

EE Reqs Changed

By Lily Wu

The option requirements in electrical engineering will be changed as of this September. The changes place a greater emphasis on digital systems and require fewer specific courses for graduation.

The shift of emphasis from analog circuits to digital systems is meant to reflect the new areas of development in electrical engineering and to take advantage of the digital specialization of the newer faculty members of the department.

For the undergraduate electrical engineering student, one less term of specific required classes provides more room for electives. The list of required classes also reflects a wider range of topics now.

Current freshmen and sophomores are encouraged to **continued on page 10**



For Sergay Mnatzakanian's stack, the S. and M. Liberation Army took over a TWA 747.

Photo by Praveen Asthana

Senior Ditch Day

Tuesday, Caltech undergraduates busied themselves with senior ditch day, 1984. The *Tech* received the following "Inside World" accounts of the day's activities in the student houses.

Blacker

It was the night before Ditch Day and all through the House, you couldn't hear anything except for the circular saw and drill and whatever the heck else they were using

The seniors were coming back from the Pantry with grocery bags brimming with stuff for bribes. And trying to look as if we or they really didn't know when was Ditch Day. OK?

And then they all left by eight the next morn and we were awakened by an obnoxious horn blowing.

Well, the freshmen ran around and the sophomores ran around and the juniors ran around and the freshmen ran around.

We solved lots of puzzles and found lots of clues and did lots of fun things and ate lots of foods.

Each senior came back and asked about his stack and we said was fine e'en though we were lion

Now the juniors are panicked 'cause they know they're gonna have to do the same tomorrow next year
jshciwlnsvlfjdnslafd-
ssuskdfweusiflstdifgame.

Dabney

Have you ever wondered where all the lights are on campus, or about the mating habits of slugs, or about the relationship of Swiss chocolate to Ding Dong's? Well, some seniors have, and in different ways imparted this knowledge to the

underclassmen in Dabney House.

—Racer X

P.S. There are still points that can be earned in section 10 of Joe Decker's stack, see Joe. Note: No bribe, but the reward is what you work for.

P.P.S. Art is in the courtyard. P.P.P.S. There is none.

Fleming

At 7:55 a.m. on Tuesday, as the seniors were making last minute adjustments in order to get the hell out of here, Jonathan made sure all were awake. The Alley-4 east "pre-stack" was the first to go at around 12:30, leaving the upper 4 john, as well as Glayed, Paul, and Eric, extremely clean. Shors' stack fell soon, and spuds flew as the bribe was declined. Migron's encoding was decoded shortly thereafter. Who put the fish in my bed? Oliver's and Jeanne's stacks came down soon as the bridgeners were not to be denied. Kup, Tarik, and company led a crowd to the golden egg in what was perhaps the most creative of them all. Krehbiel wimped out at 2:00. Villasnor's and Hayes' crossword was completed by a few dinosaur rockers, and Stewart's "dream game" went off fairly well. Krehbiel's getaway at 3:00 amazed everyone. After searching everything within 11 inches of Russ Natter's room, Dereck found the map, the pool, and the key. Matt took notes for Sahr, Jones, Ned and T-Bird, Candi, and Fossy to help break that stack; others were excited electrons or turbulent eddys. After working all day on Abeln and Remmer's stack, Doug and Frank played interior decorators. Krehbiels weturn at **continued on page 6**

Interview

Chairman on Caltech

By Lily Wu and Chris Meisl

We interviewed Ray Stanton Avery, Chairman of the Board of Trustees of Caltech, two weeks ago so that we could find what exactly a trustee is.

Avery is Founder Chairman of Avery International, an \$805 million corporation that he started in 1935 with a 100-square-foot office in Los Angeles and \$100. The company is now the world's leading manufacturer of self-adhesive labels.

Avery is also Chairman of the Board of Trustees of the Huntington Library and is on the Board of Trustees of the Los Angeles County Museum of Art.

CHRIS MEISL: *What does a trustee do?*

RAY STANTON AVERY: I have been trying to figure that out. I do have some perceptions of that, but I think the best way to express it is that organizations are departmentalized of necessity; specialized, and are hierarchical in their structure. So there are territories of responsibility for individuals within the different groups that make up the campus or organization.

Everything tends to focus on the president because he is the apex of the pyramid, and you might say he is the ameliorating force that keeps everything peaceful if he can.

Then you have to say, "who looks at the president?"—and that is the board of trustees. It has, you can't really say a different point of view because they are both interested in the overall welfare of the organization, but we have different weights of responsibility. The president being very involved with the administrative and operational aspects and the trustees with how well that is done; an observer, not so much a supervisor, but an observer of the administration.

Then it takes a very broad view of the total interest of the Institute in the nation, in the society as well as in itself, and of course among rival institutions because you are competing for good professors. So the Board is part of the struc-

ture, and a very useful part of the structure as aid to the president.

CM: *Why did you become a trustee?*

SA: Oh, I don't know. I was Chairman of the Board of Trustees at the Claremont Colleges for nine years. One of the functions of their trustees in cooperation with the President is helping with reorganization, restructuring or growth problems, if you need them.

At Claremont that is a continuing thing because of the complexities of the relationships between the colleges, I

"I live as an individual in a very conceptual world. I don't like detail"

had initiated two restructurings, each of which accomplished some things, and we had a third coming up. I felt that after having spearheaded two of those, people were going to get a little tired of my style and way of doing things.

I wasn't disillusioned or anything there, but I felt I had done what I could to help that group of colleges grow and get along together, so I dropped off their board. When I did, Arnold Beckman, who was Chairman of Caltech, invited me to join the Caltech board. One thing that always amused me was that my scholastic

record was not especially good or impressive. Fortunately, they did not check on that. Nevertheless, Caltech is the most stimulating environment you could ever dream of and I know it causes me to operate above my norm, and I think it has that effect on other people.

Directly on your question, in my life, and in my style of living and doing things, I live as an individual in a very conceptual world. I don't like detail, which a lot of managers

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Caltech Completes Successful HEIST

Caltech News Bureau

HEIST, the High Energy Isotope Spectrometer Telescope designed by Caltech physicists to gather unprecedented data on the heavy cosmic ray isotopes bombarding the solar system, has successfully completed its flight as scheduled over west Texas. Carried beneath a 17-million-cubic-foot balloon, the 2,600-pound detector lifted off from the NASA National Scientific Balloon Test Facility in Palestine, Texas, at 5:18 pm. Pacific Daylight Time, on May 13. After a flight of 41 hours, 38 hours of it spent at operating altitude, the experiment was concluded at 10:04 am PDT on Tuesday, May 15. The instrument package reached a maximum altitude of about 120,500 feet (approximately 23 miles) and drifted about 250 miles

from the launch site.

HEIST, which was constructed by Caltech's Central Engineering Services, appeared to perform excellently, according to Caltech Senior Scientist Steven Schindler, although full analysis of the data will take several months. Other scientists involved in the project include Andrew Buffington, senior research associate in physics at Caltech, Edward C. Stone, Caltech professor of physics and chairman of the Institute's Division of Physics, Mathematics and Astronomy, and Ib Rasmussen of the Danish Space Research Institute.

The Caltech scientists hope that HEIST will yield new insights into the age of cosmic rays—high-energy atomic nuclei stripped of their electrons—and the galactic material they have encountered in their millions of

years of travel through the Milky Way. For instance, the radioactive isotopes of such heavy elements as aluminum, calcium, and iron can function as cosmic ray "clocks," to measure how long cosmic rays have been streaming through space. Isotopes are atoms of the same chemical element that differ only in their mass.

Information provided by HEIST could also help resolve the question of whether cosmic rays are stellar ashes blasted from exploding stars—supernovae—or are cold space dust caught up in the hurricane-like shock wave of a supernova as it sweeps through space.

With its inaugural voyage successfully completed, HEIST could be adapted for use on the space shuttle. The Caltech project is supported by NASA.

Avery Guides Trustees, Who Guide Tech

from page 1

and chairmen and presidents do. One time I contracted tuberculosis and was in bed for several months. My life was almost as active in bed as when I was standing up, because I was daydreaming of things and formulating—which is related to what you do as Chairman of the Board of Trustees. You're dealing with the larger picture and that's what I tend to do, and what I enjoy doing, and what is needed in the trustee function.

You've got to avoid, insofar as you can, getting involved in the nuts and bolts in the administration's daily run of things. As I said, that becomes confusing. People think they have two bosses; who should they listen to, the Chairman or the President?

CM: How closely do you observe the President?

SA: Very informally, of course, the trustees and the chairman should know enough people

"there is no intentional tradition about hiring a physicist that I'm aware of."

and circulate enough to get some sense of how well things are going, whether there are problems. It's also very much up to the president to keep the chairman advised of things that he wouldn't know otherwise.

LILY WU: Isn't that one of the most important duties of the trustees, to pick a president when one is needed? What specifically were you looking

for when you picked a few years ago, and what do you think about always picking a physicist?

SA: Yes. Let me first say, there is no intentional tradition about hiring a physicist that I'm aware of. The sciences can produce broad based people, or narrow based people, and so

"You've got to avoid, insofar as you can, getting involved in the nuts and bolts in the administration's daily run of things."

it would be foolish for us to be always limiting ourselves to hiring a physicist. So that's not intentional.

I'd say there are two things in my mind. One is that he be a person of great integrity, intellectually and in every way. And that he be respected by the community in which he is working, which is the broad community of the Institute; not just the professors, but the students and the public, and the board, and the parents. But for him to be president of Caltech, he must also be respected for his abilities in his own field, be it physics or something else. If you put those together, then you've got a good man, or woman.

CM: How much time do you actually spend as trustee?

SA: Not a lot, and it varies. There is sort of a delicate balance there. If you spend too much time at Caltech—this is my own feeling—it would begin to interfere with the president's prerogatives. People would start making end runs around the President, appealing to the Chairman because they weren't getting their way

with the president, and I don't think that's good. Things will not always be perfect at all times, but that shouldn't be necessary and it is confusing.

CM: So do you have a weekly contact with the president?

SA: We have no scheduled contacts, no. It might not be a bad idea to have monthly or weekly

sit-down talks. We've simply not fallen into that pattern. And I feel that the best relationship is informal. If things are all right, then as Reagan says, "if it ain't broke, don't fix it."

