

Music, Science Combined for Ditch Day 1992

Christopher Dunn

Wednesday was Ditch Day, a Caltech tradition. As usual, reporters buzzed about the campus trying to make sense of the mayhem.

Seniors reportedly spent billions of dollars for stacks that had been under construction since childhood. The dollar figure has not been confirmed.

A sluice on the Olive Walk helped techers mine for gold in 1869. Darbs built a cannon to fire Oranges at Fleming. Protesters marched for the rights of moose. The Bent was tied up with string for a stack apparently designed by a disgruntled engineer. Aliens who had nothing to do with Sigourney Weaver invaded Caltech at another stack. Paramedics from the new fire station came to the aid of a heart attack victim in a medical stack.

As techers stood in a passageway in a Norse Mythology stack, they were showered with jello from an overhead trap. That spurred talk of a counter-stack.

One Biohazard Stack (there were two that used the biohazard symbol) pitted three teams against each other to win a big defense contract. They were expected to lie, cheat, and double-cross like corporations. One task involved rats in a box. When the techers failed to entice the rats

out, they opened the "hole of desperation", freeing thousands of ladybugs into the hallway.

Several techers gave a musical performance on the Olive Walk to raise money for gambling in the Club 69 Stack. They spied on the dealer with a video camera and discussed strategies through wireless microphones. Whenever the dealer, a former techer, noticed something suspicious, he boosted the arm of a wall-size suspicion meter. When the meter reached the top, a gambler was expelled and could return only incognito.

Bill and Ted's Excellent Stack provided a real time-traveling phone booth. Other pop-culture stacks included the Movie Mogul Stack, the Hitchhiker's Guide to Caltech, the Calvin and Bart Stack, a stack with several Gladiators matches, stacks involving Buckaroo Banzai and A Clockwork Orange, and one which required techers to wear superhero costumes.

Disillusioned scientists found salvation in Brazilian music as part of a Carnival Stack. They donned gay apparel and covered their bare skin with fingerpaint to celebrate.

Techers wore kilts as they worked on the Highlander 3 Stack. They searched for dummies, lopping off the heads to see the color of the jello

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Photo by Julian Chen.

David Perlman, Mickey Wilber, Michael "Zeus" Su, and others examine the vacuum chamber of the "NX-5" laser as part of Frank Filipanits' "Mission: Impossible" Stack. The stack opened with a self-destructing tape recorder and required its participants to defuse a "bomb" in order to break the stack.

Faculty Board to Consider Women's Center Proposal

Christopher Dunn

The Faculty Board will consider a proposal for a Caltech Women's Center on Monday at 3pm. There will be a rally to demonstrate support on the Olive Walk at noon the same day.

According to graduate student Rob Johnson, the endorsement of the Faculty Board is essential. If the proposal is not endorsed this year, Rob and other supporters will try again next year. Otherwise, the next requisite would be the approval of the trustees.

The Graduate Study Committee endorsed the idea this year and recommended that the Board study the proposal, which is still inchoate.

"It's really in a very dynamic state," said Johnson. He stressed that the Center would be "for the

whole community" and, therefore, that plans will not be concrete before more voices are heard.

The Organization for Women at Caltech, who drafted the current proposal, modeled it on the job of the Coordinator of International Student Programs, Parandeh Kia. The estimated cost of \$100,000 per year includes a full-time coordinator, a part-time clerical assistant, funds for programs, and honoraria for guest speakers. A page of the proposal outlines a typical day for the Women's Center coordinator, but details are still sketchy.

A private donor would be solicited to endow the Center with approximately one million dollars initially. The Institute might cover a portion of the operating costs.

Some members of the community see a strong need for the Center. Anne Marie Eldering, a graduate student, said, "Some things are harder here at Caltech than they are in the world at large, and that's especially true for women."

A female staff member said, "This f—ing place is a men's center." She believes that men at Caltech already have the advantage, and she hopes that the Women's Center can help

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Registration Survey Results

*Pamela Abshire
& Maneesh Sahani*

At registration for this term, undergraduates were asked to complete a survey about certain topics relevant to student life. This survey was created by the group of students following up last year's Student-Faculty conference. *[Please note that the survey was not an act of the administration. This was an effort by students for students.]* Volunteers from the followup committee distributed and collected the forms at registration. We received 421 responses!! (That's about half of the undergraduate student body.) The relatively large sample size ensures that the results are an accurate representation of student sentiment, although there will be an inevitable bias towards those students who registered on the first day of the term. Those results have now been compiled, and we would like to present them to the community in this forum.

The first four questions of the survey address issues concerning graduation requirements. Dedicated readers of the *Tech* may recall a controversy last term over graduation requirements. (See the issue of March 13, 1992.) An open letter to

Dr. Richards, chairman of the Faculty Board, requested that he stall the consideration by the Faculty Board of a proposal involving graduation requirements. This letter was signed by 347 people, including many students and some faculty members. Currently the catalog does not specify how graduation requirements are to be determined, and the proposal in question purports to clarify that indeterminacy. The proposal in question suggests amending the catalog as follows:

It is your responsibility to keep informed and to comply with the rules and policies affecting your academic standing as a Caltech student. You should consult from time to time with the Registrar and your option advisor concerning the requirements under which you graduate.

This policy would actually represent a departure from previous policy and make it difficult for students to plan consistent courses of study for their years here. The policy adopted by the last five Deans has been that students could graduate under any catalog for which they had registered, but the new proposal allows the possibility that graduation requirements might be different from those stated in any catalog. The

first three questions of the survey were designed to gauge student awareness of and support for the various possibilities. The new proposal ("graduation requirements determined by registrar and option officers") was listed with several other possibilities to answer the first three questions. When students were asked, "What was your understanding a month ago of how your graduation requirements were determined?" the most common response was "any catalog for which you have registered" (50.4%), which is consistent with the actual policy adopted by the last five Deans. (This survey was distributed and collected at the beginning of third term, when that issue of the *Tech* publicizing the controversy over graduation requirements was less than a month old.) The next most common response was "entering catalog" (41.3%). When asked, "What is your current understanding?" the same two responses were first and second, but with lower percentages (37.3% and 34.6%, respectively) and much more uncertainty (93 people answered U). The greater spread in the answers to this question indicate that many undergraduates were aware of the contro-

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LETTERS

Posters and Vandalism

To the Editors,

I am writing to draw the attention of the Caltech community and especially of the student body to two unsigned letters—one typed, one handwritten—posted on the notice board outside the south door of the Coffeehouse. Both letters have been defaced by a single, unknown individual.

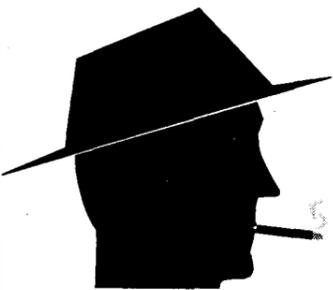
The unidentified maunder wrote, with very large bold letters, "YOU SUCK" across the first page of the typed letter and proceeded to write uncivilized remarks. The second,

handwritten letter appeared in support of the first, and the maunder defaced it too with comments like "no shit," "you are some kind of pinko socialist," and "crap."

I am outraged and disappointed to see such deplorable means of discourse at Caltech. If the anonymous defacer disagreed with the letters, the democratic way was to write a letter in response. I do wish that both letters were signed, and the defacer had the moral courage to identify himself. Nonetheless, no matter how offensive the posted letter may be to anyone, defacing it is barbarous behavior. Disgusting remarks do not convince anyone.

Khurram Dastgir-Khan
Box 261, 585-8817

Crime & Incident Beat



Rajan Ranga

5/1 The victim secured his apartment in the Catalina Complex and went out of town for a few days. When he returned he discovered that someone entered the apartment, apparently through the sliding glass door. The victim did not know what was missing.

5/3 A suspect approached a group of students in Ricketts house lounge at 12:18 PM. The suspect asked the students about

the effects of the recent riots on Caltech. The suspect seemed to be agitated. When one of the students called security, the suspect left.

5/4 An infrared scope is missing from a room in the Beckman Institute. The room was locked and there was no evidence of forced entry. Value: \$1500

5/6 The victim left his watch and binoculars on his desk in his office in Beckman Institute on 4/30. When he returned on 5/6 he discovered that the watch and binoculars were missing. The office was left open on 4/30. One witness reported a suspicious person loitering in the hallway who did not appear to be a Caltech student. Value: \$115

5/6 A witness notified security that there were three suspects in the Fleming house kitchen who did not appear to be Caltech students. When the officers arrived, the three suspects were observed leaving the courtyard. When asked, they stated there were here to see a friend. The suspects did not know the last name of the address of their "friend." One of the suspects had microwave french fries in her possession. The suspects were interviewed and told that they were trespassing on private property. They were then escorted off campus.

Total Value: \$1,615

The Writing on the Wall

Rajesh "Q" Bilimoria

One thing I've noticed since I've been at Caltech is the lack of graffiti almost everywhere, even bathroom walls. Maybe Caltech students respect property? Maybe not. I don't want to criticize the undergraduates for being lazy; I think enough other people do that. But after the riots, a letter with the title "READ THIS" popped up all over campus, discussing some of the issues relevant. Not too long afterward, the letter was vandalized. Next, beside the copy of "READ THIS" outside the Coffeehouse appeared "Read This Too." Again, the letter was vandalized. There are several things wrong with this kind of discourse and debate. Primarily, all the writings I've referred to are unsigned. The lack of an identifiable author makes it impossible for the reader to recognize the inherent bias in the writing. I don't want to discuss whether or not the letter was correct or incorrect, but I am interested in the reasons it was posted unsigned.

