CALTECH NEWS

April 1985

Proposed tax reforms threaten philanthropic support

Tax reforms proposed by the federal government have raised serious concerns among those who fear the consequences of their impact on educational and charitable institutions. In this article, Tom Gelder, Caltech's director of individual giving, examines aspects of the proposed tax changes that would significantly decrease the flow of contributions to philanthropic institutions.

Recent moves in Congress by both politicial parties to simplify the tax system are generally favored by the American public. The Treasury Department's response has been to prepare a number of measures calculated to simplify the methods used by Americans to report their income and, at the same time, to raise tax revenues by modifying or eliminating deductions ("loopholes") that have benefited certain taxpayers.

The ruckus caused by these proposals centers not on whether tax reform is necessary, but on how charitable organizations, and those Americans who benefit from them, will be affected by the changes. In large part, the proposals repeal or modify the long-standing government policy of encouraging private philanthropy through tax incentives.

Conservative estimates by a number of philanthropic organizations indicate that, under the proposed changes, charitable gifts by individuals would decrease by approximately 30 percent. This decrease in funds would come at a time when the organizations—particularly educational and charitable ones—are already smarting from government cutbacks.

These are the six proposed changes in the Treasury's plan that would have most serious impact on charitable giving:

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Elias Lazarides and graduate student Lois Banta examine a tissue segment, using indirect immunofluorescence.

Caltech joins research consortium to tackle Alzheimer's Disease

By Winifred Veronda

The mood swings and rapid deterioration in the intellectual functioning of a 55-year-old German woman horrified her family. The year was 1906, and the family physician defined the woman's condition as "pathological jealousy."

But the young neurologist who treated her believed her problem had another basis, and almost 80 years later researchers still identify her illness with his name: Alzheimer. Only now are they beginning to understand the roots of the affliction that destroyed his patient—an affliction that today is the most common cause of dementia among the elderly. Alzheimer's Disease strikes between one and two million Americans and, in an aging population, its incidence is rising.

The process of understanding—and of progress toward cure—must be accelerated, scientists agree.

Alzheimer's Disease, which now affects approximately one out of two people over 80, creates an increasingly devastating burden for its victims, their families, and the financial capacity of the health care industry.

Active in supporting research into Alzheimer's Disease since the mid-1970s, the federal government has intensified its efforts. Last fall, through a federal research initiative, Congress allocated funds for the establishment of five national AD centers. The new Alzheimer's Disease Research Consortium, administered through USC, brings Caltech to the project as one of four participating institutions through the research of Elias Lazarides, associate professor of biology.

Lazarides and his group are working to learn more about the abnormal clumps of fibrous proteins that are found in diseased neurons in the brain tissues of Alzheimer patients.

The collaborative effort is called Alzheimer's Disease Research Center Consortium of Southern California, and the participants will receive $2.4 million in funding from the National Institute on Aging over the next five years. The other participating institutions are the City of Hope and UC Irvine.

In the past, Alzheimer's research has been independently pursued. Teams have worked on projects without benefit of an organizational structure to oversee and to coordinate their efforts, and without an organized system for exchange of information. Now the five consortiums will provide those functions through tissue resource centers for neuropathologic studies, patient registries for statistical studies, and educational programs for professionals and laymen, in addition to basic coordination and sharing of research findings and other data.

Neurologists, neurobiologists, molecular cell biologists and neuropathologists will tackle the problem from their unique perspectives and will pool their findings.

The West Coast facility is co-directed by Caleb Finch, professor of

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Proposed tax reforms threaten philanthropic contributions

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1. Reducing tax rates to three levels —15 percent, 25 percent, and 35 percent—from the present graduated rates that peak at 50 percent—would substantially increase a donor's cost of giving. For example, under current law a donor in the 50 percent tax bracket can make a $1,000 charitable cash gift for an after-tax cost of $500. Under the proposed law, the same gift (assuming the donor was in the highest tax bracket of 35 percent) would have an after-tax cost of $650 —an increase of $150.

2. Modifications in the tax treatment of capital gains and gifts of appreciated property would limit the deduction for gifts of appreciated property to an inflation-adjusted basis or fair market value, whichever is less. For example, under current law, a donor making a gift of property worth $10,000 receives a deduction of $10,000, even if the donor only paid $1,000 for the property. But under the proposed law, the same gift would generate a deduction of only $1,000, assuming no inflation and that the donor paid $1,000 for the property. To a person in the 50 percent income tax bracket, the after-tax cost of the $10,000 gift would increase from $5,000 to $9,500.

3. The charitable deduction available to taxpayers who itemize deductions would be limited to amounts in excess of 2 percent of the donor's adjusted gross income. This means, for instance, that a donor with an adjusted gross income of $40,000 would only be allowed to deduct charitable gifts in excess of $800. Contributions under $800 (2 percent of $40,000) would not be deductible.

4. An increase in the "zero bracket amount" (more commonly known as the "standard deduction") and a reduction in allowable deductions would reduce the number of people who itemize their deductions. Those who itemize give more than two-thirds of all contributions to philanthropy. This proposed change, in connection with the 2 percent floor discussed in #3, would mean that the gifts of almost 70 percent of the people who itemize, and 50 percent of the amount of their gifts, would not be eligible for a charitable deduction.

5. Eliminating the 1981 law that extended the charitable income tax deduction to people who do not itemize their deductions would affect about 40 percent of the people who claimed $500 million in gifts in 1982.

6. Abolishing the annual deduction limitation on charitable gifts (currently 50 percent of the "adjusted gross income" for gifts of cash or unappreciated property) and eliminating the five-year carryover for excess charitable deductions would affect the very largest givers—approximately 50,000 taxpayers. The combination of these two changes would reduce the incentive to make very large gifts. With no carryforward, deductions in excess of a donor's annual income in the year of the gift would be lost.

For example, under present law, a donor whose adjusted gross income is $100,000 may deduct up to $50,000 of his or her adjusted gross income in any one year, assuming the donor has made a sufficiently large gift of cash or unappreciated assets.

If the donor contributed $300,000 to a charity, $50,000 of the $300,000 deduction could be utilized in the year of the gift and the remaining $250,000 deduction could be carried forward for up to five additional years.

Under the new proposal, the same donor could deduct up to $100,000 of his $300,000 gift in the year that the gift was made, but the remaining $200,000 charitable deduction would be lost.

In summary, these proposals will create dramatic decreases in charitable giving. Such reforms—accompanied by dismantling of the highly effective and efficient incentives for charitable giving that our tax laws have encouraged for almost 60 years —seem particularly ill conceived in this time of federal belt tightening.

Concerns about these proposals boil down to the belief that the benefits from increased federal revenues are far outweighed by the loss of contributions to educational organizations and charities. The fear is that these far-reaching changes will significantly reduce the flow of private assets donated for public purposes.

$1 million Irvine Foundation gift to fund equipment

The James Irvine Foundation has awarded Caltech $1 million for the purchase of scientific and engineering equipment for research and education.

Caltech President Marvin L. Goldberger said the grant will help the Institute meet a critical need for new equipment. "The need at Caltech for sophisticated new instrumentation has never been greater, nor the costs higher, than today," he said. "And unfortunately, our ability to provide the equipment needed by our research groups is far beyond our financial means."

The problem is common to colleges and universities throughout the country, Goldberger said. "The rapid evolution of science has pushed the evolution of scientific instruments, and this has accelerated the evolution of science. If Caltech is to continue to play a major role in scientific research, we must provide the best possible environment and facilities for research and education."

The Irvine Foundation grant will become part of Caltech's Renewal Fund for Scientific Equipment, inaugurated with a grant from the W. M. Keck Foundation in 1983. This fund is being used for a broad range of new equipment at the Institute, including instruments for research and education in neurobiology, chemistry, engineering, and geology. These include new analytical instruments and advanced computer systems.

Gas intensifier to support research on deep-earth conditions

A gas intensifier that will extend the capabilities of Caltech geologists to reproduce conditions deep in the earth's crust has been given to the Institute by Haskel, Inc. Caltech alumnus Richard L. Hayman is the firm's chairman and chief executive officer.

The intensifier will enhance research in the laboratories of Peter J. Wyllie, professor of geology and chairman of the Division of Geological and Planetary Sciences, and Edward M. Stolper, professor of geology.

Both conduct experiments at high temperatures and pressures comparable to those deep within the earth where many geological processes have their origins.

The new instrument gives them the capability to simulate very high temperature conditions to a depth of 40 kilometers—a capability that is critical to a better understanding of vulcanism and other phenomena.

Haskel, Inc., of Burbank is a manufacturer of high technology hydro-mechanical devices sold throughout the world. A resident of Flintridge, Hayman is president of The Associates of Caltech.

Richter donates lifelong science fiction collection to Millikan Library

When the voice at the other end of the telephone mentioned a gift to Millikan Library of some science fiction books from Charles Richter (professor of seismology, emeritus), the staff member had little notion that 75 cartons of material would be forthcoming.

A lifelong collector of science fiction, Richter decided to present his treasure to the Institute. It consisted of 275 hardback books, 1,220 paperbacks, and 1,450 magazines. With it came a homemade card catalog for the articles and stories in the magazines, and for newspaper clippings and reviews of sci-fi movies and television programs, as well as correspondence with other collectors and book dealers.

A bonus portion of the gift included 150 chess books and magazines, several shoe boxes full of postcards showing chess moves by mail, 360 books on seismology, and about 1,275 scientific reprints and journals.

The older science fiction magazines —some going back to the late 1920s —have been cataloged for the archives, where they will receive the protection and preservation that they deserve. Many of the hardback books have been sent to the humanities and social sciences library, and the paperbacks have been divided among four of the student houses.

Jennings foregoes fly fishing for new challenge: engineering division chairmanship

By Phyllis Brewster

There is a good chance that Paul Jennings is fly fishing on the Mataura River at this very minute. But even 5,000 miles away in New Zealand, Jennings's thoughts are probably very much with Caltech and the responsibilities he has taken on as the new chairman of the Division of Engineering and Applied Science—an appointment that began January 1.

One of the first things Jennings had to deal with when he decided to accept the chairmanship was to pare down to six weeks his six-month lecture appointment at the University of Canterbury in Christchurch. He would also have to postpone starting the earthquake engineering book that he intended to begin writing in New Zealand—and he would have a lot less time for fly fishing.

