

photo courtesy of www.treasure-divers.com

Ze brain coral, ze meticulous master-mind of ze Deep. Despite zer pacif facade, ze intricate folds of zees massiv organisms collectifs may hold ze memories of ze eons upon eons of ze dramatique historie of ze Ocean's climate.

Layers of Atlantic Corals Hold Record of Climate Change

By ROBERT TINDOL

The deep-sea corals of the North Atlantic are now recognized as "archives" of Earth's climatic past. Not only are they sensitive to changes in the mineral content of the water during their 100-year lifetimes, but they can also be dated very accurately.

In a new paper appearing in *Science Express*, the online publication of the American Association for the Advancement of Science (AAAS), environmental scientists describe their recent advances in "reading" the climatic history of the planet by looking at the radio-carbon of deep-sea corals known as *Desmophyllum dianthus*.

According to lead author Laura Robinson, a postdoctoral scholar at the California Institute of Technology, the work shows in principle that coral analysis could help solve some outstanding puzzles about the climate. In particular, environmental scientists would like to know why Earth's temperature has been holding so steadily for the last 10,000 years or so, after having previously been so variable.

"These corals are a new archive of climate, just like ice cores and tree rings are archives of climate," says Robinson, who works in the Caltech lab of Jess Adkins, assistant professor of geochemistry and global environmental science,

and also an author of the paper.

"One of the significant things about this study is the sheer number of corals we now have to work with," says Adkins. "We've now collected 3,700 corals in the North Atlantic, and have been able to study about 150 so far in detail. Of these, about 25 samples were used in the present study."

"To put this in perspective, I wrote my doctoral dissertation with two dozen corals available," Adkins adds.

The corals that are needed to tell Earth's climatic story are typically found at depths of a few hundred to thousands of meters. Scuba divers, by contrast, can go only about 50 to 75 meters below the surface. Besides, the water is bitter cold and the seas are choppy. And to add an additional complication, the corals can be hard to find.

The solution has been for the researchers to take out a submarine to harvest the coral. The star of the ventures so far has been the deep-submergence vehicle known as *Alvin*, which is famed for having discovered the Titanic some years back. In a 2003 expedition several hundred miles off the coast of New England, *Alvin* brought back the aforementioned 3,700 corals from the New England Seamounts.

Researchers Uncover New Details About How Signals Are Transmitted in the Brain

By ROBERT TINDOL

An international team of scientists has announced a new breakthrough in understanding the molecular details of how signals move around in the human brain. The work is basic research, but could help pharmacologists design new drugs for treating a host of neurological disorders, as well as drugs for reducing alcohol and nicotine craving.

Reporting in the November 11 issue of the journal *Nature*, researchers from the California Institute of Technology and the University of Cambridge explain how they have learned to force a protein known as the 5-HT₃ receptor to change its function by chemically changing the shape of one of the amino acids from which it is built. Using a technique developed at Caltech known as "unnatural amino mutagenesis," the researchers altered a proline amino acid in the 5-HT₃ protein in order to modulate the receptor's ion channel. This gave the researchers control of the "switch" that is involved in neuron signaling.

According to Dennis Dougherty, lead author of the paper and the Hoag Professor of Chemistry at Caltech, the new research solves a 50-year-old mystery of how a neuroreceptor is changed by a chemical signal. Scientists have long known that signaling in the brain is a chemical process, in which a chemical substance known as a neurotransmitter is released into

the synapse of a nerve and binds to a neuroreceptor, which is a protein that is found in the surface membranes of neurons. The action of the neurotransmitter changes the neuroreceptor in such a way that a signal is transmitted, but the precise nature of the structural change was unknown until now.

"The key is that we've identified the switch that has to get thrown when the neuroreceptor sends a signal," Dougherty says. "This switch is a proline."

The 5-HT₃ receptor is one of a group of molecular structures in the brain cells that are known as Cys-loop receptors, which are associated with Parkinson's disease, schizophrenia, and learning and attention deficit disorders, as well as alcoholism and nicotine addiction. For treatments of some of these conditions, pharmacologists already custom-design drugs that have a general effect on the Cys-loop receptors. But the hope is that better design at the molecular level will lead to much better treatments that address more precisely the underlying signaling problems.

