

Student Injured in Noyes Explosion

By Ken Whang

A second year graduate student was critically injured Wednesday night in an explosion in the Noyes chemistry laboratory. The accident occurred shortly before 9.

The student, whose name was not released, was working on a routine inorganic synthesis procedure, observing all normal safety precautions. The reaction was apparently cooled too much, so that an added reagent that should have been consumed instead accumulated to a dangerous level, causing a pressure explosion that sent glass flying.

Glass from a flask pierced the side of the student's neck, shredding an important artery to the left side of his brain.

He was immediately rushed to the Huntington Hospital, where surgery was performed to repair his artery. As of Thursday afternoon, he was showing some motion in the right side of his body, indicating that regions of his left brain hemisphere were undamaged.

Exposure to pressure and chemicals in the explosion may cause further serious problems, especially in his lungs.

A second graduate student was also in the room during the explosion. He suffered only minor cuts.

John Bercaw said of the incident, "I can't recall a more serious accident in the twelve years I've worked in the chemistry lab here." He was impressed by the quick, effective reaction of several others who were in the building at the time of the emergency.

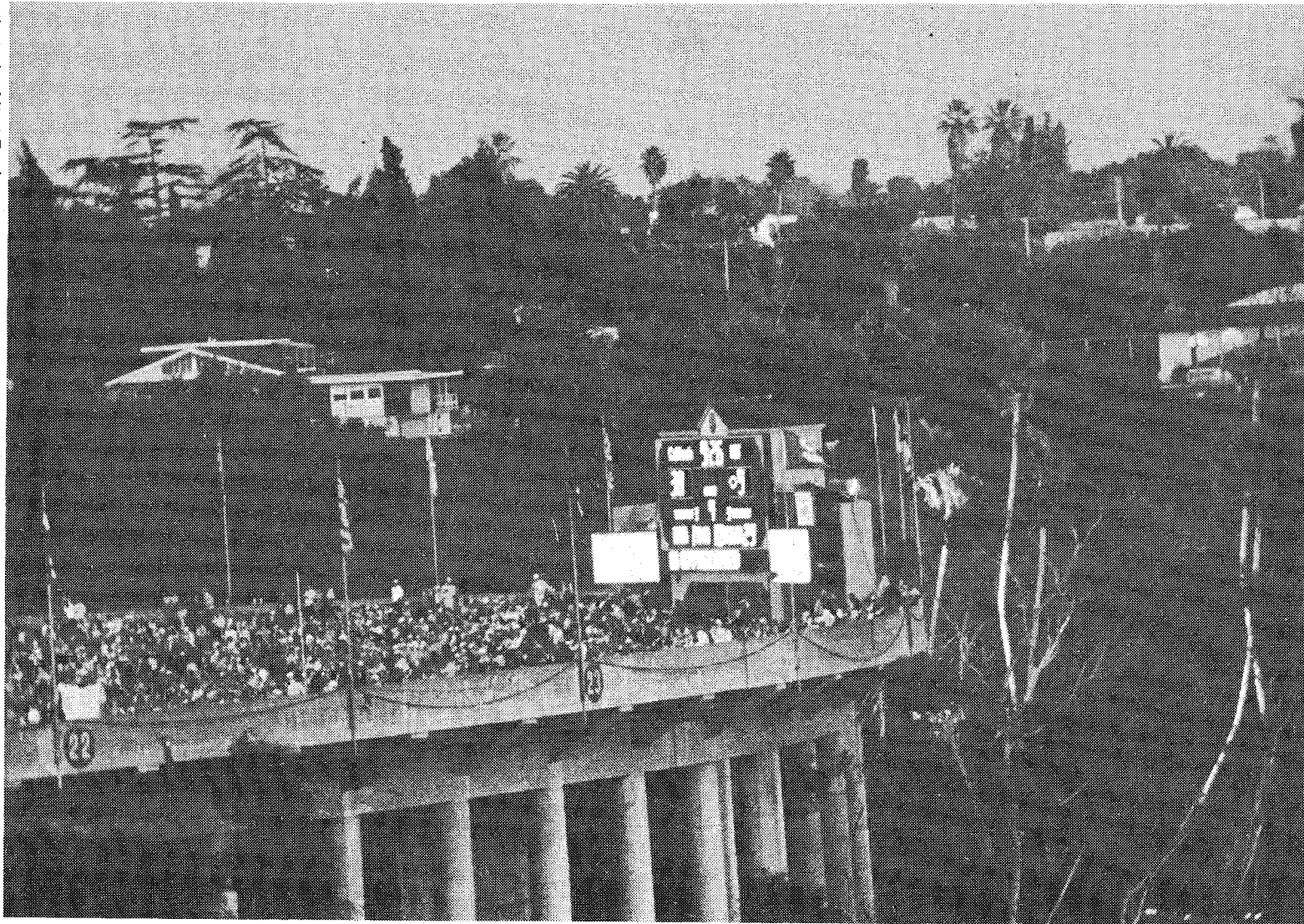
For now, Bercaw and others in the lab are keeping their fingers crossed.

Jackson Campaigner to Speak at Tech

Jesse Jackson's Massachusetts campaign manager, a political populist named Mel King, speaks next Wednesday night in Baxter Lecture Hall on the prospects of a black president for the United States.

King, an attention-getting figure in Massachusetts politics for the past decade and an instructor in urban planning at MIT, narrowly missed being elected mayor of Boston last fall. In a runoff, he lost to Raymond Flynn. Flynn is white, but like King is a member of Boston's working class; both campaigned on issues related to "economic justice."

Photo by Mimi Zucker



Tech Scores Big at Rose Bowl

By Hossein Mohammad

The Campus was moved with a nostalgic sense of contentment and excitement this week, after a return of the much awaited, second Caltech Rose Bowl prank. A national TV audience of at least 20 million people watched as the electronic scoreboards of the Rose Bowl displayed the score of "Caltech 38—MIT 9" in the final minutes of the 1984 Rose Bowl between UCLA and Illinois. Amid the noise and confusion at the stadium, it was Caltech that claimed the victory.

The Monday night event was the culmination of some four years of efforts on the part of several different groups of Caltech students to parallel the now legendary Caltech Rose Bowl prank of 1961. In that year, students managed to obtain and alter the plans for an elaborate half-time card show by the University of Washington's cheering section during the Washington-Minnesota game. As a result, the Huskies discovered that they were holding up cards spelling out "CALTECH" instead of "Washington" in front of a nation-wide TV audience. Ever since then, Caltech undergraduates have held a fascination for the New Year's Day

Rose Bowl games, attempting several times in recent years to match the famous stunt.