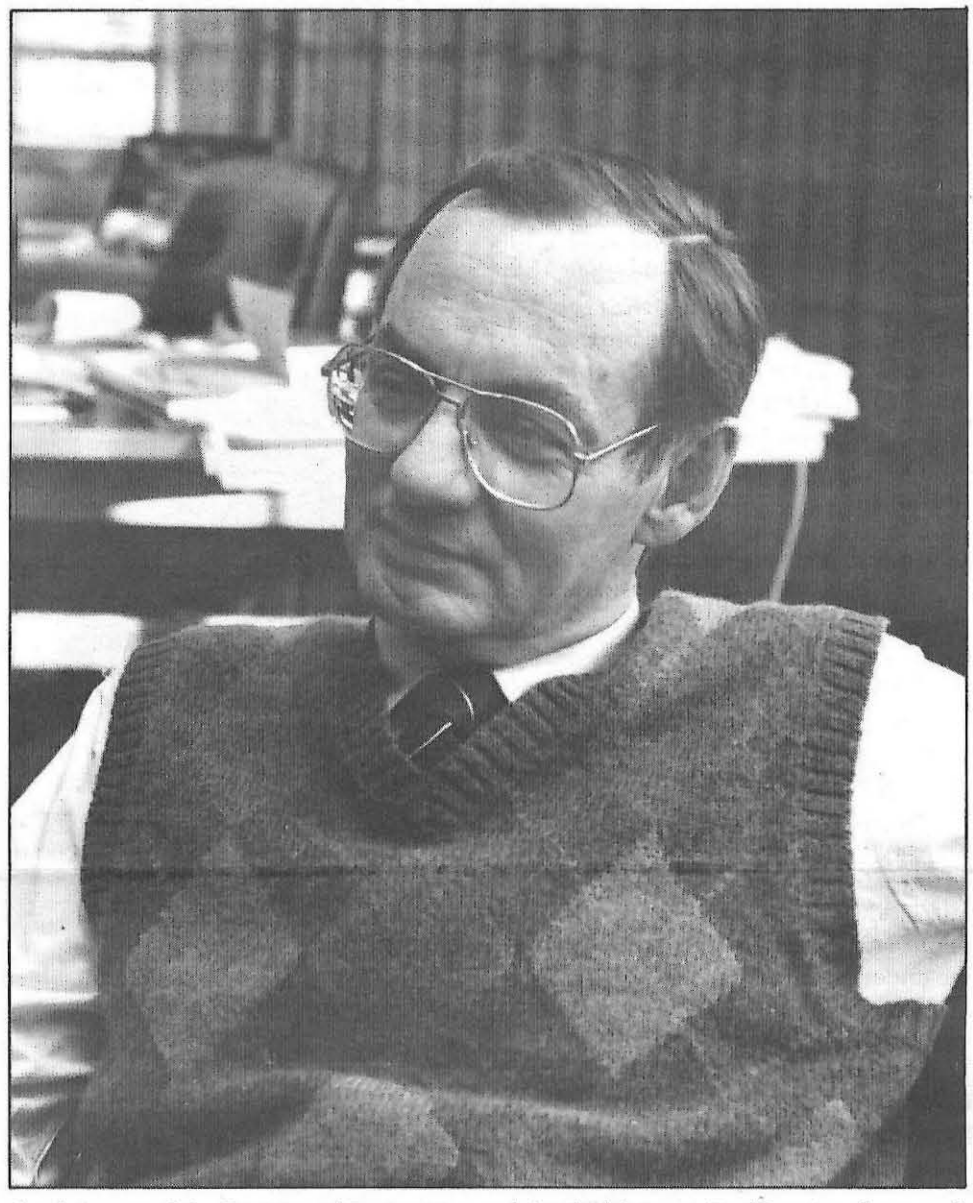
Obviously those adjustments are only a few of the many that Jennings will be making as a result of the new position. What made him agree to the prospect of restructuring certain aspects of his professional and personal worlds?

"The opportunity to serve as chairman came at a time in my life when I was willing to try something different—to accept a new challenge," says the earthquake engineering expert who has been a member of the Caltech faculty for almost 20 years. In his office at Caltech, a few weeks before leaving for New Zealand, Jennings outlined some of the specifics that the challenge might entail.

The national shortage in available engineering faculty is certainly one of the major issues facing the division—a shortage made more acute because of record high undergraduate engineering student enrollments.

"More than half the undergraduate student body at Caltech, and more than a third of the graduate students, are in this division," Jennings reports. "Our faculty numbers about 70—clearly too low a figure for us to do the job we have to do in teaching and research.

"Throughout the country, not enough top-notch students are going on for their PhDs. The high-salaried job offers, primarily from industry, are drawing off students at the bachelor's and master's levels."



As chairman of the Division of Engineering and Applied Science, Paul Jennings faces such issues as the national shortage of engineering faculty and high undergraduate enrollment.

Among the most competitive areas for new faculty at Caltech are computer science, electrical engineering, and applied physics, he says.

Complicating the engineering faculty shortage at the Institute is the fact that the division will be losing an average of two faculty members a year for the next ten years, to retirement.

It is not surprising, then, that one of Jennings's goals is to bring the division up to strength by "making a significant number of very good appointments in the next few years." Competing with the extremely attractive offers from industry and other universities is a difficult situation. Jennings says that "we intend to be competitive" and that "the administration has been very helpful in understanding our problem and doing something about it."

Jennings's extensive Caltech background—his two graduate degrees, a visiting appointment in 1965 while teaching at the Air Force Academy, a faculty appointment the next year, and five years as executive officer for civil engineering and applied mechanics—gives him a good running start at understanding Caltech and the division. But he clearly understands the understatement when he says, "Being chairman is quite different from being a professor."

As chairman, the biggest single challenge that Jennings sees is represented by "the extreme diversity in our division, the many academic interests and styles of operation.

"In one sense, this diversity is a very real strength," he says. "On the other hand it makes it more difficult to keep the division working smoothly."

Long-time colleagues agree that Jennings's energy, enthusiasm, and organizational skills will greatly benefit the division.

"Paul definitely knows how to run an organization," says a close associate, pointing to Jennings's past presidencies of the Seismological Society of America and of the Earthquake Engineering Research Institute.

His knowledge of the Washington scene is also highly regarded by his colleagues. He is a member of the National Academy of Engineering and a past chairman of the National Research Council's Committee on Seismology. He is also a member of the National Science Foundation's advisory committee on earthquake engineering.

Another colleague believes that Jennings's "wonderful touch with people and his sense of fairness" will be valuable assets. "Paul has the rare ability to diffuse potential trouble in a tense situation. This can be extremely helpful in a heterogeneous division like ours."

So, as the New Zealand trip is over and Paul Jennings temporarily puts aside his fishing equipment, he takes up "equipment" of another kind—qualities and skills and experience that will benefit him in the new venture, and ultimately, the division that he is heading.

Annual Meeting Notice

NOTICE IS HEREBY GIVEN that pursuant to the bylaws of the Alumni Association, California Institute of Technology, the annual meeting of the members thereof will be held Thursday, June 20, 1985, at 6 p.m. in the Athenaeum, 551 South Hill Avenue, Pasadena, for the purpose of transacting any and all business that may come before such meeting of the members.

CAROLE L. HAMILTON, PhD '63
President
PAUL H. WINTER, BS '44
Treasurer
DAVID J. D. HARPER, MS '77
Secretary

Alzheimer's consortium

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biological sciences and gerontology at the USC Ethel Percy Andrus Gerontology Center, and Carol Miller, associate professor of pathology at the USC School of Medicine and chief neuropathologist at USC. (Miller's husband is Seymour Benzer, the James G. Boswell Professor of Neuroscience at Caltech.)

At Caltech, Lazarides and his research team will focus on gaining a better understanding of a major component of the problem: the nature of the proteins that are involved in fibroid masses found in the neurons of Alzheimer patients, where they have destroyed functioning. The neurons die as the fibroid structures accumulate in their main trunks. Some scientists believe the structures are created through major changes in the way the brain metabolizes glucose. Others believe that they form when neurotransmitters become unable to do their work.

In a normally functioning nervous system, the brain sends orders to organs and muscles by electrical impulses that travel at speeds of up to 55 miles per hour. When they reach a synapse—a gap between one nerve and its neighbor—they are transported across the gap by neurotransmitters.

There are many classes of neurotransmitters—each slightly different from the others, and each responsible for a specific set of signals. The loss of any one class is marked by a particular set of physical and psychological symptoms. When the cells that make up a specific class of neurotransmitters are destroyed, the set of nerve signals generated by those neurotransmitters can no longer cross between cells, and communication shuts down.

In the neurons of the dead cells in Alzheimer patients are found tangled fibroid structures that scientists call paired helical filaments. These tangles are also found in the neurons of normal brains, but in nowhere near the same abundance as in Alzheimer patients.

Within a normal nerve cell, much of the space is filled with filaments of protein that serve multiple functions. By contrast, paired helical filaments of Alzheimer cells are abnormal in both composition and arrangement, and they serve no known function.

They are also much more durable than healthy filaments. Their durability is reminiscent of the rigidity of proteins that form muscle tendons—structures built for maximum resistance to breakdown. Because of their durability, some researchers believe that the patient's brain cannot break them down and that, as a consequence, they accumulate irreversibly.

The road that leads to an understanding of this problem will involve many steps—some of these taken in the lab of Lazarides where much work has been devoted to defining the structure of proteins.

Lazarides and his colleagues will use molecular probes to compare normal and diseased proteins in brain cells. Through this technique, they hope to isolate and characterize the genes that send instructions for the proteins' creation. This is part of an effort to understand whether Alzheimer's Disease affects genes, causing them to send out fatal instructions for the creation of abnormal proteins, or whether the disease affects the proteins themselves.

A second probe will focus on the effects of antibodies on the biochemical makeup of the proteins and on the metabolic interaction within the cell protein and among cells.

"One great benefit of this research—beyond what we learn about Alzheimer's Disease—will be an increase in our understanding of how a normal brain functions," said Lazarides. "The more we understand about any disease process, the better we understand the normal process."

As Lazarides and his group are studying the cause of Alzheimer's Disease in their laboratory, others involved in the consortium are launching an effort to learn as much as possible about the medical and family history of Alzheimer patients. Their work will involve history and screening, neuropsychological testing at six-month intervals, and post-mortem examination.

