CALTECH NEWS

February 1986

Three major campus construction projects announced

Two major construction projects will soon get under way on campus: the second phase of a graduate student apartment complex on Catalina Avenue and the Institute's first multi-level parking structure.

These projects, plus construction of the second phase of an energy cogeneration system, are being financed through Caltech's first sale of tax-exempt bonds.

The three-story graduate student apartments will resemble units completed in 1984 that received a Pasadena Beautiful Award. Rustic in exterior design, the six rectangular buildings will be of stucco with rough-hewn wood trim and shingle roofs. They will cluster around a central recreation building containing a laundry room, fireplace, couches, efficiency kitchen, and barbecue.

On a 1.25-acre site just north of the original units at Catalina, the buildings will provide 78 two-bedroom apartments and will be ready for occupancy for the fall term in 1986. They meet a need for more living space on campus for graduate students at a time when rising rents in Pasadena have become an increasing burden.

The parking structure will be located on the west side of Wilson Avenue directly east of the graduate student complex and will provide approximately 500 parking spaces for faculty, students, and staff. Of concrete and steel, the exterior will resemble the facades of other campus buildings in color and texture. Groundbreaking is planned for March 1986.

The third major project is phase two of the Institute's program to produce its own electrical energy through the cogeneration process. Caltech's initial cogeneration plant, completed in 1983, uses steam produced by campus boilers to operate a turbine generator that produces about 20 percent of the power needs of the campus.

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Halley's comet displays its ion tail

Previously unrevealed features of the ion tail of Halley's Comet appear in this photograph. The ion tail is a billowing stream of electrified gases, carbon monoxide, and water vapor pushed out by the solar wind. The comet's other tail, called its dust tail, is created by the force of sunlight. When this photograph was taken by JPL astronomer Eleanor Helin on December 13, the comet was about 74 million miles from earth. Approximately 11.25 million miles of its tail show in the picture. The photograph was taken with the 48-inch Schmidt Telescope at Palomar Observatory.

Mexico quake: two powerful shocks

The disastrous September 19 Mexican earthquake of surface wave magnitude 8.1 actually consisted of two powerful shocks seconds apart, according to Caltech seismologists. The seismologists found that such a double pulse is highly unusual in earthquakes along the Mexican coast. The double pulse meant that the effective duration of shaking was much longer than if the event had been a simple single pulse.

In addition, the area was hit by a powerful aftershock (magnitude 7.5) on September 21.

Caltech graduate student Holly Eissler described the findings made by her and her colleagues, graduate student Luciana Astiz and Hiroo Kanamori, professor of geophysics, in a paper delivered at the fall meeting of the American Geophysical Union.

The seismologists based their studies on seismic records from instruments located at Caltech and around the world. These records indicated that the main shock was actually two roughly equal tremors about 16 seconds in duration, separated by about 25 seconds. The second shock was about 90 kilometers southeast of the first.

The quake was the largest in Mexico since the 1932 Jalisco earthquake that had an estimated surface wave magnitude of 8.2.

The researchers' analysis showed that the September 19 earthquake was a "thrust motion on a shallowly dipping fault plane, at an angle of about 10 degrees, parallel to the coastal trench," according to Eissler. This is precisely the mechanism that would be expected for an earthquake produced by the subduction of the Cocos plate beneath the North American plate—the tectonic mechanism underlying all major earthquakes along the Mexican coast.

The earthquake occurred in a "seismic gap" along the Cocos North American plate boundary, where tectonic motion has lagged behind that of adjacent regions. This area, known as the Michoacan Gap, had previously been bracketed by magnitude 7.6 earthquakes to the northwest and southwest—the Colima earthquake in 1973 and the Petatlan earthquake in 1976.

On the cover

This photograph is a mosaic, combining four high-resolution Voyager 2 images of Ariel, satellite of Uranus. The images were taken on January 24 at a distance of about 130,000 kilometers (80,000 miles). Ariel is about 1,200 kilometers (750 miles) in diameter. Much of its surface is densely pitted with craters several kilometers across. Many valleys and fault scarps crisscross its highly pitted terrain. The Voyager project is managed for NASA by JPL.

Construction projects announced

Continued from page 1

The second phase, a gas/oil-fired combustion turbine, should supply another 60 percent of current energy requirements.

All three projects will be financed from proceeds of the first sale of Caltech tax-exempt bonds. According to David Morrisroe, vice president for business and finance and treasurer, the board of trustees authorized the sale of $20 million in bonds through the California Educational Facilities Authority, and all have been sold.

Four original student houses to be renovated

An extensive renovation of Caltech's four original student houses —Blacker, Dabney, Fleming, and Ricketts—will begin this summer.

The project will involve replacing the plumbing and electrical systems and restoring woodwork and exterior details to their original condition, renovating kitchens, improving laundry facilities, and refurnishing rooms. The goal, according to the Caltech administration, is to return the houses to "their original condition or better."

The common basement area shared by the houses also will be renovated, and the coffee house, now in an off-campus house owned by the Institute, will be relocated there.

Work on Blacker and Ricketts will take place this summer and on Dabney and Fleming the following summer.

Kieschnick elected a Board of Trustees vice chairman

William F. Kieschnick, a Caltech Trustee since 1982, was elected a vice chairman of the Board at the Trustees' meeting on October 25. As an officer of the Board, he joins Ruben F. Mettler, chairman, and Harry Wetzel, vice chairman.

Newly elected as members of the Executive Committee were Victor K. Atkins, Benjamin F. Biaggini, William R. Gould, Shirley M. Hufstedler, William F. Kieschnick, and Chauncey J. Medberry III.

Other Trustees named to committees at the October meeting include: Howard B. Keck, Jr., James E. Robison, and William E. Zisch to the Audit Committee; Harry Wetzel (chairman), Camilla C. Frost, William R. Gould, Howard B. Keck, Jr., and Pamela B. Pesenti, Buildings and Grounds; Harry M. Conger, James W. Glanville, Stanley R. Rawn, Jr., and Dennis Stanfill, Investment; Shirley M. Hufstedler (chairman), Harold Brown, Ralph Landau, Pamela B. Pesenti, and Roger B. Smith, JPL; and John F. Akers, Harold Brown, and Philip M. Hawley, Nominating.

Industrial Associates announces three conferences

Caltech's Industrial Associates will sponsor three conferences during the remainder of the academic year.

A Research Directors' Conference focusing on new research at Caltech concludes February 5. An Oxidation Chemistry Conference is scheduled for February 25-27, a conference on the Science and Technology of Small Particles for March 20-21, and a program on the Geochemical Approach to Materials Science for April 22-23.

Stewart recipient of Laskowitz Award

Homer Stewart, professor of aeronautics, emeritus, has been named the 1985 recipient of the I. B. Laskowitz Award for Research in Aerospace Engineering Sciences, Support Systems, and Components by the board of governers of the New York Academy of Sciences. He received a gold medal and accompanying certificate in December in New York City.

"Mechanical Universe" wins two awards

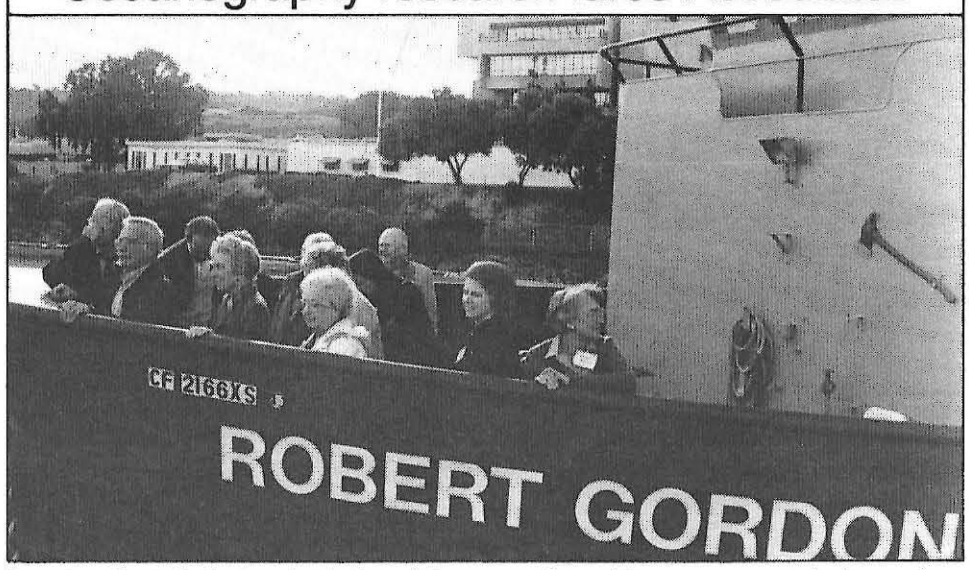
"The Mechanical Universe," Caltech's college-level introduction to the history, laws, and applications of classical mechanics, has won two awards for excellence: the Gold Medal in the scientific themes category of the International Film and Television Festival of New York, and a Golden Plaque in the educational films category at the Chicago Film Festival.

The educational television program uses computer animation, outerspace sequences, and other tricks of modern filmmakers' trade to make physics visually glamorous. It premiered last fall on educational television stations throughout the country, including five in the local area. David Goodstein, Caltech professor of physics and applied physics, is project director and host. The show was inspired by a series of Physics I lectures presented by Goodstein to Caltech freshmen.

The series was prepared for both teachers and students in high schools, community colleges, universities, and companies with continuing education programs. Its creators also set out to create a show interesting enough to attract a general audience—in addition to those who take it for credit—whose members would be entertained and informed by what they see.

The 26-part series will also be available to high school students, thanks to a grant from the National Science Foundation to adapt and tape segments on videocassettes for use in both regular and advanced placement physics classes.

Oceanography research lures Associates



Learning about the Scripps Institution of Oceanography and its programs was the focus of a day-long excursion for some 40 members of The Caltech Associates. Leaving the campus accompanied by Wheeler North (Caltech professor of environmental science), the group stopped at Beckman Instruments to pick up Orange County members and traveled on to Scripps where they were welcomed by its associate director, George G. Shor, Jr. (BS '44, MS '48, PhD '54). Lunch, lectures, a tour of the facility and of its aquarium, plus a visit to Nimitz Marine Facility and its research boats and dinner in Corona del Mar filled the day. Above: The group tours the research boat, the Robert Gordon Sproul. *Photo by Phillip G. Cook.*

Two killed in crash of Flying Club plane

Eric Umland, a research fellow at Caltech from 1983 to 1985, was killed November 17 in a plane crash in Frazier Park in Kern County. Umland, a student pilot, was on a flight from El Monte to Bakersfield in a Piper Warrior plane owned by the Caltech Flying Club. Flying instructor Carl Shollenberger (MS '68, PhD '71) also died in the crash. (See obituaries, p. 10.)

