

SURFers Present Research

SURFers, great and small, converged on campus last weekend to celebrate the end of this year's Summer Undergraduate Research Fellowship program with a scientific conference.

The SURF program at Caltech began in 1979 to encourage creative research, promote interaction between undergraduates and faculty, and improve the undergraduate program. In five years, it has grown from 18 students to 77 students. In 1983, nearly one-third of all faculty in science and engineering participated as sponsors.

The students applied for their fellowships by developing research proposals in collaboration with sponsoring faculty members. The applications were reviewed by a committee of faculty members familiar with the fields

represented. Fellowships were awarded on the basis of perceived merit.

SURF students worked full time for ten weeks during the summer to complete the project, and then submitted papers summarizing their work. This year, stipends of \$2400 were paid to each student.

Last Saturday, Oct. 8, was SURF Seminar Day. Each student had an opportunity to orally present his work in a fifteen minute summary to students, faculty, and visitors.

The schedule of SURF Seminar Day was patterned after scientific conferences. The day started with a luncheon reception, followed by nine seminar sessions of about eight speakers each.

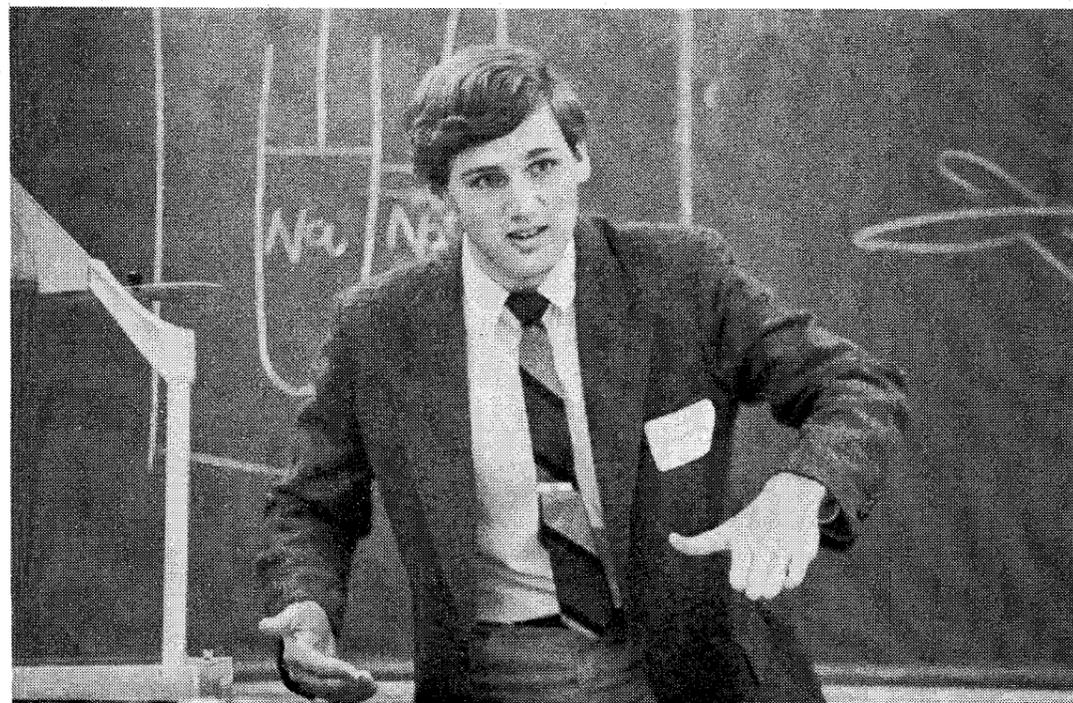
The topics of the SURF projects represented nearly all major areas of science. Projects ranged from Bradley Brock's mathematical work on Hadamard Matrices to John Butman's biological study of the growth of sympathetic neurons in biology.

Not all projects were necessarily dry or abstractly scientific. Catherine Hayes examined the influence of the Eighteenth century novel on the writings of Lord Byron. Paul Filmer set out on a trip through several European countries that took him across Gibraltar on a ferry to Morocco to conduct geological studies.

The presentations and the final written reports showed just how successful the program has been in providing a genuine scientific experience for the students. Not many of the participants reported total success in their projects, but the majority had achieved a great part of the goals outlined in their proposals. A few students reported failure or very little progress. There were even some complaints about frustrations with equipment and lack of lab space.

Applications for next year's SURF program will be distributed and collected near the end of second term. This leaves ample opportunity to study and prepare for a research project. Two valuable sources to consult are old ASCIT Undergraduate Research Opportunity booklets (and this year's, when it becomes available) and the literature put out by each department to attract graduate students. The latter usually contains specific information on the work of individual faculty members. Caltech faculty are generally extremely receptive to students and previous SURF fellows can also provide guidance about the program.

Copies of the Final SURF Reports will soon be available in the form of a book in the reserve section of Millikan Library.



Still SURFing

Top, Clare Stassen discusses computer generated holograms

Left, Robert Anderson demonstrates landing techniques of birds in his talk titled "Water Channel Tests of Trapped Vortex High-Lift Airfoils."

Fox Named to Computing Post

Professor of Theoretical Physics Geoffrey C. Fox has been named the first occupant of the new post of Dean for Educational Computing at Caltech. As Dean, he will oversee the Institute's investment in computing facilities and development of creative ways to use those facilities in education.

"The designation of a major academic post strictly to oversee educational computing is a highly unusual, if not unprecedented, step in higher education," said Caltech Provost Rochus E. Vogt in making the announcement. "However, we feel it necessary in view of the remarkable revolution in computer hardware now under way, and our determination to

use that revolution to its greatest advantage in educating our students."

According to Dr. Fox, educational computing at the Institute will be distinguished by several features, although detailed plans are not yet complete. For one thing, he said, students themselves will govern the major student central computing facility, which will include three recently purchased Data General MV4000 computers. A fourth Data General computer will be for general student and academic computing by faculty. Also unusual will be the wide array of hardware and software available to students at the Institute, he said.

"We want to provide a

highly diverse environment for our students," said Dr. Fox. "We don't want to graduate students who only know about one type of computer and one operating system. There may be a piece of equipment so cost-effective that we should standardize on it, but if we can provide diversity without paying too high a price in maintaining the hardware and software, we will clearly have provided a superior computing experience."

Besides the Data General computers, the Institute has recently upgraded or purchased numbers of computers from Hewlett-Packard, IBM, Zenith, and Digital Equipment Corp. that will be available to students, said Dr. Fox. Many

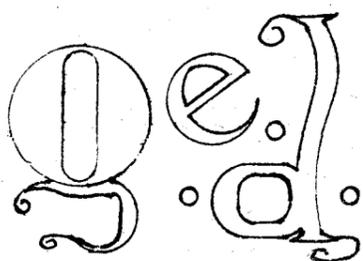
of these facilities will be tied together by the Institute's campus-wide computer network, to be operational this fall.