CM: So does the president mainly speak to you, and then you speak to the other trustees?

SA: It can go both ways. The president is so intimately involved with everything that he has to communicate with the trustees, I'd say far more than the chairman would communicate with the professors or the administration. The Presi-

dent and the Chairman are really in the same boat. They have very closely the same responsibilities, in their own realms. In some realms the Chairman is more equal and in other realms, the President is more equal.

LW: Your only regular source of information would be publications, then?

SA: No, whenever issues come up or difficulties or opportunities arise, we should call each other. Then of course the board meetings bring everything together. I do read your paper and other news, but not everything by any means.

LW: Who attends the board meetings from the Caltech administration?

SA: The Provost is always

"The hardest money to raise is the general fund, the endowment, because people have the feeling you're just asking for money."

there, and the Secretary of the Board is part of the administration. The Financial Officer isn't there regularly.

We've been doing a very good thing recently which Murph has been spearheading. We have a special presentation by some professor at each board meeting and that's always very stimulating.

CM: On campus, the President takes care of things. But off campus, to the community, are the trustees more important, then?

SA: In a sense, yes. Structurally, the President serves at the will of the trustees. That is, he is found and employed by the trustees. I think the public knows that. It isn't a matter of dominance in a simple sense of either one over the other. They've got to have each other or you don't have a full organization.

CM: So do the trustees spend most of their time trying to get money for Caltech?

SA: They should be helpful. They would feel very responsible for that.

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Filmer and Sutton Win Noland

Paul Filmer and Eliza Sutton received the Noland Leadership Award at a dinner in the Athenaeum on Thursday evening, May 10th.

Each received a check for \$1,500 and the congratulations of Robert Noland and several executives of the AMETEK Corporation.

The awards are funded by AMETEK in honor of its president, Robert Noland, a Caltech alumnus.

The major criterion of the award is the ability of a particular awardee to show potential qualities of outstanding leadership and to stimulate leadership qualities in others to the maximum possible extent.

AMETEK feels that "Leadership is exemplified by the unique ability of a particular individual to select and develop from among qualified individual personnel or an industrial organization those individuals who can assume the responsibilities of managerial skills which is essential to the growth and success of the organization.

"Without such leadership and the selection of proper persons and the stimulation of others, there will be stagnation in the industry that will contribute to its eventual failure. With this leadership and leadership inspiration, industrial firms and institutions will grow and prosper, making a rightful contribution to our American social and economic structure."

Paul Filmer receives the Noland Leadership Award because of the way in which he takes on responsibility for specific tasks and completes them in a very capable and responsible manner. He spent

tireless hours as ASCIT treasurer. The books had been in great disarray when he began. He was able to arrange the books and reorganize the system so they will be kept up-to-date.

He took a leading role during the Faculty-Student Conference, co-organizing one of the sessions on Humanities and Social Sciences. His careful analysis of the problems associated with this subject provided an excellent session.

Filmer works quietly in the background engineering changes. He has also been active in fencing, wrestling, and cricket.

Filmer is a junior Geophysics major. Last summer, he travelled extensively in Europe as part of a SURF, doing work in Geophysics.

Eliza Sutton has been chosen for the Noland Leadership Award because of her outstanding contributions over several years, and especially because of her leadership on the Board of Control. She is respected by many for her clear thinking and her thorough, competent manner.

Sutton organized several discussions in the Student Houses about the Honor System and the Board of Control. She co-organized the Faculty-Student Conference discussion on graduate-undergraduate relations this year.

Sutton has been active in women's sports and the Upperclass Admissions Committee. She is able to balance her many extra-curricular activities with excellent academics.

Sutton is a senior majoring in Chemistry. She has won two

SURFs and plans to attend graduate school at Harvard next year on a National Science Foundation Fellowship.

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Avery Discusses Fundraising for Caltech

from page 2

CM: I suppose they bring in a lot themselves.

SA: Insofar as they are able, they should help financially themselves, and they should encourage others to give. They do serve on fund raising to help the President and others get money for the Institute. That's a very important function. But they are not necessarily chosen for that. Some people make a great contribution who are not particularly wealthy people or connected with wealth. I think that's why Caltech enlarged its board to the size that it is, so we could get diversity in the members—which you are bound to get when you have 45.

LW: When you talk about raising funds, do you raise them for specific projects or just in general? And if it is for specific projects, what kind of projects are the easiest to raise money for and how do the funding priorities fall?

SA: You do both. The hardest money to raise is the general fund, the endowment, because people have the feeling you're just asking for money. It's not easy. Money comes more readily when you build a building which is then called so-and-so, or a professorship which is named so-and-so, and that's necessary.

Then on special projects, right now we are talking about this thirty meter telescope in conjunction with UC, for which we need to raise twenty-five million dollars. I don't know how we're going to raise that. That's a highly specialized project and one that's very important to the future of Caltech. So we're mobilizing.

But to show you the complexity of it, you have to do that without subtracting funds from something else. In this case, it is a search for some group or groups or an individual who are especially interested in that and who might

not give otherwise. But endowment is the most difficult to increase because it is sort of anonymous.

LW: Aren't non-research type projects, student centers or athletic facilities, difficult to raise funds for? Because they are not strictly related to the well-being of the Institute,

build a board or a public that is supportive, and then, as you say at Caltech, work the problem.

CM: Is fundraising, then, an ongoing process for the trustees, or is it grouped, like fundraising activities on campus among the faculty members?

to be supported.

CM: Do the trustees actually try to dampen Caltech's publicity?

SA: I've never been aware of that. No.

CM: I was just curious because the trustees seem so reserved. They're so quiet, almost invisible.

SA: I'm sure that is true; that it's almost threatening to have someone in the background who is powerful as well as unknown. You almost have to accept them on faith, that they are not self-serving, that they are for the good of the Institute. And they are, each in his or her own way.

It gets into this are that I mentioned earlier of the delicate point, where if the trustees inject themselves too far or too frequently or too intimately, people wonder who should be listened to. So it's necessary that the trustees not be too visible or too active.

They've also got to know what's going on and the way to handle that is to use advisory committees like the JPL advisory committee which is interested in the relationship between JPL and Caltech. They do a real good job, do not interfere with the administrative day to day running and can be extremely helpful.

So, the visiting committees in the different departments, some are better than others of course, more active than others, are another window, which is helpful and not obtrusive. Those are some of the mechanisms that are used to make the whole thing into a whole and give specialized attention to the parts, but not erode the position of the administration.

CM: The trustees work with Caltech. Does that include JPL?

SA: Yes and no. JPL has no Board as such, but there is a trustee committee which is assigned that responsibility.

LW: But I guess that's complicated because the government is also part of JPL.

SA: That's right. We are just the managers under NASA or with NASA, and I think that relationship is as good now as it has ever been. It's been very productive.

LW: You mentioned the trustees like to stay in the background as much as possible, but if things come up or, say, a suit is pending, how powerful can they be?

“it's almost threatening to have someone in the background who is powerful as well as unknown.”

SA: Oh, they can be as powerful as they wish.

LW: But does that come up very often?

SA: No, that would be in serious situations only.

LW: Have any such crises occurred?

SA: Well, the Arroyo Center question was about as disturbing as anything that has occurred while I've been chairman.

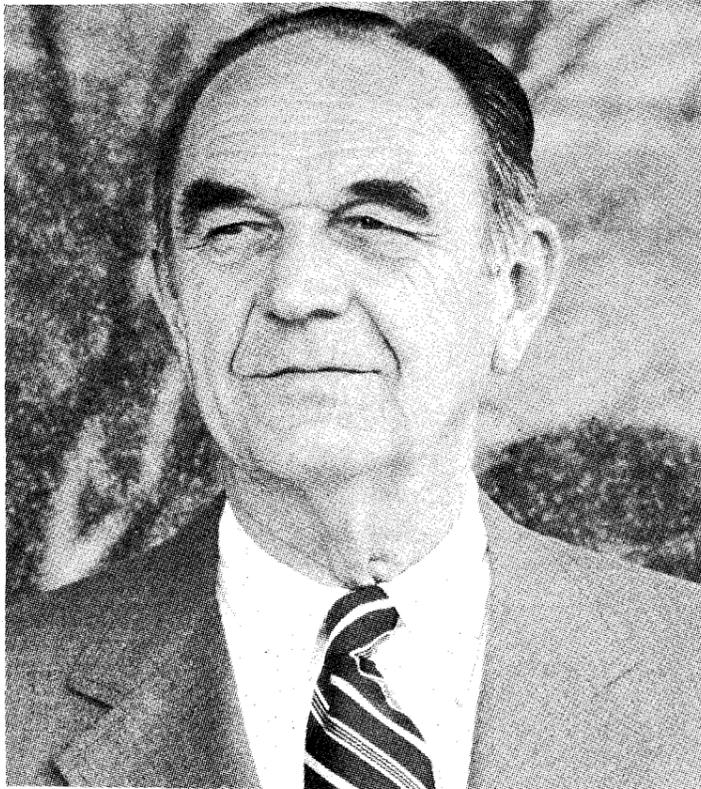
I've been on the Board for a little over ten years, and I'd say the success of the Board or the Chairman and the President can be measured by whether anything happens or not. “If it ain't broke, don't fix it”—but at the same time be aware that things can go wrong and the Board is the ultimate straightener-outer if serious problems come up.

LW: But if something like a suit comes up, who ends up being sued? Does Caltech, the administration, or the trustees end up being responsible in that case?

SA: What sort of a suit?

LW: Say an employee sues

continued on page 5



R. Stanton Avery

“We've always been concerned about the effects of classified work on the scientific mode of thinking and exchange of information.”

though they are things that students in particular would like to have.

SA: Right. There are the new athletic facilities which you have which the Brauns gave. The Brauns have been exceedingly generous to Caltech and have been very thoughtful. You need that sort of help.

