

The Caltech Archives announces...

Feynman Video Lunch

Fridays, noon to 1, in Beckman Room,
first floor, Beckman Institute (SE corner).
Seating limited to 10 seats only (reruns by request
only, noon-1, the following Monday-Thursday).

February 17: *Strangeness Minus Three (1964)*.

An original film made by the BBC for Caltech.
Chronicles the search for the omega-minus particle.
Feynman, Murray Gell-Mann and Yuval Ne'eman talk
about scientific ideas and methods. 54 min.

February 24: *Physics 2, Track B (1980)*.

Feynman lectures to Caltech sophomores on quantum
electrodynamics over the course of two weeks in Feb-
ruary 1980. About 50 min. each lecture.

March 3: *Physics 2, Track B, cont'd*

March 10: *Physics 2, Track B, cont'd*

March 17: *Physics 2, Track B, concluded*

To be continued Spring Term, starting April 7
with the BBC's *The Pleasure of Finding Things Out*.
Watch for announcement in the Tech.

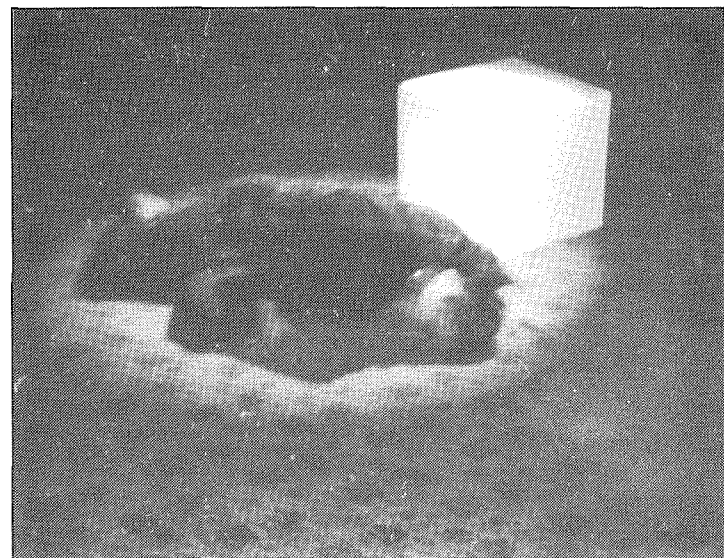
Questions? Call the Archives, x2704.

TACIT Introduces a "Fever" to Campus

by Adam Villani

A far cry from the musicals and comedies TACIT is well known for, "The Fever" is a political psychodrama written by Wallace Shawn (*My Dinner With André*) that takes place inside one man's mind on an almost bare stage. The central, unnamed character (presumably bourgeois playwright Shawn himself) confronts his feelings on the essential struggle between the poor and wealthy of the world as he lies in a foreign prison cell, tormented by unseen captors. While the prisoner is represented in the present tense by freshman Phillip Rodriguez, senior director Asif Hassan has successfully adapted the original monologue so that different aspects of the prisoner's mind, portrayed by senior June Fujimoto, sophomore Mehrin Masud, and freshman Mike Davies, share time in a frantic debate with one another over whether it is right that the rich have wealth and the poor do not.

The riveting production is immediately engaging, keeping a sense of urgency and never wallowing in ponderous navel-gazing. Rodriguez accurately described the play as



Freshman Phillip Rodriguez shivers in pain as the prisoner in TACIT's new production, "The Fever."

"draining," and the despair and humiliation brought upon the prisoner are readily transferred to the audience in the close confines of Winnett Center. The players, all undergraduates, do an admirable job with the difficult material and bring the character's thoughts to life forcefully and with conviction. Hassan's staging and Dan Dilling's complex lighting keep the connection between the different actors smooth and the pace quick. Those of you who want to see a stimulating

play that will keep you talking for hours afterward will want to go out of your way to see "The Fever."

"The Fever" is showing in Winnett Student Center Friday, Saturday, and Sunday of this weekend and next weekend, February 17, 18, 19, 24, 25, and 26, with all shows at 8 pm. Note that the time listed in the Caltech Weekly Calendar is wrong. Tickets are \$5.00, \$2.00 for Caltech students. The show is about an hour and fifteen minutes long.

Bower's Watson Lecture Teaches Education

by Ross Brown

This Wednesday evening at 8pm, Dr. James M. Bower, or "Jim" as he introduced himself, gave an interesting lecture on "Scientists and Science Education Reform" in Beckman Auditorium. The Watson Lecture was attended mostly by educators, some students and a few people from the Caltech community.

The lecture began with a short film depicting what appeared to be elementary school children building structures out of cards and soda straws. As the music and sound alternately faded in and out, the kids' voices could be heard as they worked. The kids said things like "We're ready!" and "Let's take turns doing everything," as they energetically went about building their structures.

After the film ended, Jim Bower went to the lectern and explained that the class was actually one of many that have been doing projects such as those shown. Although the film itself was only two and a half weeks old, the Caltech Pre-College Science Initiative (CAPSI) program's outreach to the Pasadena Unified School district is in its tenth year.

Dr. Bower explained that the audience was going to undergo the same learning process as the children in the Pasadena schools; we would view the film, hear what he had to say, develop our own questions, ask them, and then view the film to experience what we had learned. It worked quite well, since by the second time around the audience was able to pick out a lot more of what

was going on.

He discussed the methods with which they have been teaching grade school children high school level science. Every eight to ten weeks a new subject is introduced that begins a chain reaction of inquiry, experimentation and learning. The emphasis is placed on the children asking and answering their own questions. Although CAPSI has not finished developing tests, this type of learning has proven in the past to stay with the child long after the unit has ended. Also, other studies that the grade-schoolers are in seem to have benefited as well, from history to poetry.

This energetic, fun learning made the "normal" classroom with all its lectures and textbooks look like a participatory coma. Dr. Bower was careful to point out that it was not a "feel-good" powder puff band-aid solution to a growing problem. It is very structured, but dynamic enough to teach creativity and analytical thinking at the same time.

He also explained that National Science Education Standards are being written up at this time, and presented quotes from the draft report. Interestingly enough, the quotes from the "education experts" in Washington D.C. were mirrored by the child in the short film strip, such as "cooperation is essential to science education," (this reporter's paraphrase) to "Let's take turns doing everything."

Dr. Bower was quite excited and admitted mild apprehension at the phenomenal growth that the pro-

gram has experienced. CAPSI has received a six million dollar grant from the National Science Foundation in Washington D.C. to expand the program into fifteen California school districts and five more in other parts of the country. In addition, scientists and science educators from around the country and around the world have come to tour the classrooms and talk to the students.

He also stated that the venture is not partisan, bi-partisan or anything-partisan. He said that the primary problem that they run up against in this venture is the total lack of funding. "This is not a Democrat thing or a Republican thing—it is an economic thing," he said. CAPSI is getting industry support because the long-range thinkers are discovering that a lack of skilled and thinking workers will spell doom for the economy and society in general. At present, the priorities, and thus the money, are completely out of whack and 180° from where they should be.

Bower brought home this fact by pointing out that in this year California has crossed a deceptively invisible line: we will spend more on prisons than on education in 1995. "Why not spend the \$36,000 to house a criminal on education instead, to keep today's kids out of prisons tomorrow," he said "I don't think we can build enough prisons to house all of our current 2nd graders."

Bower emphasized that every student in the PUSD was involved in this program, even the "special

education" kids. Apparently, they took to it just as well, if not better than the "normal" students. Also, the emphasis has been on public schools and not private or parochial schools. He stated that the students at those schools are already receiving an excellent education and have the opportunity to receive this type of education. Zeroing in on the cash-strapped public schools give them the chance to educate everybody, including the minorities that make up a large part of our population. "We are not educating a mono-culture [here]," he said.

Bower answered many questions

after the lecture, from the practical "How do you test the kids?" to the philosophical "Why teach science to kids if it may be dying as a field of study?". His answers were both honest: "We don't know how to test the kids yet, but we're working on it," and humorous: "I hope science doesn't die before I leave the field! We still need the grants!"

Dr. James M. Bower is an assistant professor of neurobiology here at Caltech. He has been working with Dr. Jerome Pine and CAPSI since his appointment as assistant professor in 1984.

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Letter to the Editor



February 13, 1995

In its last issue, *The California Tech* printed an anonymous letter from an obviously disturbed individual. The letter's contents do not merit comment aside from certain points that are potentially damaging to all Caltech students.

The Registrar's office never changes an instructor's grade, and never changes credit granted for a course except when explicitly asked to do so by the instructor, or by the relevant faculty committee. Prospective employers, graduate schools and other users can have absolute faith in the integrity of the Caltech transcript.

Sincerely,
(signed)
Dr. Judith R. Goodstein
Registrar

Please send submissions for letters to the editor to *The California Tech*, Caltech 40-58, Pasadena, CA 91125, or by electronic mail to editors@tech.caltech.edu. Deadline for submissions is Monday at 5pm on the week of publication.

The editors reserve the right to edit or refuse to print any letter for any reason.



This is No Joke, Mr. Feynman

Mitra Hartmann

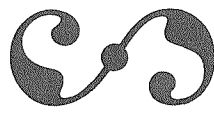
Let's look closely at the kinds of stories scientists like to tell about themselves. Let's look closely at the first part of *Surely You're Joking, Mr. Feynman*. Feynman does indeed admirably convey his enthusiasm for science. But he also chooses to present himself as an insensitive, egotistical man, and chooses to tell stories in which he consistently and unrelentingly relishes degrading and humiliating people. These character traits are both obnoxious and completely independent of Feynman's scientific ability.

Beginning with the chapter "String Beans," the reader is supposed to empathize with Feynman's difficulty in getting unimaginative, "conventional" people to appreciate his inventions. Never are these people presented as complex human beings, and never does Feynman attempt to explain their rejection of his inventions; he simply presumes they haven't sufficient open-mindedness to understand them. The characters are merely foils for Feynman's cleverness, and his contempt for them is at best thinly disguised. Feynman contrasts himself with these dull-witted individuals by telling stories of his own intellectual exuberance and mischief. In one story, he confuses his fellow MIT freshmen by describing "unique" geometrical properties of a French curve, which are in fact tautological. In a second story, Feynman bewilders a Princeton colleague with a verbose problem about a clock on a rocket, only to later explain that the problem is trivially solved using a fundamental "principle of Einstein's gravity."

Feynman claims that these stories illustrate that his targets "don't know what they really knew." But

Feynman neglects to observe that the success of both pranks requires that the targets initially trust in Feynman's good will: the target are *pre-biased*. Feynman's pranks worked only because both the MIT freshmen and the Princeton colleague assumed that Feynman's statements warranted initial respect. They trusted that there was something to the problem Feynman posed, assumed that Feynman had perhaps thought about it some, and maybe even worried that the answer was trickier than it appeared. If there were an obvious answer, the targets may have reasoned, why would Feynman have asked it? It takes a while for them to realize that Feynman has intentionally blinded them with a flurry of words; most people do not initially assume that others are out to humiliate them. Feynman took advantage of goodwill most human beings presuppose when interacting with a colleague.

