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THE CALIFORNIA TECH

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AMERICA'S
CUP
FEVER

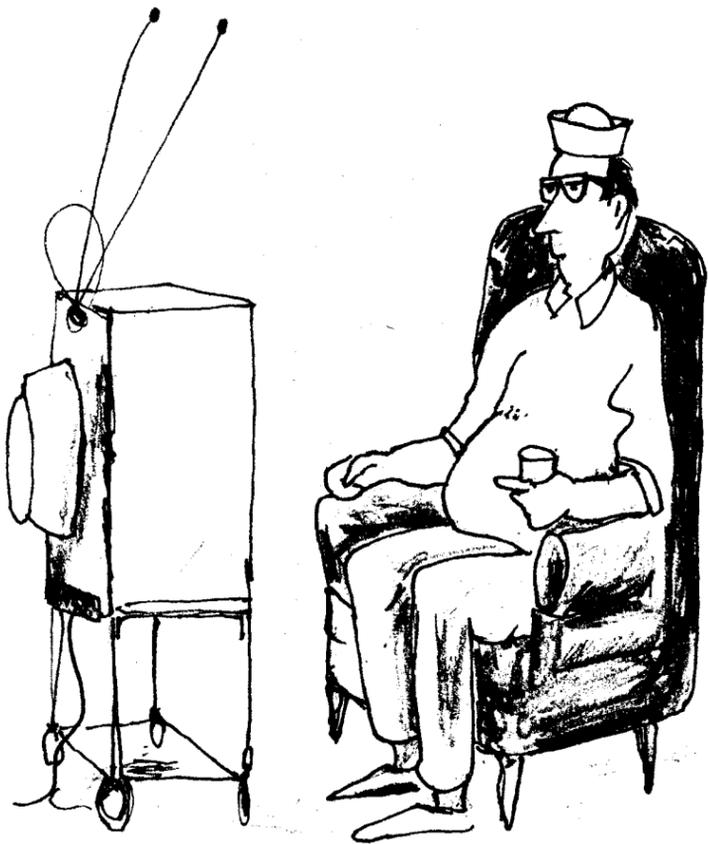


Illustration by Sandip Biswal

Watson Lecture

Clauser Builds A Better Boat

by Kathy Perry

Caltech Professor Francis Clauser, presented "The America's Cup—What Might Have Been and What Might Be" on Wednesday night as part of the on-going Watson Lecture Series. Clauser, the Clark Blanchard Millikan Professor of Engineering, Emeritus, has served as Chief Scientist for the Newport Harbor Yacht Club. He entered the packed Beckman Auditorium wearing a sailor's cap from his days at sea.

Dr. Clauser began his talk with a description of the race and its history. The America's Cup contest began when an American yacht successfully challenged the British yacht clubs in 1851. It is a race between clubs, not nations, and for 132 years, until 1983, the New York Yacht Club was the perennial winner. When the Australians upset the New York Yacht Club in 1983, others began to dream of winning the cup.

In the summer of 1984 George Tooby, a 1935 graduate from Caltech, recruited Dr. Clauser into the Newport Harbor Yacht Club. Clauser had received his B.S. from Caltech in 1934 and brought his long experience with aeronautical science to service. Some of the problems of the 12-meter yachts, particularly with stability and control, were similar to problems of early plane design. Clauser re-

marked that he felt as though he had regained his youth in doing aeronautical design.

Tooby formed a syndicate to raise eight or ten million dollars in order to build two yachts: one conventional, one radical and innovative. Johan Valentijn, Newport Harbor's chief designer, was responsible for the conventional design, and Dr. Clauser devoted most of his time to the radical design.

Experiments with the conventional design led to some surprises. For example, the conventional boat encountered less resistance when it was towed backward than when it moved forward!

Rules sharply delimit the possibilities for innovation. For example, the rated length of twelve meters is derived from an equation: $0.422(L + (1/2)(d1) + (2)(d2) + (1/3)(d3) - F + \text{sqrt}(S))$. Clauser identified L as the distance between the bow and the stern, measured seven inches above the water; d1, d2, and d3 are girth measurements. F is the freeboard, the average distance from the deck to the water plane. And S is the sail area. The professor joked that the equation and its coefficients were arbitrary.

Other restrictions define the permissible displacements, forbid hollows in the hull, set a lower bound on the length of the yacht measured two inches above the

water, and, most significantly, require that the boats be built along an archaic set of specifications which eliminate most structural innovations.

Notwithstanding these limitations Dr. Clauser devised several innovations for the new and radical boat. He found that a lighter boat with broader beams (the sail area must be adjusted to satisfy the rated length requirement) improved the handling and decreased the resistance. This new boat planes like a surfboard on the waves.

Other innovations aided stability. Pontoons deployed on the outriggers could take the place of a lead hull if the pontoons are out of the water and so do not violate the requirement of a single hull. The advantage was greater stability and more flexibility in the equation of rated length. Dr. Clauser found that ailerons, as on airplanes, a slotted sail, and a proboscis on the bow all improved performance. The radical boat performed spectacularly in tests.

However, in the rules for the contest there is a clause which allows any innovation to be challenged as peculiar. The International Yacht Racing Union has a final—and subjective—say on what is "good for the sport." So the ideas may not be adopted on the grounds that they are not "good for the sport."

A Mediator Worth His Salt

by Mark Looper

The goals of the United States in the Geneva arms talks are "to achieve deep arms cuts that are equitable and verifiable, to strengthen strategic stability, and to prevent an arms race in space," said State Department Special Geneva Mediator Mike Stafford in a talk titled "Arms Control: Beyond Salt II."

To show what progress has been made toward achieving these goals, Stafford outlined the current U.S. and Soviet positions in the negotiations, noting areas of agreement and disagreement, and then fielded questions from the audience of 18.

The three major divisions of the arms talks are the negotiations on strategic offensive arms, including inter-continental and submarine-launched ballistic missiles and heavy bombers; this segment is called by the acronym START. The INF negotiations cover Intermediate-range Nuclear Forces, those of less than inter-continental range, primarily deployed in Europe. The major examples are the U.S. Pershing II and ground-launched cruise missiles and the Soviet SS-20.

The third division of the talks deals with defense and space arms,

and focuses on the Strategic Defense Initiative and parallel Soviet efforts.

While all three areas are the subjects of continuing negotiations in Geneva, Stafford said that "the most important two meetings" in the process were the Geneva and Reykjavik summit meetings, since these directly engaged the two leaders who are ultimately responsible for the direction of negotiations and since the pressure of the approaching summit spurred progress in the ongoing talks in each case. It was on the results of these two meetings that Stafford focused.

The Geneva summit produced an agreement to negotiate 50% cuts in arsenals and to try to reach an agreement on INF in the interim.

The major remaining issue to be settled in the START negotiations was that the U.S. wanted to make the 50% cuts in delivery systems of intercontinental range only, while the U.S.S.R. wanted to include "all systems that can reach the territory of the other side"—this would have included such non-inter-continental weapons as our carrier-based aircraft.

In the INF talks, the major obstacles remaining were the questions of just what arms would be included in an agreement. The

U.S.S.R. wanted to include the independent nuclear deterrents of our European allies in the reckoning, while the U.S. insisted that the talks be strictly bilateral. The U.S.S.R. refused to include in the counting its SS-20 missiles based in Asia, and shorter-range missiles which could be moved to the front in the event of a confrontation in Europe.

Finally, in the defense and space arms talks, the U.S.S.R. sought a ban on "purposeful research," development, testing and deployment of SDI-type systems, though "fundamental research" would be unverifiable.

Besides, said Stafford, the principal effect of the U.S.S.R.'s distinction between "fundamental" and "purposeful" research, and the criteria they used, would be to "effectively kill SDI while still allowing the Soviets to continue their program," which differs from ours mainly in that "it was started some years earlier and until recently more money was being spent on it."

Thus matters stood at the end of the Geneva summit. Negotiations continued, and last June the U.S.S.R. significantly modified its position. A series of expert discussions then laid the groundwork for the Reykjavik summit. This meeting resolved many important issues, and though no final agreement was signed, both sides have stated that their respective offers remain open. In the START division, the U.S.S.R. dropped its demand that non-inter-continental-range delivery systems be included in the 50% cuts.

The principal remaining disagreement was that the U.S. wanted sublimits on the different kinds of delivery systems, contending that

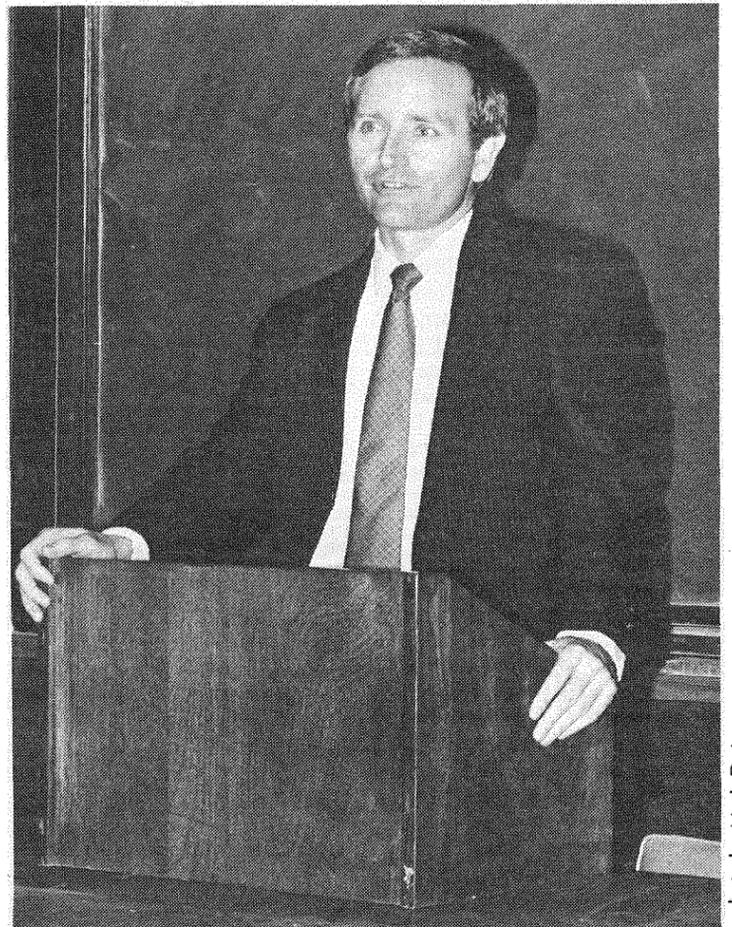


photo by Mark D. Looper

Mike Stafford, State Department Special Geneva Mediator presents the current status of negotiations in arms talks between the U.S. and the Soviet Union.

ICBM's in particular are destabilizing; the U.S.S.R. did not accept this. In the INF talks, agreement was reached on an equal global ceiling of 100 warheads per side, with none to be deployed in Europe; however, the question of the shorter-range missiles remains, with the U.S.S.R. wanting a freeze at current levels, which are hundreds to zero in their favor.

And in the defense and space arms arena, the two sides agreed to extend the Anti-Ballistic Missile treaty by 10 years. However, the U.S. wanted to keep the current version of the treaty, while the

U.S.S.R. wanted to modify it to forbid testing of other than ground-based systems. Also, the U.S. wanted to allow deployment of defenses at the end of the 10-year term unless an agreement against this was reached in the interim, while the U.S.S.R. wanted to negotiate deployment "later," leaving vague the question of exactly when.

The U.S. maintains that defense systems are needed as an "insurance policy" against violations of agreed-upon cuts, and that even after the ultimate goal of a nuclear-

continued on page 4

Club Questionnaires

by Jeff Tekanic

A week from next Tuesday, the ASCIT Board of Directors will hold the annual budget meeting. To help the BOD in this decision-making process, a questionnaire will be mailed to all ASCIT members. The questionnaire will list all of the clubs that currently receive funds from ASCIT.

We strongly encourage you to give us your opinions as to whether these organizations have been funded too much or not enough and if they should be funded in the future. It will only take a minute to fill the form out and return it to Thu Le, 1-55 by Friday, March 6.

OPINION

Newman Center
Vague on Vega

To the Editors:

I was ashamed at the sham presented [11 February] by the Newman Center and the Y under the guise of the "real story" about what is happening in Nicaragua. In the fliers for the talk by Bishop Pablo Vega, his sponsors billed him as "a voice of truth and moderation" who "is not a representative of, nor identified with, the Sandinistas nor the contras." They claimed that his "credentials in representing the people" are that he was called a "Red Bishop" by the Somoza regime and was booted out of the country by the Sandinistas. (These are credentials?) Let's take a look at Vega's record. In early March of 1986, he attended a meeting of the Heritage Foundation in Washington where he accused the Sandinista government of persecuting the Church, conferred with contra leaders, and endorsed the idea of invasion. Several days before his ouster from Nicaragua, this "neutral" bishop openly expressed his support for Reagan's \$100 million aid package for the contras. Of course he was expelled by the Sandinistas—I have no doubt that someone lobbying to get \$100 million dollars to overthrow the U.S. government would be promptly tossed out of our country. (A good example is the recent FBI roundup of 8 Los Angeles-area Palestinian students, under the thinly-veiled guise of INS violations, for simply being associated with a radical Palestinian group. Heck, the Palestinians don't even want to overthrow the United States—they simply want to negotiate with our friend Israel to get a place to live.)

In any case, the part about Vega not being identified with the contras is a blatant lie and I'm surprised that the sponsors of his lecture allowed him to be billed this way. Is it possible they didn't know Vega was a contra supporter? (It isn't a deep, dark secret—I confirmed it with no less than three different sources before I sat down to write this.) Weren't they a little curious as to why he was expelled by the Sandinistas? The editors of

the Tech are guilty as well—the article by Huy Cao that it published on the talk stated as fact that Vega "isn't identified with either the Sandinistas or the contras." The editors are either going to have to start checking all of the "facts" that Huy Cao puts in his stories or run them on the opinion page where they belong.