"We are currently adding 100 computers for undergraduate use—a considerable number for an institution with only 850 undergraduates," he said. "Our tentative strategy is to continue that rate of progress so that in five years, when computer technology has somewhat matured, we'll have about one station per student."

"However, the real challenge will not be in choosing hardware, but in developing the use of computers for educational aims in a wide variety of disciplines," said Dr. Fox. "While computers have been widely used in engineering education, there are clear analogs of these uses in physics, chemistry, biology and the humanities. This year, we have added courses in com-

puter science and in computational physics and engineering, and we will continue to explore new instructional uses for computers. Caltech, with its concentration of very able and technically literate students and faculty is well placed to be the leader in innovative uses of computers in education.

In addition to his work in high-energy physics, Dr. Fox has served as Executive Officer for Physics and is a leader in a major project at Caltech to develop a new kind of super-computer, based on concurrent processor architecture. He received his Ph.D. in theoretical physics from Cambridge University, and has done research at the Institute for Advanced Study in Princeton, Lawrence Radiation Laboratory, Cavendish Laboratory, Brookhaven National Laboratory, and Argonne National Laboratory.



by Zobi-Wan

The recent proliferation of proofs of the as yet unnamed theorem whose basic contention is that "everything you know is wrong" has prompted many to inquire into the nature of nature. That is, we desire to define the maximal set of things that are known that are right. Contrapositively, we may ask: What is the minimal set of things you know that are right that are actually wrong? Hilbert, Picard, and others have identified the Reflexive and Uniqueness Properties of numbers as absolutely fundamental not only to abstract constructions, but also to all descriptions of reality itself. Therefore, if we can cause these two basic notions to confound each other utterly, we will possess a useful tool for describing many of the right things that are wrong. [Cf. M. Python: "...I'm convinced that the vast majority of wrong-thinking people are right."]

We commence, then, with a review of the postulates to be thwarted. The Reflexive Property states that

(1) $a = a, \forall a.$

In particular, if a has the value 1, we obtain

(2) $1 = 1.$

As we shall demonstrate, the Reflexive Property has no significance whatsoever without the Uniqueness Property, a corollary of which states, in part, that

(3) $1 \neq 2.$

So a useful starting point for us would be the proof that $1 = 2$. Many notable proofs of this hypothesis have been put forth in the past. We shall examine two of them here, both from the collected works of that most prolific of scholars, P. Domain.

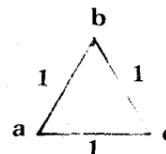
Proof 2.1. Let $a = b, a \neq 0$. Then

$$\begin{aligned} ab &= bb \\ -ab &= -bb \\ a^2 - ab &= a^2 - b^2 \\ a(a-b) &= (a+b)(a-b) \\ a &= a+b \\ a &= a+a \\ a &= 2a \\ 1 &= 2. \end{aligned}$$

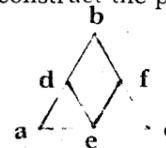
But Proof 2.1 is clearly invalid because $a - b = 0$, so the division is illegal.



Proof 2.2. Construct the equilateral triangle $\triangle abc$, with sides ab , ac , and bc of length 1.



Then the path $P_1 = abc$ has length $1 + 1 = 2$. The region between P_1 and the path ac has area $\frac{1}{2} \times 1 \times \sqrt{3}/2 = \frac{\sqrt{3}}{4}$. Now find the midpoints d, e , and f , and construct the path $P_2 = adefc$.



This path has length $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 2$. The area under it = $2 \times (\frac{1}{2} \times \frac{1}{2} \times \sqrt{3}/4) = \frac{\sqrt{3}}{8}$. Now find the midpoints g, h, i, j, k , and l , and construct the path $P_3 = aghiejklc$.



This path has length $\frac{1}{4} + \frac{1}{4} = 2$. The area under it = $4 \times (\frac{1}{2} \times \frac{1}{4} \times \sqrt{3}/8) = \frac{\sqrt{3}}{16}$. The process can be repeated

an arbitrary number of times.

In general, then, any path P_n constructed in this manner has length $L = 2n/n = 2$ and bounds an area $A = 2^{-(n+1/2)}$. Also, the 2^{n-1} triangles bounded by P_n and ac have height $H = 2^{-n+1/2}$. We apply the concept of the limit to obtain

(5) $\lim_{n \rightarrow \infty} L = \lim_{n \rightarrow \infty} 2n/n = \lim_{n \rightarrow \infty} 2 = 2.$

$\lim_{n \rightarrow \infty} A = \lim_{n \rightarrow \infty} 2^{-(n+1/2)} = 0.$

$\lim_{n \rightarrow \infty} H = \lim_{n \rightarrow \infty} 2^{-n+1/2} = 0.$

Since $H \rightarrow 0$, the path P_n approaches the line ac in a straightforward manner:

(6) $\lim_{n \rightarrow \infty} P_n = ac.$

Consequently we find that this limit path, following a straight line with endpoints a and c , has a length equal to 2 and bounds an area equal to 0. But by construction, the line segment ac has length 1. Therefore,

(7) $1 = 2.$

As is often the case, this particular proof will no doubt cause something of a stir in the general populace. If the magnitude (and direction) of this stir are sufficient, we shall examine further, equally convincing proofs of equation (7) next week.

The Caltech Y Fly-by

Friday...October 14

Noon Concert - Richard Davis Quintet. Jazz at lunchtime.
Creativity Window - continues Friday 3-6 pm in the Y workroom. Relax and enjoy the weekend.
Sign-ups for the L.A. Philharmonic October 21 performance begin today in the Y office.

Wednesday...October 19

Noon Update - Informal noon discussion with Dr. Tom Tombrello entitled "Geochemical Precursors of Earthquakes(?)." Bring your lunch to Clubroom 1 - upstairs Winnett.
Films - short films (produced by National Film Board of Canada) which the U.S. Department of Justice deemed "political propaganda". They are "Acid Rain: Requiem or Recovery" and "Acid from Heaven". Baxter Lecture Hall, 8 pm.

For more info do not hesitate to call the Y office at 356-6163.

Cinemattech

Run Silent, Run Deep 7:30 pm

Paths of Glory 9:30 pm

Saturday Evening in Baxter Lecture Hall
 Students, \$1 All Others, \$2

THE ASCIT MOVIE

TONIGHT at 7:30 and 10:00

"THE NIFTIEST CHASE SEQUENCE SINCE SILENT FILMS!" - Paul D. Zimmerman, Newsweek

20th Century-Fox presents
THE FRENCH CONNECTION
 IN THE GREAT TRADITION OF AMERICAN THRILLERS.