One might forgive Feynman for playing harmless, if slightly embarrassing practical jokes on his colleagues, especially if put in the context of youthful showmanship, and if the basis for the jokes' success were then tacitly acknowledged. But Feynman wrote this book as a retrospective — and when looking back on the incidents, Feynman draws the conclusion that a person's intellectual ability is compromised if he falls for such a joke. In fact, Feynman goes so far as to suggest that such people don't even "learn by understanding." This conclusion is self-serving and illogical. If I ask an acquaintance for the time, I can certainly choose to punch him in the stomach when he looks at his watch. Because he is unsuspecting, he is unlikely to protect himself from the blow, but that does not mean his boxing capabilities are deficient. Feynman's stories do not illustrate his relentless or superior intellect. They illustrate a pathetic need for one-upmanship, both



Opinion

at the time of the joke, and, more importantly, in retelling the story with explicit humiliation the primary narrative goal.

Neither does Feynman limit his intellectual abuse to those he believes should be his educational equals. He is also a bully. Feynman's story about the waitress and the water glasses in nothing short of sadistic. Feynman explains that at a particular restaurant he liked, every worker was upside down, with a nickel tip under each of them. He knew that in order to clear the table for the next customer, the waitress will spill water all over the restaurant floor — not once, but twice. Only if the waitress is particularly clever can she avoid spilling the water, and even should she successfully avoid the spill, the incident will substantially disrupt the pace of her work.

This particular practical joke is neither original nor unusual: it's most frequently associated with boisterous junior high school children. What is unusual is that a man in his sixties would adopt such a story as part of his adult professional identity. But indeed, Feynman tells his story with great delight, and its place in the book implies that it depicts something important about him. Feynman is proud of having played this joke, and his retrospective description of the prank finds fault only with the waitress for insufficient cleverness. Most strikingly, Feynman is not even ashamed that his prank caused the waitress to slip in the water she spilt — Feynman flaunts a joke that led to the bodily harm of another individual.

Two aspects of this prank are worth further consideration. First, its basis is not that the waitress is simply "duped," but rather, that she is put in an unwinnable dilemma. Feynman has set things up so that *whatever* action the waitress takes — whether she circumvents his plot of

falls prey to it — she necessarily capitulates to his will. If the waitress tries to come up with ways to avoid the spill, she has in essence agreed to play Feynman's game: she spends her time "proving herself" to Feynman. Her only alternative is to accept Feynman's punishment (the water spills). Second, Feynman puts a tip in the glasses in order to give the external appearance that the waitress willingly submits to his control for her own financial gain. If this analysis seems to give undue importance to Feynman's top, consider that Feynman might have chosen to leave the tip *next* to the overturned glasses. While both sides of the dilemma are still there (the waitress must either play his game or spill the water), the feel of the joke is considerably less bitter.

Feynman may well have been a wonderful scientist. He might even have been a wonderful person, but that's not a conclusion one could draw from his book. Feynman mistakes intellectual exhibitionism and arrogance for relentless intellect, insensitivity, and brutality for childlike insouciance, and close-mindedness for singleness of purpose. Not all of the stories in *Surely You're Joking* are like this. But the introductory chapters — the ones which establish tone and draw the initial portrait of Feynman's "curious character" — are. Why does the culture of science worship such a malformed and malevolent personality? If Feynman really wasn't like this, why did he choose to present himself in such a way? What is the appeal?

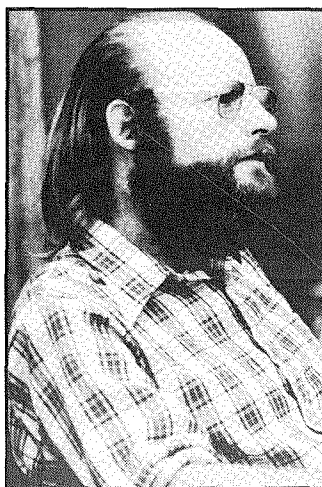
Editors' Corner

From your Adjective-Impaired Tech Editor

Guess what. Due to having to clean up the Tech Office and lots of homework, I don't have time to write much here. So, here are the customary

Deadlines for Submission to The Tech

Letters to the Editor — 5 P.M. Monday
Events and Notices — 5 P.M. Tuesday
Unsolicited Articles — 5 P.M. Tuesday
Regular/Semi-Regular Columns — 5 P.M. Wednesday
Articles, News Submissions — 5 P.M. Wednesday
Art/Photo Submissions — 5 P.M. Thursday



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to Work for
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phone: (818) 395-6153
e-mail: editors@tech.caltech.edu
ISSN 0008-1582

VOLUME XCVI, NUMBER 17
FEBRUARY 17, 1995

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Published weekly except during vacation and examination periods by the Associated Students of the California Institute of Technology, Inc. The opinions expressed herein are strictly those of the authors.

Letters and announcements are welcome. All contributions should include the author's name and phone number and the intended date of publication. Submit copy (preferably on Macintosh 3.5" disk) to the *Tech* mailbox outside SAC room 40, or e-mail to editors@tech.caltech.edu. The editors reserve the right to edit and abridge all submissions for literacy, expediency, etc. All articles are the property of the authors. Authors and columnists retain all intellectual property rights.

The California Tech is distributed free. Issues will be mailed off-campus upon receipt of \$11 per year to cover third-class postage and preparation costs. Printed by News-Type Service, Glendale.

SOMETHING DIFFERENT AT CALTECH

CHINESE GOLDEN DRAGON ACROBATS

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Science Education at Caltech: An Observation

by Ross Brown

The Watson Lecture on Wednesday inspired me to write about a problem that I have noticed here at Tech and elsewhere. My claim is this: unless something changes soon, I am afraid that Caltech may lose its place as one of the premier science institutions in the world. I was extremely disappointed by the utter lack of Caltech professors at the lecture Wednesday night. "Science Education" sounds like a topic that would interest science educators, doesn't it? So what if it was about teaching elementary school science, that doesn't exempt PhDs from learning something from it, and I think they *can* learn quite a bit from it.

The future of education lies not in the dusty classrooms and musty textbooks that constitute the bulk of "education" here and elsewhere, but rather in more natural and sensible methods of teaching. I am not advocating more use of white boards or computers, they are not a panacea. The problem lies deeper than the materials used in "education."

There is an established system that has dominated the education scene in America for more than a century. In K-12 the science curriculum is usually as follows: "The students are here to have their heads filled with equations and facts." This fosters a dependence on the "experts" for information, not for one's own abilities to get the information. This is often a prime ingredient for a passive population to found a fascist ruling class on. But enough of Orwellian predictions, on to the here and now.

A friend of mine approached his advisor to get advice on studying techniques and methods. The advisor told him to go to the deans, that wasn't his purview. The assistant dean, Barbara Green, was nice but told him that there was nobody here that was trained in that sort of thing. "Maybe at another school..." she said. She suggested the Counseling office (sort of like going to the doctor's office for a haircut) or talking to the TA or getting a tutor. There is no established way for teaching Tech students *how* to learn, just *what* to

learn.

The professors seem to lay the material out casually like pouring out food for a pet. We go to lectures to have the information presented to us in an ever so detached manner, just waiting for us to pick it up. There are no real problems to solve, just carefully distilled exercises to "reinforce" the lecture material. And in the middle and the end we get a stressful 3 hour take-home interrogation to see if we successfully sponged up the information they have laid out. Sometimes we get demos, which are cool, but are not true exploration.

Of course the blame can't be placed on the professors. I have encountered many in my three years here that are frustrated with this system and care about their students. Also, when they are hired or "appointed" by the institute, they are not trained to educate, they are just assumed to be able to lay out the material to be absorbed. However, real education should be taking place, like teaching critical and analytical thinking. Problem solving skills should be emphasized, not endless prattling on theorems and proofs. Ways should be taught for stretching one's mind to embrace a new concept or even just to pass on simple, practical study habits.

The real culprit is the entire system of "student," "educator," and "education" as institutions that we have grown up with and are comfortable to us. We need to reform not only the ways we teach and learn, but our own thoughts, feelings and ideas toward learning. Science is not something that is "casually observed" as

so many of our esteemed textbooks say, it is an active pursuit of knowledge about our world. We should be trained to pursue it, not just regurgitate what has been "casually observed."

I have mostly ranted about the problems till now, so on to the solutions (otherwise this would only be

science school to me, more like the class Ferris skipped out of in "Ferris Bueller's Day Off" (what is the shear stress equation ... anyone ... anyone ... $\sigma = P/A$, blah, blah, etc.).

As a part of this suggestion, I would like to see grades and tests done away with. Before you all start yelling, let me say that there are other ways of evaluating students' performance than these crude methods. Ask me about them. I have seen my friends get completely drunk because of the stress here, stress caused in part by the threat of bad grades. Most Caltech students have a drinking problem (as in alcoholism). Yes, its true, if you don't believe me go to any party and watch.

When I asked my math professor last year if I could do extra work to try to improve my grade, he told me that he was going to only grade based on strict percentages set forth at the beginning of the class (the final is worth 33%, etc.). He couldn't make allowances for one of his students trying to improve his score. Otherwise, it wouldn't be objective, he said.

This institution should not pride itself on how difficult it can make the coursework, but rather how well it can train us to tackle it and the real world problems we will encounter after graduation. The established, tried and true methods may have worked in the past, but they are quickly becoming dated as we move into the next millennium.

If anyone reading this would like to discuss this at greater length, please call 568-8028, send on-campus mail to Box 441 or email me: rosshb@cco.caltech.edu.

There is no established way for teaching Tech students how to learn, just what to learn.

about 2% useful). I suggest that we all (students, professors, TAs, etc.) step back and look at the real life processes and then model our behavior on reality. The solutions will come from that naturally if we let them. The thing not to do is start appointing more committees and drafting up silly little band-aid solutions like last year's "Quality of Teaching" committees' "more student feedback" forms. Of this supposed "solution," I have seen nothing. Besides, I have been in many classes where the professor asks a question and gets, if he or she is lucky, a few mumbles. Most of the time it is silence, forcing the poor professor to answer for the students. This doesn't sound like a high-tech

THE ALLIANCE TO SAVE STUDENT AID has created a telephone hotline and posted Internet resource addresses to help college students, their families, and other Americans contact their members of Congress to express their views on proposals that would cut federal student aid significantly.

The telephone hotline number, 1-800-574-4AID (4243) connects callers directly to the Washington, DC offices of their members of Congress. If the call does not go through, a fax message is sent in the name of the caller. The cost of each call is \$3.65, billed to any major credit card.

The Alliance also is establishing an e-mail address on the Internet that provides access to background information on student aid issues, a sample letter to Congress with a list of congressional e-mail addresses, and additional information on the 800 number. The Internet resource addresses, which went on-line last week, are as follows:

- ⇒ e-mail: student-aid@nchemail.nche.edu
- ⇒ gopher: student-aid@nche.edu
- ⇒ WWW: <http://student-aid.nche.edu>

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Sat-Mon Bargain Matinee 2:00 p.m.

Shallow Grave

Daily 5:15, 7:30, 9:50 p.m.
Sat-Mon Bargain Matinee 12:30 p.m.
Sat-Mon Regular Matinee 2:55 p.m.