Umland, a JPL employee with the campus/JPL concurrent computing project, had been a Bantrell Research Fellow working with the research group of Steven Koonin, professor of theoretical physics. He was born April 28, 1956, and earned his BS degree from MIT and his MA and PhD degrees from Rice University. He is survived by his wife, Jaye Umland, of Altadena.

Cancer Society honors Caltech at charity ball

Caltech and those involved in cancer-related research at the Institute will be honored at the second formal charity ball of the Northeast County Unit of the American Cancer Society.

The Victory Ball will be held on February 8 at the Sheraton Premiere Hotel in Universal City with the theme, "A Celebration in Baroque." J. Ben Earl (BS '44), an active ACS volunteer, has been instrumental in planning the event.

ACS gives approximately $500,000 in research grants to Caltech scientists each year.

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Alumni recruiters share their experiences with prospective students

By Winifred Veronda

Who can do a more effective job of telling an applicant what it's like to be a Caltech student than someone who's been through the experience? The Alumni Association believes that no one can, and has begun a new program of high school recruiting on behalf of the Institute.

The program was launched in July under the direction of Robert Drew (BS '69), Dwight Carey (BS '72), and Lynette Schneider (BS '81), with support from Karen Natwick, staff program coordinator for the Alumni Association.

Through their efforts, there are now six active Undergraduate Admissions Support (UAS) committees throughout the country. Their chairmen are: Tom Bjorklund (BS '60) in Denver; Bill Gardner (BS '53) in Riverside; Edward Krehbiel (BS '58) in San Diego; Grace Mah (BS '81) in the San Francisco Bay Area; Joe (BS '73) and Shelley (BS '76) Rayhawk in Portland; and Hank Waggy (BS '71) in Chicago.

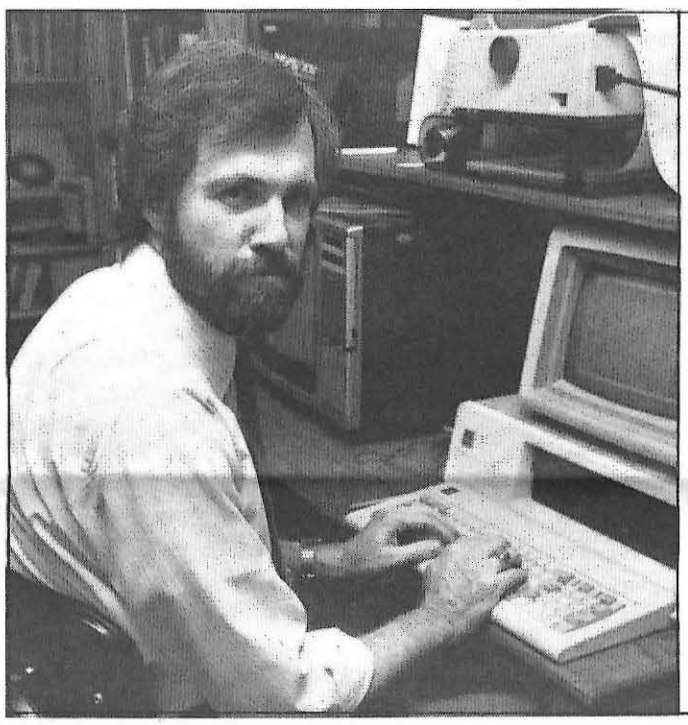
Robert Drew explains that all of the district chairmen are building an organization of alumni volunteers to represent Caltech in the high schools in their UAS districts. The volunteers' efforts will consist primarily of fall or spring visits to "target" high schools—high schools identified by the Caltech Admissions Office as good potential sources of high quality students.

Says Drew, "The Denver and Bay Area groups organized so quickly that they were able to put fall visiting programs into effect. Visits in the spring are planned in Chicago, Riverside, San Diego, and Portland."

In making student contacts, the committees work closely with Stirling Huntley, director of admissions, to coordinate their own efforts with those of the admissions staff.

"It's important that Caltech continue to attract high quality students, but there is evidence that we have some visibility and image problems," Drew says. "Students won't apply to Caltech if they haven't heard of it, or if they don't like what they've heard.

"We believe alumni are the best qualified to evaluate a prospective student's chances for success at the Institute. I think of our role more as counseling than as recruiting. We're really encouraging the students who should come to the Institute to accept admission, and helping students who would probably do better somewhere else to make another choice."



Robert Drew heads the Alumni Association program to help recruit students for the Institute.

In looking for volunteers for the program, Drew emphasizes that an attempt is made to attract recent graduates who can speak with authority about what the Institute is like today.

When Drew looks for a young person with good potential for success as a Caltech student, he says he looks for someone who has found success in several areas—not just in academics. "I like to find a prospect for whom academic achievement isn't the only goal in life," he says. "I want to find a student who is secure in scientific abilities, but who has broad interests—who has been involved in athletics, perhaps, or in drama, or on the student newspaper.

"Not everyone can be at the top of the heap here, academically. A student with several interests can accept this more easily."

Lynette Schneider got interested in volunteering as a recruiter when she was asked to help at a program for women at Chico. Then she moved to Los Angeles and was asked to help on the local committee by attending a college night in southern California. She liked the program and now she is busy recruiting other alumni as volunteers.

"I have very positive feelings about my experience as a student here, although I wouldn't want to go through it again," she says. "A student can get something by going to Caltech that it isn't possible to find anywhere else.

"I try to be as honest as possible when I talk with the prospects. If I'm talking to someone that I don't think would do well here, I don't offer a lot of encouragement. Generally the students who *wouldn't* fit here decide for themselves and make another decision."

Schneider says she frequently is asked how hard it is to get into the Institute, and—from parents—how much financial aid is available.

Students whose interests are almost exclusively academic are not so worried about how well they will fit in here, according to Schneider, compared with those who are more socially and athletically active. These students may have read some of the guidebooks that she says have "portrayed the Caltech student body as a 'conglomeration of social misfits.'

"I talk with them about activities that are available here—sports, drama, and so on. I stress the house system as a strong plus. I tell them that, at a small school, although the variety of activities may be smaller, the chance to get involved, and to play a major role in an activity, is much greater than at a big school.

"For me, recruiting is fun and rewarding. I meet students who feel isolated in high school because of being brighter than their peers. I tell them, 'Here's a place where the other people will be as bright or brighter than you are.' They generally feel excited about this.

"I also try to be up front in saying, 'You won't be the best student here. If you can't cope with not being number one, you should go somewhere else.'

"There are kids who belong at Caltech and who will do best here. Our object is not to persuade everyone who applies to come to the Institute, but to make the Caltech name well enough known so that those who do belong here will be able to find us."

The UAS program has these goals, Drew explains:

1) To increase the pool of high-quality applicants to Caltech.

2) To increase the number of students who are admitted and who go on to accept admission.

3) To build relationships between alumni recruiters and the staff members of the "target" high schools.

4) To relay information back to the Admissions Office about areas of concern on the part of prospective applicants.

5) To build a community of alumni volunteers who are willing to work to achieve the first five goals.

Drew notes that other prestige schools, such as MIT and Harvard, for instance—rely heavily on alumni to assist in recruiting. "There are some great Caltech alumni out there who have been visiting schools on their own initiative for years, 'selling' Caltech," he says. "We want to build on their efforts."

In addition to visits to "target" high schools, the UAS alumni volunteers attend "College Night" programs, representing the Institute to students, teachers, and parents. Several Alumni Association chapters also sponsor spring receptions for applicants and their parents.

South Africa:
Two students discover its simultaneous realities

By Winifred Veronda

Kathleen Fletcher speaks of South Africa as a land where many realities overlap.

She and Robin Whitt lived in two of those separate realities when they spent several months in South Africa last year on Caltech Summer Undergraduate Research Fellowships.

Fletcher lived with a Cape Town colored (racially mixed) family whose members included two high school teachers. The family was deeply involved in the struggle for an open society, and in the evenings, on occasion, Fletcher saw government armored cars roll down the streets or helicopters drop tear gas canisters where clumps of people were gathered.

Whitt rented an apartment on the beach in Cape Town that once had belonged to the Swedish embassy. His rent was the equivalent of $180 a month. Whitt mingled with middle-class whites, blacks, and coloreds, with Indians, and with members of two leading black tribal groups, the Xhosa and Zulu. He had fewer contacts with blacks and coloreds in poor urban areas, he says.

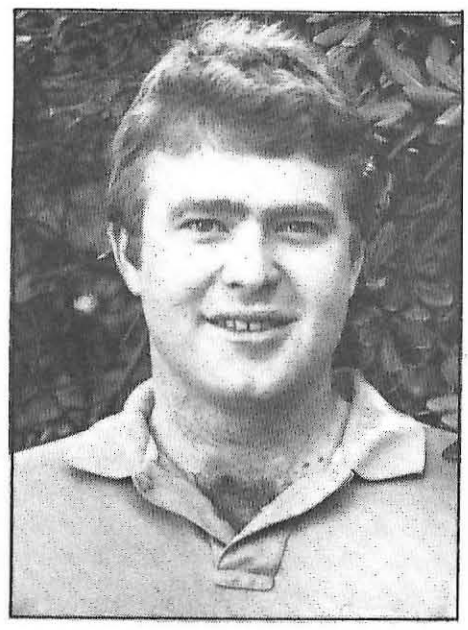
"Foreign press reports of South African racial problems are very incomplete," insists Whitt. "So many people are doing good things, and nobody outside the country gives them any credit."

"I would sit with my family in the evening as they talked about one of their students who had been beaten by the police that day," says Fletcher. "To hear them describe their experiences and feelings—this was a nightmare."

Both Whitt and Fletcher arrived in South Africa to be involved in research or teaching at the University of the Western Cape—and also to advise personnel there in setting up the university's own version of a SURF program that would match students with faculty members in research projects. Their opportunities were created through contacts of Edwin S. Munger, Caltech professor of geography. Both students had taken classes from him.

The latter goal—helping to create a SURF-like project—was deferred when, two days into the term, South African students decided to boycott classes to show their lack of support for government policies and to encourage civil unrest.

"Nothing could have prepared me for my experience in South Africa. I was surprised at the extent to which apartheid still exists, and at the lack of fundamental change."



"Foreign press reports of South African racial problems are very incomplete. So many people are doing good things, and nobody outside the country gives them any credit."

Whitt's experiences in the country began when he went to the Botswana border shortly after he arrived to pick up a car left there by a friend of Munger's. He was to drive it to the University of Western Cape and eventually leave it there for students to use. Stolen paperwork led to many difficulties in attempts to register it, and to the need for help from a professor of law at the University of Baputhatswana when the car was seized by officials at a black police station.

Eventually, attempts to register the car took him inside 15 South African police stations, where he met officers of all races and obtained a layman's-eye view of this aspect of the country's law enforcement structure.

From the Botswana border, Whitt drove 1,400 miles to Cape Town, stopping for several days in Kynsa on the southern coast when the car broke down and required a new engine. In Cape Town he visited the University of Stellenbosch and talked extensively with scientists there. Eventually he visited five of the country's major universities, each officially designated for students of a specific race but, in reality, with a mixture of racial groups in the student population.