Putting political affiliations aside, what did the "voice of truth and moderation" have to say about events in Nicaragua? For starters, in case we were still confused as to who he supported in Nicaragua, Vega accused the Sandinista regime of being a "totalitarian, communist government." This is the sort of name-calling, propagandist crap I'm used to hearing from the Reagan Administration, but was surprised to hear coming from a man of the cloth. Let's ignore the fact that Vega's main concern is supposed to be human rights, not political ideology, and examine these charges. Under the 'communist' Sandinista regime, 60% of the country's businesses and 80% of the farmland is privately owned. The 'totalitarian' government is in reality far more democratic than most other governments in the region, having been elected by 67% of the people in internationally monitored elections. The government reflects the will of the people far better than other U.S.-supported dictatorships that the Reagan Administration routinely hails as "pillars of democracy."

Vega went on to claim that "the Nicaraguan government's purpose is to be part of the Soviet bloc," forgetting that the revolution which overthrew the repressive Somoza regime and installed the Sandinistas was a popular revolution supported by a majority of the Nicaraguan people. I guess he was too busy lobbying for aid to the contras to notice the widespread celebrations by the Nicaraguan people marking the recent seventh anniversary of Triumpho, the Sandinista victory. (For the skeptics who believe the celebrations were government sponsored showpieces, I'd like to point out that the anniversary was celebrated here in Los Angeles as well as in Nicaragua.)

What did Vega have to say about human rights, his alleged main concern? He fantasized that human rights were better under the Somoza government than the Sandinista one, citing as evidence the

fact that the number of prison cells in the Nicaraguan city of Juigalpa has risen since the revolution. In noting this fact, however, he failed to point out the possibility that a six-year-old civil war might be the reason for this change. He also turned a blind eye to the fact that under the Sandinistas the death penalty has been eliminated and the maximum criminal penalty set at thirty years of imprisonment. If the Sandinista regime engaged in wholesale slaughter of political prisoners as the Somoza regime did, the jails would empty in a hurry but the graveyards would fill just as quickly. How has life changed in Nicaragua since Somoza was ousted? People can now expect to learn how to read and write—the illiteracy rate has dropped from 67% to 14% since 1982. Vaccinations against childhood diseases have become routine, and polio has been eliminated. The government is striving to improve food supplies, medicine, and education despite the economic difficulties due to the continuing contra war.

When asked about the human rights record of his contra pals, Vega avoided condemning them and skirted the issue by asking "Why would they kill their own people?" They would kill their own people because they are following instructions in a CIA-supplied 'terrorist manual' calling for acts against those trying to make the Sandinistas' programs work—teachers, doctors, nurses, technicians, etc. As of last year, for whatever reasons they have, the contras had murdered 103 teachers, 103 technicians, 293 students, 420 peasants, 5 doctors, 3 nurses, as well as close to 900 children. Even if Vega's claim that many of these deaths were caused by the Sandinistas and blamed on the contras is true, I don't think that even Vega will claim that the contras' hands are entirely free of the blood of innocent people. Besides being murderers, the contras are documented thieves (the General Accounting Office testified before

the House of Representatives that almost half of the money allocated to the contras in 1985 cannot be "satisfactorily accounted for," i.e., was embezzled) and drug dealers (the U.S. government returned \$36,000 of money confiscated in a California cocaine arrest to one of the defendants after receiving a letter from contra leaders stating that the money was "political money for the reinstatement of democracy in Nicaragua.")

In the past, I have looked to religious figures to promote peaceful, nonviolent resolutions to conflicts and to work towards solutions designed to alleviate suffering and promote fairness and justice. I expect their views to transcend politics and ideologies and instead be based on human concerns. I have been very impressed in general by the role the Church has played in the peace movement and all of the good that has come about as a result. I guess that's why I'm shocked that instead of arguing for a negotiated end to the Nicaraguan conflict, Bishop Vega advocates prolongation of the conflict and continued violation of international law by supporting U.S. military aid for the contras. A negotiated end to the conflict would save countless lives, ease the economic hardship that is causing children to go hungry, and give the Sandinistas a chance to relax their restraints on the Nicaraguan people. Why not try giving peace a chance?

—Ann Terese Heil
206-41
x4594

Bishop Vega In
Wonderland?

To the Editors:

"When I use a word," Humpty Dumpty said, in a rather scornful tone, "it means just what I choose it to mean—neither more nor less." "The question is," Alice said,

"whether you can make words mean so many different things."

—Lewis Carroll, *Through the Looking Glass*

For all the attention given Nicaragua, widespread confusion surrounds basic issues and definitions. Like Alice, many trying to understand this unfamiliar country are confronted by a topsy-turvy world where words and their meanings have become quite jumbled. Press accounts and White House statements frequently cloud rather than clarify the issues.

Bishop Vega's talk on "Nicaragua—the Real Story" and the subsequent report by Huy Cao in the *California Tech* in Feb. 13 ("A Bishop Whom No One Likes") contribute to the already

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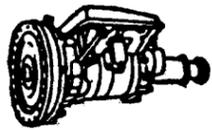
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OPINION

widespread confusion about what is happening in Nicaragua.

On the flier announcing the talk, the Caltech Newman Center presented Bishop Vega as "a voice of truth and moderation" and thereby intended to prepare the audience to hear "The Real Story" about Nicaragua. This is simply pretentious and dishonest. The same is true when Huy Cao presents Bishop Vega as "anti-contras and anti-sandinistas" and has having "impressive credentials in representing the people, and not any political organization."

I did some research on Bishop Vega and, rather than getting my information from the Vatican daily *L'Osservatore Romano*, I found an excellent article in the *Christian Science Monitor*: "Church-state relations hit a new low in Nicaragua" (7/7/86). When I mention the contras, I mean the armed counter-revolutionaries. Here are some of the conclusions I reached after reading the article:

• Bishop Vega was accused by the Sandinista government of campaigning in favor of United States aid to the contras. He made a trip to Miami in March 1986 to discuss with two leaders of the FDN, the main contra force.

• Bishop Vega was expelled on July 4, 1986 soon after he made some comments to foreign correspondents after President Ortega had warned that an eight-month-old

state of emergency would be enforced in all its rigor in the wake of the U.S. House of Representatives June 25 vote to give \$100 million to the contras.

• Bishop Vega has always refused to condemn U.S. aid to the contras, saying that though it was "neither desirable nor efficient... one cannot deny the people the right to defend themselves against repression."

• The Catholic Church in Nicaragua is divided: on one side, the Catholic Church hierarchy (of which Bishop Vega is the second most important representant) which has been critical of the Sandinista government, partly because of the presence of numerous Catholic priests in the government (the Foreign Minister, the Minister of Culture, the Minister of Education, among others...); on the other side, the "Popular Church" who supports the Sandinista government, has access to the pro-government media and widespread support abroad, including many U.S. religious bodies. The "Popular Church" has campaigned fiercely against the Church's refusal to condemn the contras openly.

• According to opposition leader Godoy Reyes, "there is no religious persecution [in Nicaragua], there is political persecution of the Church over political issues."

Yes, there is political persecution in Nicaragua. In April 1986, Amnesty International released, not a report of human rights *against* the contras, as presented by Huy Cao, but rather a 36-page report documenting the human rights record in Nicaragua since the fall of the Somoza government in 1979, 5 pages of which are related to the contras. AI's concerns in Nicaragua include "a pattern of frequent, although generally short-term, imprisonment of prisoners of conscience; prolonged pretrial incommunicado detention of political prisoners, and restrictions on their right to a fair trial; and poor prison conditions for political prisoners." AI has found "no evidence of widespread torture" on the part of the Sandinista government. About the contras: "since 1981, AI has also been concerned about the frequently reported torture, mutilation, and execution-style killing of captives by irregular military forces opposing the Nicaraguan government."

Oh, by the way, Huy Cao failed to report Bishop Vega's charge that AI is an organization that has been infiltrated by the communists. Everyone who has read AI's reports on countries ranging from the Soviet Union to Chile knows of AI's impartiality.

Let me finally thank the Caltech Newman Center and the Y for giving us the opportunity to meet a representant of the Catholic Church hierarchy in Nicaragua. Let me also remind them, as well as Huy Cao (who should have published his "report" in the opinion section of *the Tech*), that they have a responsibility to the Caltech community to present Guest Speakers as impartially as they can, and that they should refrain from any personal judgement. An adequate title would have been: "Nicaragua—as seen by Bishop Vega."

As a footnote, according to the *Christian Science Monitor* (2/12/87), "The Roman Catholic Church's radio will be allowed to reopen and two expelled priests (Bishop Vega and Msgr. Carballo) could be allowed to return to Nicaragua, a top Sandinista official said, 'so long as they obey the law'."

—Eric Majani
Steele 116-81



Correction

To the editors:

I apologize for my erroneous letter of last week. The waters of Throop are, in fact, not miniature golf park blue, but are actually more of a British racing green. While this upscales the high society acceptability of the color, the notion of dying the ponds remains about as cheesy as asking ASCIT members if they approve of a club or not. Sincerely,

—Josh Kurutz

For the Sake of Safety

To the Editors:

Concerning your article of February 20, regarding the safety of the athletic facilities after hours, we are in complete agreement. We therefore propose that, after 6PM, no spastic geeks be allowed entrance to the gym.

—Commissioner Gordon and
Police Chief O'Hara

Alternate Job Fair

by Marty St. Clair

"Many of the best know defense contractors have the reputation of being overwhelmingly large and bureaucratic, of putting hundreds of engineers together in rooms the size of playing fields, of giving the young engineer very little chance of calling any product his own. Few are known for the quality of their management." Left-wing propaganda?

No... the above quote is from a report issued by the MIT career office. It illustrates one of the reasons that the Caltech chapter of Student Pugwash is sponsoring an Alternative Job Fair on Tuesday, March 3, from 11:00AM to 3:30PM in the Winnett Student Center. The event is designed to give students the opportunity to talk informally with representatives of organizations that are willing to hire scientists and engineers who choose not to do military research.

Companies and agencies that will be represented include Procter and Gamble, Hewlett-Packard, the City of Los Angeles, Bell Industries, and others. In addition, information on alternatives to working in the military industry will be available.

What an alternative job fair? There are a variety of reasons for choosing not to work in the "defense" industry. Citizenship requirements bar many Caltech students from these positions.

Others may wish to avoid the secrecy, security checks, overspecialization, and political instability associated with Department of Defense contracts.

For many students, the fundamental question is moral: Do I want to use my skills to produce bigger and better weapons? Isn't there a more productive use in society for my talents? Whatever the reason, the Alternative Job Fair offers an opportunity to explore your career options.

Student Pugwash is a national organization of undergraduate and graduate students devoted to examining the social and ethical implications of science and technology.

As many of the goals and interests of the organizations coincide, Caltech's STRIVE recently affiliated with the national Student Pugwash organization.

For more information, please contact me, Marty St. Clair, at campus x6576.

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More of the Mediator Genetics Cures Mice

from page 1

weapon-free world is reached such systems would be needed to protect against "cheaters and madmen," said Stafford.

So where do we go next? The U.S. proposes a three-step process: first, the areas of agreement should be put on paper and signed by the leaders to serve as a firm base for, second, continuing negotiations on areas of disagreement. Once the issues have been ironed out, the third step of working out the details of the actual treaties can be completed. The U.S. has presented what its negotiators see as the areas of agreement and disagreement to the U.S.S.R., who are now putting together a response; thus the Geneva talks continue.

The area of strongest disagreement is, of course, SDI and missile defense in general, which Stafford said brought the U.S.S.R. back to the negotiating table lest we deploy it unilaterally. Such unilateral deployment is part of what the U.S. hopes to avoid, said Stafford, since one of our goals is "to prevent an arms race in space"—an accelerating deployment by both sides of weapons, offensive or defensive, with no governing agreements.

Despite this, some Administration officials have been advocating early deployment of part of the system, before the end of this Administration. The criteria for any system to come out of SDI are that it be militarily effective, that it be able to survive a pre-emptive attack, and that it be "cost-effective at the margin," i.e. that it cost less to compensate for new Soviet offensive arms than the arms themselves cost.

The scuffle over early deployment has led to a reaffirmation of the third criterion, and to the addition of two new ones: that, in a multi-phased deployment, each phase, not just the finished system, must enhance stability, and that step one will not be undertaken until the entire deployment process is mapped out and ready. Consistent with this, said Stafford, there will be no deployment during the remainder of this Administration.

On the question of a test ban treaty, agreement was reached at Reykjavik on a three-step process: first, verification must be assured and agreed upon; second, progressively smaller limits on numbers and/or sizes of tests will be set in place in parallel with reductions of arms; and third, a full test ban treaty would be enacted as part of the final treaty on nuclear arms as a whole.

So what's holding up the process of working out the details? "You may laugh at this," said Stafford, but the major obstacle remaining is the name of the negotiations. The U.S. wants to call the negotiations "Talks on Nuclear Testing" or some such, while the U.S.S.R. wants to call them "Talks on the Ending of Nuclear Testing," which the U.S. negotiators feel is an indication that the U.S.S.R. intends to renege on the second step above and press for an immediate and total test ban treaty.

The U.S. maintains that testing must continue while nuclear arms exist to assure the credibility of our deterrent; indeed, testing demonstrated that "most of our submarine warheads wouldn't have worked." When someone from the audience pointed out that only a small fraction of U.S. nuclear testing is actually for the purpose of reliability testing, Stafford noted that the remainder of the tests are necessary to test hardening of ground installations and other things besides the reliability of the warheads themselves.

Also during the audience questions, Stafford was asked why we should not negotiate a freeze on weaponry to take effect during negotiations on cuts. He replied that a freeze is by no means as simple as it sounds. Do you freeze numbers of launchers? Of warheads? Do you include the short-range weapons that are already such a problem in the INF talks? Do you allow modernization? In short, negotiating a freeze would be every bit as difficult as current negotiations on cuts; and in any event, such a desperation measure is not needed.