Their findings will become part of a central registry where data are available to anyone who needs access to them.

Besides studying the history of the patients themselves, the researchers intend to follow the medical histories of their offspring in an effort to learn whether the affliction strikes in a purely random fashion, or whether it may have hereditary aspects. Computer correlation of data from the five centers across the country eventually should yield insight into this question.

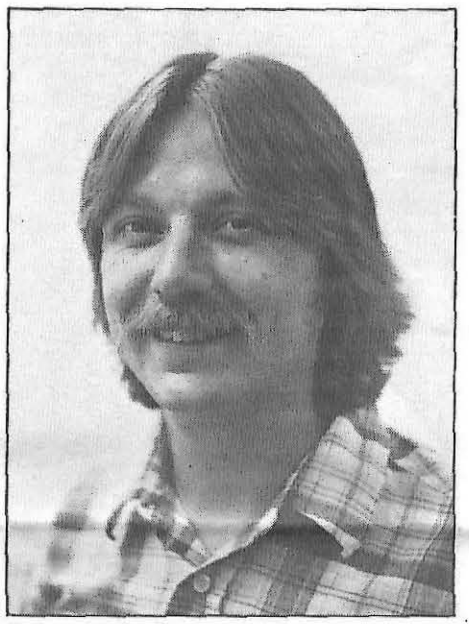
The road to successful treatment and cure of Alzheimer's Disease will probably be long. Some scientists have predicted that it could take decades. But creation of the five national AD centers represents a major step toward unraveling the biochemical basis of the disease, and eventual success in ending the tragedy that it represents.

Scientific search yields no evidence for quarks

Where are the quarks?

A highly sensitive apparatus, capable of detecting one fractionally charged particle among five hundred million billion (5×10^{17}), has failed to find any particles or any evidence for them, Caltech physicists have reported.

Fractional charges are the signatures of free quarks—particles that have been objects of a long and intensive hunt by particle physicists.



Robert D. McKeown

According to current theory, quarks, which are the fundamental building blocks of all matter, may not exist free in nature but only as the constituents of subatomic particles such as neutrons or protons.

In a paper at the annual meeting of the American Physical Society, Robert D. McKeown, Caltech assistant professor of physics, reported on findings by himself and his colleagues in their search for fractionally charged particles.

Others involved in the experiment were Richard G. Milner, a graduate student; Barbara H. Cooper, formerly of Caltech and now a faculty member at Cornell; Kai H. Chang, a research fellow; and Kevin Wilson and James Labrenz, both undergraduates.

A number of free-quark searches have been attempted since the announcement in 1981 of evidence for their existence by William Fairbank of Stanford University. Fairbank found evidence for fractional charges on tiny niobium spheres suspended in a magnetic field.

In the Caltech search, which began in the summer of 1984, scientists used a 30,000-volt beam of argon ions to erode small samples of niobium or tungsten into individual atoms in a process known as sputtering.

Then the charged ions from the process were accelerated to high energies in Caltech's three-megavolt tandem electrostatic accelerator. After the ion beam—consisting of about one million particles per second—was accelerated, it was passed through an apparatus that determined the charge of the particles by the way they were deflected in an electric field.

The Caltech researchers chose niobium as one of the materials to be searched because it was the substance used by Fairbank when he obtained positive results in his free-quark search. Tungsten was chosen as the other material because the Stanford scientists annealed the niobium samples by heating them on tungsten.

Some scientists have theorized that fractionally charged particles in the tungsten may have been transferred to niobium in that process.

The Caltech scientists achieved sensitivities high enough to detect fractional charges at the same concentration reported by Fairbank, according to McKeown. But there were no signals indicating fractional charges in the beam.

"Our results don't mean that Fairbank's findings can be ruled out, but they do put a great number of constraints on what one can assume he is observing," McKeown said.

"We have confidence in our results because we were able to detect very small levels of rare charged ions that were produced in the sputtering process, so we believe we would have seen fractional charges if they had been present."

Because the Caltech apparatus can search any material that can be sputtered into atoms, the scientists can extend their search for fractionally charged particles to other substances, said McKeown. For instance, they plan to analyze copper wires that have been exposed to high-energy beams of heavy ions in experiments at the Bevalac accelerator at Lawrence Berkeley Laboratory of the University of California. Scientists have theorized that this type of bombardment might liberate free quarks.

The Caltech scientists also plan to search meteorite samples—ancient material where free quarks might still exist.

The Caltech studies are supported by Institute funds and by the National Science Foundation.

IRAS data center to be at Caltech

Caltech will be the site of a NASA project for analysis of the treasure trove of data gathered by the Infared Astronomical Satellite (IRAS) in its ten-month mission to map infrared emissions in the sky.

The Infrared Processing and Analysis Center (IPAC) will consist of a one-story 17,600 square-foot building staffed by scientists and data processing specialists. Construction of the building is expected to be completed by the end of 1985.

The center will have an annual operating budget, funded by NASA, of $8 million to $9 million. About 25 percent of the budget will support the research of visiting scientists, who will work at their home institutions or at IPAC.

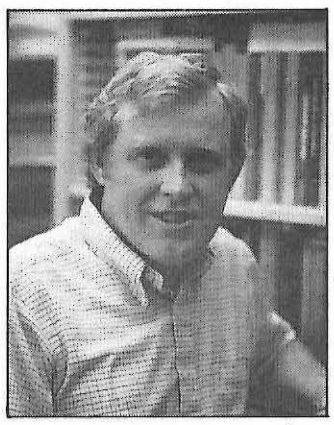
The center will house computing and analysis equipment that will allow scientists from the U.S. and other countries to do detailed analyses of the more than 200 billion bits of data gathered by IRAS. These will include studies of objects such as comets within our own solar system, the galactic center, infrared-emitting stars and molecular clouds in our own galaxy, and distant galaxies and quasars.

IRAS was launched into a polar orbit by NASA on January 25, 1983, from Vandenberg Air Force Base in California. The orbiting telescope is a joint project of NASA, the Netherlands Space Agency, and the United Kingdom's Science and Engineering Research Council. JPL is the management center for the project.

Gerry Neugebauer, Howard Hughes Professor and professor of physics at Caltech, and director of Palomar Observatory, is U.S. co-chairman of the Joint IRAS Science Working Group.

McGill named Fletcher Jones Professor

Thomas McGill (MS '65, PhD '69) has been named the Fletcher Jones Professor of Applied Physics at Caltech. McGill is an expert on the properties of semiconductor materials



and device structures that are the basis for modern electronics.

The professorship was established in 1977 through a gift from the Jones Foundation of Los Angeles. Before his death in 1972, Fletcher Jones was the founder and chairman of the board of Computer Sciences Corporation.

In his research, McGill probes the fundamental behavior of semiconductor materials and devices. His recent work has dealt with designing man-made structures at the atomic scale with novel electronic and optical properties. The structures are expected to bring about new generations of electronics.

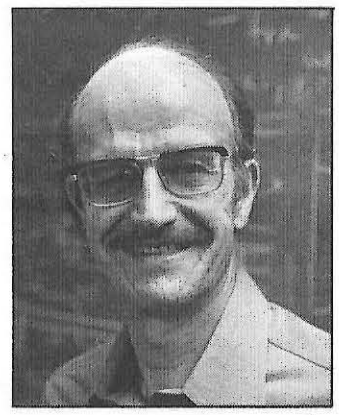
After working as an engineer at Hughes Aircraft and studying at the University of Bristol, England, and Princeton University on postdoctoral fellowships, McGill returned to Caltech in 1971.

Attardi: first Grace C. Steele Professor

Giuseppe Attardi, professor of biology, has been named the first Grace C. Steele Professor of Molecular Biology at Caltech.

The professorship was endowed by a gift from the Harry G. Steele Foundation, which was created by the late Mrs. Grace C. Steele in her husband's memory in 1942.

Attardi is an authority on the genetics of human mitochondria—tiny rod-shaped structures within



cells that serve as the cells' main "power plants." Mitochondria transform the chemical energy of food into a form that can be used by the body to fuel life processes.

Mitochondria possess their own genetic material, separate from that of the rest of the cell. One of Attardi's main research efforts has been to elucidate how the mitochondrial genetic system functions.

Attardi came to Caltech in 1959 as a research fellow and became a professor in 1967. He is a member of the National Academy of Sciences and has been both a Fulbright Fellow and a Guggenheim Fellow.

The late Mr. Steele bought a major interest in U.S. Electrical Manufacturing Company in 1922. In 1927 he became controlling stockholder and president of the company, which was to become U.S. Electrical Motors. He continued as president until his death in 1942. The firm merged with Emerson Electrical Manufacturing Company in 1962.

After her husband's death, Mrs. Steele became a vice president of the company. She was a life member of The Associates, as was her daughter, Virgina Steele Scott. Her son and daughter-in-law, Mr. and Mrs. Richard Steele, are life members of The Associates.

Her son, Richard Steele, and daughter, Mrs. Audrey Steele Burnand, and their spouses are also life members of The Associates.

The Steele Foundation has made numerous gifts to the Institute, including those making possible the Harry G. Steele Laboratory of Electrical Sciences, completion of the endowment of the Lee A. DuBridge Professorship, and establishment of astronomy scholarships and fellowships.

Neugebauer given Space Science Award

Gerry Neugebauer, the Howard Hughes Professor and professor of physics at Caltech, has been presented the 1985 Space Science Award by the American Institute of Aeronautics and Astronautics for "pioneering work and scientific leadership in infrared astronomy, culminating with his leadership of the IRAS science team."

Neugebauer, who is director of Palomar Observatory, has played a major role in infrared observation and study of the planets, including the development of instrumentation for the Mariner missions to Mercury and Venus, the Pioneer missions to Jupiter and Saturn, and the Viking missions to Mars.

At Mount Wilson and Palomar observatories, he has headed teams conducting ground-based infrared studies of stars, the Milky Way, and other galaxies.

Associates welcome their new members

Approximately 213 Caltech Associates and their guests attended the annual dinner honoring new members. Richard L. Hayman, president of The Associates, welcomed guests to dinner at the Athenaeum and President Marvin L. Goldberger spoke about the importance of the members' contributions.