An engineering and applied science major at Caltech, Whitt was impressed by South Africa's scientific community and says that "they don't do things on our scale, but in the things they've chosen to do, they're very effective."

At the University of Western Cape he pursued his research on solar photovoltaic cadmium telluride cells, undeterred by the boycott. He says he met with "much success due to cooperation of people of all races in the Cape Town area."

Whitt was also impressed by the country's medical care ("There is outstanding medical care for everyone at low cost; I was treated for a cut at a colored hospital for 12 rand, or about four dollars") and by "how like the United States the country is. The histories are similar (slavery was voluntarily abolished in South Africa in the 1930s) and so are many of the attitudes. I had expected South Africa to be a European country, but I felt as if I was among Americans."

In Johannesburg his interest in motor racing took him to "the bad part of town where all the mechanics were," and to visits with executives at an Alfa Romeo factory. "They were all very nice and I had a good experience with all of them," he says.

In Cape Town, Whitt rented an apartment in an exclusive part of the city and found coloreds living there. "They're not supposed to live there by law, but many do," he said. "You're surrounded by blacks and coloreds wherever you go. The apartheid laws are only minimally enforced in areas where people get along. Buses, trains, hospitals, schools—some of these are supposed to be separate, but they aren't. If the country got rid of apartheid, things wouldn't really change much. The real progress has been in the evolution of attitudes."

Whitt's diverse contacts led him to note the broad spectrum of black political opinion. "There are conservative blacks and liberal blacks, and blacks that support apartheid for economic reasons," he says. "Two black tribal groups—Xhosa and Zulu—would be at the core of civil war if the present government fell and there was one vote for every person. Most people in all groups are for peaceful change, not for a violent overthrow of the government.

"I don't believe the country will ever experience full-scale violence. For one thing, South African military power is very strong and the country hasn't begun to use its military machine.

"These were the three richest months of my life," Whitt summarizes. "Cape Town is a major metropolitan city with a wide spectrum of culture. I liked everyone I met and I never felt any fear, or threat of danger. It's beautiful to be exposed to so many different ideas. I enjoyed the television, with four languages on four successive nights—Xhosa, Zulu, Afrikaans, and English.

"And the scenery is extraordinary. For beauty, I've never seen anything that matches it, and I've traveled in many countries." All that, he adds, and some of the world's best food.

"I'm going to go back," concludes Whitt, who is a senior. "I had job offers to teach at the University of Western Cape and there are lots of opportunities in industry. It's all just fantastic."

Whitt found the country to be substantially more male dominated than the United States. This has not discouraged his wife, Ragnhild, a native of Norway, from her own enthusiasm over the decision to return to live and work there.

Fletcher, meanwhile, was sharing the home of a 76-year-old colored woman and two of her daughters, both high school teachers. A third daughter, a social worker, was the wife of a professor at the University of Western Cape, and the fourth was a housewife. The strongly cohesive family met together at least once a week.

"Nothing could have prepared me for my experience in South Africa," says Fletcher. "I was surprised at the extent to which apartheid still exists, and at the lack of any fundamental changes being made. Over the summer there were attempts to desegregate the trains. While I was there the colored cars were desegregated, but the white cars remained all white."

When Fletcher could not work as a teaching assistant or help to put together a SURF-like project, because students were not coming to classes, she spent time interviewing staff members at the university and attending their meetings. She also attended student meetings and rallies.

Fletcher says she only felt in danger when she attended mass meetings, or when she joined a march to the prison where Nelson Mandela was being held. (During states of emergency, it is illegal for more than two people to congregate.) Once, tear gas released by police on campus came through her office door.

"During these times I realized that the fact that I was white, that I was a foreigner, that I was a woman, would make no difference, that the police would have no compunctions about firing on me, even though a march or meeting I was participating in was peaceful," she says. "This is something I'll never forget.

"I was nearby when the police dropped tear gas canisters directly into a peaceful march, and into neighborhoods where a few people were standing in the street talking and where old ladies were standing on their porches," says Fletcher. "Often in the evenings we would see armored cars rolling down our street to 'build rapport with the community.'

"This doesn't happen in a white community. Apparently the 'rapport' isn't needed there. But the colored don't have the luxury of tucking themselves off in the suburbs and shielding themselves from what is going on.

"What stands out most for me," she concludes, "are the teachers for whom I came to have strong affection and respect as I watched how they dealt with the boycott. They wanted so much for the students to be in class, and yet they respected what the students were doing. Their politics, their professional and home lives, were all part of an intermeshed system in their struggle.

"I learned to look on them as role models. I came to see that education doesn't have to be an abstract academic pursuit; it can be socially useful."

Fletcher was a history major at Caltech after initially studying biology and spending two years at the University of Oslo, Norway, on a Monticello Foundation Grant in neurophysiology. This past fall she transferred to UC Santa Cruz—a change she had been considering. A senior, she is majoring in sociology and planning on a career in education.

"My experience in South Africa solidified my desire to leave science," she says.

Fletcher adds, "If I had an advanced degree, I would love to teach in South Africa on a sabbatical, but I couldn't stay permanently."

These are bits of two of the simultaneous realities of South Africa —experienced by two sensitive and observant newcomers to that complex land.

News about faculty

Caltech salutes Pauling on his 85th birthday

"A Salute to Linus Pauling," a day-long symposium honoring, on his 85th birthday, Caltech's professor of chemistry, emeritus, and twice winner of the Nobel Prize, is scheduled for February 28. Sponsored by the Division of Chemistry and Chemical Engineering, the symposium is open to all alumni. Reception and dinner are $30.

Among the speakers, whose topics will range from the personal to the scientific, will be Norman Davidson (Caltech's Norman Chandler Professor of Chemical Biology) on "Linus Pauling at Caltech, 1946-1964"; Alex Rich of MIT, "Chemistry and Biology of Left-Handed DNA"; William N. Lipscomb and David W. Christianson of Harvard University, "Ligand Binding and Mechanistic Implication in Carboxypeptidase A"; Henry Taube of Stanford University, "Mixed Valence Molecules"; Edward W. Hughes, Caltech's senior research associate in chemistry, emeritus, "Life with Linus."

Francis Crick of the Salk Institute is chairman of the morning session, while E. Bright Wilson is the afternoon session chairman. Fred Anson, chairman of the Caltech Division of Chemistry and Chemical Engineering, and Rochus E. Vogt, Caltech vice president and provost, will join in remarks at dinner.

Pauling himself will take the podium before the seminar breaks for a reception in the Athenaeum lounge. Edward Hutchings Jr., lecturer in journalism and editor of *Engineering & Science* magazine from 1948 to 1979, will speak after dinner on "The Pauling Era at Caltech."

Electrical engineer meets 25-year-old Feynman challenge

"It was the best of times, it was the worst of times." So begins the microbe-sized reproduction of the first page of Charles Dickens's *A Tale of Two Cities*, which recently won a $1,000 award promised 25 years ago by Richard Feynman (the Richard Chace Tolman Professor of Theoretical Physics).

Feynman offered the prize to the first individual who could shrink the information on the page of a book to 1/25,000th of its original size, leaving the text readable by electron microscope. Last November, the challenge was finally met by electrical engineer Tom Newman, a recent Stanford PhD whose specialty is electron microscope lithography.

Feynman made the offer in a 1959 talk on micro-miniaturization entitled "There's Plenty of Room at the Bottom," in which he also volunteered "just for the fun of it" to pay $1,000 to the first person who could create an operating electric motor no larger than a cube one 64th of an inch in diameter. The motor was produced and the payoff awarded within six months, and the motor is on permanent display on the first floor of East Bridge.

Koonin receives West German honor

Steve Koonin, professor of theoretical physics, has received a Senior U.S. Scientist Award from the Alexander von Humboldt Foundation in Bonn, West Germany, to conduct a year of sponsored research at the Institute of Theoretical Physics, University of Frankfurt. He will be spending several short periods there during the fall of 1986.

Koonin uses computer modeling techniques to investigate the structure of the atomic nucleus and the atomic physics of neutron stars. His study of low-energy collisions among the nuclei of heavy atoms has yielded models that are now standard in the field and has shown these interactions to display both classical and quantum mechanical properties.

Dervan receives Cope Scholar Award

Peter B. Dervan, professor of chemistry, is the recipient of an Arthur C. Cope Scholar Award. These awards recognize and encourage excellence in organic chemistry. Each consists of a certificate and a $15,000 unrestricted research grant.

Currently in his research he has pioneered in the techniques necessary to analyze very accurately the binding locations of antitumor, antiviral, and antibiotic drugs on DNA, the basic material of genes.

Using the tools of organic chemistry in combination with molecular biology techniques, Dervan is developing a set of rules for the three-handed dimensional readout of right-handed double helical DNA. This work has major applications in developing novel chemotherapeutic strategies for treatment of cancer and viral diseases.

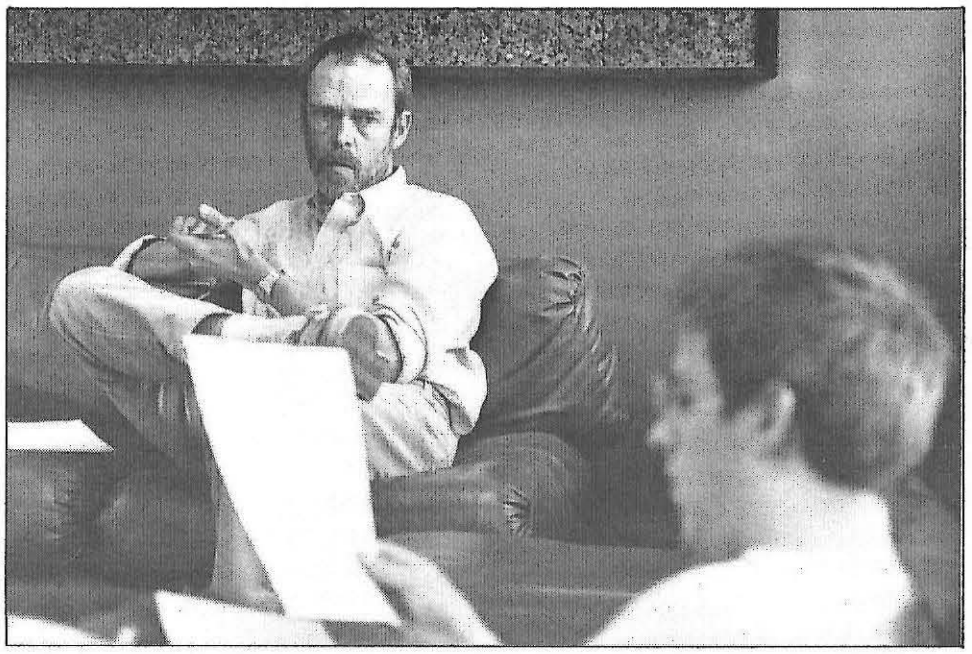
Olga Todd elected to professional office

Olga Taussky Todd, professor of mathematics, emeritus, has been elected vice president of the American Mathematical Society, a professional organization dedicated to the advancement of research and scholarship in all branches of mathematics.