Tonight's ASCIT MOVIE

Baxter Lecture Hall
7:30 and 10:00 pm
\$1.50 ASCIT/\$2 Non

Schwarzenegger
True Lies



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next Sat: WITH THE
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The
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by
Wallace Shawn

Mike Davies June Fujimoto
Mehrin Masud Phillip Rodriguez III
directed by Asif Hassan

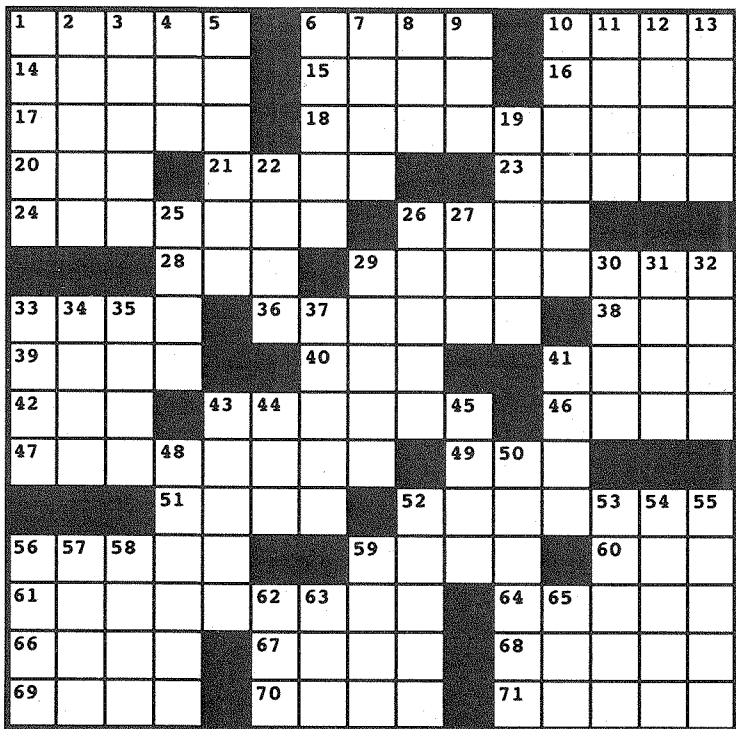
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Crossword - "Christopher"

edited by Wei-Hwa Huang



ACROSS

- 1. Carter
- 6. Johnson
- 10. Reagan
- 14. Scents
- 15. Seed cover
- 16. Wave of the past?
- 17. Time or speed
- 18. Ford
- 20. Something to usher in
- 21. Mars
- 23. Tough
- 24. Places for legislation
- 26. Desert animal
- 28. Obi-wan, familiarly
- 29. Open space in a forest
- 33. Man of the Algonquias
- 36. Eisenhower
- 38. Revis of TFM
- 39. It gets breached in Star Trek
- 40. Maiden name
- 41. Dog in *For Better or For Worse*
- 42. Sailor Mercury
- 43. Lincoln
- 46. Jewish lyre
- 47. Spiffs
- 49. T. Roosevelt
- 51. Sped
- 52. Panders
- 56. Carraran mountains?
- 59. Female elephants
- 60. Broadway hit signs
- 61. Washington
- 64. It enters the Black?
- 66. Beginning with
- 67. Employed
- 68. Tired
- 69. Brown of CSS Space News
- 70. Undo an Undo
- 71. I gave him one, you gave him two, they gave him three or four

DOWN

- 1. Tunneling "mice"
- 2. C'est _____
- 3. Off-limits land
- 4. Dernier _____
- 5. A mansion, perhaps
- 6. Brings in the bacon
- 7. Geller and Cummings
- 8. Lisa to Maggie
- 9. Cubic meters
- 10. Top _____: Newest video game in the SAC
- 11. Good spirit
- 12. Thought by Alain?
- 13. "The World According to _____"
- 19. Somalians
- 22. Destroy
- 25. Victim of fratricide
- 26. To go French
- 27. Understand
- 29. Bald, earringed man
- 30. Land of 43-Down
- 31. He not Claudius
- 32. Rev
- 33. Addams
- 34. Butt
- 35. Lamb's pseudonym
- 37. Single
- 41. Uters
- 43. 30-Down container
- 44. Uncle Scotty
- 45. Boat on the Nile
- 48. Husks
- 50. Gravity might do it
- 52. Landlordless apt.
- 53. Not a ketone, nor an alcohol
- 54. Antagonist in first Xanth book
- 55. Good health
- 56. When a door is not a door
- 57. Mexican thought cost
- 58. Unexplicable overhead phenomena
- 59. Boys and girls
- 62. Where the word "robot" was first used
- 63. Another compass direction
- 65. Place to exercise

After a five week hiatus, it's back! The one and only...

CSS SPACE NEWS

by Ross Brown and Devon McClain

This week begins a new format for this column. Ross Brown will bring you the news of spacecraft and the space program, while Devon McClain will occasionally contribute the latest in the world of astronomy and space science. This column will be shifted overall to an even mix of astronomy, space science and space exploration. Enjoy!

Discovery Meets Mir in Orbit

Last Monday, February 6th, the Discovery space shuttle and the Russian Mir space station came within spittin' distance of each other while speeding at 18,000 miles an hour 245 miles above the Pacific Ocean. Overcoming a fuel leak that threatened to scrub the mission, the Discovery astronaut team became the first American crew to meet Russians in space in 20 years. The last time astronauts and cosmonauts met each other above Earth was the Apollo-Soyuz rendezvous in 1975.

The commander of the space shuttle, James Wetherbee, maneuvered the 100 ton space shuttle to within 37 feet of the Mir space station. This flight also saw two other "firsts." Eileen Collins was the first woman to hold the position of pilot in the entire history of the 14 year old shuttle program. Also, Payload Commander Bernard Harris Jr. had the honor of being the first African American to go on a "spacewalk."

This experiment recalls the days of the Gemini series of projects, in which every mission was carefully thought out to test all of the maneuvers and situations that might arise on a mission to the moon. In incremental steps, the Gemini crews

trained themselves (and the operations personnel) for the 'moon shot' of Kennedy's challenge. In a similar way, the space shuttle crews are gearing up for rendezvous with the Russians to build an international space station.

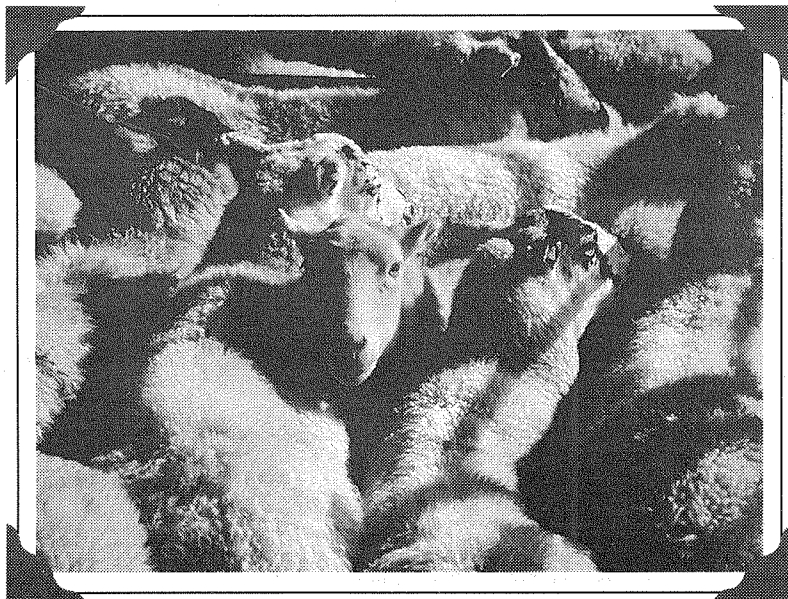
Many obstacles must be overcome before the cooperative effort can begin. The Mir space station and the space shuttle have many differences, the most troubling of them all is the difference in standards. For example, Mir is metric, while the space shuttle is based on the English system of units. The Russians' technology is considered by some here in the west to be arcane, but has stood the test of time remarkably well. By contrast, the American spacecraft are made with extreme care and high construction standards, but it remains vulnerable to the rigors of space.

But NASA remains optimistic. Last week's gymnastics by the space shuttle, no more than 44 feet from Mir, put the sensing and tracking devices aboard Discovery to the ultimate test. There were worries that the angular design of the Russian space station would throw off the shuttle's radar and navigation sensors, but they were assuaged when the shuttle strayed no more than four degrees off course.

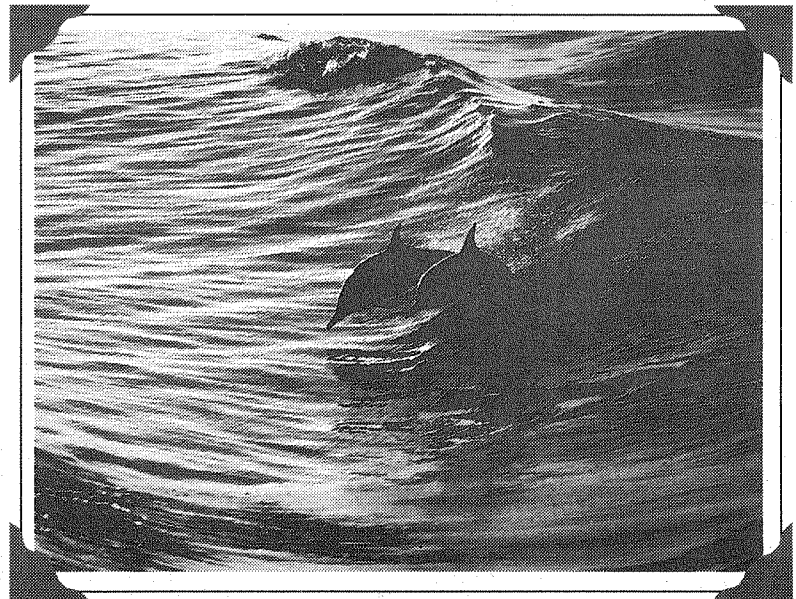
The space shuttle is scheduled to actually dock with the 9-year old Mir space station starting this June, leading to the total merger of the space programs of the two former Cold War rivals by 1997. This unified space program will lead the world in the construction of the 40 billion dollar global space station. Discovery landed at Kennedy Space Center last Friday.

SEE CSS, PAGE 5

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FROM PAGE 4

Reigniting Supernova 1987A

Sometime in early 1997, astronomers may be able to witness the rebirth of a long dead star. In 1987, the seemingly insignificant star in the Large Magellanic Cloud, designated Sanduleak -69°202, ended its life as a blue supergiant in the most spectacular supernova in almost four centuries. Supernova 1987A continued

to provide astronomers with a wealth of information for several years afterward. Today, the star can barely be seen without a telescope. Yet it may shine brightly once more.

Before it went supernova, Sanduleak followed the life of an aging red and, later, a blue star. It expelled several solar masses of material on solar winds over a period of about a million years during its time as a red supergiant. When it became a blue supergiant, the solar wind greatly increased as did the material it carried with it. Both periods succeeded in accumulating a large ring

of dust and gas about a light year in diameter around the star. The debris from Supernova 1987A is now on a direct course for this ring of material. When the two collide, the ring will heat up and begin to glow. Even though it is the ring that will be glowing, it will appear about an arc-second in diameter so only large telescopes such as the Hubble will be able to discern any fine detail. Observers on Earth will be able to see the rebirth of Sanduleak as a 6 to 9th magnitude point of light. It truly will be a fitting end for a Supernova that has given us so much to see already.

Earth's Second Moon

I'll bet you didn't know Earth had two moons! It seems that several observations have been made over the years of a mysterious reflection of the sun's light in a region in the path of the moon's orbit around Earth. This area is called a Lagrange point by astrodynamics, and trails the moon by about 60° in its orbit.

The most likely possibility is that there is a collection of gas and tiny particles trapped there by gravity. This dust may be the leftover materials from the formation of the solar system, or merely recent particles from passing comets swept up

by the gravity fields of Earth and Luna. If you consider any collection of material to be a satellite, then our Earth has two!

