat you well?

There's no holding back. They constantly treat me with respect and confidence. That counts for a lot when I'm trying to build up myself to believe I can be a full member of the Caltech faculty someday. Then there's my beautiful office, and my beautiful labs downstairs, and the fact that they didn't hesitate to let three graduate students join my group in the first year. Even the way they handle the lab rehabs for new faculty members is special here. I know that at Stanford, they don't even offer to do a rehab for a new faculty member. There, the cost comes out of a budget given to the new assistant professor to start up, and sometimes this package isn't large enough to cover a rehab, on top of buying new equipment, supporting graduate students, and so on. At Caltech they say, "Here's your start-up package," and it's specifically to buy new equipment.

They say, "Whatever you want in that lab, you've got it," until it gets to the point of being outrageous, of course. They roll out a red carpet for you. It's great!

Do you mind having so few female colleagues?

I came here as an undergraduate, when the ratio was about 15 percent women, so I got used to it. I remember when I first got to Stanford, I walked around campus and into the library and the coffeehouse and just stared. Half the students were women! It was wonderful.

Within science, of course, the ratios at Stanford are still the same as they are

at Caltech. And when you go to a conference, you're part of a very, very small minority, because all the ages above you are there, and at the older age levels, women are very scarce.

I came back here to a department where there was already a female professor. Frances Arnold is here, and she's just tearin' it up. She's going great, I think, and it's neat to be in a department with another woman. It's wonderful that, while I was away, Caltech greatly increased its number of female faculty members. As a society, we're still a long way from feeling that it's perfectly "normal" to be a woman in science, but I hope that's coming.

What do you think about the increase in the number of female undergraduates at Caltech?

I think it's based on sound judgments in admissions. We can't overcome all the programs that society puts in from day one that discourage women from science. But when there are good candidates out there, we need to have an appropriate way of recognizing them, and that means not judging them on the basis of their SAT scores alone. These women have overcome a lot just to get where they are. So if they're a few points lower on their SAT scores, that may just reflect all the hurdles they've gone over that the guys didn't have to face. If we recognize that these women are as talented as the men, we can put them on the same track at Caltech. They're still going to have to face the hurdles that come from not necessarily getting the same level of respect for their abilities from their peers and families that the men get. But these women have already shown that they can overcome those hurdles. And they'll do fine here.

What do you do for fun?

My favorite outside activity is playing soccer. I play on the Caltech women's soccer team, and I hope to keep playing until I'm 60. When I can set enough time aside, I love to cook, and to go hiking and camping. And I like just spending time with friends.

What are your goals?

Well, right now I just want to be a good professor. I feel like I'm still a student, studying to be a professor. So I'm figuring out how to mentor, how to motivate graduate students, how to be successful in undergraduate teaching, how to balance my time. So far, the hardest thing is trying to keep up with the literature.

I've allowed myself some years to learn how to be a professor. When I get to the point where I feel like I've kind of got that down, I'll think about what goals to set next. In the meantime, I hope to relax and enjoy being at Caltech, even though there's a possibility that I won't get to stay here. So I want to enjoy it while I can.

Kim West named director of residence life

Kim West has joined Caltech as director of residence life. Previously she was at USC as associate director of residence life. West comes to the job with 11 years of experience in student affairs, and a master's degree from Columbia University in higher and adult education. She comes with a deep interest in students, a concern for the quality of student life, and an enthusiasm for her new professional home at Caltech.

According to Gary Lorden, vice president for student affairs, the position that West holds was created to enhance the quality of student house life. She will manage key support programs independently of the master of student houses. "The job of master is expected to become considerably less burdensome," Lorden says.

West, who will be working on her doctorate at USC while she is at Caltech, says that attitudes toward student affairs on campuses across the country have undergone important changes during the past five years. "We now see that what we do outside the classroom is critical. It isn't enough just to prepare students professionally. We have to prepare students for life in general."

New director of student affirmative action programs

Eduardo Grado has joined Caltech in the newly established position of director of student affirmative action programs. Grado comes to Caltech from MIT, where he received his BS degree in management science in 1983 and has been associate director of admissions and coordinator of minority admissions since 1984.

"We're delighted to have someone of Grado's background and experience joining us in student affairs," said Jeanne Noda, assistant vice president for student affairs. "Grado will be filling in the opening created by Lee Browne's retirement and will also have additional responsibilities as reflected in his new title."

At Caltech, Grado will be in charge of Institute programs dealing with minority student recruitment, student retention, secondary school relations, and early-outreach projects. He will also work with the admissions committee in evaluating student applications.

ALUMNI

Alumni Activities

October 13, 1990, *Day trip to San Onofre Nuclear Generating Station.*

December 10, 1990, *Alumni Association holiday open house, 4:00 p.m.—6:30 p.m. at the Alumni House.*

January 1, 1991, *Rose Parade event.* Reserved seating at Hill and Colorado for the 102nd Tournament of Roses Parade. A Caltech float will be featured in the parade.

January 17-23, 1991, *Pre-safari extension trip to the east African coast.*

January 22-February 6, 1991, *East African safari (Kenya/Tanzania) travel/study program with Edwin S. Munger, professor of geography, emeritus.*

May 16, 1991, *Class of 1941—50th reunion dinner, the Athenaeum.*

May 17, 1991, *Half Century Club reception and luncheon, the Athenaeum.*

May 18, 1991, *54th Annual Seminar Day.*

May 18, 1991, *All-Classes Reunion Dinner, Ritz-Carlton Huntington Hotel.*

June 20, 1991, *Alumni Association Annual Meeting and Honorary Alumni Dinner, the Athenaeum.*

June 23-30, 1991, *Yellowstone travel/study program with Robert P. Sharp, Robert P. Sharp Professor of Geology, Emeritus, and Leon T. Silver, W. M. Keck Foundation Professor for Resource Geology.*

September, 1991, *Owens Valley/Yosemite travel/study program.* Learn about California's natural resources with Le Val Lund, BS '47, civil engineer of water resources and earthquake engineering.