Stafford pointed out that SALT II would have allowed doubling of current levels of weaponry, and took an inordinate time to negotiate. The Geneva process, on the other hand, is only two years old (since the Schultz-Gromyko talks) and is already close to halving current levels. Thus, he said, progress is being made rapidly, and he has hopes for a treaty in the relatively near future.

[CNB]—Biologists at Caltech have cured mice suffering from an inherited disease in which they shiver uncontrollably and die an early death.

To cure these "shiverer" mice, the biologists placed the gene coding for a key protein involved in the insulation of nerve fibers into fertilized eggs. When the gene, missing in the diseased mice, began to function in the resulting offspring, those offspring showed no evidence of the disease.

Authors Carol Readhead, Brian Popko, Carmine Puckett, and Naoki Takahashi of Caltech; David Shine of Harvard University; Raul A. Saavedra of Caltech; Richard Sidman of Harvard; and Leroy Hood of Caltech reported their studies in the February 27, 1987 issue of the journal *Cell*.

Shiverer mice are a mutant strain that have lost the ability to synthesize myelin basic protein, a key component of the myelin sheath that surrounds nerve cell appendages, insulating them and speeding nerve impulses. The gene

that codes for myelin basic protein is nonfunctional in these animals. These mice begin to shiver about 12 days after birth, experience convulsions within one to two months, and die within 90 days.

In the Caltech studies, the researchers injected into fertilized mouse eggs the gene for myelin basic protein, including additional control segments at either end of the DNA chain—a total of about 37,000 DNA nucleotides.

This gene segment had been previously inserted into a piece of viral DNA known as "cosmid vector," which acts as a biological copying machine to create huge numbers of copies of the gene.

Once inside the mouse egg, the circular cosmid vector opened and inserted itself into the mouse DNA. The egg was then implanted into a foster mother, which gave birth to the treated mouse. In about one treated mouse egg out of 150, the myelin basic protein gene began to function, resulting in a cured mouse.

The cured mice showed no evi-

dence of neurological problems, and electron microscope studies of their brains by Harvard scientists Drs. Shine and Sidman revealed nearly normal myelination around their nerve cells.

So far, as many as three generations of the cured mice have been raised with no evidence of the disease, said the scientists.

"These mice will offer us a powerful new way to study the myelination process," said Dr. Hood, the Ethel Wilson Bowles and Robert Bowles Professor of Biology. "Using this genetic engineering technique, we have found it possible to construct a series of mice with different levels of myelin around their nerve cells."

"What's fascinating is that we can separate the different symptoms of the disease by producing these mice with different levels of myelination. For instance, mice with a minimal level of myelin begin to live longer, those with a bit more no longer convulse, and those with still more lose their shivering difficulties."

Although this marks an important advance in genetic engineering—
continued on page 5

There was a time when people only shot pictures.

Over the past three decades, use of our nation's forests has surged dramatically.

But so has vandalism.

Signs blasted apart. Trees, rocks and campsites defaced. Public facilities destroyed.

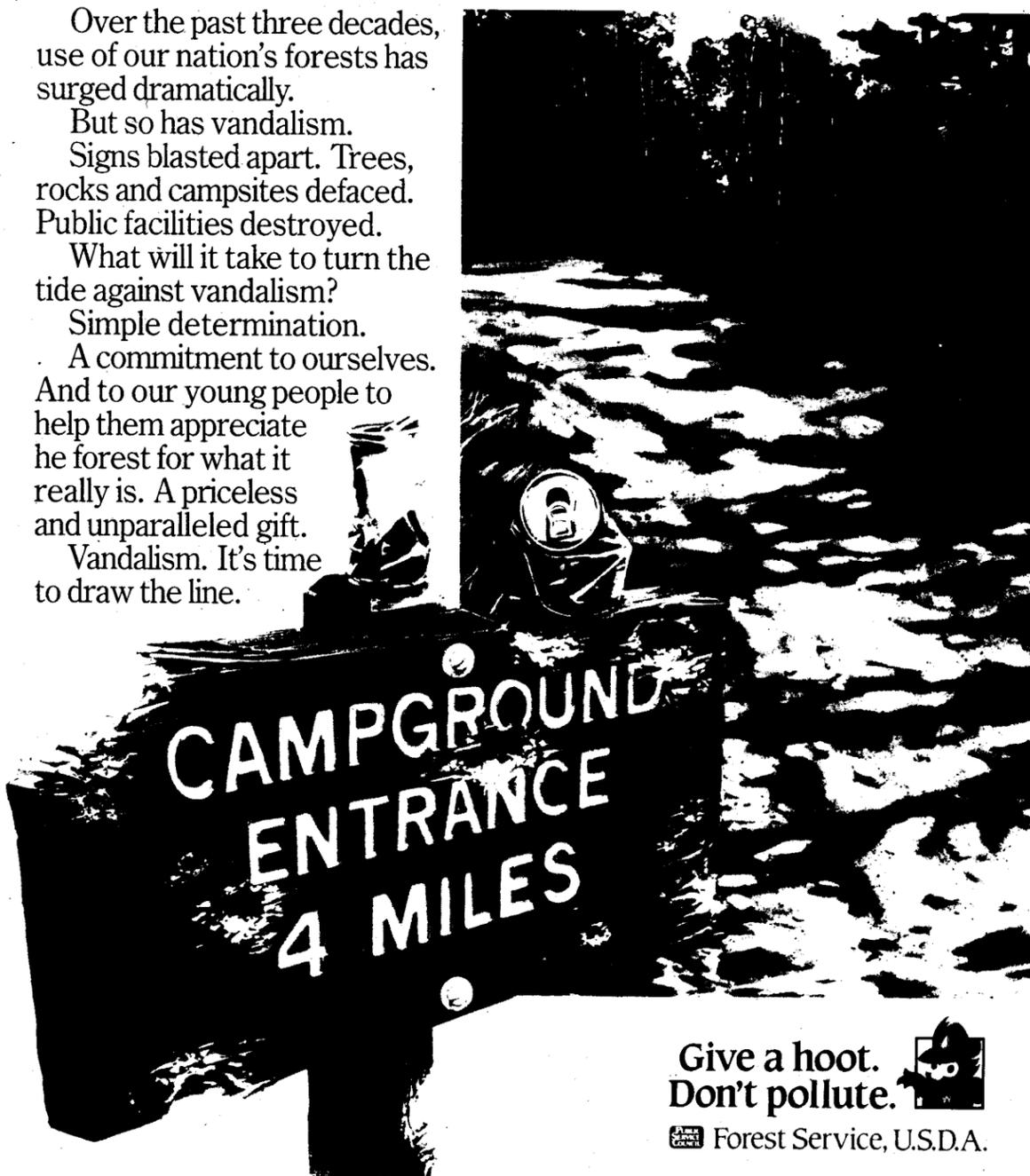
What will it take to turn the tide against vandalism?

Simple determination.

A commitment to ourselves.

And to our young people to help them appreciate the forest for what it really is. A priceless and unparalleled gift.

Vandalism. It's time to draw the line.



Give a hoot.
Don't pollute.



Forest Service, U.S.D.A.

The Inside World

Blacker: "Thank goodness for little girls."
—Thomas Hardy, 1907.

Ah, February. Groundhog (Gopher?) Day, Valentine's Day, and Spring almost here. It's that time of year when a young Techer's thoughts turn to love. And in Blacker house we're full of it. Yeah, right.

Andrew Hsu is especially full of it because he bends over for anyone. And then there's Min-Ei, Mr. Mofomofo himself. Scott, preoccupied with his long, hard, Chinese, Semi-automatic, uh, rifle, brings new meaning to fairness in love and war. Tim uses his infinite discretion before engaging in any sexual activity; who knows when the most effective form of birth control's going to fail? Maybe Irene knows; hey, do jock straps work? Sammy has yet to impregnate our beloved FEMALE President; maybe there's a gender problem. Dr. Dave shuts down the clinic for a week to give special attention to his, uh, nurse. Upon reopening, he found a rash of emergency cases. Opus approached him with a problem he'd been having with Alice and Tracey. He's all worn out from the sexual demands of the ravenous bitches of Blacker. We all have that problem occasionally -- right, Mike? Then after an exhausting chain announcement, the entire Senior class of Blacker came to (in, on, around?) the doctor's office to speak with him about the outrageous demands of a certain frosh girl. Meanwhile, Andy has found the right combination of love and technology in his HP28c, surely a match made in Heaven. Speaking of matches, Brad and Ed make a pretty hot couple.

And remember:

Sensitivity, strength, security, intelligence. All the qualities women look for in a man can also be found in a foilpack of condoms.

They're an extremely effective way to prevent pregnancy. Especially when they're used with contraceptive foam.

They're fun to put on, if you use your imagination.

And they make a fantastic gift for that special occasion when words... just aren't enough.

You can get them at any drugstore or your local Planned Parenthood.

So next time, show how much you care. With foam for her. And condoms for him.

It might take a sense of humor. But it's part of getting serious.

"Yeah, and some of the other sizes too."

—Mike and Dave, 1987.

Dabney:

The Meaning Of Food

Paul Rubinov

Paul Rubinov is well known for his insightful essays on childbirth and adolescence, and many of his short poems on the beauty of wild flowers have inspired us at one time or another. However, in his newest work, *The Meaning of Food*, Paul attempts to break new ground in a subject which frankly, I am tired of hearing about. Being the latest fad in our kaleidoscopic society, books about the culinary art have saturated the stores with a nauseating rapidity. My gullibility has caused me to purchase several cookbooks which could, to be blunt, no more feed a rodent than a human.

Fortunately, in his first full-length work, Paul applies his intellectualism and keen sense of humor with a generous hand, using metaphor and sarcasm with the skill his audience has come to expect. "Food is not just a state of mind, it is what separates man from God" is his opening quote and using his almost frightening familiarity with the English language, Paul continues to ridicule America's fanaticism toward comestibles in a truly brilliant manner. "Contrary to popular belief, the antithesis to the act of eating is not the act of brushing your teeth, but the act of using a Water-Pik to get the peanut butter from under your fingernails" was but one of the multitudes of memorable lines in the opening chapter.

In the following chapters, Paul examines the subjects of Mexican food, dieting, milk, the threat of saturated fats, and gefilte fish with a piercing but just mind, liberally spreading amusing anecdotes and yarns among the biting sexist and racial remarks. It is amazing how Paul always manages to weave important social comments into any subject he chooses, making them seem as unobtrusive as snow at the South Pole.

However, my favorite chapter of all was the last, a satirical dialogue between Paul and his real-life next-door-neighbor, Donald Finnell. This alone makes the book worth buying for Don's sparkling wit is unmatched in my experience. The piece is masterfully composed, with subtle crescendos of bad taste perfectly complementing the crests and valleys of sophisticated banter. The repeated mention of Don's penis and its relation to Oscar Mayer hot dogs may seem somewhat uncultured at first sight, but Paul manages to integrate it with the touch of a literary genius.

It is not often that a writer can be so prolific and still have such consistent quality in his work, yet Paul seems to have season-tickets as far as the Muses are concerned.

The Meaning of Food has the earmarks of an intellectual classic, easily one of Paul's best works to date. My largest complaint was the unreliable and somewhat ribald page-numbering (perhaps intentional), but this is overshadowed by Paul's huge writing talent. I give *The Meaning of Food* my highest rating, five stars, for a thoroughly enjoyable and enriching insight into the American culture.

—Don Paris

Fleming: How many more wins does it take to win Discobolus? One less than before, since we destroyed the moles in basketball on Sunday. The lame, lawless, losers from Lloyd are the next victims of the roundball demons.

Speaking of athletics, wine and candlelight is Saturday at 7:00PM. Somebody (other than Sue) please volunteer to sit next to damage.

Interhouse Volleyball starts next week and as usual Fleming is the team to beat. Undeafed and unscored upon? Maybe.

The only guy here at Tech with eyes googlier than Rob Williamson is Parkinson, who, I understand, is \$17,500 richer. Dave, you may have money, but you've still got Clea.

—Boy Wonder

Lloyd: First—and ONLY—quiz style Inside World...

- Which takes longest?
 - Planets to condense out of interstellar gas.
 - Mountains to be worn down to the sea.
 - Physical plant to hook up our hot tub.
- Which do people care least about?
 - The price of eggs in Peking.
 - The motion of a tiny little amoeba in darkness at the bottom of the ocean.
 - Dwight Berg's hockey announcements.
- The furry thing wandering the halls of Lloyd is...
 - Tom Rathjen's cat, Jacob.
 - Cathy Chang's guinea pig.
 - Lev Nay velt.
- What accounts for Bibi's astonishing popularity in Blacker House?
 - Her personality and charm.
 - Her leadership potential.
 - Nothing can account for this mystery.
- The lamest nickname in Lloyd House is
 - "Pope"
 - "Top Bun"
 - "John Haba"

And now we break new ground... exploring strange and wondrous new concepts... kind of like Robby Robb's hair! But seriously, here's the bonus "matching" section. Match each person to the corresponding celebrity the most resemble:

- | | |
|----------------------|-----------------|
| Rob Groethe | Big Bird |
| Thuy Nguyen | Col. Khadaffi |
| Lev Nay velt | The Joker |
| Jim Bob Coykindall | Siskel & Ebert |
| Carol Mullenax | The Ewok |
| Charles P. & Matt C. | Bo Duke |
| Bassem Mora | Smokey the Bear |

We shamefully dispense with the Drink o' the Week after the unnecessary rudeness of Dabney's Inside World last week.

Only six more weeks till our MAJOR format change.