But Ted Williams' and Dan Kegel's plan this year is the first one to be successfully completed. Kegel and Williams are seniors in Blacker and Lloyd, respectively, who designed and carried out the sophisticated plan with the help of several other undergraduate friends. Since the Monday night game, they have been contacted by numerous local and national media outlets curious to see how the intriguing prank was conceived and executed.

According to Kegel, the original idea for the project was formed around May and June of 1982, when Art Fortini, Mike Nolan, and he, all from Blacker House, visited an empty and unguarded Rose Bowl to search for possible ideas for a prank. It was then that they gained access to the Scoreboard Room of the stadium. The control mechanisms of the scoreboards are located in the Press Box. A cable running from the Press Box to the Scoreboard Room carries the information to appear on the screen from the control mechanisms to the scoreboards. This information is in the form of special computer commands which are interpreted by the scoreboard units and translated into specific lines of text or graphic messages.

The idea of the prank was to tap into the cable that brings the information to the scoreboards. Last year, Kegel, Williams, and Nolan conducted much of the research necessary for designing and building the necessary devices. These were built during the Fall Term and installed in the stadium after five trips.

One of the most interesting features of the operation was that the students did not need to be present at the stadium to send messages to the scoreboard. A microprocessor/radio unit operated two miles away from the Rose Bowl, would send the messages in form of radio waves to a second microprocessor installed in the stadium. Equipped with a power unit and antenna, the second microprocessor, which was connected to the cable carrying information from the controls to the scoreboards, would receive these radio messages, process them, and send the appropriate commands to the scoreboards through the cable. Since the second microprocessor was on the path from the stadium scoreboard control mechanisms to the scoreboards, it could intercept and override the information sent by the operators at the stadium to the scoreboards through the controls. Thus, Kegel and Williams had complete control of the scoreboards.

The Caltech-MIT score was not the only message that appeared on the board, but it was the last one. "In the second



Mel King

Tech Takes Rose Bowl

quarter we put DEI, which is a symbol for Caltech, on the message board," Williams told the San Diego Tribune. "We also put a picture of a Beaver, the Caltech mascot, on the message board during the second quarter.

"We left them up for only 30 seconds, but when it appeared no one noticed we decided to leave our messages up for longer periods. That's what we did during the third quarter." Other messages to appear included "Go CIT!" and "CALTECH". In the meanwhile, the pranksters were situated on a hill overlooking the Rose Bowl, where they could see the scoreboard by a binocular.

Said Williams, "We were really disappointed when it appeared no one noticed, when it didn't get on television and we didn't hear them say anything about it on the radio.

"That's why we decided to change the names of the teams to Caltech and MIT."

When Caltech's fictitious score remained frozen on the scoreboards, unable to restore the situation, Rose Bowl operators shut down the electronic boards for the rest of the game. This nullified the final plans of the pranksters. The two were to end the game by flashing on the screen the message "Thank you for coming to the 1984 Beaver Bowl."

Reaction to the prank has been mostly positive, with radio, TV, and newspaper pieces generally praising the students. Dan Kegel says that, nowadays, he and his friends are customarily stopped and congratulated on campus by well-wishers. "For the first time in four years," reported one of the pranksters, "Mrs. Casey remembered my name."

One amusing comment came from the Illinois coach Mike White. "The highlight of the game for me came when the scoreboard went out," he said.

As expected, the prank made big news on campus this week. Each Techer, of course, learned of the incident in a different fashion. John Krehbiel, a Senior in Fleming, was in a plane taxiing out of the Honolulu Airport when he was alerted by an agitated companion to a silent TV broadcast of the game with the fateful scene of the scoreboard on the screen.

Rather surprisingly, Williams and Kegel, themselves, were not as pleased or excited about the matter as one might expect. For one thing, because of transmission difficulties, they could not send as many messages as they would have liked to. But, on a different note, there was the confusion that followed the matter. *The Los Angeles Times* in a first page article in its sports section Tuesday quoted a Rose Bowl official who had mistakenly stated that the students had short-circuited the scoreboard and caused it to be turned off. In fact, the group had taken special care to ensure that only the portions of the scoreboard that displayed the names of the teams and public messages would be controlled. The students, Kegel maintains, did not have the ability to interfere with vital game information such as the score, the time remaining, and the status of the current play. In yet another twist to the story, a piece appearing in *The New York Times* attacked the Institute for having sponsored course credit for the prank. As it turns out, although one of the students does receive some EE credit for his technical work on the project, the professor learned of the purpose of the project only after the fact.