October 19-25, 1991, *Hawaii travel/study program with Robert P. Sharp, Robert P. Sharp Professor of Geology, Emeritus.*

Get involved in the centennial

The centennial year is fast approaching, and festivities will begin on January 1 with the 102nd Tournament of Roses Parade. If you are interested in attending the Rose Parade, the Alumni Association offers two ways for you to get involved: decorating Caltech's float and viewing the parade with other alums.

Float Decoration

We need your help! We are currently seeking interested alumni and their families to help with the decoration of Caltech's float "for every action . . . a reaction" in the 102nd Tournament of Roses Parade.

Between Christmas and New Year's we will need Techers and their friends to prepare the float for its journey down Colorado Boulevard. The work crews will be divided into two shifts of eight hours each. There is a maximum number of 30 people per team. Assistants must be 14 or over.

Decorating the float takes some skill and can be an arduous task. Volunteers interested in helping with the "flowering up" are strongly urged to attend one of the two floral float-decoration seminars. Charisma Floats will be offering on November 7 and 13, from 7 to 8:30 p.m. The first workshop will be in Winnett Lounge on campus; the second at Rosemont Pavilion, where the float is being built, at 700 Seco Street, at the corner of Rosemont and Seco, south of the Rose Bowl. Teaching the seminars will be Charisma's co-owners, Ollie Wright-Young and Ross Young, and their floral director, Richard Seekin.

We encourage you and your family to get involved in this enjoyable event. If you would like to be a member of a decorating team, please contact Karen Kurilich at the Alumni Association, 818-356-8364.

Rose Parade Viewing Event

Association members and their guests are also invited to join the Alumni Association on New Year's Day to watch Caltech's centennial float roll down Colorado Boulevard. Whether you've been busy decorating the float, or just want to see the end result, it will be a wonderful way to start the new year.

The celebration will begin with a continental breakfast at the Athenaeum, followed by a short walk to Colorado Boulevard and our reserved parade seating. After the parade, guests will return to the Athenaeum for a buffet lunch.

Detailed information has been sent to local Alumni Association members. Alumni living outside the Los Angeles area, or local alumni who have not received their mailing, may contact Karen Kurilich at 818-356-8364 for more information.

From the alumni president

By E. Micheal Boughton

As we begin a new year, Caltech will reach an exciting milestone—its centennial. With this in mind, our primary focus over the next few months will be to increase alumni participation in Association activities.

With several programs planned campus-wide to focus on Caltech's achievements, it is an excellent time for alumni to get involved and strengthen ties with the Institute. The Alumni Association has nine committees that actively plan programs for alumni. Look among them to see if you would like to join in.

The Membership Committee focuses on the resources of the Association. Most of our programs are funded by membership dues and require the help of Association members. Seminar Day, reunions, chapter events, travel/study programs, and the alumni directory were all conceived to help alumni keep in touch with the Institute and each other. Membership dues also enhance the quality of student life on campus. From freshman camp to various athletic events, the Association supports a variety of organizations. This year Joseph Dobrowolski (BS '49) chairs the membership committee and his primary goal is to increase our membership.

The Centennial Committee has planned several alumni-related activities to be scheduled during the year-long celebration. Ted Combs (BS '27) and Chuck Holland (BS '64) co-chair this committee and are looking for alumni who are interested in becoming involved in the centennial. An immediate goal is to find alumni who would like to participate in the decoration of Caltech's Rose Parade float.

The Seminar Day Committee is chaired by Bob Burket (BS '65) who has set the gears in motion for the 54th Annual Seminar Day on Saturday, May 18. Members of this committee meet with division chairmen and faculty to identify speakers currently involved in exciting research at Caltech and JPL. These speakers cover a wide variety of topics from science and engineering to humanities and social sciences. This year's committee will create an expanded program and hopes to have the lectures, as well as the exhibits and demonstrations, tie in with the centennial celebration.

An all-classes reunion dinner, to be held at the Ritz-Carlton Huntington Hotel, is the main event planned by the Reunion Committee in 1991. Chaired by Association past president Rhonda MacDonald (BS '74), the committee is busy planning for this remarkable gala on May 18.

The Undergraduate Admissions Support Committee has worked cooperatively with the admissions office to develop a program that gives alumni the rewarding opportunity to speak with

prospective students. Co-chairs, Ed Lambert (BS '82) and Bill Whitney (BS '51) are forging ahead with their expansion plans and are working with the committee to round out their alumni work force. In addition to visiting high schools and representing Caltech at college fairs, volunteers also attend fall information meetings and spring receptions to speak with prospective students about life at Caltech.

Involvement with the Program Committee means planning exciting alumni travel/study programs in the United States and abroad. Chaired by Tway Andrews (BS '44), this committee chooses destinations that give alumni the opportunity to explore new territory while enhancing their scientific and cultural education. Several trips are already on the calendar through 1993, but an immediate goal is to supplement those with short, low-cost programs for younger alumni and families.

Our chapters have increased from eight to twelve, and all will be busy with chapter events throughout the year. Vic Veysey (BS '36), chair of the Chapter Affairs Committee, will work with members to strengthen the programs hosted by each chapter (rather than focus on chapter expansion). The committee is also planning a series of centennial-associated events.

Le Val Lund (BS '47) chairs the Student/Faculty/Alumni Relations Committee. This committee works to stimulate interaction between students, alumni, and faculty. Members will be working to expand alumni/student house events and the Day on the Job

Program, as well as establish an alumni/intercollegiate program—all excellent opportunities for alumni and students to work together.