COLOR BY DE LUXE®

In Baxter Lecture Hall
 50¢ ASCIT members \$1 all others

THE CALIFORNIA TECH

Volume 85 Number 3
 Friday, October 14, 1983

Published weekly except during examination and vacation periods by the Associated Students of the California Institute of Technology, Inc. The opinions expressed herein are strictly those of the authors and do not necessarily reflect those of the editors.

- Editor in Chief** Ken Whang
- Sports Editor** Stewart Peebles
- Photo Editor** Brian Tsai
- Photographers** Karyn Betzen, Chris Mihos, Brian Tsai
- Reporters** Bill Craven, Doug Cutrell, Ken Hahn, Elliot Hohri, Sonny Lee, Chris Meisl, Stewart Peebles, Scott Rowland, Behzad Sadeghi, Gordon Smith, Biff Yamazaki
- The Outside World** Yosufi Tyebkhan
- The Inside World** Bob Bolender (Ri), Ken Hahn (Bl), Dierdre McClure (Ru), Scott Rowland (Fl), Bill Callahan (Da), Gordon Smith (LI), Lisa Cummings (Pa)
- Production** Bena Currin, Janice Sakai, Nick Smith, George Stecher, Sherry Smith, Brian Tsai, Yosufi Tyebkhan
- Business Managers** Joseph Lee, Peter Lim
- Circulation Manager** . Paul Gillespie

The offices of the California Tech are located in Winnett Center on the Caltech campus.

Editor: Room 115 356-6153
 Business Manager: Room 107 356-6154
 Production: Room 115 356-6153

The California Tech, 107-51 Caltech, Pasadena, CA 91125

Printed by News-Type Service, Glendale, California.

Subscriptions should be directed to the attention of the business manager.
 \$6.00 per year (three terms)
 \$100.00 per life ISSN 0008-1582

letter

More on the "Open Letter" Longtime Social Issues

To the Editor:

I would like to address some of the issues raised concerning my writing and distribution of *An Open Letter To The Freshmen*. Hopefully, this will serve to clear up the purpose of the letter.

The similarities between the social issues facing us today and those existing here years ago are striking. A 1961 article in *The California Tech* writes: "Many attempts have been made to pinpoint what it is that makes a great many students unhappy with life at Caltech. No clear conclusions have ever been reached. Blame has fallen on the faculty, the administration policies, the Student House system, the Admissions Committee, something inherent in the type of guy who desires to be a scientist, etc."

Many of the same social problems, feelings, reactions, and frustrations have perpetuated themselves to us. Consider the following excerpt from a 1965 *Tech* editorial: "Most students are aware that a problem exists, but do not quite understand what it is. How often is the phrase 'Tech is a crock' used? Students gripe, but about symptoms, without realizing that these are only symptoms of an underlying problem. Up to now, any solution offered (e.g. abolition of Frosh grades) would treat these symptoms but would not cure the disease. . . . What really disturbs students is their environment. This includes their courses, their physical isolation, and most important, the mental atmosphere in which they are suffocating. Before they get here, most students expect the school to be vibrant, alive, and exciting, not only

scientifically, but also culturally. They are disappointed. . . ."

These words could have been written today.

Describing the rotation process he encountered in 1958, Dr. R. A. Huttenback, Master of Student Houses at Caltech for ten years until 1968, writes in his *Confessions of A Genial Abbot*:

"At the end of ten days, the freshmen listed the houses in order of preference. The houses, for their part, under the delusion that they could judge a man's worth in a couple of hours, devoted endless time to preparing dossiers on the various candidates and ranking them in order of desirability. . . . It was all rather juvenile and only differed from the fraternity counterpart in that each freshman got into some house. At the end of the rotation, all the house presidents and resident associates assembled in Arden House [the then residence of MOSH-Ed.] one evening to divide up the flesh. . . . It was a rather unfeeling system, and I was happy that the victims did not really know how it operated. I do, however, clearly remember how hurt boys were who ended up in their last choice house. On the other hand, I also recall how often the freshman a house felt it had been forced to accept emerged as its president some three years later!"

I'm not quoting the above passage because of its inherent criticism of the process. The purpose is to show how the essence of things have remained the same at Caltech, even through our transition from the non-coed four-house system of 1958 to today's

seven-house, co-educational arrangement.

"With rotation over," continues Dr. Huttenback, "initiation became the order of the day, and where the former had attempted to seduce the freshmen into choosing a particular house, the latter was designed to 'integrate' them into it by forcing them to become involved in various forms of high-jinks, many of which, it must be admitted, were quite amusing. Some of the boys enjoyed the ritual, others did not. All, however, were expected to conform. It was a situation I found rather repugnant, as I was required to approve all the stunts. . . ."

"On the whole," concludes the author, "the question was not whether all of life should be serious and without nonsense, but whether a ritualized system which permitted one group to chastize another should be condoned. Effective change at this level necessitates student involvement, and I foresaw many years of debate and slow change."

It is not just a series of traditions and rituals that are passed down to new students every year. A set of attitudes and feelings; i.e. the same limited, negative outlook on life at Caltech, is also transferred to them.

Here is my question. If as

undergraduates we go around and complain about life at Caltech; if we know we have a system that each year produces many socially numb or disenchanted people; and if we realize that the lives and academic work of a few Caltech students each year are adversely affected by our social environment, then why do we insist on taking the freshmen each year and forcing them into this system?

Unscathed as yet by the social problems of Caltech, the freshmen still retain their positiveness, energy, and independence. It is such characteristics that can eradicate the problems we've inherited through our passive submission to the way of thinking represented by the system. The alternative is to continue our traditional patterns of behavior in the houses and, as another former Master of Student Houses put it, "kill the initiative and drive in freshmen."

To revive our environment, we need to subject every aspect of the undergraduate system of life at Caltech to detailed analysis. No principle should be left too sacred to question, no tradition too controversial to challenge. Discussions can take place through *The California Tech*. I also call on the Caltech Y and the Master's Office to sponsor specific-subject sessions. But the most

effective and important form of discussion is the serious and honest, one-to-one interaction that can take place between friends. Particularly, at this point in time, when the freshmen are under enormous social pressures to go along with various activities in the houses, we need to provide them with the opportunity to voice their thoughts, challenge our practices, and offer alternatives.

The purpose of *An Open Letter To The Freshmen* was to bring up some of the more immediate of these issues. The letter was written to give the freshmen a sense of the problems that, I think, exist at Caltech. It attempted to outline the process through which, in my mind, our negative attitudes and our traditions are perpetuated.

As for the "bad timing" of the letter, the following should suffice. If our purpose is to honestly discuss the problems with one another, there is no point in postponing the process. Shall we tell the freshmen, "Excuse us, Ladies and Gentlemen, let us deceive you for only two weeks and then we'll level with you?"

Unless we take action now, twenty years from now, people will be reading these words and shaking their heads in disbelief.

—Behzad Sadeghi

The Outside World

James Watt resigned this week after two and a half controversial years as Secretary of the Interior.