It's been two weeks since the day after the King verdict was announced. *The California Tech* has, in the past two weeks, received no letters concerning the verdict, the looting, the riots, the urban underclass, or anything else relating to the verdict and its aftermath. We recently received a letter expressing outrage about the posters I've mentioned above, but that's it. Even after I wrote an editorial after the riots began, we've received no letters.

Does everybody who reads this paper agree with me? The sampling of opinions in the same issue as the editorial indicates that this is not the case. Or are my opinions so "safe" that no one gets upset enough to write. To me, the events almost two weeks ago were very upsetting for many reasons, the reasons I expressed in my editorial. I think almost everyone had an opinion about what has happened.

We have a very small staff, so we often don't have a large number of articles. But anyone can write us a letter, with no commitment involved. This isn't just a simple request for our readers to write to us; I really wonder how this community feels. I hope all of our readers feel free to express their opinions in the form of letters to the editor. Think of the Letters page as the readers' forum, because that's exactly what it is.

EDITORIAL

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Women's Center Proposal

find out why women leave and why they feel pressured.

Lucy Guernsey, Director of the Y, said, "[Women] have got special needs that we have to address."

A recent survey evinced broad support from female staff members and moderate support from female students.

One room being considered for the Women's Center is the previous location of the Red Door Cafe, near the Y. The OWC currently employs the room.

Undergraduate Linda Maepa has asked persons of all genders to join the rally Monday to "show the Faculty Board that the Women's Center isn't confined to paper but a living reality and a living need." Lemonade and cookies will be served at the rally.

Jim's Journal



The Tech meets every Friday at 12:15 p.m. in the Coffeehouse. Send E-mail submissions to editors@tech.caltech.edu

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EDITORS
Rajesh "Q" Bilimoria
Michael Oder
Christopher Orth

CRIME BEAT EDITOR & PHOTOGRAPHER
Rajan Ranga

WRITERS
Pamela Abshire
Ned Bowden
Jill Bush
Jim Caron
Christopher Dunn
Amitabh Mehra
Maneesh Sahani
Sam Webb

BUSINESS MANAGER
Khurram Dastgir-Khan

CIRCULATION
John Grade
Jennifer Wright

THE CALIFORNIA TECH
Caltech • 40-58 SAC
1201 East California Boulevard
Pasadena, California 91125
(818) 356-6154

Jim's Journal



by Jim

Jim's Journal



by Jim

FRIDAY NIGHT ASCIT MOVIE

Trek VI

STAR TREK
THE UNDISCOVERED COUNTRY

PG

NUFF SAID!!

Baxter Lecture Hall
7:30 and 10:00 pm
\$1.50 ASCIT
\$2.00 Other

Next Week: **Bruce Lee: Enter The Dragon** Next Week:

LAEMMLE THEATRES

ESQUIRE
2670 E. Colorado Blvd.
(818) 793-6149

COLORADO
2588 E. Colorado Blvd.
(818) 796-9704

Raise the Red Lantern

Daily 6:30, 9:15 p.m.
Sat-Sun Matinees 12:30, 3:30 p.m.
starts May 20
LOVERS

E. M. Forster's Howards End

Daily 4:00, 7:00, 9:45 p.m.
Sat-Sun Matinee 1:00 p.m.

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Registration Survey

versy: there is no stated policy, so confusion is the appropriate response. When asked, "How do you feel they should be determined?" the same two responses were again the most popular, with "any catalog for which you registered" taking an even larger percentage of the total response (50.9%) and "entering catalog" less popular (37.4%). The final question asked students how helpful the registrar's office had been in determining graduation requirements, and the overwhelming response was that it had not been very helpful. The average response was 3.9, with a standard deviation of 1.2, where 1 meant very helpful and 5 meant not at all helpful. When the sample was restricted to those who had been here at least two years — that is, those entered in 1989 or earlier — the response was slightly less negative, with an average response of 3.8 (std. dev. 1.2). The intention in restricting the sample was to eliminate possibly negative answers from people who simply had not tried to obtain help.

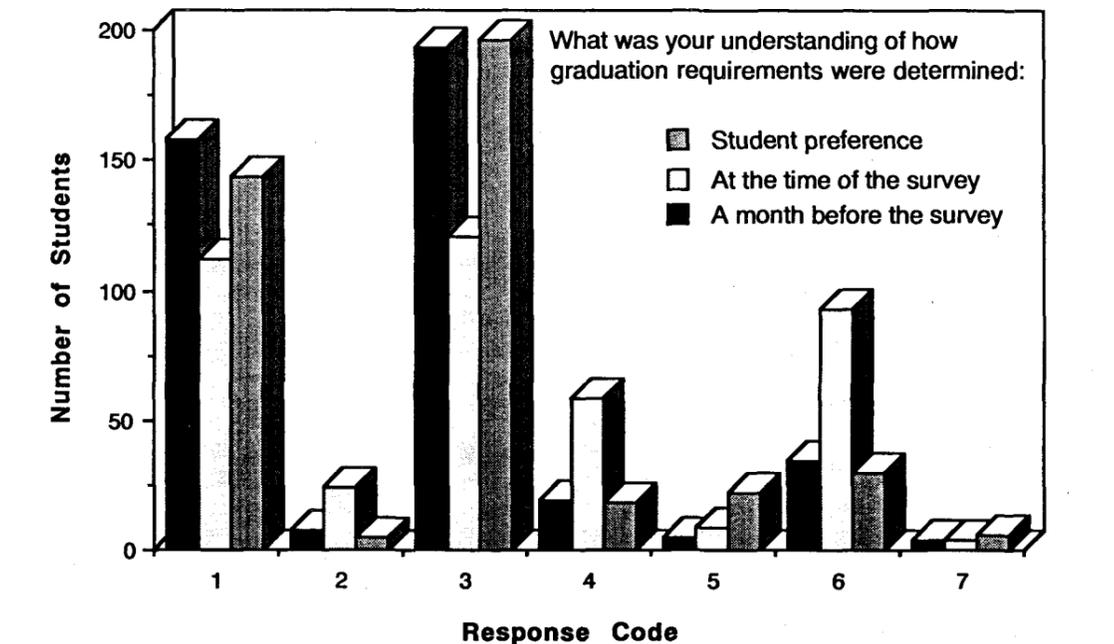
This controversy over graduation requirements is not over yet!! The same proposal returns to the Faculty Board this Monday, May 18, for consideration. If approved, the Institute would seem to be admitting that it is unable to commit itself to a consistent set of graduation requirements. This would obviously make life difficult for those who plan their schedule of classes years in advance, but would also undermine the catalog's value as the contract between students and the Institute. This proposal appears to create an imbalance, for students are bound by the catalog, but the Institute would be claiming that it is not. The results from the registration survey are fairly unambiguous: students do not support the proposed change in how graduation requirements are determined.

Question #22 asked students, "How much would you be willing to pay towards having phones permanently installed in campus rooms?" The average response was 3.4 (standard deviation 1.3), which sets the average amount a student would be willing to pay between \$20 and \$40. (2 meant \$20 or less, and 3 meant \$40 or less.) This show of support is fairly impressive; the results did not change significantly when the sample was restricted to those students who had indicated in the demographics section that they lived on campus (in that case, the average was 3.3 with standard deviation 1.2). This financial support, furthermore, is quite in line with the expected cost of such a system. An estimate for the one-time cost of a phone system serving the undergraduate houses was compiled over spring break this year by Rick Walker, a Blacker alumnus who graduated in 1982, and Walker Aumann, a senior in Blacker House. They estimate that such a system would cost each student living on campus about \$30. Each telephone line would cost \$40, for a total cost of \$24,000. This cost would be levied only once, with no service charges for things like switching lines. Before such a system can be installed, however, the designers need to construct a prototype system. ASCIT has funded them with \$1000 seed money for this initial design, and they plan to build it this summer. Furthermore, if the prototype works, and if they can get funding for the entire system, they plan to construct it also this summer. It could be in

place by the time people return from frosh camp! It is notable that the survey was distributed before this estimate came to general attention.

The last two questions focused on the campus community. The next-to-last question asked, "Do you believe there is a Caltech Community?" The average response was 2.4 (standard deviation 1.2), where 1 meant certainly and 5 meant no. A common sentiment expressed at last year's Student-Faculty Conference was that there is no such thing as a Caltech community. These results seem to suggest that the sentiment is not as widespread as might be indicated by the results of the conference. For some types of questions, however, it's instructive to not only consider average numbers, but also to look at individual answers. If a significant percentage of the respondents believe that there is no community, no matter how many believe that there is one, then the "community" has a problem. Out of the 400 undergraduates who answered question #25, 70 (17.5%) answered negatively. Undergraduates, moreover, are more likely to have a sense of community than are graduate students, faculty, or staff, because of affiliations with an undergraduate house. The houses constitute communities, often very strong and cohesive communities, but those who do not fit into one of these communities, or who find that all their needs are not met by these communities, are left out in the cold. It was a strong suggestion of both last year's Student-Faculty Conference and the one previous to it, in 1986, that the Institute establish a Community Center. It's very hard to foster a community when there is no base for interaction within the community. There are plenty of places to eat or hang out on campus, but very few of them are on "neutral ground." Faculty, staff, and graduate students might feel unwelcome in the Coffeehouse, at Decompression, at an ASCIT movie, or at a Caltech Y function, in the same sense that undergraduates might feel unwelcome at GUSH or department functions. Interactions between the various classes of this "community" are strained when they must always occur on someone's turf. Because of ties to one of the houses, undergraduates are probably the class within this "community" who least need such a Community Center, but even they seem to be calling for it.