The committee also serves as a liaison between the Summer Undergraduate Research Fellowship (SURF) program and the Seminar Day committee to ensure that alumni have the chance to hear about the current student research at Caltech.

The 1992 Alumni Directory, and increased advertising revenues for *Engineering & Science* are just two of the projects the Publications Committee will be working on. Headed by Pete Mason (BS '51), this committee reviews and directs the production of all Alumni Association publications, including *Engineering & Science*, *Caltech News*, and special publications such as *Legends of Caltech*—fast becoming a legend itself.

I encourage you to reflect on Caltech, and I hope that you can find time to share your experience with others, and renew your relationship with the Alumni Association and the Institute. The rewards of active participation are many. As you can see, the committees cover a broad range of areas and offer alumni diverse opportunities to get involved with the Association.

We appreciate feedback from alumni regarding any Association issue. If you are interested in volunteering for a committee, or would like more information on Association activities, please contact us by mail or phone: Caltech Alumni Association, mail code 1-97, Pasadena, California 91125, 818-356-6592.

54th Annual Seminar Day/Reunion Activities Interest Form

In preparation for the centennial celebration, the Alumni Seminar Day and Reunion Committees would like to know what events you might attend during the Seminar Day/Reunion activities May 16–18, 1991. Please indicate below (with estimated number of guests) which events you are interested in attending.

Thursday, May 16, 1991

_____ Class of '41 50th reunion dinner

Friday, May 17, 1991

_____ Half Century Club luncheon, Athenaeum

_____ Campus tours

_____ Class of '51 40th reunion dinner, Athenaeum

_____ Alumni/Student barbecue (seating by House), Dabney Gardens

_____ Student house reception for alumni

_____ Glee Club concert, Beckman Auditorium

Saturday, May 18, 1991

_____ 54th Annual Alumni Seminar Day, on campus

_____ Hosted wine and cheese reception, on campus

_____ All-classes reunion dinner (seating by year), Ritz-Carlton Huntington Hotel

Please return this form, by mail or fax, to Patsy Gougeon, Reunion Coordinator, Caltech Alumni Association, mail code 1-97, Pasadena, CA 91125. Fax 818-795-8736; phone 818-356-8366.



E. Micheal Boughton, 1990–91 president of the Alumni Association, came to Caltech by a long and indirect route. He was an only child whose father, an oil company employee, took him and his mother to live in a succession of small towns in Wyoming, Texas, Oklahoma, and Missouri. The schools were small, and in the third and fourth grades, Boughton's classroom was a one-room schoolhouse. In 1940 the family moved to O'Fallon, Missouri, where his mother had grown up—back, in fact, to the same house where she had lived.

Throughout his early years, Boughton was often the brightest student in the class. When he was in the sixth grade, he made up his mind to major in physics. "I was always reading, and spent a lot of time on science," he says.

Meanwhile, Boughton's parents divorced, and his mother earned a library science degree. Boughton attended the eighth and ninth grades in Panhandle, Texas—total population, 900. "The quality of the high school was really marginal," says Boughton. "It was obvious that if we stayed there, I would go to Texas Tech."

"It doesn't make any sense for you to go there," his mother told him. "Where do you want to go? Caltech or MIT?"

Boughton opted for Caltech, and he and his mother then headed for California, where she had heard of a possible opening for a librarian in San Luis Obispo. That did not work out, so they headed to Fresno, where there was an opening for a librarian, and they stayed.

At Fresno High School, Boughton met young people who were interested

By Winifred Veronda

in a wide range of intellectual subjects. "There, for the first time in my brief history," he says, "I wasn't a misfit." Boughton's best friend during his sophomore year was Carver Mead, now the Moore Professor of Computer Science. "We did a lot of technical things together," says Boughton.

When it was time to apply to college, Boughton made his only application to Caltech. Richard Jahns, a member of the Caltech geology faculty, came out to interview him, and Boughton was even more convinced of his choice in schools. He entered Caltech on a full scholarship plus an outside scholarship.

Reality, Caltech style, was a rude awakening. "I had always made all

A's," he says. "I had felt invincible. Once here, I discovered that everybody had been class valedictorian. It was a pretty painful experience. The effort required was unbelievably difficult. I was thoroughly shaken by the first physics test. I spent the whole first term through Christmas break thinking of transferring to Cal Berkeley. But the grade slip was a happy surprise, and after that, things were OK. I was able to graduate in physics, as had been planned so much earlier."

Boughton had joined Fleming House and played intramural sports. He was house social chairman in his junior year, and a member of the house executive committee. An avid photographer, he was photography editor of the *Big T*,

"I was thoroughly shaken by the first physics test. I spent the whole first term through Christmas break thinking of transferring to Cal Berkeley."

and was president of the drama club and an editor of the literary magazine. These involvements led to a friendship with J. Kent Clark, now professor emeritus of literature—a friendship that continues to this day. Through this contact, Boughton was a member of the cast of Clark's first musical, *Let's Advance on Science*. As an alumnus, he continued to participate over the years as a cast member in Clark's musicals.

Among other faculty members who had a special influence on Boughton were Robert F. Bacher, now professor of physics, emeritus (whose daughter Boughton dated); Robert B. Leighton, now the William L. Valentine Professor of Physics, Emeritus; Jesse L. Greenstein, now the Lee A. DuBridge Professor of Astrophysics, Emeritus; and Robert P. Sharp, now the Robert P. Sharp Professor of Geology, Emeritus.

The summer before his senior year, Boughton joined a number of other physicists who decided they would shift to medicine as a career objective. As a consequence, in their senior year they each carried 72 units of mostly biology and chemistry classes, a huge overload. It even led to Boughton being listed in the annual under the biology option. After graduation, Boughton owed an obligation to the Air Force ROTC, and he was assigned to Holloman Air Force Base in New Mexico.