The society, established in 1881 in Providence, Rhode Island, has a membership of 20,000. Todd, who has been a member of the faculty since 1957, was appointed professor in 1971 and emeritus professor in 1977.

The Associates choose new officers

Newly elected members of The Caltech Associates Board of Directors meet with Richard L. Hayman (president of The Associates, who is serving his second term in this office), front left; Ruben F. Mettler (chairman of the Caltech Board of Trustees), front center; and Caltech President Marvin L. Goldberger, front right. New board member are, from left, George P. Armour, Mrs. Vernon Barrett, William T. Gimbel, and Frank S. Whiting. Not in the picture is George A. Brumder.



Caltech Y director Huston Horn discusses programs with senior Adam Lewenberg, president of the Y.

The Caltech Y:

70 years of caring

By Phyllis Brewster

The Caltech Y will be 70 years old on February 16. It's difficult to imagine the Institute without the Y—without Friday noon concerts, ski weekends, backpacking and sailing trips . . . without noon discussions, distinguished speakers and loans . . . without counseling and loving care.

One of the first references to the Y appeared nine years after its 1916 founding date. *The Throop College Bulletin* carried a reference in 1925 to the fledgling organization: "A thriving Young Men's Christian Association with a full time Secretary has its office in Throop Hall and performs many valuable services: receptions for new students, hikes, meetings, and classes for *the study of life and other problems.*"

Much has changed since 1916, not the least of which have been the names of the Y and of the Institute itself. And at least one of the original objectives—"to bring students closer to Jesus"—has been broadened, in an environment of widely different religious faiths and beliefs, to "enable students to understand more fully the moral concerns of humankind."

Still unaltered, however, is "performing many valuable services," including the *study of life and other problems.*

Because of the broad range of its activities and programs—social, political, recreational, and cultural—many people may not think of the Y as a religiously oriented organization. But this aspect of its heritage is central to its history. Formal membership ties with the Christian-oriented YMCA were maintained until 1978, and all Caltech Y executive directors to date have come from religious backgrounds.

In 1946, Wes Hershey began his 30-year leadership of the campus organization fresh out of Yale Divinity School, just as had his immediate predecessor, John Price. In 1976, Walt Meader—a former staff member at the First Congregational Church of Pasadena—became Y director, and in 1982, Huston Horn left his post as director of parish life at All Saints' Episcopal Church in Pasadena to come to campus.

But whether rooted in religion in the broad sense of the word, or in a humanistic spirit, the underlying principle of the organization is caring.

"Our greatest value is the personal touch," says Y administrative assistant Julie Bolster. "The students know that people here care about them."

"Caring and concern are basic to our operations," confirms Y secretary Nancy Patchett. "A lot of students just need a sympathetic ear—a parental-type person they can talk to."

That's exactly what senior Adam Lewenberg thinks. Lewenberg, president of the Y this year, says that "the Y gives you the kind of support you would get from your family, except that your family isn't here."

According to Y staff members, students are constantly in and out of the office, and staff members are always on call for advice and other help.

"Can you take me to the electric company before they turn off my lights?" "Where can I get an airline ticket to Charlottesville?" "I've got to have a loan." "When can Huston marry us?" "I need a divorce lawyer." "Where's a safe place to camp in Mexico?" "Please suggest some places I can take my parents when they're here." Counseling, a more structured kind of assistance, is a specific responsibility of the director.

Students are not the only people who turn to the Y for help. A Pasadena mother phoned to ask if her daughter would be safe at a party on campus with a Tech student. And "Mark Twain" asked for a razor (when he came from Washington, D.C., to appear on stage under Y auspices). He had forgotton to pack his.

In addition to counseling and caring, another of the Y's major commitments is to offer the Caltech community opportunities to explore the political and philosophical issues of the day. Horn's ideas about this aspect of the Y's campus role are influenced by his theological perspectives.

"I believe it is essential to a full life to at least give consideration to a theological perspective," he says. "Many of today's students reject established religion—which sometimes deserves rejection—but they haven't always really explored the subject. People should have a good idea of *why* they reject something before they do so."

"Our greatest value is the personal touch. The students know that people here care about them."

Earlier Caltech Y program planners held similar concerns. In the minutes of September 19, 1937, the recording secretary reported on proposed religious activities: "We concluded that our problem would be difficult because students at Caltech hadn't had much religious training, or had too much when young, and did not care to participate further in religious activities."

In 1960, 23 years later, the situation was assessed by undergraduate Lance Taylor (BS '62), who wrote that "the Y is extremely successful as a religious organization on an agnostic campus."

Perhaps that observation still applies, but Horn finds it lamentable that, as an institution, Caltech all but ignores the religious perspective and sometimes even perceives religion as alien to education.

"Many eastern universities are reporting an increased interest in religion as part of the study of culture and history," Horn says, "but here I sense an institutional embarrassment even to posing religious questions. Perhaps students are afraid of being laughed at."

Although one of the director's responsibilities is to recommend program ideas, the speakers, lectures, and discussions scheduled by the Y do not necessarily reflect Horn's concerns. The final authority for the program selection lies with the student executive committee (excomm). The students who make up the excomm generate ideas for programs and help plan and execute them.

Because excomm membership changes every few years, so does the program emphasis. And while many recent programs have dealt with such issues as the arms race, the draft, and apartheid, recreational and cultural activities have often taken priority.

Horn points out that the Y's program direction is substantially affected by its independent operating status. "We have a symbiotic relationship with the Institute," he explains. "Caltech allows us to do what we think needs to be done, and we provide services that the administration would have to take care of if we didn't offer them."

And that's good, says professor of mathematics and Y board member David Wales. "An independent organization can sometimes be more responsive to students and more experimental with its programs," he observes.

Sunney Chan (professor of chemical physics and biophysical chemistry and also a Y board member) agrees that its independent status gives the Y "more maneuvering room and the freedom to be innovative."

In addition to Wales and Chan, many other members of the Caltech community have served on the Y board of directors. Almost all would agree that the Y provides valuable opportunities for students to develop leadership.

Although only a handful of students are as deeply involved in the Y as are the excomm members, Kevin Gunning (BS '84), a former excomm member, estimates that 80 percent of the undergraduates have contact with the Y while they are at Caltech. For some, the contact may be as indirect as participation in a club project for which the Y has contributed funds.

The ability to fund activities is important to the Y's autonomy. This autonomy received a big boost in 1950, when Robert and Greta Millikan endowed the organization with $100,000 (a sum that has grown to $348,192).

Administrative head of Caltech from 1921 until 1945, Millikan appreciated the value of an independent Y. In 1931, he received a letter from an irate Institute Trustee, objecting to a lecture on campus by a "Socialist," and Millikan made clear his views on the Y's independence: "Paul Blanchard was brought here by the YMCA, not by the Institute as such. Our policy is to be pretty free in letting speakers present their views, whether we agree with them not . . . our theory being that with our students, a man without a head will hang himself easier than we can hang him."

Funding does go a long way in providing freedom. Last year's annual budget of $153,000 came from endowment ($31,000), Friends of the Y ($28,000), United Way ($22,000), and the Institute ($22,000). Other funds came from parents, alumni, students, and fees. An additional distinguished speaker's fund of $10,000 from President Goldberger helps to draw lecturers of the stature of Robert Scheer, Admiral Noel Gaylord, and Freeman Dyson.

About $35,000 of the Y budget goes for activities. Last year these included Wednesday noon discussions, Friday noon concerts, backpacking trips, ski trips to Mammoth, sailing trips to Catalina, spontaneous excursions to Venice Beach and the UCLA Mardi Gras, a stranded-at-Christmas party, and tickets to dozens of special events in the Los Angeles area.

How do the recipients of the service and entertainment perceive the Caltech Y? The responses vary.

"It isn't that students don't notice the Y; they tend to take it for granted," John Beahan (BS '85) says. "So many things the Y does, non-involved students think of as 'sourceless' events."

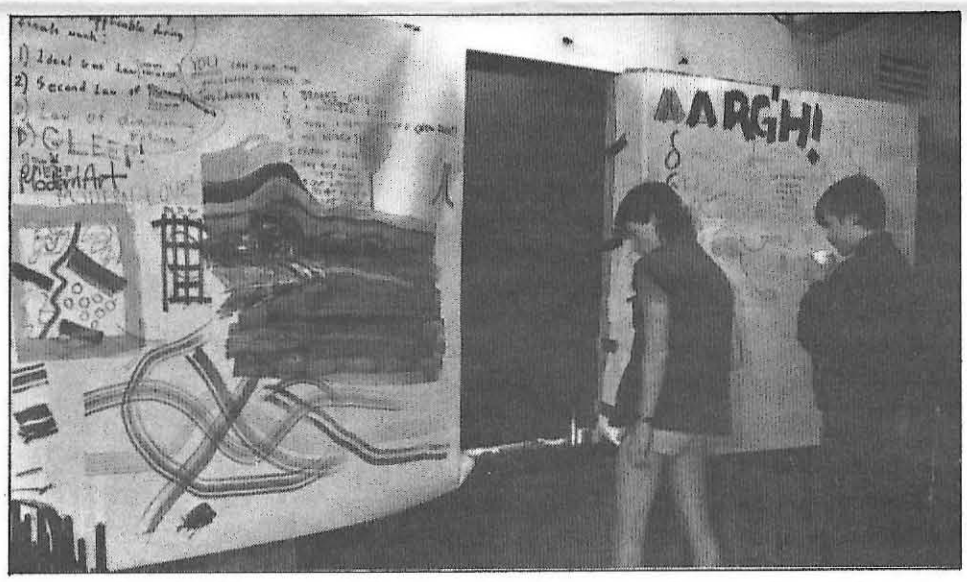
The biggest single exception to this is Decompression, the Y-sponsored party during exam week where students can drop in until 2 a.m. or so and nibble nutritious food, watch cartoons, scrawl free-form prose on the wall, play mindless games, and generally let off steam. It is the best-attended, most appreciated of all Y activities.

For students deeply involved in the Y, like excomm members, the effects of their involvement can be great. Says Beahan, "You can have great experiences. You can meet people who change your whole perspective on life."

"If you think of Caltech as a disaster, think of the Y as the Red Cross."

Gunning, one of those who is fully involved, says that the Y made his life on campus "one, bearable; two, enjoyable."

"If you think of life at Caltech as a disaster, think of the Y as the Red Cross," one anonymous student commented.



Most popular of the Y programs is Decompression, the exam-week party where students can drop in until 2 a.m. to snack, watch cartoons, play mindless games, and scribble graffiti on giant roles of paper.

Another student remarked, "The Y makes life at Caltech a little easier. It offers chances to take breaks, to keep the stress level from building up."