The last question of the survey asked, "How much would you like to see a Community Centre built at Caltech?" The response to this question was also positive, with an average of 2.3 (standard deviation 1.2), where 1 meant very much and 5 meant not at all. This is another one of those questions where it may also be useful to consider individual responses as well as the average. Out of the 370 undergraduates who answered question #26, 219 (59.2%) answered positively, and many gave suggestions for services they'd like to see in such a community centre. The average result may have been biased toward the negative by people who did not know what such a community centre would encompass. Those students who were not involved with last year's student-faculty conference (like frosh!) may very well have never encountered the idea before. A community centre would essentially be a student center, but encompassing the entire community. It would include things



Response codes: 1=entering catalog, 2=exiting catalog, 3=any catalog for which you registered, 4=the registrar and option officers, 5=file a plan with registrar, catalog in effect then, 6=unsure, 7=no response.

like the bookstore, a women's center, a minorities center, a 24-hour food place, meeting rooms, a movie theater, an ATM, and whatever else the community calls for. Some of these services already exist on this campus, but they are spread out from one another and hard to find out about, and they often segregate the various classes of the "community" (faculty, undergrads, grads, staff). A community centre would put all these services in one central place, a location equally accessible to all members of the Community

that such a centre would foster.

There's more to come next week. We've only presented the results of seven of the 26 questions on the survey here. The followup committee continues to meet and discuss these issues, but many of us are graduating this year! We need you! Come to the next meeting or send us mail. Meetings are currently at noon on Thursdays in the IHC room. Send mail to Maneesh Sahani (maneesh@ugcs; box 895) or to Pamela Abshire (abshire@egg; box 613) if you have questions or com-

ments. Check out the new Community Center in front of Firestone! It was constructed on Ditch Day and is dedicated to Chris Brennen.

METHODS: We entered all results from the survey into data files on the ugcs cluster. When multiple answers were marked, we entered either the most neutral one or U, depending on the question. If anyone is interested in making correlations between questions, or between questions and demographic information, please contact Maneesh Sahani (maneesh@ugcs).

Jim's Journal



Come to the
CALTECH



Spring Crafts Faire

MAY 20-22
Winnett Lawn

Sponsored by the Caltech Student Activities Office

I.H.C. MINUTES

Karen Ross

Present: Ed (Ru), Joanna (Ri), Rich (Fl), Rob (Ll), Alf (Da), Kate (Bl) Paquito (Pa), David Wales (MOSH), Ed Goins, Eddie Grado, John White, Rob Hanna, Lanny Boswell, Jill Soha, Ben, and me.

The meeting began at 9:03 PM. **Frosh Numbers:** Each House will house 23-2 students and one transfer next year. These 21 students plus the 225 expected frosh give a total of 246 incoming students who will live in affiliated housing. Numbers calculated at the last meeting were based on 265 incoming students, so those numbers were revised to reflect the additional 19 spaces available in the Houses for upperclassmen. The Houses will take the following numbers of incoming students: Blacker: 29, Dabney: 24, Fleming: 38, Lloyd: 36, Page: 43, Ricketts: 32, Ruddock: 44.

Jill Soha left at 9:30 PM. **Caltech Cultural House:** Ed Goins distributed a proposal for a Caltech Cultural House. The proposal requested an off-campus house, holding about 7 students that would be a place where black, Hispanic, and Native American cultures could flourish. The house would not be open to first year students, but would be another option for upperclassmen who want to live off-campus. Anyone would be allowed to live in this house, but the goal is to create a place where minority students feel comfortable and

can practice their cultures. Eddie Grado explained that the house would be a way of providing more support for minority students. It would only hold about 10% of the minority students, so it would not pull all the minorities away from the Houses. The Cultural House has an advantage over other ideas for helping the minority community (eg. clubs or a cultural center) because it doesn't cost any additional money. The students want to have the Cultural House for this coming year, and it would presumably be one of the unaffiliated single family houses on Holliston. The major concern expressed was over the backlash that would result from suddenly pulling one of those houses out of the lottery at this late date. The general community has not been informed of the proposal, and in light of the housing crunch, if the Cultural House was "sprung" on the community now, it would meet a lot of opposition. The students who want to live there are willing to absorb most of the backlash. Another problem concerns the procedure for picking students to live in this house. The plan was to have anyone who wanted to live in the Cultural House enter a separate lottery. Since lottery numbers for the main off-squared pick are already up, the Cultural House might attract people who have low lottery numbers and are desperate for a chance to get off the waiting list for housing. The IHC was generally in

favor of the idea, but felt that having the house for next year would cause too many logistical problems. It was suggested that the students who want this house should hold discussion sessions to explain the proposal to the rest of the community, with the goal of opening such a house for the 1993-94 school year.

Summer RA's: The application for the job of summer RA was distributed. Houses should recommend people for the job to Kim.

Discobolus: Dabney forfeited last week. Fleming and Ruddock will compete in track on Sunday.

Paquito left at 11:30 PM.

Summer Housing: The pamphlet explaining the procedures for summer housing was distributed. The pamphlet basically outlined the plan the IHC had agreed on several weeks ago. The only major change was to state explicitly that doubles cannot go as singles off-campus.

Random stuff: Ben has a campus extension in his room now. It is X6964, "the IHC hotline." Call him up and bug him. Lanny stressed that when Houses turn in lists of people who have picked on-campus rooms, they must also turn in a housing contract for every person on those lists. **Anyone who doesn't fill out a contract at that time will lose their room!!** This is to prevent people who don't intend to return in the fall from picking a room.

Quote of the day: "The president has absolute power until the House disagrees." —K.Q.

The meeting ended (finally) at 11:55 PM.

ASCIT BoD Minutes

Korhan Gürkan

Minutes of the ASCIT BOD Meeting of May 12, 1992

Present are the BOD minus Mike, Eric Stout, Bryce, Lucy Guernsey, Aimee Ellicott, Ewald, Laurent, Paul & Jill, Gavin Claypool.

Appointed Offices: Signups for Big T Editor and Coffeehouse Users Group Reps are still open. If you are interested, sign up.

This weekend is packed with ASCIT events. Friday is International Day. **The ASCIT Tanning Invitational** will be on Saturday at 150 S. Chester. Also on Saturday is ASCIT Club Ricketts.

Y NEWS

Philip Cofield

Welcome to the extra-quick version of the Y News. Today (meaning Wednesday) is Ditch Day, and I don't feel like spending a great deal of time on this article, so here is a quick rundown of the upcoming week's events:

In case you haven't been outside yet today (now today means Friday), today (still Friday) is International Day. There are lots of internationals dying to tell you about their cultures, entertain you in multinational ways, and give you free food. Wander around Winnett Quad for a while, and enjoy yourself.

Coming next week, we have the rescheduled Caltech Whiffle Ball tournament on Wednesday (Can you believe no one showed up to play on

Wellness Week: Aimee Ellicott is planning to have some sort of health awareness week called "Wellness Week". The event will take place some time late October. If you want to help, go to the planning meeting on May 21.

Scott Dolim shows us the ASCIT Camera. (just in time for Ditch Day) Glee Club, Bike Shop, Engineering Club, Club Homeboy and CLAGS pick up their checks. Tim submits a budget report. Everything looks fine.

Phone System: The BOD decides to spend \$1000 on the prototype for the phone system (4-0-3).

Just as the meeting is about to end, Fru comes with a request for financial support for the sound system. After long discussions, the BOD decides to support the sound system.

Ditch Day?). Thursday at 7:30 in Baxter Lecture Hall there will be a talk about the Dead Sea Scrolls. If you don't know anything about them (such as just what the hell they are), you might want to show up. In an effort to provide non-stop music, there will be a noon concert supplied by Primordial Undermind next Friday, then the Arroyo String Ensemble will play for us on Saturday.

This year was the kickoff year for the Into the Streets volunteer program. We sent students to various parts of Pasadena and Los Angeles to do community service. Next year we're looking at integrating local high schools into our program. Anyone interested in being a member of next year's organizing coalition should contact Riki at 356-9258 as soon as possible.

As usual, more information and sign-up sheets are available at the Y on the second floor of Winnett or call x6163.

Caltech Scientists Discover Magnets in Human Brain

Robert Finn

A team of scientists at the California Institute of Technology has isolated microscopic crystals of the magnetic mineral magnetite from samples of human brain tissue. The presence of magnetite in human tissues may explain some anomalous results from magnetic resonance imaging (MRI), and opens up the possibility that the magnetic fields associated with MRI and some household appliances could have biological effects.

The discovery was made by Joseph L. Kirschvink, associate professor of geobiology at Caltech; Atsuko Kobayashi-Kirschvink, associate research engineer at Caltech; and Barbara J. Woodford, formerly a research fellow at Caltech, and now a research associate at the University of Southern California. Kirschvink will describe their finding at Caltech's annual Alumni Seminar Day on Saturday, May 16, 1992. A scientific, entitled "Magnetite Biomineralization in the Human Brain," has been accepted

for publication in the prestigious *Proceedings of the National Academy of Sciences*.