Boughton had been admitted to the Rockefeller Institute for Medical Research, and expected to go there when he got back, but he was released from the Air Force three months early, and found himself with nothing to do from March through September. An offer from the Ramo Wooldridge Corporation led to immediate immersion in the early space program. Boughton wrote to the Rockefeller Institute asking them to grant him a one-year extension. They responded, "You have the extension, but we'll never see you." And they were right.

Boughton stayed at TRW for 31 years and left two years ago. In the beginning, he worked on the early moon probe programs, earth-orbiting satellites, interplanetary vehicles, the Venus probe, and Apollo. In 1971 he went to Cleveland for three years to the company headquarters, learning more about how

Continued in next column

the nonaerospace segments of TRW operated. Boughton's assignment was to take technology developed in the United States and transfer it to TRW subsidiaries in Europe, installing it, and seeing that it was used correctly.

Boughton's technical experience led him to a corporate diversification project in automotive electronics. That in turn led to Boughton's transfer back to California to join another diversification project, an innovative entry by the company into the energy field. This stemmed from the first energy crisis and President Nixon's Project Independence, which was designed to make the country free of the need for foreign oil. TRW assisted in the planning and organization of the national effort and then took up many projects of its own. Boughton stayed with the company's energy development effort until it was curtailed after increased oil production by the Arab states, Mexico, and Venezuela.

Boughton retired from TRW in 1988, when an opportunity arose in Hawaii that "combined all the things I had done for 35 years." Living on Maui, with his wife, Elle, Boughton is a vice president of the Maui Economic Development Board, a private nonprofit company with the objective of strengthening and diversifying the economy of the island. He works especially in the fields of information technology, alternate energy, and biotechnology, and sees ample opportunity in Maui for technology transfer, new business development, and technical innovation.

During the years since he graduated, Boughton has been involved with Caltech on many projects. "Coming back to Caltech and being able to work with alumni and students, faculty and administration, was a very satisfying experience," he says. "In my new level of involvement I had the opportunity to work with all parts of the Institute, and to interact much more than I ever could as a student with the people who make it such an exciting institution. There's something very satisfying about helping to meet some of Caltech's needs."

The involvement has been nearly continuous. One of Boughton's early contributions was to connect individual faculty members with projects at TRW. In 1968-70, and again in 1974, he worked with the campus computing center as it gradually evolved. He continued to be a member of the cast of Kent Clark's musical productions, and he joined The Associates. From 1975 through 1979 he lectured in Alan Sweezy's economics class about the world energy situation.

During 1968-70, a period marked by campus riots across the country, he worked with Wesley Hershey, then the Caltech Y director, in a program to involve both undergraduate and graduate students in constructive campus projects. Participating in the effort were the administration, the student houses, and members of the faculty. The project took form during one summer vacation when participants put together short-term technical projects for the war on smog. "We took what could have

developed into an ugly situation and used the energy for something constructive," says Boughton. "There were no major upsets or riots on the Caltech campus." Evolving from that was an opportunity for undergraduates to work at meaningful technical projects at TRW and later at other companies during summer vacation.

In 1975, Boughton became involved with the Alumni Association, working with the Seminar Day Committee and later becoming its chairman. This led to a position on the board, and ultimately to his becoming Alumni Association president.

As Boughton discusses plans for the Alumni Association's celebration of Caltech's centennial year, he says, "the opening salvo is the Rose Parade float. We are recruiting students and alumni to participate in making it. In all, some 600 people will work on it, and I hope that a fourth of these will be from the Alumni Association."

Seminar Day will feature an all-class reunion, he notes, and the centennial Seminar Day will be expanded to cover a wider range of activities than is typical. Chapters will be involved in centennial plans, and there will be a special edition of *Legends of Caltech*.

"In general, we want to make the Association as valuable as possible to the Institute," says Boughton. "The Annual Fund and the Alumni Association are two distinct organizations, and alumni need to understand this. The Association provides a comfortable way to maintain or resume contact with Caltech, a way that doesn't require them to give money but lets them establish a continuing connection to the Institute, to come back in a new role, and find it enjoyable and rewarding."

One of Boughton's goals for the year is to extend the involvement of members in the activities of the Association. "The range of activities offered by the Association has grown rapidly in recent years," he says. "Now these activities need to be assimilated. For instance, the number of alumni chapters is up to 12. They are widely dispersed over the country. Each chapter now must develop its own character and become a permanent fixture, and without being an insupportable burden on the staff."

"The Student Faculty Alumni Relations Committee will be working to build more kinds of interaction between students, faculty, and alumni, and we will continue to increase our work with the admissions office, recruiting alumni to talk to prospective students."

"And of course, we want to help make the centennial year the best it can be. The many special activities will make it possible to connect with more alumni and get them involved with the Association. We hope this will be a long-term contribution to its growth and success."

Boughton is the first person to serve as president of the Alumni Association who is not living in Los Angeles County, but he offers dynamic leadership that spans the miles.

Chapter news

Robert McEliece speaks to Chicago chapter

Twenty alumni and guests from the Chicago area gathered in Skokie, Illinois, on July 10 to hear a talk by Robert J. McEliece (BS '64, PhD '67), Caltech professor of electrical engineering. McEliece discussed "Safety in Numbers: Correcting Data Mathematically." After a presentation on error-correcting codes and the part they played in Voyager's telecommunications system, McEliece brought his subject to life with a computer disk demonstration.

Edwin B. Seidman (BS '55) is acting president of the Chicago chapter until elections can be held later this year. Anyone wishing more information on how they can be involved should contact Arlana Bostrom at 818-356-8363.