—Skeeter & Jethro

Page: EE 90.5.Dynamics of Overload.2 units (0-2-0) first, second, third terms. Introduction to destruction of electronic components by application of an excess of power. Smoke theory (letting the smoke out). Bigger is better. Lab safety is stressed. Students begin with monolithic stock components, learning techniques which produce the most dynamic effects. Later experiments involve such things as constructing inductor coils

continued on page 6

ENTERTAINMENT

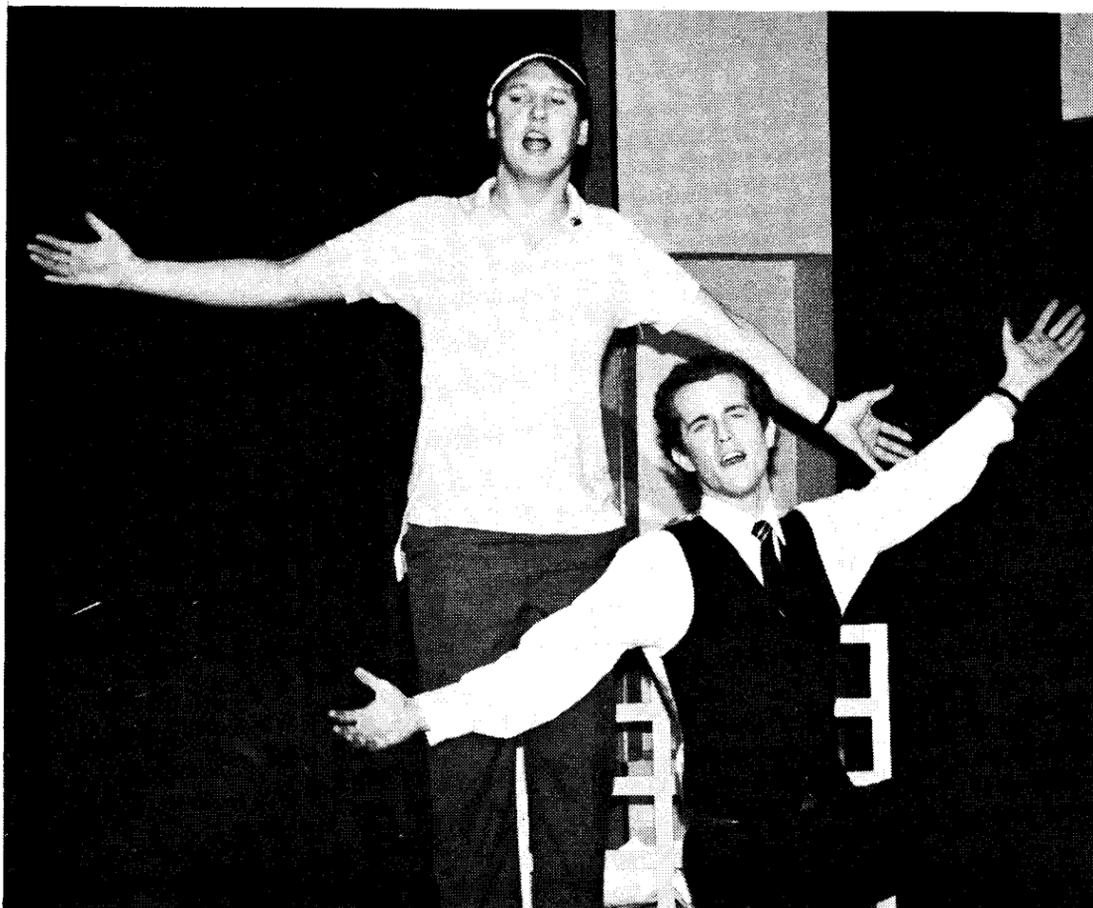


photo by Ron Gidseg

Bill Craven as Mr. Twimble and David Stevens as Mr. Finch sing "Company Way" in the TACIT production of "How to Succeed in Business Without Really Trying." The show opened last week in Ramo Auditorium and continues through this weekend.

World-Wide Wickets In Wamo

by Rob Grothe

Tacit no longer, the Theatre Arts at the California Institute of Technology has transformed Ramo Auditorium into World-Wide Wickets, Inc. to show you "How to Succeed in Business Without Really Trying" and much, much more. For the price of admission, you'll get singing, dancing, buckets o' laughs, gorgeous show girls, and possibly such notable celebrities as Nobel Laureate Richard Feynman, the Mayor and Chief of Police of Pasadena, and Caltech instructors including David Goodstein, Harry Gray, and Jenijoy LaBelle (one of the gorgeous show girls).

Freshman David Stevens is terrific as J. Pierrepont Finch (F-I-N-C-H), a cunning and charming window-washer turned young ex-

ecutive who winds his way chapter by chapter through the book "How to Succeed in Business Without Really Trying" and rung by rung up the corporate ladder. Finch is the master tactician, knowing just how to appease his fellow employees; his strategies to impress Mr. J. B. Biggley (the chief oarsman of World-Wide Wickets played convincingly by Al Hibbs) are as funny as they are effective. But, as you might have supposed, it's not quite that easy for Mr. Finch, who maneuvers his way into and out of a number of sticky wickets throughout the show.

His obstacles include Rosemary, (played by sophomore Heidi Anderson), the pretty young secretary who has other ambitions—"Ponty" and a home in New

Rochelle; Bud Frump (Richard Doherty, recent Caltech grad) Bigley's spoiled nephew whose aspirations far exceed his means; Hedy LaRue, an associate of the boss in the business of pleasure and continually confuses business and pleasure, alluring and endangering the men of WWW; and eventually the entire executive core, wary of Finch's rapid climb.

The musical comedy will play all next weekend at Ramo: Friday at 8PM, Saturday at 2PM and 8PM, and Sunday at 2PM. Tickets are \$9.50 for the general public, \$8 for Caltech staff, and non-Tech students, and \$6 for Techers. The efforts of the cast, the orchestra, and the stage crew have produced a terrific production, a smart investment of a couple bucks and a few hours of your weekend.

CALTECH MOVIE CALENDAR

Day	Date	Time	Class	Movie	Location
Mon.	3-2	7:30PM	H 131	Cousin Angelica (Spanish)	Baxter Lecture Hall
Tue.	3-3	8-11:00AM	Lit 11	Macbeth (BBC)	125 Baxter
Tue.	3-3	7:30PM	Hum 103	Barry Lyndon	125 Baxter
Wed.	3-4	8:00PM	Caltech Y	Half Life	Baxter Lecture Hall

More Mice

from page 4

ing, the achievement will have no direct consequences for the medical treatment of human genetic or neurological diseases, caution the scientists.

According to the researchers, there is no corresponding human disease, and the technique of genetic surgery on fertilized eggs is inappropriate for technical

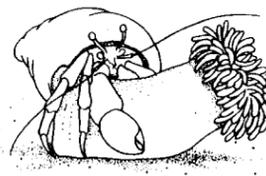
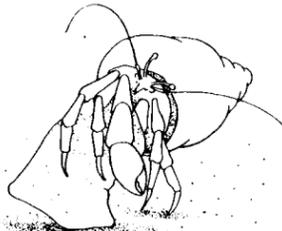
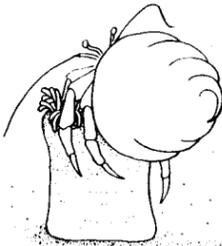
reasons for use in treating humans.

The modification of sex cells as opposed to body cells also poses ethical questions, notes Hood. The procedure is complex and has a low success rate. However, he said, the method of inserting working genes into target body cells of adult sufferers of genetic disease is extremely promising, and is being planned for the near future in several laboratories around the world.

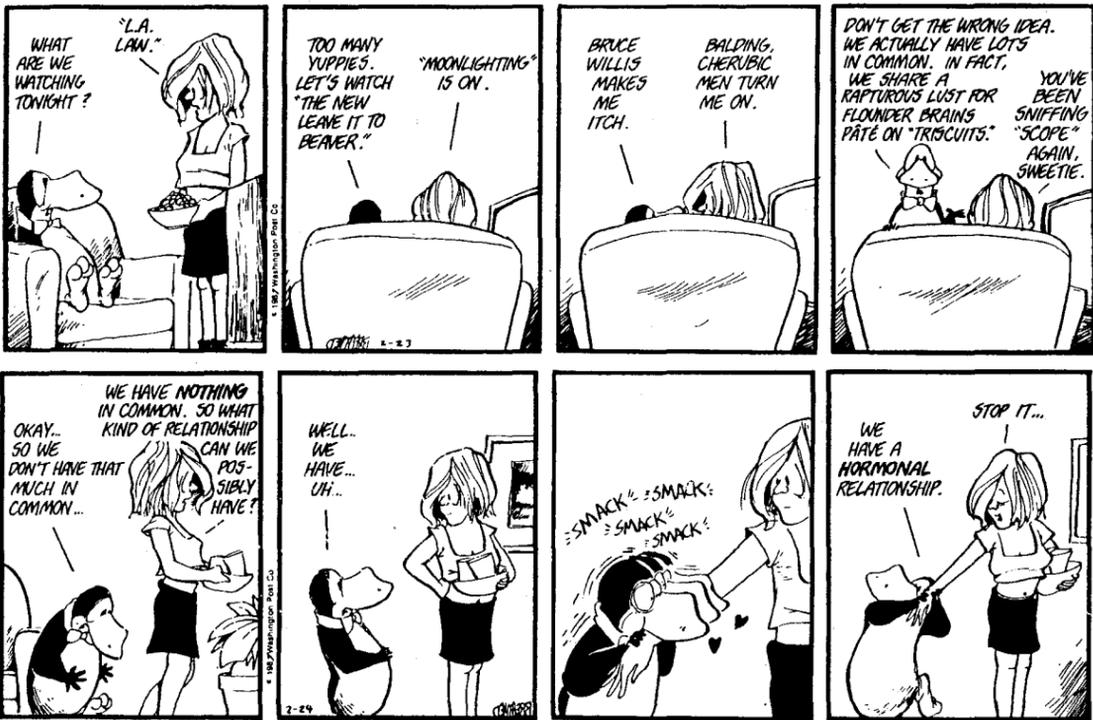
The molecular biology and

cloning experiments were carried out in the Braun Laboratories at Caltech and was supported by the Seaver Foundation and the National Institutes of Health.

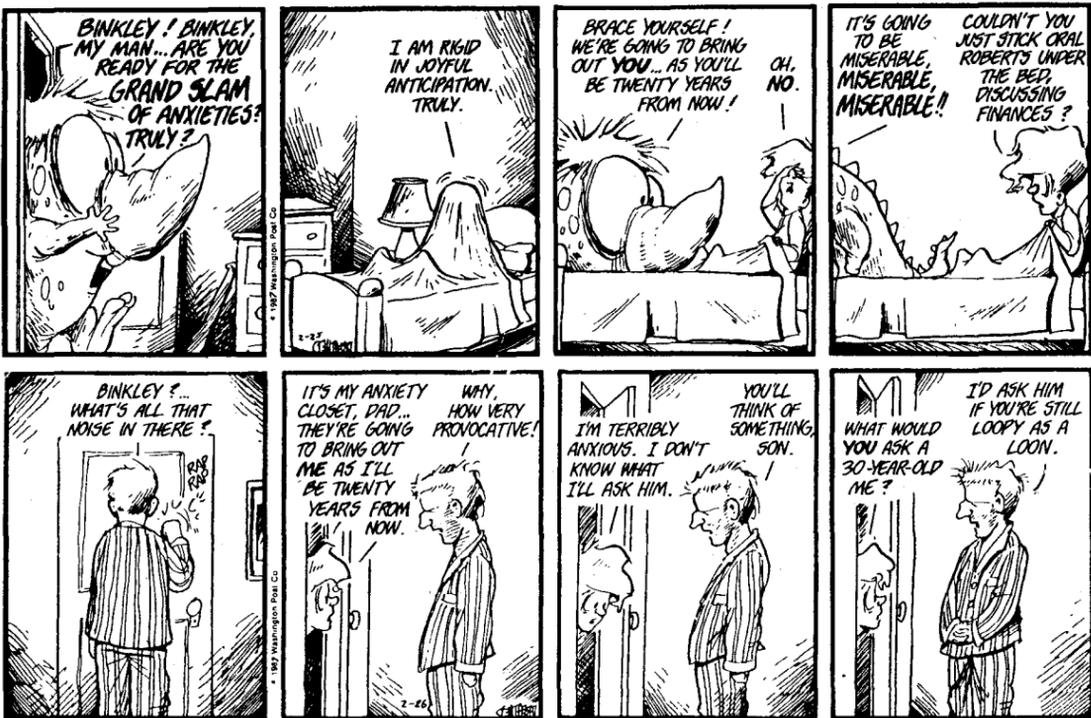
The cure of shiverer mice by Dr. Hood and his colleagues is only the second instance of the use of genetic engineering techniques to cure a neurological disease. Last December scientists at Genentech, Inc. reported curing mice of a hormone deficiency that prevented normal sexual development.