This phenomenon is difficult to observe with ground based telescopes because of atmospheric effects, but someday may be studied by probes or space based telescopes. If this is indeed true, then we would have difficulty parking a space station at this Lagrange point because of the danger of micro-meteoroid impacts.

If you wish to know more about CSS and its activities, please call us at 568-8028, write us at 157-58 SAC or email us: css@cco.caltech.edu.

YNEWS

by Topher Hunter

Crunch! Smack! Slam!

What do those sounds mean? Those are the sounds of **Boffo Bonecrusher Broomball** in action! That's right, sign ups open today for this term's Broomball tournament. We'll be playing on Sunday, Feb. 26, from 10:30 pm to 4:30 am. (Note the unusual day and times.) Since we have more ice time this term, we have space for ten teams to sign up. Prices are \$30 per undergraduate team and \$45 per graduate team.

Black History Month continues at the Y, with a dramatic presentation by the Ixthus Players today at noon in Winnett. The Black History Film Fest will be showing *Daughters of the Dust* in the Y lounge on Tuesday at 7:30 pm. For storytelling entertainment, drop by Winnett Center on Friday the 24th to hear the magic of Ellaraino. Black History Month comes to a colorful close next Saturday, the 25th, with an African Marketplace at Brown Gym from 10-2, and a jazz classics concert (also in Brown Gym) from 2-6 pm, featuring the musical talents of Patrice Rushen and Nduagu Chanler.

In other news: the O. J. Simpson trial is on the Y TV most every day. Drop by, rot your brain, and categorically prove that you have no life.

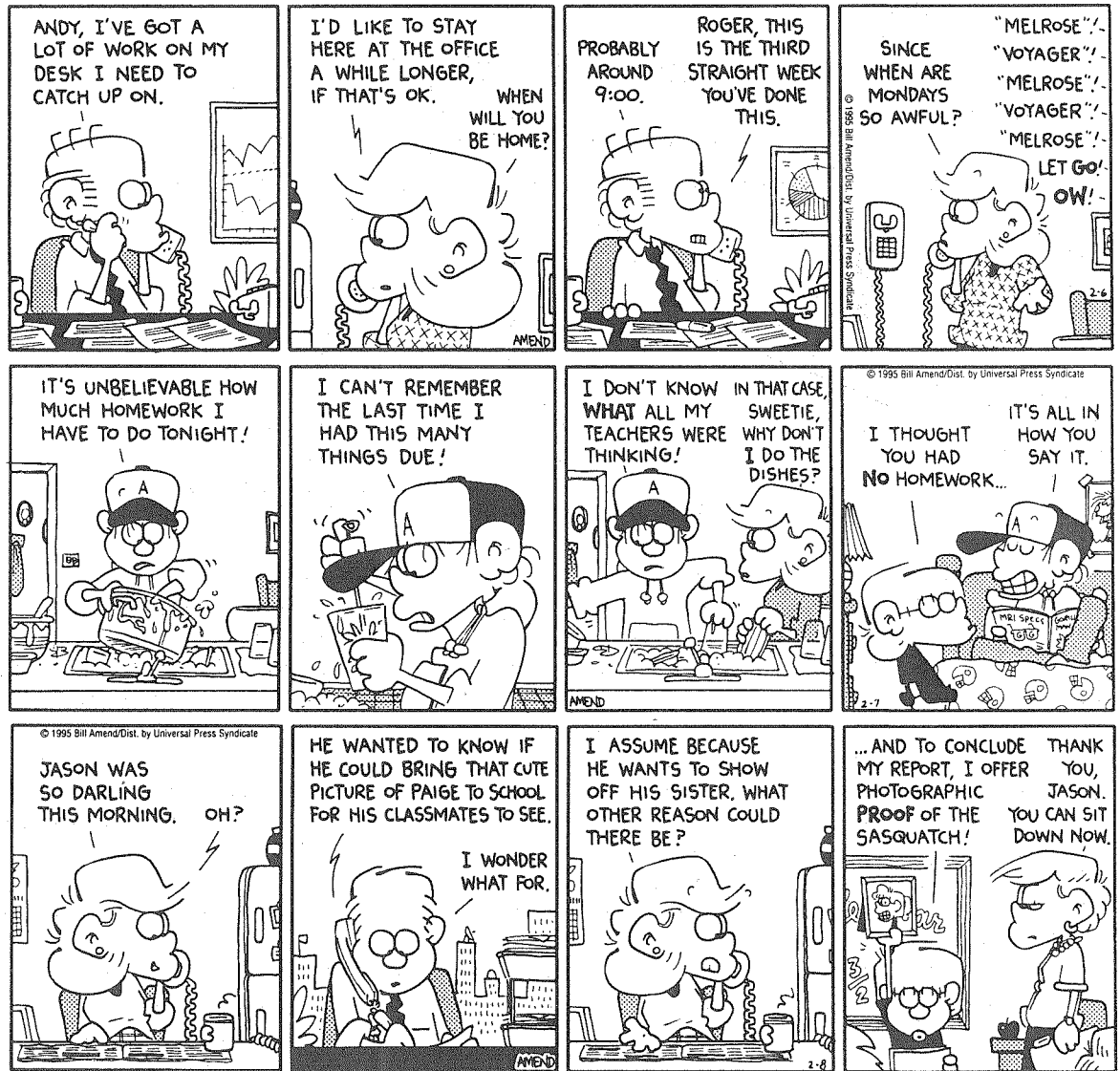
Earth Day is coming soon, and if you'd like to help plan Caltech's celebrations, come by the meeting on the 22nd at noon.

Lastly, the Y will be sponsoring another **Pepper Spray** training class on the 23rd from 12-4 pm. Drop by the Y or call x6164.

Remember, folks: if you'd like to help with the Y's planning, or if you're just curious as to how things work up here, our ExComm meetings are open to all members of the Caltech Community. The ExComm meets at noon every Monday in the Y lounge. We'd love to have your company!

FoxTrot

by Bill Amend



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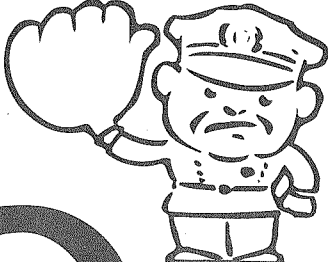
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 - B. Send and receive Internet e-mail using Delrina Internet Messenger™
 - C. All of the above

3. When the prof gives you an assignment you:
 - A. Panic
 - B. Think to yourself 'It'll be easier the second time around.'
 - C. Smile smugly because you have WinComm PRO 1.1, the perfect research tool that lets you access on-line information with the click of a button

4. Dylan is currently dating:
 - A. Kelly
 - B. Valerie
 - C. Who cares, tell me more about WinComm PRO.

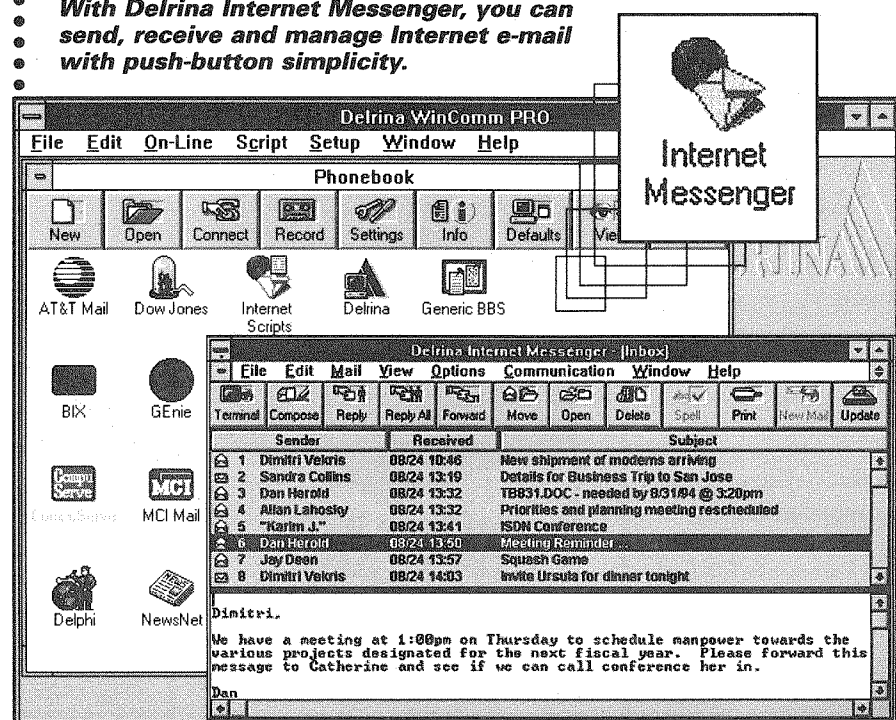
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SPORTS

Matters Left Undecided As Cross Country Team Heads For Bahamas

by Tom Meyer

Last weekend took the Caltech men's cross-country team back to La Mirada "Frisbee Golf" Park for the important SCIAC Multi-Dual Meet, the first of two meets that determine conference standings for this season. Despite strong individual performances by several team members, Caltech came away with several unexpected defeats and a 1-6 record for the meet. Hopes are set on the conference championship meet that is still another weekend away, when the team hopes to have said its final farewell to Adams States and anything (workouts in particular) related to it, as well as benefitting from a full complement of healthy, uninjured runners.

A light precipitation the night before the race prepped the turf at La Mirada to sodden perfection for the day's struggle, but Caltech was to figure poorly against their opponents. Dan "Tip of the Iceberg" Kleiman jogged through an incredibly-paced 26:44 race, taking down all but three men by the time he entered the finish chute. But Schuyler "Who needs shins?" Cullen didn't quite pick up the slack between Kleiman and the entire scoring team of La Verne University. His victory over their sixth runner was significant for team morale, however, even if it didn't put fear into the hearts of Caltech's old nemesis. Tom Meyer and Francisco "Darwin" Gutierrez added to the score, finishing within fractions of a second each other around 29:51, and Ron "I run the 800" Stieger completed the scoring for Caltech seconds later. Although Meyer broke 30:00 for a personal first, and Gutierrez for a first this season, the pack performance wasn't enough to compete with the impressive times both La Verne and Whitter presented. Only Cal Lu succumbed, although that victory was muted by the fact that Cal Lu didn't even field a full team.

Workouts in these intervening weeks between meets will focus on "doing grass" (in Lacy Park) as well as concentrating on "kicking—" (at Prado Park). Coach O'Brien intends to pursue more ingenious workouts in an effort to push a new and improved pack under the thirty minute mark. Keep in mind that practices are open to any interested KELROF runners.

Caltech Velo Hits the Road

by Michael Kantner

The intercollegiate road cycling season started slowly for Caltech. In San Diego, on February 4th and 5th, the team finished 12th and 11th. A week later, in Long Beach, the team placed 11th and 10th. While not really pacing well as a team, there were some strong individual performances.

The season started on February 4th with a road race 25 miles east of San Diego. The course was 14 miles of steep hills. Michael Kantner raced in the Men's C category (2 laps). The hills quickly shredded the pack, and he finished 18th. Cyrus Behroozi was the team's only entrant in the Men's D (1 lap) race. He finished out of contention, and saw the first crash of the season. No one was hurt, and Cyrus was not involved. Jody White provided the high note of the day, finishing 11th in the Women's B (1 lap) race.