Fundraising is, well, let's say opportunistic. You try to

SA: Yes, ongoing, too. The alumni of Caltech have been mobilized and are being very generous, very contributive, which was not always true. That's a great help. Certain things like the associates are an ongoing thing, and you mobilize as many of those as you can, because they are continuing. And then the special projects come and go and need

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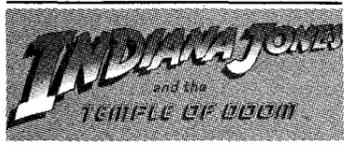
Movie Review

Indiana Returns

By Lily Wu

Outside the theater, there was nothing at all to indicate that a special preview would be showing of *the* movie of the summer of '84. There were no announcements and no press coverage, but an hour before the show, hundreds were lined up with preview tickets hidden somewhere on their persons. No one uttered a word of excitement, as if seeing previews were all they ever did.

Once inside the anonymity of the dark theater, everyone ran for a seat, hugging their popcorn, waiting for Indiana Jones to return.



This movie is full of short suspenseful sequences like the one that opened *Raiders of the Lost Ark*, where Indiana Jones entered a cave to obtain a figure and, just as you'd had your fill of heart-stopping setbacks and all seemed to be well, director Spielberg would introduce yet another.

Indiana Jones and the Temple of Doom easily has more action and excitement than *Raiders*, but the price for it was a skimpier plot.

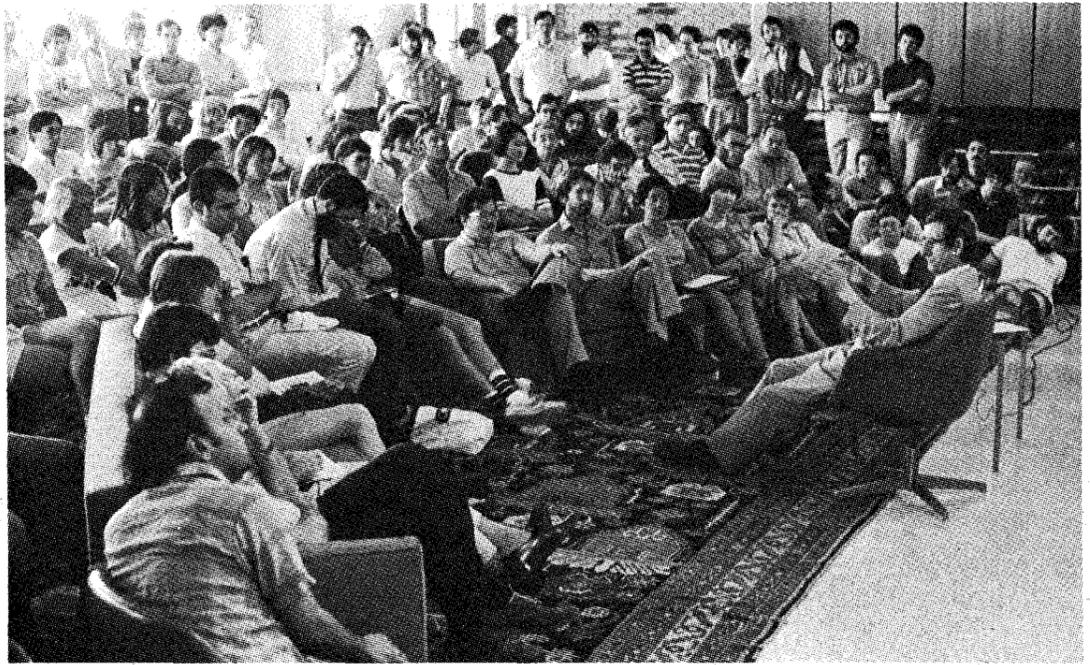
Lost on his way between nowhere and New Delhi, archaeologist Jones, played by Harrison Ford, is asked by a village shaman to stop over at the Temple of Bankot to reclaim the village's children and fortune.

The shaman explains that right after their sacred rock was taken, the village was struck with drought and famine. In addition, one evening all the children were kidnapped and taken to the Temple.

Unlike in *Raiders*, where Indiana's motivations were purely for his own fame and glory, he chooses to go on this venture to help the village. As in the Star Wars trilogy, writer George Lucas tends to mellow out his characters' rough edges in successive sequels.

Accompanying him on his adventure is a cute urchin Indiana picked up in Shanghai named Short Round and a reluctant night club singer, played by Kate Capshaw, who whines and complains for the whole trip.

All in all, the film is very well put together and the viewer is guaranteed to have fun. Lapses of credibility that the plot may suffer from are forgiven and forgotten amid the color and thrill of this film.



Winnett Student Center held a full house for Freeman Dyson's talk on Nuclear Weapons.

Photo by Huston Horn

Dyson on MAD Nuclear Policies

by Matt Swass

Freeman Dyson, author of *Weapons and Hope*, was the guest at one of the Caltech Y's noon discussion series. The discussion was well received, with more than one hundred members of the Caltech community attending.

Dyson is a physicist at the Institute for Advanced Studies at Princeton. His career has spanned many fields, from radio astronomy to arms control. He presents some unique views on contemporary arms control issues.

He began his discussion by asserting that atomic bombs aren't as useful as weapons and are over-rated. He posed a counterfactual question: Suppose the axis powers, in 1943, had perfected an atomic bomb. Would they have won? Dyson says probably not—they might even have lost more quickly, if anything.

Dyson stated that the current policy of Mutually Assured Destruction (MAD) raises the moral indignation of many people. Yet many in the government prefer MAD because it is believed to be more stable than the proposed alternatives. In the long run, it would be more desirable to switch to a new defense concept, one which gives people more hope.

The problem is a multifaceted one, as was reflected in the discussion. The problems encountered today stem from many sources. One is the belief that treaties have to be completely verifiable in order to be any good. Another is that current treaties don't take into account the Soviet point of view adequately. One last one is the view that if arms reduction talks are successful, and weapons stockpiles are eliminated, the country that reneges on the agreement and hides a few weapons will have a great advantage.

This gets back to the counterfactual question posed earlier—would a few weapons make all that much difference? Dyson says no, because one needs a complex delivery system and support system to be able to use nuclear weapons, and the task of hiding these is

too difficult to be successful.

Given that the current policy of MAD isn't very satisfactory, Dyson suggests alternative concepts, some of which he lists in his book. They range from "Nonviolent resistance" to "Non-nuclear resistance" to "Defense unlimited."

The "Defense unlimited" alternative concept is essentially the same as the Reagan Ad-

ministration's Strategic Defense Initiative, and this caused Dyson a little embarrassment at the discussion, as well as generating some confusion among the participants.

Dyson only wished to point out that some of these alternative ideas have a stronger moral appeal than does MAD, and so would probably make for a better, more hopeful future.



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The Caltech Y Fly-by

Friday... May 18

Noon Concert—"Rush Hour," Mellow Jazz.
Presented by our own Suzy Blue.

Monday... May 21

"After 300 years, a new gravity equation," Dr. Lawrence Boren. Is this guy for real? Come to the Y Lounge at noon and see. (Rescheduled from Tuesday, May 15.)

"Tribute to Andrei Sakharov," Dabney Lounge, 8 pm, co-sponsored by The Y.

Tuesday... May 22

Noon Update, "Uranus," David Stevenson, Winnett Clubroom 1. Bring a lunch and a friend. (Normally on Wednesday.)

"From Russia With Slides and Photos." What is it really like? Find out from some Techers who went there over spring break. Winnett Lounge, 8 pm.

Wednesday... May 23

"Coercion or Persuasion: A Theology for the Nuclear Age." Claremont Professor David Griffin. Winnett Lounge, noon.

"The Cold and the Dark: The Ecology of Nuclear War." Paul Ehrlich, a Weingart Distinguished Speaker, 7:30 pm, Beckman Auditorium. FREE. Presented by the Y and the World Affairs Forum.

For more information, contact the Caltech Y office at 356-6163, or just drop in.

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CHEVROLET

Problems Trouble Trustees

from page 3

Caltech for unfair practices. Wouldn't, in cases like that, the trustees be very concerned about...

SA: We would be ultimately responsible and would have to be sure that we were defended as best as possible and things were straightened out if they needed to be.

Are you thinking of liability?

LW: That sort of thing.

SA: Well, for instance in genetic engineering, if something jumped out of the test tubes; we worry about that sort of thing. Wherever there is a crucial issue the Board is involved. At the same time, it's its duty to see that there are no crucial issues, if it possibly can.

LW: *What specific aspect of that Arroyo issue concerned you the most? Was it that Caltech was possibly involved with classified research or was it just that an uproar was made over it altogether? Was it the ethics of the question that bothered you or was it just that a question arose?*

SA: Oh, I wasn't thinking in terms of judgement on the merits of it, which there are many different positions on, but I mention that only as sort of a threatening schism or emotionally loaded as well as intellectually loaded problem which shook the Institute. I'd

"Wherever there is a crucial issue the Board is involved. At the same time, it's its duty to see that there are no crucial issues, if it possibly can."

rather not try to comment on how I felt about it or how anybody else felt about it. But that was an example of one of the things that can happen which stress the organization.

CM: *Was there something that went wrong in the communication between the trustees and the administration?*

SA: The communication was not good. The level of communication in that case. The board authorized it. It was presented by the administration. We discussed it. We knew it was a sensitive subject and it was authorized, and then fell apart. That's the disturbing part of it, I'd say from a Board point of view. I don't want to point fingers in any direction, but that's what made it stressful.

CM: *So does the board now keep a closer eye on things, such as classified research, defense-related work?*

SA: We've always been concerned about the effects of classified work on the scientific aspects or the scientific mode of thinking and exchange of information. It's been our desire to keep that at a minimum for that reason. It's intrusive as far as pure thinking and pure research are concerned. At the

same time, of course, you can't do the best research in a vacuum either. Where do you go with it? We all live in a real world, so classified work itself isn't... Well, the limitation on classified work is that it's

"the Arroyo Center question was about as disturbing as anything that has occurred while I've been chairman."

classified. It's sort of stymied because of that, and yet, there's got to be some level of secrecy.

CM: *Can the Board of Trustees actually shut down a project, like a classified research project at JPL or something like that?*

SA: If you express it that way, I would say no. In fact, if you had a terribly complex and difficult situation, it would be

"the problem in dealing with this is that what's one man's meat is another man's poison. People feel very strongly on both sides of an ethical issue."

their duty to see that something was done, that it was studied. They should make sure that problem was worked. And included in that might be the possibility that it would be terminated or phased out or something else phased in. But it sounds a little, it would be a little too dramatic to say, they would walk over there, look at it, and say... "Shut it down!"