Dougherty says the work required the collaboration of organic chemists, molecular biologists, electrophysiologists and computer modelers. His Caltech group worked closely with the research group of Caltech biologist Henry Lester, and with the group at Cambridge headed by Sarah Lummis, to establish how proline changes

its structure to open an ion channel and launch a neuron signal.

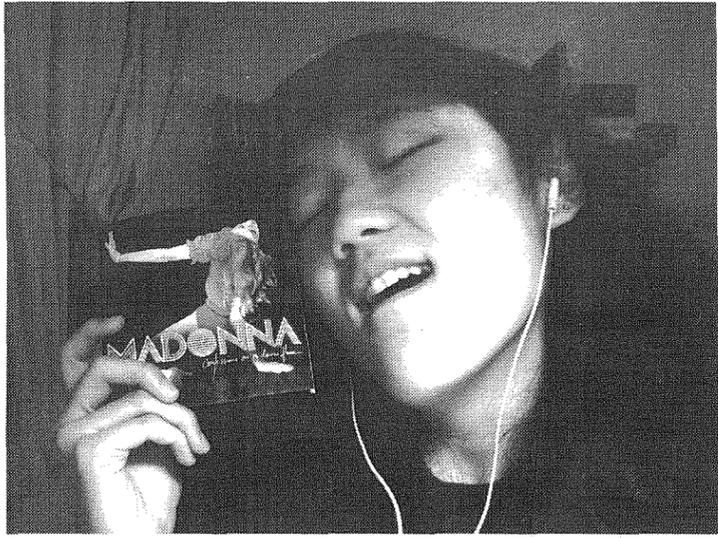
"This is the most precise model of receptor signaling yet developed, and it provides valuable insights into the nature of neuroreceptors and the drugs that modulate them," Dougherty says.

"The promise for pharmacology is that precise control of the signaling could lead to new ways of dealing with receptors that are malfunctioning," says Lester, Caltech's Bren Professor of Biology. "The fundamental understanding of how this all works is of value to people who want to manipulate the signaling."

The 5-HT₃ receptor is also involved in the enjoyment people derive from drinking alcohol. If the 5-HT₃ receptors are blocked, then alcoholics no longer get as much pleasure from drinking. Therefore, better control of the signaling mechanism could lead to more potent drug interventions for alcoholics. The nicotine receptors are also related, so progress could also lead to better ways of reducing the craving for nicotine.

In addition to Dougherty, Lester, and Lummis, the other authors of the paper are Caltech graduate students Darren Beene (now graduated) and Lori Lee, and Cambridge researcher William Broadhurst.

The research is supported by the National Institute of Neurological Disorders and Stroke.



Madonna Gets Her Groove Back

By CINDY KO

Madonna- *Confessions on a Dance Floor* (2005)

One of the many, many, many, many downsides of studying at Caltech is that I have no idea what's going on in the outside world. Take, for example, the time that I didn't even know my hometown was on fire and it was all over CNN (true story!). Of course, I know better now and I've taken measures to make sure that this shitty bubble doesn't separate me from the world completely ... and I have pinkisthenewblog.com to thank for it! (Fingers firmly on the pulse.) Yeah, so Trent still won't be able to inform me of my hometown's ashy demise, but at least I'll know about the latest fugly thing that Britney wore out in public.

Pinkisthenewblog is the holy grail of entertainment gossip, and it was Trent's blog that informed me of the glorious release of Madonna's new album. After 21 years in the business, Madonna, Queen of Pop, has reincarnated herself into a disco diva. If you haven't already heard the new single, "Hung Up" you should go throw yourself off a turntable. (Actually, if you're a big ABBA fan, you've probably heard part of the new single anyway. The track HEAVILY samples off of their song, "Gimme! Gimme! Gimme!" and ABBA is not complaining. Sources say they are sweeping in millions from royalties.) The song is super! And if you have an extra 5 minutes, you should watch the video, too, because it features Madonna strutting around in a pink jumpsuit. Hot. (Recent sources tell me that some guys DO NOT think that Madonna looks hot in this video, due to, "weird-looking multi flap" and "that abyss underneath her hip bone...") Anyway, see for yourself.