New Associates Officers

Officers of The Associates for 1985 are, from left: Robert Henigson, vice president; Richard L. Hayman, president; Joanna Muir, vice president; Patricia Sigmon, secretary; and J. Howard Marshall III, treasurer.

Vol. 19, No. 2 **April 1985**

Issued six times a year (Feb., April, June, Aug., Oct., and Dec.) and published by the California Institute of Technology and the Alumni Association, 1201 East California Blvd., Pasadena, California 91125. Second class postage paid at Pasadena, California. Postmaster: Please send address changes to *Caltech News*, 1-71, California Institute of Technology, Pasadena, CA 91125.

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USPS 085-640

Fr. Donald Merrifield:

Physicist, Jesuit, university chancellor — and advocate for hope through problem solving

By Winifred Veronda

Inspiring a young man to enter the priesthood is not a conventional role for the Caltech community. But the unanticipated is a respected part of the scientific process, and Donald Merrifield, who came to the Institute intent on a career in chemistry, graduated with a degree in physics—and with plans to go on to seminary.

The Rev. Donald Paul Merrifield (BS '50), SJ, PhD, chancellor and former president of Loyola Marymount University, recipient of the Caltech Distinguished Alumnus Award, grew up in Inglewood in a Roman Catholic family. But as a college freshman, his interest in his faith was at a low ebb.

During his sophomore year he got involved with the Caltech Y, and questions that he posed in conversations with the Y's executive director, Wesley Hershey, led Hershey to lend him books on Catholicism from his own collection.

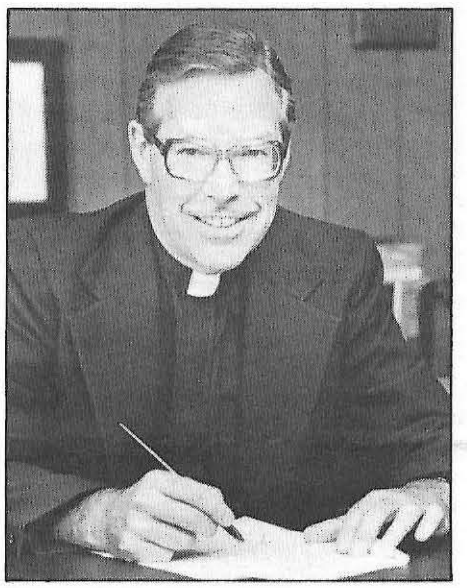
"Reading these books brought me back to an appreciation of my faith," Fr. Merrifield says. "By my senior year, I was sneaking out of Ricketts House to attend early morning mass. I would go to mass while everyone else was in bed, and when I got home, they would just be getting up." He had already become active in Newman Club, and organized the first Newman Club retreat for Caltech students.

Fr. Merrifield found a role model at the Institute in the late Fr. James O'Reilly (PhD '50), a Catholic priest who was studying astrophysics at the Institute, and in faculty members like Linus Pauling, who he says "integrated science and humanism" in a compelling blend.

In members of the humanities faculty he found men who posed tough questions about deep spiritual matters and issues of faith. "Harvey Eagleson [professor of English] raised more difficult questions in his literature class than anyone in the sciences," he says.

The questions inwardly resolved to his own satisfaction, Fr. Merrifield kept with his decision to become a priest. "I followed through in the typical Caltech fashion," he says. "I conducted research in the library on the religious orders."

His research led him to the Jesuits, who often combine their spiritual vocation with a secular occupation, and he was accepted for the Jesuit novitiate at the end of his senior year.



Fr. Donald Paul Merrifield

"But I got cold feet and put off entering the Jesuits," he says, "and enrolled instead at the University of Notre Dame for a master's degree in physics."

After Notre Dame he did enter the novitiate of the Jesuits in Los Gatos, California, and then went on to complete degrees in philosophy and in sacred theology from St. Louis University and the University of Santa Clara, respectively. In 1962, he received a PhD in physics from MIT. There he specialized in solid-state physics and molecular theory. His research interests have included the theoretical physics of molecular structure, intermolecular forces, and the interaction of molecules with surfaces.

During his years of study in philosophy and theology, his physics and mathematics often took a sabbatical, although he continued to put his knowledge to use by tutoring undergraduates who came to him for help. "Go talk to Merrifield," an MIT graduate student told an undergraduate who was floundering in a math course. "He *has* to help people."

Fr. Merrifield found a more intensive use for his scientific training while he was still a theology student at the University of Santa Clara. His PhD dissertation on the electronic structure of the water molecule raised interest at JPL, and he was asked to become a consultant to the physics group in the Space Sciences Division.

He continued to work as a consultant to the group for seven years, initially flying down weekly from Santa Clara. Guards at the laboratory sometimes greeted him by asking, "Do we have a launch today?" They pretended to believe that the visitor in the priest's collar had come to say a blessing for the spacecraft.

"I loved the opportunity to work with the other scientists in the space program," Fr. Merrifield said, "and we had many an interesting luncheon conversation on my 'other life' as a theology student and later as a priest."

His formal studies completed and after ordination in 1965, he went on to faculty positions in physics at Loyola University, the University of Santa Clara, and the University of San Francisco.

In 1969, after two years as a member of the faculty at USF, he was asked to become president of Loyola University. He was the first scientist to serve in this capacity, but "only a few eyebrows were raised," he observes.

"If we don't act as if there's going to be a future, we become catatonic. We have to believe that human beings *can* solve problems; we have to get involved."

"This was at the end of the 1960s, and during a time of upheaval," he says. "The university was looking for a young president. I lacked administrative experience, but I had developed a reputation for getting along well with students and faculty at USF. The board of trustees hoped my administrative abilities would evolve on the job."

In his new role he soon made use of his competence with computers, developing his own program for handling university finances. "After doing this, I possessed a considerable understanding of the university's finances," he says. "This didn't always make me popular. The rest of the administration of any institution doesn't always like it when the president knows where the money is hidden, or has intimate knowledge of costs!"

One of his tasks as university president was a project that he particularly enjoyed: "Coaxing science and engineering programs to become one college, our own 'institute of technology.'" In 1973 he also presided over the merger of Loyola University with Marymount College, and he devoted much energy to dealing with changes taking place within the student body. He found special pleasure in working with minority students. In his presidential role, he was variously addressed as Don, Father Don, Reverend President, Mr. President, and a few other variations on those themes.

Of the students and the times he says, "I have memories of wonderful scenes from the late 1960s and early 1970s that belong in grade B movies. For example, early in the 1970s, a group of students came into my office to challenge me on several issues. They looked like members of a guerrilla group. They wore dark glasses and ringed themselves around my desk, refusing to sit down.

"We agreed to set up a scholarship program in the law school for minority students. This seemed like a good idea to me; I think they were surprised that I agreed so quickly.

"Members of that group of visitors, and others who came, are much mellower today. Quite a few of them have asked me to perform their marriages, to baptize their babies, and so on."

Fr. Merrifield speaks proudly of the achievements of the minority students who entered through special admission and scholarship programs. "A great many of them succeeded," he says. "Today they're professionals, in medicine, in law, in teaching—still strongly dedicated to their communities."

"Today," he notes, "the students at LMU are behaving much differently. They elected a student body president who is a conservative Hispanic Republican and who worked in Washington on the staff of a Republican congressman."

Thoughts about the role of a Catholic university in a secular society, and about the special contributions that a Catholic university can

make to its students, inevitably come to Fr. Merrifield. That role, he has said, is "to raise the ultimate questions and to bring the message of the Gospel to bear on the human, secular situation."

For the students, the environment at a Catholic university offers "living proof of the possibility of integration of spiritual faith and the whole spectrum of human endeavor."

"One of the important contributions of the priests and nuns," Fr. Merrifield says, "is that they're visible to the students—in the dormitories (where some live and are available 24 hours a day), in classrooms, around the campus.

"They're role models and living examples of the possibility of integrating religious faith with secular knowledge. So are faculty members who are not clergy but who are witnesses to their own secular and spiritual unity." These include members of a variety of religious traditions other than Catholic, he points out, all of whom find LMU a congenial place to work.

During his years as president of Loyola Marymount, Fr. Merrifield maintained a deep interest in the life of the Los Angeles inner city and the work of the wide variety of groups whose members serve the needy there.

He developed a close relationship with the Missionary Brothers of Charity, founded by Mother Teresa, whose members live among and work with derelicts on skid row and other impoverished inner city dwellers. During his Loyola Marymount presidency, he enjoyed providing religious ministry to the brothers and those with whom they work, and he has helped tutor and counsel homeless boys who live there.

He has also brought groups of students from the university to the downtown area on retreats. There they were encouraged to learn about the inner city and its people, and to pray and reflect on their experience.