Eighteen people were killed and forty-eight wounded when a bomb exploded at a wreath-laying ceremony in Rangoon, Burma. Among the dead were high-ranking South Korean officials accompanying South Korea's president Chun Doo Hwan on his visit to Burma. South Korea has blamed North for the explosion, though no group has taken responsibility.

The Israeli parliament voted in a new cabinet, headed by Yitzak Shamir, after Menachem Begin's resignation. The new government faces severe economic difficulties, and has already devalued the shekel by 23 percent and reduced subsidies on consumer goods.

Kakuei Tanaka, former prime minister of Japan, was found guilty on graft charges involving the Lockheed corporation after a six year court case. Mr. Tanaka's lawyers are expected to file an appeal, which could take over a decade.

Argentina's annual inflation rate has reached 924%, the highest rate in seven years. This comes two weeks before general elections which may lead to popular rule.

Buy Caltech Cards
and save 20%

CALTECH'S

Buy Caltech Cards
and save 20%

BURGER CONTINENTAL

WELCOME FRESHMEN AND INCOMING GRAD STUDENTS



good food at reasonable prices
refills on soft drinks at all times
seconds on salad bar

SPECIALTIES: SHISH-KABOB, SHAORMA, SOUVLAKI-STEAK
HOMEMADE PASTRIES: BAKLAVA, BURMA AND NAPOLEONS

FOR THE ENTIRE MONTH OF OCTOBER

A free root beer float to all Frosh and Sophomores

Faculty, Grad Students, Attend!

Mondays and Tuesdays are Beer Days. Half price on Beer.

On Lake Avenue
1/2 Block North of California

MEDICAL SCHOLARSHIP

We provide:

- * Four full years tuition and fees
- * All books and supplies
- * \$549 per month stipend
- * Naval commission



If you are a U.S. citizen, have been accepted at an accredited medical or osteopathic school, and would like to have your educational costs paid, call toll-free 800-252-0559.

The Navy Officer Information Team will be on campus 10 November. For an interview, call the Placement Center or call toll-free 800-252-0559.

Folk Music in Winnett Carla Sciaky to Perform

The Caltech Folk Music Society will be presenting two concerts this month. The first will be tomorrow (Saturday) and will feature singer, instrumentalist and songwriter Carla Sciaky, who will perform at 8 pm in Winnett Lounge. Tickets for the concert are \$4 for the general public, and \$2 for Caltech students (thanks to a GSC subsidy). For information contact the Caltech Ticket Office at 356-4652.

Carla performs a wide range of music, including traditional folk ballads of the British Isles and Eastern Europe performed on guitar, Scandinavian fiddle tunes and

medieval tunes performed on the psaltery. Also delightful are her own original compositions, which she weaves in with traditional songs and tunes. Carla has appeared in the Dufay Consort and with the Aman Folk Ensemble, but this will be her first major solo concert in the L.A. area.

Carla's voice prompted this comment in the Olympia, Washington *Op: Independent Music*: "Sciaky's distinctive high pure voice reminds me of Jean Redpath's but is more delicate. It can easily carry the mixture of traditional tunes...and swell originals." Following her Carnegie Hall

recital in the Dufay Consort, the *New York Times* wrote, "Miss Sciaky's guileless soprano registered superbly." (We guess that means in English that they liked her.)

Future concerts that the Folk Music Society has planned include: Berline, Cray and Hickman, one of the best known bluegrass trios in the country, who will appear on Friday, October 28, and Old Mother Logo, a five-member all-woman stringband, who will perform their old-timey music on Friday, December 2. These two concerts will be in Dabney Hall.

—Brian Toby

The Inside World

Blacker: This week, Blacker was the place to be. Yessiree, let me tell you, for non-stop action, intrigue, and just plain knee-slappin' good times, Blacker was not to be outdone by any organization on Earth. Our benevolent representative of the Church and House of Blacker (the two being one and inseparable) once again invited the new froshes to a casual stroll across the lounge. As usual, however, the upperclass persons conversational expertise proved too compelling for even the most steadfast frosh, and the order of saints gained no new initiates. More excitement came to Blacker at the expense of the Ath team and House of Page (the two being one and indistinguishable) when the Blacker softball machine pulverized the Pageboys 30-zip (or something like that), and there was much rejoicing. Meanwhile, the new frosh have been systematically humiliated in consecutive badminton games in preparation for the revival of the Peter L. Smith memorial badminton ladder. (Obviously, this has not been a very effective memorial, since no one seems to remember who the heck Peter L. Smith was.) Finally, Blacker's guardian demon, the Black Hand, graced his minions with his presence, causing each freshman to quiver at the sight of the dripping hand outside his door, and to hide in his room at night, trying to cover his ears from the sounds of screaming from the next alley, or the rattling of slowly approaching chains.

—Bannister Man

Dabney: On Tuesday night at dinner, the Great Spirit of Registration appeared and did bring forth a great multitude of Number Four cards in the colors of white, gray, blue, light green, dark green, orange, bright yellow, pink, and beige. They disappeared quickly into the hands of the Darbs, all greedy to add units, and there is a report that Marrie Casey accepted a beige one Wednesday morning, though these rumors are adamantly denied by the Registrar's Office. The Great Spirit said he hopes it doesn't cause too much confusion, and that he just wants to wish Mrs. Casey the best of wishes, and add some color to her job. She'll be retiring at the end of this year, so all of us at Dabney say, "We love you Marrie, and we'll miss you!"

—Bill Callahan

Fleming: No entry.

Page: Sunday afternoon featured the traditional Greased Frosh Races and Weight Alley won the bowling pin after a grueling final match-up against Sparta. Severity ended for the Page Froshlings on Thursday after harassment and general condescension were practiced by the sophomores to the freshmen of undue wimpiness. The three designated Initiation Chairmen were showered by the indefatigable herd of forty-seven frosh, so Page House is unified once again. A pizza-and-pop (*That's "soda," of course —FF*) will welcome the Schmitts the day after tomorrow.

—Lisa Cummings

Lloyd: The annual frosh elections (spelled w-a-s-h) went off without a hitch for the first time in years, as all twenty of our newest Lloydies had to escape the house library through the windows, only to meet many gallons of water. But they got their vengeance, showering president Sergay Mnatzikanian at dinner.

The Creek alley refrigerator got its once-a-year cleaning, the event which all the rats turn out for every year. This year's crop of cultures provided them no disappointments.

Before wetting themselves, the frosh elected house shortperson Sho Kuwamoto as pope, replacing the late-but-forgotten ex-pope Gainey the first, and Tim Parrott as his counterpart the anti-pope. Matt Crandall was appointed work sucker...strike that...work *chairman*, Charles Patwell was named FUCC (pronounce that with an Italian accent or else...), and Ray Trent was named as the house warlord, in keeping with the tradition of placing the most maniacal frosh in the spot where he'll do the least damage.