Okay, so when I initially wanted to review this CD, I didn't want to drop the cash

for it, so I was like, "I know, I'ma gonna download it. Haha, I'm so clever and Madonna's rich anyway." Boo, dude. After going through a bit of trouble getting all twelve tracks, I realized that I had downloaded piracy-detering mp3s of silence. Fine, Madonna. You win this time. I shelled out the cash for your stupid new album and I like it a lot, so fine. Maybe it was worth it (it so totally was!). (This isn't her first anti-piracy attempt. Someone reminded me of how Madonna put an anti-piracy thingie on her album, *American Life*. A dummy copy was circulated with mostly blank tracks, and an angry, "What the f*ck to you think you're doing?!" from the Queen herself. Some people later set up the Madonna Remix Project, dedicated to sampling the irate songstress in countless dancemixes.)

Confessions, with all its strings aside, is a great album. I mean, she's regarded as a master in the music industry for a reason. I feel that most of the credit for the awesomeness on this album should go to her choice of producers, french electronica notables, Stuart Price and Mirwais Ahmadzai. The former worked with her on previous albums and as keyboardist on her Drowned World Tour, the latter co-wrote and collaborated with her on *Music* and *American Life*. Also called to contribute to the album were Bloodshy and Avant, whose most famous work is Britney Spears's pinnacle of geniusness hit, "Toxic." As a result, the album has sounds reminiscent of Daft Punk, old-school disco, and a little bit of New York scratch (à la Le Tigre) while remaining wholly Madonna. I won't go through a detailed song-by-song analysis, because the entire album is worth a good listening to. Enjoy!

Grade: AAAAAAAAAA
AAAAAAAAAAAAAAAA
AAAAAAAAA

Students Pay Price for Administration's Poor Planning of Parking Places

By JONATHAN DAMA

Over these past few months statements by various administrative officials have suggested that parking structures are nonscientific construction and not directly related to research; they assert that Institute funds that could be used to support research should not be assessed for parking. While such a principle might be convenient for placating the faculty, it is dangerously naive and goes to one of the root causes of the budget crisis now facing the Institute: a general and consistent failure to properly account and plan for the additional operating costs incurred by expansion.

Put simply, the parking and budgetary pressures the Institute faces are a direct result of expanding research operations. Over the past years, the Institute population increased by approximately 2500 persons. Yet the graduate student population increased by about a scant 300 persons, and the undergraduate population has remained essentially unchanged. Such growth in the Institute's non-instructional staff has significantly increased the demand for parking. Meanwhile a multitude of building projects displaced inexpensive surface parking: the renovation of the Bookstore, the removal of San Pasqual, construction of Sherman Fairchild Library, Beckman Institute, Moore Laboratory, and the Broad Center. Furthermore, the parking lot east of Keith Spalding is slated to be replaced by an Astronomy Building, and the parking lot east of Moore is slated to be replaced by the Annenberg Information Science and Technology Building in the next few years.

The construction of Avery House also displaced surface parking, but Avery was constructed in part to replace the Undergraduate Housing that used to line Holliston, demolished to build a parking structure and additional physical plant facilities, which in turn were necessary to accommodate other on-campus expansions.

Thus the parking crisis developed incrementally as the budget of each building project in turn failed to be assessed for the amortized cost of displacing the existing parking and for the future demand that would concomitantly be incurred as the buildings filled with staff. Perhaps donors refused to pay for such prosaic ancillary projects, but if such refusal did occur, the Institute had an obligation to pay such costs out of less restricted endowment funds or forgo the project entirely. Transferring the costs to the community in the form of effectively reducing stipends or, in the case of the students, by levying an additional fee, is a mere concealment of a more innate problem and does little to discourage expanding research activities from inducing a tragedy of the commons situation by avoiding responsibility for the costs they are imposing on the academic community.