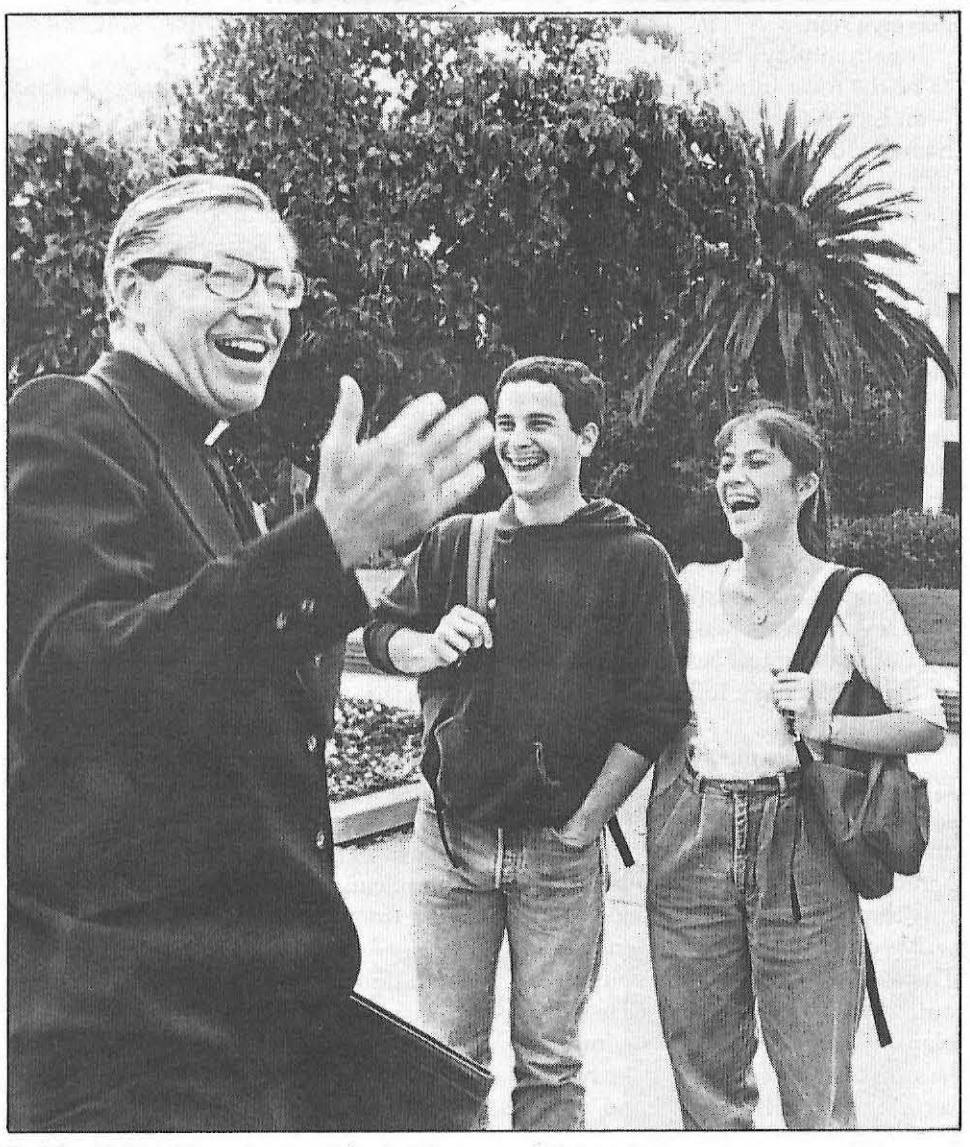
Another deep interest has been the Hispanic community in Los Angeles, for which he has developed a strong affection. He serves as chairman of the board of the Santa Marta Foundation of Santa Marta Hospital in East Los Angeles and has frequently said mass in Spanish in various parishes in southern California.

Away from his professional duties, he is an avid sailor and frequently has taken students along to crew for him on a boat belonging to the university. He also bicycles frequently, generally along the coast, and he often carries his bike with him on the back of his car. Venice is one of his favorite biking locales; here he says he is conducting "an ongoing survey of the area and its sociological development."

He has received many honors—among them an honorary doctorate in sacred theology from the University of Southern California and an honorary doctorate of humane letters from the University of Judaism.

He is former president of the Association of Independent California Colleges and Universities and a member of the board of trustees of the University of San Francisco.

As Fr. Merrifield moves from the presidency of LMU to his role as chancellor of the university, he becomes involved in a variety of new projects. These include leading major fund-raising efforts with a significant increase in endowment as one goal, and also expanding work with alumni through individual contacts and seminars, representing the university at public functions within the city, expanding continuing education programs, and continuing to do volunteer work in the community.



Fr. Merrifield with students at Loyola Marymount University.

In a world where many people hold dismal expectations for the future of the earth and the human race, Fr. Merrifield is a spokesman for hope, and he chose this topic as the title of his commencement address in 1984.

In expressing optimism for the human condition, he draws inspiration from the sciences because he says that scientific research "offers hopeful examples of how people can tackle problems and solve them."

"If we don't act as if there's going to be a future, we become catatonic," he says. "We have to believe that human beings *can* solve problems; we have to get out and get involved.

"Hope is not futuristic optimism but a serious appraisal of our resources and an orientation to problem solving," he told graduates in June. "Hope believes that in spite of the irrationalities and limitations of our human experience, we can do something about our fate here in the universe, in the country, in the city, in our own lives — but not that success is inevitable."

He also likes to remind young people of St. Ignatius's famous dictum: "Pray as if all depends on God, but act as if all depends on you."

Another favorite quote—one that he used both in his inaugural address in 1969, and again in 1984, is from Robert Kennedy: "Our future may lie beyond our vision, but it is not completely beyond our control. It is the shaping impulse of America that neither fate nor nature nor the irresistible tides of history, but the work of our own hands, matched to reason and principle, will determine destiny. There is pride in that, even arrogance, but there is also experience and truth. In any event, it is the only way we can live."

With this perspective to motivate him, Father Merrifield is actively involved in a new phase of his career —one he could never have anticipated when he enrolled at the Institute to study chemistry. But the problem-solving orientation that characterizes the scientific process will be active in his work, along with a strong measure of hope that beyond the problem there lies a solution.

Goldreich awarded Chapman Medal

Peter Goldreich, the Lee A. DuBridge Professor of Astrophysics and Planetary Physics, has been awarded the Chapman Medal of the Royal Astronomical Society for 1985.

The award was made in recognition of his work on the dynamics of planetary rings.

Goldreich joined the Caltech faculty in 1966 as associate professor of planetary science and astronomy. He has conducted theoretical research on planetary rings, the rotations of Mercury and Venus, stellar winds, radio bursts from Jupiter, the mechanism of pulsars, neutron stars, and the natural masers in interstellar clouds.

He has been elected to the National Academy of Sciences and the American Academy of Arts and Sciences, and in 1979 he was named the Henry Norris Russell Lecturer of the American Astronomical Society. He shared the title in 1981 of California Scientist of the Year—an honor conferred by the California State Museum of Science and Industry.

Real Genius:

Caltech by any other name gets help from an insider

Among 1985's theatrical releases will be an entry called Real Genius, *about undergraduate life at a high-powered school of science and engineering. Produced by Brian Grazer (*Splash, Night Shift*),* Real Genius *is a comedy about a group of brilliant science students and their unique lifestyle at the Pacific Institute of Technology, otherwise known as Pacific Tech.*

If all of this sounds a bit familiar, it's no coincidence. Although the film's exterior scenes were shot at Occidental and Pomona colleges, Pacific Tech's inventive and irreverent students, unique environment, and high-tech pranks are modeled to a considerable degree on life at Caltech.

Behind the scenes, the film also includes a genuine Caltech student, David Marvit, BS '84, who was hired as the production's technical consultant to help, as he puts it, "keep the portrayal as true to life as possible."

Currently on leave of absence from Stanford, where he is a first-year graduate student in neuroscience, Marvit has been with Real Genius *since the first day of shooting in October 1984 and is currently involved in editing of the final cut.*

Here he talks about his advisory role in the production and about the film makers' efforts to create the sort of institution likely to harbor "real genius."

David Marvit was interviewed by Heidi Aspaturian.

Their minds enmeshed in the intricacies of science and technology, Pacific Tech students add little luster to a campus social occasion. David Marvit, BS '84, technical consultant and extra, is second from right. Photograph by Marcia Reed.

The movie's plot revolves around a science prodigy named Mitch Taylor. He comes to Pacific Tech at age 15 to get his degree in physics and to work with his idol, Jerry Hathaway, an egocentric scientist who is described in the script as a cross between Carl Sagan and Jerry Brown.

Mitch and his roommate Chris, a senior, are designing a laser for Hathaway without realizing that he made a lucrative deal with the military to sell the finished product. When the laser disappears, they realize they've been set up and they decide to sabotage the instrument.

The way I got involved in the film says a lot, to me anyway, about the advantages of being a Caltech student. The movie's associate producer called the dean's office, wanting to talk with a student about life on campus, and she was given my name.

At Tech I was known as someone really into film and, because the Caltech community is as small as it is, the dean's office was aware of my interest in this area. The associate producer and I had a long talk about student life, about slang, and about the Caltech experience in general. Then I got a call from the director, Martha Coolidge, and we had several long phone conversations.

I was hired because Martha's premise is that audiences know when they're being lied to. Basically, I was to be responsible for keeping things as honest as possible, both to the science and to the spirit of life at Tech. My role was to be a resource when one of the actors, or the writer or the director, wanted to ask me questions.

For instance, in one scene a character says that he has a plan to increase the power of the laser "at least tenfold." I suggested changing this to "an order of magnitude," because it's a more correct way to say it, whether the audience knows the meaning or not.

Some of my more elaborate ideas actually wound up in the film. My largest contribution is a scene where each time Mitch goes into a classroom there are more and more tape recorders and fewer students. Eventually he comes in and there's a large reel-to-reel lecturing to a room of nothing but tape recorders. I got a real charge when they actually filmed this—with 60 tape recorders of all different shapes and sizes!

I'm also an extra in the film. In fact, they used about a dozen Caltech students as extras in scenes in dorm hallways, on campus, and at the president's freshman tea. To me, this is both an asset to the film—Hollywood extras don't generally look like Techers—and kind of a valentine to the school.

The producers made a concerted effort to get all kinds of firsthand background on Caltech. A lot of the actors and production people came out several times, including a trip to Interhouse.

A couple of times they came out with Jonathan Grice, who plays one of the leading roles, and toured the steam tunnels. Jonathan had several long talks with me about his character and about how I would perceive him.

Jonathan plays the character I find to be the most interesting in the film —an eccentric computer genius named Hollyfield who's a campus cult figure. In the film, he was one of the brightest guys in the history of the Institute, but then he realized one day that his work had been used to kill people. Suddenly he either graduated or dropped out, and vanished into the steam tunnels.

A lot of his character and actions are based on pranks in *Legends of Caltech*. For instance, he enters the Frito-Lay Sweepstakes and he does win a certain high percentage of the prizes. This is based on the McDonald's Sweepstakes that Caltech won several years ago, and the upshot of that contest is that this time, all the entries have to be handwritten.

So he has this machine that Special Effects put together, on the basis of some discussion with Martha and me and the prop guys, that does the handwriting for him. It has an aperture that holds five pen points, and it writes on cards and spits them out. There's a closeup of it just spitting out Frito-Lay entry blanks. He explains the whole thing by saying that he's come to recognize that he has certain materialistic needs and the company made up the rules, so . . . .

He also has a high quality computer from Symbolics in the steam tunnel, along with a whole series of wonderful gadgets. There's a toaster where you put the bread in a little cage and push some buttons on a computer keyboard, and the toast moves across between two heat guns which toast the bread, and then past two spray guns. You can spray on two different varieties of jelly, then butter, and then the toast drops onto a plate.