"I think this discovery is significant from several points of view," said Kirschvink. "Biological magnets have been found in a number of different living organisms, including mollusks, bacteria, honey-bees, pigeons, and salmon. Scientists have long suspected that such materials might be found in human brain tissue, but this is the first clear demonstration of that. Crystals of magnetite are not only permanently magnetic, they are also metallic-type conductors. Hence, this is the first truly new material to be discovered as a natural component of human tissues. In addition, a number of conflicting and controversial studies of the possible health effects associated with electromagnetic fields have been published recently. Many scientists dismissed out of hand studies showing possible health effects since they thought there were no plausible mechanisms by which electromagnetic fields could affect biological tissue. But

they did not know about human magnetite. Our studies of the magnetite crystal we isolated from human brain tissue show that they could be moved around by magnetic fields only slightly stronger than the Earth's natural magnetic field. If, for example, these crystals are coupled to ion channels within human cells, electromagnetic fields could be opening and closing these channels, with unknown biological consequences.

"Because this study has the potential to be misunderstood," continued Kirschvink, "I want to be absolutely clear about what I am saying and what I am not saying. Yes there is magnetite in the human brain tissue. Yes, it is possible that the presence of magnetite mediate any health effects of electromagnetic fields. But in my opinion the jury is definitely still out on whether electromagnetic fields actually do have health effects. The epidemiological studies on this point are suggestive, but certainly not conclusive, and much more work is still needed. We also don't know what normal function magnetite might serve in humans, and in particular I want to be explicit about the fact that we have no evidence at this time that humans have a magnetic sense."

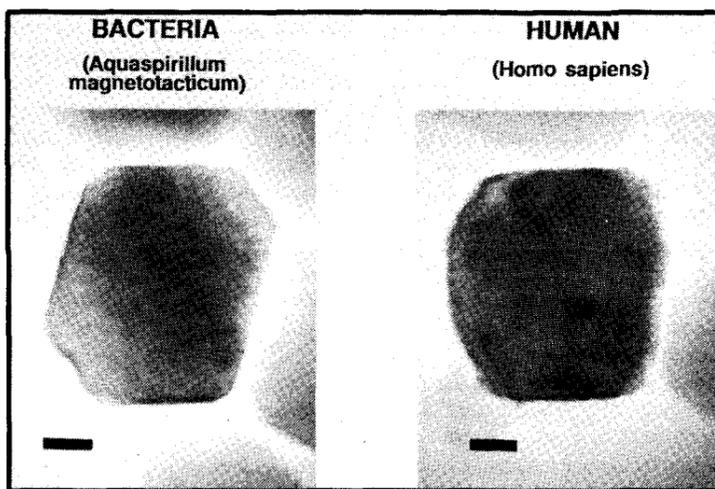


Photo by Atsuko Kobayashi-Kirschvink
Comparison of magnetite crystals isolated from a bacterium, *Aquaspirillum magnetotacticum*, and from a sample of human brain. The bar is 50 μ m.

The scientist obtained samples of human brain material courtesy of USC's Carol Miller, director of the Alzheimer's Disease Consortium of Southern California. The samples came from autopsies of seven patients within 12 to 24 hours after their deaths. (Four of these patients were suspected of having Alzheimer's Disease. The researchers noted no systematic differences between the brains of the Alzheimer's patients and the others in their magnetic characteristics.) To avoid possible metallic contamination, Woodford dissected the

the brain samples using ceramic or Teflon-coated instruments. The samples were transported to a magnetically shielded, dust-free clean room within Kirschvink's Caltech laboratory.

Kirschvink and his co-workers conducted two types of studies in this clean room. In one study they dissolved the brain tissue and tried to extract any magnetic material present, for visualization under an electron microscope. In the other study, they froze the brain tissue and formed it into cubes. These cubes were examined in a "superconducting quantum interference device" (SQUID) magnetometer to determine their magnetic characteristics.

In the extraction studies, small samples of brain tissue were dissolved and liquefied to free microscopic particles of magnetite from within brain cells. These samples were placed for a period of at least one week in special glass vials, custom made by Atsuko Kobayashi-

continued on page 10



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ENTERTAINMENT

Bridge Without Sam

Jeff Goldsmith

Torture

I am playing in a regional pairs event with a new and relatively inexperienced partner. Things are going well when a local pro comes to our table and sits on my left. I do not recognize his partner, though she is obviously a client. I deal myself

♠AJ632 ♥Q4 ♦AJ65 ♣42

The bidding is swift and inaccurate:

ME	PARTNER
1♠	2♥
2♠	4♠
(All Pass)	

The opening lead is the ♦ 2, and I see

♠ K107
♥ K10652
♦ 3
♣ KJ105

N
W E
S

♠ AJ632
♥ Q4
♦ AJ65
♣ 42

The bidding was a little rough, but the contract is not too bad, though that is just a coincidence. If I can open hands like mine, then I think partner must only invite game with his.

I start with two aces to lose and two queens to find. I also have three diamond losers that need to be disposed of; I can ruff one in dummy, but I might be unable to draw trumps if I ruff more than that. I shall need the hearts suit, I think, so I win East's ♦ Q with the Ace and advance the ♥ Q. East wins this and returns a trump. I duck, of course, and West's Queen is found under my King. I still need to do something with the hearts, so I cash the ♥ K. The pro contributes the Jack, which I am confident is a true card. It looks like trumps are breaking 3-2, though I do not know where the length lies yet. It would be dangerous to assume this just from the play, but the pro looked a little annoyed by the trump return, so I doubt that was a singleton Queen. If trumps are breaking, I might be able to play this hand along reverse dummy lines, so I ruff a small heart with the ♠A. West contributes a small club. I think I shall make this hand if the ♦ A is on my left, so I lead a club to the King, losing (oops) to the Ace. RHO should now know that I am 5-2-4-2, and should cash their club trick if she has the Queen, then return a heart. I shall go down if that happens. She is not up to this defense, however, and continues the assault on her partner's trumps. I play low, he contributes the Eight, and I win the Ten. I think I can place the whole hand now. West has 3-2-4-4 distribution and East has the ♦ Q, because West would probably have pitched a diamond instead of a club with ♦ Qxxx. It is just barely possible that West is 2-2-4-5, but he might have led a club in that case. In any event, I think I see a way to make this hand against either of those holdings.

I cash the ♥ K, pitching my losing club from hand, and West pitches a club, slowly. Now I am sure about the hand, and these cards are left

♠ 7	♥ 6	♦ -	♣ J105
♠ 7	♥ 6	♦ -	♣ J105
♠ J105	♥ -	♦ J65	♣ -

The remaining play goes quickly for me, but slowly for the pro; he has to decide when to use his trump. Each discard comes more slowly. I think he knows the hand, but he does not see that the contract is cold, yet. I cash the last heart, RHO pitching a club, the rest of us diamond. Another mistake for her, now I have no guess in the club suit, but I was sure she had the Queen, anyway. The ♦ J is, of course, covered, and I ruff with the J; West now is in possession of the high trump! I ruff a diamond with dummy's trump and cash the good club pitching my last diamond. West can ruff whenever he wants, but I have the rest.

This hand has taken about twelve of our fifteen minutes and the pro is sweating. His partner asks if her trump return was best, but he is silent as we finish the round. Later, I find that +420 was top on the board, and we win the event. This time, I think I have earned it.

The Caltech Bridge Club meets every Monday night at 7:15 in the Red Door Cafe and holds lessons for new players every Tuesday night in 72 Jorgenson Hall at 8:15. Everybody is welcome; call Jeff Goldsmith at x2818 for details.

This term, the lesson series will be covering "intermediate topics" and will be taught by expert guest lecturers. Everyone is welcome.

Delicatessen

12345678910

Delicatessen is an odd-ball French film directed by Jean Pierre Jeunet and Marc Caro that takes place in a post-apocalyptic society. This film is a blackly humorous drama that focuses mostly on the characters in the story. It is set in a tattered apartment complex that houses several tenants and a landlord who is also a butcher by trade. Each character has a bizarre twist to their personality which sets a pace for the rest of the film to follow in a deathly funny way.

Food is scarce in their apocalyptic world where man has become man eater and it becomes the commodity with the most value. However, this film is not about savages and cannibals. Much to the credit of Jeunet and Caro, Delicatessen becomes a film more focused on the people involved in it rather than on their eating habits. The black humor results from the day to day living of the people in the apartment building.

In one apartment room there is a brother tandem who manufacture and eats well only to later be slaughtered and eaten by the tenants. But, that's not all, there also exist a vegetarian underworld that

upstairs is ghastly white complexioned woman who is fascinated with death and is fixated on creating elaborate mechanisms to kill herself. There is also some space for companion rivalry which is nicely filled by a naive butchers daughter (Sylvie Laguna) who de-

lives in the sewers of the city streets and is trying to steal the butchers money which, for all intents and purposes, is food in the form of grain.

This film is bizarrely humorous and can only be described as a combination of Monty Python and the

Three Stooges. Out of context the scenes in Delicatessen are disturbing and definitely not funny. However, directors Jeunet and Caro found a way to put this story plot together in such a way that it actually makes you laugh. As was mentioned previously, this film

focuses more on the the characters with twists in their personalities and how they inter-relate with each other. That is what makes this film work and be successful. There are not a lot of twists and turns or a complicated plot scenario to follow in this movie. The beauty in this film is in its simplicity and in how the directors use of the camera with tilting shots and close focuses set the feeling for the action. Overall, this is a well made film that will make you laugh in a strange way.