CM: *Is there anybody in the Caltech community who would be responsible for stopping some project?*

SA: The person who could, within his or her responsibilities would be the President. As every president has his own style of doing the job, you might have a president who would be inclined that way. I don't think that's the best way myself, but he could. If he did and the board didn't agree with him, that might create a very serious situation, so I think he would be unlikely to opt for a certainly thoughtless decision.

LW: *It seems peculiar that, from what I gather, the ethics of the question hardly even enter in. It's just merely the fact that a controversy exists. How heavily do the ethics of the question weigh?*

SA: Are you referring to the Arroyo Center or anything?

LW: *Well it applies to anything. How strongly does the Board feel the issue is truly right or wrong? Even if it is controversial, if you believe in the issue enough, you should stick with it.*

SA: That's a very good point. If you have unanimity on the Board or on the administration that this is unethical, then that would be that. Being the open society that we are, there normally isn't the same level of

concern or agreement on whether it is even an ethical problem or a moral problem or a practical problem.

I think you're right that from an administrative standpoint, you almost have to deal

with it as a moment of tension which should be ameliorated or should be resolved. The clarity of an ethical position or judgement just isn't there in any group, unless it's a specialized group who is focusing on a point.

But I'm very interested in your raising the question in that way because I come from a minister's family and ethics and morality and those things I know have been tremendously important in my business life

and my life in general. I have strong feelings that I also lack the power to enforce them very

often, or more often than not. On the ethical aspect, what specifically did you have in mind as the subject?

LW: *With the Arroyo question, it seemed more the issue that a controversy which shook the Institute was raised, rather than an issue of whether the Institute should be involved in classified research.*

Sometimes it's good that questions like that come out into the open and shake institutions because they are very important questions. Is it right or desirable to conduct research for defense purposes?

SA: Well as I say, the problem in dealing with this is that what's one man's meat is another man's poison. People

"in the middle of Chapel ceremony, one of the standard pranks was to have a bag of flour in the ventilation system with an alarm clock."

feel very strongly on both sides of an ethical issue.

For instance the nuclear freeze question is a very good subject in that arena. I personally feel that the freeze is wrong and I know other people who feel very strongly that it isn't. My brother, who is a retired minister, feels just as strongly in the other direction that somebody has to start and we should start.

LW: *On a lighter note, another thing that caused a lot of publicity was the Rose Bowl prank.*

SA: I loved that. I thought Pasadena was being very stuffy about that. The moment they said that the students did it, there should have been a wide latitude of tolerance, having been a student myself.

Pomona College had very irreverent pranks when I was there. The reason for that was that we had compulsory chapel at 8:30 every morning and very few people liked to get up that early, and particularly to get up to go to chapel. So there in the middle of Chapel ceremony, one of the standard pranks was to have a bag of flour in the ventilation system

with an alarm clock. In the middle of the talk, the alarm clock would tip the flour over and the flour would be blown out all over the stage.

There were people who thought that was pretty irreverent. And finally they did away with compulsory Chapel. It was sort of a form of protest, I guess. I think there should be wide tolerance with students.

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Bowl**

Tomorrow is Today; Students

from page 1

4:00 was an unluck one, he then visited the Ath before receiving the grand tour. Spott's stack was broken with 10 minutes to go, but he still doesn't know who those two girls are. Granon's Senior trivia quiz was too different for the many who tried, and Childs' clues disappeared, these were the only two which survived.

—Al Fansome

Ricketts

News Flash: Ditch Day is not tomorrow! That's right, it happened again and through the settling dust you can begin to make out the bodies abused by tremendous sugar & food overdoses the remains of once glorious stacks and little styrofoam beans everywhere, right Dave? We had many stacks this year and there was always something to be done throughout the day. For the athletically inclined there was Frisbee golf (twice), gymnastics, aerobics, tennis ball and water balloon throwing, as well as softball with Fleming. For those more cerebrally inclined there was Ed Suranyi's cryptography/airline/geography stack, Evan's Gödelization, and many crossword puzzles and riddles to be solved. Ditch Day is also a day of special fondness especially thanks to Hiram's hugging stack. Special congratulations to Stan and Minami, the second couple to tie the knot this year; I can't wait till the pictures come back. Anyone who's seen Dave's furniture please tell one of those undercover types hanging around the campus lately.

—Bob

Ruddock

Well, tomorrow finally dawned last Tuesday, much to the underclassmen's feigned surprise. So at 8 a.m. we were all awake, bright-eyed and bushy-tailed (thanks to Evan), ready to crack open some stacks.

Things were pretty congested up in Alley 4, where there were three stacks side by side. The Meixner/Michelson stack involved tracking down that international terrorist Mr. Cow—who it turned out had been dead three years, killed by Prof. Ellersieck. That stack was the first real stack to break. Next door, Cromwell showed us what a day in the life of a chemist was like. Lots of chemistry, but it had its rewards. And Mahoney, Marvit, and McDowell had the underclassmen build a metal Frankenstein that tried (but failed) to bash open the door.

Meanwhile, Swanson, Schlom, and O'Donnell subtly linked their stacks which involved a treasure hunt using drawings and directions. The stack culminated in a hike up Echo Mountain—unfortunately, the hikers got back too late to crack open the box before the deadline.

Katz and the Stassens had an intricate logic stack where ten little black boxes had to be correctly arranged to show the

location of the room key. Behind that door was lots of very good food (so I hear—I got down there a little too late).

Fong and Lau also linked their stack—people were sent all over the place—the zoo, the beach, wherever, and finally collect the clues for how to wire up the electronic boxes so the doors would open.

Anderson and Sorenson teamed up on a CS-type stack where a bit code had to be figured out to enter the room. The stack was broken into with very little time left, and the counterstacker only had time for a quick rearrangement of the wiring. Oh well.

Powerful Dave had a D-Day stack in honor of the 40th anniversary of D-Day. After following some rather literary clues, people were supposed to "conquer" certain cities on the map of France on his floor with a radio controlled tank, but the stack was never broken. Oh well.

And of course Ditch Day wouldn't be Ditch Day without a Purple Gap Room stack—this year courtesy of our friend Zobel. Zobel sent us on a video tape hunt—part of the time on skates, part of the time a phone

chase a la Dirty Harry.

There wasn't a whole lot of counterstacking, due partly to not being able to get into a lot of rooms because of stack failures, and also due to the nice bribes left behind, such as food, beer, white russians, and other fine consumables. All around, it was a pretty good holiday.

Page

The final score read "Seniors: 4, Underclassmen: 6." I'm not going to speculate about the supposed superiority of the seniors, but I think the score is indicative.

Mike Terepka and Dave Chavez had the most ambitious stack, but tomorrow came sooner than they thought. Instead of being opened by manipulating laser beams with mirrors, the door was opened by connecting two wires found hanging outside the window. It was counter-stacked by actually using the laser, splitters, and mirrors. The two seniors had to retrieve some of these parts from the bottom of a mug full of alcohol.

Honor stacks were popular this year. People were seen skipping from the Ath in

bathrobes, serenading girls with Johnny Cash songs, going to adult book stores in drag, washing cars, vacuuming rooms, writing essays about today's morals, and drinking bottles of vodka.

Ken Hui's and Phu Nguyen's stack consisted of driving a radio-controlled tank through a maze in order to retrieve a key. Although parts of the maze were hidden from view, it was broken with the aid of a mirror and stick.

The stack of Erik Fernandez and company was called "The Severity Stack." By performing certain acts, people could earn money with which to buy imaginary air flights. The object of the stack was to visit certain cities around the world.

The stack of Joe Lee and Steve Baxter gave Page people the chance to complete a crossword puzzle, sample exotic Chinese delicacies, and scurry around campus. Much to the chagrin of the underclassmen, the key to the room had been hidden inches away in a light.

Other stacks included the chess game idea of Hank Erving, Dave Hawley, Jim Determan, and Mark Waggoner.

Next door, people were busily collecting old Time magazine covers for the stack of Mark Marley. J.R. Page's ingenious stack had Ed Zanelli building a parking lot in the space south of Page House. Brad Brock's consisted of solving math problems (of course!). Eliza Sutton's stack also involved math.



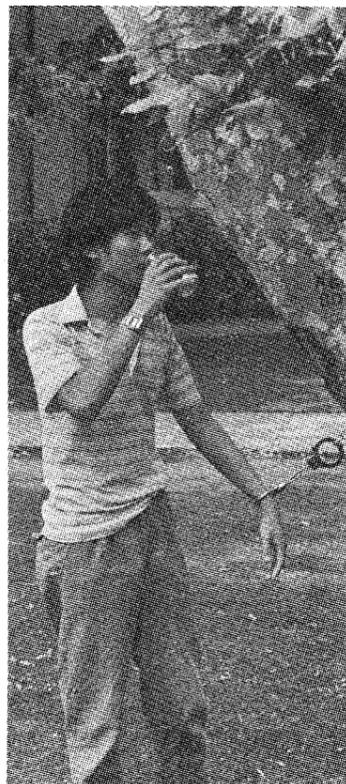
Rudds dance on the Ath lawn to the beat of John Fong's stack.