In targeting the students and academic support staff as well as graduate students and other researchers, the parking fee has done more than merely charge research budgets indirectly for the incurred cost. Furthermore, it is

an inefficient mechanism requiring the issuance and tracking of permits and previously unheard of enforcement costs. Some may consider the fee levy to be merely an indirect and clever means to assess research budgets for the costs incurred, but it has done more by targeting the students and academic support staff as well. Furthermore, it is a rather inefficient mechanism requiring the issuance and tracking of permits and hereto unheard of enforcement costs. Indeed, one may consider the introduction of the plastic parking permits in 2001

historical footnote. I have not endeavored to conclusively resolve Caltech's budgetary problems but instead to pull one thread of the tapestry of errors. A startling lack of curiosity and intellectual rigor seems to pervade the decision making process. We need more than the flimsy theories and fallacious reasoning that have been publicly proffered. No one ought to expect that because some other university does things a certain way, so should Caltech. As a school of the best and the brightest, we ought not to let mediocrity govern us.

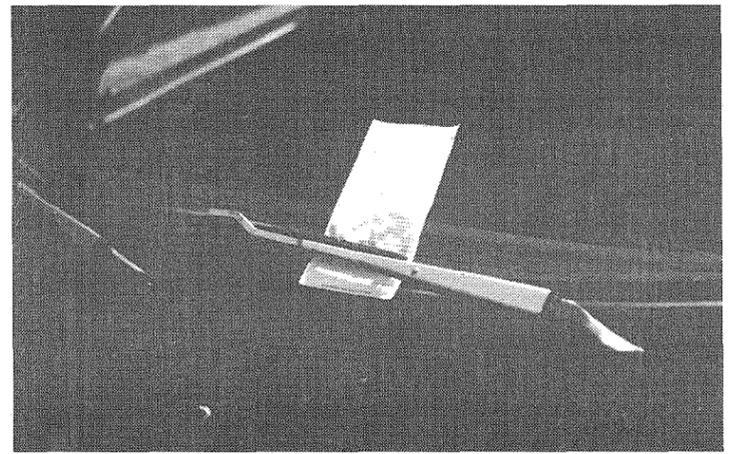


Photo by Kevin Peng

Caltech Security's recent tickets have included this one warning the owner not to park on the east side Holliston Avenue, directly across from Avery.

as merely the preparatory work for the collection of a parking fee, just as the zoned parking system is a potential avenue for slowly taking parking spaces away from the students without having to openly deny them permits.

Though the buildings and their associated parking structures have already been built, at least some fraction of the depreciation costs are eligible for reimbursement as a component of indirect overhead costs under OMB guidelines. However, ultimately, we should not depend on Federal grant rules for our sense of moral rectitude, nor are such grants the sole source of funds to pay for expenses incurred by the Institute's research activities. Determining the fair allocation of the costs begins not with what can be exacted from grants but from an objective assessment of the origins of the costs themselves.

As a whole, the students have been subjected to a steady but gradual stream of breaches. Each year, as old students leave and new ones enter, the abuses of the past are forgotten and accepted as merely the status quo. Few students today remember that, when the department libraries were collapsed into SFL, the Institute promised the graduate student community twenty-four hour access. Points of contention such as the Ricketts firepot recede into distant memory and people forget being out-manuevered into transferring the MOSH's prerogatives to the Director of Residence Life and then to Student Life or turning the VP of student affairs into an administrative rather than faculty position, at each step replacing the gentle hand of faculty oversight with crisp control vetted by Caltech legal.

Long since has Millikan's vision of Caltech become a mere

We can begin to address these issues by changing the procedures and guidelines governing campus expansion to better anticipate, control, and ultimately commit the necessary funds to pay the ancillary costs of new buildings and new staff. We should also reexamine the presumptions underlying the budgetary crisis, at least some part of which owes to debt service of unfunded yet commenced capital projects. Such capital expenses should be absorbed by the endowment on a one-time basis irrespective of whether doing so will require drawing upon principal rather than merely interest. The money is spent; the projects are faits accomplis. It is time to recognize that the past was a mistake that should be accepted and corrected, not merely concealed behind new fees and transfer payments.

The California Tech

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Cracking Toast-of-the-Town, Grommit: Dilly-dallying at Oxford and Cambridge

By MAYRA SHEIKH

To all the techers in non-freezing Southern California,

I sure hope midterms treated you guys okay, though they've never been nice to me. It is beginning to get rather cold in Britain, which definitely makes me miss tech and California Sunshine, midterms or not. Even with my sunshine withdrawal, I have been adventurously tromping around Britain. I'm writing today to tell you about visiting two of Britain's cities that have academic halos, two havens of knowledge, the oh-so wonderful Cambridge and Oxford.

