

Freshman Class Floods Tech, Plumbing in Ruins

by Ann Orel

History is repeated *again*—a new freshmen class floods into Tech. Upperclassmen are confronted with frosh attempting to "make it" at Caltech and getting lost in the process.

There will be 217 students in the class of '77—a drop from last year's high figure. The number was kept down by a system of "rolling admission." The people on the waiting list were admitted as space became available (the last being admitted two weeks ago).

Vital Statistics

Now to the vital statistics: twenty-nine of the class are women (a three point gain from last year's figure, and considerably more than the dismal of seventeen proposed earlier this year).

The number of applicants this year was up slightly, countering a long downward trend. The same trend has been noted in a



Caltech Y members exploring off-campus housing facilities.

majority of private colleges. This is due to recent upturns in costs caused by inflation and a lack of money available to supplement private education.

The upperclassmen who have been on campus during the influx of freshmen will have a brief rest in direction-giving and lost-sheep-rescuing while the froshlings are trapped on Catalina. But we'll be back Saturday.

A Life of Sin?

Molly Rooming With Hal

by Dave Peisner

Four years ago, the *California Tech* converted its typesetting procedure from letterpress methods to the IBM cold typesetting process. At the time, only part

Krout and Schneider Take Over Security

by Eric Eichorn

Caltech's entire twelve-person Security force has been dismissed and a private security agency hired to take over its duties. This action, apparently decided on in June, was executed in a matter of hours, and with a level of secrecy that would make The Plumbers envious.

On the morning of Monday, September 10, the members of the now defunct Caltech Security Force were called to a special meeting. At that time they were

given their final paychecks, including two weeks or more severance pay, depending on the individual's length of service. Discharge from the job was immediate, with severance pay serving in lieu of advance notice. This lack of notice was said by Lee Chapman, current Security Manager, to be necessary in security operations, to avoid possible sabotage by employees who have been given notice of termination.

By Any Other Name

The firm of Krout and Schneider, Inc. has been given the contract to provide security officers at Caltech. It is a private police agency, listed in the phone directory as "Investigators," and popularly known as "rent-a-cops" or occasionally as "dial-a-fuzz." This contracting of operations is preceded by the hiring of Saga, Canteen, and R&R to run food service, which was originally operated by the Institute itself. The contract was signed Friday afternoon, September 7, with service starting the following Monday morning.

This change has been in the wind for most of the summer, but the possibility was never mentioned to the public, or to our Usually Reliable Sources, until after the end of third term when most students had gone. Around June 9 John Elliott was fired as head of Security and replaced with Chapman. Interviews for the job began four to five months ago, with Elliott notified only on his day of termination. Two guards were fired in the last few months (for cause), and several others, in response to rumors that Security would be disbanded, took jobs elsewhere.

An Explanation

The official reasons for the change are fairly straightforward. The previous force was sufficient to provide three officers on each

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Y Camping Trips

Frosh Exposed to Western Wilds

by Peter W. Beckman

Over seventy members of the Caltech Community, divided into a Yosemite group and a Baja California group, participated in this year's Y Camping Trip last weekend.

Both groups left Tech by bus late Friday morning. Upon arrival at Tuolumne Meadows the Yosemite group split into four hiking parties. One party traveled down to the Yosemite Valley floor, the second went up to Clouds Rest, the third hiked up to Youngs Lake, while the fourth went down Lyell Canyon.

Aside from occasional raids by hungry bears, the trips were relatively uneventful, although

one group did climb Half Dome in the dark so that they could watch the sunrise from the top. The water level in the area was extremely low—so much so, in fact, that Yosemite Falls itself was dry.

The Baja group, on the other hand, stayed more-or-less together at all time. They visited "La Bufadora", a coastal blowhole, and spent one afternoon sunning on the sandspit that runs into Ensenada Bay. Sunday afternoon everyone went into Ensenada itself and quickly became bored by the tacky tourist establishments. That evening was spent consuming everything (primarily *Tres Eques, Mendelo, Corona, and Tecate*) that couldn't be

taken back across the border.

While Monday's return trip was relatively uneventful for the Yosemite group, the Baja group experienced the joy of a very thorough inspection by U.S. Customs officials (including a rather mangy German Shepard with a fancy for duffel bags). About two hours later a tire went flat and the group was delayed for ninety minutes while it was fixed.

Everyone agreed that this year's camping trip was a great success. The freshmen and upperclassmen talked and interacted a great deal and had a lot of fun. Just as important unlike the last two years, everyone returned safely to Tech.

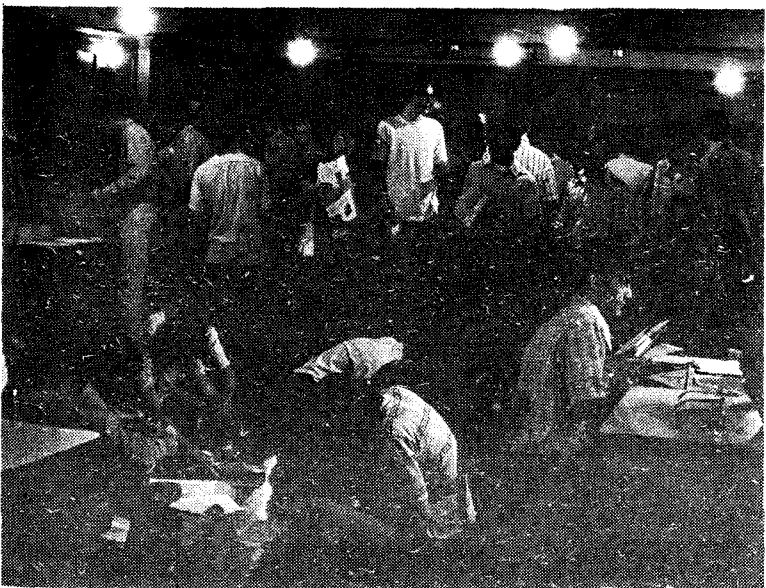
of the system could be acquired due to the high cost, and the Tech staff had to make special arrangements to produce the paper. Last month, IBM delivered the final piece of equipment.

Typesetting the Tech is a two-step process. First, a typist makes a magnetic tape of the copy by typing it on the IBM Magnetic Tape Selectric Typewriter. Then the tape is played back on the IBM Magnetic Tape Selectric Composer, which produces the material for the paper exactly the way you see it here.

When the Tech first utilized this method, only the Composer was purchased, and the staff used the Selectric Typewriter that the Biology department owns to produce the necessary tapes. Earlier this summer, the Tech made the final payment on the composer and immediately ordered the Selectric Typewriter.

Now, typesetting takes less time than ever before and allows the staff to spend more time improving the greatest paper in the world. [Ed. note: Of course, since none of us has the time nor the desire to go to London, we use this spare stuff to work on the *Tech*.]

Registration Day Blues



Math 1a students discovered Wednesday that a line was not necessarily the shortest path between two points. Photo by Feeney.

News Briefs

Fellowships Now Available to Grads

The Watson and Danforth Fellowships are now both available from the Office of the Deans. Those students who have an interest ought to apply early. Anybody interested should drop in at the Deans' Office to find out more.

Coffee, Tea, Or Me??

Coffee, tea, chicken soup (and others) in Winnett Center Office Sept. 24-28 from 10:30 a.m. to 5:30 p.m. every day. Doughnuts from 4-5. Come and get acquainted with Dr. Richard Hertz, Flora Constanten, and all the other people.

Precinct Workers Needed Immediately

Wanted: Three registered voters from this precinct to work on November 6, from 6:45 a.m. to 8:30 p.m. as election officials. Pay is \$20-\$25. See Flora in Winnett immediately.

Tolkien Trolls Hold Picnic

The Mythopoeic Society will hold its annual Bilbo-Frodo Birthday Picnic from noon to sunset, Saturday, September 22 at Arroyo Seco Park (Pasadena Fwy to Ave. 57—Herman Ave. Turnoff). Organized events (games and costume judging)

begin at 3:00 (frosh camp returns about 2:30). Rides available through Jim Vibber (792-8776). Please arrange ahead of time. Bring a mothom; costumes encouraged but not necessary.

Lecture: Benefits Of Transcendental Meditation

The energy crisis we are now facing in this country is causing every individual to fall back upon his own inner resources. We are all experiencing a period of transition in which the individual, if he is to survive, must become aware of his own inner

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Editorials

Frosh: Read This!

Hard to believe: another summer gone by. Or about to go by, at least. For you freshmen there still remain several carefree days at Camp Fox. Carefree (ha! he was heard to snicker). Free from care.

What you now hold in your hot, little hands is the culmination of several days' work for the people who represent *The California Tech*. Their days of freedom ended quite a while ago.

You'd better like this issue, dumb frosh. It was designed with you in mind. In these twelve pages you'll find articles laced with information on the Associated Students of the California Institute of Technology, its Board of Control, its Board of Directors, its Executive Committee, maybe even its movie program. You'll find some random (good word to use) information on the upcoming Rotation week. You'll find sports articles, some features, and a self-serving introduction to this paper.

This first issue of the year is slightly different from the other first issues of the year that we have on file: an experiment. We want to know how you react to it, so feel free to say anything you want to Claypool (he's going to be on the island with you).

-Dennis L. Mallonee
Eric H. Eichorn
Gavin D. Claypool

Security Blues

The entire Caltech Security Force has been disbanded (see related article on page one). While the people responsible for the change have given apparently valid reasons for the move, we feel that it was carried out in an entirely inappropriate manner, and violates a trust which the students put in the administration.

The bulk of the responsibility belongs to Richard L. Mulligan, Director of Business Services. While an ad hoc committee studied the issue (without the Caltech community being aware of the committee's existence), the issue originated with Mulligan and was finally executed by Mulligan.

The committee claims to represent the students by virtue of the membership of one graduate student and one undergraduate. The students at large were not involved in the choosing of these "representatives," nor was there any opportunity for students to express their views to them, due to the secret nature of the committee. While we have the highest respect for these individuals, we cannot believe

Continued on Page Three

FRANKLY SPEAKING by Phil Frank



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Masochism, Inc.

Your Fearless Tech Staph

Deep within the darkest pits of Winnett Student Center there reside the inconceivable trolls who compose the working body of *The California Tech*. Who are they? What are they? Why are they?

The tall, good-looking, brown-haired young man with glasses and short pants is Gavin Claypool. He has barely outgrown the fundamental year of sophomore editorship and now begins his monotonic progression along the GPA ladder. Under rapidly multiplying pseudonyms, he casts his blue suit forth against the enemies of editorial freedom. He is pure in heart, word and deed.

The tall, better-looking, brown haired young man with glasses and long pants goes under the guise of Dennis Mallonee. He currently holds down a *Tech* editorship and a double major. Although he is obviously not stupid, he is obviously a dope.