Photo by Min Su Yun



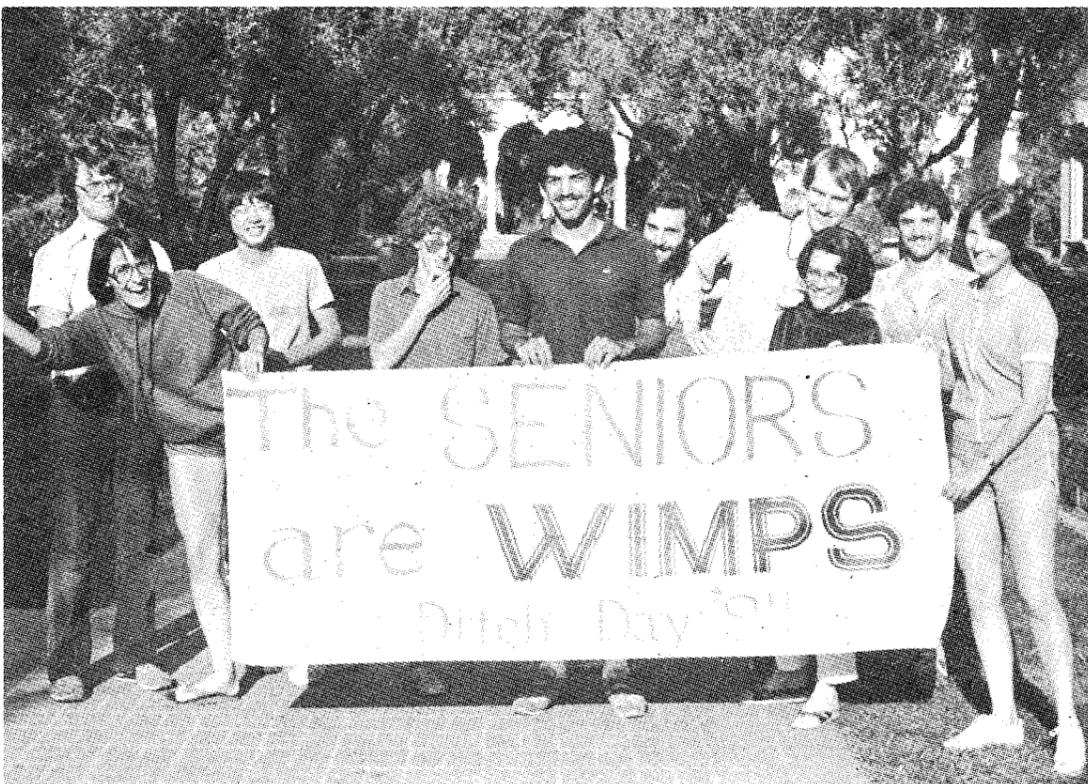
The BOC comes under fire from Marit Jentoft—Nilsen of Flemming House.

Photo by Min Su Yun



Senior Han Toh captured by Page dudes and handcuffed to a tree for the day.

Photo by Min Su Yun



Lloyd seniors reveal their true identities for counterstack.

Photo by Min Su Yun

Scramble to Solve Stacks

Underclassmen were supposed to plug in values into a complex formula and get the combinations to padlocks attached to the door. Asad Khan's stack, which was broken using the unconventional method of snipping wires, had people hypnotized by seemingly random patterns of LED's. Dan Davis sent frosh running

around doing their usual tasks (i.e. nothing).

Ditch Day came and went again this year in Page House. For those of us who were given a short reprieve on homeworks, it was a welcome relief. But for all, it was great fun. It's too bad that tomorrow only comes once a year.



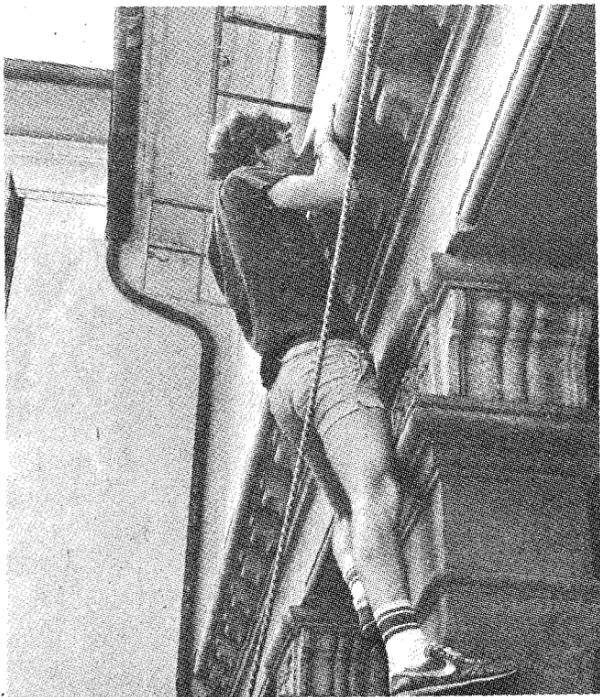
Flems play softball with Scurves to complete Stewart Pebble's stack, which required the Flems to win by 10.

Photo by Min Su Yun



Ms. Mnatzakanian's debut at the Sawmill in Sergay's counterstack.

Photo by Min Su Yun



John Wall climbing into Blacker library as part of John Houde's stack.

Photo by Chris Meisl

Lloyd

Ted Williams' Ditch Day stack involved several facets of his life at Caltech. Questions and activities involving holography, the Bible, Tau Beta Pi, electronics, and, of course, the Rose Bowl, along with an activity involving a "SWAT" team, made this an 8 a.m. to 4:59:30 stack.

Memorable incidents included several secretaries trying to ponder the infernal question "How should wimps talk to a computer?", the sight of a banner criticizing the Pasadena DA in City Hall, an unreadable hologram, wonderful timed clues, impossible trivia questions whose answers were correctly guessed, "efficient" driving, and Ted looking into his room just seconds after we had entered.

Sally Rigden, or Resident Australian, left us with a set of timed envelopes which contained four photographs and several clues.

Each picture lead us to an Australian on campus, who gave us a bag of ingredients. With the ingredients, we had to prepare an Australian dessert, which we then took back to the person who gave us an envelope

containing parts of a picture.

After concocting Lamingtons, a Pavlova, and pumpkin scones, we had enough of the picture to begin the search for the man who had Sally's key. We found him and entered the apartment around 2:30.

The counterstack team arranged for a eucalyptus tree and stuffed koales. Unfortunately, the man with the wallaby flaked out, so we had to settle for a nice dinner.

Sergay's stack revolved around five favorite themes of the ex-president.

Planes—he got the underclassmen to play hijackers in the cockpit of a 747. The feat took quite a bit of doing. Many congratulations to Yosifi, Miles, and Dave.

Food—Sergay challenged three underclassmen to finish a Super Antejitos *El Zapato* burrito and three hot fudge sundaes. He also had them send Ernie Cohen some Bill's Chicken and Ken Rozendal a Tommy's Burger. (Both of these former Lloydies are at UT Austin.)

Photography—Sergay decided to be artistic, so he got three frosh to pose next to the UCLA and USC signs. The only catch was that they had to moon the poor things.

Cars—Pictures of silhouettes of cars had to be found in various Pasadena phone booths. The first letter of the make of each car was part of a clue to the location of the hidden key. Also, Bob Shore's '76 Pinto, "Sir Isaac", had to be moved to his residence on Michigan.

The key was finally found at Paradise Cove and rushed back to campus...just in time!

Scott Paine and Mehrdad Haghi's stack was designed with the diverse underclassmen in mind. Seven tasks needed to be performed, each of which yielded a seven digit number, forming the rows of a 7 by 7 magic square.

One of the columns was the phone number for the professor who had our key. The tasks included everything from breaking seven concrete blocks to find one number, to finding 5-micron thick digits etched in a 500 angstrom gold film, to whistling a Vivaldi concerto, to factoring a 42 digit number.

None of these tested the wits and skills of the underclassmen as much, though, as finding a way of asking tens of professors if "they had had a banana today" without looking too silly.

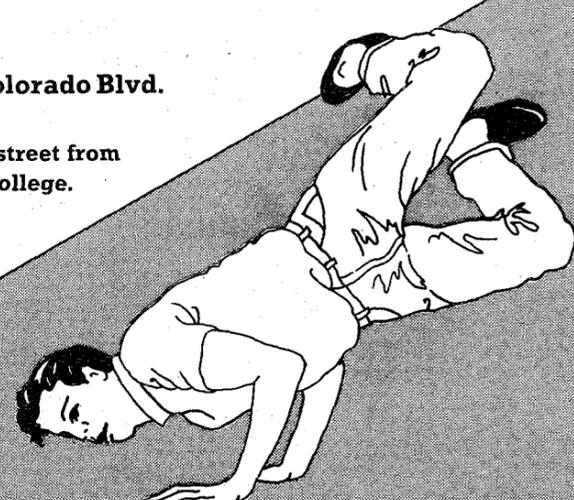
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Interhouse Football Begins

by Ath Man at Large

This year's Interhouse Football season is in full swing, and it appears that Page and Fleming will contend for top honors, although Ruddock will have a shot at the top spot when they play Fleming later in the season.

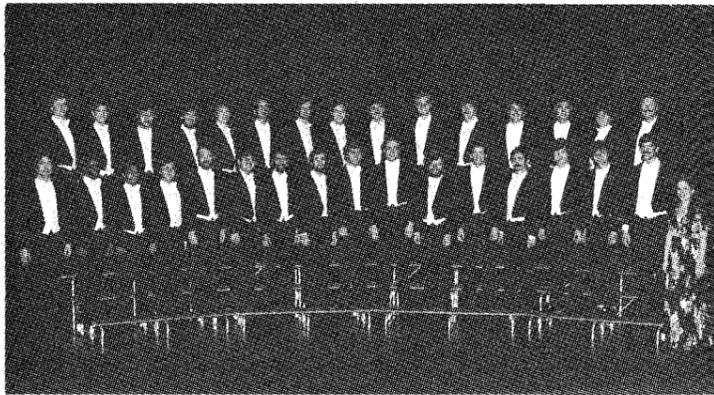
Fleming opened the season with a bang by defeating Page, 26-7, last Friday. The Flemings jumped out to a 20-0 halftime lead on touchdown passes from Ed Zanelli to Tim Magee (2) and Stefan Feurabendt. The Fleming offense was given good field position through the work of freshman Joel York, who sacked the Page punter inside the page 10-yard line,

blocked another punt, and intercepted a pass. A long touchdown pass from Zanelli to Dave Childs completed the scoring for Fleming in the second half, and Phil Scott passed to Mike Keating for Page's only score.

Page came back strong against Ruddock on Monday, edging by the Rudds, 32-21. It was a seesaw affair, with the teams trading touchdowns all game until Phil Scott's short pass to Pat Harrison gave Page a 26-21 lead in the fourth quarter. A last-ditch Ruddock drive was snuffed out when Ed Felten made a diving interception on his own one-yard line. On the final play of the game, Scott threw a touchdown to

Mike Burl from the Page end zone, the play covering more than 70 yards.

In other games so far, Lloyd defeated Ricketts, 20-0, and Page stopped penalty-prone Blacker 13-0. There should be plenty of exciting action today and next week, so come out and watch.