Mock as I may, the two college towns have quite an appeal, aesthetic as well as intellectual. First of all, Oxford and Cambridge Universities differ from the American version of Universities. Each University is comprised of 20 some odd colleges scattered around each city. The coalition of the colleges is what is called the University. The colleges vary in size and are the center of the social scene. Both Oxford and Cambridge have colleges with common names. I was very much jealous of the Cambridge students when I saw their huge accommodations; some even have ensuite bathrooms and kitchens. All of the colleges have beautifully manicured lawns with ugly signs that say "don't walk on

the grass." Each also has its own Hogwarts-style dining hall and mini-Cathedral-like Chapel with stained glass and images ranging from Mary, Jesus, and archbishops to English Monarchs, notably the Tudors. The architecture of the buildings is great; some of the chapels have fanned, vaulted ceilings, and others have stucco embossed domes. Some of the chapels even have towers up which one can climb to see the whole city. However, the narrow, winding, two-way stairwells can be rather terrifying.

For those who don't quite appreciate man made things like buildings as much as I do, there is nature. Cambridge has the gorgeous Cam River running through it. A handful of colleges sit on the banks of the river, and large parks and open spaces run down to meet the water's edge. The calm state of mind I achieved at 9-ish on a brisk, cold British morning overlooking the river with a cup of hot coffee was worth the \$50 train ticket up there. The river is not only for looks; you can go punting on the river. Some companies that have people punt for you and charge an hourly fare, and some colleges rent out punts to their students for a minimal fee, so students can take a stab at punting themselves. Either way, it's a unique experience. Other than the

river, there are tree lined walks and winding pathways. Some of which lead to small grazing fields, as cows are an everyday presence for the Cambridge students.

However, modern conveniences still exist. Multiple streets are lined with all sorts of shops: everything from grocery and department stores to small coffee shops with good sandwiches. There are also many, many pubs in both cities, suggesting the Brits like their pints. Cambridge also has outdoor market that sells handmade jewelry, souvenirs, jam, bread, or raw meat, depending on the day of the week. On another side of town is an outdoor craft market with varying trinkets made of wood, stone, clay, and beads. Both cities have playhouses and even student-run playhouses featuring student performances. Overall, Oxford has more a city-like vibe to it, and Cambridge definitely has the small-town feel. I thoroughly enjoyed visiting both of the crowning glories of British Academia and would advise any other visitor to do the same. Speaking of academia, I should get cracking on the small amount of British homework I have.

Still living in a Big City --
Mayra

When Online Gambling Becomes a Problem

By LEE H. COLEMAN, Caltech Counseling Center

Though we don't know the exact numbers, many Caltech students enjoy gambling over the Internet. Gambling in privacy and relative anonymity appeals to many of our students, and a solid understanding of probability theory can help fuel fantasies of beating the odds. For most students of legal age, gambling in moderation is not inherently problematic. For a small minority of students, however, online gambling can lead to significant academic, social, and financial problems.

There are no hard and fast rules for what defines a gambling problem, but some general criteria do seem to apply. Some signs you may have a gambling problem include:

Objective Behaviors:

-Lying to others to conceal the extent of your involvement with gambling

-Jeopardizing or losing a significant relationship, job, or educational or career opportunity because of gambling (e.g., missing classes, missing house social events, etc.)

-Relying on others to provide money to relieve a desperate financial situation caused by gambling

-Chasing your losses – in other words, continuing to gamble in the hopes of winning back money you've lost

-In extreme cases, committing illegal acts such as forgery, fraud, or theft to finance gambling

Subjective Emotional States:

-Being preoccupied with gambling (e.g., reliving past gambling experiences, handicapping or planning the next venture, or thinking of ways to get money with which to gamble)

-Needing to gamble with

increasing amounts of money to achieve the desired excitement

-You've made repeated unsuccessful efforts to control, cut back, or stop gambling

-You're restless or irritable when attempting to cut down or stop gambling

-You gamble as a way of escaping from problems or to relieve an unpleasant mood, such as helplessness, guilt, anxiety, or depression

Online gambling also carries some risks that may not be evident at first glance. Be advised that many Internet gambling sites are located abroad and are not subject to any particular regulations, making it more difficult to adjudicate disputes with your money. Also, one recent study* found that out of 117 gambling sites tested, 39% of them artificially inflated their payouts during the demo period. Once players joined the site and began playing for real money, however, the payout rates declined significantly.