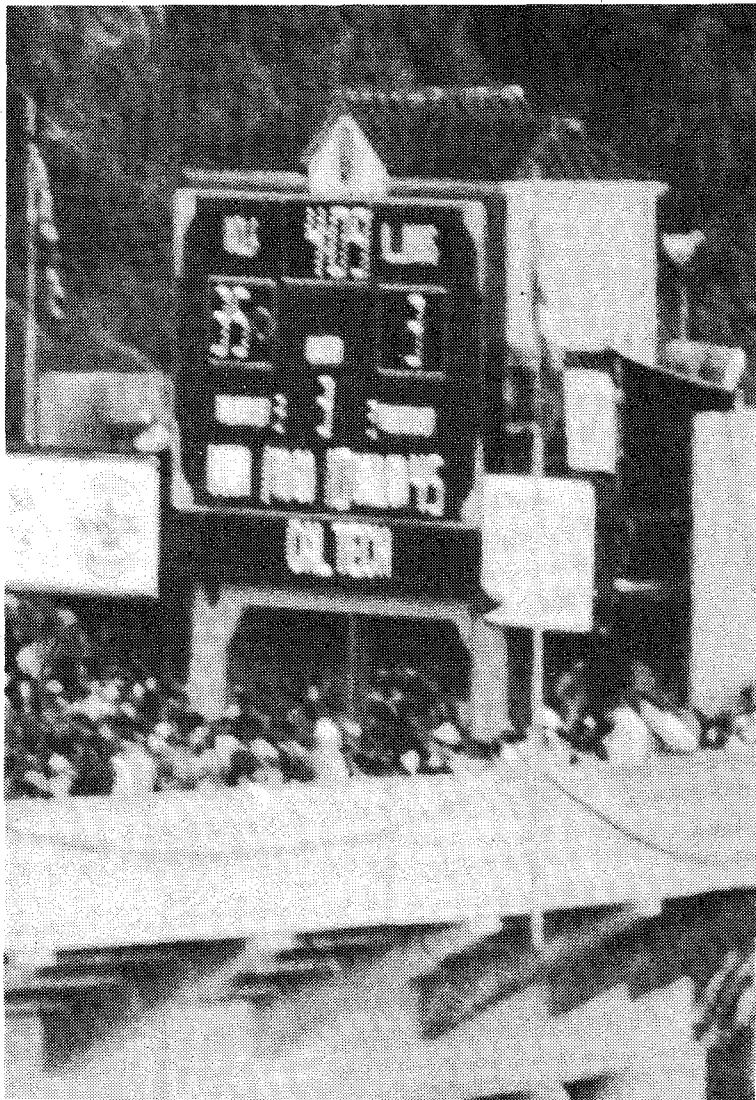


Photo by Mimi Zucker

letter

Write for the Refuseniks

It reads like something out of George Orwell's fictional 1984: secret police searches, confiscation of property, harassment, arrest and imprisonment as the penalty for religious activity. But it is everyday life in the real 1984 for Gennady Khassin and hundreds of refuseniks like him in the USSR. Their crime? Not Oldspeak, but applying for an exit visa.

Gennady Khassin, his mother Adele, his wife Natalia, and their daughters Helen and Yehudit first applied to leave Moscow and go to Israel, where they would have religious freedom, in 1976. After the long and involved process of application, Adele was granted permission and left, and the rest of the family was told that they would be able to join her within two months. Instead they were refused on the grounds that Professor Khassin knew "secrets" which "...would en-

danger the security of 260 million Soviet citizens..."

Gennady Khassin is a prominent mathematician, an Associate Professor of Mathematics at a prominent Moscow engineering school until he applied for permission to emigrate, and the author of 16 articles and four books which have been widely published and are available abroad. After he applied for a visa he was dismissed and given a job teaching at a Moscow high school; after his second application he lost that job too and lost the right to work at all. He has since made a living by teaching Hebrew, and has been repeatedly arrested and prosecuted for "parasitism", i.e. not having a job. Natalia Khassina, also a mathematician, has had similar problems.

The Khassins have been harassed and had their apartment searched by the KGB and their belongings confiscated. Natalia has been arrested

several times for her activities on behalf of other refuseniks.

Caltech's Hillel has "adopted" the Khassin family and is attempting to help the family get permission to leave, by writing to Soviet officials on their behalf. Hillel's previous adoptees, the Rudin family (parents of Caltech student Lenny Rudin) were released from the USSR and came to the United States two years ago, after five years of refusals. The purpose of the letters is to let Soviet officials know that the Khassins are not forgotten by the rest of the world and that someone cares what happens to them.

If you would like to give even a few minutes of your time to help the Khassins, please come write and mail letters and enjoy a delicious brunch courtesy of Hillel on Sunday, January 8 at 11 am in the Red Door Cafe, Winnett Center.

—Judy Goldish

Titan May Have Ethane Oceans

(Caltech News Bureau)
A strange world covered by a kilometer-deep, muddy-brown ocean of ethane, with a bottom of acetylene mud, and fed by a continual mist of ethane rain and acetylene snow through a hazy nitrogen atmosphere—that is the exotic picture of the Saturnian moon Titan painted by three Caltech planetary scientists, who have advanced a new theory of that frigid body's surface.

The scientists' theory, published in the December 16 issue of *Science*, explains previously puzzling results from the Voyager 1 flyby of the planet in 1980. Authors of the article "Ethane Ocean on Titan" are graduate student Jonathan I Lunine, Associate Professor of Planetary Science David J. Stevenson, and Associate professor of Planetary Science Yuk L. Yung.

When Voyager 1 flew by Titan, instruments on board the probe revealed an atmosphere principally composed

of nitrogen, but also containing methane. The methane ocean these results suggested seemed to be ruled out, however, by still another experiment on board the spacecraft. That study, which measured the bending of radio waves from the spacecraft as they passed through the Titanian atmosphere revealed that the change in temperature with height in the atmosphere was close to that expected for a desert-like planet. The study also showed that the amount of methane in the lower atmosphere—about three percent—was too low to be in equilibrium with a pure methane ocean at Titan's surface temperature.

Although some theorists used these results to construct a picture of Titan as a dry planet, others questioned that assumption. They pointed out that Titan's atmosphere would have to be continually resupplied with methane because ultraviolet rays from the sun were constantly tearing apart

methane molecules in the upper atmosphere, releasing hydrogen into space.

—continued on page 4

THE CALIFORNIA TECH

Volume 85 Number 11
Friday, January 6, 1984

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.

Letters and announcements are welcome. Included with all contributions should be the author's name and phone number and the intended date of publication. The editor reserves the right to abridge letters, so please keep them concise.

Turn in copy to the *Tech* office mailbox, room 107 Winnett. The deadline for copy is Wednesday evening at 8:00 pm. Late copy may not be printed unless previous arrangements have been made with the editor.

Editor in Chief Ken Whang

Sports Editor Stewart Peebles

Photographers Karyn Betzen, Chris Mihos, Brian Tsai

Reporters Bill Craven, Doug Cutrell, Sonny Lee, Chris Meisl, Stewart Peebles, Behzad Sadeghi, Biff Yamazaki

The Gadfly Lily Wu

The Outside World Yosufi Tyebkhan

The Inside World Bob Bolender (Ri), Bill Callahan (Da), Lisa Cummings (Pa), Rodney Kinney (Bl), Dierdre McClure (Ru), Rod Van Meter (Lj), Ed Zanelli (Fl)

Production Bena Currin, Nick Smith, George Stecher, Brian Tsai, Yosufi Tyebkhan

Business Managers Joseph Lee, Peter Lim

Circulation Managers Steve Baxter, 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 circulation manager.

\$6.00 per year (three terms)

\$100.00 per life ISSN 0061-1582

THE ASCIT MOVIE

TONIGHT at 7:30 and 10:00

Magnum Force

In Baxter Lecture Hall

50¢ ASCIT members

\$1 all others

AWARDS

Ronald F. Scott

Ronald F. Scott, professor of civil engineering at Caltech, was selected by the American Society of Civil Engineers (ASCE) to present the 1983 Terzaghi Lecture at the annual ASCE Convention in Houston in October.

Karl Terzaghi (1883-1963) is recognized as the founder of soil mechanics and foundation engineering, the areas of civil engineering in which Dr. Scott specializes. Each year a distinguished civil engineer is selected to give the Terzaghi lecture. The 19th lecturer, Scott was chosen on the 100th anniversary of Terzaghi's birth.