Caltech Men's Glee Club

Caltech Choral Groups Perform

By Jung Im

An all-Caltech production of Gilbert and Sullivan's musical, *Trial by Jury*, and the best from the much publicized Glee Clubs' spring tours will highlight this year's annual home concert at 8 p.m. this Saturday in Beckman Auditorium.

Joining the Glee Clubs will be our chamber singers, men's barbershop quartet, and the new women's sextet. Shutz's Psalm 100 opens the program, followed by madrigals, spring songs, and works by Gounod, Rossini, and Ives.

The concert will conclude with the traditional "Salvation

Belongeth to Our God," by Tchesnokov and the Caltech Alma Mater, followed by a reception at Dabney Hall.

This Saturday should be one of the most artistic events Caltech has had this year. For information regarding the concert, call the Caltech Ticket Office at x4652.

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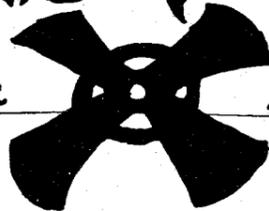


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TALES OF CAP'N

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ADVANTAGE



The Body Shop

Stay Cover'd for Summer

By Janice Ramaeker
Health Center

It's summertime and the livin' is easy. We head to the beach to bask in the sun in search of a good healthy tan. But that healthy tan is truly a sign of unhealthy, damaged skin.

The sun sets us up for wrinkles, sags, discoloration, dryness, solar keratoses (warty growths) and skin cancer much earlier in our life than ex-

pected. Even though a tan is flattering, the exposure to the sun is damaging and most times only corrected with surgery.

Sun screens can put an effective barrier between you and the sun, reducing the amount of UV that is allowed to penetrate. There are two basic types of sunscreens used: chemical absorbers and physical reflectors.

Reflective-type sunscreens

protect the applied area by scattering the rays. They contain titanium dioxide or zinc oxide, or red, yellow or brown iron oxides. Application of this type of sunscreen must be spread evenly and reapplied frequently.

Chemical absorbers' main ingredients are PABA, PABA derivatives and benzophenines and its derivatives; PABA filters UV-B, the benzophenines absorb UV-A. These screens are more popular than reflective-type because the active chemicals can be mixed with lotions and creams. There can be some drawbacks with these screens, fabric staining, skin irritations and allergic reactions.

Sunscreens are rated (sun protection factor) by the amount of protection they pro-

vide against sunburn. The higher the SPF, the greater your protection. Your choice of what SPF to use should depend on your skin type, the season, the time of day you are outdoors and the usual weather condition (humid, windy). The SPF are classified as: 2-4, minimal protection; 4-6, moderate; 8-15, maximal protection. More than one application of sunscreen doesn't increase the SPF. Anything over SPF-15 gives a false sense of security.

Safety in the sun does go further than a SPF. Be cautious when you are outdoors.

The sun is at its peak June 21, and always between 10:00 am and 2:00 pm.

In water, the UV light penetrates 3 feet deep.

Snow and ice reflect 90% of the sun rays.

If you can see through a T-shirt, UV rays can go through it. A wet T-shirt lets about 40% of the UV light through.

Certain drugs can cause light sensitivity reactions.

Hair and eyes need protection too. Wear a hat/scarf and dark green or gray sunglasses.

If you do end up with a burn, take 2 aspirin or acetaminophen every 4 hours for pain and soak in a cool bath or apply wet, cold towels to the skin. If you blister badly, see a clinician. Do not use any type of topical anesthetics, they may make matters worse.

Well, it's summertime, so make sure you are well covered!

A Change for the Better

New EE Requirements Favor Student

from page 1

follow the new curriculum, though they may choose to graduate under the present requirements. All incoming classes will be required to follow the new curriculum.

The new courses, though not listed in the current preregistration material, will be offered beginning this fall.

Specifics of the new requirements:

- Sophomore year requirements will remain the same with EE 90 ab and EE 14 abc.

- Junior year requirements will no longer include EE 114 abc. Instead, a new course, EE 32 ab offered first and second terms, will be required.

- EE 40 is still required along with EE 60, which has been renumbered EE 160.

- EE 151 ab is no longer required, leaving only E 10 and EE 91 ab to be taken in the senior year. To replace it is EE 51 ab to be taken second and third terms junior year.

Course changes:

- EE 32 ab, Introduction

to Linear Systems, is a new class modeled after the old EE 13 abc. The course will deal with signal processing, transform methods, and system and circuit analysis.

- EE 160 will cover the same material as EE 60 and is still called Communication System Fundamentals.

- EE 51 ab, Engineering Electromagnetics, will cover the same material as EE 151 ab.

- EE 114 abc will still be offered as an elective geared towards seniors and graduate students.

- New electives to be introduced next year are EE 152, Guided Wave Circuits, and EE 153, Antennas. These two one-term courses will focus in depth on the topics normally covered in EE 151 c.

- The existing EE 112 abc will shift emphasis from analog and digital filter design to digital signal processing principles.

- EE 140 ab, Electric Machines Modeling and Control, which was given this year, will be reoffered next year.

BLOOM COUNTY

by Berke Breathed



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5	NAD	5200	CD PLAYER	TRAY LOAD	\$648.00	\$419.00	N/D
1	NEC	CD-803	CD PLAYER	2 TIMES OVERSAMPLING	\$1,295.00	\$799.00	DEMO

QTY	BRAND	MODEL #	DESCRIPTION	COMMENT	NEW PRICE	SALE PRICE	N/D/U
1	ACUSTAT	1	PREAMPLIFIER	MOS FET	\$795.00	\$497.00	DEMO
1	BEDINI	6677DE	PREAMPLIFIER	DUAL MONO	\$850.00	\$399.00	DEMO
1	66DE	66DE	PREAMPLIFIER	DUAL MONO	\$325.00	\$149.00	USED
1	PY-3(MOD)	PY-3(MOD)	PREAMPLIFIER	MASSIVELY MODIFIED	\$495.00	\$350.00	USED
1	PAS-3	PAS-3	PREAMPLIFIER	"ANOTHER CLASSIC"	\$280.00	\$25.00	USED
1	ESS-1	ESS-1	PREAMPLIFIER	"A CLASSIC"	\$400.00	\$29.00	DEMO
1	101A	101A	PREAMPLIFIER	ASSEMBLED	\$300.00	\$289.00	NEW
1	110A	110A	PREAMPLIFIER	"A CLASSIC"	\$400.00	\$199.00	NEW
1	110K	110K	PREAMPLIFIER	"BRAND NEW"	\$178.00	\$69.00	NEW
1	1020	1020	PREAMPLIFIER	WITH N/C HEAD AMPLIFIER	\$850.00	\$526.00	DEMO
1	SA-2	SA-2	PREAMPLIFIER	"CLEAN"	\$690.00	\$199.00	USED
1	4H	4H	PREAMPLIFIER		\$650.00		
1	C-2	C-2	PREAMPLIFIER				

QTY	BRAND	MODEL #	DESCRIPTION	COMMENT	NEW PRICE	SALE PRICE	N/D/U
1	AR	670	SPEAKER	MODIFIED	\$600.00	\$139.00	DEMO
1	CENTURY	6.5	SPEAKER	12" 3 WAY	\$600.00	\$39.00	USED
1	CT-1	CT-1	SPEAKER	COFFEE TABLE SUBWOOFER	\$300.00	\$149.00	NEW
1	DVC-1	DVC-1	SPEAKER	DUAL VOICE COIL WOOFER	\$329.00	\$166.00	DEMO
1	LC-1	LC-1	SPEAKER	LATEST DESIGN W/MODS	\$850.00	\$518.00	DEMO
1	MODEL 10	MODEL 10	SPEAKER	ORIGINAL DESIGN	\$300.00	\$199.00	N/D
1	MODEL 20	MODEL 20	SPEAKER	8" SINGLE WOOFER SYSTEM	\$400.00	\$387.00	N/D
1	MODEL 30	MODEL 30	SPEAKER	2 WAY POLYPROPYLENE/DOME	\$550.00	\$449.00	N/D
1	MODEL 1	MODEL 1	SPEAKER	6.5" (x2) WOOFER SYSTEM	\$700.00	\$388.00	N/D
1	MODEL 2	MODEL 2	SPEAKER	3 WAY TIME ALIGNED	\$1,150.00	\$757.00	DEMO
1	MODEL 3	MODEL 3	SPEAKER	6.5" (x2) WOOFER SYSTEM	\$650.00	\$249.00	DEMO
1	MODEL 10	MODEL 10	SPEAKER	VALKYRIE TOPS	\$200.00	\$39.00	DEMO
1	MODEL 20	MODEL 20	SPEAKER	PANEL SPEAKERS	\$1,150.00	\$649.00	DEMO
1	MODEL 30	MODEL 30	SPEAKER	500 W/CHANNEL	\$400.00	\$141.00	DEMO
1	PANEL 1	PANEL 1	SPEAKER	PROTOTYPE 8" 2 WAY	\$295.00	\$199.00	DEMO
1	PARTY 1	PARTY 1	SPEAKER	VALKYRIE TOPS	\$800.00	\$299.00	USED
1	PROTOTYPE	PROTOTYPE	SPEAKER	PROTOTYPE 8" 2 WAY	\$700.00	\$499.00	DEMO
1	SM-P1	SM-P1	SPEAKER	4x10" PER CABINET	\$400.00	\$299.00	DEMO
1	SUB-4	SUB-4	SPEAKER	ELECTROMAGNETIC	\$200.00	\$99.00	NEW
1	ME-2	ME-2	SPEAKER	10" 2 WAY	\$400.00	\$199.00	DEMO
1	SM-120	SM-120	SPEAKER	5" 2 WAY	\$600.00	\$339.00	DEMO
1	SM-126	SM-126	SPEAKER	8" 2 WAY	\$650.00	\$379.00	DEMO
1	SM-81	SM-81	SPEAKER	TYPE ALIGNED 3 WAY			
1	SM-861	SM-861	SPEAKER				
1	TO-20	TO-20	SPEAKER				

QTY	BRAND	MODEL #	DESCRIPTION	COMMENT	NEW PRICE	SALE PRICE	N/D/U
2	AUDIO CONTROL	CT101A2	EQUALIZER	WITH SPECTRUM ANALYZER	\$420.00	\$299.00	DEMO
1	AUDIO CONTROL	VC-1	EQUALIZER	W/MARBLE TONE GENERATOR & M	\$240.00	\$110.00	DEMO
1	MIX	127	EQUALIZER	FOR AUDIO AND VIDEO	\$200.00	\$129.00	USED
4	SHERWOOD	EQ-200	EQUALIZER	15 BAND / CHANNEL	\$220.00	\$99.00	NEW