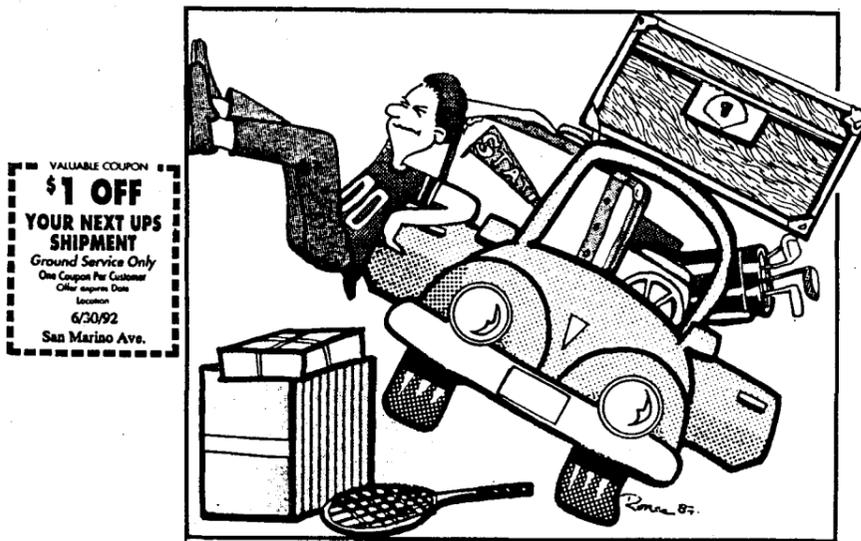
icides to court a pug-ugly former circus clown (Dominique Pinon) who is the newly hired maintenance man and must fend off a crazy gun wielding postman. The scam in the building is that the landlord and butcher (Jean-Claude Dreyfus) puts an ad out for a maintenance man to work in the building and upon getting hired he does minor repairs and eats well only to later be slaughtered and eaten by the tenants. But, that's not all, there also exist a vegetarian underworld that



Jim's Journal by Jim

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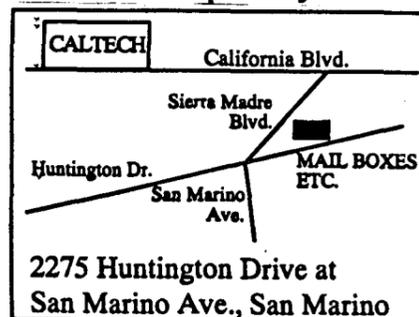
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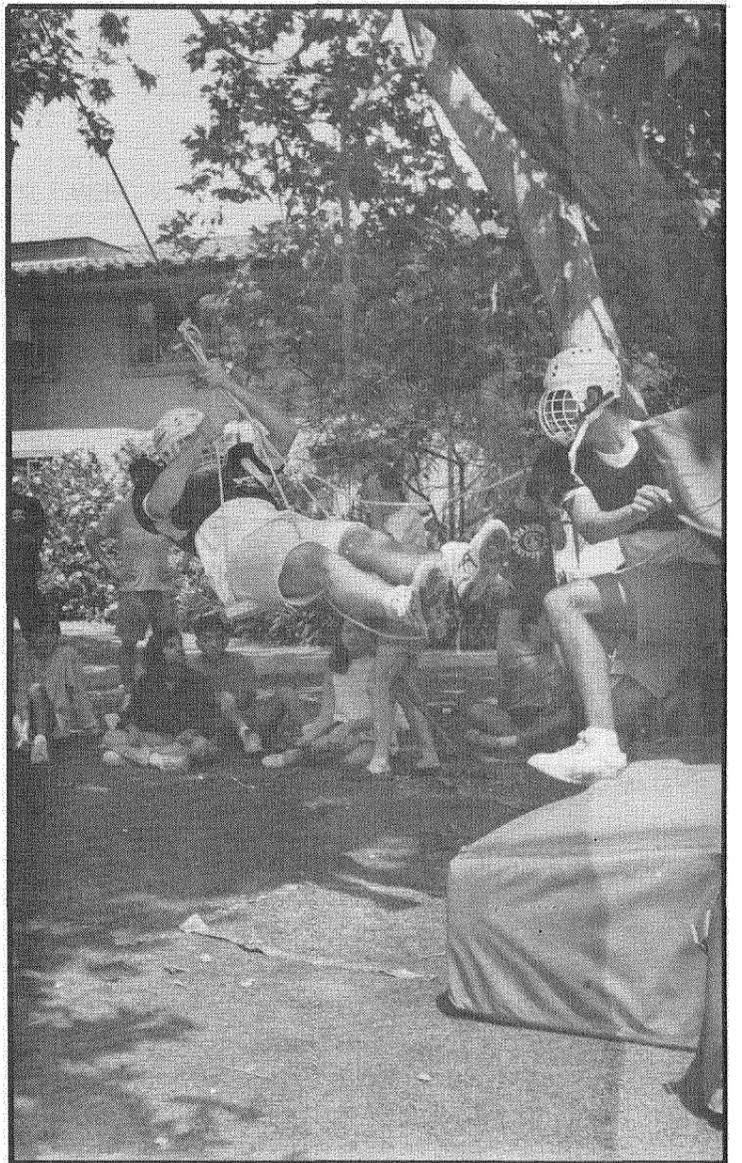
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Ditch Day 1992



Clockwise from right: Posing beneath their sculpture, a group of Scurves rest after breaking Dan'lstack. The Holly gladiators battle for control in Winnett quad. A group of musicians hijacks the "Enjoy Life" bench for a bit of fund-raising in the Club 69 stack. A group of Darbs construct a community center for Pam Abshire's stack.



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Jim's Journal

by Jim

Last night Mr. Peterson was standing on my back, kneeling me with her paws.

I was trying to fall asleep, but she was too distracting.

Finally she sat at my feet and fell asleep.

I must have, too, because that's the last thing I remember.





continued from page 1

Ditch Day

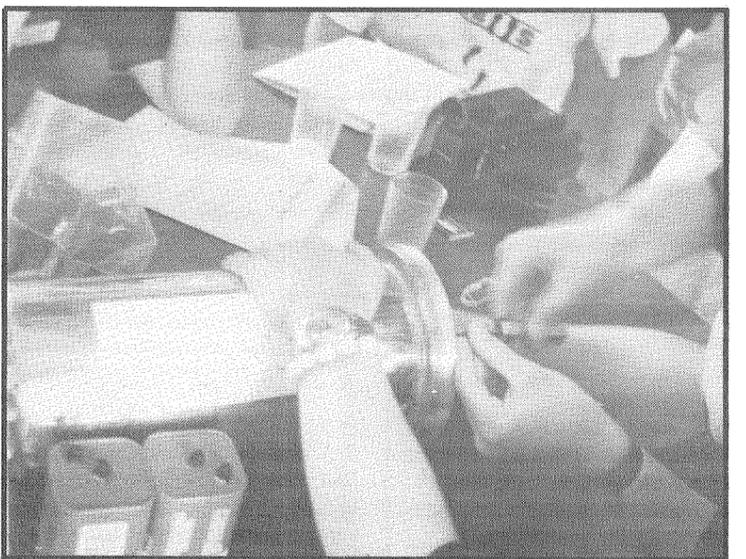
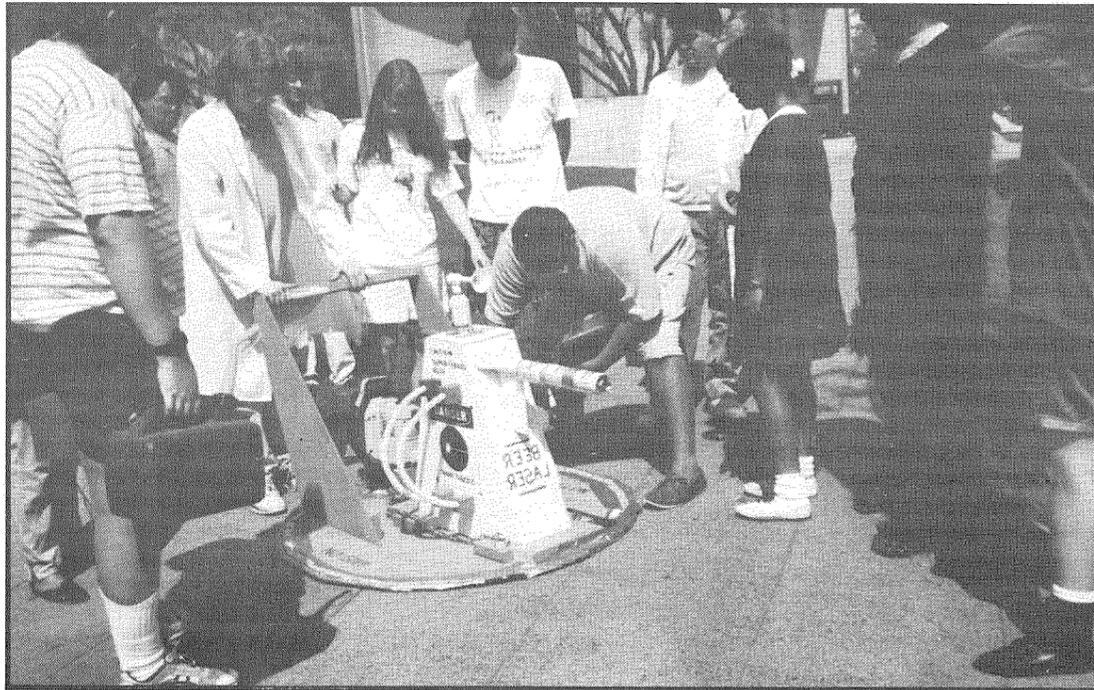
inside.

Others wore trench coats and disguises as they solved a Pink Panther Stack. They were fed typical French cuisine: fries, toast, dressing, etc.

At the Air Jordan Stack, teachers ate Wheaties, drank Gatoraid, wore Nikes, and lunched at McDonald's. They hung an Air Jordan silhouette from Millikan Library, and one team nearly lost their shorts in a strip basketball shoot-out.