A member of the National Academy of Engineering, Scott joined the Caltech faculty in 1958. He was principal investigator on the lunar soil properties experiment on the JPL Surveyor spacecraft, a member of the soil mechanics team for Apollo manned lunar missions, and a member of the physical properties team on the NASA Viking spacecraft to Mars in 1978.

Harry B. Gray

Harry B. Gray, chairman of Caltech's Division of Chemistry and Chemical Engineering, is the 1984 winner of the American Chemical Society's Award for Distinguished Service in the Advancement of Inorganic Chemistry. Gray is the Arnold O. Beckman Professor of Chemistry at Caltech.

The \$3,000 award, sponsored by Mallinckrodt, Inc., will be presented at the society's 187th national meeting next April in St. Louis.

Dr. Gray is being honored for research accomplishments in several areas including inorganic photochemistry (which holds potential for making solar energy more economical)

and electron transfer in metalloproteins.

He is a member of the National Academy of Sciences and American Academy of Arts and Sciences, and is a foreign member of the Royal Danish Academy of Arts and Sciences. He is the recipient of numerous awards, among them the ACS Award in Pure Chemistry and the ACS Award in Inorganic Chemistry.

Michelle A. Miller, '86

Michelle A. Miller, a sophomore in nuclear engineering here at Caltech, has received a scholarship for the 1983-84 academic year from the Institute of Nuclear Power Operations (INPO) in Atlanta.

INPO is a non-profit organization dedicated to promoting excellence in construction and safe operation of the nation's nuclear power plants.

Miller, of Las Vegas, Nev., received one of 200 scholarships awarded to students around the nation. Each year, the Institute provides \$300,000 to top-notch undergraduates studying in fields related to nuclear power. The funds are provided by INPO's members—the U.S. utilities that are operating or building nuclear power plants.

William J. Evans, '87

William J. Evans, a freshman here at Caltech, has been awarded the Bell Laboratory Scholarship for Minority Undergraduate Students in Physics. The scholarship consists of an award of \$2,000 to Evans and \$500 to the Caltech physics department.

The scholarship program, administered by The American Physical Society, is intended to increase the level of minority participation in physics in the United States.

Baxter Art Gallery Contemporary Ceramics

More than 100 ceramic pieces by 67 artists will be on exhibit at Baxter Art Gallery from January 4 through January 29.

The exhibition, "Contemporary Ceramic Vessels: Two Los Angeles Collections," features the private collections of Betty

Asher and of Howard and Gwen Laurie Smits.

Although a few of the artists represented are from outside California, including Great Britain, most are from southern California. Among those represented are Philip Cornelius, Viola Frey, Michael and Magdalena Frimkess, Gifford Myers, Elsa Rady, Paul Soldner, and Gertrud and Otto Natzler.

"Southern California is one of the most important American centers of activity in ceramics, and it is very appropriate that some of the major collections of contemporary ceramics are developing here," says Baxter Art Gallery Director Jay Belloli.

Other ceramicists whose works will be on exhibit are Robert Arneson, David Gilhooly, Kenneth Price, Peter Voukos, John Glock, and Betty Woodman.

An exhibition catalogue containing interviews with the collectors and black and white photographs of selected works will be available at the gallery for \$4.50.

Baxter Art Gallery, located in Baxter Hall, is open seven days a week from noon until 5 pm. For further information, call 356-4371.



Roy Lichtenstein's *Ceramic Sculpture 2* is on display in Baxter Art Gallery's Contemporary Ceramics exhibit.

The Body Shop Need to Lose Weight?

What is the best way to lose excess fat? Is dieting the answer? And if so—what kind of diet? It's almost impossible to read anything these days without another diet staring you in the face. And do diets really work?

The first thing to understand is that it isn't excess fat that is so bad, it's the lack of athletically trained muscle that is at the root of the problem. Dieting can decrease the weight of the fat but it cannot increase

the amount of muscle. There is a difference between being overweight and overfat. A person who appears skinny may actually be high in fat. You may worsen your situation by dieting because radical dieting, unbalanced dieting, shots and fasting have been shown to lessen muscle mass while you are losing fat. There is good evidence that one should get fit before embarking on any kind of diet program. A well-exercised body seems to res-

pond more quickly and with less muscle loss to the stress of dieting.

During strict dieting the body begins to burn calories at a much slower rate in order to prevent what it perceives as oncoming death by starvation. So you see—you will get the best results if you view fat loss as a gradual process, and concentrate most on exercise and balanced eating.

—Sheri Ripley
Health Center Staff

Buy Caltech Cards
and save 20%

CALTECH'S

Buy Caltech Cards
and save 20%

BURGER CONTINENTAL

will offer you a deal you can not refuse.



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 January

A free root beer float to all Juniors, Seniors, and Grad Students

Faculty, Grad Students, Attend!

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

B. C.: On Lake Avenue
½ Block North of California

The Inside World

Blacker: The Aird House football team scored a stunning 45 to 9 victory recently (blah blah blah), even though the entire team blacked out during the final four minutes. Naomi, if you're our there, please let us know.

—Sig

Dabney: No entry.

Fleming: No entry.

Page: No entry.

Lloyd: No entry.

Ricketts: No entry.

Ruddock: No entry.

Titan

from page 2

The Caltech researchers' theory resolves the quandary. According to their chemical and physical model, Titan once did have a methane ocean. However, this methane steadily evaporated, found its way into the upper atmosphere, and reacted with sunlight to form ethane and acetylene, which condensed out. At Titan's atmospheric temperature of about -180 degrees centigrade, ethane would precipitate as a liquid, and acetylene as a solid, which would settle to the ocean bottom.

Over the age of the solar system—about 4½ billion years—this process has

gradually converted the Titanian ocean into a mixture of 70 percent ethane, 25 percent methane, and 5 percent nitrogen. The researchers calculate that the ocean would be about a kilometer deep, with the acetylene sludge bottom layer from 100 to 200 meters thick. Because the vapor pressure of ethane is lower, the surface would give the "dry" appearance suggested by the Voyager radio experiment.

"A kilometer-deep ocean would probably cover most topography that could be expected from meteorite impacts," said Lunine. "A few islands of water ice—the 'bedrock' of Titan—might poke up. Impurities of heavy hydrocarbons

would likely make the ocean a mucky red color, matching the cloudy and hazy red of the sky. Organic solids and tars would coat the ocean bottom and even island surfaces.