Lee Hanon to head San Diego chapter

Lee Hanon (BS '55, MS '58), a member of the San Diego chapter since 1987, is its new president. "The chapter should provide an opportunity to socialize and network," says Hanon. "But getting together the 600 alumni who live in the greater San Diego area is no small task. The prospect of driving across town in rush-hour traffic prevents many from attending. We need to find a way to make the meetings more accessible for all alumni."

Another goal is to encourage the participation of young alums who are busy raising families. "We are thinking about having lunchtime meetings, when the younger alums are more available." In addition Hanon hopes to have several dinner meetings with speakers discussing "the high quality of research going on at Caltech."

Hanon is president of Innovative Systems Solutions, which designs sensor and instrumentation systems for defense, aerospace, and other industries. He received his degrees from Caltech in mechanical engineering. He and his wife, Billie Louise, live in La Jolla.

Association to visit Galapagos Islands

The Galapagos Islands were used by Charles Darwin as a living laboratory in piecing together his theory of natural selection. These rare volcanic islands, 600 miles at sea, were remote, removed, and home to unusual indigenous plants and animals. Flightless cormorants, 500-pound tortoises, and colorful prehistoric iguanas clamber over the starkly beautiful lavascapes. Once visited by pirates, whalers, and sealers, these islands, suspended in time, are now part of the Ecuadorian National Parks system.

The Caltech Alumni Association is

currently planning a travel/study program to this unique chain of islands. Tentatively planned for April 2-14, 1992, the program will begin with a land tour of Ecuador, followed by a seven-day cruise on the *Isabella II* through the Galapagos Islands. Space on this trip will be limited to 36 participants.

If you are interested in joining this excursion, please return the form to the Caltech Alumni Association. If you have any questions, please call Karen Kurilich at 818-356-8364.

Galapagos Islands Travel/Study Program

Interest Form

I/We would be interested in participating in the Caltech Alumni Association's travel/study program to Ecuador and the Galapagos Islands.
I/We would probably want to reserve _____ spaces.

Name _____

Address _____

Phone: Home _____ Business _____

Please return this form to:

Caltech Alumni Association
Mail Code 1-97
Pasadena, CA 91125

PERSONALS

1934

ALEXANDER C. CHARTERS, JR., MS '36, PhD '38, of Santa Barbara, California, was presented the Distinguished Scientist Award of the Hypervelocity Impact Society at the Hypervelocity Impact Symposium in San Antonio, Texas, on December 13, 1989. He was presented the award for "sustained leadership, innovation, and technical excellence," and for his contributions to aeroballistic range design, projectile aerodynamics, and terminal ballistics, among other fields. He is currently an employee of the General Research Corporation, conducting research in armor penetration.

FRANKLIN F. OFFNER, MS, of Deerfield, Illinois, was elected to the National Academy of Engineering for "fundamental contributions to electronic technology and its application to instrumentation and control, especially in biomedical engineering."

1935

MILTON A. SLAWSKY, MS, has been running a clinic for students with a fear of physics at the University of Maryland in College Park for the past 15 years. He launched the clinic with his twin brother, Zaka, after retiring from the position of director of physics and engineering sciences for the U.S. Air Force Office of Scientific Research.

ZAKA I. SLAWSKY, MS, retired from the position of head of physics research at the Naval Ordnance Laboratory in 1975. Along with his brother, Milton, he runs a physics tutorial clinic at the University of Maryland in College Park. The clinic is very successful—there are a total of seven teachers helping more than 500 students per week.

J. HAROLD WAYLAND, MS, PhD '37, of Pomona, California, was inducted into the Alumni Hall of Fame during commencement exercises at the University of Idaho in May. Wayland received an honorary doctoral degree from UI in 1977. Wayland is a professor of engineering science, emeritus, at Caltech. He received his BS degree from UI in 1931, and was a physics teaching assistant and math instructor there from 1931 to 1935. Wayland joined the Caltech faculty in 1939 as a research fellow, and was made associate professor in 1949, and professor in 1957. Wayland is internationally known for his work in blood-flow analysis, and for his pioneering development of quantitative measurements at the microscopic level for investigation of fundamental life processes. He retired in 1979 and has been a visiting scientist and guest lecturer at many universities throughout the world, including the Netherlands, Germany, Sweden, Israel, and New Zealand.

1940

ROBERT W. WAYMAN writes, "When returning from a two-year Australian assignment in 1985, my wife and I toured South Africa, a one-month stay, and Brazil. Since then, I've carried on consulting work on automotive automatic transmissions, including a one-year assignment in Korea during the Olympics. I'm still a private flyer, and enjoyed a trip to the Grand Canyon

and Las Vegas in a Piper Warrior last April. We will move in July to a new home we are building on the lake in Mission Viejo, California. Like so many retired people, I'm busier than ever and wonder how I found the time to work."

1942

ROBERT ROSS STALEY, MS '43, writes, "I was sorry to see Knox Millsaps's name in the June obituaries. I was disappointed . . . to see no mention of the fact that he once played the drums for Benny Goodman. Knox was justifiably proud of this accomplishment, although I wondered how he could have reached the cymbals, given his very rotund shape even when young. . . . Knox realized that there is more to life than math and physics."

1944

LEON KNOPOFF, MS '46, PhD '49, professor of physics and geophysics at UCLA, was awarded the Medal of the Seismological Society of America for 1990.

1947

ROBERT M. STEWART, of Monterey Park, California, writes, "Three years ago I tried to escape LA air and traffic and moved to Tehachapi, but the wind goes through Tehachapi at 100 mph and blew my wife, Mei-Lin Ma, and me back to LA." He was recently awarded an Individual Grant for Design Advancement from the National Endowment for the Arts for his project, Concepts and Applications of Mathematical Analysis for Basic Design Practice and Public Media Design.

1948

FRANK F. SCHECK has been elected president of the New York Patent, Trademark and Copyright Law Association for the 1990-91 year. He continues his practice of intellectual property law with the firm of Pennie & Edmonds in New York City.