Still another added, "They bring up moral and philosophical questions that aren't addressed anywhere else on campus."

On the Y's 50th birthday in 1966, one Caltech undergraduate wrote, in the vernacular of that decade, "The Y is the Caltech antidote to random trolls and talented nuts. It is to apathy and withdrawal what the committee report is to insomnia."

For the 1986 equivalent, come to the Y's 70th anniversary celebration this month, or read about it in the next issue of *Caltech News*.

Seven-year project:

Astronomers create celestial map of northern hemisphere

Last month, a group of Caltech astronomers at Palomar Observatory began a seven-year project to map the northern hemisphere. In this endeavor, they are using the same 48-inch Schmidt Telescope that charted the northern sky from Palomar for the first time 30 years ago. The celestial map will be combined with a southern sky chart photographed on a nearly identical UK Schmidt in Australia, creating the first pictorial record of the entire universe.

Although partly prompted by the success of the southern sweep, the new survey is being undertaken mainly because of the development of photographic emulsions sensitive enough to capture light from objects five times fainter than those observed during the scan of 1950-1957. Using this technique, the astronomers expect to gain new insights into the structure and evolution of the Milky Way, find thousands of new cosmic objects, and study the features of better known phenomena in unprecedented detail.

If the results from the southern mapping are any indication, they should also uncover some unusual cosmic formations, including peculiar ringed galaxies, galactic jets, and streamers that extend for thousands of light years, and clusters of dim brown stars whose faint luminosity may have implications for the current theory that much of the universe's mass is hidden "dark matter."

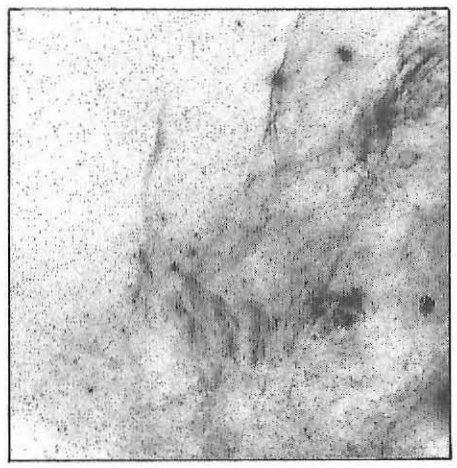
"In the southern sky, they also obtained some fantastic shots of galaxies cannibalizing each other at incredible speeds," enthuses Jim Schombert, research fellow in astronomy and a participant in the study. "We are hoping to find some of those as well."

The project is headed by Wallace Sargent, the Ira S. Bowen Professor of Astronomy. Other Caltech scientists involved are Robert Brucato, assistant director of Palomar Observatory, and Charles Kowal, member of the professional staff in astronomy, in collaboration with photographic scientist Alain Maury and Gerry Neugebauer, director of Palomar.

The sky map will be photographed on 14-by-14-inch glass plates, slicing the sky into 894 regions. Because many luminous objects tend to shine most strongly in one particular color, each picture will be taken with red, blue, and infrared plates.

(Many quasars, for example, radiate the energy of a million suns a day primarily as ultraviolet light, to which only blue film is particularly sensitive.)

After 18 months of preparation—which has included outfitting the Schmidt with a new corrector lens—and renovating other observation facilities at Palomar, the astronomers began taking their first clear pictures last month. The glass negatives are sent to Caltech's graphic arts department to be processed and developed.



Thirty years ago, the 48-inch Schmidt charted the northern sky from Palomar, recording celestial vistas such as this one. Now Caltech astronomers have begun a new seven-year project to map the northern hemisphere of the cosmos.

To find out exactly what the latest and best equipment and techniques are, three Caltech staff members flew to Edinburgh and Munich to scout the labs where the Sky Survey of the southern hemisphere is being produced. Director of business services Jim Minges, manager of graphic arts Lowell Peterson, and photography lab supervisor Ben Sewell spent several days in each of these cities, inspecting clean-room labs, consulting with technicians and businessmen, and taking careful notes and hundreds of photographs.

In a departure from most observational astronomy, which today is conducted mostly at computer consoles, the crucial tasks of loading, unloading, and repositioning the plates during each photo session will be carried out by hand.

"In some ways, this project is more like traditional astronomy, where astronomers spent long, dark nights alone with their telescopes," says Schombert. "It's an interesting comment that while the technology has certainly changed in 30 years, and even our concepts of the large-scale structure of some of the galaxy have changed, some of the hands-on techniques you need to do this work successfully have hardly changed at all."

Beavers go for "best team" title with 9-0 football record

The 1985 "Battling Beavers" squad can make some strong arguments toward a claim as Tech's all-time best football team. The 9-0 season record stands above that of Coach Lin Parker's 1983 team, which set the previous win total with seven. Coach "Fox" Stanton's 6-2-1 "wonder boys" were strong in 1931, and many alumni have argued for the 4-0 team of 1944. That team (some will insist) was an extension of the 1941 Stanford University squad with considerable help from other participants in the Navy V-12 program.

As he endeavors to lay claim to the title of best football team in Caltech's 93-year history, Coach Parker backs his statements with a 32-point-per-game-average; opponents were allowed only 10 points per contest.

The latest edition of Beaver footballers finished with a number three national ranking in the National Collegiate Football Association. The team scoring title fell to the Tech squad, as did the single-game best rushing effort: Jonathan Brown of Fleming House gained 214 yards against Cal Poly Pomona.

The Cal Poly win (35-28) was especially sweet, considering the university's 19,000-student enrollment.

Early season victories were won over the University of La Verne JVs, 20-14, and over the oldest continuous club team in the United States, the San Fernando Valley Freelancers, 27-8. Highwater scoring mark came against the Northeast Los Angeles Bengals, 48-0.

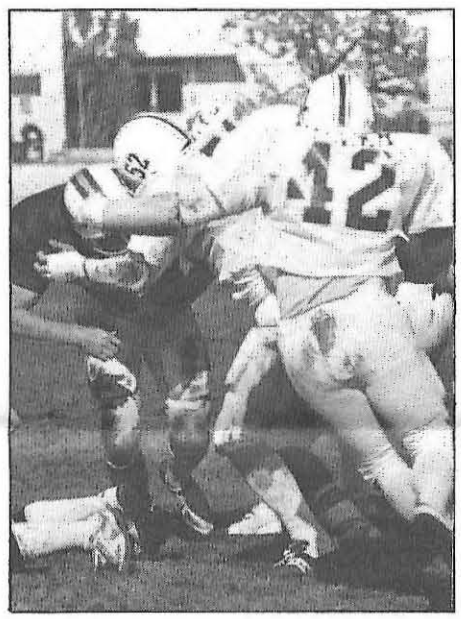
The season featured two bowl appearances by the Beavers. Tech played in the 12th annual Bola Amistad (International Friendship Bowl) against the University of Baja California Rojos, emerging with a 39-14 celebration and fiesta at the host's rancho.

An unprecedented bowl appearance for Caltech was the Tournament for Tots Bowl on December 7 at Horrell Field, PCC, against the Pasadena Police Officers Association. In this game, Caltech rallied from a 26-26 tie in the fourth quarter to win going away 40-26.

(Ed. note: The Pasadena *Star News* observed that Tech won despite the fact that senior tailback Jonathan Brown, who gained 214 yards rushing against Cal Poly, had to skip the game to study, and that his backup, Rick Gilbreck, who rushed for 160 yards against La Verne, also was absent to attend his sister's wedding.)

Of the 48 men who checked out football equipment this fall, 42 celebrated at the Alumni House at the annual awards barbecue. Tom Tysinger earned his four-year letterman's award, and three-year awards went to Jonathan Brown, Brandon Mymudes, and Marc Schuyler.

The longevity award went to Larry Sverdrup, a PhD in applied physics, who lettered for the seventh year.



Martin Brouillette, a Caltech graduate student, is tackled by members of the Pasadena Police Officers' Association team. Photo courtesy of Pasadena Star-News.

Co-captains David Brinza, Mike Burl, and Don Thomas received plaques for their leadership.

"Outstanding First Year Player" award went to Craig Jahnke and "Rookie of the Year" was Tony Wittry. Martin Brouillette received the "Best Defender" trophy and the "Most Improved" title went to Dwight Evard. The Irv Noren Trophy for "Outstanding Back" was voted to Jonathan Brown, while the Max West Trophy for "Outstanding Lineman" was awarded to Scott Miskovish. The coveted Wheaton Trophy for "Leadership and All-Around Excellence" was awarded to Aram Kaloustian, a freshman.

Elswhere in the SCIAC, Occidental College wrapped up its third consecutive conference championship and continued post-season play in the NCAA Division III playoff system. Occidental won one game before losing to Central College of Pella, Iowa, 71-0.

Men's Cross Country

This fall's cross country season will be remembered as a monumental success for many reasons. First, the participation level greatly increased over last year. Out of a team of 26 athletes, 21 were newcomers to the program and 16 of those were freshmen.

Returning runners John Gehring and Darin Acosta came back to school in reasonably good shape. Veteran track runner John Beck didn't intend to run this year and hadn't trained over the summer, but he experienced an early season change of heart and joined the ranks. Chuck Lee joined the team after the first meet and established himself as the number two man.

Meanwhile, as some of the upperclassmen were rounding into shape, the talented corps of freshmen took up the slack. Notable early season performances were turned in by Jeff Willis, John Haba, Ray Hu, John Bowers, James Shih, and Alex Athanasopoulos.

Despite a competitive running schedule, the 1985 Caltech harriers finished the season with 5 wins and 7 losses and, within SCIAC, they broke even with 4 wins and 4 losses.

Caltech hosted the SCIAC championships on a challenging course at La Mirada Park.

Once again, Occidental dominated the meet with a low score of 22 points, while Pomona and Redlands battled for second with scores of 55 and 57 points, respectively. Claremont claimed fourth and Caltech garnered fifth place with 148 points. Rounding out the placing was La Verne in sixth and Whittier in seventh.

John Gehring led the charge for Caltech's harriers in 25th place. John Beck placed 28th, with Chuck Lee a few steps behind in 30th and Darin Acosta closing fast for 31st. Alex Athanasopoulos finished out the scoring in 34th place, while John Haba and Jeff Willis were in 35th and 36th place, respectively.

The NCAA western regional meet was held at Cal State Stanislaus in Turlock. Caltech was well represented by the stellar performances of John Gehring and Chuck Lee. Gehring raced to his best time of the season by more than a minute, stopping the clock at 26:27. Lee was only 2 seconds off his best time of the year, finishing in 47th place.

At the team's annual awards banquet, John Gehring received the Paul Barthel Award as Outstanding Runner. John Haba was recipient of the Outstanding Newcomer Award, and Alex Athanasopoulos of the Most Improved Runner Award.

Women's Cross Country

The brightest aspect of the women's cross country team this year was simply that there were enough competitors to field a full team—one that scored in all the meets except the first one. This was a significant step forward for the program, and the enjoyment and commitment were enhanced by the camaraderie the women experienced.