—Gordon Smith

Ricketts: A relatively quiet week was punctuated by an occasional lounge war. The major event of the week was the house meeting last night at which the Social Battle plans for the term were arranged. The opening of the coffeehouse and the Framehouse cocktail party last Friday were enjoyed by all.

—Bob Bolender

Ruddock: Ruddock kicked off its social season on Saturday with the traditional picnic under suicide bridge. Highlights included an impromptu frisbee lesson for beginners from Wonderboy, a great, anyone-can-play softball game with Gleen and GH3PO as captains, and more than enough burgers for everyone. Fun was had by all.

At the first excomm and house meetings of the year, themes for interhouse were discussed and the term's social calendar was revealed. Included were movie trips, breakfasts, and parties. Don't forget the GAAC on Sunday at 4.

—Dierdre McClure

C.I.A.

AN EQUAL OPPORTUNITY EMPLOYER

NOW IS THE TIME TO CONSIDER JUNE EMPLOYMENT OPPORTUNITIES

CAREER OPPORTUNITIES
WITH THE
CENTRAL INTELLIGENCE AGENCY

The Central Intelligence Agency has professional opportunities for persons trained in the disciplines listed below. If you are a senior or graduate student now completing your studies we will be pleased to review your credentials.

- Aeronautical Engineering
- Electrical Engineering
- Electronic Engineering
- Nuclear Engineering
- Aerospace Engineering
- Optical Engineering
- International Relations
- Information Science
- Computer Science
- Mathematics
- Economics
- Physics

All initial assignments are in the Washington D.C. area. Some require foreign travel. U.S. citizenship required.

Get an application form from the PLACEMENT CENTER, Room 10, Dabney Hall. MAIL IT NOW!! Qualified applicants will be contacted to arrange off-campus interview.

MAIL YOUR RESUME OR APPLICATIONS FORM TO:

L.L. CURRAN
P.O. BOX 669
LAWNDALE, CA 90260

CENTRAL
INTELLIGENCE
AGENCY



Nuking the Shovel Theory

Robert Sheer to Speak Next Week

"With enough shovels," one Defense Department analyst has speculated, the United States could survive a nuclear war.

"Weird!" says Author Robert Sheer, who pretty much buried the shovel mentality in a recent book critical of current U.S. nuclear thinking. He will speak at Caltech on Saturday, Oct. 22, at the Athenaeum.

The Caltech Y has 12 free tickets for students to attend the \$12.50 luncheon.

Sponsored by the United Nations Association of Pasadena and The Y, the talk by Sheer, National Correspondent for the *Los Angeles Times*, will commemorate United Nations Day. His topic: "Problems in U.S./Soviet Relations."

The available tickets will be provided to students who drop by the Y office upstairs in Winnett.

**S
A
M**

SLACKS
SUITS
SKIRTS
SHIRTS

ALTERATIONS
RESTYLING
TAILORING

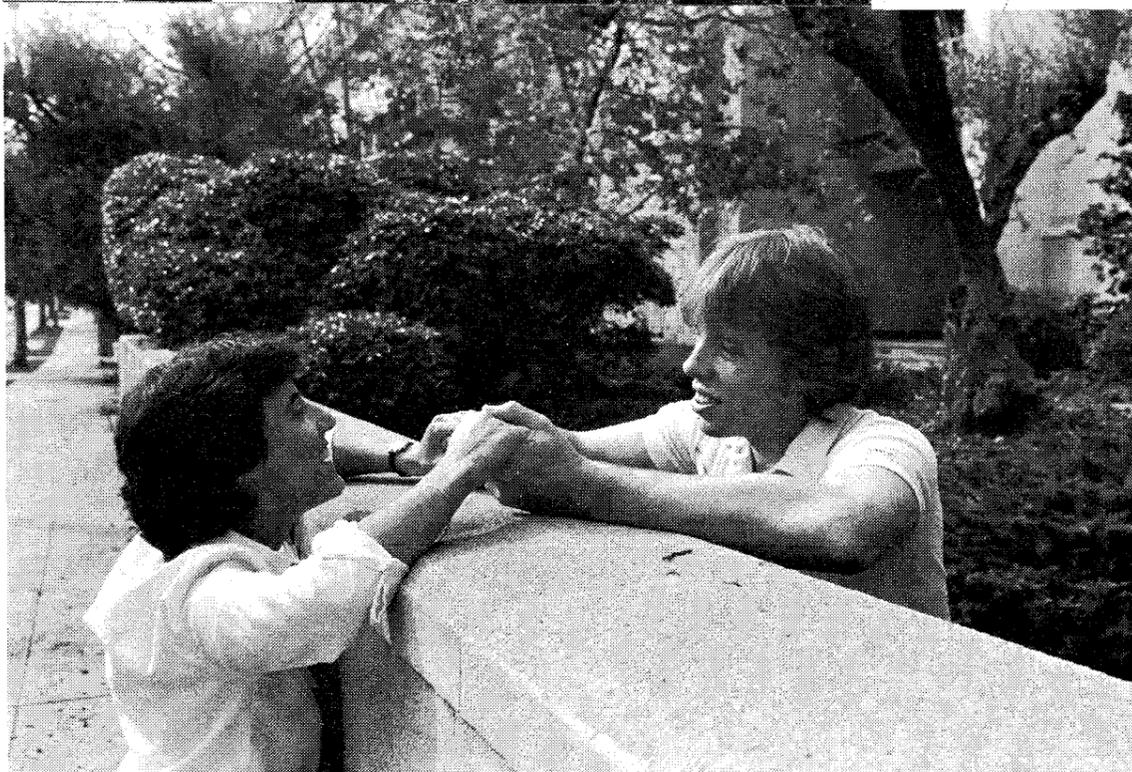
TEL. (213) 449-8634
DAYS & EVENINGS

159 So. Allen Apt. 106 Pasadena



The Fantasticks

Bellomy (left) and Huckelbee (right) are the fathers of the girl and boy *The Fantasticks*.



Luisa (left), played by Susan Berkeley, and Matt (right), played by Dean Elzinga, in a love scene.

Engineering, Math, Computer Science, Physics Grads:

Total Involvement-

It's yours, at Logicon.

From initial concept through completion, Logicon offers you the opportunity to put your talents at center stage and be an integral part of the entire creative process in a variety of software engineering and computer science areas.

We're the industry pacesetter in systems and software engineering, and as such, we can offer engineers, programmers, analysts, systems engineers and operations analysts unparalleled career opportunity and challenge. Our diverse range of government contracts allows you to tackle new problems and develop original solutions.

You'll work in a small team that's in direct contact with management so your efforts will be seen, recognized, and rewarded.

Visit with our representatives:
Tuesday, November 8, 1983

Logicon offers top working conditions in a modern 11-story building which overlooks the historic San Pedro Harbor. Our scientific environment is enhanced with private and semi-private offices and easy access to computer facilities. We also have other offices in Ohio, Utah, Colorado, Massachusetts, and Washington, D.C.