QTY	BRAND	MODEL #	DESCRIPTION	COMMENT	NEW PRICE	SALE PRICE	N/D/U
1	CARVER	DRA-300	RECEIVER	MORE KNOBS PER DOLLAR	\$750.00	\$566.00	NEW
1	DENON	DRA-400	RECEIVER	33 W/CH CLASS 'A'	\$300.00	\$225.00	DEMO
1	DENON	DRA-700	RECEIVER	45 W/CH CLASS 'A'	\$500.00	\$425.00	DEMO
1	DENON	THE 600	RECEIVER	60 W/CH CLASS 'A'	\$550.00	\$49.00	USED
1	FISHER	R-451	RECEIVER	40 W/CH TUBE	\$550.00	\$375.00	NEW
1	KYOCERA	R-85T	RECEIVER	MOS-FET AMPLIFIER 45W/CH	\$850.00	\$247.34	NEW
1	KYOCERA	7125	RECEIVER	MOS-FET AMPLIFIER 85 W/CH	\$298.00	\$398.36	DEMO
1	NAD	7140	RECEIVER	25 W/CH DIGITAL TUNER	\$598.00	\$456.00	DEMO
1	NAD	7150	RECEIVER	40 W/CHANNEL SCHOTT TUNER	\$360.00	\$242.00	DEMO
1	NAD	930	RECEIVER	50 W/CH	\$300.00	\$35.00	USED
1	PROTON	9A-400	RECEIVER	35W/CH SCHOTT TUNER MC AMP			
1	TOSHIBA		RECEIVER	QUADROPHONIC 15W x 4			

QTY	BRAND	MODEL #	DESCRIPTION	COMMENT	NEW PRICE	SALE PRICE	N/D/U
1	AUDIRE	POCD	TRANSFORMER	STEP UP FOR MOVING COIL	\$175.00	\$49.00	DEMO
1	LINA BASKI	LV-1	TRANSFORMER	STRAIGHT/MEDIUM RAGE	\$200.00	\$39.00	USED
1	MARCOF ELEC.	630	TRANSFORMER	STEP UP FOR MOVING COIL	\$130.00	\$39.00	NEW
2	NAD	RC-6100	HEADPHONES	DYNAMIC	\$39.95	\$10.00	NEW
1	NAD	SP-7	HEADPHONES	REMOTE FOR NAD 6100	\$50.00	\$48.99	NEW
1	ORFON	1-20	HEADPHONES	DYNAMIC	\$79.95	\$99.00	DEMO
1	PROTON	320	TRANSFORMER	STEP UP FOR MOVING COIL	\$250.00	\$49.95	NEW
1	SME	3009	TRANSFORMER	STEP UP FOR MOVING COIL	\$100.00	\$26.00	DEMO
1	SUNING	MHT	TRANSFORMER	L SHAPED PRETER	\$85.00	\$99.00	USED
1			TRANSFORMER		\$170.00	\$188.00	NEW

QTY	BRAND	MODEL #	DESCRIPTION	COMMENT	NEW PRICE	SALE PRICE	N/D/U
3	AR	BASIC	TURNTABLE	BLT/DRV MANUAL NO TONEARM	\$325.00	\$188.00	NEW
1	DENON	DP-11	TURNTABLE	AUTOMATIC QUARTZ LOCKED	\$290.00	\$99.00	DEMO
1	DENON	DP-15	TURNTABLE	DIR DRV/AUTO QUARTZ LOCKED	\$200.00	\$147.00	N/D
1	DENON	DP-52	TURNTABLE	DIR DRV/AUTO QUARTZ LOCKED	\$525.00	\$393.00	DEMO
1	DENON	DP-62	TURNTABLE	DD/SEMI-AUTO QUARTZ LOCKED	\$590.00	\$42.00	USED
1	DENON	720	TURNTABLE	BELT DRV/SEMI-AUTO	\$199.00	\$57.00	USED
1	HARMON KARDON	KB-5070	TURNTABLE	DIR DRV ROCK BASE MANUAL	\$400.00	\$189.00	USED
1	KENWOOD	L-60	TURNTABLE	BELT DRIVE	\$190.00	\$26.00	USED
1	Lenco	CP-1010A	TURNTABLE	BELT DRV/SEMI-AUTO	\$140.00	\$59.00	USED
1	ONKYO	BA-312	TURNTABLE	BELT DRV/SEMI-AUTO	\$180.00	\$44.00	USED
1	PHILIPS	PL-12(7)	TURNTABLE	BLT/DRV FLOATING SUBGRASIS	\$100.00	\$74.00	USED
1	PIONEER	FP-055	TURNTABLE	BLT/DRV/MANUAL	\$175.00	\$44.00	NEW
1	SANSUI	ST-880	TURNTABLE	DIR DRV/SEMI-AUTO	\$100.00	\$77.00	NEW
1	SHERWOOD	ST-890	TURNTABLE	DIR DRV/SEMI-AUTO	\$150.00		

QTY	BRAND	MODEL #	DESCRIPTION	COMMENT	NEW PRICE	SALE PRICE	N/D/U
1	ACCUPHASE	23R	CARTRIDGE	MOVING COIL	\$475.00	\$344.00	NEW
3	DINAVECTOR	6RACE	CARTRIDGE	MOVING COIL	\$310.00	\$153.00	NEW
10	ORFON	MC-15 SFR	CARTRIDGE	MOVING MAGNET	\$105.00	\$9.00	NEW
6	ORFON	MC-15 SFR	CARTRIDGE	MOVING MAGNET	\$85.00	\$9.00	NEW
2	ORFON	MC-15 SFR	CARTRIDGE	MOVING COIL	\$175.00	\$35.00	NEW
6	ORFON	MC-15 SFR	CARTRIDGE	MOVING MAGNET	\$79.00	\$25.00	NEW
6	ORFON	MC-15 SFR	CARTRIDGE	MOVING MAGNET	\$300.00	\$177.00	NEW

QTY	BRAND	MODEL #	DESCRIPTION	COMMENT	NEW PRICE	SALE PRICE	N/D/U
1	DENON	UNLIM DENON	AMPLIFIER	INTEGRATED AMP 100 W/CH	\$620.00	\$488.00	DEMO
1	DENON	UNLIM DENON	AMPLIFIER	INTEGRATED AMP 20 W/CH MINIMUM	\$218.00	\$174.40	NEW
1	DENON	UNLIM DENON	AMPLIFIER	INTEGRATED AMP 40 W/CH SOFT CLIPPING	\$292.00	\$199.00	DEMO
1	DENON	UNLIM DENON	AMPLIFIER	INTEGRATED AMP 80 W/CHANNEL	\$320.00	\$149.00	USED
1	DENON	UNLIM DENON	AMPLIFIER	INTEGRATED AMP 120 W/CH MOS-FET	\$795.00	\$399.00	DEMO
1	DENON	UNLIM DENON	AMPLIFIER	POWER AMPLIFIER 120 W/CH MOS-FET	\$450.00	\$277.00	DEMO
1	DENON	UNLIM DENON	AMPLIFIER	POWER AMPLIFIER CLASS 'A' 50W/CH	\$350.00	\$269.00	NEW
1	DENON	UNLIM DENON	AMPLIFIER	POWER AMPLIFIER 115 W/CH KIT FORM	\$278.00	\$149.00	DEMO
1	DENON	UNLIM DENON	AMPLIFIER	POWER AMPLIFIER 40 W/CH BRIDGEABLE	\$1,150.00	\$1,086.00	DEMO
1	DENON	UNLIM DENON	AMPLIFIER	POWER AMPLIFIER 100 W/CH MOS-FET	\$1,550.00	\$1,027.00	DEMO
1	DENON	UNLIM DENON	AMPLIFIER	POWER AMPLIFIER 200W/CH MINIMUM MOS-FET	\$250.00	\$127.00	USED
1	DENON	UNLIM DENON	AMPLIFIER	POWER AMPLIFIER BIPOLAR 85 W/CH	\$1,595.00	\$699.00	USED

QTY	BRAND	MODEL #	DESCRIPTION	COMMENT	NEW PRICE	SALE PRICE	N/D/U
1	DENON	3020A	TUNER	SERVO LOCKED ANALOG	\$225.00	\$148.00	N/D
1	NAD	NA-1090	TUNER	QUARTZ LOCKED DIGITAL	\$285.00	\$218.00	DEMO
1	ACUSTAT	T-120	TUNER	SERVO LOCKED ANALOG	\$218.00	\$144.00	N/D
1	220A	220A	TUNER	QUARTZ LOCKED/SCHOTT CIRCUIT	\$248.00	\$244.00	DEMO
1	2140B	2140B	TUNER	QUARTZ LOCKED/SCHOTT CIRCUIT	\$236.00		
1	10 NAD	10 NAD	TUNER				
1	1 PERREUX	1 PERREUX	TUNER				
1	1 PERREUX	1 PERREUX	TUNER				
1	1 SAE	1 SAE	TUNER				
1	1 STREETS	1 STREETS	TUNER				

QTY	BRAND	MODEL #	DESCRIPTION	COMMENT	NEW PRICE	SALE PRICE	N/D/U
1	GNP	KRC-312	CAR STEREO	SERVO LOCKED ANALOG	\$250.00	\$89.00	DEMO
1	KENWOOD	PA-300	CAR STEREO	REAR DECK PANEL 2 WAY	\$289.00	\$199.00	N/D
1	NARAWACHI	SP-400	CAR STEREO	TUNER/CASS/AMPLIFIER 12 W/CH	\$340.00	\$244.00	DEMO
1	NARAWACHI	TR-1200	CAR STEREO	70 W/CHANNEL	\$390.00	\$244.00	N/D
1	NARAWACHI	TR-1200	CAR STEREO	PREAMP/TUNER/CASSETTE	\$1,260.00	\$819.00	N/D