Clea Bures led a contingent of nine runners, eight of whom hadn't trained over the summer, and four of whom had not run competitively before.

Despite the graduation of last year's top runner, a total team effort and some outstanding individual performances—coupled with steady improvement by all the women harriers—made a smooth transition possible. With junior Clea Bures finishing as Caltech's first runner in every meet this season, it was easily apparent that her summer of hard training was bringing big dividends.

Pam DeMoor firmly established herself as the team's number two runner, while Marit Jentoft-Nilsen ran third in her final year of cross country competition. Additionally, seniors Yvette Madrid and Betsy Arnold made strong contributions despite some nagging injuries. Bibi Jentoft-Nilsen led a group of four freshmen—Carmen Shepard, Dee Morrison, and Laura Smith—each of whom made fantastic progress throughout the season.

The team took its lumps early in the year while compiling a dual meet record of 3 wins and 8 losses. Within the SCIAC, the team record was a representative 3 wins and 5 losses. At the SCIAC championships, Clea Bures ran very well, finishing 19th and earning second team all-conference status. Pam DeMoor followed in 22nd place, while Yvette Madrid ran her best race of the season to claim 26th.

Closing out the scoring was the sister combination of Marit and Bibi Jentoft-Nilsen in 28th and 29th places, respectively. Betsy Arnold and Carmen Shepard came through in 34th and 36th places.

While Occidental won the meet with 35 points, its team was pressed by both Claremont and Pomona, scoring 45 and 47 points, respectively. Caltech finished ahead of Whittier, Redlands, and La Verne to claim fourth place in the conference with 113 points.

At the annual awards dinner, Clea Bures was awarded outstanding runner honors, while Pam DeMoor received most improved runner award. Both Bures and DeMoor represented Caltech at the NCAA

Western Regionals in Turlock as each ran her fastest time of the year.

Recipient of the outstanding newcomer award was Bibi Jentoft-Nilsen. Special commendations for most dedicated athletes were given to Dee Morrison and Carmen Shepard, as their attendance at practice and meets was perfect. Marit Jentoft-Nilsen received a prestigious award for earning a varsity letter in each of the four years that she competed in cross country.

Water Polo

Coming into the season, the Caltech water polo team looked promising. Senior hole forward Hans Hermans and senior goalie Fred Ferrante blended their talents with those of a crop of fast and able freshmen. Early-season victories came easily over Chapman College and Rio Hondo. Ferrante's younger brother, junior Vincent Ferrante, and sophomore David Bruning aided in close victories over Redlands and Pasadena City College.

The varsity made a good showing against the alumni but bowed to a fourth-quarter rally and lost, 12-7. Going into SCIAC league play, the Beavers' record was a respectable 6-10.

After its first league game, a 17-13 win over Redlands, the team came down with a bout of mental illness. The Beavers lost their next ten games —including all the remaining league contests and a match with Cal Poly San Luis Obispo. This left the Techers with a disappointing final record of 7-20.

Claremont finished first in the SCIAC for the third straight year, followed by Pomona-Pitzer. The Beavers ended with a tie for fifth place and stayed out of the cellar.

Scoring leaders for Caltech this year were Hermans, 71 goals, Vincent Ferrante, 64 goals, and Dave Bruning, 55 goals. Hermans made the SCIAC second team while Fred Ferrante received honorable mention. The coach's cup went to Hermans while Vincent was named most improved player. Boyd Bangerter was chosen outstanding freshman.

Coach Clinton Dodd noted the improvement in the playing of Eric Christensen and Randy Brown and the reliability of senior Robby Dow and junior John Sarapata. For the first time in seven years, four freshmen lettered: Bangerter, Clark Highstrete, Devin Leonard, and Jordan Holt. Coach Dodd pronounced himself pleased with the squad's abilities, and is looking forward to improving their SCIAC standings next season.

Varsity defeats alumni in annual basketball classic

After trailing the alumni for much of the game, the varsity pulled ahead during the second half to win, 65-52, in the annual alumni-varsity basketball classic. Christos Kyriakakis (BS '85) led alumni scoring with 13 points, followed by Ken Hanson (BS '71) with 12. Jerry Feely (BS '73) added 10 points to the alumni total. Top scorers for the varsity were Ed Zanelli with 20 points and Brian Porter with 18.

The alumni defeated the junior varsity, 46-44, in a second contest, as Doug Carlson (BS '77) scored two free throws in the last 6 seconds of an exciting see-saw competition.

In all, 22 alumni participated in the dual event. One of the oldest classes represented was 1958: Richard Van Kirk (BS) and Robert Emmerling (BS). Roger Noll (BS '62) and Fred Newman (BS '60) traveled from the Bay Area for the game. Working in the Caltech gynmasium, Newman has twice made a place for himself in the *Guinness Book of World Records* —for completing the most consecutive free throws in a 24-hour period and for the most free throws scored during 10 minutes, shooting with two balls and utilizing two ball retrievers. He holds another near record for making 88 consecutive free throws while blindfolded.

After the games, about 50 players and guests met for a reception in the Alumni House where they made peace over refreshments.

Warren G. Emery, director of physical education and athletics, expressed appreciation to the alumni for the competition. "The game gives the varsity a chance to play against people who are strong and competent, and who know the Caltech offensive system," he said. "The alumni always give the varsity a battle."

Alumni invited to join annual Sports Day contests

For the first time this year, alumni are invited to join with students and faculty in Caltech's annual Sports Day. Planned as a homecoming event, Sports Day will begin at 10:30 a.m. with a series of contests pitting students against alumni and faculty.

Alumni may test their skill in tennis (10:30 a.m.), volleyball (10:30 a.m.), soccer (10:30 a.m.), softball (1 p.m.), basketball (2:30 p.m.), inner tube water polo (2:30 p.m.), and a tug of war (2:30 p.m.).

Buffet luncheon will be served at noon under tents on the athletic field, to music by the Caltech-Occidental orchestra, and a challenge triathlon will conclude the day's events.

Sponsors and planners are the Master of Student Houses' Office, Vice President for Student Affairs' Office, Athletic Department, Alumni Association, Dean of Students' Office, Caltech Y, Graduate Student Council, and Interhouse Committee. For reservations contact Karen Natwick, the Alumni Association, Caltech 1-97, Pasadena, CA 91125.

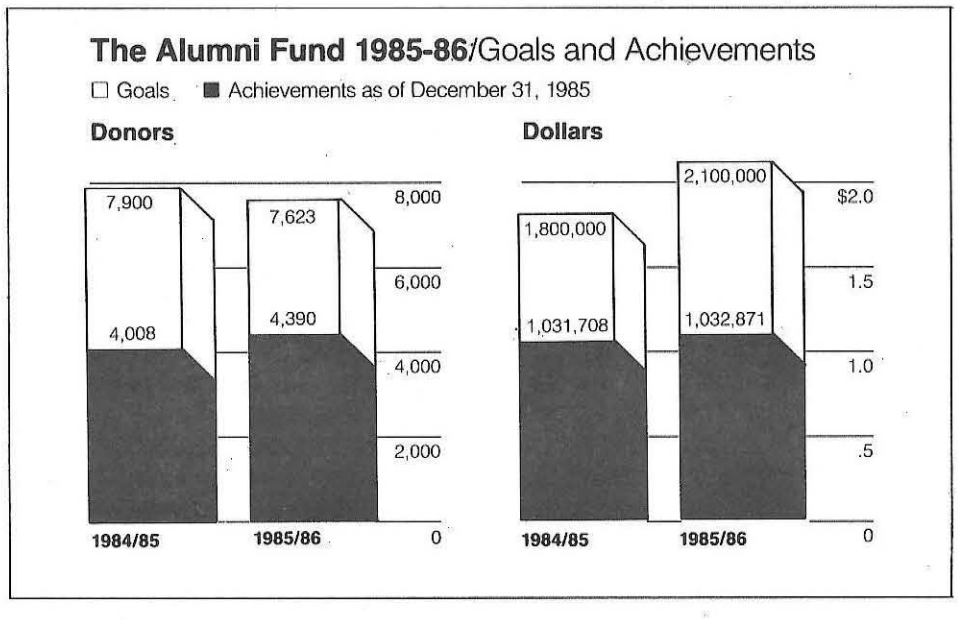
Alumni Fund telephone program begins next month

Caltech's annual Alumni Fund telephone program will get under way in March as alumni at some nine locations call former classmates throughout the country to seek their support for the Institute.

Many of the calls will be made from the Alumni House, where a bank of 23 telephones will be in use. Calls also will go out from Burbank, Orange County, West Los Angeles, San Diego, San Francisco, Oakland, Seattle, and from Rice University in Houston. Volunteers will work at one of those locations during March and April. Twenty-five evenings for calling have been scheduled.

During January, Caltech students began their telephone program for the Fund as they made calls from the Alumni House. Last year, some 150 students contacted alumni in support of the Institute.

Caltech alumni who would like to help in the program are invited to call the Alumni Fund office, 818-356-6286.



Do you have a summer job for a Caltech student?

The Alumni Association is seeking help from alumni who may be able to offer Caltech students summer jobs with their companies. Persons with available summer positions are asked to contact Karen Natwick, Caltech Alumni Association, 1-97, Pasadena, CA 91125, or to call (818) 356-6593 with a list of possible openings. Those responding will be contacted by the association with names of prospective candidates.

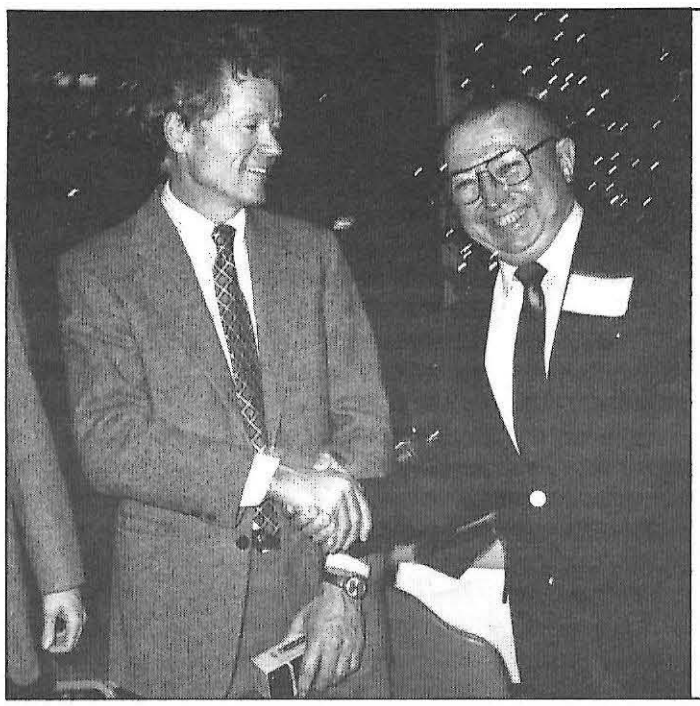
A resume of summer job candidates at all class levels may be purchased by sending a check for $30 to the Alumni Association. The check should be made payable to the Caltech Career Development Center.