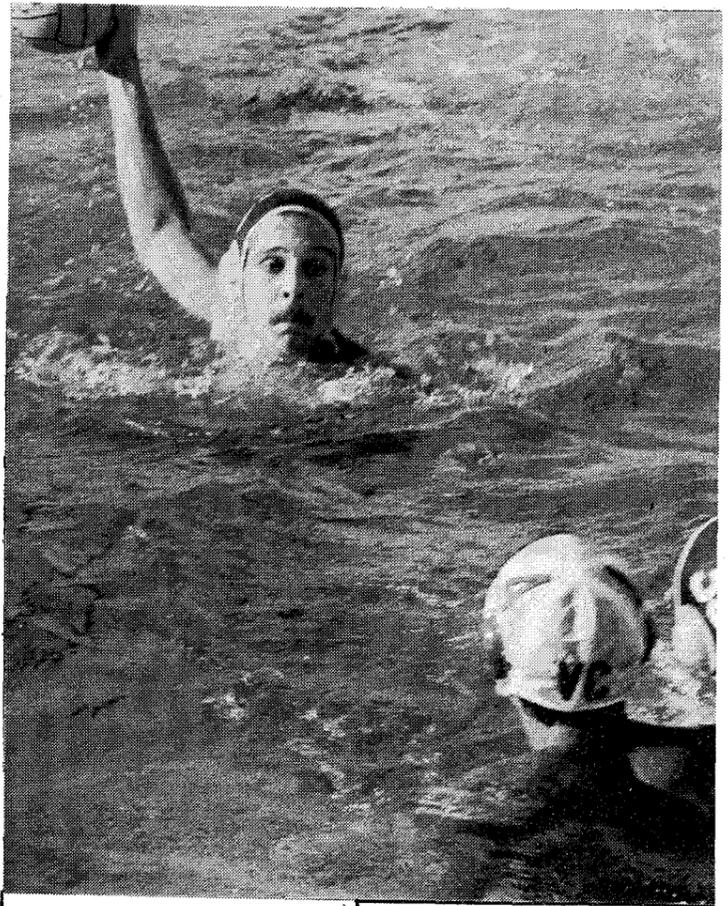
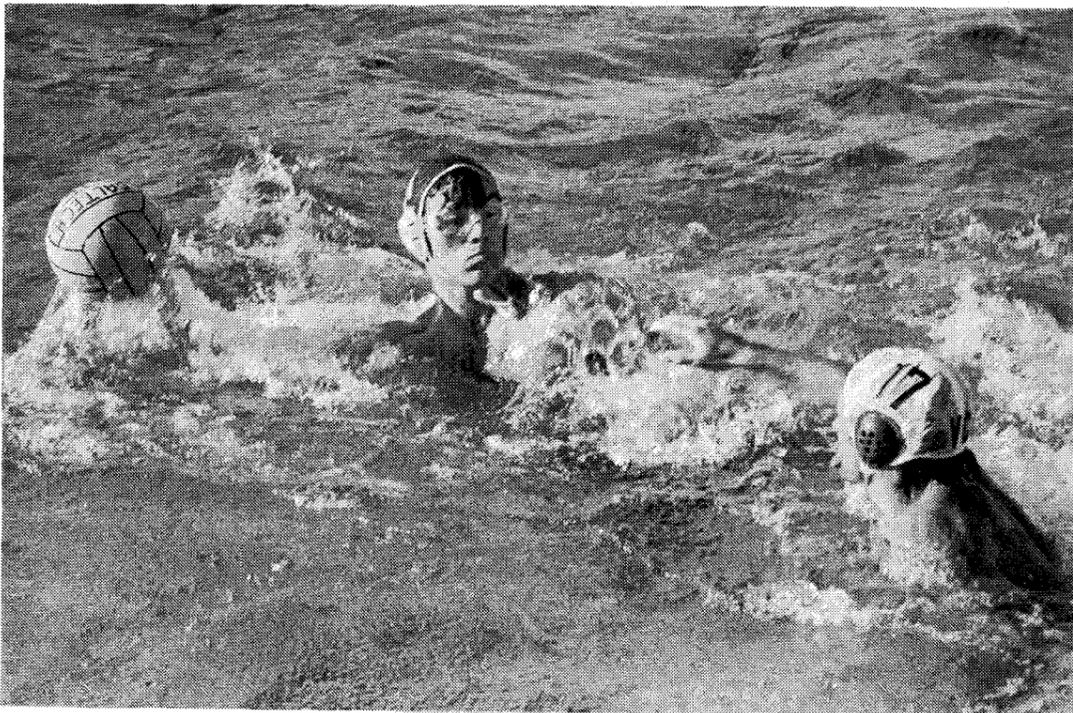
We're looking forward to meeting with you on the 11th. But if you are unable to attend, please send a resume or letter detailing your experience and career desires to:

Nancy Hancock
LOGICON
255 W. 5th Street, Dept. 86V
P.O. Box 471, San Pedro, CA 90733, (213) 831-0611
An Equal Opportunity Employer M/F/V/H

LOGICON

U.S. Citizenship
Required

sports



DAY	DATE	TIME	SPORT	OPPONENT	LOCATION
Fri.	10-14	7:00 pm	Women's Volleyball	Whittier JV	Caltech
Sat.	10-15	TBA	Cross Country	Biola Invitational	La Mirada Park
Sat.	10-15	10:00 am	Soccer	Claremont-Mudd	Caltech
Sat.	10-15	10:00 am	Water Polo	Redlands	Redlands
Sat.	10-15	2:00 pm	Women's Volleyball	Christ College	Caltech
Tue.	10-18	6:00 pm	Women's Volleyball	Occidental JV	Occidental
Wed.	10-19	3:00 pm	Soccer	So. Cal. College	Caltech
Wed.	10-19	4:00 pm	Water Polo	Claremont-Mudd	Caltech
Sat.	10-22	9:00 am	Fencing	Cal State Northridge	Northridge
Sat.	10-22	9:30 am	Cross Country	Pomona & Claremont	La Verne
Sat.	10-22	10:00 am	Soccer	Whittier	Whittier
Sat.	10-22	10:00 am	Water Polo	Whittier	Caltech
Sat.	10-22	1:30 pm	Football	Northeast Bengals	Caltech
Sat.	10-22	2:00 pm	Women's Volleyball	Redlands JV	Caltech

The Water Polo team lost to L.A. Valley 17-7. Above left, Dave Watkins searches for an opening past a charging opponent. Above, Paul "Bone" Graven powers up for a might shot to the Goal. Photos by Brian Tsai

Beaver X-Country Takes Third Victory

Coach says "Everyone finished well"

Despite injuries to three key people, the Caltech men's Cross Country team was able to post its third victory of the season October 8. The Beaver harriers jumped on Whittier at Bonelli Park and came away with a 22-38 decision (low score wins).