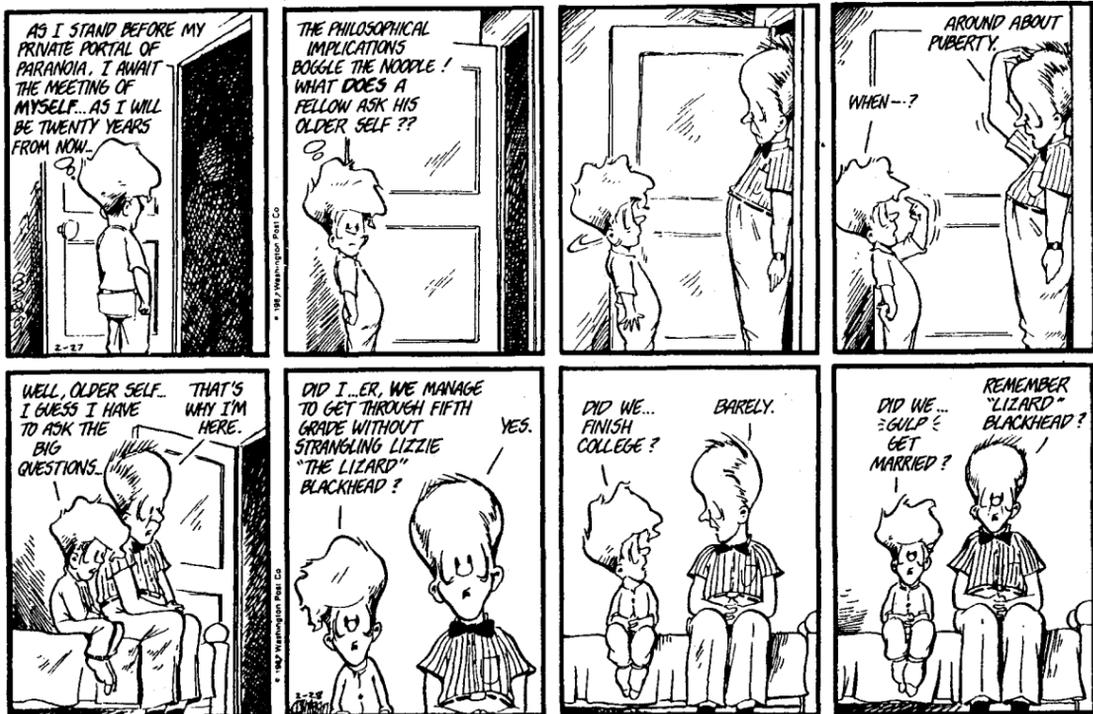
BLOOM...



...COUNTY



by Berke Breathed



More Inside World

from page 5

and integrated circuits, building up to the Grand Finale. Prerequisites: None. Bring your own sunglasses. Instructor: Staff

Ph 3.5. Mechanics of Destruction. 2 units (0-2-0), second, third terms. Explores various topics in Classical Mechanics which produce amusing effects but can be implemented with a minimum of preparation. Experimental topics are dependent on interests of students and instructor. Creativity and active participation are encouraged. Subjects covered in recent terms have been such as the Effects of High-Velocity Impact on Food Items, Hydraulic Propulsion of Projectiles, Throwing Stuff at Bowers, Smoke Dispersion in a Long Hallway, and various projects involving shopping-carts. Instructor: Staff

Up Against the Wall and Spread 'Em Dept.

Lower Arlington and Beast Alleys have been declared a Butt-fucking-Free Zone. This means that from now on, all penile-anal contact is forbidden (even with the use of a condom) (even your own penis to your own ass, for those of you who are so gifted), as are other anal sex acts such as "rimming" (oral-anal contact), "fisting" (manual stimulation of anus), "felching" (don't even ask) or use of foreign objects to penetrate the anus for sexual pleasure ("dildoes" or sex toys). Possession of possible anal stimulation devices (such as hamsters, coke bottles, light bulbs, sticks of dynamite, and Preparation H) will be strictly controlled. Penalties for disobeying this mandate will range from expulsion from the alley to death by impaling, depending on the severity and/or creativity of the crime. This notice is sponsored by the ABFL and the Gods of Lower Arlington/Beast.

-Don't blame me, I just work here

Ricketts: Horror, tragedy, and downright rudeness struck Ricketts Hovse this weekend as those big, men Scurves mercilessly abused a group of poor, innocent Page Boys who, through no fault of their own, wandered into one of Ricketts' more decadent traditions. Under the pretense of helping the gentlemen find their way out of that den of perversity those filthy Scurves took the opportunity to abuse, harrass, and humiliate the good people. One barefoot hedonist was actually rumored to have raised his voice to a delicate-eared young man! Such actions must not be tolerated! Fortunately, one of our young heroes refused to be intimidated and delivered a blow, the like of which has not been seen since Laura's last brakedrum pile. But in any case, such behavior must not be tolerated! Something must be done about those Scurves! In the meantime, at least give the Page Boy's some milk and coo...er...cake.

Whoa! Wait a minute! Reality shift! For a second there I had shoes on! For any of you that aren't still too hung-over to notice, I'm *not* Shithead #11. We sent him packing to the IHC. Giggles is still around, but tonight she's phoning alums, so I have usurped complete and total power over the Inside World. (Just don't tell anyone, or I'll get in a lot of trouble, okay?)

In case you didn't notice, or have since forgotten, Apache was last weekend. We can thank Drew for the great band, but the funny colored orange juice was a big flop. Larry was a fantastic emcee, and the garter contest was a success. I was, however, robbed.

Alas, for all you hopeful Social Science majors, it is now too late to enroll in PS/Psy 159. The results: Diamond Dave is our illustrious leader; the voluptuous and ever-so-fun-to-shower Gabby is second in command; Brian and Samer-baby won a close race for the team office of money-grubber; the Broken Cherry ginger ale fund pushed through their candidate Nicole, for name-tag-maker and housekeeper (the *what tax?*). I, of course, was elected to the most coveted house office for my second year. Oh, by the way, Christina, what does getting laid have to do with being Vice-President?

Other naughty bits: The newly-elected house couple noisily celebrated their victory Tuesday night in the Up Your bathroom. Danny will soon be doing seven loads of Sam and Gabby's laundry. I certainly won't bang on Sam's door again for a long time. Leopold is, in fact, a space alien (pi#80.17 and Batman was hung thanks to him.) Oh, one more thing...Blacker's dumb!...er...done!

-The Lil' Cook-Man
Ruddock: Nik said, "No!"; Munir said, "I have to go to Physlab."; Brett, Dave, and Paul said, "Ask Cameron."; Vax said, "No way!"; and all Marty could moan was "Find me a lunch sub." So I'm stuck with it once again...

This week's social event is RF on anyone or anything... (No Rich, it's not the Tacit Musical but if you want to see Doughboy in a leopard leotard and gold lame shorts, don't miss it.) Anyway, if you hate your roommate, hate Jamal, or think the Pasadena Police shouldn't be having a ticketing field day at 2AM: then get to work. The awards ceremony is Friday night around 11.

Lloyd's in charge of cancelled volleyball practices but talk to him anyway if you want to play for real or even just for Interhouse. Ruddock won his first GSC soccer game, last Saturday; Kleber made a great goalie and Vax almost scored a lot.

The word for the week is "frottage" and it's safe for sure. If you need a demo ask Rich Till.

-Bets the Frosh

P.S. Thanks for the roses.

Young Sherlocks

[CNB]-Two faculty members, one graduate student, and three graduates of Caltech have been named recipients of the third annual Presidential Young Investigators Awards by the National Science Foundation. They are among 200 outstanding young scientists and engineers nationwide who have been selected for the honor for 1987.

The two Caltech faculty members are Dr. John Doyle, associate professor of electrical engineering, and Dr. Kenneth Libbrecht, assistant professor of astrophysics.

Established in 1984, the Presidential Young Investigators Awards are designed to help universities attract and retain gifted young scientists and engineers who might otherwise pursue non-academic careers. The awards carry a research stipend of up to \$100,000 per year for a period of five years, through a combination of federal and matching private funds.

Dr. Doyle is developing mathematical techniques designed to improve the performance of advanced automatic control systems in such fields as chemical engineering and aerospace. One application of his research has been to the design of the re-entry flight control system for the space shuttle.

Dr. Libbrecht conducts research in helioseismology, which

studies oscillations on the sun's surface to probe the solar interior, much as geophysicists use seismic waves to study conditions inside the earth. This research is expected to answer such questions as the sun's speed of rotation, interior rotation, and amount of helium near the solar core.

Dr. Doyle earned his B.S. and M.S. from MIT in 1977, and his Ph.D. in 1984 from the University of California. He came to Caltech as a visiting assistant professor in 1985 and was appointed associate professor of electrical engineering in 1986.

Dr. Libbrecht received his B.S. from Caltech in 1980 and his Ph.D. from Princeton in 1984. He returned to the Institute as a visiting associate in 1984 and was appointed assistant professor of astrophysics that same year.

The other four recipients are Robert Arnold, currently assistant professor of environmental engineering at the University of Arizona, Dr. William J. Dally, assistant professor of electrical engineering and computer science at MIT, Dr. Peter Felker, assistant professor of chemistry at UCLA, and Dr. Michael Hopkins, now of the Los Alamos National Laboratory. Dr. Felker received his Ph.D. from Caltech in 1985, and Drs. Dally and Hopkins in 1986. Arnold receives his doctorate this June.

Check It Out, Mate

by Czech Matey

"By hook or by rook," the chess team of Caltech undergrads was determined to do well in, if not win, the 1987 U.S. Amateur Team Championship West. As it turns out, the team didn't actually win. They won three of their six matches with other teams, but in the process, produced some immortal games for the chess history books!

The team consisted of chess Expert Gerard Jungman, Tim Parrott, Huy Cao, and Ed Ratner playing boards one, two, three, and four with chess ratings of 2115, 1908, 1789, and 1563 respectively.

In the first round, the team ran into difficulty, having been matched with one of the best teams in the tournament. They gave it the ol' college try, but were beaten 4-0 by their opponents whose average rating was 2181.

The second round was better for the Beavers, and it would have been even better had they not lost 3-1. Although the other team had a lower average rating, they won board three and scored upsets on boards one and four. However, Tim Parrott saved the team from

being shutout by scoring a crucial victory.

As you might have inferred, the Beavers got off to a slow start. Maybe it was recovery from midterms. Maybe it was the long, forced layoff from chess that most Techers have to endure. But they weren't about to make excuses! For the next four rounds, the team suffered only three losses.

The third round was a turning point for them as they won 3-1 over their opponents. Gerard, Tim, and Huy swept the first three boards, leaving their opponents pawning, "Gee, I wonder what I did wrong."

From UC San Diego came "The Unsound Gambits"—an appropriate name indeed—who were the fourth round opponents. They didn't know what checkmated them after they lost 3 1/2 - 1/2. Tim, Huy, and Ed played brilliant, pretty good, and hey—that's great games (respectively). Gerard Jungman played one of the best players at the tournament (rated 2316) and forced him to accept a draw! For the listing of that exciting draw, see the end of the article.

Inhuman, untalkative, and un-

friendly describe the Techer's fifth round opponents. These players wouldn't even shake hands, and had to have someone do it for them! Actually, it was the Novag Knights, a computer team with an average rating of about 2050, that the Techers faced. Gerard and Tim got into tactical troubles in their games and had to accept difficult losses, while Huy and Ed drew their games. The team found out the hard way that artificial intelligence is indeed improving.

In the sixth and final round the Beavers confronted "Her Majesty's Secret Service" and won convincingly 3 1/2 - 1/2. Gerard, Huy, and Ed won by crushing, crushing, and crushing, respectively, their opponents. Tim Parrott too had an advantage in his game, but because of time trouble he settled for a draw.

The team recorded a 3-3 final record, with individual scores of 2 1/2, 3 1/2, 3 1/2, and 2 1/2 for Gerard Jungman, Tim Parrott, Huy Cao, and Ed Ratner.

The result was good enough to tie them with Occidental for second place among the five colleges present (most of the teams weren't college teams). A solid Stanford team placed first in the college division.

In case you haven't heard the big news in Caltech chess, here it is: The Caltech chess club will

be restarting, and everyone is excited! If you are a beginner or a master and even remotely interested, please contact Huy Cao at 1-54 or 578-9294.

But back to that draw. Probably the best game for the Beavers is the following fourth round match by Gerard Jungman. No really, draws are very exciting! You may recall that the chess community was in shock (from excitement and wonder) two years ago when Karpov and Kasparov drew dozens of games consecutively! So here it is, a tense, strategic, exciting draw by Gerard. Even if you don't know how to play chess or don't know chess notation, just follow along anyway. The exclamation marks mean "wow, that's good, that's deep." The question marks mean "that's horrible." Without further ado, let's peek in on this immortal game.

White: Gerard Jungman (2115)

Black: Burt Izumikawa (2316)

1. d4!

Gerard sees deep into the game and foresees that this will bring good results.

1. ... Nf6 2. c4 e6 3. Nf3 b6 4. g3 Bb7 5. Bg2 Be7 6. O-O O-O 7. Nc3 Ne4 8. Qc2 Nxc3 9. Qxc3 Be4

So far, the game has been "book", i.e. standard. Now Gerard

shows his innovation, rarely played in chess before:

10. Nd2! Bxg2 11. Kxg2 d5 12. e4 dxe4 13. Nxe4 Nd7 14. Rd1 Nf6 15. Qf3 Nxe4 16. Qxe4 Bf6 17. Bf4 Qe7 18. a3!

This subtle move prevents penetration by the black queen. A very deep move.

18. ... Rd8 19. Rd3 c5 20. dxc5 Rxd3 21. Qxd3 Qxc5 22. Rb1 Rd8 23. Qe4 Rc8?!

This move is perhaps not wise for black.

24. Qb7 Rd8 25. b4 Qxc4 26. Rc1 Qd5+

Black forces an exchange to prevent complications for himself.

27. Qxd5 exd5 28. a4 Kf8 29. Rc7 Be7 30. Bd2

If white had gone to b5, black would gain control of d2 by way of Bb4, which might have been important because of the passed pawn down the middle.

30. ... a5 31. bxa5 bxa5 32. Ra7!

This must have been what white foresaw when he played move 24.

32. ... Bb4 33. Bxb4 axb4 34. Rb7 Ra8 35. Rxb4 Ke7 36. Kf3 Kd6 37. Ke3 Kc5 38. Rb7 Rxa4 39. Rc7+

This check is necessary to prevent further penetration by the black king.

39. ... Kd6 40. Rxf7 Re4+ 41. Kd3 Rg4 42. Ra7 draw

That was a !!! game, eh?