Caltech fared slightly better in Sunday's criterium. The 0.9 mile loop had a hill before the finish line, which led to some exciting sprint finishes. Unfortunately, Caltech was not involved with them. Cyrus placed 7th in the Men's D race. Jody earned prime points for the team, though she did not place in the Women's B race. Michael was trapped behind a crash during the last lap of the Men's C race. He did not fall, but was forced to nearly stop to avoid other fallen riders.

The team had more success at the Long Beach criteriums on February 11th and 12th. Saturday's loop was 0.8 miles long with 6 turns. As usual, Jody was Caltech's only entrant for the Women's B race. Midway through the race, 3 riders broke off the front of the pack. Jody missed the break, and was left in the main group. Ini-

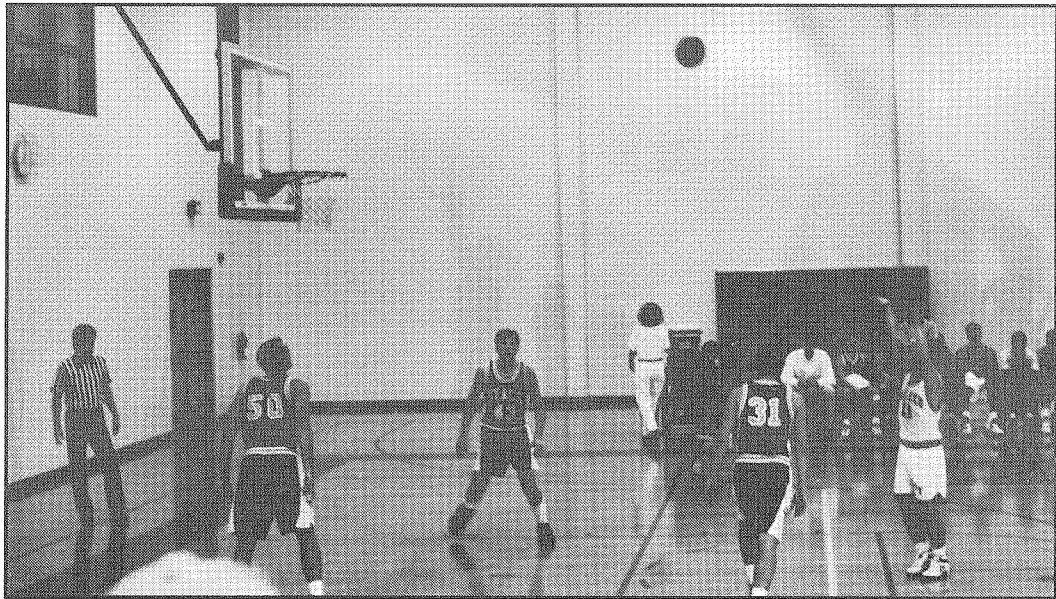
tially, she tried to catch the breakaway, but no one else was helping. It quickly became apparent that the break was gone for good. With one lap to go, Jody was following Kate Elsley (from UCSD) who increased the tempo. The main group disintegrated, and Jody and Kate were alone in front. In the final straight-away, Kate led the sprint for 4th place. Jody tried to come around on Kate's right, but she didn't have enough time. Jody was 5th overall, about 1 foot away from 4th place.

Cyrus's luck was not as good. The Men's D race ended in a field sprint. Cyrus was in great position going into the final turn, about 10 people behind the front on the inside. However, the two riders directly in front of him touched handlebars and crashed. Cyrus slammed on his brakes, but was unable to avoid hitting them. He fell, sprained his wrist, and did not place.

The Men's C race was uneventful, until the last lap. At the start of the final lap, a UCSB rider jumped off the front. Michael attempted to go with him. He misjudged the UCSB rider's speed and was caught in second place, 10 yards behind the leader and 20 yards ahead of the pack. After a fatal moment of indecision, he decided to try and solo to the finish line. UCSB had teammates in the front of the pack blocking for their rider, so Michael had a chance for second. With 30 yards to go, the pack caught Michael, and he finished 9th overall. The UCSB rider was not caught, and he won the race.

Sunday's criteriums were less exciting. Jody placed 7th in the Women's B criterium and also earned prime points for the team. Michael's race (Men's C) ended in a field sprint, and he placed 5th. Midterms and a sprained wrist kept Cyrus from racing.

There is intercollegiate road racing nearly every weekend until May. On April 2, Caltech is hosting a race on campus. For more information on collegiate cycling, contact Michael Kantner at x4882 or cycling@cco. One day racing licenses are available, and there are races for all skill levels.



SAMANTHA FOSTER

A beautiful shot from Tech at the basketball game against Claremont-Mudd on Saturday. This Saturday we play LaVerne at 7:30 pm. Be there!

Men's Tennis vs. Biola

by Jason Jenkins and Ronak Bhatt

After a close match with Whittier and a tough loss to Occidental, the Caltech men's tennis team found its form this past Saturday, February eleventh, against Biola. Caltech swept all six singles matches, giving up no more than five games in any match.

The Biola match saw many players knock the rust off their games. Team captain and senior Chandra Das led the way to victory with a 6-3, 6-2 win over Will Geisler of Biola. In second and third singles juniors Atul Salvekar and Amir Alagheband handled their opponents with ease,

winning 6-1, 6-4 and 6-2, 6-3 respectively. At fourth, fifth, and sixth singles freshmen Jenkins, Ronak Bhatt, and Dhazi Chen followed suit with easy wins.

In doubles action on Saturday the first doubles team of Das and Alagheband lost a tight two set match. At second doubles, the undefeated team of Bhatt and Jenkins added another win to their list of victories. At third doubles, Mike Zeineh teamed with Atul Salvekar to add strength and experience to the winning team.

When all was said and done and the smog had cleared the final score was Caltech 8, Biola 1. Come out and see the men's tennis team take on Pomona at home on Wednesday, February 22 at 3:00 PM.

Intense V-Ball Opener

by Daniel Chang

Last Friday, the Caltech Men's Volleyball Club team hosted Pasadena City College in a battle for bragging rights in Pasadena. Loud and fired-up, the PCC squad came with their hoard of fans. Add that to the Caltech fans, and over eighty spectators were there, yelling and screaming for one thing—intense volleyball action. That is exactly what they got.

Caltech jumped to an early lead in Game 1 with a devastating solo block by opposite Jack Prater, eliciting a roaring cheer from fans and players alike. Paul Barriga led the outside attack, hitting around the opponent block at will for a team-high seven kills. But sloppy serving on the part of Caltech—eight service errors in all—cost us the game, 15-10.

Concentrating more on our service, Caltech worked to a 14-12 lead in Game 2. Ready to tie the match at one apiece, Andreas Masuhr put the ball into play at game point. But then misfortune struck. In a collision at the net, Paul sprained his left knee. Jack immediately came in for Paul, contributing two quick kills to seal the game, which went to Caltech, 15-12.

Happy to make it out of Game 2 with a win, Caltech was ready to take the lead. Staying with the outside attack, Chad Edwards kept setting outside hitters Andreas and Jack, who earned nine and eight kills, respectively. Although middle blocker Stuart Demcak had two kills in the game, the middle attack was never established as a viable threat, and Caltech lost a close game, 15-13.

With eight kills in Game 4, Andreas continued his superb outside hitting. However, Jack was troubled by inconsistency, as evidenced by his five kills and nine attack errors. Caltech's only service ace came in Game 4 at the hands of Brendan McKenney. Although close, Caltech let the game—and the match—slip away, 15-12.

The match was a riveting 2-hour, 10-minute battle, and everyone present knows that it could have easily gone either way. We'll get them next time, when we visit PCC. By the way, the game against Claremont McKenna tonight at 7:30 pm. has been canceled.

Come out, join the action, and show your support for the Caltech Men's Volleyball Club team!

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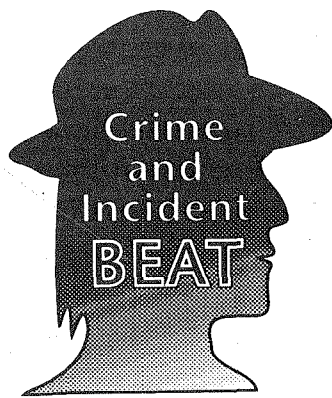
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Saturday, February 25th

Locations: UCLA, USC, CSUN, PCC, UCR, Cal Poly, Pomona

KAPLAN

The Caltech Space Society, a chapter of SEDS and the National Space Society, is hosting a high school educational conference called Space 101. If you would like to assist with this event, which will take place on Saturday, February 25, please come to our meeting this Saturday in SAC 15, Clubroom B (next to the music wing of the SAC). If you would like to assist but cannot attend this meeting, email css@cco or call 568-8028. *Ad Astra!*



SPECIAL TOPICS COURSES OFFERED SPRING TERM

Freud. The development of psychoanalysis, especially Freud's theories of hysteria and dreams, from its origins until the early years of the twentieth century will be covered in Hum 119. Topics will include the interplay between Freud's developing theories and clinical evidence and his relations with the scientific and medical community of the day. Course offered by Prof. Pigman Th 1-3. Advanced Humanities credit.

Ec 101—Industrial Organization. Third term Prof. Simon Wilkie is teaching a course that will examine how technology affects issues of market structure, such as the number of firms in an industry, and how market structure affects observable economic outcomes such as: prices, profits, advertising, and research and development expenditures. Emphasis will be on how the analytic tools developed in the course can be used to examine particular industries in detail. Offered MW 2:30-4.

Documenting African American Life in the Jim Crow South (H 161) taught by Robert Korstad, visiting professor of history from Duke University, will explore the lives of African Americans during the age of Jim Crow. In addition to books, articles, and primary documents, the course will use film, music, and art to interpret the inner life of the black community as it affected and was affected by the external constraints imposed by disenfranchisement and segregation. First-person testimony of African Americans who lived during the period between the late 1890s to the beginnings of the direct action civil rights movement after WW II will be stressed. Th 7:30 p.m. Enrollment limited.

Prof. Robert Rosenstone will teach **U.S. and Japan: The Cultural Encounter (H 161)** spring term. The course will deal with the cultural, personal, and political interaction between the United States and Japan, and the American people and the Japanese, since the first contacts between the two nations in the mid-nineteenth century. Topics will include (but not be limited to) the Westernization of Japan, the Japanization of (some) Americans, images and stereotypes, racism and national competition, World War II, motion pictures, and baseball. M 1-3; third hour to be arranged.

Course on **Latin American Literature (Lit 180).** 20th-century narrative, in translation. Students will be introduced to the study of short stories and novels by well-known authors, such as Horacio Quiroga, Maria Luisa Bombal, Jorge Luis Borges, Gabriel Garcia Márquez, Julio Cortézar, Juan Rulfo, and Carlos Fuentes, among others. Aspects to be examined in the course are the interplay of history and fiction, the rise of anti-realist trends in contemporary fiction, and the ideological role of fantasy in Latin American culture. Instructor: Mabel Moraña. TT 9:30-11.

Bike Thievery

Feb. 2	White 10-speed	\$150
Feb. 2	Blue	\$60
Feb. 10	Red Trek w/helmet	\$300

Other Thievery

Feb. 5	Personal portable computer	\$3,000
Feb. 8	Backpack w/books & swimjacket	\$???

"We Want Beer!"

February 3: Soda machine found laying on the steps of the Firestone, overturned trash can on the south side of Winnett. Security made a search of the area, no suspects in area. The machine appears to have been pushed from the second floor of Page House

February 5, The Day of Suspicious White Males

Case 1: 5'7", wearing a black and white checkered shirt, was seen writing on the walls of Dabney House Library. (*Yeah? So? —ed.*) Suspect last seen leaving in the direction of Olive Walk. Security responded, suspect no longer in the area.