CONWAY W. SNYDER, PhD, of Canyon Country, California, writes, "The very interesting June issue of *Caltech News* prompted me to send in an item for the personals section for the very first time even though I have been associated with Caltech in one way or another for most of the years since 1942. I retired after almost thirty fascinating years in space science at JPL. My last office (like my first) was actually back on campus at the Infrared Processing and Analysis Center (IPAC). During the past year I have been working with two other alumni, Hugh H. Kieffer, BS '61, PhD '68, and Bruce M. Jakosky, MS '80, PhD '83, as coeditors of a large book on the status of the scientific knowledge about Mars. I have been writing the chapter on the history of spacecraft missions to the planet. At age 72 I find it to be hard work, but enjoyable."

1949

GEORGE M. PETZAR, of Riverside, California, was sent to India by the World Bank to consult with cement industry officials on how to compete profitably in a free market.

1951

EUGENE N. PARKER, PhD, received the American Geophysical Union's most prestigious award, the William Bowie Medal, for outstanding contributions to fundamental geophysics and for unselfish cooperation in research. The medal was awarded at the AGU's annual spring meeting in May. A geophysicist and astrophysicist, Parker is known for developing the solar wind concept—that ionized gas flows supersonically and continuously from the sun, and extends to the outer reaches of the solar system. The solar wind concept is one of the most important foundations of modern astrophysics. Parker is a professor at the University of Chicago.

1952

JERRY GREY, PhD, was appointed to the position of visiting professor in the department of mechanical and aerospace science at Princeton University, where he teaches space science and technology. He continues as the director of science and technology policy for the American Institute of Aeronautics and Astronautics, in Washington, D.C.

1953

GORDON P. EATON, MS, PhD '57, president of Iowa State University since 1986, has accepted the position of director of the Lamont-Doherty Geological Observatory of Columbia University. He will assume his duties on November 1. Before joining Iowa State University, Eaton was on the faculty at Texas A&M, where he served as dean of the college of geosciences, and then as provost and vice president for academic affairs.

WILLIAM D. GARDNER, of Riverside, California, retired on January 31 from the position of deputy public works director with the city of Riverside after 33 years. He is continuing to manage his 23 apartments, and has become a full-time remodeling contractor. He says, "I'm busier than ever, and having a ball!"

LYLE N. HOAG, JR., MS '56, of Fair Oaks, California, has recently retired after 30 years with Brown & Caldwell, Consulting Engineers. He has become the executive director of California Urban Water Agencies, an organization of the ten largest urban water supply agencies in California.

1955

SHANKAR LAL, PhD, was awarded the Rear Admiral John Lay Schiefflin Award for Excellence in Teaching by the Naval Postgraduate School in Monterey, California, at the school's commencement exercises on June 21.

1956

DONALD W. LEWIS, of Moraga, California, was appointed chief geologist of the Chevron Corporation, headquartered in San Francisco. He was formerly general manager of exploration for Chevron USA's western region. Lewis has been with Chevron since 1958.

1958

HENRY M. LACOMBE, MS, is currently manager of commercial engine quality at Snecha, the main aeroengines manufacturer in France. He is working on cooperative programs with the General Electric Company. He is a life member of the Alumni Association.

WAYNE NELSON has recently published *Accelerated Testing: Statistical Models, Test Plans, and Data Analyses*, his second book with John Wiley & Sons. He works as a statistical consultant in Schenectady, New York.

CLARKE C. REES, writes, "I've just started an assignment in London for DeLeuw Cather International Limited, as business development manager and adviser on the Channel Tunnel Project. The family is looking forward to going to England and learning more about Europe firsthand."

1960

FRANK H. CORMIA writes, "It has been 25 years since I have seen or talked to most of my Caltech classmates, with the exception of my brother-in-law Phil Reynolds, BS '58, MS '59. Phil, the best man at my wedding, married my wife's sister, Liz, maid of honor at the same wedding! For the last ten years, I have been a player in the modernization of Alcoa's Tennessee operations. This is my fourth such assignment in 30 years with Alcoa. It has given me the opportu-

nity to travel all over the world in search of technology. During this time, my wife, Mary, and I have gracefully aged (she more than I), and our four children have left the fold. She has now returned to teaching school. In April I was reelected to the board of the Virginia Technical School of Industrial Engineering and Operations Research (having previously served as chairman). In October 1989 I was reelected to the board of the Georgia Technical School of Industrial and Systems Engineering. In May 1990 I was elected chair of that board. Both are alumni boards, but I think because my alma mater is Caltech, they forgave me for my trespasses. With Alcoa's Tennessee modernization winding down, I was loaned to the Mexican Aluminum Company in 1989. Ten trips later, I was elected a member of their board and executive committee. Despite my best efforts, all my Mexican friends speak much better English than I do Spanish. I am good only with taxi drivers, waiters, and shopkeepers. When I am in L.A., I always take time to walk around Caltech. I have visited no other university which is as well-planned, well-kept, or as beautiful. Maybe I'm prejudiced. I hope all of you I knew at school are well and perhaps someday we can meet and share experiences. P.S. Can I say hello to John Price, Dave Nissen, John Walsh, and Brad Efron, all groomsmen at the aforementioned wedding?"

1963

NEIL PAUL ROSENTHAL, of Tarzana, California, practices neurology and is on the UCLA faculty. He and Margaret have five children: Barbara, 23; Isabel, 21; Andrew, 18; Amy, 16; and Lucy, 9.