A WORD FROM "PYTHON" PISCOPO EX-WRESTLER ABOUT MILLER LITE



© 1986 Miller Brewing Co., Milwaukee, WI

"DUH"*

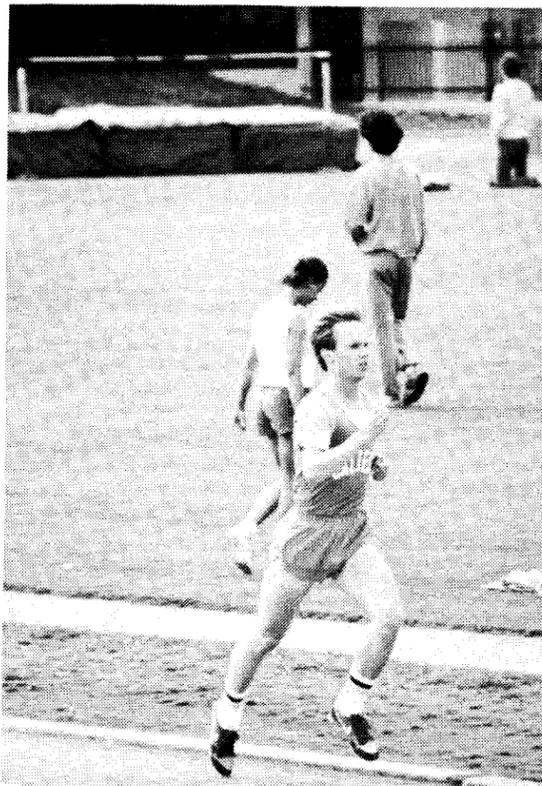
* TRANSLATION: A SUPERBLY BREWED, FINE TASTING PILSNER BEER.

THERE'S
ONLY ONE
LITE BEER



SPORTS

Runners Work Hard, But Place Third



Photos by Jim O'Brien

Dee Morrison warms up for her events and John Gehring races along the track, both ready to better their personal bests and rack up the points for Tech. The Beaver track team had a good time and worked hard last week at the SCIAC quadrangular meet, but came in third overall.

by Steep L. Chaser
Last Saturday at Claremont-Mudd-Scripps, Caltech's exciting track team faced Occidental, Claremont, and Whittier in a SCIAC Conference quadrangular meet.

The bad news is that we took some lumps against Oxy and Claremont, both of whom defeated a much improved Caltech team. The good news is that we defeated Whittier again and were able to deliver a few lumps of our own.

In only the second meet of this very young season the performances of many of our athletes indicate that this is potentially the best track team we have seen around here in twenty years.

Dave Gates put in a full day's work by winning the Long Jump (21'4 1/2") placing second in the Triple Jump (43'7 1/2"), running the 100m in 11.62s and anchoring the 400m Relay Team. Both of his jumps are improvements by more than a foot over last week. The bad news is that Dave sprained his ankle in the process. He deserves a rest anyway as he is currently our top point scorer this season.

More Good Throws

Ed Mao showed steady improvement in the Shot Put and Discus. He had his best throw ever in

the Shot to claim third place in 36'11 1/2". While the Discus is still a new event for Ed, his potential is only limited by the amount of time he can devote to practicing his skill. He threw the discus 90'2 1/2". Both Mark Carlin and Matt Crandall scored important points vs. Whittier as these two track newcomers continued to progress.

Ray Hu shaved thirty seconds from his steeplechase time to record an impressive performance of 11:10.1s. After seven and three-fourths laps of running with thirty-five barriers to clear, including seven water jumps, Ray was looking for another race to run later in the day. Ray is one tough hombre.

John Gehring got caught up in the mental midget gymnastics being played out by some of Oxy's athletes in the 1500m race. In a nutshell, the Oxy runners were determined to drag through the race as slowly as they could afford to, while staying close enough to kick to victory in the last half of a lap.

After one lap of slow-motion, Gehring took control of the race and forced the pace, trying to make up for precious lost time. This strategy seemed to backfire though, as he ran out of steam in the end to finish fifth in 4:17s. John also came back later to try his hand at

WEEKLY SPORTS CALENDAR

Day	Date	Time	Sport	Opponent	Location
Fri.	2-27	ALL DAY	Wrestling	NCAA Div. 3 West. Regional	U. Wisconsin, Oskosh
Fri.	2-27	ALL DAY	Fencing (W)	Women's NCAA West. Regional	Stanford
Sat.	2-28	ALL DAY	Fencing (W)	Women's NCAA West. Regional	Stanford
Sat.	2-28	11:00AM	Track	Pomona-Pitzer All-Comers Meet	Pomona-Pitzer
Sat.	2-28	12 NOON	Baseball	Redlands	Caltech (2)
Sat.	2-28	1:30PM	Tennis (M)	Whittier	Whittier
Sat.	2-28	1:30PM	Tennis (W)	Cal Lutheran	Cal Lutheran
Sun.	3-1	1:00PM	Women's Soccer	Wildcats	Caltech
Mon.	3-2	1:00PM	Golf	Claremont-Mudd	Pomona-Pitzer
Tue.	3-3	3:00PM	Baseball	Redlands	Redlands
Tue.	3-3	3:00PM	Tennis (M)	La Verne	Caltech
Wed.	3-4	3:00PM	Tennis (W)	La Verne	Caltech
Thu.	3-5	3:00PM	Baseball	Pomona-Pitzer	Pomona-Pitzer
Fri.	3-6	3:00PM	Tennis (M)	Fort Lewis College	Caltech
Fri.	3-6	ALL DAY	Fencing	Men's NCAA West. Regional	Cal State Fullerton
Fri.	3-6	ALL DAY	Golf	S.C. Intercollegiate Tournament	Torrey Pines
Sat.	3-7	ALL DAY	Golf	S.C. Intercollegiate Tournament	Torrey Pines
Sat.	3-7	ALL DAY	Fencing	Men's NCAA West. Regional	Cal State Fullerton
Sat.	3-7	11:00AM	Track	La Verne, Whittier, Masters, Christ	Caltech
Sat.	3-7	11:00AM	Tennis (W)	Redlands	Caltech
Sat.	3-7	12 NOON	Baseball	Pac. Coast Baptist Bible College	Caltech (2)
Sat.	3-7	1:30PM	Tennis (M)	Christ College	Christ College
Sun.	3-8	ALL DAY	Fencing	Men's NCAA West. Regional	Cal State Fullerton
Sun.	3-8	3:00PM	Women's Soccer	TNT	Caltech

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SPORTS

Runners

the 800m finishing in 2:10s. Best of all, he learned to run his own race from the start.

John Beck was concerning himself with staying one step ahead of little brother Kelly who runs for Claremont. In the tactical 1500m he cruised in at 4:16s looking like he had plenty to spare in garnering fourth place (little brother was seventh in 4:20s) For a guy who says he can't double in the 1500-800, Beck proved himself wrong by again placing fourth in the 800m in 2:04.2s.

Another Great Performance

As if that weren't enough, Beck also came back and anchored the 1600m Relay Team to a come-from-way-behind second place finish. After receiving the baton in last place, Beck churned out a fifty-two second quarter to demolish the teams from Oxy and Whittier down the stretch. And this was done without the services of Alex Athanasopoulos who was out with the flu.

Randy Ralph outdid himself last Saturday. While playing basketball and only jumping in practice occasionally, he was able to come out the last two weeks and win the High Jump. This time though, he was inspired! On Thursday evening Ralph attended a seminar at Cal State LA with Coach O'Brien.

The speaker was none other than Doug Nordquist, the number one ranked jumper in the world for 1986. And with that little bit of new information and inspiration he popped off a jump of 6'5" which is a personal best for Randy.

Andrew Stevens is proving to be a dependable workhorse with a wide range of talent. In the 400m, he was clocked in at 54.63s for third place. Additionally, he sprinted to a respectable 24.86s for 200m and ran second leg for the 1600m Relay. Andrew is working hard in practice but is hampered somewhat by back spasms. He'll be tough to contend with when he gets healthy.

Konstantin Othmer ran a strong 100m in 11.83s and also got both the 400m Relay and 1600m relay off to good starts. He is proving to

be a valuable new addition to the squad.

Dee Works Hard

Dee Morrison once again took part in the three throwing events for women. She managed 27'16" in the Shot, 14'4" in the Javelin, and 89'11" throwing the Discus. All of her early season work will pay big dividends at the conference finals.

The final scores of the men's meet read as follows:

Claremont	110	Caltech	49
Oxy	114	Caltech	45
Whittier	45	Caltech	78

The Claremont and Oxy scores look depressing but both scores are at least twenty point improvements over last year's performances against these two teams.

We are looking forward to a fun meet this coming weekend at Pomona-Pitzer's NEW BLUE TRACK. This will be an all-comers meet of NCAA Division III schools only. Word has it that their track is lightning fast!

Look out—the natives are restless and the track animals are hungry for more.

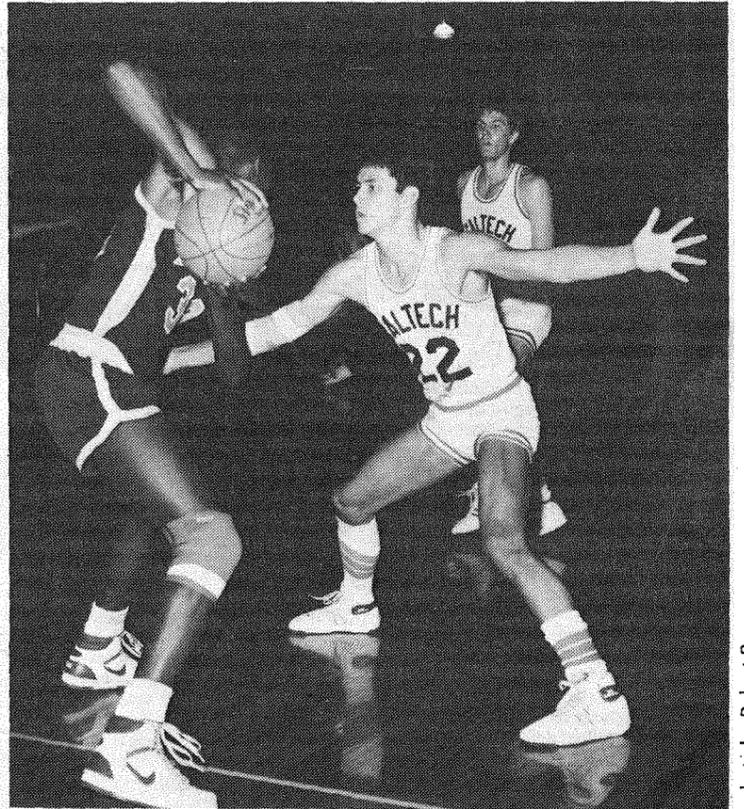


photo by Robert Paz

A fine example of blocking by Caltech's Bill Gustafson. Brett Bush looks on, prepared to rush in and do what's necessary to assure Tech a win on the floorboards. This week the game ended in a forfeit by Occidental after their coach got booted from the game for fighting.

Basketball Bout

by Sam Dunk

The Caltech Basketball team ended its season on a strange note Wednesday, as Occidental was forced to forfeit after their coach was ejected.

The Beavers started out slow in the first half due mainly to a sluggish offense. The team's leading scorer, Ed Zanelli, was held to just two points. The play of Brett Bush and Brad Scott kept the Beavers in the game, although they trailed 26-40 at the half.

But the Beavers didn't roll over, and came out fired up for the second half. Bush and Zanelli scored at will against Oxy and brought the Beavers within four points at 53-57. Oxy had the ball, and was frustrated by the tough defense being played by Caltech. A flagrant elbow was thrown at Zanelli, and a foul was called. As the Oxy player walked down court, Ed Zanelli tripped the player using all the finesse that Jim Helgren in three years had taught him.

A shoving match ensued, with

both benches clearing. The coaches intervened, presumably to separate the players, but the Oxy coach threw a punch at Bill Gustafson. This is when the shoving match turned into a brawl.

Three players were ejected for fighting, as was the Oxy coach. NCAA rules state that each team must have a coach on the sidelines, and as a result Oxy forfeited with 7:31 to play.

Despite the fact that they were trailing at the time, most fans and players felt that Caltech had the momentum to win the game. It was Bush, Gustafson, and Zanelli's last official game in a Caltech uniform. Over all it was a great four years of basketball for these three top players, and the team would like to thank the fans for their support during a frustrating season in which the Beavers finished 6-6.

To wrap up the season the team will play the Caltech faculty. The game is this coming Sunday at 4:30PM, so come out and watch.



photo by Robert Paz

The Caltech hockey team leans into action again, sliding swiftly across the ice and smashing pucks through the goals, while handing another crushing defeat to their Cal State Northridge opponents. The season is going well, and the Beavers expect to finish their season right at the top, owing to a lot of really sharp players on the team

CSUN Eats Puck

by Jason

The mighty Caltech hockey machine continues to roll onwards. Wednesday night the Beavers went to Burbank and stomped Cal State Northridge 5-1.

Though the checking was not that heavy, it wasn't very good either and the result was sixteen penalties, nine against Tech. The scoring was started in the first period by Phil Askenazy with Mike Freeman getting the assist.

Later in the same period, Mike passed to Dwight Berg who took a long slap shot. Jim Bower tipped the puck in for Caltech's second

goal. Northridge scored a power play goal near the end of the period.

In the second period the combination Bower to Freeman was responsible for the only goal. The same combination racked up another score in the third period. The scoring was finished by Jim with the assist going to Martin Brouillette.

Next Wednesday Caltech has another home game at 9:45 pm. The opponent will be USC. Come out and see some good, clean violence.

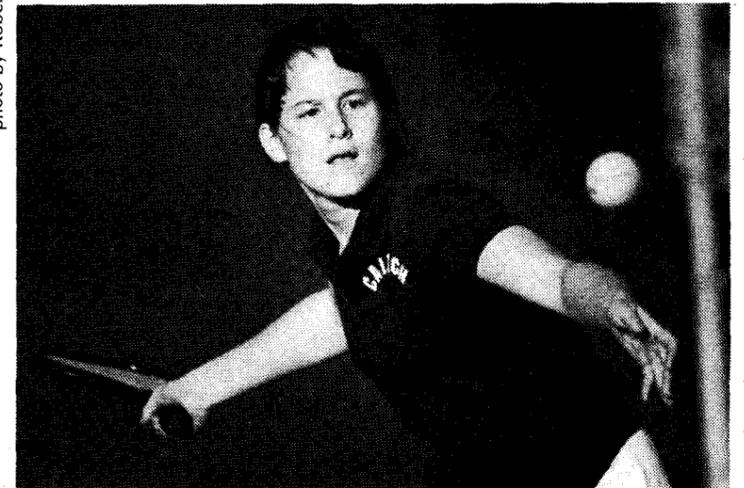


photo by Robert Paz

Women's Tennis Rained Out. Laura Hernandez lines up the ball, about to smash it back to her opponent. It turned out that she didn't need this practice anyway as the match on Wednesday got rained out.