Case 2: Tall, long blond hair, sleeping in the hillside area behind 1121-1127 South Arden. Security check the area and found a bed-roll. Security made further search of the area with negative results.

Case 3: 49, 5'8", 160 lb., brown hair, blue eyes, blue jeans, striped shirt, black shoes. Was loitering on the porch of 286 S. Chester. Security responded, determined that the suspected was not affiliated with Caltech and escorted him off campus.

"Dieseling?"

February 8, 9:50 AM: security discovered a grey four-door Toyota Corolla dieseling on the corner of San Pasqual and Holliston Street. No occupants inside the vehicle; ignition in the off position. Sparks and smoke were observed coming from under the front portion of the vehicle. Fire Department responded. The owner was later notified.

"Where Am I?"

February 10, 8:10 PM: intrusion alarm activated in the Central Engineering Service Building. Security responded and discovered a subject inside the building. It was discovered that subject was Caltech-affiliated. Suspect was informed that he was in a restricted area.

Twilight Zone

February 11, 4:55 AM: at 1170 E. Del Mar Blvd., person reported hearing the door bell ring several times, when investigated, no one was at the door. Security notified, made a check of the area, all secured.

That Incident

February 12, 11:10 PM: security responded to report of a water flooding in the Student Activities Center. Student had accidentally bumped a back pressure valve, causing it to rupture. On duty maintenance mechanic and Custodial Service responded for clean up. There were no injuries. (*Whaddaya mean, no injuries? How about lower back pain from trying to bail water out of the Tech office? — ed.*)

S & M

by Sharon & Marc

Next Monday we will be celebrating Presidents' Day, commemorating two of our country's greatest leaders, George Washington and Abraham Lincoln. We were planning on taking this opportunity to comment on more recent presidents, but we decided that we didn't want this week's column to be overly negative. And while politics usually provide excellent fodder for our humorous proclivities, this week we opt for a different tone.

Two summers ago, we visited Washington D.C., partly as tourists, but also as citizens searching for reminders of why we should be proud of our great country. Our quest was not unrewarded, one of our most memorable stops was in the Lincoln Memorial. There we read the Gettysburg Address, a brief yet powerful reminder of one of our country's darkest hours, and of the price that we have paid over the decades to protect our freedom. We were unabashedly moved.

Below is a reprint of the Gettysburg Address. We hope that reading it will help to remind you, as it did us, of why we should take such pride in our country, and why we celebrate the lives of two of its greatest presidents.

"Fourscore and seven years ago our fathers brought forth on this continent a new nation, conceived in liberty and dedicated to the proposition that all men are created equal. Now we are engaged in a great civil war, testing whether that nation or any nation so conceived and so dedicated can long endure. We are met on a great battlefield of that war. We have come to dedicate a portion of that field as a final resting-place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this. But in a larger sense, we cannot dedicate, we cannot consecrate, we cannot hallow this ground. The brave men, living and dead who struggled here have consecrated it far above our poor power to add or detract. The world will little note nor long remember what we say here, but it can never forget what they did here. It is for us the living rather to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us — that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion — that we here highly resolve that these dead shall not have died in vain, that this nation under God shall have a new birth of freedom, and that government of the people, by the people, for the people shall not perish from the earth."

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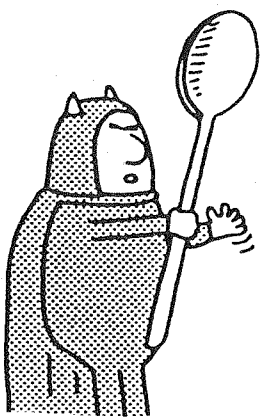
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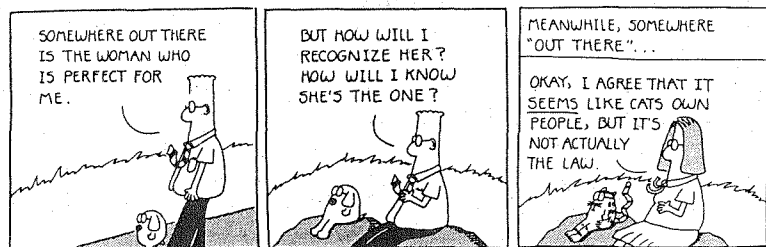
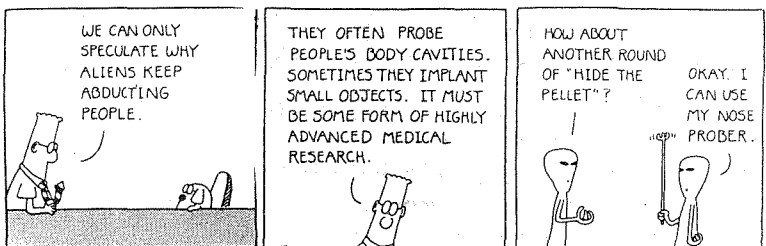
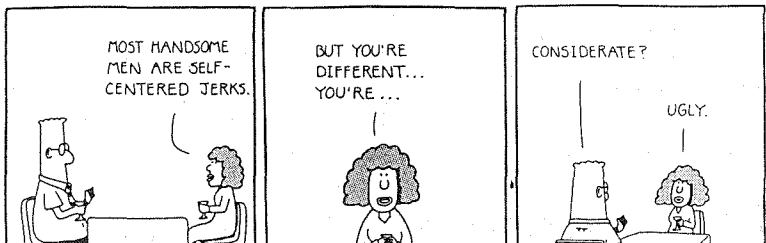
Dilbert®

Try your hand at the following list of trivia questions...all about our favorite comic strip.

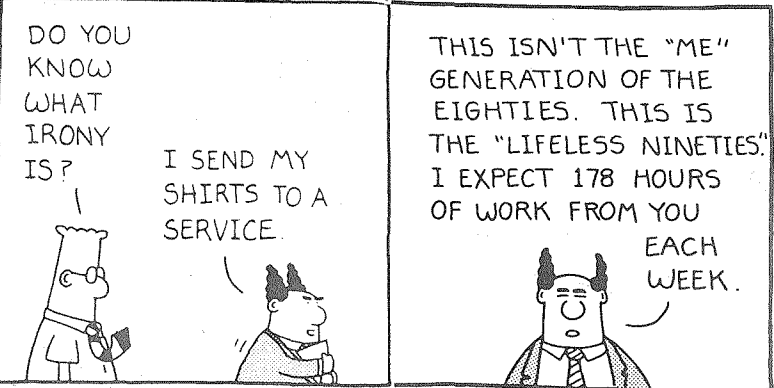


1. Here's an easy one. Who draws Dilbert®?
2. What is his e-mail address?
3. For what company does he work for?
4. Can you name the 4 characters in Dilbert®'s household?
5. How many of Dilbert®'s coworkers can you name?
6. Who is this character on the left? How was he created?
7. What is the title of the first Dilbert® book?
8. What was the last issue of *The California Tech* that did not run any Dilbert® comics? And why?
9. What was the first issue to run Dilbert®? (within one month)

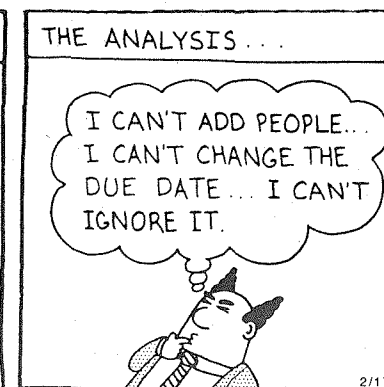
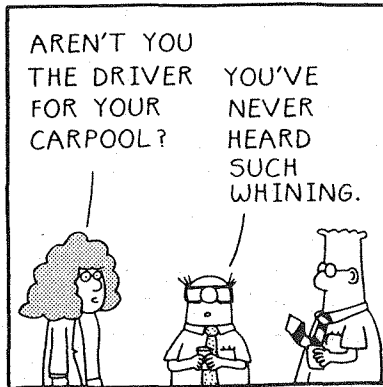
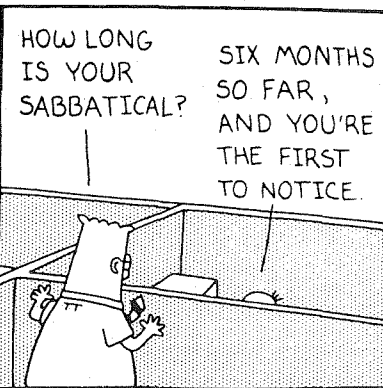
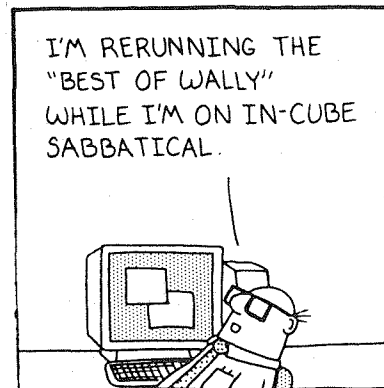
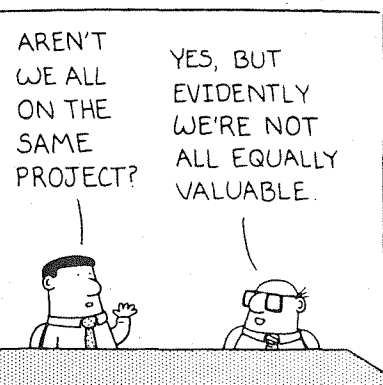
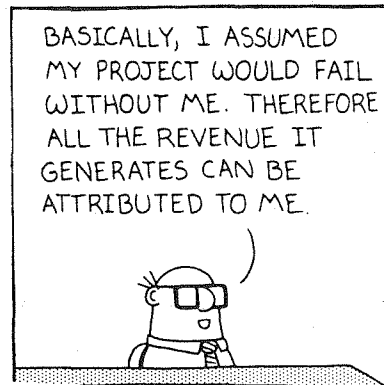
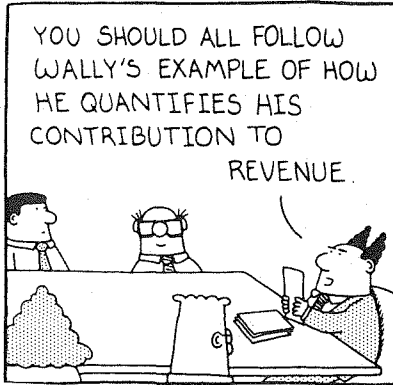
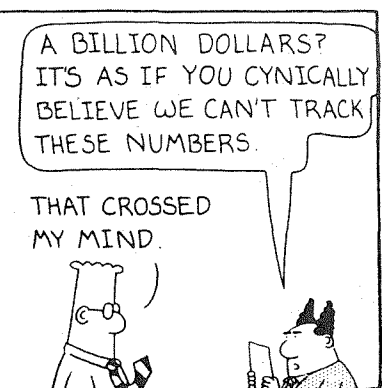
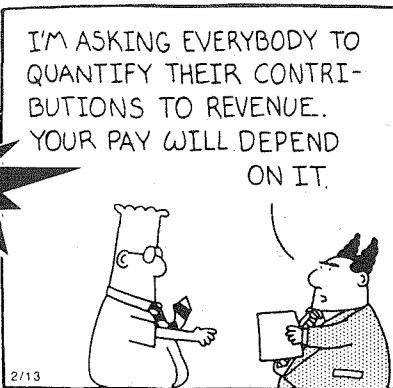
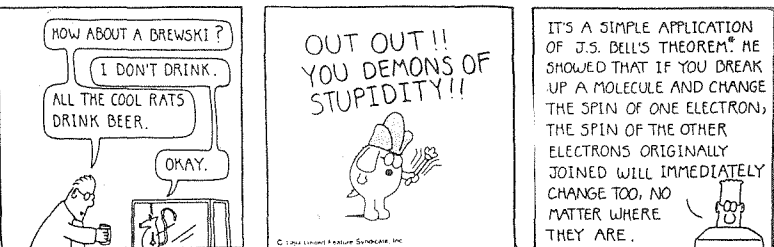
10. Which one of these three strips was in that issue?