"It is possible, however, that the ocean bottom is not simply a placid repository of hydrocarbon garbage," he said. "Titan's interior might still hold a liquid magma of ammonia-water, which occasionally could find its way to the surface. Such a mixture, erupting at a temperature of -100 degrees Celsius into the -180 degrees Celsius ocean would be no less dramatic than basaltic lava at 1300 degrees Celsius erupting into our 10 degrees Celsius terrestrial oceans."

Inside Information

Online Library Searches

ONLINE to the rescue. You have a term paper due next week. Not much time to search the indexes, even though you know what you want to write it on. But "What will it cost me?" Possibly not much more than the Xerox charges.

The charges vary on each database, but a well thought out search that combines terms to limit the size of the set is not very expensive. The actual price depends upon the database used, time on line, and print charges if any. A search on Spin (AIP) would be around \$5 to \$7 at \$35 per hour, on Compendex (Engineering Index) \$10 to \$15 at \$90 per hour.

The most recent papers are listed first, and sometimes five to ten references will give you enough to start. Tell us whether it's for a term paper or, perhaps, a more complete search for a thesis. Not everything is searchable online, but there is no charge for asking if a search is feasible.

SCISEARCH is a multidisciplinary database in

pure and applied science. Coverage in Scisearch is 1970 to the present. Science Citation Index is the printed version of this database. Scisearch also has records from Current Contents which are not in the printed version. The unique feature of this index is the ability to search cited references, in addition to the ability to search by author and/or subject.

OK. You found a little gem. It's a 1978 paper which is seminal to a new direction in your field. Who has built on that? Who cites it? A major online system used at Caltech, Dialog, carries Scisearch in four databases:

#34, 1981—the present
#94, 1978–1980
#186, 1974–1977
#187, 1970–1973.

A search in #34 and #94 would flush out papers citing that gem up to the present time.

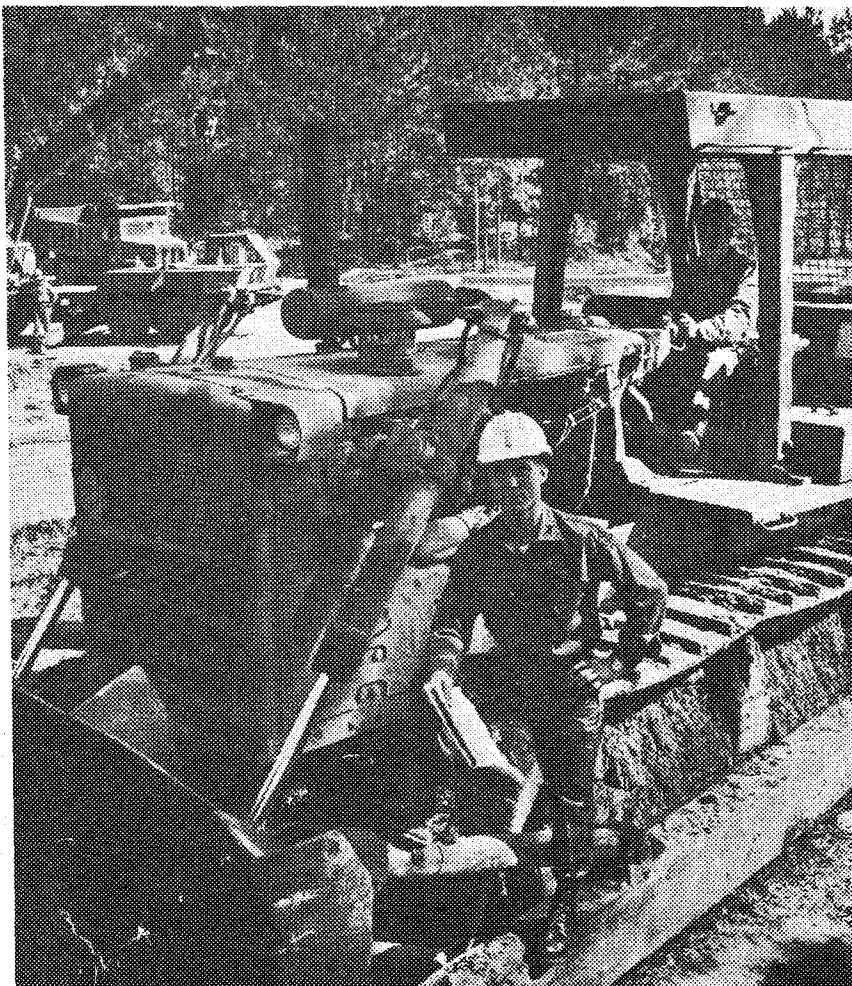
Call or see Dana Roth, x6243, or Jean Anderson, x4521; Dana's at Chemistry Library in Millikan, Jean at Aeronautics in Guggenheim.

HIS FIRST YEAR OUT OF COLLEGE, FRANK QUACKENBUSH RENOVATED THREE BUILDINGS, WORKED ON A DAM, PAVED A ROAD, AND BUILT TWO CHOPPER PADS.

"Most of the engineers I graduated with probably wound up as an assistant engineer to somebody else. Maybe doing the details for somebody else's design or supervising some small aspect of construction.

"But my first year as an Engineer Lt., I've designed many of my own projects and supervised the construction on everything from baseball dug-outs to concrete work on a dam. Earthmoving, grading, filling, paving, concrete work, masonry—you name it, I've supervised it.

"Whether I stay in the Army or go into civilian construction work later, I've got experience that some engineers won't have when they're 30!"



2nd Lt. Frank Quackenbush majored in civil engineering at the University of Arizona and was a member of Army ROTC.

"More than supervising construction, I've learned how to manage people. I've got 40 right now I have to plan for and see to in terms of a myriad of details of their lives.

"What I learned in Army ROTC about leadership and management, I've put to good use."

Army ROTC got Frank Quackenbush off to a good start in his field. It can do the same for you whether you're a civil engineer or an English major. For more information on Army ROTC, scholarships and the \$1,000 a year spending money you can earn your last two years, stop by the Army ROTC office nearest your campus. Or call (213) 863-5819 for details.

ARMY ROTC. BE ALL YOU CAN BE.

sports

Beavers Outdo Christ College in Close Victory

by Ath Man At Large

The Caltech Beavers basketball team defeated Christ College, 68-63, on Wednesday night, raising its intercollegiate record to 5-2 and thrilling a raucous home crowd by winning its fourth home game in five starts. The Beavers trailed early 20-10, but fought back to tie the game 31-31 at halftime. Caltech was plagued by turnovers and poor foul shooting in the first half. The Beavers pulled ahead at the start of the second half, leading by as many as eight before Christ College, refusing to fold, pulled within one at 64-63 in the final minutes. Late free throws by Ed Zanelli and Stewart Peebles provided the final margin of victory.