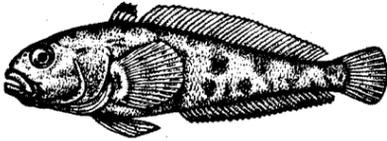
Sports Notice -

The Caltech varsity basketball team will play the infamous faculty team in an exciting faceoff this coming Sunday, 26 February, at 4:30PM. Come on out, bring a friend, and watch the last game of the year for Beaver basketball.

WHAT GOES ON

Attention Fishermen

Beginners fly casting lessons may be starting third term. This would be a beginners class open to all students, faculty and staff. A limited number of rods and reels will be available. Basic fly casting techniques will be stressed. Those of you interested, please contact Tom Perry on campus, x4705.

**Soviet Ecology Tour**

An ecological tour of the Soviet Union will be conducted this August by invitation of the Soviet government and coordinated by Source Media. It appears that more consideration and latitude than conventional tourist groups can be anticipated; this should lead to free interchanges and perhaps the formation of lasting personal relationships with Soviet citizens and scientists. The group is prepared to accept up to 15 additional members with ecological interests, as long as they are in good health and condition to undertake the planned field trips. Probably because of the anticipated benefits of this information exchange mission, the unusually low price of \$2850 has been set by the Soviet Union in spite of the devalued dollar. For further information contact: Source Media, Box 1143, Canoga Park, CA 91304. Phone (818) 992-4526.

Become a Zoo Docent

Los Angeles Zoo Docents provide tours to students, teach youth and adult workshops in the zoo, and present classroom programs in Los Angeles area schools. Applications are now available for the Fall 1987 Provisional Class scheduled for Tuesdays 9:30-2:30 beginning October 6, or the Saturday class beginning October 10. Deadline for applications is May 1. Interested men and women should call the Greater Los Angeles Zoo Association at (213) 664-1100.

Water Pollution Job Fair

The California Water Pollution Control Association is sponsoring a Student Job Fair to be held as part of the 1987 Annual Conference in San Diego, Ca., on Wednesday, April 22, 1987. This event will provide an opportunity for students who plan on entering the field of environmental engineering to meet with potential employers. For information, please call the Career Development Center or Margaret Nellor, Student Job Fair Coordinator at (213) 699-7411.

Study In the Ozarks

Saint Louis University is offering a summer program of field biology courses at its Reis Biological Station near Steelville, Missouri. Courses will be offered during two three-week summer sessions (May 11-30; June 22-July 11). Students may enroll in courses for either or both of the sessions. Enrollment in each course is limited to 12 students to insure that each student receives individual attention. Early application is therefore suggested.

Courses: Session I—*Natural History of the Vertebrates and Field Ornithology*, both 4 semester-credit courses. Session II—*Field Parasitology and Ichthyology of the Mississippi River Basin*, 4 and 3 semester-credits respectively.

Tuition for each course is \$135 per credit. A field fee of \$150 covers the cost of housing, meals, and field expenses. For more information, call (314) 658-3902, or write: Dr. Nevin Aspinwall, Director, Reis Biological Station, St. Louis University, 3507 Laclede Ave., St. Louis, MO 63103. Application deadline is May 1, 1987. A \$50 deposit is required and is refundable until May 1, 1987.

Gay/Lesbian Discussion Group

An ongoing discussion group on Gay/Lesbian topics is held every Tuesday evening from 7:30-9:45PM at the Archibald Young Health Center. All members of the Caltech community are welcome. Refreshments are provided. For further information please contact Bruce Kahl, x6393.

Programming Position

The Career Development Center has a Programming Position for a student. The work will be 10 or more hours per week now and fulltime during the summer. The student will be required to program in DBase III Plus (and will be paid while learning DBase). If interested, leave resume or note describing your computer experience at 08E Parsons-Gates for Sheryl Mercer.

Amnesty International

The Pasadena Chapter of AIUSA will present "Your Neighbor's Son" on Thursday, March 5 in Clubroom 1 of Winnett Center, at 7:00 pm. It is a powerful documentary about the training and indoctrination of torturers during the years of the military junta in Greece. For additional information on AI, contact Eric Majani at x3729.

Bike-Aid '87

Want to do a lot of bike riding for a good cause? You would be: touring the country on a bike; developing dialogues and relationships with people nationwide; learning about issues and options facing global hunger and poverty; raising money for self-help community development projects in the Third World and here at home; and helping to perpetuate awareness of these issues by educating yourself and others this summer.

If all this appeals to you, you may wish to consider spending your summer biking across the country as a part of Bike-Aid '87. On June 17th, cyclists will depart from four West Coast cities and meet in Washington D.C. on August 12th, then pedal together to New York on August 19th for two days of festivities. Interested? We need riders, campus and community organizers, and donors. For further information please write: Bike-Aid '87, Dept. CN2, Box 2306, Stanford CA 94305, or call (415) 725-2869.

Summer Crossroads 1987

International students at the graduate level and planning to return home no later than May, 1988 are invited to apply for Summer Crossroads 1987, to be held in Los Angeles, from May 30 through June 6. This is an intercultural exchange between foreign students and American families and a pre-departure orientation through which students evaluate their American educational experience and prepare for return to their home countries. Applications and references are due April 1, 1987. Information and applications are in the Career Development Center.

Another Essay Contest

Vector Marketing Corporation will sponsor an essay contest exclusively for undergraduates with scholarship monies totaling \$2,000 for winning entries.

The contest is open to part-time and full-time students at recognized colleges and universities, not currently or previously employed by or associated with Vector Marketing Corporation.

Students are asked to write a 500-750 word essay on: The Importance of Interpersonal Communication Skills Specific To Your Career Goals. This topic was chosen to emphasize the role that interpersonal communication skills play in today's highly competitive business world. Essay contestants are encouraged to include their personal definitions of effective interpersonal communication within the text.

The winning essay contestant will receive \$1,000 in scholarship monies, another \$1,000 divided among three runners-up. In addition, all essay contest participants will be offered the opportunity to interview for a position as a summer sales representative through the Vector Marketing Corporation office nearest their college or home town.

Entries will be judged on the basis of originality, practicality and creative thinking. Copy must be typed (neatly, gang), double-spaced, on white 8 1/2 by 11 paper and should not exceed 750 words. All entries should include a return address and phone number along with the student's class year and major. All submissions will become the property of Vector Marketing Corporation. Winners will be notified by mail no later than March 31, 1987. Entry deadline is March 16, 1987.

Send entries to:
Essay Contest
Vector Marketing Corporation
1260 Woodlawn Ave.
Springfield, PA 19064

Dramatic Lubrication?

The manufacturers of TriFlow, a spray lubricant containing Teflon, are sponsoring a contest with a \$5,000 first prize.

Students entering the contest must develop a dramatic, creative and original demonstration which highlights the superior lubricating qualities of TriFlow. Top ten finalists and their sponsoring professors will be flown to New York City for the awards presentation in June. Sponsoring professors of winning students will receive a cash prize matching that of the students.

Intent to enter forms are due no later than 28 February, so hurry. For more information, write: TriFlow Tech Contest, c/o Walker & Associates, Inc., 1100 Morgan Keegan Tower, Memphis, TN 38103. For more information here at Caltech, contact Professor Rolf Sabersky (x4142).

Job & Scholarship Combined

Freshmen interested in working at Leslie's Swimming Pool Supplies on weekends until the end of spring term and full time during the summer will be eligible for a \$1,000 for 1987-88. Students earn \$5 and hour. Interested students should write to: Leslie's Swimming Pool Supplies, "Scholarship Work Program," 20222 Plummer St., Chatsworth, CA 91311. Additional information (including job locations) available in the Financial Aid Office, 12-63.

S.W.E. Scholarships

The Southern California sections of the Society of Women Engineers is sponsoring several \$1,000 scholarships for 1987-88. Applicants must have high academic ability, participate in technical organizations, and show leadership. Application material must be postmarked by 15 March 1987. More information is available from the Financial Aid Office, 12-63.

Leadership Program

The International Leadership Program is seeking applicants for its summer-long leadership development program. Titled "Leadership America," this is a national program for college students who will have completed the junior year of their undergraduate studies by this June. Fifty students will be selected to spend 10 weeks strengthening their leadership skills. The objective of the program is to prepare these students to accept major leadership responsibilities earlier in their careers and to handle them more effectively. This non-partisan program takes place between June 12, 1987 and August 22, 1987. Students selected will receive a \$3,000 stipend. To be eligible to apply from Caltech, you must be currently enrolled, and complete your junior year by June 12. The primary criterion for selection is that the applicant have an "outstanding potential for leadership." Applications for this program must be completed no later than March 20, 1987. For additional information, contact Jeanne Noda, Deans' Office, 102 Parsons-Gates.

Interned In New York?

The National College Internship Service, specializing in internship development for college students, is now accepting applications for summer 1987 internships. Placements are available with sponsoring companies in New York City, on Long Island and in Westchester. For further information or application material, contact: National College Internship Service 374 New York Ave. Huntington, NY 11743 or phone (516) 673-0440.

Political Internship

The Beckman Internship will be available for the summer of 1987. The internship, supported by friends of Dr. Arnold O. Beckman, will pay a stipend of \$2,000. It allows a selected Intern to spend the summer working in the office of a politician and to see from the inside the process of government. The Intern is expected to make arrangements with the appropriate political persons. It is open to any Teacher who intends to be a Caltech undergraduate next year. If interested, contact Gary Lorden, Dean of Students, or Jeanne Noda, Associate Dean, x6351, or come to the Deans' office, 102 Parsons-Gates.

Research Associateship Program

The National Research Council has announced the 1987 Research Associateship Programs for post-doc and senior research awards. Students participating in the program conduct research of their choice at one of the federal laboratories or centers. Participants must submit a proposal for research during the application process. Drop by the CDC in room 8 Parsons-Gates for further information.

Summer In Livermore

The Department of Applied Science of the University of California, Davis/Livermore and the Lawrence Livermore National Laboratory offer appointments to outstanding junior (class of '88) physics and engineering students for the Undergraduate Summer Institute on Contemporary Topics in Applied Physics.

The Summer Institute will be held 17-28 August 1987 in Livermore, California. The curriculum will consist of lectures and projects on the fundamentals of magnetic fusion, laser fusion, free electron lasers, laboratory X-ray lasers and advanced computational modeling.

Selection will be based on academic record, aptitude, research interests, and the recommendations of instructors.

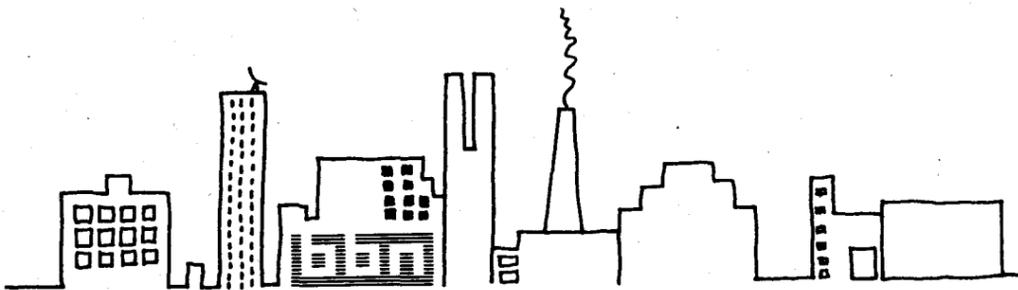
Travel and living expenses of the participants will be funded by the Institute. In addition, a grant from the Hertz Foundation will allow payment of a \$1,000 stipend to each participant.

Applications are available in the Deans' Office, 102 Parsons-Gates. The deadline for the receipt of applications is 1 April 1987.

Disease Fellowship

The National Institute of Allergy and Infectious Diseases (NIAID) will sponsor a Summer Fellowship Program for minority and non-minority students. Students receive 6-8 weeks of biomedical research training in NIAID laboratories and are provided a training stipend. Summer fellows train in very active and highly productive research laboratories. The mentor system is used, and counseling is offered. Weekly research project(s) to peers, and specialists in their particular field of interest. Although travel will be provided by the NIAID, housing must be covered by each of the candidates from their stipend.

Nominees must have a 3.0 or higher GPA, preferably higher in their science coursework. Selection criteria shall include academic records, GPA, special achievements, recommendations from major professors and Deans, the student's letter of motivation, and curriculum vitae. Applications are due no later than 2 March 1987. For further information please call Mr. Vincent Thomas or Dr. Katherine Jaouni at (301) 496-4846 or (301) 496-1409.



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Ebell Scholarship

Undergraduate students living in Los Angeles County and who have a minimum GPA of 3.25 are eligible to apply for the Ebell of Los Angeles Scholarship. Further information and applications are available in the Financial Aid Office, 12-63. Deadline is 6 March 1987.

Still More Money For Women

The Business and Professional Women's Foundation has two financial aid programs available. The Loan Fund makes loans for \$500 to \$5,000 available to women in their final two years of any engineering program. The Scholarship Program is for women 25 years or older in the last two years of their program of study and show financial need. These awards range from \$500 to \$1,000. Deadline is May 1. Further information is available in the Financial Aid Office, 12-63.

Leadership America

The International Leadership Center is seeking applicants for its summer-long leadership development program. Fifty outstanding men and women from campuses across the country will be selected to spend 10 weeks strengthening their leadership skills. The program takes place between June 12, 1987 and August 22, 1987.