An ambitious robot stack that malfunctioned stirred the most serious sentiments to counter-stack.

When one junior was asked Wednesday night whether he had had fun, he replied, "Yeah, I had fun."



Today I went to a movie with Ruth and Steve.



Clockwise from above: The Beer Laser is brought out in the DR. Science stack. A group of Darbs make modifications to a sign. Scuves attack a Lectroid for Tod Kurt's Buckaroo Bonzai stack. Flems perform "Smells Like Teen Spirit" for the Wrinkled Sphincter stack. Scuves examine the vacuum chamber of a laser for the Mission: Impossible stack.

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continued from page 4

Kirschvink. Into these vials were placed strong neodymium-iron-boron magnets. Over the course of the week, the tiny particles of magnetite migrated through the solution of brain tissue to the glass wall surrounding the magnet. After a week, the vial and its attached magnetic particles were examined on the high-resolution transmission electron microscope in the Caltech Materials Research Center.

The extraction revealed two types of magnetic crystals. Of the 70 crystals examined, 62 had diameters of 10 to 70 nanometers, while the others had sizes ranging from 90 to 200 nanometers.

"I was struck by the similarities between the human magnetite and the magnetite found in magnetic bacteria," said Kirschvink. "magnetic bacteria sometimes have long strings of magnetite crystals organized in cellular organelles called magnetosomes. These bacteria clearly use these magnetosomes to sense the Earth's magnetic field. Bacteria swimming around in a pond could use information about the Earth's magnetic field to tell up from down, as long as the pond wasn't right on the equator, since magnetic field lines descend into the Earth's interior. A Bacterium that wanted to go down, away from the surface and toward the nutrient-rich mud on the bottom would follow the north pole of its magnet in the northern hemisphere and the south pole of its southern hemisphere. I want to repeat that I don't know whether people have a magnetic sense, but many of the magnetite crystals we found in human brains are very similar to those in bacteria, and are shaped in such a way as to be optimal for use as a magnet."

The SQUID magnetometer studies showed that the samples of human brain tissue had the unmistakable signature of the ferromagnetic mineral magnetite (Fe₃O₄). (Ferromagnetic material are those that strongly interact with a magnetic field. Ferromagnetic materials are contrasted with diamagnetic materials that are weakly repelled by magnetic fields, like water or most fatty substances, and paramagnetic materials that are weakly attracted by magnetic fields, like some of the iron in the hemoglobin molecule, which carries oxygen to the blood.)

All areas of the brain had significant levels of magnetite—about four nanograms of magnetite per gram of brain tissue—but the highest levels were associated with the meninges, a membrane that covers the brain, which had about 70 nanograms of magnetite per gram of brain tissue. This translates to about 5 million magnetite crystals per gram of brain tissue, and more than 100 million crystals per gram of meninges. Furthermore, the SQUID magnetometer studies suggest that the crystals occur in clumps of between 50 and 100 particles.

"At 70 nanograms per gram, magnetite makes up only a small fraction of the iron in brain tissue," noted Kirschvink. "However, even if only one cell in a million contains magnetite, this small fraction could have a large effect when exposed to the strong electromagnetic fields associated with MRI, or the somewhat weaker fields associated with some household appliances. Effects at single cell levels can sometimes have significant consequences. The electromagnetic fields associated with most power transmission lines are not strong enough to affect these magnetite crystals."

"We have not seen magnetite crystals in electron micrographs of intact brain cells, and neither, to my knowledge, has anyone else," said Woodford. "Even with 5 million to 100 million crystals per gram of tissue, it would be much worse than looking for a needle in a haystack. I hope that, as a result of this study, many neuroanatomists will be on the alert for structures that look like magnetite crystals."

Joseph Kirschvink and Atsuko Kobayashi-Kirschvink are a married couple who have devoted their careers to the investigation of biological magnetism. They have, in fact, named one of their sons Jiseki, Japanese for "magnetic stone," and the other Koseki, Japanese for "mineral stone." In addition to their studies of human brain tissue, they have studied magnetite in bacteria, fish, and insects, and are currently undertaking a study that is attempting to determine whether honeybees actually use their magnetite as an internal compass to help navigate during foraging for food.

The studies of human brain biomagnetism were supported by grants from the N.I.H.

SPORTS

Boffo Bonecrusher IX

Sam Webb & Amit Mehra

Last Saturday night and early Sunday morning, the Caltech Y, ASCIT, and the GSC sponsored the pinnacle in sporting endeavors when the top ten broomball powers collided on the ice at the Pasadena Ice Center for Boffo Bonecrusher IX. For the first time in a long time, the once mighty Damn Scurves were vanquished early, and did not play a role in the dramatic play-offs, as the Cockstogensens took the crown in a thrilling decision over French Kissing.

There were numerous highlights in the initial broomball rounds. For four of the first five games Not Brains/Bolts were thrashed about the ice mercilessly by four much stronger, quicker, and talented teams, including Team Howie/Whatever twice, losing by combined score of 0-7 over the four games. The Cocks defeated the Lame Juniors in a game that featured a very pissed Rob Rickenbrode, who claims that the other team was playing unfairly. The Cocks did lose a style point in that game, but still won. The next game was Lloyd Bowl I, pitting the Sophomore Crew against the Worthless Team Moosebreath. It was a slaughter from start to finish, as the sophomores quickly vanquished the unexperienced frosh 2-0.

The next game was a classic, featuring the proud Damn Scurves and French Kissing. It was a scoreless match for the first 19:58, with both teams squandering scoring opportunities. However, with two seconds left and the crowd counting the time down, French Kissing scored a goal to defeat the Scurves. The Scurves tried valiantly in the final two seconds to mount an attack, but fell short.

The next game featured the Sophomore Crew against the Cocks. The Lloyd team tried to restore honor to the Lloyd broomball name, but got their butts bashed as the Cocks showed no mercy and destroyed the Crew by a devastating score of 5-0. (OUCH) In Lloyd Bowl II, the juniors taught the frosh a second lesson, as they finished the game with a flurry of goals, with the aid of a few ringers. The juniors put away the frosh 3-0, with each goal being very important in the final standings. The final game featured a very angry Damn Scurve squad against

Larger than a Truck. It was a very physical match, with the two teams trading scores and blows until Julius Yang scored the clincher to put the Scurves on top. There was a small fight near the end of the match, but no one was seriously injured. Jason Hollinger had an impressive hit that rocked Hans Hornstein against the boards. However, it wasn't enough, as the Scurves failed to make the play-offs.

clock. This led to the final between French Kissing and the Cocks. This was a dirty rough and tumble game, and both teams were guilty of misconduct. The Cocks took an early lead into the half, but with time running out French Kissing scored a goal to tie the game. It appeared that the game would end that way until the Cocks mounted an attack against the weary French with under a minute left. To the amaze-

Broomball Results

TEAMS

- 1. Damn Scurves
- 2. Cockstogensens
- 3. Sophomore Crew of Cusswords
- 4. Team Whatever
- 5. Larger than a Truck
- 6. Lame Juniors
- 7. Not Brains
- 8. Not Bolts
- 9. French Kissing
- 10. Team Moosebreath

RESULTS

First Round	Semi-Finals	Finals
4 vs 8 0-1		
9 vs 7 0-2		
8 vs 5 2-0		
7 vs 4 0-2	2 vs 6 1-0	
6 vs 2 0-1		2 vs 9 2-1
3 vs 10 2-0	9 vs 4 1-0	
1 vs 9 0-1	(O.T.)	
2 vs 3 5-0		
10 vs 6 0-3		
5 vs 1 1-2		

The first round of the finals featured a rematch between the first place Cocks and the Lame Juniors. As the game proceeded late into the night and early into the morning, tensions rose as the Cocks got over aggressive and hit Albert Ho across the head with a broom! However, despite his viscous attack, Albert still played courageously displaying many impressive slide tackles. The game ended just as it did in the first round, with the Cocks advancing 1-0. The second round of the play-offs had French Kissing facing off against Team Whatever. It was a scoreless duel for the entirety of regulation. The teams then proceeded with a five minute sudden-death overtime, and French Kissing finally scored with 2:06 left on the

ment of the crowd, the Cocks scored with only 18 seconds remaining on the clock, making the final score 2-1 and giving the championship to the Cockstogensens.

A special tribute goes out to Seiya "Emergency Man" Fukuda, who was a faithful assistant and heroically raced out on his bicycle to obtain ice for a badly beaten Melinda Au. Seiya encountered more misfortune on his way back, as he witnessed a two-car accident. He valiantly stopped and called the rescue squad to come help the hurt motorists.

Thanks to all the teams who participated, and look forward to Boffo Bonecrusher X first term next year.

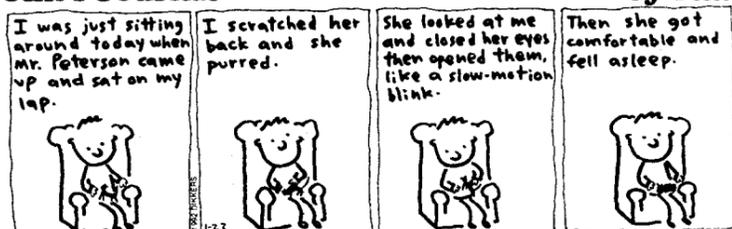
Jim's Journal

by Jim



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SPORTS

Caltech Track Successful at SCIAC Finals

Ned Bowden

Last Saturday was full of excellent running from the Caltech track and field team. The team competed in the SCIAC conference track finals at the Caltech track.