The short, squirrely-looking, dark-haired young man with glasses and short pants and a car is Eric Eichorn. Eric comes from Imola. He fears no evil, and throws caution to the wind by continuing as an editor despite almost flunking out last year.

Dave Peisner, the *Tech's* business manager, occupies the desk at the middle of the west wall in 115 Winnett. He also occupies just about every ASCIT position that has anything to do with money. If you need some Business Mangling done, look for Dave in Winnett. He's usually looking for money under the cushions in the lounge.

Peter Beckman is an ex-*Tech*-editor, recently converted into an Entertainment Editor with hopes of reviving the *Tech About Town* feature that used to be run once in a while. He's a bubbly, bibulous sort of Dude, of moderate stature and brownish hair. We like him.

The sign of the empty stare indicates Features Editor Steve Sweeney, who has yet to come up with any good ideas what-

soever. He continues his methodical plodding despite recurrent threats to promote him to Editor-in-Chief next year.

The blonde, Darb Sports Editor (whose articles on football, water polo, and cross-country will appear today or else) is Bob Kieckhefer. He continues to pressure the construction crews by trotting over to the old Throop site, burying himself waist-deep, and doing the butterfly.

Our Photo Editor is called Ray Feeney (for a very good reason). He is responsible for the maintenance of the Publications Darkroom, and the maintenance of a photo staff. Many of the photographs reproduced in this issue are his fault.

Also aiding and abetting are the following people, too numerous to mention:

TypistPetty Patti Horne
Staff Marc (Toad) Donner,
Paul Harper, random disoriented frosh.

Lots of non-entities.

Just The Facts, Ma'am, Just The Facts

by Eric Eichorn

On Tuesday, September 11, the Caltech Bookstore was held up at gun point (that's a 211 for you Adam-12 freaks). The robbery, which took place at approximately 11:45 a.m., netted \$855 for the robber.

This robbery took place one day after a new security force took over at Tech, but has no apparent connection.

Pasadena Police Department investigated the robbery at the request of Caltech Security.



CALTECH FORUM

To Bryan Jack:

I am writing to you in your capacity as head of the Honor System Board of Control to report a recent development regarding the phonograph record collection in Millikan Library. We have just completed our annual inventory of the collection and find that in the past year 240 albums have disappeared. During the preceeding year 155 albums were missing. For purposes of comparison, in years previous to the past two, the losses have been around fifty to seventy-five albums. At any rate, the combined losses of the past two years are 395 albums representing almost one-third of the total collection, and having a monetary value of around \$2,000, exclusive of staff time in ordering, cataloging, circulating, etc. At this point it would appear that adding to the collection is as futile as pouring water into a sieve; indeed, at the present rate we will soon have no collection at all. As an emergency measure, therefore, we have regretfully had to withdraw the record collection entirely and place it under lock and key. I earnestly hope that this will be only a temporary measure. I cannot say at this point what new procedures will have to be instituted as a result of this, but the new policy will clearly have to be something other than the previous one of free and open access with unsupervised circulation.

-John H. Loetterle
Humanities Library

The CALIFORNIA Tech

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A Word of Warning . . .

Don't Feed the Bears

by Dave Malone

Camp Fox is nestled snugly at the landed end of a small inlet of Santa Catalina island, about 25 knots due south-west of Long Beach Harbor. At this Camp, you, the prospective Techer, will find yourself cut off from civilization, much in the same manner that you will be cut off from civilization during the next few years.

Not quite. Camp Fox has delighted everyone who has gone to Freshman Orientation during the last two years.

The campgrounds are surrounded on three sides by cactus covered slopes that reach up to tickle the clouds (ootchy-kootchy). On the other side, the interested person will find infinitely clear water led by a rocky beach that continues at a seven degree slope out into the Pacific.

If geology is your bag, be warned: expeditions into the back country are organized continually. If you're an aspiring artist, you might take a look at some of the bare sections of the hillside and consider what could be done with them (maybe take some rocks and lay out a religious slogan). Jocks will find that the Glendale YMCA has bequeathed a miniature basketball court, volleyball areas, table tennis platforms, and a relatively flat surface designed for futsal. Aquatic adventures can include sailing, rowing, swimming and diving, snorkeling, dunk the Dolf, or anything else that can be thought of. Camp Fox offers a touch of nature that you'll never get on campus—unless you like

to hunt moles or turkeys.

Living in Sin

Camp Fox offers a variety of living quarters. The lucky lads will get to roll out their packs in an open-air no-wall construction improperly called a cabin. Here they will experience nature at its finest. They will live with salt water spray, root beer loving bees, and a sunrise that hits them smack in the eyes. There are cabins with walls. These will be filled primarily with females, who will miss the comforts of outdoor life. The lodge (the big building where meals are served) will hold camp officials, Caltech faculty, and all-night poker games. Also, out where the inlet meets the sea, many members of the faculty or administration will be anchoring sailing vessels, filled with interesting people and good stuff to drink.

Bad Stuff to Eat

Food will be abominable again this year. Meals will be semi-awaited (you'll hear more about that from your advisor, frosh), and you will have to eat what is served . . . unless you prefer to starve.

Enjoy. Catalina will be left behind sometime around noon on Saturday. You will thereupon return to Pasadena for a weekend of finding your way about. Classes begin on Tuesday. Cries of "You're doomed, frosh!" begin on Wednesday.

Mark Johnson

Seismic Waves Changing Velocity

Dr. Hiroo Kanamori, professor of geophysics at Caltech, has reported that the seismic wave velocity in the earth's crust beneath the city of Riverside has apparently been changing in recent years.

The variations were discovered by measuring the changes in the velocities of seismic waves under the Riverside area. The waves emanated from nuclear explosions in the Aleutians in 1965, 1969, and 1971, from dynamite blasts from a cement quarry in the neighboring city of Corona, and from distant earthquakes, the geophysicist explained.

Using old seismic records of more than a dozen stations in the Caltech Seismological Laboratory's network, Kanamori measured the velocity of the seismic waves by comparing the time that they activated seismographs at the various stations.

He found that the velocity did not change significantly over the years at any of the stations—except for the one at Riverside. There the velocity remained constant between the 1965 and 1969 Aleutian nuclear explosions. But waves from the 1971 detonation had increased in velocity about fourteen percent in the Riverside area, and not at other southern California stations. Wave from the dynamite blasts and distant quakes corroborated the finding.

Subsequent to 1971, seismic records of quarry blasts and distant earthquakes show that seismic wave velocities in the Riverside area have returned to

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Editorial

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that they were able to effectively represent the student body.

While we question the need for a change in security forces at all, the main issue is the way the change took place. The Institute not only did not announce the act until it was history, but did so two weeks before school started, while there was not a sufficient number of students around to express any opposition. We feel that this is an inconsiderate way of doing things and shows poor judgment on the part of the Institute.

It is argued that when dealing with a security operation it is necessary not to give the employees any advance notice, which requires giving no one any advance notice, so that angry employees will not act against the Institute while still employed. The loss of efficiency or even property for this reason cannot compare with the loss of a security force which is part of the community it protects, and the loss of confidence in an institution.

—Eric H. Eichorn
Gavin D. Claypool
Dennis L. Mallonee

The first name immediately following an editorial indicates the primary author. Succeeding names indicate approval of the contents of the editorial on the part of other editor(s). The opinions expressed in an editorial are those of the signators, and are the opinions of this paper only when signed by all three editors-in-chief. The *California Tech* welcomes all letters, but reserves the right to edit due to space limitations if such editing does not change the meaning of the communication.

Smog Profile

More You Have — More You Get

The production of smog particles is a double-barreled affair. They are produced ready-made from such sources as factories and autos and at the same time by photochemical reactions in the atmosphere.

"We find that the more pollutants you have in the air, the faster new pollutants will form," Dr. Rudolf B. Husar said in describing a research project he was involved in at Caltech.

"In a three-hour span there was a fourfold increase in aerosols while the atmosphere was being sampled at different altitudes from a plane. We concluded that more than fifty percent of this increase was in the production of aerosols in the air itself.

"It is too early to generalize about the percentage of aerosols

that are produced by atmospheric reactions, but we hope to have quantitative estimates in the near future."

The paper presented by Husar to the American Chemical Society was co-authored by Warren H. White, research fellow in environmental health engineering at Caltech, and by D. L. Blumenthal and D. S. Ensor of Meteorology Research Inc., Altadena, California.

Aerosol particles range in size from two five-millionths of an inch in diameter up to five thousandths of an inch. They reduce visibility, carry toxic materials (such as lead) into the lungs, and even modify weather by preventing a normal amount of sunlight from getting through the atmosphere.

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at Beckman Auditorium

One Performance Only!

Saturday, October 6 — 8 p.m.

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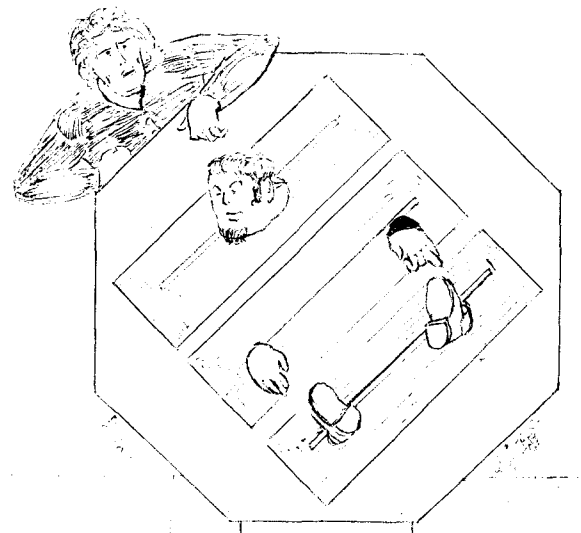
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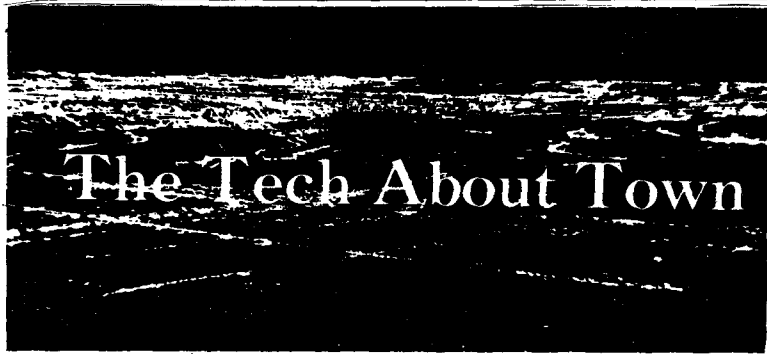
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*"I Got no sympathy!
You should never have said anything about it to Dirty Dave!"*





by Peter W. Beckman

The Los Angeles area is noted for the great number and variety of social and cultural events offered within its boundaries. Musical activities, ranging from symphonic concerts to appearances by the latest pop stars, abound, while theatre, both legitimate and experimental, flourishes. This column will attempt to keep *Tech* readers up to date by informing them of upcoming events in the area of entertainment.