He's made a nice little home for himself down there in the tunnels. He's a caricature, but I know Techers who would do exactly that, if they could.

I also helped a lot with props. I put together a set of books to use, like the *Feynman Lectures on Physics*. Anyone who has attended Caltech in the last 20 years will recognize those. I also made some of the key projects for the science fair sequence (the film's opening sequence, which introduces the prodigy Mitch on the eve of entering "Pacific Tech").

I even got involved in costuming at one point, something I never anticipated. Wardrobe had actually gone to Caltech to take a number of photographs of students. I sat down with the wardrobe supervisor on one of the first days of work as we tried to pick out the "fashion trends on campus." She was looking the pictures over, and finally said, "My God, it's like these people dress in the dark." They did a remarkable job of duplicating that look in the film.

I think that almost everyone who comes to Caltech has a love-hate relationship with the school. And in my case, I think the love won out. I think this comes through in the film. I'm doing my best to make it a positive place. I think this film will be good for Tech. I certainly hope so.

Basketball team breaks 56-game league losing streak

Basketball

The 1984-85 Caltech basketball season featured four highlights:

1. The Caltech varsity defeated the alumni for the first time in three years.

2. The Beavers traveled to St. Louis in November for a tournament featuring four universities acclaimed for their high academic standards. The tournament was made possible in large part because of the financial assistance to the tournament by a former Washington University alumnus, Stanley Lopata. The hospitality and friendliness extended to the Caltech team was most impressive. On the floor, Tech faced a talented WU team and lost 96-50, even though the Beavers shot 72 percent during the first half. The second night, Caltech trailed MIT by only 5 points at the half but had difficulties in the second half and lost, 71-46.

3. After losing 58 straight league games (the last victory was in 1980 over Pomona-Pitzer), Caltech defeated La Verne 48-47. Tech celebrated the victory for several hours after the game, and it is said that coach Mike Poizner now wears a permanent inner smile. The victory allowed the Beavers to tie for last place with La Verne, rather than being the sole last-place occupant.

4. Next year Caltech's varsity squad will play SCIAC's junior varsity teams in an experimental league schedule to see if the Beavers can be more competitive. The major drawback is that Caltech will not have a JV team and that some players may play less or not at all under this system.

The varsity squad finished the season with a 6-17 overall record, defeating the alumni, Pacific Coast Baptist Bible College (twice), Pacific Christian, LIFE College, and La Verne College. Ed Zanelli was the leading scorer, averaging almost 13 points a game. He was followed in scoring by Chris Kyriakakis and Jim Helgren.

Sophomore Brett Bush joined the team and added height and speed at center. Brian Porter, a transfer from Whitman, helped the Beavers in scoring, rebounding, and defense, and was voted winner of the Vesper Award. Porter was also voted captain of the 1985-86 basketball team. Bill Gustafson and Chris Cotterel also made many contributions.

Redlands won the SCIAC title, with Whittier in second place followed by Claremont-Mudd.

Next year the Beavers look strong with the hoped-for return of Jeff Lester and Jeff Ford. The Beavers will lose Chris Kyriakakis and Chris Cotterel, but several key players will return. With the varsity squad playing junior varsity teams in the league, Tech is hopeful of winning between 15 and 20 games next season. Is this possible? Read this publication next year to find out!

Ed. note: The height of the bars in the February *Caltech News* Alumni Fund Chart were not accurately proportioned to conform to the statistics they represented. We regret the error.

Wrestling

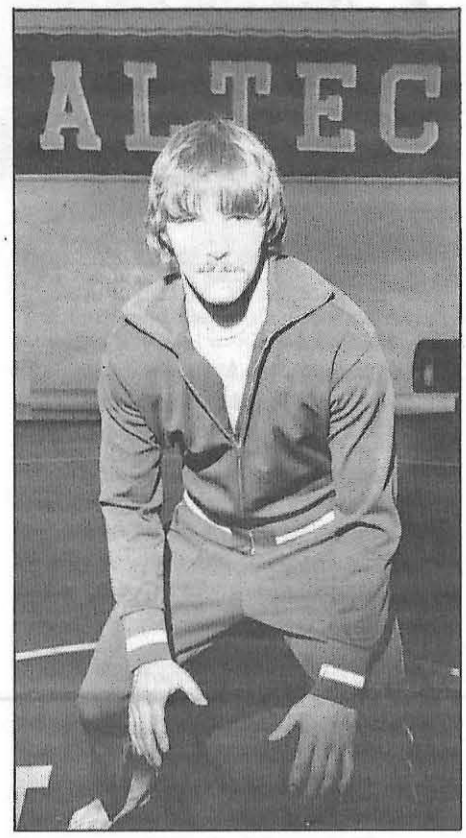
Intercollegiate wrestling nearly disappeared at Caltech this year. Several SCIAC schools dropped the activity, and wrestling was eliminated as a conference sport. The 1985 season was abbreviated due to a limited number of southern California opponents.

Nevertheless, a determined number of Beaver grapplers fought on in a spirited effort to maintain their sport as a competitive collegiate endeavor. Starting the season after the winter break, the team worked fiercely to achieve a 3-win, 3-loss, 3-tie record. The wrestlers were fortified by the return of last year's "outstanding frosh" when the muscular Mike Burl gave constantly strong performances in many key matches.

Joe Williams from Delta Junction, Alaska, was named the "Most Improved Wrestler." The "Outstanding Newcomer" award was presented to Ricketts House member Robert Green from Donegal, Pennsylvania.

Team captain Tim Cotter from Northumberland, Pennsylvania, led the 1985 squad. Cotter also won the coveted Thomas W. Latham Trophy for a second consecutive season.

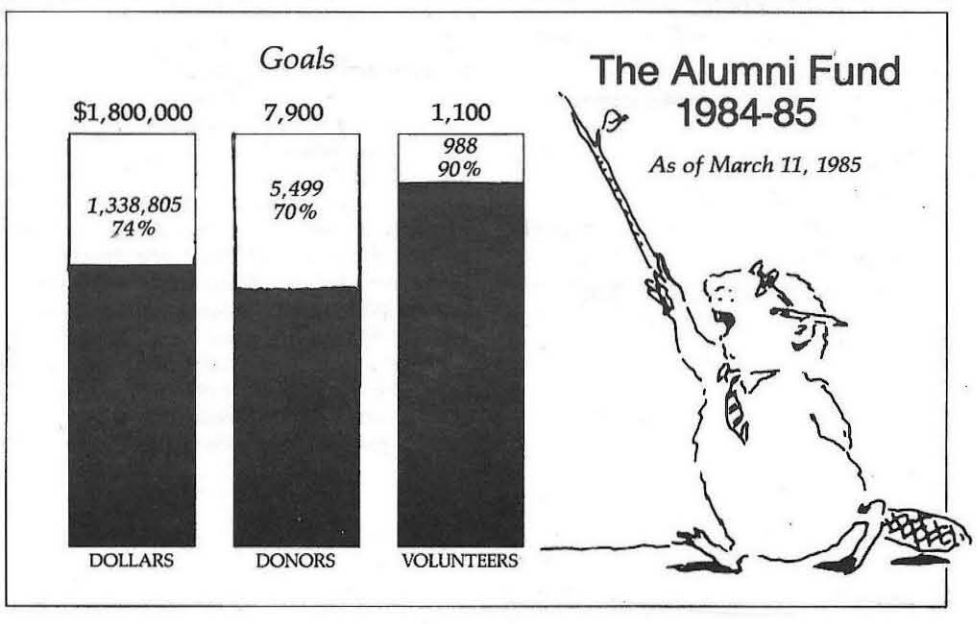
Season highlights included a 30-0 forfeit win over Claremont-McKenna College when the "Stags" informed



Sophomore Mike Burl from Ovid, Michigan, was named "outstanding frosh" wrestler last year and gave strong support this season to Tech wrestling efforts. Burl is a member of Page House and of the Tech football team.

Tech that they were no longer competitive and could not wrestle. La Verne also fell victim to Caltech, 30-0.

The season concluded with 150-pound junior Tim Cotter in action at the NCAA Division III Western Regional Tournament contest at the University of Wisconsin, Oshkosh.



Soccer

The 1984 soccer season was disappointing. Enthusiasm and morale were high and play was aggressive, but fewer experienced players returned than in past years and Tech's opposition had improved.

The only victories came at the expense of Christ College, and even these were by tighter margins than in the past. The Beavers played in close contests with Whittier and with the alumni, but the margin of defeat in the other 13 games was generally decisive.

Captain Manuel Acevedo-Ruiz, a senior from North Bergen, New Jersey, was outstanding at fullback all season long. His superior play was recognized by conference coaches who voted him first team all-conference. Acevedo-Ruiz was also selected as Caltech's outstanding soccer player for the second year.

Stefan Feuerabendt, a senior from Corona del Mar, California, was the leading scorer. He received assistance from two freshmen, Paul Cabral of Trinidad, West Indies, and Randall Bownds of San Ramon, California.

Sophomore Mike Keating of Savannah, Georgia; senior Ted George of El Paso, Texas, and Derek Ney, a sophomore from Chevy Chase, Maryland, were the starters at midfield.

Paul Furth, a senior from Washington, D. C., started the season in the goal and did a fine job until he was injured. His replacement was Sam Weaver, a freshman from Knoxville, Tennessee.

Freshmen Doug Roberts, Konstantin Othmer, and Michael Taylor teamed with senior Mark Lewis and juniors Kaveh Taleghani and Kwang Huh to provide bench strength all season long. With six freshmen, three sophomores, and two juniors returning, next year's record should show improvement.

Claremont-Mudd continued to dominate the conference and advanced to the semi-finals of the NCAA Division III national playoffs. Occidental and Redlands improved considerably over previous years, but still finished behind runners-up La Verne and Pomona-Pitzer.

Marcus awarded $100,000 Wolf chemistry prize

Rudolph A. Marcus, the Arthur Amos Noyes Professor of Chemistry, has been awarded the $100,000 Wolf Foundation Prize in Chemistry for 1984-85. Marcus received the Israel-based international award in chemistry for his contribution to chemical kinetics, especially the theories of unimolecular reactions and electron transfer reactions.