Zanelli was the Beavers' high scorer with 23 points, as he made numerous spectacular inside shots in addition to some clutch outside buckets. Stewart Peebles tied his career high with 20 points, while grabbing 16 rebounds, and Jim Helgren netted 14 points. Dave Wertz had some key rebounds and baskets in limited playing time, and Tom Heer, again supported by a highly heterogeneous personal cheering section, made numerous key steals, baskets, and rebounds.

The Beavers' next game is tonight at 8 here at Tech, against LIFE college, a team the Beavers defeated in a tight game before Christmas. Be there!

Ice Hockey Team Beats Harbor College

by Grant T. Yokum

Still exhausted from the previous night's battering at the sticks of Pierce (resulting in a 7-1 loss), the Caltech Ice Hockey Team engaged Harbor College on Dec. 7. Four players majoring in Geology chose to attend a scientific meeting in San Francisco, leaving the Beavers with only nine skaters (the normal complement of skaters is 15). Harbor collected two easy goals in the opening ten minutes of play to take early control of the game. Caltech slowly awoke and responded when Phil Askenazy scored midway into the first period. Following Askenazy's lead the Beavers picked up the tempo and by the end of the first period Tech had taken a 3 to 2 lead, with additional goals by Yates and Askenazy.

In the second period, veteran defenseman Jim Engstrom, who scored Tech's only goal in the previous night's contest against Pierce, charged down the ice in his characteristic "steam roller" fashion, rolled over several opponents, and rammed the puck past Harbor's fear-stricken goalie. The scoring was rounded out with goals by Jim Killory (assisted by Steve Klippenstien) and Askenazy. Harbor was unable to mount any

further attack and the Pucksters cruised to a cool 6-2 victory.

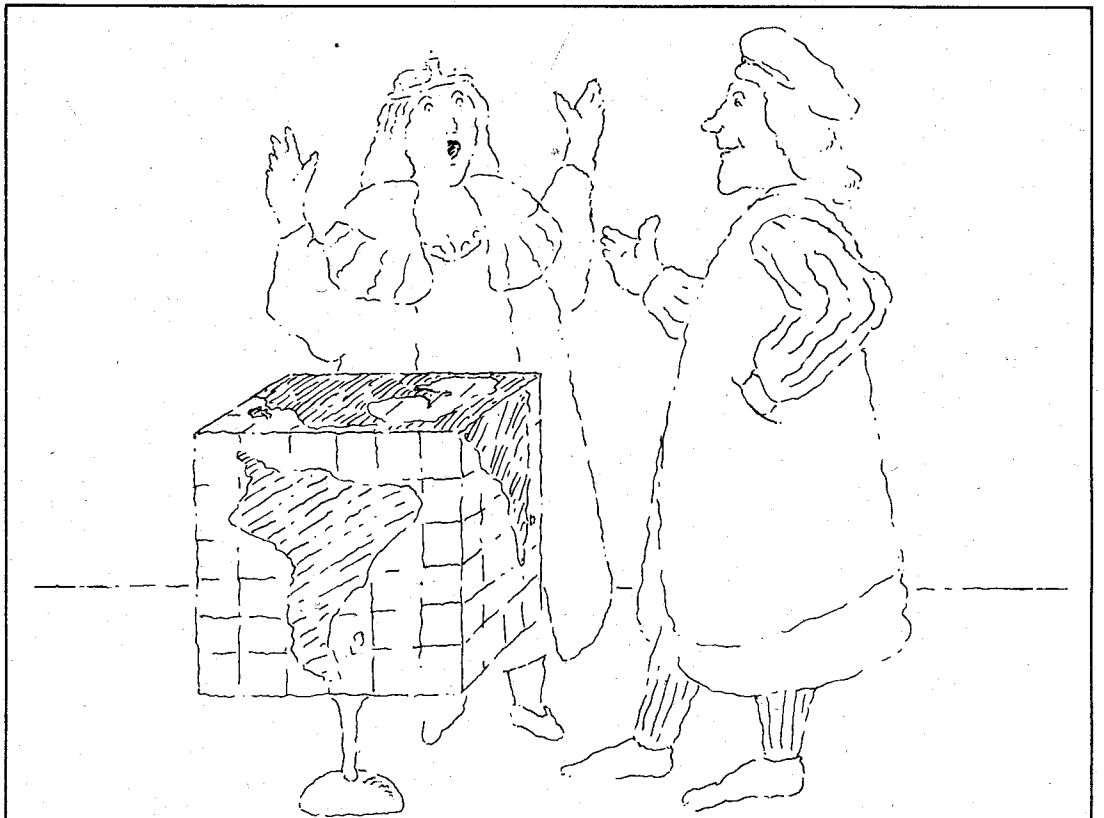
There can be little doubt that the real star of the game was Phil Askenazy. Phil may not be very big (that's what his girl friend says), he may not be very strong (that's what his boyfriend says), and he may not be very quick (that's what his teachers say), but he sure has the knack of putting the puck in the net. Askenazy hammered home three goals for his second hat trick of the season and is currently the Pucksters' leading point grabber.

On the sidelines, team scorekeeper Nick "Nasty" Jones was returned to duties after suffering a gash over his right eye in last week's victory over Irvine. From his position at the scoring table, Jones, not one to avoid the opportunity to avoid pain, had thrust his face into the path of an errant puck and latter bragged "I had my eyes open the whole time." The wound required 6 stitches during which Nick never batted an eyelash, except at the attending nurse.

The Beavers, after hibernating over the Christmas holidays, resume activity on Jan. 11 at 11:30 in West Covina, when they play Pierce.

Weekly Sports Calendar

Fri.	1-6	8:00 pm	Basketball (Varsity)	LIFE College	Caltech
Wed.	1-11	4:00 pm	Swimming (W)	Mills College	Caltech
Wed.	1-11	6:00 pm	Basketball (JV)	Pomona-Pitzer	Pomona-Pitzer
Wed.	1-11	8:00 pm	Basketball (Varsity)	Pomona-Pitzer	Pomona-Pitzer
Wed.	1-11	7:30 pm	Wrestling	C.S.U. Fullerton JV	CSU Fullerton
Wed.	1-11	11:30 pm	Hockey Club	Pierce #2	Caltech
Sat.	1-14	10:00 am	Swimming (M)	U.C. Riverside	Caltech
Sat.	1-14	10:00 am	Wrestling	Caltech Invitational	Caltech
Sat.	1-14	6:00 pm	Basketball (JV)	Occidental	Occidental
Sat.	1-14	8:00 pm	Basketball (Varsity)	Occidental	Occidental



We're looking for people who can see beyond the obvious.