Pasadena

Close to home. Caltech's own Beckman Auditorium opens its fall season on October sixth with a performance by *Don Ellis and His Big Band*. This exceptional contemporary jazz group, led by the composer of the soundtrack of *The French Connection*, will play material from their many hit recordings. Tickets are \$6.00, \$5.00, and \$4.00. As an introduction, L.A. Times jazz critic Leonard Feather will talk on "Jazz: Yesterday and Today" in Ramo Auditorium at 8 p.m. on October fourth. Admission to this lecture is free.

Locally, *The Icehouse*, Pasadena's most famous and popular nightclub, will offer music by Ian Whitcomb through Sunday. Backing him up will be Charles Fleischer, a former regular on *Laugh-In*, and Walt Conley. From September 25 through 30 Bolland and Somerville will open the show followed by Kip Addotta and Sadie Green Sales. A word of warning — *The Icehouse* is usually very crowded, so get your reservations in early.

Procolmonic?

This month L.A. is living up to its reputation as one of the popular music centers of America. First on the lineup is a concert by *Procol Harum* and the *Los Angeles Philharmonic* tomorrow evening at the Hollywood Bowl. Tickets are \$7.50, 6.50, 5.50, and 4.50.

The following weekend a number of major groups will give performances. Saturday evening, September 29, *Three Dog Night* will appear at the Forum. For those interested in afternoon entertainment, there will be a Country-Rock Party at the Universal Studios Amphitheatre that Saturday and Sunday. *Waylon Jennings, Commander Cody and his Lost Planet Wirmen, Roger McGuinn, and The New Riders of the Purple Sage* will appear. Tickets to each event will be \$6.50, 5.50, and 4.50.

The Hollywood Paladium will be the site of a performance by *Rare Earth* and *Fleetwood Mac* September 30. All advance tickets will be \$5.50.

Gone With The Chinese Opera

The Music Center is currently offering two major theatrical productions. *Gone With the Wind*, Harold Rome's musical adaptation of the famous novel is at the Dorthy Chandler Pavilion, while the Ahmanson Theatre now boasts *The National Chinese Opera Theater. The Tooth of Crive*, an experimental play by the Center Theatre Group, is opening at the Mark Taper Forum. Performances will continue through Sunday. For ticket information about any Music

Center offering please call 626-7211.

Elsewhere about town *Oh Coward*, a musical kaleidoscope based on Noel Coward's works, is appearing at the Ivar Theater, and *The Boys in the Band* is at the Off Broadway.

Upcoming theatrical events include Tennessee Williams' *Summer and Smoke* starring Eva Marie Saint which opens October first at The Huntington Hartford Theatre. The fall season will start at the Ahmanson October 16 with the debut of a new production of *Cyrano de Bergerac*. Richard Chamberlain will play the lead role.

Draft Registration Still Required

Even though there is no draft, men still are required to register with Selective Service at the time of their 18th birthday. Failure to register is a violation of the law, and could result in prosecution by the Department of Justice.

The Selective Service System currently is undergoing a reorganization as it moves into a standby system of operation. The number of local board administrative sites is being reduced to 925 nationwide from a total of 2,700 which were in existence in December, 1972. Widespread appointments of volunteer registrars and advisors to registrants are being made in most communities throughout the country so that young men may obtain guidance and be able to register without the need for traveling to the local board administrative sites. With no inductions, few problems are expected to arise for the registrants which would require visits to the local board administrative sites.

Young men have three legal responsibilities: (1) they must register at age 18, (2) they must notify their local Selective Service boards when they change addresses, and (3) they must carry their draft cards with them

The Humanities Division has brought something special to Caltech this year: instruction in chamber music by the internationally known Schoenfeld Duo, just returned from their 16th annual European concert tour.

Individual instruction and Master classes will be open to students, faculty and staff in strings, piano, woodwinds, and French horn. There will be no beginning instruction. If chamber music is your bag, mark September 24 on your calendar: auditions will be held at 4:00 p.m. in 25 Baxter.

The instructors, Alice and Eleonore Schoenfeld, have concertized in the music centers of three continents. More than two hundred of their recordings of solo and chamber music literature have become part and parcel of the European networks' presentations. They've played with leading Philharmonic and Radio Orchestras, including the L.A. Philharmonic, under the direction of Zubin Mehta.

In addition, the Schoenfelds are members of the music faculty at USC, and have coached many prize-winning students and chamber music ensembles in nationwide competitions.

Picasso Did It**Art Fair Next Weekend**

by Dick O'Malley

The 28th annual Pasadena Art Fair will begin next Friday, Sept. 28, at the Pasadena City Hall Plaza. This year, as in every year, it promises to be a fabulous Carnival in the Streets—not to be missed.

The Art Fair is being sponsored by the Pasadena Artist Associates (as usual), and is being promoted by Mr. Sammy Israel, who will doubtless be found standing near the corners of Colorado and Lake or some of

the other busy areas of Pasadena for the next several days, dressed in an incongruous outfit with a top hat and mixed match shoes, telling people what to expect.

"The Art Fair is going to be similar in concept to the Renaissance Pleasure Faire," he explains, "in that it's a place where people can do what they've always wanted to do. Plus, there will be creative artistic works of all kinds, music, folk dancing and rock in the streets. [You can] dress for your own pantomime and be a minstrel of song or sound or be a clown and join in the dancing and singing and the hundreds of artists and craftsmen displaying and selling their ware."

The Pasadena Art Fair will be open 12 noon to 10 p.m. on Friday, 10 a.m. to 10 p.m. on Saturday, and 10 a.m. to 5 p.m. on Sunday. It may be well worth the time to take a look.

Caltech Women Unite!

by Mary Beth Ogilvie

The Caltech Women's Coalition is an organization of women students, staff, and faculty designed to bring Caltech women together for discussion and action. The first meeting of the year will be held on Tuesday, October 2 at 5:30 p.m. in the Health Center Lounge. Election of officers and adoption of a charter will be followed by a talk by JPL scientist Dr. Marcia Neugebauer on "Being a Woman in Science".

Consciousness-raising sessions will be held this fall under the leadership of Ivy Bottini, one of the original members of the New York City chapter of NOW. A CR session held during the summer was attended by a wide variety of women with diverse careers and interests, and proved to be a valuable experience.

One of the projects started during the summer was the development of an affirmative

action awareness seminar for the Institute for managers and others who work with women. Another project has been the preparation of questionnaires to be sent to women undergrads, grads, staff, technical staff, and faculty on such subjects as pregnancy-insurance and leave, general health coverage, abortions, vasectomies, and attitudes towards jobs and people at Caltech. The information gained from the questionnaires will be used to help plan serious action programs for the coming year.

The women's movement has the potential to become a real force on campus. Please join—all are welcome.

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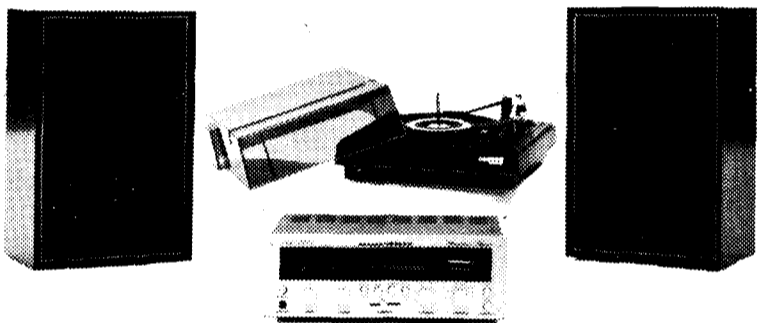
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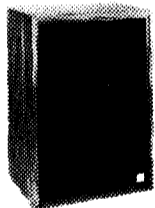
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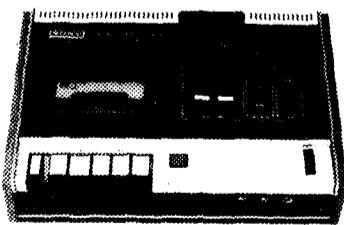
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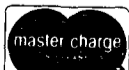
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UNIVERSITY STEREO

NSF Fellowship Awards

The National Research Council has again been called upon to advise the National Science Foundation in the selection of candidates for the Foundation's program of Graduate Fellowships. Panels of eminent scientists appointed by the National Research Council will evaluate qualifications of applicants. Final selection will be made by the Foundation, with awards to be announced on March 15, 1974.

Initial NSF Graduate Fellowship awards are intended for students at or near the beginning of their graduate study. In general, therefore, those eligible to apply will be college seniors or first-year graduate students this Fall; in particular, eligibility is limited to individuals who by Fall 1974 will have completed not more than one year of full-time or part-time graduate-level study. Subject to the availability of funds, new fellowships awarded in the Spring of 1974 will be for periods of three years, the second and third years contingent on certification to the Foundation by the fellowship institution of the student's satisfactory progress toward an advanced degree in the sciences.

These fellowships will be awarded for study or work leading to master's or doctoral degrees in the mathematical, physical, medical, biological, engineering, and social sciences, and in the history and philosophy of science. Awards will not be made in clinical, education, or business fields, in history or social work, or for work leading to medical, dental, law, or joint Ph.D.-professional degrees. Applicants must be citizens of the United States and will be judged solely on the basis of ability. The annual stipend for Graduate Fellows will be \$3,600 for a

twelve-month tenure with no dependency allowances.

Applicants will be required to take the Graduate Record Examinations designed to test scientific aptitude and achievement. The examinations, administered by the Educational Testing Service, will be given on December 8, 1973 at designated centers throughout the United States and in certain foreign countries.

The deadline date for the submission of applications for NSF Graduate Fellowships is November 26, 1973. Further information and application materials may be obtained from the Fellowship Office, National Research Council, 2101 Constitution Avenue, Washington, D.C. 20418.

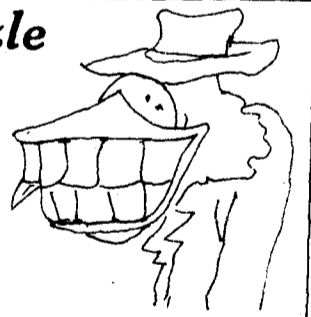
European Lectureship Available Now

Applications will be accepted until November 1, 1973 for junior lectureships in American studies in Belgium, France, Italy and Spain for the academic year 1974-75. Applicants should be advanced graduate students or scholars who have recently completed the Ph.D., preferably in American literature, American history or government, but also in economics, geography, psychology, or sociology. Good knowledge of French or Spanish is required for appointments in France or Spain.

One award is also to be offered to a junior scholar for research in Belgium in some aspect of Atlantic studies.