"His work has set the tone for all of the modern work in this field," according to the prize jury for the Wolf Foundation, "starting with his initial work on RRKM theory in 1951 and continuing through his present work on semiclassical dynamics and chaos. Some of these theories are currently referred to as the Marcus Theory, and many fields of chemistry have been greatly influenced by his work."

Born in Canada and educated at McGill University in his native Montreal, Marcus joined Caltech as professor of chemistry in 1978.

The Wolf Prize in Chemistry was shared by professors Herbert S. Gutowsky of the University of Illinois, Urbana; Harden M. McConnell of Stanford, and John S. Waugh of MIT.

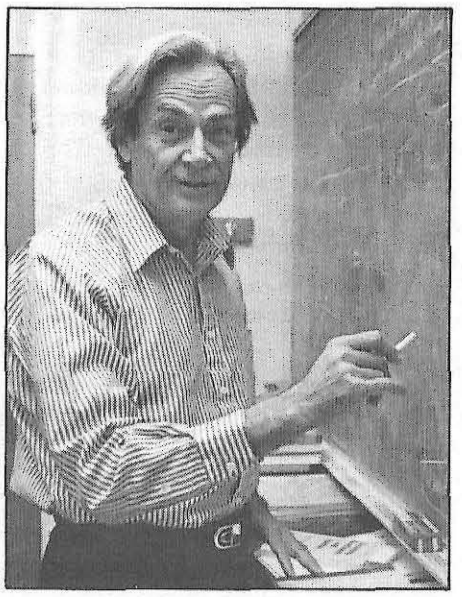
Tombrello receives Navas travel award

Thomas A. Tombrello, professor of physics at Caltech, has received the 1985 John Navas Foreign Travel Award. This award is given annually to a Caltech faculty member for outstanding dedication to the welfare and education of students.

The Navas Award, which consists of $4,000 in funds for overseas travel, will enable Mrs. Tombrello and the couple's youngest daughter to accompany Tombrello on a month-long visit in September to the People's Republic of China where he will be a consultant for the World Bank.

This year's Navas Award recognizes Tombrello for his commitment to the involvement of undergraduates in physics research, particularly through the Institute's SURF (Summer Undergraduate Research Fellowship) program.

Surely he's joking?



"Surely You're Joking, Mr. Feynman," Adventures of a Curious Character *has been tickling the funny bones of critics and of ordinary readers since it was published in January by W. W. Norton & Company. The reminescences were taped by Ralph Leighton "intermittently and informally" during seven years of very enjoyable drumming with Feynman. Ed Hutchings, former E&S editor, edited the book.*

SURF research nets physics prize for 1984 alumnus

Tak Leuk Kwok (BS '84) is recipient of the Apker Award of the American Physical Society—the only national prize given by APS for the most promising physics research done by an undergraduate in the United States.

At the awards session of the APS annual meeting in January, Kwok presented a seminar on the work he did on a 1983 Summer Undergraduate Research Fellowship (SURF) with Harvey Newman, Caltech associate professor of physics. This research was the basis of his award.

Tak Leuk conducted his SURF project in high energy physics at the Deutsches Elektronen Synchrotron (DESY) in Hamburg, West Germany, which houses the world's largest highest energy electron-positron colliding machine. His topic was "charge asymmetry in dimuon production from electron positron annihilation." Research at DESY focuses on an understanding of the basic structure of matter.

Alumni board nominates officers

The Board of Directors of the Alumni Association met as a nominating committee on February 21, in accordance with section 4.01 of the bylaws. Five vacancies on the board, and a chapter representative, in addition to the positions of president, vice president, secretary, and treasurer, are to be filled. These are the nominees for terms beginning at the close of the annual meeting in June 1985:

President: Donald P. Wilkinson, BS '48—one year.

Vice president: Paul H. Winter, BS '44—one year.

Treasurer: David J. Harper, MS '77—one year.

Secretary: Charles H. Holland, Jr., BS '64—one year.

Directors:

Edward M. Boughton, BS '55—three years.

Joseph B. Earl, BS '44—three years.

Gary A. Lorden, BS '62—three years.

William M. Whitney, BS '51—three years.

Paul H. Winter, BS '44—three years.

Spicer V. Conant, BS '64—chapter representative, one year.

Section 5.01 of the bylaws provides that members may make additional nominations for directors or officers by a petition signed by at least 50 regular members in good standing, providing the petition is received by the secretary no later than April 15. In accordance with section 5.02 of the bylaws, if no additional nominations are received by April 15, the secretary casts the unanimous vote of all regular members of the Association for the election of the candidates nominated by the board. Otherwise a letter ballot is required.

Below are biographical summaries of those nominated for directors.

Edward M. Boughton

Edward M. Boughton, BS '55, graduated from Caltech with a degree in physics. He is director of developmental energy systems with TRW and lives in Palos Verdes Estates. Boughton is a member of the Gnome Club and a life member of the Alumni Association. He was a member of the Alumni Seminar Day committee in 1980-81, 1981-82 and 1983-84, was program chairman in 1983-84, and is general chairman for Seminar Day in 1984-85. As an undergraduate he was a member of Fleming House, Beavers, *The California Tech* and *Big T*, and president of Drama Club.

Joseph B. Earl

Joseph B. Earl, BS '44, was president of The Caltech Associates in 1977. He is a director emeritus of The Associates and a contributing life member, as well as a member of the President's Circle. A resident of Arcadia, he is president of the O.K. Earl Corporation, Pasadena. As an undergraduate he was a member of the student chapter of the American Society of Civil Engineers and a letterman in football and golf. He came to Caltech in 1943 from Stanford and was a participant in the Navy V-12 program on the campus.

Gary A. Lorden

Gary A. Lorden, BS '62, is professor of mathematics and dean of students at the Institute. An Arcadia resident, he earned his PhD from Cornell University in 1966 and joined the Institute faculty in 1968. He was a member of Page House, Beavers, the Caltech Glee Club, Tau Beta Pi, Pi Kappa Delta, the Caltech Y, and the debate squad.

William M. Whitney

William M. Whitney, BS '51, whose Caltech degree is in physics, is manager of the Microelectronics Technology Section at JPL and a resident of Pasadena. As an undergraduate, he was a member of Dabney House, Tau Beta Pi, Beavers, *Big T*, and *California Tech*. He was a member of the Alumni Seminar Day committee in 1980 and he is a life member.

Paul H. Winter

Paul H. Winter, BS '44, is president of Paul H. Winter, Consulting Engineers, in Los Angeles. He is a Pasadena resident. Active on the committee for Alumni Seminar Day for several years, he was a member in 1975 and 1976, assistant program chairman in 1977, program chairman in 1978, chairman of the Program Committee in 1981, and general chairman for Seminar Day in 1982. A life member, he was secretary of the Alumni Association in 1983-84 and treasurer in 1984-85. As an undergraduate he was secretary of the student chapter of the American Society of Civil Engineers and a member of the Throop Club.

Spicer V. Conant

Spicer V. Conant, BS '64, is a resident of Phoenix, Arizona, where he is president of The Conant Group, Inc. He is a member of the Gnome Club and a life member of the Alumni Association. He was secretary-treasurer of the San Francisco alumni chapter in 1969-70, a member of the Association's board of directors in 1971-74, a member of the High School Relations Committee and of the Finance Committee in 1972-74, and chairman of the former committee in 1973-74. As an undergraduate, he was a physics major and president of Page House, a member of the Physics Club and Beavers, vice president of ASCIT, a member of the Board of Control, and was named permanent class secretary.

Five-year alumni reunions planned

The class of 1980 will hold its five-year reunion at 12 noon on June 15 in Tournament Park. There will be a barbecue at 1 p.m. with softball and volleyball afterward.

See February *Caltech News* for details of reunions for other alumni who graduated 50 years ago and at five-year intervals since that time. Reunion dates are: Half Century Club, June 1; class of 1930, May 31; class of 1940, June 8; class of 1945, June 7; class of 1950, June 8; class of 1955, May 11; class of 1960, May 17-18; class of 1965, April 13; class of 1970, May 17; class of 1975, April 13.

William Fowler: Seminar Day keynote speaker

William A. Fowler, the Institute Professor of Physics, Emeritus, will be the keynote speaker at Caltech's Alumni Seminar Day on May 17.

Fowler, 1983 Nobel laureate in physics, was scheduled to speak last year on "The Quest for the Origin of the Elements: Nobel Prize Lecture in Physics, 1983," but was unable to do so because of illness. This year he will give an updated version of that talk.

A special feature of the Seminar Day program will be presentations by three SURF (Summer Undergraduate Research Fellowship) students—Peter Cho, Gary Gibbs, and Minami Yoda.

Speakers from the faculty and from JPL who will present research seminars include James F. Bonner, professor of biology, emeritus; William A. Goddard III, Charles and Mary Ferkel Professor of Chemistry and Applied Physics; John D. Roberts, Institute Professor of Chemistry; John F. Hall, assistant professor of civil engineering; James T. Kajiya, assistant professor of computer science.

Kerry E. Sieh, associate professor of geology; David J. Stevenson, professor of planetary science; Bruce E. Cain, associate professor of political science; Thomas A. Tombrello, professor of physics; Robert D. McKeown, assistant professor of physics; Roger Blandford, professor of theoretical astrophysics; Richard C. Flagan, associate professor of environmental engineering science and mechanical engineering.

Caltech's 48th Alumni Seminar Day will begin at 8:15 a.m. with registration in Dabney Lounge. Exhibits, a picnic lunch, a wine and cheese reception in the Alumni House, dinner in the Athenaeum, and a Glee Club concert in Beckman Auditorium will be features.

Obituaries

1920
E. VICTOR HOUNSELL in Pasadena on January 19. He retired in 1972 after 41 years as a supervising engineer with Pacific Telephone Company. An avid traveler, he especially enjoyed travel by train and freighter, and for 20 years he and a colleague in Glendale conducted tours to Canada and Mexico and to U.S. national parks. He is survived by his wife, Edith; two sons, Edward II and Kenneth; a daughter, Elaine; and five grandchildren.

1922
WILLIAM T. TAYLOR on October 8, 1984, in Temple City, California, after a long illness. He retired from Pacific Telephone in 1965, and had lived for many years in El Cajon, California. He is survived by his wife, Nora; a daughter, Carol; and a brother, George.