QTY	BRAND	MODEL #	DESCRIPTION	COMMENT	NEW PRICE	SALE PRICE	N/D/U
1	ASHTON/TATE	851UP	SOFTWARE	DATABASE PROGRAM	\$300.00	\$199.00	DEMO
1	CENTRAL POINT	851UP	SOFTWARE	120 CPS DOT MATRIX	\$500.00	\$369.97	NEW
1	CONTINENTAL	851UP	SOFTWARE	ARCHIVAL BACKUP	\$40.00	\$32.00	NEW
1	DIGITAL RESEARCH	851UP	SOFTWARE	PERSONAL FINANCE	\$150.00	\$80.00	NEW
1	DR. LOGG	851UP	SOFTWARE	EDUCATIONAL	\$100.00	\$60.00	NEW
1	EINSTEIN	851UP	SOFTWARE	WORD PROCESSOR W/SPELLER	\$495.00	\$300.00	NEW
1	ENERTRONICS	851UP	SOFTWARE	HOLDS 50 DISKS	\$30.00	\$19.99	NEW
1	FINANCIERII	851UP	SOFTWARE	FLOPPY DISKS	\$55.00	\$25.99	NEW
1	IDEA PROCESSOR	851UP	SOFTWARE	CAD W/ 3D & STATISTICS	\$250.00	\$175.00	DEMO
1	INTEGRATED SPREADSHEET	851UP	SOFTWARE	PERSONAL FINANCE	\$195.00	\$135.00	NEW
1	WORD PROC	851UP	SOFTWARE	WORDPROCESSOR WITH HERBE	\$195.00	\$135.00	NEW
1	THINK TANK	851UP	SOFTWARE	WORDPROCESSOR	\$120.00	\$99.99	DEMO
1	UNLIMITED DATABASE PROGRAM	851UP	SOFTWARE	IDEA PROCESSOR	\$500.00	\$329.99	NEW
1	UNLIMITED DATABASE PROGRAM	851UP	SOFTWARE	INTEGRATED SPREADSHEET	\$500.00	\$329.99	NEW
1	UNLIMITED DATABASE PROGRAM	851UP	SOFTWARE	VERSION 3.24 WORDPROCESSOR	\$495.00	\$350.00	NEW
1	UNLIMITED DATABASE PROGRAM	851UP	SOFTWARE	WORD PROCESSOR V1.0</			

announcements

Dinner Winner 4

Just one week left to win \$20 in the *little t's* restaurant review contest. Send your entries by next Wednesday to: *little t*, 107-51. This week's winner is Eric Olafson.

If you don't know what to review, you can try any of the following: Pizza Man, Uncle Nick's Falafel, El Pollo Loco, Yum Yum Deli, PCC Cafeteria, Blimpie's, Taco Tree, Sonny's Pizza, Real Taco. All of these are just a short walk from campus.

CLASSIFIED

FOR SALE—

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GENERAL—

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WE HAVE THE LOWEST AIR-FARES to Europe and Across America! For Free Color Brochure, Write To: Campus Travel, Box 11387, St. Louis, Mo. 63105.

HELP WANTED—

HELP WANTED. Test question writers. \$5-\$20 per question. Mechanical comprehension, data interpretation, and general science, Call Psychometrics at (213)829-0248. Ask for David or Pat.

HOUSING—

HOUSING WANTED: Room or apartment wanted for summer 1984. Call Mark at (301)366-3559 evenings, (301)338-8375 days, or (814)536-5882. I am a summer engineering student.

APARTMENT FOR RENT: Unfurnished 2 bedroom upstairs apartment (no pets) at 600 S. Mentor. \$550/month. Call 796-4160.

ROOMATE WANTED: Female Non-smoker wanted to share cute 2-bedroom apt. \$212.50/mo. plus util. You would need your own bedroom furnishings. Available June 15. Call Sue: x4538 or 798-7309 eves.

APARTMENT FOR RENT: Unfurnished studio apartment in small complex. Near Caltech, \$515 per month. Call Mary at 289-4088.

TYPING—

TYPING AND WORDPROCESSING: Reports, Term Papers, Letters, Resumes. Low rates and prompt, neat service. Call 795-8467.

PROFESSIONAL TYPING Excellent typing by executive secretary. IBM Selectric. Term papers, resumes, reports, whatever. 304-0927.

Tad White, Soloist

The Occidental-Caltech Orchestra will present its final concert of the year this Wednesday, May 23, at 8:30 pm in Ramo Auditorium. This program will feature Tad White as soloist playing the Mozart Piano Concerto No. 21 in C Major. Also featured will be two other winners of the annual Oxy-Caltech Concerto Competition, both students at Oxy. Alan Mar will play the third movement of the Beethoven Violin Concerto, and soprano Margaret Welsh will sing a Mozart concert aria, "Basta, Vincesti—Ah non lasciarmi, no". Other selections will be the *Russian and Ludmilla Overture* by Glinka and *Capriccio Espagnole* by Rimsky-Korsakoff.

The orchestra, directed by Dr. Allen Gross, is composed of students, staff, and faculty from both schools; it has over 60 members, including around 20 from Caltech.

The concert is sponsored by the Office of Student Affairs, with support from the Caltech Student Investment Fund and the Office of Public Events. It is free and open to the public.

C•L•A•G•S

CLAGS will meet on Sunday at 2:00 in 210 Baxter to make the final plans for the May 25th dance. Everyone is welcome. Birthday cake will be served.

Clubs/Activities

If your club or activity was not listed in last year's *little t*, please send a short description of what your group does, along with the name, mail code & phone number of a contact person for next fall, to: *little t*, 107-51.

Run For The Pi

The Organization for Women at Caltech will hold its second annual "Run for the Pi" on Saturday, May 19 at 8:30 am, starting in Tournament Park, behind the Caltech gym. There will be a one mile Fun Run and a 5K race. Prizes will be awarded to the top finishers and the top age group competitors of each sex. After the races, all are invited to partake of a Pancake Breakfast at the Park and to take their chances on winning a prize at the awards ceremony.

Entry fees will be \$2.50 for faculty and staff; \$1.50 for students and children, with a maximum family fee of \$5.00. The Pancake Breakfast will be \$2.50 for adults, \$1.50 for students and children. Come join the fun!

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A Suits
M Skirts
Shirts

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Der Junge Toerless

There will be a showing of *Der Junge Toerless* (1966) in conjunction with Andreas Aebi's class, Lit 106b (German Literature in translation) on Monday May 21 at 7:30 in Baxter Lecture Hall. This film was a multi-prize winner and marks the beginning of the "new German film."

Chamber Music

There will be a chamber music concert tonight in Dabney Lounge. The concert will begin at 8:15 pm and it is free. Students from the Caltech Chamber Music program will play music by D'Inoy, Mendelssohn, Rattenbach, and Kuhlau. There will be a reception, with refreshments, following the concert.

From Russia With Slides

On Tuesday, May 22 at 8:00 pm in Winnett Lounge, the undergraduates who went to the Soviet Union over spring break will present a Caltech Y program based on their experiences. It will be a rather informal get-together in which we will show slides and photos and speak on our individual experiences.

Caltech Jazz Band

On Thursday, May 24, at 8:15 pm in Baxter Lecture Hall, the Caltech Jazz Band will play their final concert of the year. Nick Ceroli, drummer with Stan Kenton, Cleo Laine and Benny Goodman, will be the guest soloist. Caltech has a great jazz band—try not to miss the concert. Admission is free.

Attn: Page, Fleming, (and all undergraduates who participated in the shower-raid on the grad house at 5:00 Ditch Day):

It's good to see there is a little fighting spirit in the undergrads here at Caltech. However, you had better "Ride the Valkyries" a little faster next year. It took 3 rousing choruses for you to retaliate.

Signed,
—JMH, PB & Wagner
(as he rolled over in his grave)

New Grad Jobs

If you have not yet decided on a permanent position, be sure to check the "New Grad" job folder in the Career Development Center. Companies who were unable to recruit on campus have sent us a job descriptions hoping to attract one of you. There are some attractive openings available.

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KELROF

KELROF is tomorrow!!! If you have a team make sure you have timers and contact me so that I can give you poster board to keep track of your times. It starts at 9:00 am so be there to run, time, or watch. Dave Gallup, x6180, 131 Lloyd.

Housing Office Jobs

The Housing Office will be offering part-time Summer jobs, that can be worked around most schedules. Stop by the Housing Office to see about earning some extra money this summer.

Nuclear Theology

Dr. David Griffin, professor of theology and process studies at the School of Theology at Claremont, addresses the issue of a nuclear-age theology next Wednesday at noon.

Instead of The Y's usual Noon Update in Clubroom One, Griffin will be speaking in Winnett Lounge. His title is: "Coercion or Persuasion: A Theology for the Nuclear Age."

Griffin is an expert on the philosophy of Alfred North Whitehead, Harvard's famed philosopher and mathematician of the 1920s. The application of Whiteheadian concepts to theology is at the heart of process metaphysics.

How a process understanding of God (who is held to affect creation persuasively rather than coercively) can be related to the use of nuclear arms will be the thrust of Dr. Griffin's discussion.

(The Y's faculty Noon Update will be held on Tuesday next week, presenting "Uranus" with Caltech's Dr. David Stevenson.)

Food For Techers

The Old Spaghetti Factory

5939 W. Sunset Blvd.
469-7140

Housed in an old mansion with purple velvet wallpaper, the Old Spaghetti Factory is as interesting to see as it is to eat in. The price is also right—\$5 will buy an all-inclusive dinner of milk, spaghetti, good warm sourdough bread, a salad, and ice cream. Near the Sunset Blvd. exit on Hollywood Freeway. \$ ***

Beef Bowl

On Colorado, just east of Hill—Opening soon

Fast food Japanese style. The menu is small, just beef or teriyaki chicken, or a combination of the two. The taste is all right and the cost is only \$3-4 dollars per person. It is walking distance and much better than American fast food burger joints. \$ ***

Bill's Chicken

942 E. Washington Blvd.
797-9222

For real fried chicken fans: Bill's is a little greasier, a lot cheaper and better flavored than Kentucky Fried Chicken. Their ribs are also excellent. Best of all, Bill's gives tremendously large servings for the price. \$5 will buy 5 large pieces of chicken, a salad and a helping of baked beans, which is enough for two. But if you can't take grease, don't try it. \$ **

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