Additional information and application forms are available from the Committee on International Exchange of Persons, 2101 Constitution Avenue, N.W., Washington, D.C. 20418.

crossword puzzle

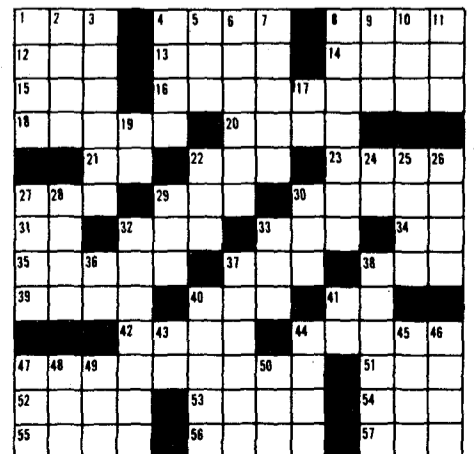


ACROSS

- 1 Swig
- 4 Capital of Latvia
- 8 Cancer
- 12 Tonal language
- 13 Rickenbacker and the Red Baron
- 14 Occurs by chance (arch.)
- 15 Drama: Joe ...
- 16 Dog
- 18 Flanders flower
- 20 Used with shift and box
- 21 Comparative suffix
- 22 Bog
- 23 Shade of green
- 27 Finished first
- 29 Jolt
- 30 Character from Peanuts
- 31 Article
- 32 Range of knowledge
- 33 Catcher in the ...
- 34 Steamship (ab.)
- 35 Fragrance
- 37 View
- 38 River in Scotland
- 39 Soccer hero
- 40 Insect
- 41 Symbol: helium
- 42 Used with drome and nautical
- 44 Kind of hemp
- 47 Character from Peanuts
- 51 Australian bird
- 52 Sea eagle
- 53 Saber's cousin
- 54 Fabulous bird of prey
- 55 Exploit
- 56 Auld lang ...
- 57 Attempt

DOWN

- 1 Football
- 2 Orhelo's nemesis
- 3 Character from Peanuts
- 4 Risque
- 5 ... liebe dich
- 6 Kind of counter
- 7 Pallid
- 8 Character from Peanuts
- 9 Gridiron cheer
- 10 Movie: The World of ...
- 11 Youth organization (ab.)
- 17 University of Arizona (ab.)
- 19 Abbreviation used in advertising
- 22 Aficionado
- 24 The doctor is --
- 25 Terpsichore, for example
- 26 Being (Lat.)
- 27 Sociologist's term
- 28 One time
- 29 A certain set
- 30 Soap ingredient
- 32 Squeezed
- 33 Soak
- 36 -- Dorado
- 37 Character from Peanuts
- 38 Gobi, for one
- 40 Palacio de Bellas ...
- 41 Greeting
- 43 Plural suffix
- 44 Travel on thin runners (var)
- 45 Love Spanish style
- 46 World's greatest fustbudget
- 47 Spiced
- 48 Bauxite
- 49 Any number divided by itself (ab.)
- 50 Period of time (ab.)



New Security Force

Continued from Page One

shift, providing that everyone always worked his regular shift. With vacation, sick leave, and special events, the force was frequently undermanned, according to Chapman. Krout and Schneider has a bigger pool of personnel to draw from, and is expected to be able to fill absences by bringing in employees who normally work at other locations, although there would be a regular crew of guards for Caltech, and presumably a regular crew of substitutes. All of the regular crew has been hand picked by Caltech, and officers on the old force are being encouraged to apply for work with the contractor, Chapman said. To date, four members of the old force have been hired back by Krout and Schneider.

By not having to pay overtime, and because rent-a-cops are basically cheaper than a resident professional security force, the Institute expects to lower its costs while raising its coverage. Having had much loss to theft recently (see *California Tech* of May 24, 1973), the extra coverage is much needed, and saving money is always a major concern.

Opposition Bypassed

Pressed as to why the change was made so quickly and without prior announcement (which would have allowed for feedback from the Caltech community, and possibly averted later surprise and resentment about the new guards among the student body). Chapman responded that "drastic circumstances require drastic actions." It is not clear that the above mentioned reasons are sufficiently drastic for the action taken, and it seems likely that there were other reasons.

It has been argued by some of the members of the old Security Force that it is unreasonable to expect three (sometimes two) guards to adequately patrol a campus with over one hundred buildings and occupying approximately 80 acres.

Who's in Charge Here?

It is fairly clear that the decision to switch to contract security was made at about the same time as that to replace Elliott with Chapman, though Richard L. Mulligan, Director of Business Services, maintains that they were two independent decisions. It has been more difficult to determine who was responsible for the decision, since it came through an ad hoc committee, the identity of which has been difficult to determine. The formal announcement came from Mulligan's office. Mulligan conceded that he was on the committee, but refused to reveal any of the other members (it being a secret committee).

Dr. Lyman Bonner, Director of Student Relations, turned out to be a more cooperative source of information. Dr. Bonner revealed that the committee con-

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sisted of himself, Mulligan, Dr. Robert Sharp, Dr. Robert Christy, Dr. Hardy Martel, Robert Gilmore, Russ McDuff, and Blair Folsom. McDuff was selected by the faculty and administration members of the committee to represent the undergraduates, since he was BOC chairman at the time of the formation. Folsom held the similar position of chairman of the Graduate Review Board, and was chosen to represent the graduate students. This method of selecting committee members varied considerably from the usual practice of announcing such an opening to the students at large, and considering all respondents.

Ends Justify Means

Dr. Bonner maintained that the secrecy of the very existence of the committee, as well as that of its work, was absolutely necessary so that Security would not know that it was under scrutiny. It was felt that this justified not soliciting student opinions beforehand. Bonner continued that the committee was to act in an advisory capacity only, and that the final decision lay with Mulligan.

The decision having been made, apparently irreversibly, it is necessary to determine the ground rules under which the new guards are operating. Chapman stated that it is his policy that master keys will be confiscated whenever discovered, until such time as the Institute administration changes its policy. It is necessary to point out that this has been the stated policy for years, and it has not been enforced to the letter by Security up to now. It remains to be seen how the new guards will act, and will no doubt depend on individual circumstances and personalities. Mr. Chapman has indicated that his door is open to students who wish to discuss things with him, and that communication is encouraged with him and with the officers.

Smog

Continued from Page Three

Husar explained that his group wanted to gain a better understanding of how pollutants get into the air, and particularly what proportion are formed there by chemical reactions.

"Agencies trying to reduce the smog level must have this information before their efforts can be successful," he explained.

Husar then described the method used by Meteorology Research Inc. to reconstruct the

movement of air within the Los Angeles Basin, and to measure chemical change.

"Three times a day at fifteen different locations, flying an airplane in a spiral from near the ground to the top of the smog layer, Meteorology Research made vertical profiles of a column of air, measuring its temperature, relative humidity and turbulence," he said. He added that the height of the air column generally varied between 1500 and 3000 feet.

"At the same time, they took

readings of its content of carbon monoxide, ozone, nitrogen oxides, condensation nuclei, and the light-scattering coefficient. The last is a measure of smog aerosols, as well as a gauge of visibility."

Because ninety-five percent of the carbon monoxide in the air comes from automobile emissions, it provided a means of judging the accuracy of the method being used. Husar reported that the scientists found a close correlation between the increase in carbon monoxide in a parcel of air and the amount of traffic that air would have passed over if their calculations of its path, based on wind data, were correct.

Then they used the same procedure in measuring the increase in aerosols, as they checked the changes in the light-scattering coefficient of a column of air at different intervals on its path through the basin.

"Again we found that the pollutants were increasing as the air moved along, but this time the increase was faster," Husar said. "We discovered that the more aerosols you have in the air, the faster new aerosols will form."

Waves

Continued from Page Three

"normal," Kanamori said.

"It is possible that the velocity change takes place without any association with an earthquake. In a tectonically active area velocities can change without any relation to a quake because fluids can move around without relation to earthquake-generating stress."

Dilatancy

He said that the change also may be associated with dilatancy. Geophysicists are using this phenomenon to develop an earthquake-predicting technique. Dilatancy occurs as stress approaches the breaking strength of rocks. Riverside is near the southern tip of the central segment of the San Andreas Fault, where it splits into several faults. Land on the west side of the San Andreas is moving northwesterly at the rate of more than an inch a year in relation to the land east of it.

According to dilatancy theory, rocks have microscopic water-filled cracks in them. As the strain increases, the cracks enlarge and the superheated water turns into steam. The enlarged, steam-filled cracks reduce the velocity of seismic waves that pass through them.

As the cracks continue widening, water enters them. This speeds up seismic waves again. When the expanding cracks are filled with water again, the seismic wave velocities return to "normal," and the rock is weakened to failure. This theory,

based on the way strain of seismic waves would be affected by the interactions, is being developed by geophysicists into a quake-prediction technique.

Permanent Waves

"The crucial thing in regard to the Riverside area is to determine whether the changes there are related in any way to dilatancy," Dr. Kanamori said.

Kanamori believes this can be done by measuring the velocities of seismic waves at different angles across the fault. If such measurements indicate some directional change of seismic waves with respect to the fault strike, it could imply dilatancy.

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Efficient Fuel Use & Energy Crunch

More efficient use of fuel by autos and dwellings could cut the rate of increase in energy demands of the United States from 4.2 to 2.8 percent per year by 1985, thus providing a 10- to 15-year "breathing space" in the energy crunch. Prof. Lester Lees, director of the Environmental Quality Laboratory of the California Institute of Technology reported last Friday.

He stated that this goal could be accomplished by increasing the production of lighter-weight, gas-conserving autos at a rate of 10 percent a year until at the end of 10 years at least 80 percent of all cars produced are in this category, and building energy-conserving dwellings: so that with proper insulation less intense lighting, and with apartments making more use of windows and air ducts during cooler weather the load on air-conditioning systems could be

reduced.

Slow Down

Achievement of the goal would result in a less steep rise in fuel prices and substantial reductions in the importation of foreign fuels, Lees and Mingin Philip Lo noted in their EQL report on "Time Factors in Slowing Down the Rate of Growth of Demand for Primary Energy in the United States."

The vehicle and housing factors account for virtually half the annual increased demands for energy in this country. "Reductions of the annual growth rate of the remaining 50 percent of U.S. primary energy consumption that seem quite feasible would bring the overall (energy) growth rate down to about 2.5 percent per year by 1985," they state in the report. "If reductions in growth rate of this magnitude could in fact be achieved, energy imports would peak in the

mid-1980s at a level no higher than about 60 percent above the present (1973) volume of imports."

Strategy & Tactics

The energy strategy in the next 25 years should contain a mix of four factors, according to the EQL report:

1. An increase in imports of oil and liquified natural gas.
2. An increase in the rates of domestic supplies, especially of uranium and coal.
3. Development of new energy sources—such as geothermal and solar energy.
4. Slow down the rate of growth of energy consumption by improving the efficiency of use and reducing "wasteful" practices.