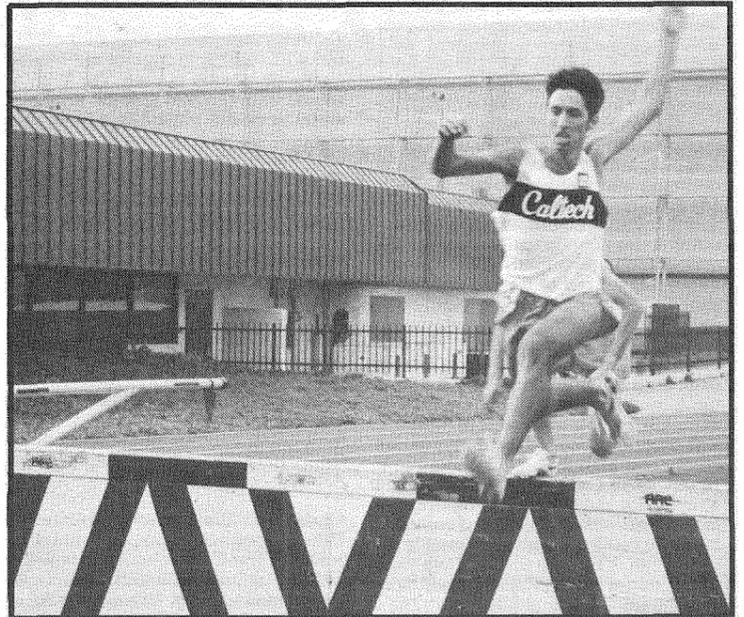
The leading scorer for the team

was Greg Dudey who placed second in the pole vault and in the 400m intermediate hurdles. Greg admitted to playing with his opponents minds by casually clearing 12' in the vault and then asking the bar to be raised to 14'. His strategy worked as many other vaulters fal-

tered. Steve Harkness placed a strong fourth in the shot put despite having a poor day. In the distance events, Ned Bowden placed fifth in the 1500m and fourth in the 800m finals. The 1500m was a warm up for a strong, season-ending 800m race where he set a personal record of 1:57.18. Brady Montz raised his arms at the end of the 100m final in Ben Johnson fashion as he saw that he had finished sixth and won an All-Conference placing. In the javelin Jeff Martin strutted his stuff by placing second in the conference with a throw over 165'. Emmeline Naranjo closed out her season by running so well that she was All-Conference in four events!

An exciting turn of events for the team came in the last event of the meet, the 4X400m relay. The team entered as the underdogs to everyone else. Rob Whiteley led off the race with an excellent leg. Ned went next and managed to give the baton to Ron Steiger with two other teams nearby. The next 400m were run faster than Ron had run before. In the final leg Dudey caught the two teams ahead of him but ran out of gas before he could pass them. The team finished with a season record of 3:29.

After the meet Aaron Matzner went to Occidental College to race in the 3000m steeplechase. Aaron had pulled out of the SCIAC meet



Aaron Matzner will be competing in the Division III National Championship in Waterville, Maine in the 3000m steeplechase.



Emmeline Naranjo competes in the hurdles at last Saturday's SCIAC competition, which was held at Caltech.

to rest up for a chance to go to nationals in the steeplechase. The time he needed was 9:13.0 and there promised to be runners in the race who could run sub 9:00 who could pull him through to a good time. Aaron went out strong and ran at a pace just over what he needed to run to qualify for nationals. He watched as a runner from the University of Redlands who also wanted to go to nationals went out too fast and

slowed down at the end. With 700m left Aaron was close to the qualifying time, but he needed to pick up the pace. Coach O'Brien shouted at him to run faster, and he responded. Every hurdle was attacked as Aaron ran an impressive 70 second lap. In the last three hundred meters he raced with everything he had and finished in 9:12.9! Aaron will be going to the national meet in Maine in ten days to represent Caltech.

Women's Tennis

Jill Bush

The Caltech Women's Tennis Team had a disappointing ending to an extremely well-played season. Going into the SCIAC Tournament the team had a 0-9 conference record that did not reflect the many close, tough matches of the season. The Beavers were confident that a few good draws at the tournament would give them the edge to overcome the last place position.

Originally scheduled for May 1st and 2nd, the competition was postponed one week due to the riots in South Central L.A. Faced with some scheduling problems, the Beavers would be forced to play without their number one doubles team of Diane Wong and Miran Rhee. However, an extra week of practice was perhaps just what the women needed to prepare for some tough matches.

On Friday May 8th the Caltech Beavers once again traveled to Redlands, but this time without number one singles player Nancy Hua, who became ill but made it for her doubles match with partner Fiona Lo. Wong and Rhee, who were coming to play singles, had some car trouble and arrived late, but proved to be the players of the day.

In first round singles Wong was matched against Leslie Heitler from Oxy, whom she had beaten in a tough three hour match just a couple weeks earlier. Wong had no trouble this time, and racked up two points

for Caltech with her 6-4, 6-0 victory. Rhee also won her first round singles match, beating her opponent from Laverne 6-1, 6-3. Number two singles player and co-captain Fiona Lo played a tough match against SCIAC's number one seed, Shelley Keeler, and entered the consolation round along with Yu-Chien Kuo and Jill Bush.

First round doubles started Friday afternoon, and the Beavers had some tough draws. With two years of experience playing together, co-captains Hua and Lo played an excellent first set, taking four games from CMS. Monica Oei and Jill Bush played number two for Caltech, and Yu-Chien Kuo and Monica Holboke teamed up especially for SCIAC at number three. Both teams played hard, but all three were entering the consolation round on Saturday.

The rain in Pasadena on Saturday did not stop the Beavers from making the trip out to Redlands. Unfortunately, it was raining just as hard there, and after a couple of hours of waiting the coaches decided it would be impossible to finish the tournament. Pomona-Pitzer was declared conference champions based on their record in dual matches, and Caltech was robbed of the chance to pull out of last place. It was a disappointing way to end a season that felt like a definite improvement over last year, and the team can only hope for the best next season.

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WHAT GOES ON

NOTICES

Preregistration - Class sign-ups for the fall term, will be held in **Winnett Lounge** on Monday, May 18 from 8:00 a.m. till 12 noon. The Registrar's Office requests that you bring a completed pre-registration card; your adviser's signature is not necessary.

ME-72 Preregistration-The ME-72 pre-registration for fall term 1992 will NOT be on a first-come/first-served basis. Each pre-registrant will be asked to fill out a questionnaire, and the responses will be used to determine who is eligible to take the class. (At this time it is my intent to have these questionnaires available at the registrar's office during pre-registration week). A list of eligible class participants will be posted in Thomas at the end of the pre-registration period.

Ec 131, Labor Economics, taught by Professor Joni Herscht MW 2:30-4 p.m. (see the description in the *Catalog*), and a special topics course in history, **H 161, the History of the Civil Rights Movement in America**, will be offered for advanced Humanities credit, also MW 2:30-4 p.m., instructor: Bryant Simon. Using primary and secondary sources, film and novels, H 161 will examine the legal, political, social and economic history of the Civil Rights Movement in the second half of the 20th century. Both these classes missed the Fall Prereg list; add them and sign up.

H/Hum 131 replaces Hum 133 - H/Hum 131, *History on Film*, has been substituted for Hum 133 for the fall term. All other information remains the same. Please note on your prereg list.

Wanted: Books! - This year's annual book sale is scheduled for Friday, May 29, and members of the Friends of Caltech Libraries are preparing now by collecting new and used, hardback and paperback books from members of the Caltech/JPL community. Donations in all subject areas are needed. Bring donations to the first floor of Millikan Library during the week between 8 a.m. and 5 p.m.

Poetry Workshop - In Y lounge, 2nd and 4th Tuesdays of every month, 7:30 to 10 p.m. For more information contact kathy@bombay.gps.caltech.edu (also x6955).

EVENTS

Gay, Lesbian and Bisexual Discussion Group - meets the 1st and 3rd Tuesdays of every month from 7:30 - 9:30 p.m. in the Health Center. This confidential meeting is open to all members of the Caltech community. The first hour is devoted to discussion of a specific topic, and the remaining hour is open for general conversation and socializing. For information call 356-8331.

Women's International Friendship Group will meet on Monday, May 18 at 415 S. Hill at 9:30 a.m. All women from foreign countries are warmly invited. Children will be supervised. For further information, call Gretl Hornung at 355-9661.

Caltech Y Excomm Meeting will be held in the Wes Hershey lounge of the Winnett Center on Monday at noon. The Y invites anyone who wish to cosponsor an event to attend on the first or third Monday of every month.

The CIT-KNIT Group meets at noon on Tuesdays in the Benioff Conference Room (Rm. 256 S. Mudd). Come and join us.

Preschool Playgroup - Structured activities for mothers and their children. Sponsored by The Caltech Women's Club in the Caltech Villa Apartments on Tuesday, May 19 from 10 a.m. till noon. For more information contact Valerie Murray, 287-8960.

Caltech Medieval Renaissance Society Meeting in Winnett lounge at 7 p.m. on Wednesday, May 13. Last meeting before the Tourney. For further information call Alison Johnson, 584-3828.

Christopher Brennen's "Retirement" as Dean of Students Party! - At the end of this academic year Christopher Brennen will be "retiring" as Dean of Students to return to his research and teaching. To honor him for his four years of

Wellness Week planning meeting will be held on Thursday, May 21, from noon to one, in the Red Door Cafe. We need students to help create events that promote physical and emotional health for Wellness Week, which will be held in October, 1992. Bring your creative ideas and energy - we will provide a sandwich lunch. For more information call Aime Ellicott at x8331, Chris Sunderberg at the Y at 6163 or Robert Cobb at x2935.