11. In what issue this term were undergraduates treated to an entire page of Dilbert®?
12. What was the last issue to not run a full complement (6 days) of Dilbert®? How much did it run and where was it run?
13. Name the people in the group of three that ran for *Tech* editor on an all-Dilbert® platform.
14. Which of these four panels has this paper not run before this issue?



15. Name the date this panel appeared, within 6 months.
16. How about this one? (Within 3 months)
17. What footnote followed the * in this panel?



Contest Results: Elementary States?

I goofed on the last announcement of the results. People noticed that while I said Florida was the Everglade State, I listed Washington as having that sobriquet. What I meant to say was that although both Washington and Florida both have the moniker "The Everglade State," Washington is more commonly known as "The Evergreen State," so perhaps you thought I made a mistake. And if that didn't confuse you enough, instead of giving the winner's result I had given the runner-up's! Anyway, Advocita got 12 right, not 11.

Another goof was in yesterday's crossword...we had two extra black squares. As many chemists know, many elements were discovered independently by different people, and although each of them may suggest a name, only one of them goes into the accepted nomenclature. Most of the names I listed are "rejected" names of this sort. Anyway, the answers are: BREVIUM = element 91 = PROTACTINIUM, AUSONIUM = element 93 = NEPTUNIUM, ESPERIUM = element 94 = PLUTONIUM. EKAWOLFRAM is element 92, URANIUM. It's the name that would have been assigned had Mendeleev's notation caught on (prefix EKA- to the element above in the same group). You *did* know that WOLFRAM referred to TUNGSTEN, did you not? Also, HYPON = element 118, hopefully the next noble gas to be discovered, and KURCHATOVIVUM = element 104, an element whose official name is still in dispute. The IUPAC calls it UNNILLQUADIUM, another group calls it RUTHERFORDIUM. This name is after the physicist Igor Vasilyevich Kurchatov. And finally, inspired by Eric Temple Bell (famous mathematician), we have SAPTRINGSHATLAWRENCIUM, element number 1287. (What am I talking about? Go and read the May 1935 issue of *Astounding Stories*.)

Oh, and the check was won by John Hubenschmidt, who did *not* get the last question.

Send your answers to gp@tech before Wednesday 8:00pm. Win \$10!

Notices

NEW Please note: the Caltech Weekly Calendar lists the wrong times for the Sunday performances of *The Fever*. The show will start at 8:00 p.m., not at 2:00 p.m. as listed. The Friday and Saturday performances are correctly listed as starting at 8:00 p.m.

The Totem is now accepting submissions! All undergraduates, graduates, and faculty are welcome to submit poems, short stories, essays, photos, art, music, or any original compositions. *The Totem* is also looking for a creative cover design for this year's volume. Designs should be drawn in ink and be 8 1/2" x 11". Please limit designs to two colors. The winner will receive \$25 and a free, autographed copy of *The Totem*! The deadline for both talent

searches is April 14th. Send all submissions either by e-mail (totem@tech.caltech.edu), mail (MSC 990), or by foot (Page, room 132).

Sharyn Slavin, Assistant Vice

President for Student Affairs, and Stan Borodinsky, Student Affairs Administrator, invite you to stop by the Coffeehouse on Friday afternoons from 2 to 4 p.m. to talk with them. All students are welcome, and free drinks will be available. Please drop by and get to know Sharyn and Stan. They will be happy to answer questions or provide assistance.

The AIDS Service Center pre-

sents "Just Say Know," a free educational support group that will explore different topics related to HIV and AIDS. "Just Say Know" will meet every Tuesday from 6:30 to 8:30 p.m. through March 21st at the AIDS Service Center, 126 West Del Mar Boulevard, Pasadena. To participate, call Tom Drake at (818) 398-4553.

The Caltech Muslim Student Association will hold Muslim Fri-

day Prayers weekly in the Y-lounge at 12:15 p.m.

"Take a Break and Spend Some Time with Friends." The office of the International Student Programs would like to invite you to our Open House for coffee, tea and conversation. Every Wednesday from 4:00 p.m. - 5:30 p.m. at the office of International Student Programs, Olive Walk. Open to the entire Caltech community.

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PCI 486DX2-66MHz w/o CPU\$135	MGC 15" 1280 .28 NI "GREEN"SVGA\$295
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Pentium 90MHz 256K, w/2 16550C serial, EPP parallel,FD/HD controller\$275	ACER 15" .28 NI, LR, "GREEN", Digital\$335
	ACER 17" 1280 .28 NI, LR, "GREEN"\$615
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	CTX 15" .28 NI, LR SVGA\$295
	CTX 17" .28 NI, LR SVGA\$595
	MAG 15" .28 NI, "GREEN" SVGA\$370
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From the Counseling Center

The Counseling Center is continuing its series on relationships with its presentation on: "Love and Hate: Avoiding the Pull to Co-Dependency" on Wednesday, February 22nd between 7:00 and 8:30 p.m. in the Caltech Y Lounge. Dr. Leslie Maxson, Clinical Psychologist, plans to illustrate the insidious and damaging way that co-dependency can enter into love relationships as well as the ways it can help relationships. This workshop will be especially useful for anyone who frequently finds himself/herself in a helping role, and will cover limit setting as well as ideas for building healthy relationships.

The Gay, Lesbian and Bisexual Support Group meets the first and third Tuesdays of each month at 7:30 p.m. in the Health Center Lounge. This confidential meeting is open to all Caltech community members looking for a supportive context in which to address questions and concerns about sexual orientation — including coming out, being out, self-discovery, coping with families... We begin with a focus topic but move to whatever is feeling most relevant to the group that night. Refreshments are served. For information, please call 395-8331.

Coming Events

§The Caltech Folk Music Society presents a performance by the famed folk singer Utah Phillips on Sunday, February 26th, in Dabney Hall at 7:30 p.m. Admission is \$12.50 for general admission, \$4.00 for Caltech students.

§On February 19th at 7:00 p.m. in the Dabney Lounge, the Chamber Music group will be holding a free concert focusing on the Chamber Music of Franz Schubert. The concert will include Schubert's Piano in E-flat, Op. 100, Der Tod und das Mädchen, Op. 7, No. 3, and the String Quartet in D minor, D. 810 "Death and the Maiden."

The Chinese Golden Dragon Acrobats will present gymnastics, magic, slapstick comedy and Chinese Dance on February 18th at 8 p.m. in the Beckman Auditorium. Admission will range from \$19.00 to \$25.00 for adults, \$8.00 for student tickets sales beginning one half hour before the performance.

The Lark Quartet will perform in the Beckman Auditorium on February 19th at 3:30 p.m.. The program for this Coleman Chamber Concert includes Daydn's Quartet in E-flat Major, Op. 33, No. 2; Schnitke's Quartet No. 3; and Beethoven's Quartet in F Major, Op. 135. Admission prices range from \$12.00 to \$22.50, with a \$4.00 students discount.

The Arditti String Quartet will give a Coleman Chamber Music Concert on Sunday, March 5th at 3:30 p.m. in the Beckman Auditorium. Included in the program will be Duilleux's Ainsl La Nuit; Gubaidulina's Quartet No. 3; Nancarrow's Quartet No. 3; and Berg's Lyric Suite. Fifty tickets to this concert will be available to Caltech students with identification. (limit two tickets per I.D.), available from the Caltech Ticket Office north of the Beckman. Tickets are regularly priced from \$12.00 to \$22.50.

Talks, Lectures, and Seminars

§On February 17th at 7:30 p.m. at the Los Angeles County Museum of Art, Oscar Mandel, a Caltech professor, will be holding a reading of some of his works. This is part of a series recognizing the contribution to the community by artists of spoken word, and will be held in Gallery 303 on the third floor of the Robert O. Anderson Building.

§Hosted by The Society for Calligraphy, Dr. Gene Hsiao will be giving a free lecture on Friday, March 17th, at 7:30 p.m. on "The Aesthetics and Techniques of Chinese Calligraphy" at the Pasadena City College Harbeson Hall. Dr. Hsiao's lecture will first touch upon the beauty of brush written characters and the practical value of Chinese calligraphy, followed by demonstrations of brush handling, including basic movements of the brush and taboos to be avoided.

§On Thursday, February 23rd, Dr. Ronald L. Numbers, William Coleman Professor of the History of Science and Medicine at the University of Wisconsin, will be giving a Science, Ethics, and Public Policy Lecture entitled "Scientific Creationism: From Heresy to Orthodoxy" in the Judy Library at 4:00 p.m.

Announcements

§ denotes a new announcement. Notices have been moved to page 11.

There will be another Science, Ethics, and Public Policy Lecture given by Gregg Zachary, Staff Writer on *The Wall Street Journal*, entitled "Vannevar Bush: Architect and Victim of the Postwar Scientific Order" on March 2nd at 4:00 p.m. in the Judy Lounge.

Club Announcements

§The Theatre Arts at California Institute of Technology announces auditions for the production of Steven Sondhiem's *Assassins*, a controversial musical about the history of Americans who kill. There are currently about twenty-one roles available of various age ranges, including one male child and several non-singing roles. Auditions are scheduled for Friday, February 24th between 7:30 p.m. and 10:30 p.m., Saturday, February 25th between 1:00 p.m. and 5:00 p.m., and Sunday, February 26th between 1:00 p.m. and 3:00 p.m. Auditions will be in Ramo Auditorium on the Caltech Campus. All auditioning will be asked to be prepared to sing and dance. The production also needs instrumental musicians, especially trumpet, trombone, and woodwinds, as well as technical help. The performances will be from May 26th through June 4th. Please stop by the auditions if you are interested, or phone TACIT at x6259 for more information.

§"Los Angeles Lakers versus Charlotte Hornets": The Office of International Programs invites you to watch this exciting NBA Game on February 24th at 7:30 p.m. at the Great Western Forum in Inglewood. Tickets are available to international students only. Please stop by the ISP office between February 13th and February 17th to place your name on the lottery list, or sign up via e-mail at jun@pcmail.

§The Caltech Flying Team, headed by graduate student Garrett Reisman, will be competing in SAFECON February 18th and 19th at Brackett Field in La Verne. All are invited to attend. For more information, please contact Garrett at garrett@cco.

§The Caltech Swedish Club will meet at 3 p.m. on Sunday, March 5th, at 2508 3rd Street, Apartment 8, Santa Monica to drink coffee and eat "semmlor" and Swedish cookies. Anyone interested in Scandinavian culture or speaking Swedish is welcome. For more information please contact either Lars Svensson, at (310) 450-4008 or at e-mail svensson@isi.edu or Lena Peterson at extension 6994 or e-mail lena@pcmp.