1969

DONALD L. ANEY, of Ramona, California, writes, "I have worked for Hughes for 18 years, 14 of which were overseas. I have worked in 11 countries, and have been to a total of 27. I met my wife in Spain, my oldest daughter was born in Spain, and my youngest daughter was born in Norway. I think that I am finished with overseas assignments, and hope to limit any future trips to tourist status. We are very active in 4-H in San Diego County. My ten-year-old daughter has earned her silver star, and was prevented from earning her gold star only by her age. My eight-year-old daughter has enough points for her silver star, but cannot receive it until she is a full member at age nine. Both of my intelligent daughters are taught at home by their mother instead of attending school. There is a large group of these 'home schoolers' in San Diego and Orange Counties."

1976

WAYNE M. FLICKER, MD, PhD, of Sierra Madre, California, is serving a two-year term as president of the medical staff of CIGNA Hospital of Los Angeles, where he works as a specialist in internal medicine. On May 4, he received the Senior Clinician Award, a permanent title conferred by CIGNA Healthplans of California.

1978

JILL E. BECHTOLD gave birth to a nine-pound baby girl on January 15. She is currently an assistant professor in the astronomy department at the University of Arizona, and was recently named an NSF Presidential Young Investigator.

ROBERT CHESS was selected as one of twelve White House Fellows in recognition of his leadership, professional and intellectual achievements, and dedication to his community. Chess will serve a one-year assignment as a special assistant to the office of the Vice President, members of the Cabinet, or the President's senior White House staff. Chess is a cofounder of Penederm Inc., a pharmaceutical corporation that is currently developing ways to improve the delivery of drugs into the skin. He has also

worked as a consultant to San Francisco theater groups, developed advertising for a city council campaign, and served on the board of directors of the Mayfield Clinic.

JAMES (SANDY) A. MCCORQUODALE, EX, of San Antonio, Texas, and his wife, Margi, announce the birth of their first child, Jessica Anne, on June 11.

1980

CHARLES R. LANG, JR., MS, PhD '82, writes, "On May 12, after 20 years as a single man, I married Theresa L. Haynes of Roseburg, Oregon. We had a terrific honeymoon in and about the Fiji Islands, where we chartered a 100-foot gaff-rigged schooner. My wife and I are currently living in San Jose, California, where I work as the director of CAE at a year-old startup called nCHIP. nCHIP is in the high-performance electronic packaging business and designs and manufactures custom silicon-on-silicon multichip modules. As computer clock rates push beyond 50 MHz, you can expect to hear a lot more about nCHIP."

1982

GREGORY AND SHARRON (SARCHET) GAUDET write, "We are enjoying our first son, Robert, born April 9, in Dordrecht, the Netherlands. We have just finished up two and a half years in Holland, and moved to Paris where Greg will spend several years concentrating on statistical process control and quality issues for the European division of Cabor Corporation."

PERRY G. WALKER has transferred to Londonderry, Northern Ireland, and will work as a technical consultant for Dupont's Lycra business.

1984

MURRAY R. GRAY, PhD, of Edmonton, Alberta, has been appointed professor and chairman of the department of chemical engineering at the University of Alberta.

1986

ASTAR WINOTO, PhD, has completed his postdoctoral study at D. Baltimore's lab at MIT, and, on July 1, took a position as assistant professor in the department of molecular and cell biology at UC Berkeley.

1987

DARIN E. ACOSTA was married on June 9. His wife, Janis, is a management analyst for the city of Poway, California, and is working on her MPA at San Diego State University. Acosta received his MS from UCSD in the winter of 1989 and is now in the doctoral program there. In addition to his research in high-energy physics, he is working on the TPC/Two-Gamma experiment at SLAC, and on detector research for the Superconducting Supercollider.

1989

JAMES KUYPER, JR., of College Park, Maryland, has passed part III of the mathematical tripos at Cambridge University, and is starting his PhD at the University of Maryland at College Park.

OBITUARIES

1925

HAROLD L. CRONK, EX, of Grants Pass, Oregon, on August 27, 1989. He is survived by his wife.

1926

RALPH B. BLACKMAN, of Murray Hill, New Jersey, on May 24. He had been a mathematics researcher with Bell Labs for 42 years, retiring in 1969. In 1964, he was elected a fellow of the Institute of Electrical and Electronic Engineers. Blackman wrote *Linear Data Smoothing and Prediction in Theory and Practice*, and was a coauthor of *Measurement of Power Spectra*. He is survived by his wife, Mary; daughter, Carol Kredt; sisters, Flora Conrad and Laura Paterno; and two grandchildren.

1930

COLONEL DONALD P. BARNES, MS, and a teaching fellow at Caltech from 1930 to 1931, of heart failure. Barnes, a civil engineer, spent many years in international development, and by 1967, when he retired, he had become director of engineering for the Far East for the U.S. government's Agency for International Development. He was commander of an engineer battalion in WWII, and then returned to Denver as assistant to the chief design engineer at the Bureau of Reclamation. In 1950, he was recalled to active duty in London, where he served as director of ground defense of the Third Air Force. In 1952 he returned to civilian service and worked in Athens, Rangoon, and Ethiopia. He is survived by his wife, Thedia; three sons, Frank, Erik, and Craig; nine grandchildren; and six great-grandchildren.

1934

NICO VAN WINGEN, of San Marino, California, on June 19, after a short illness. Van Wingen was a professor of petroleum engineering at USC from 1959 to 1976, and traveled the world working for a number of major oil companies.

1936

RAY A. JENSEN, MS '37, of Los Angeles, California, on April 5, 1989, of complications from a stroke. He is survived by his wife, Elizabeth, and two sons, Eric (BS '70) and Roger (EX '71).