The report deals only with the fourth factor, specifically with transportation—which comprises 25 percent of the demand increase—and residential heating, cooling and water heating—which takes 22 percent of it.

"The 'automobile' considered as a total system all the way

from raw materials through production, distribution, road-building, servicing and repair consumes 25 percent of all U.S. primary energy," the report stated, 14 percent of it being the fuel used to power the vehicles. $7 \times 4 = 28$

EQL took several factors into account in reaching its conclusion. They include: Gasoline consumption ranges from 7 to 28 miles per gallon, depending on the size and efficiency of the car; the mileage driven by the average car increases about 1 percent a year; the auto population increases about 4 percent a year. Increasing by 10 percent a year the production of gas-efficient cars (those getting 20 miles per gallon or better) means that those cars would account for 50 percent of the vehicle population by the 10th year. This shift would reduce the national energy growth rate from 4.2 to 3.2 percent (4.2 percent is a projected annual growth rate between 1971 and 1985).

Residential heating, cooling

and water heating consume 22 percent of the primary U.S. energy. The report points out that construction of new living units in about 3 percent of the existing population and the demolition rate about 1 percent a year.

If 10 percent of all new living units built the first year are energy-conserving, 20 percent the second year, and up to 100 percent the 10th year, and if a certain percentage of old residences are made energy-conserving, then the growth rate of total primary energy from this source can be reduced 0.4 percent per year.

Relativity

Because unavoidable uncertainties in estimated demand and domestic supply have large rela-

Continued on Page Eleven

Coffeehouse To Open Very Soon, Maybe, Hopefully

by Marc Donner

When asked about the date of the punative opening of the Coffeehouse the manager (who shall remain nameless) responded with the less than helpful statement, "Sometime next week, we're not sure when." When asked for any comments he might be willing to make concerning the new term and the Coffeehouse the reply was, "No comment."

Despite these inauspicious beginnings be assured, dear frosh, that the Caltech Coffeehouse is an important fixture of life at Tech and that a large number of you will find it a home away from your home away from home. Upperclassmen need no convincing of the psychological and physical value of the Coffeehouse, and in fact very few upperclassmen will even read this.

After a few meals at the Greasy you too will be convinced that this unimposing house at the physical edges of the Institute is truly the very pillar of life at Caltech. You will be even more convinced of this some night this term at about 1 a.m. when, ravenously hungry from *n* hours of trolling, you drag your weary bod into the Temple of the Grill and are saved in the nick of time from the ravages of total starvation.

For less desperate situations the Coffeehouse is known far and wide as the repository of a comic book collection whose scope and magnitude is second only to that of Major Be-Zonk. Simultaneously the managers play the music of their choice (and sometimes yours) over a powerful stereo.

The edible offerings encompass such delicacies as hamburgers and cheeseburgers (single and double); various soft drinks and coffee, tea, and hot chocolate; bagels; grilled cheese sandwiches; various ice cream concoctions and other luncheonette fare which, while not of gourmet quality, is satisfying and inexpensive.

The coffeehouse hours last year were 9 p.m. to 2 a.m. daily and for want of any negative information you can probably assume that they will be the same this year.

Everybody's talking about pollution.



Woodsy Owl has 104 ways to stop it.

Sure.

We all know how awful pollution is. And we all know that we have to start soon if we're going to save America. But where do we start? And how?

Some of the answers are right on this page. Woodsy, the nation's anti-pollution owl, came up with 104 things that you and your family and neighbors can do. Today.

Tear out this page. Read it. Remember it. And make sure that everybody gets a good look at it. Even tack it up on a bulletin board. Remember. It's up to all of us to fight for our environment. We only have one earth. Let's make sure it's here for our children, and their children to enjoy.

No. 1 Learn these Woodsy Owl "Hoosies," tell others about Woodsy Owl, and encourage them to help in our fight against pollution.

No. 2 Collect cans, bottles and papers and take them to the nearest recycling center. If there is no recycling center near you, contact your local city or county offices and encourage the establishment of such centers.

No. 3 Encourage Public Service groups to arrange for the collection of trash in your home town for recycling.

No. 4 Separate your household trash. Smash cans and put in one box; bottles in another; papers in another. This makes recycling easier.

No. 5 Don't throw away old clothes and furniture. Give them to someone who can use them or repair and sell. Everything that doesn't land in the trash pile means that much less to be burned or disposed of in some way.

No. 6 Start an "ecology cupboard" in your home. Store reusable items like string, paper, boxes, cartons, plastic containers, ribbon, yarn. Reuse them before discarding. Be sure storage is neat and safe.

No. 7 Encourage companies to discover ways to reuse or safely dispose of plastic products. Right now, the only way to dispose of plastic is by incineration. This adds to our air pollution problems.

No. 8 Encourage companies to raise the bottle-deposit sum to encourage the return of bottles.

No. 9 When possible, ride your bike or walk to meetings, school, work, etc.; encourage others to do the same.

No. 10 Form car pools and share the ride to work, school, meetings, etc.; encourage others to do the same.

No. 11 Press for action by automobile manufacturers to produce a smog-free engine.

No. 12 Ask for low-lead or no-lead gasoline for your car.

No. 13 Keep your engine properly tuned (approximately every 10,000 miles). Encourage others to do the same. This cuts down on exhaust emissions and helps reduce air pollution.

No. 14 Keep boat engines properly tuned and encourage others to keep theirs tuned also. An improperly tuned boat engine causes more petroleum wastes to go into the water and air.

No. 15 Encourage your fishermen friends to pick up their old fishing line (or someone else's). If left on the ground it can kill or injure birds and small animals.

No. 16 When you take photographs, pick up used film packs. The packs form litter and some chemicals in the packs can poison animals.

No. 17 Encourage everyone to "Take only pictures...Leave only Footprints."

No. 18 Put metal tabs from drink cans and plastic carriers for six-packs in trash cans. They are hazardous to animals as well as being a litter problem.

No. 19 Keep your transistor radio volume set moderately. Noise is a form of pollution too.

No. 20 Encourage local officials to reduce noise pollution along freeways and heavily travelled streets by proper tree and shrub plantations.

No. 21 Encourage everyone, including local park officials, to plant just one more tree or shrub. Trees play a major part in purifying air; the oxygen they release dilutes pollution in the air. Trees also help regulate temperatures; tree transpiration cools the air like a gigantic air conditioner.

No. 22 Ask Mom, when she does the family wash, to measure detergents carefully, using only enough to get clothes clean.

No. 23 Place small pieces of leftover soap in a piece of Mom's discarded nylon hose; give it to a child to bubble up their bath. This uses up bits of soap, recycles the piece of nylon hose and cleans the younger generation, all at the same time!

No. 24 Run your dishwasher only once a day, or less, depending on size of your family. This helps to conserve water.

No. 25 Put a brick in your tank! A brick in your toilet tank reduces the amount of water used to flush.

No. 26 Turn water faucets off firmly to stop leaking and conserve water.

No. 27 Don't leave garden hoses and faucets running for long periods of time. Leave lawn sprinklers on just long enough to water grass thoroughly but not long enough for water to run-off down the street.

No. 28 Don't throw trash in streams, lakes, rivers and oceans; it belongs in a trash can, not in our water supplies.

No. 29 Don't hide your trash in the snow. When the snow melts in the spring, you'll be the cause of sight and water pollution.

No. 30 Are there adequate litter containers in your city parks, schools and nearby recreation areas? If not, discuss the matter with public officials; offer to help obtain used oil drums (Service stations will often donate drums); clean, paint and decorate them with Woodsy's slogan "Give A-Hoot...Don't Pollute."

No. 31 Keep beaches, parks and roadsides clean. Urge your friends to do the same.

No. 32 Organize "Hooter Patrol" and, with the aid of the members, look for pollution problems in your area. Then take action to stop these problems.

No. 33 Don't spray paint on rocks, fences or buildings. This causes sight pollution and makes a countryside or city street ugly.

No. 34 Picking plants and wildflowers leaves the land bare, ugly and subject to erosion. Leave them there for all to share!

No. 35 Read instructions and contents carefully before buying any kind of pesticide.

No. 36 Use chemical pesticides sparingly. Follow directions carefully.

No. 37 Pull your lawn weeds out by hand. This is good, healthful exercise and eliminates the need for applying herbicides.

No. 38 Dispose of excess pesticides and their containers according to instructions on the label or advice of County Agents. Keep 'em out of drains and w.ter.

No. 39 Average air fresheners and deodorizers are a lot stronger, chemically, than their names imply. Open windows and doors to let in fresh air; this will do much to rid your home of offensive odors.

No. 40 Several bowls of vinegar placed in a smoke-laden room will clear the air quickly. Any liquid has smoke-absorbing qualities. A drop of cologne in water will help too.

No. 41 Do you see something ecologically unsound? Write to the company, calling attention to the pollution they are causing... this can help.

No. 42 Filter-tip cigarettes can be harmful to cesspools and even the largest city sewage processing plants. Put them in ash-trays, not drains and toilets.

No. 43 Some dyestuffs do not break down biologically and should be regarded with a wary eye. White tissues and paper do not contain dye.

No. 44 Be an ecologically aware shopper. Don't buy goods whose by-products or residues result in unnecessary trash.

No. 45 Support adequate local anti-litter and pollution laws and their proper enforcement.

No. 46 Public officials can help encourage interstate cooperation to control water, air and land pollution on a regional basis.

No. 47 Accumulated wire coat hangers can be tied in bundles and returned to your cleaner for reuse. If you throw them out they add immensely to the garbage problem.

No. 48 Clean, clear and disinfect sinks and drains with ordinary table salt. Salt is not toxic, and it has antiseptic and disinfectant properties, as well as abrasive, cleansing ones.

No. 49 Help decrease the mountains of garbage we generate each day by using cloth napkins.

No. 50 Protest overpackaging of fresh foods to store managers.

No. 51 Make sure your car has the required smog device and have it checked regularly.

No. 52 If you put your garbage on the street for collection, make sure the container is spill-proof. If you live in buildings with incinerators, follow instructions so you don't litter incinerator rooms.

No. 53 Organic materials (like cooking fat) clog plumbing and septic tanks, causing sewage overflow. Put them in your garbage pail...not your sink.

No. 54 Return nutrients to the soil. Start a compost pile with leaves and grass clippings. Never burn leaves and trash.

No. 55 Smokey Bear is so right! Be careful with matches... fires cause air, water and sight pollution.

No. 56 Use a hand mower if your lawn is small. Keep gasoline operated tools in top condition so noise and exhaust fumes are minimized.

No. 57 A littered picnic area is spoiled for everyone. Dispose of your trash properly and pick up discards left by others.