The Caltech Ballroom Dancing Club offers free beginning ballroom dance classes available to all. These are perfect classes for people who have never danced before or for people who want some basic step help. People are welcome to join the classes anytime and it is not necessary to have a partner for any of the classes. Please note, however, that the beginning ballroom dancing class has been moved to Thursday nights in Dabney for the date of February 23rd, though classes will resume on Monday nights in Winnett as of the 27th of February. In the larger room the group will learn the waltz, Viennese waltz, and polka. For more information, contact Jeanne Hardebeck at jhb@seismo.gps.caltech.edu, x6971, or MC 252-21.

The Caltech Folk Music Society are looking for more volunteers to help with mailing and publicizing their concerts, learning how to engineer the sound system, setting up before and tearing down after the concerts in exchange for free admission and a great opportunity to schmooze with guitarists, songwriters, and bluegrass musicians. If you are interested in giving a few hours a month, or would like to receive announcements for each concert, give Rex a call at 791-4583.

The Ballroom Dancing Club meets this Friday from 7:00 to 9:00 p.m. in Winnett lounge for a dance break. This dance practice is open to beginners, intermediate and advanced dancers who want to practice dancing or socialize and watch others dance. For more information, contact Jeanne Hardebeck at jhb@seismo.gps.caltech.edu, x6971, or MC 252-21.

Internships and Competitions

The Students For An Energy-Efficient Environment is announcing its first national internship program. SEEE is currently recruiting Student Government Leaders, Environmental Leaders, and other ambitious, motivated, and outstanding students from across the nation to join their internship program. Twenty students will receive a \$1000 stipend and a trip to Wash-

ington, DC, from March 17th to 19th, to learn about energy-efficient technologies and then work on campus to make them a reality. Open to Freshmen, Sophomores, and Juniors, all applications must be received by February 22nd. Please come to the Deans' Office at 102 Parsons-Gates for an application. If you have any questions about the internship or SEEE, call 617/493-6271 or e-mail at fne@husc.harvard.edu.

The Deans' Office is accepting proposals for the Monticello Foundation Internship. Three Caltech undergraduate women (current freshmen, sophomores and juniors) will be given an opportunity to participate in research projects outside the Caltech-JPL community for ten weeks during the summer. Each student will receive a \$3,600 stipend. Applicants are required to identify the projects in which they wish to participate. All arrangements with the principal researcher will be the responsibility of the student. If you are interested, simply identify a sponsor for your experience at a research facility for a ten-week period. In a short essay, describe your project, and submit it to the Deans' Office, 102 Parsons-Gates, along with two faculty recommendations. Proposals are due by March 3rd.

Completely exhausted of the long hours of constant droning by your math and physics profs? Internships for a culturally diverse group of undergraduate students interested in exploring careers in art museums and related areas of the visual arts and the humanities will be offered this summer by the J. Paul Getty Trust. Students of all cultural backgrounds and academic disciplines are encouraged to apply for this ten-week internship opportunity. Applicants must be currently enrolled in an accredited four year college. They must have completed at least two semesters of college at the time of the application. In keeping with the focus of the program, students in the Los Angeles metropolitan area and Los Angeles residents attending school elsewhere will be given priority. The internships are full-time, beginning June 19th and ending August 25th, 1995, and include a stipend of \$3,000. Individuals will be assigned to one department and will work with a mentor on specific projects. All applications materials must be postmarked by February 27th; notifications will be made by May 1st. To receive an application form, please contact Getty Undergraduate Internships for Diversity in the Arts and Humanities, Department of Education and Academic Affairs, The J.P. Getty Museum, P.O. Box 2112, Santa Monica, CA, 90 407-2112, or call (310) 451-6545.

The Indiana University Center on Philanthropy is seeking student applicant for its Jane Addams Fellowships in Philanthropy program. The fellowship program awards each fellow \$15,000 for the year and 12 credits toward a graduating degree. Created in the spirit of Jane Addams, the program encourages aspiring young leaders to work for the common good while studying and investigating the roles of philanthropy. In addition to guided study, students will select an internship with a nonprofit organization in the Indianapolis community. Applicants must show a demonstrated leadership potential, special interest in some aspect of community service, and academic stability. Qualified candidates will be recent graduates with a bachelor's degree, including seniors anticipating graduation; the program is not intended for students who are already committed to a program of graduate study. Interested persons should contact the Indianapolis University Center on Philanthropy, 550 West North Street, Suite 301, Indianapolis, IN 46202, or call (317) 274-4200.

Sao Summer Internship Program 1995 Applications are invited from undergraduates to participate in the Smithsonian Astrophysical Observatory Summer Intern Program at the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts. We anticipate that twelve positions will be offered during the summer of 1995. Research opportunities exist in all areas of astrophysics from planetary science to cosmology including theory, observation, data analysis, instrumentation and laboratory astrophysics. The program will provide students with the opportunity to use telescopes at the Oak Ridge Observatory and to present a paper at a scientific meeting. The Intern Program begins June 12th and ends August 18th, 1995. The stipend will be \$250 per week, and housing/travel will be subsidized. Applicants must be US citizens (or hold a valid green card) currently enrolled in a program leading to a bachelor's degree. Graduating seniors are not eligible. For more information email to: IN%kdow@corwin.harvard.edu

Fellowships and Scholarships

The Financial Aid Office has applications and/or information on the following and additional scholarships. All qualified students are encouraged to apply. The Financial Aid Office is located at 515 S. Wilson, second floor.

Jewish Family and Children's Services announces the continued availability of financial support for Jewish individuals and their families. There are loans, grants and scholarships available, and students may qualify for up to \$5,000 in aid. The Financial Aid Office has a flyer and questionnaire that you can use to apply, or you can call (415) 561-1226. There are no deadlines and students may apply throughout the year.

The American Chemical Society is pleased to announce a Minority Scholarship Program to African-American, Native American, and Hispanic students. Eligible students must be currently freshmen, sophomores, or juniors who are enrolled in chemistry, biochemistry, or chemical engineering programs. Scholarships of up to \$2,500 a year will be given for the sophomore year; students who will be juniors and seniors in 1995-96 will receive up to \$5,000. Interest in chemistry, biochemistry, or chemical engineering, demonstrated potential for success, and financial need will be considered in evaluating the applicants. Additionally, eligible students must be U.S. Citizens or permanent residents, and must have a minimum GPA of 3.0. To obtain an application, or more information, phone 1-800-227-5558 (then press 9, press 3, press 5). Applications are due March 1, 1995.

The Society of Manufacturing Engineers announces the availability of 41 scholarships for undergraduates, and 10 graduate fellowships. All of the undergraduate scholarships require applicants to be full-time, second year students with a minimum G.P.A. of 3.5. Forty of the scholarships are being offered to students who are enrolled in a degree program in manufacturing engineering or manufacturing engineering technology. One scholarship is available to a full-time student seeking a career in robotics/automated systems. The graduate fellowship is offered to a student in a graduate program for manufacturing engineering or manufacturing technology. Applicants for the graduate fellowship must have a minimum 3.5 G.P.A. and must have proven scholastic ability, exemplary character, and leadership capability and who have demonstrated their potential for future leadership in the profession. Completed applications are due March 1, 1995.

The Marin Education Fund is offering grants to Marin County Residents who are undergraduates enrolled at least half time. Specific criteria for grants and scholarships vary. Applications are available from the Marin Education Fund, 1010 B Street, Suite 300, San Rafael, CA 94901, (415) 459-4240. Applications must be postmarked by March 2, 1995.

Green Hills Software annually awards several merit scholarships in the amounts of \$2,500 and \$5,000 to Caltech undergraduates who have demonstrated ability and special aptitude in computer science. Those awards are for the Junior and Senior school years. In addition, Green Hills will award one or two Undergraduate Fellowships consisting of a Senior year scholarship plus a \$6,000 summer internship for the preceding summer. All awards are merit awards, given without regard to financial need. Any student currently holding a Junior year award must reapply in order to be considered for a Senior year award. The deadline for submitting the Green Hills Scholarship application to the Financial Aid Office is March 10, 1995. Applications are available at the Financial Aid Office, 515 S. Wilson, and the Dean's Office, 102-31.

The American Scandinavian Foundation of Los An-

geles (ASF/LA) is awarding four \$1,000 scholarships to undergraduate and graduate students with a demonstrated interest in Scandinavia. Applicants must have strong academic qualifications and must show financial need. Two letters of recommendation, appropriate transcripts, and the completed application are due by March 15, 1995.

The American Association of University Women, Danville-Alamo Branch, will be awarding several scholarships of \$500-\$1,000 to female students who will be juniors or seniors in the 1995-96 academic year, and who are from the San Ramon Valley (Danville, Alamo, San Ramon, or Diablo, CA). For more information or an application packet, send your request with a \$5.52 stamped, self-addressed large envelope (minimum 9" x 6") to: Janet Lather, 703 Contada Circle, Danville, CA 94526. Completed applications must be postmarked by March 31, 1995.

The Sunkyong Group of Korea presents its Third Annual Essay Contest for undergraduate and graduate students in the areas of business, government/law, science, and journalism. There will be four \$500 awards, four \$1,000 awards, and four \$2,500 awards. The \$2,500 award winners will also receive a one-week trip to Korea. Past winners of the essay contest are not eligible to compete. Guidelines for the essay contest are available at the Financial Aid Office. All contest entries must be postmarked no later than April 7, 1995.

The Chinese-American Educational Foundation is offering scholarships to graduate and undergraduate students of Chinese descent. All applicants must be full-time students in 1995-96, and have at least a 3.0 GPA, and undergraduates must have completed at least one year of study. Completed applications must be received by April 10, 1995.

The Jewish Community Foundation and The Jewish Vocational Service have scholarship applications available now for several different scholarships under their administration. The scholarships are designed to provide financial assistance to Jewish students who are legal residents of Los Angeles County, enrolled full-time, and are able to document significant financial need. Application forms may be obtained from Jewish Vocational Service until March 1, 1995. Write to: Room 303, 6505 Wilshire Blvd., Los Angeles, CA 90048, or call (213) 653-2858. Completed applications are due April 13, 1995.

If you enjoy teaching and kids/teens in the K through high school range you might enjoy doing a Teaching Fellowship after graduation. Science and math teachers are usually in high demand, and many Caltech students have teaching or tutoring experience. A teaching fellowship can be a wonderful interim year and a great way to experience a different part of the United States. Some independent schools are residential and others are day schools. I have recently acquired a list of current teaching fellowship opportunities at independent schools. Typically fellows receive a stipend (approximately \$15,000 to 17,000 at a boarding school plus room and board). At a day school the fellowship will have a slightly higher stipend. If you would like a copy of this list, more information on these fellowships, or help applying email Lauren Stolper at Lauren_Stolper@starbase1.caltech.edu. Deadlines vary and can be as early as February or as late as June, so start exploring this fellowship now.

Attention undergraduates interested in the application of technology, innovation, or entrepreneurship: Spend next fall as a Lemelson Fellow at Hampshire College in Massachusetts. As a Lemelson Fellow you are part of a group of fellows from across the country. Each fellow participates in a special fellowship course that focuses on solving real-world problems using innovative ideas and technology. Fellows also choose courses at Hampshire and the other schools in the Five College Consortium (Amherst, Smith, Mt. Holyoke, Hampshire and U. Mass Amherst). This fellowship honors Jerome Lemelson who holds more patents than any other living American and the third largest number in American History. Lemelson, now 70, spent the majority of his career as a successful, independent inventor. Full-tuition and fees are paid for Fall 1995. The application deadline is March 15th, 1995. Email Lauren Stolper at Lauren_Stolper@starbase1.

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