1928
STRATFORD B. BIDDLE, JR., on January 17. He was retired and had been living in South Laguna, California. He is survived by his wife.

1933
ALBERT ARTHUR KOCH on November 19, 1984, in Menlo Park, California. Well known for his work as a civil engineer, he is survived by his wife, Jeanne Elizabeth; three daughters, three granddaughters, and one grandson.

1935
EDWARD S. PEER on February 22. Peer helped to formulate the glue used in construction of the Spruce Goose, and he was actively involved in development of the first plastics. A resident of Whittier, he was retired. Funeral services were held on February 28 at the First Family Church, Whittier. Contributions to a memorial fund in his name may be sent to the Office of Memorial Funds, Caltech 1-36, Pasadena 91125.

1939
FRANK OPPENHEIMER, PHD, on February 3. The renowned physicist did theoretical work in atomic physics at UC Berkeley. There he adapted the cyclotron for an experiment proving that uranium isotopes could be electromagnetically separated. Later he worked on the Manhattan Project. After his career was interrupted during the McCarthy era, he went on to live and teach in Colorado and then to found the San Francisco Exploratorium, often hailed as "the best science museum in the world." He was recipient of Caltech's Distinguished Alumnus Award.

1948
JAMES S. ALLEN, BS '48, of a heart attack on October 26, 1984. He lived in Saratoga, California, and worked as a member of the technical staff for ESL, a subsidiary of TRW. He is survived by his wife, Dorothy; his son, Martin; and his foster son, Michael.

PHILLIP EISENBERG, Eng, in January. After several years with the Office of Naval Research where he was head of the mechanics branch, he left to organize and found Hydronautics, Inc. He served as its first president and chief executive officer and later as chairman of the executive comittee.

1956
WAYNE VAN LEER JONES II, MS, on December 10, 1984. He was retired and a resident of Houston.

Personals

1940
KIYO TOMIYASU has been elected director of Division IV of the Institute of Electrical and Electronics Engineers (IEEE) for 1985-86, as well as a member of the IEEE board of directors. Earlier this year he was selected by IEEE as a recipient of a Centennial Medal—one of only 1,984 presented within the organization's membership of 250,000. Tomiyasu is a consulting engineer for microwave technology and spacecraft operations with General Electric Corporation in Valley Forge, Pennsylvania.

VICTOR WOUK, MS, PhD '42, writes that he has been elected a Fellow of the New York Academy of Sciences and vice president in charge of engineering activities.

1957
WILLIAM H. HEISER, MS, is joining Aerojet General in June as vice president/director. He will organize and manage Aerojet's Propulsion Research Institute, a new part of the corporation's Sacramento operations. He is currently Distinguished Visiting Professor at the U.S. Air Force Academy, and he holds a professorship at the University of Tennessee Space Institute in Tullahoma, Tennessee.

JEROLD L. SWEDLOW, PhD '65, professor of mechanical engineering at Carnegie-Mellon University, has been named a Fellow of the American Society of Mechanical Engineers (ASME).

1962
COL. CHARLES F. STEBBINS, MS, Eng '63, has been nominated by President Reagan for promotion to brigadier general, U.S. Air Force. Since October 1984 he has served as deputy chief of staff for science and technology with the Air Force Systems Command.

1964
DAVID A. HAMMER, a specialist in plasma physics, has been promoted to professor in the College of Engineering at Cornell University. Hammer has gained international recognition for his research in controlled fusion, particularly in intense electron and ion beam physics and technology.

1965
JULES B. COHEN, PhD, has been elected vice president of Sverdrup & Parcel and Associates, the engineering, architectural and planning firm of Sverdrup Corporation, and has been appointed manager of the firm's Environmental Division. He previously had been deputy corporate principal for the environmental market. Cohen is with the corporation's central region division in St. Louis.

1967
DAVID F. JAMES, MS, PhD '67, professor of mechanical engineering at the University of Toronto, has received the first engineering alumni award for outstanding teaching. The $1,000 prize, named the Faculty Teaching Award, recognizes consistently outstanding performance in formal instruction, informal consultation with students, supervision of graduate students, and development and use of innovative teaching methods. James teaches fluid mechanics and has developed an undergraduate course in biomechanical engineering.

1972
ROBERT DULLIEN writes, "I graduated from Caltech in 1972 with a BS in general engineering and went on to receive an MBA from Harvard and to start a consulting company with two associates. The company is called Industrial Technology Associates. We are involved in researching technology-based disciplines and in marketing services based on our accumulation of information. We perform technology forecasting, assist with purchasing equipment, and conduct market research and industry analysis. I would like to invite any interested Caltech graduates to apply for partnership in the company." Dullien concludes by reporting, "My wife and I have two daughters, a four-year-old and a one-year-old. We live in Libertyville, Illinois."

1972
GUANING SU, MS, sends this update: "Since graduating with an MS in electrical engineering, I have been working in the ministry of defense, Singapore. I was sponsored by the ministry for a doctoral program at Stanford starting in 1980 and I returned to Singapore in 1983 with a PhD in electrical engineering and an MS in statistics. Currently I am a deputy director in the Defense Science Organization."

1975
GERHARD BLENDSTRUP, MS, has been named vice president, marketing, for Porsche Cars North America, Inc. He will oversee market research, planning, advertising, and merchandising, and will supervise development of special promotion items. Blendstrup lives in Reno with his wife, Angelika, and their children, Stephan, 6, and Francisca, 3.

1983
KENNETH T. Y. KUNG, a graduate student at MIT, has been selected as the 1984 Russell and Sigurd Varian Fellow by the American Vacuum Society. Established in 1983 by Varian Associates, Inc., the award recognizes excellence in graduate studies in vacuum science and technology. Kung was chosen for his doctoral work at MIT in plasma-enhanced chemical vapor deposition.

1984
JOHN H. CHANG has joined the marketing department of Hewlett-Packard, Santa Clara Division. He supports impedance measurement and semiconductor test equipment manufactured by Yokogawa—Hewlett-Packard in Japan.

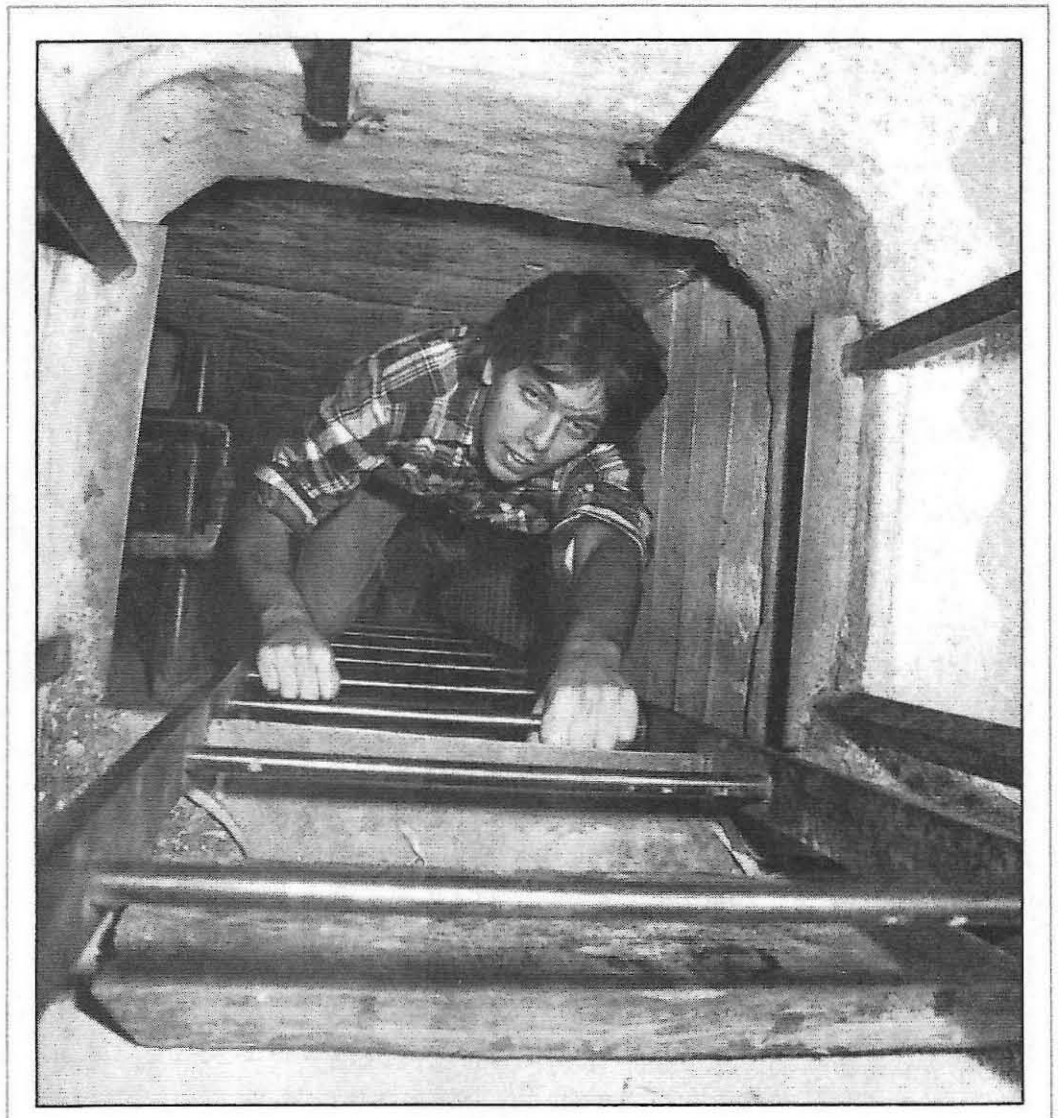
Tournament Park is ready for spring after a refurbishing that included new lawns, a new automatic sprinkler system, a redesigned playground area with new equipment, and renovated restrooms. Tournament Park was officially conveyed to Caltech by a grant deed of the city of Pasadena in 1980.

CALTECH NEWS

California Institute of Technology
1201 E. California Boulevard
Pasadena, California 91125

Published for Alumni and Friends of the
California Institute of Technology
Volume 19, No. 2, April 1985

CALTECH NEWS



A new movie peeks into Caltech's steam tunnels — and other aspects of student life at a high-tech university. David Marvit, BS '84, above, is technical consultant. See page 8.

April 1985