No. 58 Your house should be well insulated and tree-shaded to minimize fuel consumption in winter and air conditioning loads in summer. This helps to keep power loads down and helps stop pollution.

No. 59 Don't use washers and dryers during peak electrical load hours (5-7 pm). The strain at your local generating station may add to air pollution.

No. 60 Use low wattage bulbs in lamps not used for reading and turn out lights not being used to conserve power.

No. 61 Carry a litter bag in your car and boat. Bring it home and dispose of it properly, after your trip.

No. 62 Encourage local newspapers and civic club publications to publish facts on progress being made to help stop pollution. Help keep everyone informed.

No. 63 Don't sound your horn unless safety dictates. Keep your muffler and tailpipe repaired. This will help reduce noise pollution.

No. 64 Set up a "cleaner environment corner" in your school or city library. Include books, magazines, reprints and pictures on ecology, as well as Woodsy Owl materials.

No. 65 Help create community interest in schools. Focus on litter problems and efforts to combat it. Student governments can set up good housekeeping rules for school use and enforce them. Establish a school environment improvement club or committee including faculty and students.

No. 66 Proper engine maintenance to reduce smog and litter prevention instruction can be integrated into driver training. Suggest this to your school.

No. 67 Encourage teachers to write or contact local offices of agencies with active anti-pollution programs for information.

No. 68 Promote a teenage "Cleaner Environment" campaign to help clean up all kinds of pollution.

No. 69 Ask national organizations and corporations for information and assistance. Many have experience in environmental improvement programs and are willing to help.

No. 70 Examine your place of work; if you find pollution problems caused by your production, take steps to reduce or eliminate them. Make sure there are adequate trash receptacles on the premises.

No. 71 Encourage installation of scrubber systems on stacks to eliminate noxious emissions into the air.

No. 72 Encourage installation of modern, adequate waste disposal equipment on local industry operations.

No. 73 Be sure contaminated water and sewage is not discharged into local rivers, lakes and streams. Seek the installation of adequate water treatment plants.

No. 74 Talk to religious groups. Stress the spiritual value of nature and man's dependence on it for his very existence.

No. 75 Encourage the production of ecology films for school distribution.

No. 76 Encourage companies to locate new facilities so that employees can use mass transit systems or help their employees form car pools.

No. 77 Help restore natural beauty to areas where raw materials have been stripped.

No. 78 Seek adoption of safeguards to prevent oil spillage from tankers and offshore drilling. Help in the clean-up effort wherever spillage occurs.

No. 79 Discourage the erection of signs that contribute to sight pollution.

No. 80 Seek elimination or control of horn blasts, factory whistles or other loud sounds that add to noise pollution.

No. 81 Contact airline companies and encourage the installation of smog-free engines for their planes.

No. 82 Encourage development of packages that are reusable, recyclable or otherwise easily disposable.

No. 83 Encourage beautification of office and plant facilities where you work.

No. 84 Seek cooperation of public officials to make sure public facilities don't pollute in violation of codes already in effect.

No. 85 Encourage public officials to develop fair standards for all so that companies without pollution device controls do not gain unfair competitive advantage over companies that have these devices.

No. 86 Ask public officials to support basic research programs required to control pollution and promote recycling.

No. 87 Suggest incentives for companies to install pollution abatement devices.

No. 88 Attend local government meetings (city councils, boards of supervisors, etc.) and ask about their plans to control pollution; offer your assistance.

No. 89 Support measures to improve our environment and reduce pollution...even if it costs money...and it will!

No. 90 Work with official city beautification committees. If none exist, help create a citizens' committee thru support of Chamber of Commerce, women's and service groups, PTA and youth organizations.

No. 91 Organize a community conference and discuss positive approaches to pollution control. Invite public officials, representatives of labor and industry as well as other interested groups and individuals. Get all the facts and initiate action programs.

No. 92 Survey community opinion to determine how much support there is for cleaner environment programs. If there isn't enough...educate the people for their support.

No. 93 Be sure your community takes advantage of grants provided by HUD, U.S. Dept. of Housing and Urban Development for urban area beautification programs.

No. 94 To decrease sight pollution, urge city officials to provide and maintain better, benches, bus shelters, lamp posts, street signs and trash containers.

No. 95 Urge public officials to adopt a sensible ordinance to govern installation of commercial and industrial signs (including billboards).

No. 96 Encourage local home builders to develop a program of leaving as many trees as possible when they develop a subdivision.

No. 97 Encourage aesthetic plantings around freeways and public buildings to include plants and trees that have a higher resistance to air pollution.

No. 98 Enlist the help of local news media to help in pollution control efforts. State purpose clearly to elicit strong editorial support. Present all facts and avoid one-sided statements.

No. 99 Teach your children a reverence for life; inspire them with a knowledge of Nature. This will motivate them to work for and demand a cleaner environment throughout their lives.

No. 100 There is no season for pollution; it occurs every day, all year. Do something each day to fight pollution. Encourage others to do the same!

No. 101 If you own a trail bike, learn where the proper trails are located...and, use them! Tires that go off the trail cause erosion. Erosion pollutes, killing fish and plants.

No. 102 Encourage your local trash collection company to collect cans, bottles and papers in separate containers for recycling. This will also help reduce the solid waste problem.

No. 103 Encourage your telephone and power companies to place their utility lines underground.

No. 104 Work with department stores and telephone companies to help collect old directories and catalogs for recycling.

Give a hoot! Don't pollute.



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Your Student Government (Poor You)

by Simon Rapsnuzul

For every body of people collected together for a common cause, there is generally some sort of government, or ruling body. The government performs (supposedly) services for the people of that collection. For the students of Caltech, there is ASKISS, that infamous farce of farces. Better known to the state of California since 1935 as the Associated Students of the California Institute of Technology, it has an even smaller body of tight, stalwart stone faced students known as the ASCIT Board of Directors. Due to the lack of competence of any of the officers of the board, it was decided in the dark ages that each year there would be a fiasco to be known as the Elections, to be held sometime near the end of second term, to determine who the next unfortunate souls in the seat of infinite power would be. It also insured that there would be a BOD after 1939.

Tuborg & Donuts

The Board of Directors consists of more than one person (sometimes). There is the all powerful president, who is to be looked upon with great awe as he sits in his bean bag, Tuborg and cigarettes by his side. He gets to preside over board meetings, and talk with great figures in the Institute administration. Presently serving in this position is the ubiquitous Mark Johnson, complete with shades and motorcycle. The next position is that of (you guessed it) Vice-president. This unfortunate fellow gets to assist the president in his well meaning endeavors, and at the same time, is the Chairman of the Board of Control (BOC), which administers justice to the world. This office is now held by Bryan Jack, who only comes out of hiding after the winter has passed away, and there is plenty for all. At Bod meetings, he isn't the only one who stares at the ceiling with two emptys by his side.

Of course, there has to be a secretary, or else no one would remember what happened the last time they met. At meetings, he furiously writes, trying to get down everything everyone says that can be used for blackmail. He spends the rest of his time trying to put those notes into a publishable form for all posterity (and then some). Overworked, but diligent, Phil Massey does this job. He also gets to write letters to the real world, and read the ones that are going the other way. Greedily putting his hands on all of the money available within the confines of ASCIT, Dave Peisner is the Treasurer (of almost everything). He's good at thinking up reasons for not doing anything (money).

Affairs, What Affairs?

The Director of Academic Affairs is Bob Coleman. He performs the duty of preparing the teaching quality polls and is on the Educational Policies committee, and several faculty academic committees. The Director of Student Life, that great assistant organizer of things like

social events, club programs, and other random jobs, is Bob Rutherford, who recently replace Krueger, who replaced no one. (except, maybe himself.)

And then there are the Directors-at-Large. These two industrious Sophomores really get to do the random stuff for the BOD, like any of the President's whims, and the Red Cross blood drive. One of them at the time of election must be a frosh, so they are usually in the preparative stage. Paul Manis and Gary Wakai fill this position, and are doing fine, after their opera-

tions (frontal lobotomy). Typically Wakai is absent, and Manis mulls over a beer, waiting for to be dumped on.

BOC, IHC & YUCK

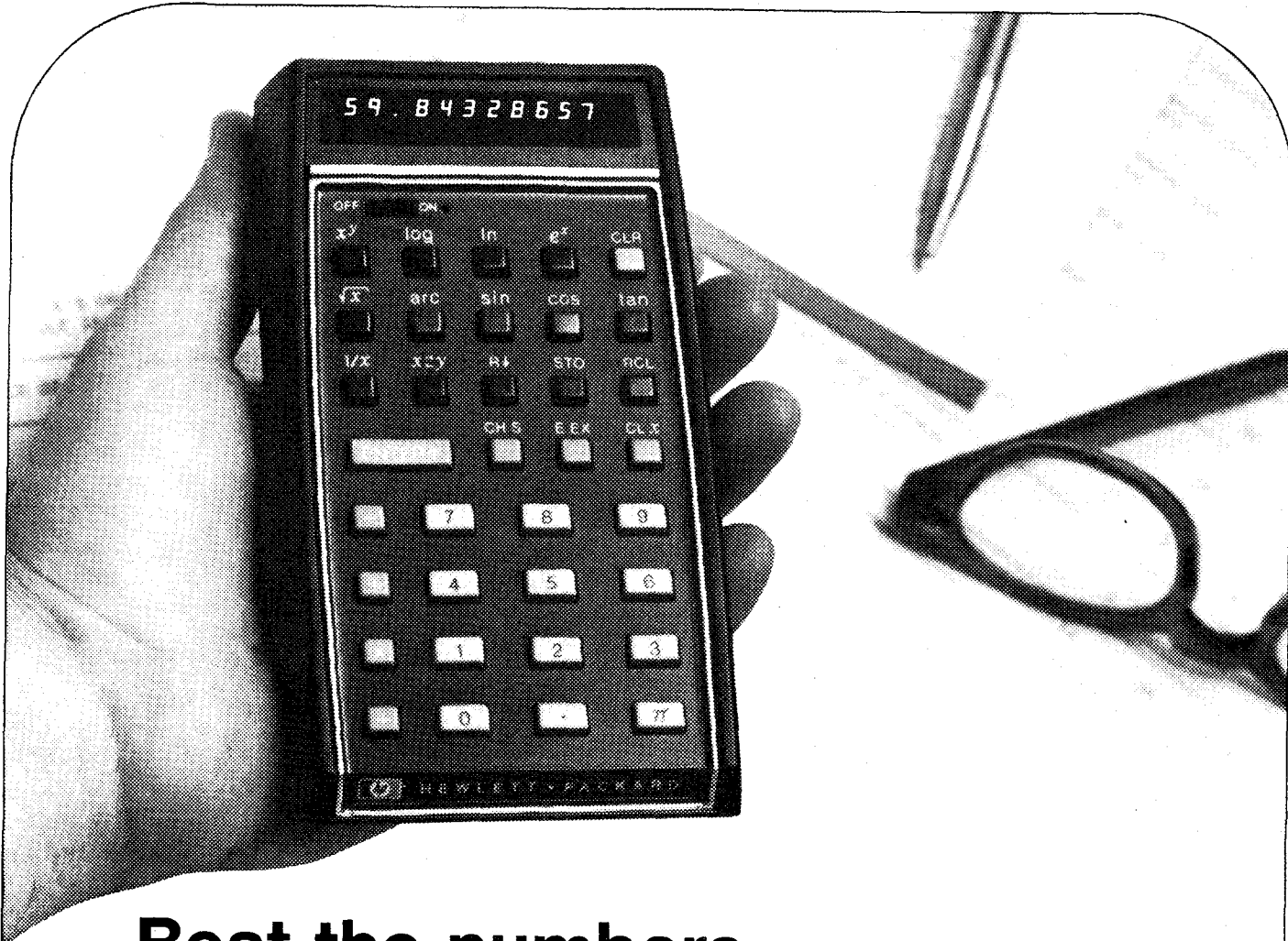
There are other offices which have no voting power, but are filled at the same time as those the BOD members. The Activities Chairman, Ed O'Rourke, is responsible for the movie program, (ASCIT) which costs something like 50 cents. These masterpieces of filming (?) are presented on Friday evenings, for the entertainment of all Techers in either Baxter or Ramo. BYOB