Leadership America includes one week in North Carolina, one week in the Rocky Mountains and three weeks in Dallas, Texas. It also includes a four-week internship in business, government, or community service followed by a closing session in Washington, D.C.

Students incur few expenses in Leadership America since most costs are underwritten by corporate sponsors. In fact, participants receive a \$3,000 stipend which offsets any expenses as well as their loss of income during the summer.

To be eligible for selection to Leadership America, a student must be currently enrolled and have completed the junior year of studies by June 12, 1987. The primary criterion for selection is that the student have an "outstanding potential for leadership". Selection will be completed by May 1. For additional information, contact Jeanne Noda in the Deans' Office, 102 Parsons-Gates. Application Deadline is March 20.

CALTECH public events**EXCITING PUBLIC EVENTS PACK THE WEEKEND****Tonight the African American****Drama Company presents the musical "High John De Conquerer"**

at 8 p.m. in Beckman Auditorium. High John was as alive and mystical as any folk hero could be and "walked" from plantation to plantation whenever he was needed by the low in spirit, the downtrodden and the weak. This company celebrates Black History month with a weave of fantasy, music and confrontation.

CIT student prices for this production are \$6.25-5.00-3.75; CIT rush tickets go on sale the day of the show for \$6.00. CIT faculty and staff prices are \$10.50-8.00-5.50; TECHTIX for the same price as student tickets go on sale today between noon and 4:30 p.m.

Saturday night brings the return of Mr. Jack Daniel's Original Silver Cornet Band to Beckman Auditorium at 8 p.m. All of the enthusiasm of a turn-of-the-century small town brass band is conjured up by some of the finest musicians in the country.

CIT student prices for this concert are \$10.00-8.75-7.50; CIT rush tickets go on sale the day of the show for \$6.00. CIT faculty and staff prices are \$18.00-15.50-13.00; TECHTIX for the same price as CIT student tickets go on sale today between noon and 4:30 p.m.

Caltech's musical "How To Succeed In Business Without Really Trying" concludes its run this weekend in Ramo Auditorium on Friday at 8 p.m.; Saturday at 2 p.m. and 8 p.m.; and Sunday at 2 p.m. Tickets are priced at \$9.50 general admission; \$8.00 CIT/JP; personnel and students; \$6.00 CIT students.

For further information about the exciting Public Events scheduled for this season, call campus extension 4652.

Forge Vital Links in the National Airspace System.

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The FAA is modernizing the National Airspace System (NAS) to make air traffic as smooth and as safe as possible. The General Electric Federal and Electronic Systems Division is proud to support The Jet Propulsion Laboratory (JPL) in the development of two projects that are part of the NAS: the Central Weather Processor (CWP) Project and the Voice Switching & Control System (VSCS) Project.

CWP is a computer-based, interactive meteorological data processing system that will receive weather and other types of data and then process, store and display the results. The CWP will provide timely dissemination of weather data products to air traffic controllers and flight service station specialists. VSCS will provide integrated radio and interphone/intercom services for the FAA Area Control Facilities.

Creative, innovative people are needed with the following skills. Apply now for one of these current openings with GE in Pasadena:

Systems Evaluation & Senior Software System Engineers

Five to ten years' experience (including lead positions) in systems engineering of software intensive systems, and as programmer or equipment engineer.

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Up to ten years' experience in real-time programming, modern micro or mini-computer programming and familiarity with Military Standard documentation and methodology requirements. Lead and entry-level positions available.

Systems Integration & Test Engineers

Three to seven years' experience with system-level integration, testing and operational test and evaluation of hardware and software data systems, real-time systems with human-machine interfaces, voice communications systems, data communications systems and traffic simulation systems. Experience with DecVAX, MicroVAX and IBM 370. Lead position available.

Systems Engineer - Data Systems

Five to ten years' experience in program definition, design and specification, requirements and performance analysis and trade-off studies, including at least three years of project work related to large-scale systems development and two to three years' supervisory experience.

Requirements Test Engineer

Seven years' experience in system-level requirements development and testing of software intensive systems at the CSCI/CSC levels. Familiarity with Military Standard documentation required: DOD STD 2167 desired.

Design Test Engineer

Five to seven years' experience in subsystem and system-level design development and testing of software intensive systems. Familiarity with Military Standard documentation at the CSCI/CSC levels required; DOD STD 2167 desired.

BS/BA Computer Science, Mathematics, Engineering or Physical Science or equivalent experience required for the above positions.

To apply for any of these opportunities, please send resume to: Professional Recruiting, General Electric Western Systems, Federal & Electronics Systems, 4041 N. First Street, San Jose, CA 95134. An equal opportunity employer, m/f/h/v.

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WHAT GOES ON

Announcements for *What Goes On* must be submitted on an announcement form (available outside 107 Winnett) or on a plain piece of paper. Please indicate the date(s) you want the announcement to run. Send announcements to 107-51, or put them in the mail slot in the door of 107 Winnett. Announcements *must* be received by the Tuesday prior to publication.

Letter Jackets

An order will be put in for Caltech Letterman Jackets within the next few weeks. If you are interested in ordering a jacket, please contact Chris Schofield at 795-4760.

A Check For You!

The Caltech Chess Club is starting up again, and we're as excited as a pawn on the eighth rank! If you're very interested, or just sort of interested, please send a short note to Huy Cao at 1-54, indicating your name, mail code, and USCF rating, if you have one. Everyone is welcome, especially beginners! So what are you waiting for? A check?!

Attention Hungry People

Beginning this Saturday, have your breakfast—or a snack—at the Red Door Cafe, upstairs in Winnett Center. The Cafe's staff is happy to announce that the Cafe will now be open on Saturdays from 12 to 5 pm to serve its traditional fresh coffee, teas, espresso, juices, and delicious baked goods and bulbous bagels. An expanded menu—designed according to the expressed desires of our Saturday visitors—will be available before third term begins. So come bring your appetites and ideas to the Red Door Cafe.

Women's Water Polo

Will there be a team this year? Contact me, Randy Brown, at 578-9562, Fleming Room 48, if you're interested. Leave a message with my personal secretary, Jim Burleigh, if I'm not in.

Financial Aid Deadline

The March 2 deadline for mailing financial aid applications for 1987-88 undergraduates is only a few days away. California residents who are applying for Cal Grant must have their supplements completed and postmarked by March 2. All undergraduate Student Aid Applications for California (SAAC) must also be postmarked by March 2.

SURF's Up!

SURF applications are now available in the SURF Office, Room 3 Dabney. The stipend this summer will be \$3000. The SURF Office has a notebook with descriptions of a few possible projects. Deadline for proposals is 5:00PM, Monday, 2 March.

Interested in the Y?

If so, then come to the Y lounge, which is upstairs in the Winnett Student Center, on Thursday, March 5, 1987, at 6:00PM. Members of the Y Excomm will be there to describe what the Y does, and what *fun* it is. If you are interested, we have Decompression coming up, and any help you could give would be greatly appreciated. Of course, we do much else, like ski trips, backpack trips, sailing trips... (You get the idea).

As an added inducement, we will have FREE pizza and soft drinks. All are welcome.

ASCIT Copier

Bibi Jentoft-Nilsen is no longer in charge of the ASCIT copier. James Ibbotson (Page x3774) is now the person to contact with your problems and questions.

Indoor Soccer

There is an indoor soccer game tomorrow night at 6:30. We are on an amazing one-game winning streak which we hope to keep alive. We are leaving from in front of the Y at 5:00. Contact Konstantin at x3976 for more info.

Philharmonic Tickets

There are several tickets left for the next concert given by the L.A. Philharmonic. Included on the program are the L.A. premiere of Zwilich's Symphony No. 1, *La Mer* by Debussy (very pretty!), and Brahms' Piano Concerto No. 1. The concert is Sunday, March 1, and tickets are \$2. Please see Gloria in the Y Office to get your tickets.

Concert Lottery Drawing

The 2nd term Ambassador Concerts Lottery drawing will be Monday afternoon, March 2nd. Each House will have one winner entitled to two tickets and the MOSH's Office will pay up to \$20 per ticket. Be sure to enter your name today!

Occidental-Caltech Symphony

The Occidental-Caltech Symphony will present its second program of the season on Thursday, March 5, at 8:00PM in Ramo Auditorium. The program will also be performed on Tuesday, March 3, at 8:15PM in Thorne Hall, Occidental College. Allen Robert Gross will conduct a program consisting of Humperdinck's Overture to *Hansel and Gretel*, Schumann's *Piano Concerto in A Minor*, and Stravinsky's *Firebird* Suite. Soloist in the Schumann concerto is Grace Choe, this year's winner of the Occidental-Caltech Concerto Competition.

Grace Choe is in her third year as a music major at Occidental. A former student of Eunee Yee, she currently studies with Patt Thomas at Occidental. Grace was the winner of the Anne Furniss Chamber Music Scholarship in 1981, the Southern California Junior Regional Back Festival competition in 1982, and a recipient of the Howard Swan Award from Occidental College in 1984.

Admission is free. For further information, please call (213) 259-2785.

ASCIT Budget Meeting

The ASCIT Budget Meeting for the 1987-88 fiscal year will be held on Tuesday, March 10 at 7 pm in the Millikan Boardroom. All clubs and organizations should turn in their budget requests by Friday, March 6. Please send them to Thu Le, mail code 1-55.

Meet Gregory Benford

Noted science fiction author Gregory Benford will be speaking on campus on Wednesday, March 4, 1987, at 8:00PM in 22 Gates. The title of his talk is "Science, Fiction, and Things In Between".

He is the author of several nifty novels, including *The Stars in Shroud* and *Timescape*. For the latter novel, he won the Nebula Award and the Ditmar Award. His most recent novel, *Heart of the Comet*, has received many glowing reviews. It was co-authored with David Brin.

The talk is free and open to the public.

Return Defense Polls!

If you're one of the 600 students who received a copy of the social science poll on defense issues, please take the time to fill it out and return it. We still need about 250 back, and we need to have most of them to be sure that the sample is not biased by getting responses only from the people who feel strongly about the issues (and the ones who are hungry for prizes...)

Careers in Physics

A career discussion on "Careers in Physics" will begin at 7:30 pm on Thursday, March 5 at the Alumni House. Undergrads and grad students welcome. Sponsored by the Gnome Club and the Alumni Association. Refreshments will be served.

Nuclear Fallout

The Space Weapons Study Group, GSC and Caltech Y present the film *Half Life*. This 1986 effort by Australian documentary film maker Dennis O'Rourke examines the tragic results of exposure of Marshall Islanders to fallout during the 1954 "Bravo" H-bomb test. The showing will take place in Baxter Lecture Hall on Wednesday, March 4 at 8 pm. Winner of awards at the 1986 Berlin and U.S.A. film festivals, *Half Life* suggests that, although avoidable, the exposure was deliberately allowed to occur in order to study its effects. The consequences proved devastating for the 236 islanders, 28 American servicemen and 23 Japanese fishermen who were exposed. For more information contact Dave Levy, x4039, or Craig Steele, x4840.

Squeezed Light Talk

Next week's Noon Update speaker is Dr. Carlton Caves (senior research fellow in astrophysics), who will be discussing "Squeezed States of Light: Darker Than Dark." Bring your lunch to this unique talk on Wednesday, March 4 at noon in the Winnett Lounge. Open to everyone!

S.P.E.C.T.R.E. Meeting

S.P.E.C.T.R.E., the Caltech Science Fiction Society, will have a short meeting in the Y Lounge (upstairs in Winnett) at 7 pm on Wednesday, 4 March 87, before the Gregory Benford speech at 8 pm. We'll decide on a budget proposal so we can get funds to bring the next science fiction speaker here (among other things), and maybe we'll decide what the acronym stands for. As always, free munchies and soda will be served. For more information, call No. 1 at 304-0006. [Society for the Prevention of Endomorphic Clones and Typical Redundant Entities?]

Alternative Job Fair

All Caltech grad students, undergraduate students, and fellows are invited to meet representatives from non-military firms and agencies, including: Proctor & Gamble, Hewlett-Packard, Bell Industries, the city of Los Angeles, Micropolis Corporation, and more. The job fair will be held from 11 am to 3:30 pm on Tuesday, March 3 in Winnett Lounge.

Hooked On Swing

Larry Elgart and his Manhattan Swing Orchestra will perform their live production of "Hooked On Swing" for two performances at Ambassador Auditorium on Tuesday and Wednesday evenings, March 3 and 4 at 8:00 pm.

Mr. Elgart's album, *Hooked on Swing*, (his 50th album, by the way), has sold over 2 million copies worldwide, making it the largest selling swing or big band album in history.

Tickets for the performances are \$20 for orchestra seats, \$16 balcony. Tickets are available at the Ambassador Ticket Office or any Ticketron or Teletron outlet.

Darkroom Users

The South Houses darkroom has been demolished, and most equipment was moved to the North Houses darkroom. However, the big Beseler 4" by 5" enlarger that used to be in the South darkroom has vanished. If anybody out there knows its whereabouts, please call Mark Looper at 304-0006 so we can move it North.

Student Space Group Meeting

If you didn't attend our last meeting, you missed two excellent films on shuttle flights. Don't miss our next meeting, where we will be showing films of Apollo 16 and Apollo 17 lunar landings. The meeting will be held on Tuesday, March 3rd at 7:00 in Clubroom 1 of Winnett Center.

One More Course

SS 101 *Selected Topics in Social Science: Mathematical Models of Choice Under Risk*. "For forty years 'expected utility theory' (EU) has been the standard economic theory of choice under risk. (According to EU, the value of a risk is the average of the values and its possible outcomes, weighted by their probabilities.) Recently EU has come under attack as a description of how people actually made choices, and several competing mathematical models have been proposed by psychologists and economists. We review the evidence against EU, the competing theories, and their implications for economic theory in general." Instructor: Colin Camerer, MW 6-7:30 pm. [Good for those trying to lose weight by not eating dinner.]

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