If Christopher Columbus had been content to ship cargo around the Mediterranean, he would have missed the opportunity to discover the New World.

If LINKABIT engineers weren't thinking about what could be, instead of what is, we wouldn't be at the forefront of the telecommunications industry.

Thanks to a cadre of conceptual achievers, however, LINKABIT has continued to set the standard in diverse and complex projects such as MILSTAR terminals, video scrambling equipment, domestic satellite systems, modems, codecs, advanced processors and fault-tolerant systems.

Now, we're looking for more of the same kinds of thinkers to join our ranks in the following areas:

- Satellite Data Communications
- Satellite Network Technologies
- Information and Network Security
- Speech Coding and Compression
- Local Digital Switching Systems
- Modulation and Coding Techniques
- Synchronization Techniques
- Advanced Digital Signal Processing

The creative, free-thinking atmosphere at LINKABIT promotes excellence and is a reflection of our

physical environment. San Diego, America's Finest City in location, climate, cultural and recreational facilities, offers you and your family an unsurpassed lifestyle. This invigorating setting, combined with the challenge, satisfaction, and reward of a career at LINKABIT, provides an unbeatable opportunity to fulfill your goals. Opportunities are also available in the Washington, D.C. area and Boston.

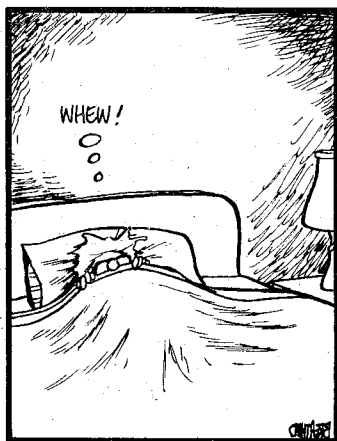
**On Campus Interviews
Friday, January 13**

Please contact your College Placement Office to arrange an on-campus interview. If you are unable to meet with our representatives, please forward your resume with college transcripts to: Dennis Vincent, M/A-COM LINKABIT, 3033 Science Park Road, San Diego, CA 92121.

M/A-COM

M/A-COM LINKABIT, INC.
Equal Opportunity/
Affirmative Action Employer

SAM SLACKS SUITS SKIRTS SHIRTS
ALTERATIONS RESTYLING TAILORING
TEL. (213) 449-8634
DAYS & EVENINGS
159 So. Allen Apt. 106 Pasadena



ASCIT Notes

ASCIT Elections are Coming

Many of you may not have realized it but next Wednesday, January 11, nominations for ASCIT elections will begin. In order to nominate yourself, you must sign your name in a place to be designated in next week's minutes and submitting a short statement in the mail slot marked "STATEMENTS" in the Dean's office. In order to help you decide if you would like to run for an ASCIT office, short descriptions of each

office follow the ASCIT notes. Also, next Monday we will be publishing several by-laws changes which the Board of Directors (BOD) has approved and which must pass a vote by ASCIT members in order to be implemented. Five copies will be posted in each house lounge and house president's will be asked to read them at dinner. The election for by-laws amendments will take place Monday, January 16. A lot of

work has gone into writing and revising many of these changes over the past year so please take the time to read and understand the changes and to vote. If you have questions about them, there will be a forum held on Wednesday, January 11, from noon to 1 pm at a place to be announced in next week's minutes. You may also ask a BOD member or you house Excomm representative.
-Candi McCoy

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**



President

The ASCIT president is basically in charge of making sure ASCIT runs smoothly. This includes making sure publications are published on time, ironing out many ASCIT-related problems, reading and answering all ASCIT mail, and occasionally taking over other ASCIT BOD officer's jobs while they are on vacation. The president runs weekly BOD meetings, attends ASCIT Excomm meetings, acts as a liaison between ASCIT and the alumni, the faculty board, and the community. The office requires a significant amount of time, organizational capabilities, patience, and dealing with people, but is, on the whole, a rewarding job.

Vice-President

The primary duty of the ASCIT vice-president is to act as chairman of the Board of Control (BOC). As BOC chairman, this officer is responsible for educating new students about the Honor System, investigating cases brought to the Board, and presiding without vote at BOC meetings. In addition, this officer assists the president in running the corporation.

Treasurer

The ASCIT treasurer keeps track of ASCIT expenditures and corporation property. The job requires organization, patience, ability to interact with people, and, of course, a calculator.

Secretary

The job of the secretary is mainly to take and distribute the minutes, which now go to about 120 people. The secretary keeps the minutes and other relevant documents. At times, the secretary may need to print stationary, write articles for the *Tech*, post announcements, record nominations, and interview nominees for some appointed positions. Unlike the IHC or BOC secretaries, the ASCIT secretary is a voting member of the board.

IHC Chairman

IHC Chairman 1bca. (0-0-0). This is a no unit course for freshmen, sophomores, and juniors who are highly motivated and show outstanding leadership potential. This course is self-taught and requires about 40 hours of lab work in September where the student organizes and carries out Rotation. Attendance is required (at ASCIT BOD and of course IHC meetings every week). Consultation with Master of Student Houses, Housing Office, and the Deans also required.

Director of Academic Affairs

The primary responsibility of this office is to chair the Educational Policies Committee, which produces the Teaching Quality Feedback Report. This involves distribution and collection of surveys second and third terms, and first term next year. This year's data and comments must be summarized, arranged in booklet form, printed, and distributed.

Director of Social Activities

The Director of Social Activities serves as a regular at the Board of Directors and as chairman of the Executive Social Committee (ESC). The ESC is a committee comprised of the seven social teams and any special assistants appointed by the director.

The director needs to call a meeting of the ESC about once a month to plan upcoming activities. These might be parties, dances, trips, picnics, or sports events. The director must plan every aspect of the event, including entertainment, transportation, food, drink, invitations and publicity, lighting, and setup/cleanup. He can delegate specific tasks to the Social Teams, but is responsible for assuring good quality and economy of every facet of the event.

The director should be prepared to devote 4-5 hours per month for meetings and 12-30 hours for each of the five or so events he'll be in charge of during his term in office. This is a lot of work, but it comes in big bursts.

The director also is in charge of distributing money to the houses for multi-house activities he approves of.

If you've questions about the office, call Dan Schwartz, the current director, at x6274.

Directors at Large

The two director-at-large positions are designed to give people an opportunity to get involved in ASCIT without taking on the larger responsibilities of other offices.