Alan Shiller is the BOC secretary, who does just that—plays super assistant to Bryan. The IHC chairman, Mac Mariani, heads the Interhouse Committee, which is composed of all the house presidents, and a secretary. The IHC is responsible for disputes over interhouse sports, and other things between houses.

The ASCIT Social Chairman has the most difficult job of all, that of forcing, yes, literally coercing Techers, to attend social events, where there might be anything from females to kites. Peter Beckman and Greg Simay are the driving force behind this game of hide and seek, poor souls. They get their first chance at this impossible job this term, and sogfl.

And finally there are the Tech editors. Three of them, no less. Capt'n Jello, Lt. Squirrel, and Major Be-Zonked. Long hard nights, a touch of craziness, and the TECH, characterized the triad. Make your own guesses.

Remember, this greatest show on the campus, the BOD meeting, is open to the public, for free, in Winnett Center Lounge, some time in the coming week. Come and watch the clowns do their act. No donuts, please.



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Starving Students At Tech

by Doug McElroy

The sight of bewildered Frosh wandering around asking questions of benign upperclassmen is nothing new. But one new twist occurs when the Frosh asks about the status of meals for this year. Even if the poor upperclassman remembers the long hassles at the end of last year, he probably doesn't remember or never, knew the outcome.

The Food Service set-up for Rotation Week is fairly straightforward. R&R (that's the new food service, by the way) has prepared a menu for the week

that will become available shortly. The dinners will all be served in each house, waited, but each house will have to fund their own waiters (no, that's not covered in the \$15.75 you are paying for the meal). The dinners in the South Complex will be at or around 6:30, and the South Houses will have to carry all of the stuff down from the North—the South kitchen will *not* be open. Dinners in the North will probably be 6:30 or a bit later.

Lunch and breakfast will be served in the North Complex, in Chandler and the north houses,

Rotation Week and thereafter. They will be on a cash or meal ticket basis in both locations.

After Rotation, it will be up to each house to arrange waited meals as they want them through R&R. R&R is currently putting together several different menu plans that the houses might want to try. They would be run roughly the same way the Rotation meals will be. That is, the house will have to hire waiters, clean up, and, in the case of the South Houses, trundle all the stuff down from the North. The preliminary consensus among presidents is that it might be a reasonable thing to try once or twice a week in spite of the hassle, especially in the North Houses.

Incidentally, when recently asked, R.W. Gang reported that the rule prohibiting cooking in the students' rooms will still be in effect and presumably will be enforced to some degree.

For further information, consult Mr. Tony Diek in Chandler, or your local house president.

The lack of a general food service for the student houses has caused some concern about food. Basically, the situation is this: food may be kept in a student's room, however, due to insurance and other reasons, no food should be cooked in student's rooms, nor should any cooked food be stored.

Roy Gould EPRI'ed

Dr. Roy W. Gould, Caltech professor of electrical engineering and physics and former head of the federal controlled nuclear fusion program, has been named to a four-man fusion advisory committee of the Electric Power Research Institute.

The new EPRI fusion advisory committee will formulate a program to accelerate research and development aimed toward achieving controlled nuclear fusion to provide large amounts of power at low total cost. Controlled fusion involves the nuclear "burning" of super-hot gases such as occurs in the interior of the sun.

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Middle Age Spread

A Bulge On the Sun?

The survival of Einstein's theory of general relativity may depend on whether or not the sun has a bulging waistline.

This issue has become the center of intense controversy between scientists from Caltech and Princeton University. Other scientists throughout the country are avidly awaiting results because the validity of one of the most convincing tests of Einstein's theory hinges on the outcome.

In the August 1 issue of the *Astrophysical Journal* Andrew P. Ingersoll, associate professor of planetary science at Caltech, has used new data to press his case for the importance of faculae in causing the apparent out-of-roundness in the sun—a position supporting the validity of Einstein's theory. His paper is co-authored by Gary A. Chapman of the San Fernando Observatory of the Aerospace Corporation Space Physics Laboratory.

Ingersoll's opponents in the debate, Drs. Robert Dicke and H. M. Goldenberg of Princeton University, contend that their data show Einstein's theory to be flawed.

Relativity

It is Einstein's theory of gravity that is at the center of their debate. Einstein proposed his theory in 1916 and scientists eagerly accepted it—in part because it explained something they had been unable to explain before: the strange behavior of the planet Mercury at its perihelion.

Each time Mercury goes around the sun, the perihelion point shifts by a small (but regular) amount. Newton's theory of gravity couldn't explain why this shift occurred. Einstein's theory explained it—and accounted for the exact amount of change in Mercury's orbit that astronomers had observed.

Challenge

In 1966, Dicke and Goldenberg presented a serious challenge to Einstein's theory. They asserted that the sun bulged abnormally around the equator—and that this bulge was considerably greater than what its own rotation should cause.

The conclusion was that if the sun's shape was distorted, then its gravitational field would be distorted enough to account for part of the shift in Mercury's orbit, and thus to create a flaw in Einstein's picture of the universe.

Met

But Ingersoll and Chapman believe that Dicke and Golden-

berg have misinterpreted their data. They claim that much or all of the extra brightness around the sun's middle may be due to bright patches of light called faculae.

These bright spots are concentrated around the equatorial regions—never at its poles—and are visible only at the edge of the solar disk: the same region where Dicke and Goldenberg's observations apply.

If Ingersoll and Chapman are correct, then the difference in brightness has little or nothing to do with the gravity field of the sun.

In their current paper, Ingersoll and Chapman base their conclusions on Dicke's day-to-day observations concerning the amount of light around the edge of the sun—data that had not been available in this form until it was published in Dicke's most recent paper. These data cover sixty-four days of observation.

Based on this information, Ingersoll and Chapman conclude that from forty to one hundred percent of the extra thickness observed by Dicke around the sun's equator is caused by faculae. Dicke contends that the faculae are only responsible for ten percent.

For Einstein

Ingersoll maintains that even if the theory proves to be flawed Einstein's reputation will remain undimmed. "Einstein's reputation is based on the enormous change that his interpretation of gravity made on scientific understanding and the step forward that he provided in our conceptual view of the universe—not on whether his theor was absolutely correct.

"Scientific insight never ceases to grow, and most theories in time are superseded by those that are more precise."

Ingersoll feels that one of his most useful contributions in the controversy has been to help motivate the design of experiments by other scientists.

It may be several years before better results are available. Until then, the controversy will continue—part of the scientific process that may ultimately lead to a better understanding of the universe in which we live.

Continued from Page One

potentialities and develop them to the fullest extent. Transcendental Meditation is a simple technique that will spontaneously bring this about. Wed., Sept. 26, 7:30 p.m. at the Republic Federal Savings and Loan, 2246 North Lake in Altadena.

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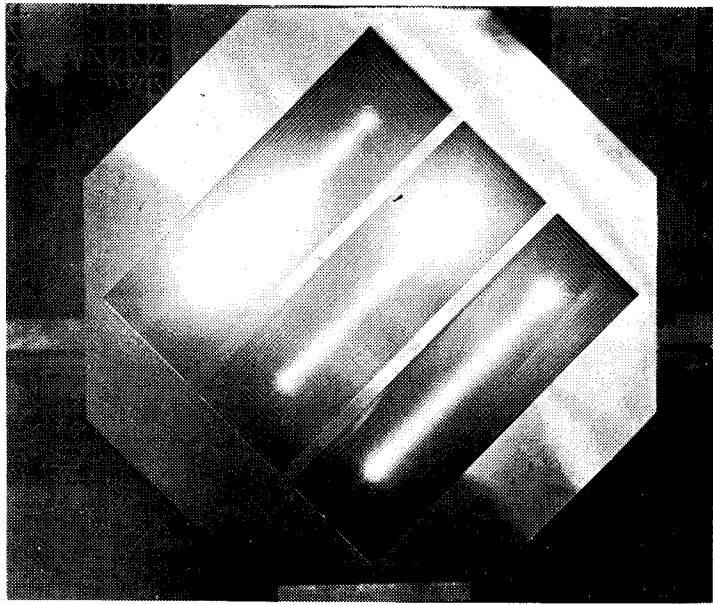
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THE OPTICS LABS would like to thank Dr. D. D. Smith for the giant diffraction grating now in place on the Olive Walk. Photo by Feeney

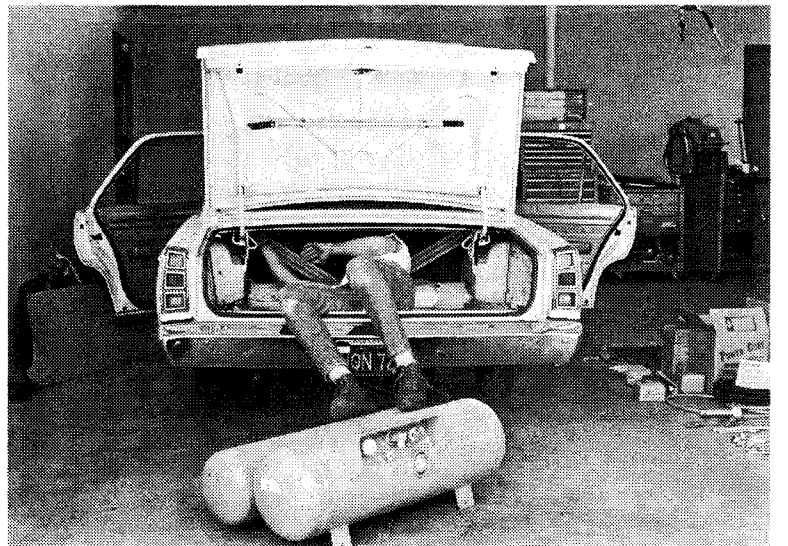
Octagon

by Ann Orel

Returning students were confronted with a new structure located in front of Firestone. The construction was bigger than a breadbox, smaller than a building, and had a unique shape that's usually reserved for stop signs. This shape gave it its popular name: The Octagon.