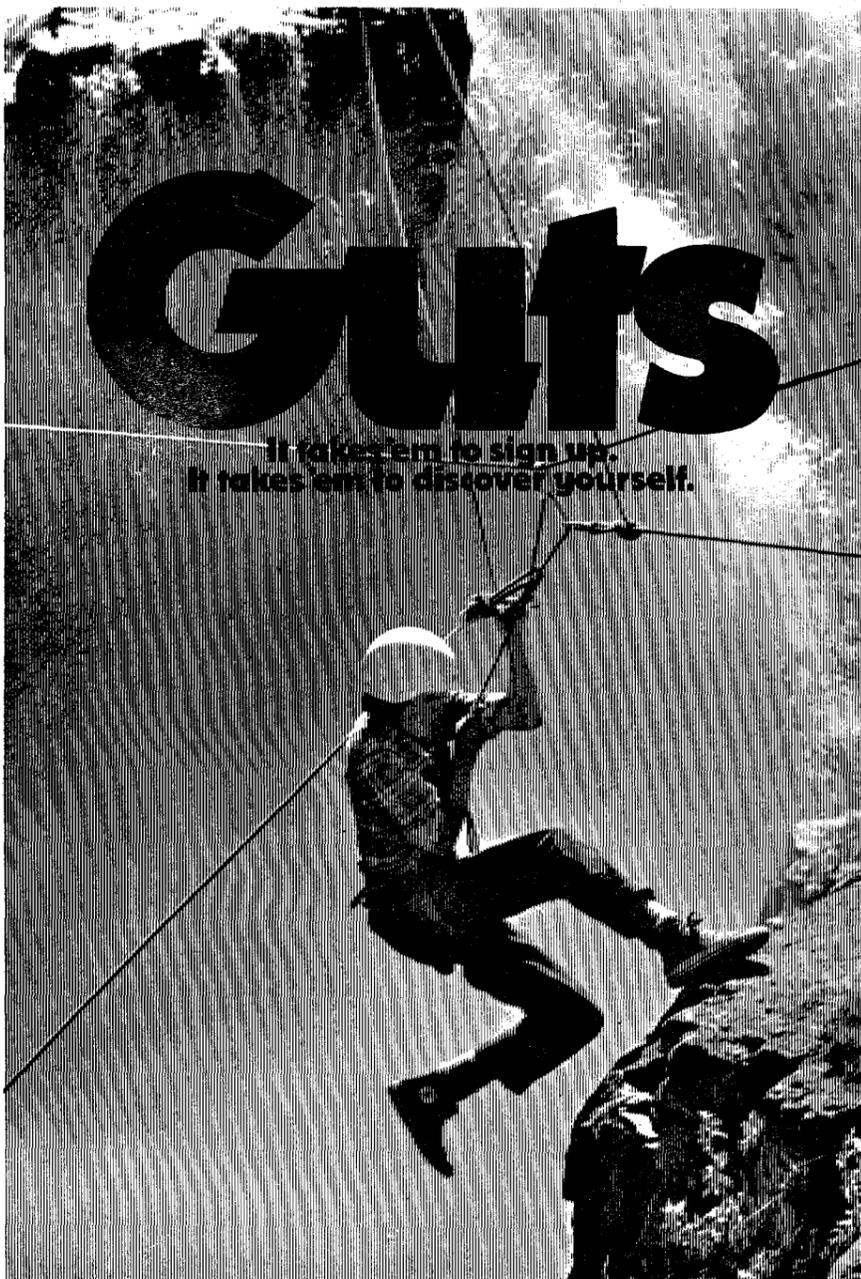
Injuries to frosh runners John Beck, Darin Acosta, and Mike Jensen left the team weaker than usual. Thus two other competing teams, Occidental and Claremont, were able to post victories of 50-15, and 26-30 respectively.

The meet results left Caltech's record at 3-7, with two wins coming a week earlier against Cal State Bakersfield and Pepperdine.

Caltech's top finisher was senior Steve Stahl, who came in ninth overall with a time of 28:55. The race was won by Ziblott of Occidental in 28:01. Other Caltech runners included Bob Kelly (14th), Brian McClain (20th), Matt Penn (21), Sean Moriarty (22), Robby Dow (23), Charles Lee (26), and Tom Workman (31).

In the women's race, Jennifer Haase claimed eighth for Caltech. No times or team results were available, as Caltech did not field a complete team.

Coach Neal is happy with the progress his team has made. He said, "Saturday's results indicate tremendous improvement for us in many areas. Everyone finished well."



Outward Bound is a shot of high adventure in the wilderness. And a lot more.

It's a trip that'll show you what you're made of.

You can discover you can do almost anything you want—if you try.

Our 3-week experience in self-confidence sure isn't easy. But it might just last you the rest of your life.

Your first challenge: send for full information.

Name _____

Street _____

City _____

State _____

Zip _____

School _____

Phone _____

Check the courses that interest you.

Canoeing _____ Desert expeditions _____

White water _____ Wilderness _____

rafting _____ backpacking _____

Sailing _____ Mountaineering _____

**Outward Bound, Dept. CG,
384 Field Point Rd.
Greenwich, CT 06830
phone toll free (800) 243-8520**

No experience necessary. Outward Bound admits students of any sex, race, color and national or ethnic origin. We are a nonprofit organization. Scholarships available.



Outward Bound®
The course that never ends

Photography: National Geographic Society

announcements

Give Blood

This fall's blood drive will be held on October 26, 27, and 28 from 9:45 am to 2:30 pm in Dabney Lounge.

To make an appointment, call Robin Craig, x6374, or sign up in your student house. Drop-in donors will also be welcome.

As usual, the house which donates the most blood will get a quarter keg of beer.

OWC Capra Retreat

A weekend at the Capra Ranch for Caltech women, Oct. 28-30, sponsored by the Organization for Women at Caltech. Time to socialize. Time to be by yourself. Beautiful surroundings, great food. All Caltech women are eligible. The fee of \$25 for the entire weekend includes room charge and meals. Theme for the Saturday discussion will be "Men as Allies" led by Karen Anderson, Ph.D., Medical Psychology. Dr. Anderson is on the faculty of the Wright Institute of Los Angeles.

Partial subsidy for child care available. Call Cheryl Con-topulos, x6105.

Make your reservations now. Call Carmela Kempton, x6195, Lesley Benson, x4717, or Jean Anderson, x4521.

CS Scholarship

Sophomores and juniors in computer science who are maintaining a B average can apply for the International Computer Programs (ICP) scholarship.

For the 1984-85 school year, this award will consist of one scholarship for a full year's tuition, room and board, and up to \$5,000 for other educational expenses.