Glee Club to tour the California coast

The Caltech Men's and Women's Glee Clubs plan a three-day tour along the California Coast during the first week of April. Performances are scheduled in Santa Barbara and Monterey, and at other locations to be determined. Additional information will be provided alumni in the area.

Kevles's book wins two awards

Daniel J. Kevles, professor of history, has received a 1985 American Book Award nomination for *In the Name of Eugenics: Genetics and the Uses of Human Heredity,* and, in a separate honor, has been selected for a Page One Award for Distinguished Science Reporting, Magazines, for excerpts from the book that appeared in the October 1984 *New Yorker* under the title, "Annals of Eugenics." The award was presented to Kevles by the Newspaper Guild of New York.



Gilbert Peppin (BS '53) greets Barclay Kamb (BS '52, PhD '56), left, who spoke at the annual meeting of Seattle-area alumni.

Seattle-area alumni hear Barclay Kamb

Some 45 Seattle-area alumni, many of them Boeing employees, honored a long-time tradition in early December by gathering for a holiday-season dinner program.

At a restaurant overlooking Lake Union, they welcomed Barclay Kamb (professor of geology and geophysics) for a talk on "Riding a Galloping Glacier." Kamb was greeted by several Caltech contemporaries who remembered him as "the guy with the 4.0."

Gil Peppin (BS '53) was in charge of arrangements for the program—a responsibility taken for many years by Tom Davis (BS '38, MS '47), who has moved to Altadena, California.

Alumni Activities

For more information about any event listed below, please contact Janet Davis, executive director of the Alumni Association, at (818) 356-6594.

FEBRUARY 16. Homecoming Sports Day on the campus, 10:30 a.m. Alumni are invited to join students and faculty for individual sports events, a buffet luncheon, a challenge softball game, and challenge triathlon. See story on Sports Day in this issue for more details.

MARCH 8. Houston chapter meeting at the Westin Oaks featuring President Marvin Goldberger as the speaker. Wine reception at 11:30 a.m., luncheon at 12:00 noon.

MARCH 14 and MARCH 21. Annual wine tastings at 7 p.m. in the Athenaeum. A selection of more than 16 vintage wines from four major wine producing regions of California —Napa, Sonoma, Santa Barbara, and Monterey—will be featured. Cost: $20 per person. Reservations are required.

MAY 17. Seminar Day on the Caltech campus, featuring faculty research seminars and exhibits. Open to all alumni, their families, and guests.

JUNE 13, 1986. Commencement on the Caltech campus.

JUNE 19. Alumni Association annual meeting and dinner honoring new honorary alumni and officers, at the Athenaeum.

Class reunions planned for spring

An opportunity to see friends and former classmates, and to renew ties with Caltech, will be available this spring as alumni who graduated at five-year intervals gather for their class reunions. More specific information about reunion plans will arrive in the mail.

Alumni who are from another class but would like to attend a particular reunion are welcome to come and share the day. Call the Alumni Association, (818) 356-6592, for more information.

Reunion dates and chairmen responsible for planning are:

April 19, Class of 1951, John Fee, chairman

Class of 1956, Dale Burger, chairman

April 26, Class of 1941, Joe Lewis, chairman

Class of 1946, Roger Clapp, chairman

May 2, Class of 1971, Donald L. Smith, chairman

May 9, Class of 1966, Richard C. Nielsen, chairman

May 16 and 17, Class of 1961, Gary Stupian, chairman. This 25-year reunion is traditionally held on Seminar Day weekend.

May 30, Class of 1976, Philip Naecker, chairman.

June 6, Class of 1926, Theodore Coleman, chairman.

June 7, Half-Century Club luncheon, class of 1936. Wally Swanson, chairman. Luncheon will be at the Athenaeum, and additional details will be announced.

June 13, Class of 1981, Bryan Dunkeld, chairman.

Obituaries

1921
ALFRED J. STAMM, of Raleigh, North Carolina, on November 25, after a long illness. He was an Emeritus Robertson Professor of Wood Science and Technology in the School of Forest Resources of North Carolina State University, where he joined the faculty in 1959. Previously, he had worked as a chemist at the U.S. Forest Products Laboratory in Madison, Wisconsin. He was a distinguished physical chemist in research on wood and related materials and developed a number of wood-related products. He was a member of many organizations, including the American Chemical Society, the Forest Products Research Society, the Society of Wood Science and Technology, and an honorary member of the International Academy of Wood Science. He was a recipient of the American Chemical Society's Anselme Payen Medal and Award. He is survived by his wife, Erdine, two daughters, a son, seven grandchildren, and one great grandchild.

1923
ORMSBY H. ENSIGN, Ex, of Sun City, Arizona, on October 6.

1925
WILLIAM U. DENT, of Bremerton, Washington, in November.

HOYT F. MARTIN, Ex, of Pasadena, on May 13, after a stroke. He was a retired physician and surgeon. He is survived by his wife of 56 years, Florence.

1927
LEWIS E. MEDLIN, of Silver Lake, Wisconsin, on August 8. He was employed as chief engineer for Temple Steel in Chicago for 20 years until his retirement in 1970.

1929
FRANK W. THOMPSON, of Los Angeles, on April 20, 1979.

1930
DAVID SHEFFET, MS '31, of Pasadena, in December 1984. He was retired.

1938
DONALD S. TAYLOR, PhD, of Pasadena, on September 12. He started his career with Shell Development Co. and DuPont before joining U.S. Borax in 1945, where he worked for 31 years. He held various positions, including vice president of U. S. Borax Research Corp., vice president of the technical department, and vice president of the administrative department of U.S. Borax. He retired as senior vice president, finance, in 1976. He is survived by his wife, Elsie, and three sisters.

1940
JAMES O. BIGLOW, MS, of Rancho Palos Verdes, California, in May. He was a retired captain in the U.S. Navy. He is survived by his daughter, Joan.

JOHN A. DILWORTH III, Eng '41, of Mercer Island, Washington, in 1985.

1941
MAX T. ROGERS, PhD, of East Lansing Michigan, on October 22. He was professor emeritus in the department of chemistry at Michigan State University.

1944
ILIF ROSS DANA, Jr., of Apple Valley, California, on October 16, after suffering a heart attack. He served as vice president of Dana Co., his father's highway construction firm, from 1953 to 1971, when Dana Properties, Inc., was formed. He is survived by his wife, Ruth, two daughters, and a son.

1947
JAMES L. SUMMERS, MS, of Saratoga, California, in June of 1985. He was retired.

1952
EDWARD A. WIBERG, Jr., MS, of Blue Springs, Missouri, on June 3. He was a retired Air Force colonel and had served as an alderman in Lake Tapawingo for eight years. A veteran of World War II, the Korean War, and the Vietnam War, he served in the Air Force for 30 years. He is survived by his wife, Marion, two sons, a daughter, a brother, a sister, and two grandchildren.

1958
JOHN H. C. MINKEMA, MS, of Auburn, Washington, in November 1985.

1963
HAROLD R. HARRISON, of West Lafayette, Indiana, on June 22, while in Delphi, Greece, on a student international study tour. The group was visiting the European and Middle Eastern countries along the Mediterranean Sea. He was a materials research scientist at Purdue University, where he joined the staff in 1971. He was a member of the International Center, Civic Theater, and International Folk Dancers Group, and was a member and caller for the Lafayette Country Dancers. He is survived by two brothers.

1968
CARL SHOLLENBERGER, MS, PhD '71, of Seal Beach, on November 17, in a plane crash in Frazier Park, California. He was a flying instructor in a plane belonging to the Caltech Flying Club, which was on a flight from El Monte to Bakersfield. Also killed in the crash was the student pilot, Eric Umland, a JPL employee with the campus/JPL concurrent computing project. Shollenberger was unit chief with Douglas Aircraft Co. in Long Beach.

Personals

1925
WILLIAM H. ALLEN and his wife, Eleanor, live in Cape Coral, Florida, and are in "excellent health" according to classmate JULIEN PHILLIPS (Ex '28) who visited them last year.

1929
BILL CLAGETT, Ex, of King City, Oregon, retired from the Bonneville Power Administration at age 70 in 1979, and is now "enjoying life in leisure." He is a life member of IEEE, a member of AFNE, (Americans for Nuclear Energy), AFEI (Americans for Energy Independence), and a former member of GIGRE, Paris.

1941
QUENTIN ELLIOTT, MS '42, of St. Paul, Minnesota, retired from the 3M Company in 1982 and has "become active in leadership roles in St. Paul's community participation government . . . ." He is on the board of trustees of the United Methodist Church. "We plan to stay in St. Paul despite its cold winters, with winter-time warm-ups to Arizona and, of course, California."

1946
JOHN W. BARNES, MS, took part in four International Security Council meetings last year in Paris, Seoul, Brussels, and Lisbon. He was a U.S. delegate at the annual congress of delegates from the Reserve Officers Association of the NATO countries, held in Oslo last August.

1948
JOHN McCARTHY received the first Award for Research Excellence at the International Joint Conference on Artificial Intelligence, which was held at UCLA. He is professor of computer science and director of the Artificial Intelligence Laboratory at Stanford. He is credited with giving AI its name, with developing the computer language LISP, and with helping found two of the country's three main AI laboratories. He also invented time-sharing, which allows one computer to do several things simultaneously.

DOUGLAS C. STRAIN is chairman of the board of Electro Scientific Industries, Inc., in Cedar Mill, Oregon, a company he helped found in 1949. Last year the company was named as one of the 100 best companies to work for in the U.S. in a survey taken by three journalist/authors. Strain has also been honored as one of the ten most influential people in Washington County in a poll conducted by an area paper. He serves on 13 boards and commissions.

1949
ALAN H. GREEN, MS, an aeronautical engineer until his retirement in 1970, works for *The Advocate*, a news weekly in Williamstown, Massachusetts, where he is "proofreader, assistant copy editor, and contributor of occasional articles and editorials."

ALLEN E. PUCKETT, PhD, has been named to serve as a director on the board of GM Hughes Electronics Corp., GM's newly formed subsidiary. Puckett is also expected to continue as chairman and chief executive of Hughes Aircraft—a position he has held since 1978.

1953
THOMAS F. TALBOT, MS, recently retired from the US Air Force Reserve after more than 33 years of service and was awarded the Legion of Merit upon retirement. He had served as mobilization assistant to the commander, armament division, Eglin Air Force Base (AFSC) for the last eight years. In addition, he has been teaching engineering at the University of Alabama, Birmingham, since June 1967 and has served as chairman of the department of mechanical engineering since May 1983.