The Octagon is a sculpture by Tony de Lap. Its purchase was arranged by the Caltech Art Committee and Dr. David R. Smith. Another sculpture by Aldo Cassanova will arrive soon, and will be installed on campus. The Committee plans to purchase several more constructions to be placed in appropriate areas.

CACP At Work



THE CLEAN AIR CAR PROJECT begins its 1974 season this year. If you have an interest in what may be going on, contact Janet Wainwright or Robert Cowan or anyone else connected with the CACP.

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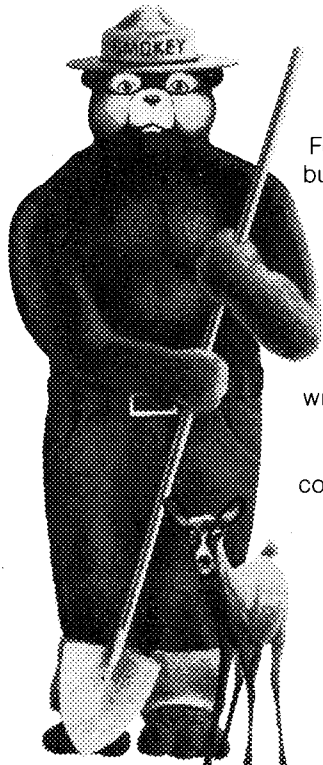
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Fuel Problem

Continued from Page Seven
 tive effects on required energy imports "it would seem desirable to encourage diversity in domestic energy sources," the report pointed out. "The cost of this diversity may be less than the cost of increased imports that would be incurred if the available range of domestic energy sources were too narrow, and some of these sources failed to come up to expectation..."

"Almost all recent energy studies agree that the unit price of energy in all forms is bound

to increase substantially over the next decade or two. But increases in unit price may not be sufficient to reduce the rate of growth in energy demand in a timely fashion because they affect operating costs much more strongly than 'first costs', and because of well-known time lags in response to price changes."

The report cited bonus and tax incentives aimed at increasing the number of owners of vehicles that consume fuel efficiently. The same incentives could be applied to stimulating the building of energy-conserving living units.

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TECH Sports

Track and Crosscountry

A Coach For All Seasons

Leroy Neal, 32, who has had experience coaching and as an exercise physiologist at Cal State San Diego, has become the new head coach of track and cross-country and head trainer at Caltech.

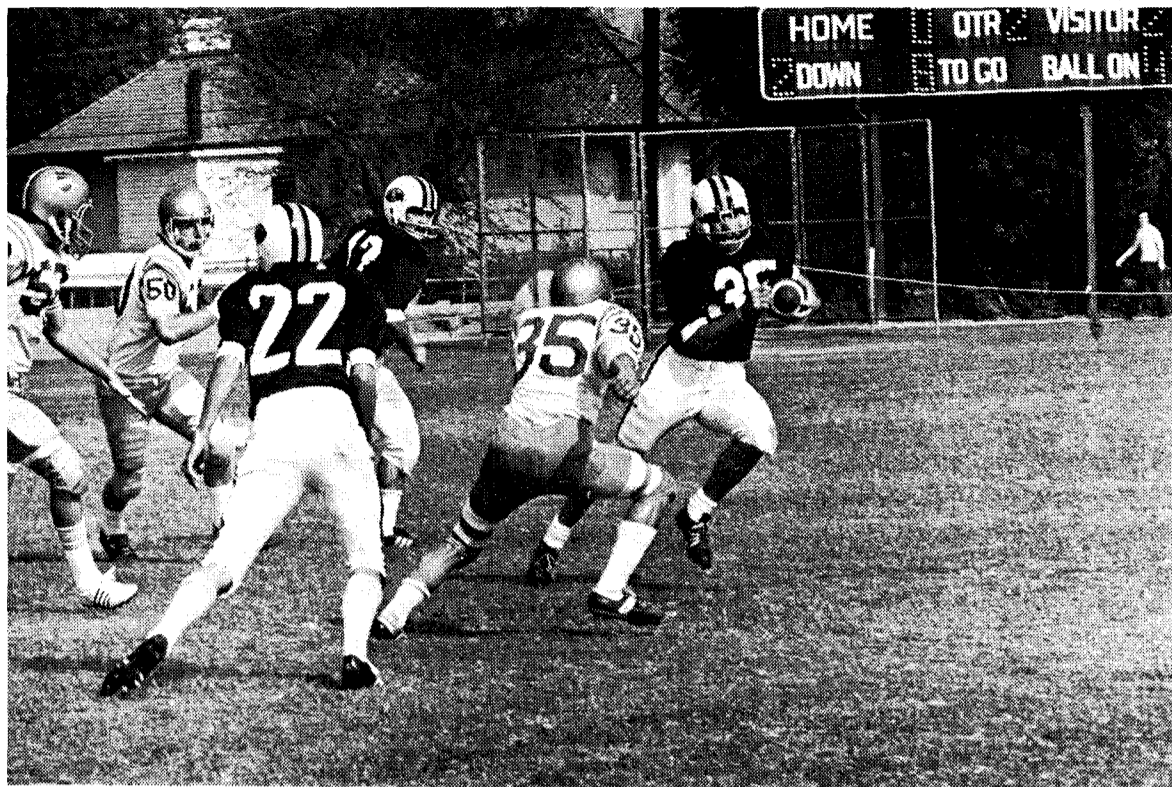
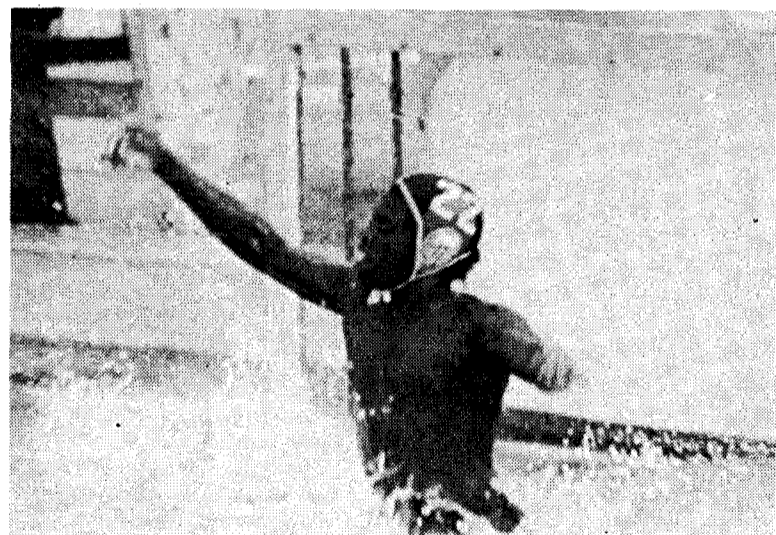
"Caltech is fortunate to find a young coach with Leroy's experience and enthusiasm for track and cross-country to replace Bert La Brucherie," Warren Emery, Caltech Athletic Director said. "His success as a middle distance runner during high school, junior college and at Occidental College speaks for itself."

"I am confident his enthusiasm will be contagious not only for the Caltech students, but also for the faculty and staff. He will be our first full-time trainer, and I am certain his knowledge in this area will benefit our whole athletic program."

Neal, who completed his master's degree in physical education last year at Cal State San Diego, has coached at Pater Noster High School in Los Angeles and at South Pasadena High. He also coached the San Diego Track Club and served as a

graduate assistant for two years at Cal State San Diego. He was an exercise physiologist for Los Angeles County for two years and in the exercise physiology laboratory at Cal State San Diego for the same length of time. He was in the Marine Corps three years, advancing to the rank of captain.

While at Oxy, Neal set a school and SCIAC mark of 4:05.4 in the mile in 1963, ran the half-mile in 1:49.8 and was SCIAC titlist with a mark of 9:18.2 in the two-mile. At Fullerton Junior College he was state J.C. champion in the 880 in 1960, setting a national J.C. mark of 1:51.7. The following year he was California state champion in the mile. He won several middle distance titles while at Fullerton High School.



Coach Gutman Says...

"We Want Your Bods!!!"

by Bob Kieckhefer

While frosh have been on camping trips and upperclassmen have been sleeping, the past ten days have seen a select few Techers working out on the four fall athletic teams. With the exception of one team, the results have been the same: the select few are now in shape, but the teams **NEED MORE BODIES.**

Coach Leroy Neal reports that the cross country team, which lost nobody by graduation, has had a good turnout of frosh, five at last count. Tech's other new coach, Ed Spencer, has not been so lucky, as the water polo team currently has nine swimmers, five of whom have been on campus for the full ten days.

They only Need Eleven

The soccer and football teams are most hard-pressed for bodies.

Both teams need eleven players to play a game, and at last report each team had, well, eleven. If we're to have any bonfires this year, we'll probably need more than eleven men on the football team!

So, frosh, it should be trivially obvious that Caltech athletic teams offer great opportunities for advancement, exercise, fulfilling the PE requirement, and even fun. Most of Tech's varsity athletes have had little or no high school experience, so don't be bashful.

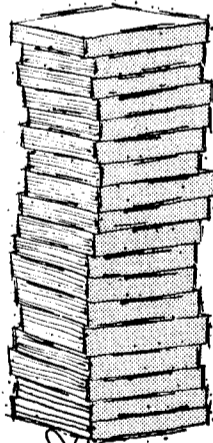
Competition begins minutes after you return from frosh camp, when soccer takes on Azusa-Pacific at Tournament Park (just north of the gym). The other teams have their first games next week - see the sports menu for details.



No Board Contract Sports Menu


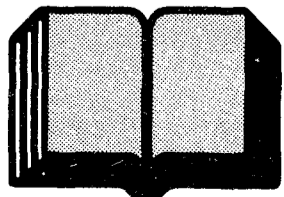
<i>Saturday, September 22</i>			
4:00 p.m.	Soccer	Azusa Pacific	Home
<i>Wednesday, September 26</i>			
3:00 p.m.	Soccer	Rio Hondo	Home
4:00 p.m.	Water Polo	Chapman	Away
<i>Friday, September 28</i>			
4:30 p.m.	Football	Palo Verde JC	Away
<i>Saturday, September 29</i>			
10:00 a.m.	Soccer	Claremont-Mudd	Home
10:00 a.m.	Water Polo	Loyola Tourn.	Away
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