Applicants will be judged by their grade point average, need for financial aid, participation in DP-related activities, school activities and leadership roles, and an essay to be written by finalists.

Applications and more information are available in the Financial Aid office. The deadline for application materials is November 15.

Volleyball Triples

The Caltech Men's Volleyball club will sponsor another triples tournament on Sunday, October 23rd, from 8 am until noon in the Brown Gymnasium.

The tournament is free and is open to all Caltech community. Teams of three will be selected at random among the participants. Trophies will be awarded to the best two teams.

Advance registration is recommended since there are only a limited number of entries.

Please contact Scott Laurence or the Athletic Office at x6146 between 10 am and 5 pm weekdays for registration or more information.

Astronauts Vs. Droids?

The L5 Society presents a lecture on the psychological and sociological roots of the man versus machine in space debate. Mr. Bill Haynes, Aerospace Corporation Manager for Manned Spaceflight Support, will discuss the humanistic basis for this crucial space policy issue. The lecture will be held on Saturday, October 22, at 7:30 pm at JPL, Von Karman Auditorium, 4800 Oak Grove Drive. The general public is invited to attend and admission is free. Call 374-1381 for more information.

Spend Time Abroad

There will be a meeting for anyone interested in the Watson Fellowship program next Tuesday at 5:00 pm in the Deans' Office, 102 Parson-Gates. This fellowship enables graduating seniors to spend a year abroad. Joe Kirschvink, a Caltech geologist and former Watson winner, will talk about his year in Australia. Goodies will be served. The *deadline* for Watson essays is next Friday, October 21st.

Rum Runners

The Bacardi Rum Imports are sponsoring their first Southern California 5 & 10 kilometer Rum Run, a benefit for the Sickle Cell Disease Research Foundation and the National Association for Sickle Cell Disease, Inc. This event will take place Sunday, October 16th, 8:00 am at Playa Del Rey Beach. Radio stations KGFJ-AM and KUTE-FM will provide live coverage. 2000 runners are anticipated and an undetermined number of spectators. Celebrities, politicians and many influential people will attend this event. All registered runners are eligible to win the grand prize of a Hawaiian trip for two. For further information call the Sickle Cell Disease Research Foundation at 299-3600.

Money For Sale

A rare coin auction will highlight the October 19 meeting of the Caltech-JPL Numismatic Society. Early American as well as foreign material will be included in the auction. Available for sale will be such interesting old items as Indian Head cents, silver coinage, and a silver dollar. At least one ancient coin will be on the block. Some lucky bidders will take home choice and interesting additions to their collections. Bring your cash and be ready to bid!

Meetings are held the third Wednesday of each month at 7:30 pm in the Church Laboratory building on campus. All members of the Caltech-JPL community are welcome to attend.

Dangleflieger

The Caltech Hang Gliding Association now exists. Anyone interested in flying or who is just curious, contact Tom Bulgerin, Dabney House, Room 4.

See Twain's Shorts

Pandora's Players, a newly formed theater company (partly of TACIT alumni), will be presenting "Mark Twain's Bizarre Shorts" on weekends Oct. 21 through Nov. 13. The show is an adaptation of several of Mark Twain's more unusual and lesser known works. Dates are Oct. 21, 22, 23, 28, 29, 30; Nov. 4, 5, 6, 11, 12 and 13. Showtimes on Fridays and Saturdays at 8:00 pm, and Sundays at 2:00 pm. Performances at the Little Theater of Hoover High School, 651 Glenwood Rd., Glendale. Tickets are \$4 for students and \$6 for the general public. For reservations and information call (213) 447-6822.

Food and Drama

For anyone interested in Theater Arts at Caltech, the Drama Club is offering a free dinner Saturday, October 15, starting at 4 pm in Dabney Gardens. After dinner, we will see the evening production of *Candida* together.

You need not have any experience in drama; we only ask for an interest. If you wish to learn we will teach.

If you want to find out about Theater Arts at Caltech and wish to meet the people involved (and get a free meal and see a show, too), come by Dabney Garden tomorrow at 4.

For more information call x6259 or drop by the Drama Office in Winnett.

Get Your Big T's

Any upperclassmen who hasn't received a copy of the *Big T* yet can pick one up in the Dean's Office.

CLASSIFIED

PROFESSIONAL TYPING by Sheri. Reasonable rates. Call ext. 6393 from 8 AM to 5 PM.

ADULTS with FOREIGN accents. POLISH your ENGLISH diction in GROUPS with DIALOGUES \$5.00—with CASSETTES \$10.00. CALL (213) 799-4073.

EARN \$500 OR MORE each school year. Flexible hours. Monthly payment for placing posters on campus. Bonus based on results. Prizes awarded as well. (800) 526-0883.

SWIMMING LESSONS Stroke improvement. Individual/Pairs. Ages 3 yrs. to 90+. Your own pool. Margaret at 449-8634.

COMBUSTION ENGRG. SR./GRAD STUDENT Needed immediately for 1-2 qtrs. as Research Asst. to UCI staff providing technical assistance to Calif. DHS on implementation of AB1513. Under tutelage of professional engr., R/A will be involved in development of performance stds. for low-level radioactive waste incinerators integrating variety of emissions stds. and testing methods with goal of designing a joint permit application usable by multiple state agencies. Primary task will be to gather and integrate materials. Hands-on testing experience possible. Occasional travel to W. LA necessary. U.S. citizenship reqd. Call JIM TRIPODES, EH&S Office, UCI at: (714) 856-7066 or 6200.

*Students in appropriate Physics and Chemistry disciplines may also apply.

THE HAIR CUTTERS

HIS AND HERS
OPEN EVENINGS

449-6967 449-1022

\$3.00 Discount for Caltech students with this Ad

1009 E COLORADO PASADENA
NEXT TO THE ACADEMY THEATRE

PARKING IN REAR



PAINTING BY GREG SUSCA

CALTECH PAINTER WISHES TO DO SIDE WORK. SPRAY, BRUSH OR ROLL, COMMERCIAL, HOUSES, APARTMENT BUILDINGS, LACQUER CABINETS, NEW WORK OR OLD WORK, INSIDE OR OUTSIDE. NO JOB TOO BIG OR SMALL. FREE ADVICE WITH EVERY FREE ESTIMATE. SPECIAL RATES FOR ALL CALTECH EMPLOYEES AND ASSOCIATES.

HOME PHONE: 248-5646



Steve's Pet & Bike



- Schwinn & Peugeot
- Complete Line of Pets & Supplies
- Grooming Also

To the Caltech community with Ad:
5% Discount on New Bikes
10% Discount on Repair & Parts

2395 N. Lake, Altadena

Open daily 9-7

797-9247

Caltech 107-51
PASADENA, CALIFORNIA 91125

The California Tech is published weekly except during examination and vacation periods by the Associated Students of the California Institute of Technology, Inc., Winnett Center, Caltech (107-51), Pasadena, California 91125.