FOCAL Book Sale - New and used, hardback and paperback books on a wide variety of topics, fiction, history, science, travel, biography and more, will be offered at the annual FOCAL (Friends of Caltech Libraries) book sale May 29 and 8:30 a.m. to 2:30 p.m. in Dabney Lounge. Enter through Dabney Garden. Most books range in price from 50 cents to \$2. Proceeds will be used to strengthen the Caltech libraries' book collections. Bring donations for the sale to the first floor of Millikan Library.

Fortunetelling at Caltech - Tarot card classes (hosted by Poetry Workshop). Make your own deck. In Y Lounge, 2nd and 4th Thursdays of the month, 7 to 9 p.m., more details from kathy@bombay.gps.caltech.edu (or x6955). Free and open to the public, so bring a friend.

Pasadena Needs You! - Be a volunteer after-school tutor in the Pasadena School System. It takes just one hour a week. Sign up at the Caltech Y or call Riki at 356-9258.

Friday Prayer - Prayers organized by Caltech Muslim Students are held in the Caltech Y lounge at 12:30 p.m. every Friday. For further information contact Asim Mughal or Shameem Hashmi at 564-1701.

ENTERTAINMENT

Tickets - Raging Waters tickets are available for weekends only for \$13.50. Sea World & Magic Mountain tickets are available for \$16.25. and \$17.50 respectively.

The Pasadena Folkdance Co-op offers beginning instruction every Friday at 7:45 p.m. in Throop Unitarian Church. Following the instruction club members provide refreshments and all are invited to participate in the dance program. Wear soft soled shoes. A \$1.50 contribution is requested.

International Day - Today from 4 to 7 p.m. witness the return of International Day, a celebration of Caltech's diverse ethnic composition. Features include: Greek and Israeli folk music, a jazz band, Tai Chi and Tang Soo Do. There will be free samples of foods from around the world. There will also be food for sale. For information call 6163.

Chamber Music: Fridays at Noon - Today in Dabney Lounge Caltech students perform music by Widdicombe, Milhaud and Torina. Lunch will be served on a first-come first served basis with preference given to Caltech students. The May 22 concert will feature all-Baroque selections. Sponsored by Student Affairs. For more information call x6198.

The Men's and Women's Glee Clubs will present their annual **Spring Concert** on Friday and Saturday, May 15 and 16 at 8:00 p.m. in Dabney Lounge. The Men's Glee Club will perform movements from Maurice Durufle's "Messe Cum Jubilo" and Carl Orff's "Carmina Burana". The Women's Glee Club will reprise their Boston tour repertoire, including works by Handel, Debussy, Korte, and Matthias. The glee clubs will join forces to present the ever delightful love songs of Brahms, "Liebeslieder Waltzer". Tickets are now on sale from members of the glee clubs or OPE (\$7 general, \$5 student). A reception will follow both performances.

The Caltech Medieval Renaissance Society invites you to join them in a day of **Revelry** in celebration of the rebirth of spring. We will all partake of many delights on the west lawn of the Beckman Institute including May-pole dancing, fine drink and food, many fine and interesting sights, crafts of all kinds and many chivalrous demonstrations of armored combat. The day begins at 9 a.m. on Saturday, May 16, and ends in the late evening with dancing under the collonade. For more information call Janis Beckenbach at 310-644-7566.

Chamber Music - Caltech's Student Ensembles present an afternoon of Chamber Music on Sunday May 17, starting at 3:30 p.m. in Dabney Lounge. The program will include music by Haydn, Beethoven, Van Slyck, Shostakovich, Hindemith and Poulenc. Admission is free and a reception will follow the concert. Sponsored by Student Affairs.

Scarecrow (Soviet Union, 1985 - Bykov) Nikolai Nikoleyich and his twelve-year-old granddaughter Lena move into a new town only to be scorned by its villagers; yet they display the fortitude and courage necessary to persevere and depart the town having left a permanent imprint on its inhabitants. The screening will take place in Baxter Lecture Hall at 7:30 p.m. on Tuesday, May 19 and is open to the public. Admission is free.

The Occidental-Caltech Symphony will give a performance Tuesday night, May 19, in Occidental's Thorne Hall and at 8:00 p.m. in Ramo on Wednesday, May 20. Admission is free. The concert will begin at 8 p.m. Call 356-4652 for concert information.

Spring Craft Faire - The Caltech Student Activities Office is sponsoring the Spring Crafts Faire on Winnett Lawn, Wednesday-Friday, May 20-22. Includes handcrafted items by artists from Southern California.

Two Harpsichords and a flute! - Rick Wilson and Jessica Madow, math faculty and staff, and Nancy Sartain, Dabney Lounge Series Musician, will perform works by J.S. Bach and three of his sons as well as Boismortier, Couperin and Telemann. Admission is free. Thursday, May 21 in Dabney Lounge at 8 p.m.

Voices - A play about five women will be performed by Theater Arts at Caltech, Friday, Saturday and Sunday, May 22-24 in Winnett Lounge at 8 p.m. Directed by Shirley Marneus. For further information call 356-4652.

Arroyo String Ensemble - The Caltech Y presents the Arroyo String Ensemble, on Saturday, May 23 at 8:00 p.m. in Dabney Lounge. The thirteen member ensemble led by John Krovova and featuring soprano Lynda Anders will play music of George Gershwin, Victor Herbert, Charles Ives, Henry Cowell, and Samuel Barber. Admission is free.

Renaissance Pleasure Faire - The Caltech Y has discount tickets available for \$12.50 for this annual event. The festivities continue every weekend plus Memorial Day through June 14th.

LECTURES

"Career Introspective" . . . Reviewing Your Career Goals - A Presentation by Sally Asmundson, Director of Caltech Development Center, will be given in Winnett Lounge on May 19, from noon till one. The presentation will cover such topics as exploring personal values related to your career, strategies for self-assessment and planning and developing career goals.

"The Rise and Fall of the Early Television Dramatist: Paddy Chayefsky, Reginald Rose, and Rod Serling" is the title to a lecture to be presented by Professor David Marc of USC in the Judy Library, 110 Baxter, at 4 p.m. on Thursday, May 21.

"The Dead Sea Scrolls: Interpretation for Studying Judeo-Christian Origins" will be present by Robert Eismann, director of the Institute for Study of the Judeo-Christian Origins, CSU in Baxter Lecture Hall at 7:30 p.m. on Thursday, May 21. Dr. William Moffett, director of Huntington Library, will give an introduction.

CAREER DEVELOPMENT

The Career Development Center is open from 8-12 and form 1-5 and can be found in 08 Parsons-Gates. Or call us at x6361.

The CDC is sponsoring a workshop **"Expanding Your Job Search Options"**. It will help people get started with their job search, and provide ideas for those already conducting their job search. We will discuss the current employment market, overcoming burnout in the job search, and developing a plan of action. The workshop will be held today, May 15 from 2:30 to 4 p.m. in Winnett Clubroom 1.

Seniors, please Remember to fill in and return your student survey as soon as your post graduation plans are definite, or by May 22, whichever comes first. The survey is very important in helping us to gather statistics to be used for our annual report. If you need another survey, just let us know!

SCHOLARSHIPS & FELLOWSHIPS

The Financial Aid Office has applications and/or information for the following scholarships. For a complete list of all scholarships check the bulletin board next to the bookstore or check the bulletin board in the Financial Aid Office. All qualified students are encouraged to apply. Our office is located at 515 S. Wilson, second floor.

SUMMER COLLEGE WORK-STUDY - Information and applications for 1992 Summer College and Work-Study are available in the Financial Aid Office. If you are interested in Summer College Work-Study, please submit the required application as soon as possible, but no later than June 1, 1992. Your entire financial aid application must be completed by June 1 to be considered. Summer College Work-Study award determinations will be announced as completed applications are reviewed. If awarded, the work-study funding will begin with the July 6th payroll period.

The Ebell of Los Angeles is offering undergraduate scholarships for the 1992-93 school year. The amount of the scholarship is \$3,000 per year paid in monthly checks, September through June. In order to apply, students must be U.S. citizens, LA County residents, have at least a 3.25 GPA, and be attending an approved college in Los Angeles County. LA county residents may be proven by in-school attendance. All applications and materials are due in the Financial Aid Office by 5:00 p.m. May 15, 1992.

The Society of Women Engineers announces its 1992-93 Freshman and Reentry Scholarship Programs. This year they are seeking applicants for seven scholarships totaling \$8,500. Applications including supportive materials, must be postmarked on or before May 15, 1992.

The 1992 Society of Consumer Affairs Professionals in Business (SOCAP) applications are now available. Completed applications must be received by May 15, 1992.

The California Council of Civil Engineers and Land Surveyors will award several \$2,000 scholarships for the 1992-93 academic year. Scholarships are available to upper division undergraduates and graduate students who are continuing their education in the field of civil engineering and land surveying. Scholarship recipients shall be US citizens with a minimum GPA of 3.5 in civil engineering and land surveying courses and a minimum overall GPA of 3.2. Deadline for application is May 31, 1992.

Two new scholarships are being offered by **Bolla Italian Wines and the National Italian American Foundation**. The scholarships, each in the amount of \$5,000, will focus on diverse areas of International Studies with an emphasis on Italian Business and Italian-American History. Applications can be of any nationality, and must be at least 21 years of age upon the awarding of the scholarship, and have a 3.0 GPA. The deadline for the application is May 31, 1992.



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