1941

ELDRED W. HOUGH, MS, PhD '43, of Carrollton, Illinois, on May 16 of a heart attack. He had managed the family farming operations since his retirement as professor and head of the department of petroleum engineering at Mississippi State University. After graduation, Hough was a research assistant and then a senior research fellow at Caltech until 1949, when he went to work for Stanolind Oil & Gas Company. He returned to academia in 1952 and was on the faculties of, among others, Southern Illinois University, University of Maine, and the College of Petroleum and Minerals, Saudi Arabia. He wrote many journal articles and was a member of the American Chemical Society, the American Institute of Chemical Engineers, and the American Petroleum Institute, to name a few. He is survived by his wife, Jane; and his children, Phyllis, Roger, Carl, and Christine Hough Smith.

1943

FRANCIS J. PARSONS, EX, of San Carlos, California. He had recently received his master's degree from Pennsylvania State University in nuclear engineering. He is survived by his wife and two sons.

1947

LEE M. GRISWOLD, ENG, of Ventura, California, on July 14, 1989. He is survived by his wife.

1949

IRVING L. KRUMHOLZ, of Orinda, California, of heart failure, on June 21. He was sole owner of Krumholz & Associates, a consulting engineering firm in San Leandro, California. He is survived by his wife, Belle; five daughters, Marni, Maris, Torri Smaus, Wendy Henry, and Robyn Hofmann; brothers Sam and Norman; and six grandchildren. Krumholz was active in the national and local chapters of the Space Society. He also enjoyed deep-sea fishing. His wife writes, "I am glad that I was a part of Irv's life while he attended Caltech. I met some lasting friends as a result of being at Caltech as a wife. He was a wonderful husband, father, and grandfather; his family misses him very much."

1952

RICHARD L. BRIDGES, on June 21, 1983.

1958

ROGER D. SUMNER, MS, during a tennis game last year. He earned his PhD at the University of Wisconsin. A geophysicist, he worked for Waterways Experimental Station in Vicksburg. At the time of his death, he had worked for Gulf Oil for 21 years. He is survived by his wife, Mary; daughter, Sharon, and son, Roger.

1960

EDWARD A. FLINN, III, PhD, on August 13, 1989, after a long, debilitating illness. Flinn was an internationally recognized expert in seismology and space geodesy. As chief of NASA's geodynamics program, he directed a global research effort using laser-ranging to satellites and to the moon, along with radiation from quasars, to detect the motion and deformation of the earth's crust. Under his leadership, the program expanded to include five other federal agencies and about 24 foreign countries. Flinn started his career, after two years as a Fulbright Scholar in Australia, at United Electroynamics, later a part of Teledyne Geotech, where he worked on the underground nuclear test detection program. During his career, Flinn's far-reaching work included studies of the upper mantle and the discovery of seismic waves reflected from the inner core, the translation of the classic French work on synthetic seismographs (with C. H. Dix), and characterization of the world's major earthquake zones through the Flinn-Engdahl seismic and geographical regions. In 1975 he joined NASA, and served the agency in several positions, including director of the division of space science lunar program. He was awarded the NASA Medal for Exceptional Scientific Achievement in 1979. From 1973 to 1978 he served as editor of the *Journal of Geophysical Research—Solid Earth and Planets*. Flinn is survived by his wife, Jane; daughter, Susan; sister, Elizabeth White; and aunt, Jimmie Prater.

1980

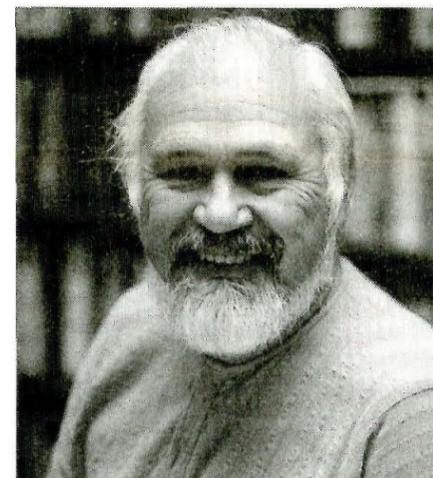
LAWRENCE M. ZWICK, of San Gabriel, California, on July 19, after a ten-year struggle against cancer. He had a distinguished career in computer systems. He is survived by his wife, Patricia Dummett; parents, Stanley (BS '50, PhD '55) and Roslyn; brothers, Daniel and David; sister, Marshal; niece, Meredith; grandmother, Bella Hoenig; and uncle, Eugene (BS '48).

Marshall Hall, Jr.

Marshall Hall, Jr., IBM Professor of Mathematics, Emeritus, died early in July while on a holiday in London. Hall was divorced and living in Decatur, Georgia. He had been consulting at Emory University since September 1985. He is survived by two sons: Marshall Hall, III (BS '67) and Jonathan Ingersoll Hall (BS '71).

David R. Smith

Professor of Literature David R. Smith died on August 31; he was 67 years old. Dr. Smith received his B.A. from Pomona College in 1944, and his M.A.



and Ph.D. from the Claremont Graduate School in 1950 and 1960, respectively. He came to Caltech in 1958 as an instructor of English. In 1960 he became assistant professor of English, in 1966, associate professor, and in 1980, associate professor of literature. In 1982 he was named professor of literature. From 1969 to 1975 Professor Smith served as Master of Student Houses. He was the founder and director of the Baxter Art Gallery from 1970 to 1975, and he served as chairman of the board of governors of the gallery from 1980 to 1985.

An expert on the works of Joseph Conrad, Professor Smith was named a Ford Foundation Scholar in 1956. He served as a Fulbright Professor at the Universités de Lille et de Toulouse in France in 1961, and as *Professeur Associé* at the Université de Nice in 1985. He was the recipient of an American Philosophical Society Grant, an Andrew Mellon Grant, and a Fulbright Travel Grant.

Professor Smith is survived by his wife, Annette J. Smith, professor of French at Caltech; their three children; and one grandchild.

The David R. Smith Memorial Fund has been established at Caltech. Donations may be sent to Charlene Chindlund, development office, 105-40, Pasadena, California, 91125.

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