1954
ED GAUSS is a member of the technical staff of AT&T Information Systems in New Jersey, after serving for 23 years on the University of Alaska faculty. He is also an accomplished artist whose work, "Impressions of the Alaskan Wild," was on display at the Poricy Park Nature Center from December through January. He was scenic artist for the Fairbanks Light Opera Theatre for many years. Many of his paintings and bronzes have taken prizes in Alaska and are in several collections there.

1955
RAY HEFFERLIN, PhD, a physics professor at Southern College in Collegedale, Tennessee, has been named one of the ten top professors in North America for 1985 in the Professor of the Year competition conducted by the Council for the Advancement and Support of Education. Hefferlin was cited for his extraordinary effort and distinction as a teacher and scholar, his dedicated service to the college (for 30 years), and his direct involvement with students and his impact on their lives.

1956
KENNETH LAWS has written a book, *The Physics of Dance*, the product of his experience as a professor of physics (at Dickinson College in Carlisle, Pennsylvania) and his interest in the teaching of ballet. Although he had never taken a lesson when he first started studying the subject, he is now an expert on ballet—nine years after his daughter's classes first piqued his curiosity and prompted him to study with the artistic director of the nationally known Central Pennsylvania Youth Ballet. In addition to occasionally performing in adult roles, Laws has been secretary of the board of the company for seven years and makes all the musical tapes for the group's performances.

1959
WILLIAM R. GRAHAM has accepted President Reagan's nomination as the deputy head of NASA and was recently named to head the agency while NASA administrator James Beggs takes a temporary leave; Graham is founder of R. and D. Associates (now a division of Logicon), a Marina del Rey advanced technology corporation. A former Rand Corporation staff member, Graham has served for the past four years as chairman of the President's General Advisory Committee on Arms Control and Disarmament. He also spent three years at the US Air Force Weapons Laboratory directing a group that conducted experimental and theoretical research on strategic weapons survivability. He has been a lecturer at the University of Illinois on computer architecture and at USC on national security and arms control issues.

AKIRA KOBAYASHI, MS, professor of engineering in the Institute of Interdisciplinary Research at the University of Tokyo, has been appointed chairman of the materials committee of the Japan Society for Aeronautical and Space Sciences and director and chairman of the international affairs committee, Japan Society for Composite Materials. In addition, he is secretary of the Third Japan-U.S. Conference on Composite Materials, which will be held this year in Tokyo.

1961
JOHN M. POINDEXTER, MS, PhD '64, vice admiral in the Navy, has been named as President Reagan's national security adviser, replacing Robert C. McFarlane. Poindexter has spent 12 of the last 19 years as a deputy or assistant in a variety of Washington offices; from 1971 to 1978, he was an aide to Navy secretaries and the Chief of Naval Operations. He was deputy chief of naval education and training from 1978 to 1981. He has served since 1981 as military assistant on the National Security Council, and most recently, as McFarlane's

deputy. He was the original planner of the October interception of the Egyptian airliner carrying the hijackers of the *Achille Lauro* cruise ship and was involved in administration deliberations over the hijacking last summer of the TWA plane in Beirut.

1969
STANLEY E. JONES of Santa Monica married Regan Ewing in May. He recently celebrated the first anniversary of his business, D.W. Kendle & Associates, which provides custom software development and consulting services.

1970
DOUG REUL and his wife, De, have adopted a 3-year old daughter, Kaylee Suzanne, from Korea. Doug is a senior staff member with Space Applications Corp. of Santa Ana. The Reuls live in Victorville and also have a 7-year old daughter, Deana.

1973
GLEN DAVID BRIN, of La Jolla, California, has won his second Hugo Award in two years. The award, the highest honor grant in the science fiction category, was given for "The Crystal Spheres," a short story that explains why alien creatures have not contacted earth. He was also nominated for *Cyclops*, a novella, at the World Science Fiction Convention in Melbourne, Australia. He has published several novels, the latest of which is *The Postman* (Bantam Books). Also scheduled for release by Bantam is *In the Tail of the Comet*, a work about an unmanned expedition to Halley's Comet in 2052. Brin is a publishing executive in Los Angeles.

1975
BRUCE HARROW "is pleased to announce the birth of Seth Adam (BS '07) on October 7." He and his wife, Melanie, are living in Salt Lake City where Bruce is a "family doc."

1976
THOMAS A. GERARD, MS, has been promoted from major to lieutenant colonel in the USAF. He'll return from a three-year tour of duty in Germany in July.

ALAN J. SHUSTERMAN, assistant professor of chemistry at Pomona College, has received a $25,000 Distinguished New Faculty Award from the Camille and Henry Dreyfus Foundation of New York. His area of research concerns organometallic chemistry. Before joining the faculty at Pomona College last July, he was a visiting scientist for IBM's research laboratory in San Jose.

1977
DAVID J. E. CALLAWAY is assistant professor in the department of physics at Rockefeller University in New York. In his spare time, he has made several climbing trips, including an expedition up Mt. McKinley to the 14,200-foot level "before being pinned down by a massive storm until the food ran out . . . a June 1986 rematch is planned. Decided to warm up in Africa, and ambled up to the top of Mt. Kilimanjaro . . . . A typical summer of Alpine climbing followed, climaxed by a 600-foot tumble while returning from the summit of the Eiger."

1979
GORDON C. OSBOURN, PhD, has received a 1985 Ernest Orlando Lawrence Memorial Award from the Department of Energy for outstanding contributions in the field of atomic energy. In addition to a citation, Osbourn received a medal and a $10,000 prize for his work in the field of strained layer superlattices (SLS), a new class of materials for microelectronic devices. He is a solid state physicist at Sandia National Laboratory in Albuquerque, New Mexico.

1980
MICHAEL W. KLYMKOWSKY, PhD, has been named a Pew Biomedical Scholar. He is an assistant professor in the department of molecular, cellular and developmental biology at the University of Colorado, Boulder.

1981
NEIL J. BARABAS lives in Chatsworth, California, and is working for Litton Systems in Woodland Hills as a senior engineer.

1983
BARRY D. DAVIDSON, MS, has received an SAE Forgivable Loan to pursue a doctoral degree in aerospace engineering at Texas A&M University. He has been employed as a lead engineer, advanced structures, and as a structural designer at the Rockwell International Space Division in Downey, California.

1984
JOHN SAHR has received a tuition grant and teaching fellowship at Cornell University where he will begin doctoral studies in the field of ionospheric radio physics. He has been a graduate research assistant in plasma physics at UCLA for the last year.

GREG SORENSEN has been accepted by the Health Sciences and Technology Division of Harvard Medical School, a joint program with MIT. He had been working toward a master of science degree in computer science at Brigham Young University.

JASON HICKEY has joined Bell Communications Research to do pure research with integrated circuit design involving telecommunications. His special field of interest will be fiber optics.

Junior Nathan Inada tackles Bruce George, captain of the Pasadena Police Officers' Association team, in the final game of a perfect 9-0 season for the Beavers. The final score: Caltech 40, Police 26. Admission to the game was a toy for the Pasadena *Star-News* Tournament of Toys/U.S. Marine Toys for Tots campaign. Photo courtesy of the Pasadena *Star-News*.

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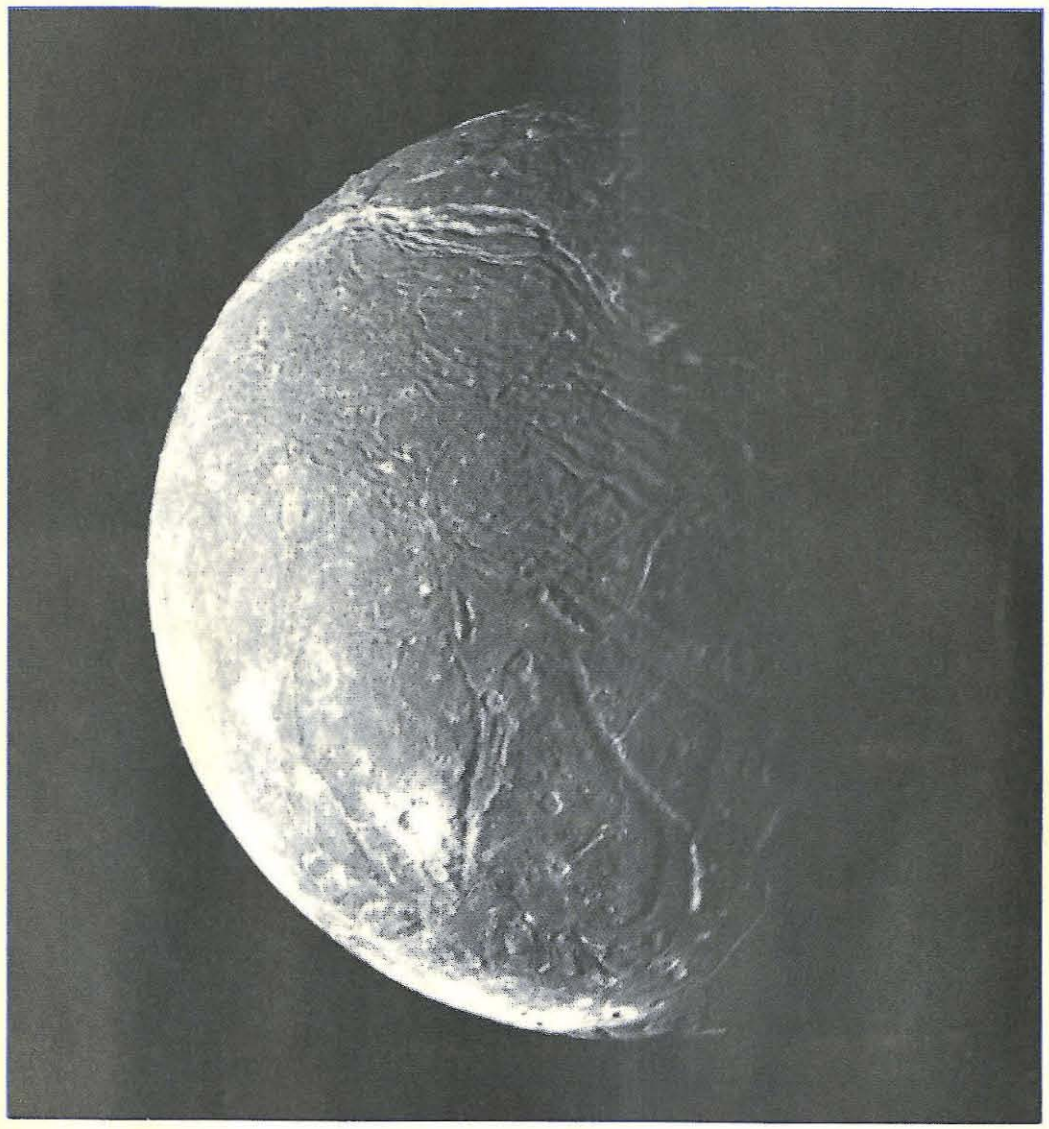

Ariel, satellite of Uranus, is revealed in this Voyager 2 photograph.
See page 1.

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