One director-at-large is in charge of the ASCIT bus, and the other organizes the research opportunity handbook.

BOC Secretary

The secretary of the Board of Control assists the chairman in investigations as well as performing general secretarial duties at BOC meetings. The secretary has no vote on the Board.

Editor of the Tech

The editor of the *California Tech* is responsible for this publication. If you're interested in this job, contact Ken Whang (Ru 203, 578-9886) for a description, discussion, and tour.

What do fast cars, expensive meals, "beautiful" company, and large salaries have in common? Only that they have nothing in common with the job of Tech Editor. But why not

Be Editor of The Tech

Any way?

ARE YOU INTERESTED IN BUSINESS, PROBLEM-SOLVING, MARKETING, AND HARD WORK?

If so, please read the following job opportunity.

The Job

We are looking for a potentially high-powered person who is interested in a career position in precious metals trading. You would be working as a trainee for a well-known, reputable, and well-capitalized West Coast-based precious metals company (established in 1965) that distributes gold, silver, and platinum in coin and bar form on a wholesale basis to banks, brokerage houses, and coin dealers throughout the United States and abroad.

Aspects of the Position

The job would entail on-the-job training and a lot of phone work; mathematical reasoning in looking at various CRT screens, thinking what the numbers mean and integrating those into prices; creative thinking; thinking about all of the markets and the activity; and thinking about what's going on around you.

- Training in national/international commodity trading of "physicals" and futures,
- You would have a close working relationship with senior company people,
- The position is challenging, requires high-energy and problem-solving, and
- It's an opportunity for creativity and originality.

Basic Trader Qualities

- An excellent mind (for example, SAT/GRE scores in the high 700's to 800 on both math and verbal).
- Outstanding common sense/"street smarts".
- Aggressive, competent, and (subtly) in control.
- Must be able to react and make decisions quickly to market changes and the flow of business.
- Must have a very good memory.
- Thinking things through in advance (a strategic-thinking mind).
- Must be self-motivated, dependable, and professional.
- A team player.
- A creative thinker.
- Respect others.

Other Key Characteristics and Responsibilities

- Must provide excellent service to customers.
- Amiable person who can work in highly charged, close working relationships with others.
- Must be able to work under pressure.
- Capable of assimilating and understanding relationships between a wide range of information.
- High energy level.
- Motivated by achievement and income, a "self-starter".

Compensation

- Salary, minimum, \$25,000 per year.
- Medical coverage.
- Parking.
- Potential bonus.

If you believe that this job could be for you, please send (a) your resume, (b) your SAT/GRE results, and (c) a letter explaining why this job could interest you, to:

Mr. Michael Kelley
A-MARK PRECIOUS METALS, INC.
9696 Wilshire Boulevard
Beverly Hills, CA 90212

We will contact you within 30 days after receiving your information.

P.S. If you know someone who might be interested in this job and who could fit these qualifications, please tell them about this opportunity.

announcements

Lights! Camera! Action!

The Caltech Film Workshop is about to embark upon its major project for the year, and we need writers, actors, cinematographers, and anyone else interested in the practical or technical aspects of this production. The next meeting will be held on Wed. Jan. 11th at 5:15 pm in Winnett Clubroom 1, and will be the organizational meeting for this production. As always, anyone interested in doing their own independent projects are invited. In fact, everyone is welcome. See you there. [Cut!]

Soprano Needed

for Caltech Chamber Singers. This twelve-voice mixed ensemble rehearses on Tuesdays from 5:15 to 7:15 pm. Students, faculty, and staff are welcome. The repertoire includes renaissance madrigals and chanson. The major program for the spring is and Athenaeum Renaissance Banquet. Contact Dr. Caldwell at x6197 or the Fleming basement Choral Music Office.

Wanna B In The T?

All clubs and organizations which wish to have their picture(s) printed in the 1983-84 yearbook should either submit their picture to 107 Winnett care of the *Big T* or contact editor Roger Fong (x3961 or send messages to 107 Winnett) to arrange for a *Big T* photographer to take a group picture. If no arrangements are made before February 20, then it will be assumed that no pictures will be forthcoming and therefore no space will be saved.

50 Confessions To Go

Some 50 copies of Robert Huttenback's *Confessions of a Genial Abbot* are available at the Dean's Office for pick-up by undergraduate students who live off-campus. The book is free, thanks to subsidies from the MOSH, the Dean's Office, and the Caltech Y.

Robert Huttenback was the Master of Student Houses at Caltech from 1958 to 1968. This book, his brief "memoires" of that period, offers a fascinating and often amusing look at the student houses during that period. Also, through it, one detects the evolution of the House System and Rotation to their present forms.

Again, this offer is for off-campus undergrads only. Each of the Houses should have already received some forty copies of the book.

H 156 On The Move

H 156: This Friday's meeting will be organizational. Class will be rescheduled to a more convenient time. The subject this quarter will be Human Genetics and Society.

LAYOUT STAFF

JOIN THE TECH

THE PAPER LOOKS?

DON'T LIKE THE WAY

Can you

~~rite~~~~right~~

write

right?

Be a Tech writer.



The newest
and most popular
electronic video games
Gyuss, Starwars, and
Dragon's Lair

Bring this Ad with you for
Six Free Game Tokens

(expires 2/29/84)

STARCRUISER™

1252 E. Colorado Blvd.
(corner of Colorado and Chester)
One coupon per customer

ALL YOU CAN EAT DINNER

Colonel Lee's
Mongolian Bar-B-Q

1115 Fair Oaks
South Pasadena
799-6176

You can make your selection from four kinds of meat and fish, nine fresh vegetables, and ten different Bar-B-Que sauces. The sliced meat and fresh vegetables are cooked on our special Mongolian grill right in front of your eyes.

CLASSIFIED

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

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

TYPING SERVICES available. Reasonable rates. Call Ann Cotton: 8 AM to 10 AM 68 897; 4 PM to 10 PM 449-6654

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

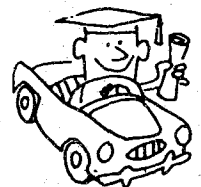
Open daily 9-7

797-9247

MARK'S

Auto and Frame Shop

- Frame Straightening
- Body Work
- Insurance Work
- WHEEL ALIGNMENT
- ENGINE REPAIR & SERVICE
- WELDING
- TUNE-UPS & OIL CHANGES
- BRAKES
- RADIATOR REPAIR
- TOWING



10% Discount to Caltech community with coupon

120 E. Maple Avenue, Monrovia CA
(213) 358-4969

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.