If you're concerned that your gambling may get out of hand or has caused you unforeseen difficulties, confidential help is available. You can consult with a therapist at the counseling center (395-8331) to help you figure out what to do next. If you'd like to consult with an organization specifically focused on problem gambling, feel free to contact either of the resources below.

-Gamblers Anonymous International Service Office P.O. Box 17173, Los Angeles, CA 90017 (213) 386-8789 - Fax (213) 386-0030, <http://www.gamblersanonymous.org>
-Compulsive Gambling Center, Inc: <http://www.lostbet.com>

*Reference:

Sévigny, S., Cloutier, M., Pelletier, M., Ladouceur, R. (2005). Internet gambling: Misleading payout rates during the "demo" period. *Computers in Human Behavior*, 21(1).

Read *The Grand Unified Theory of Physics* by Joseph M. Brown

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• The composite particle initial circular path is changed to an elliptic path with a minor axis smaller than the circular radius by the factor $\sqrt{1 - (v/c)^2}$.

• The composite particle elliptic path has an orbital period $1/\sqrt{1 - (v/c)^2}$ times the period when at rest.

• Thus, mass growth, matter shortening, and time dilation predicted by this Newtonian Theory is the same as that predicted by Einstein's Special Theory of Relativity.

For more information and to access the book, visit www.physicsunifiedtheory.com

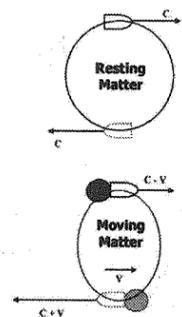
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Joseph M. Brown

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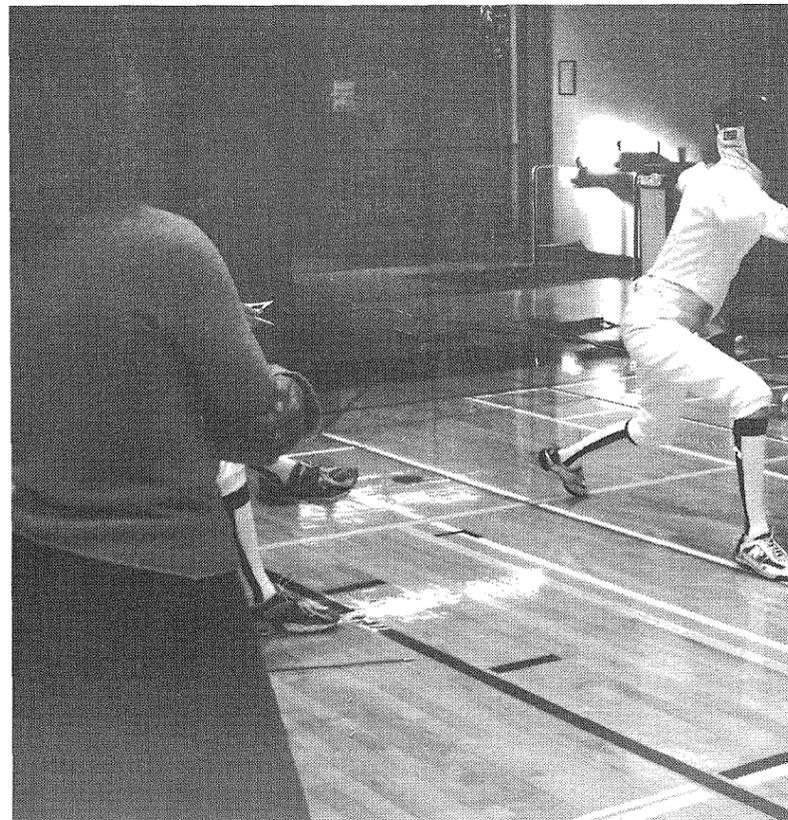
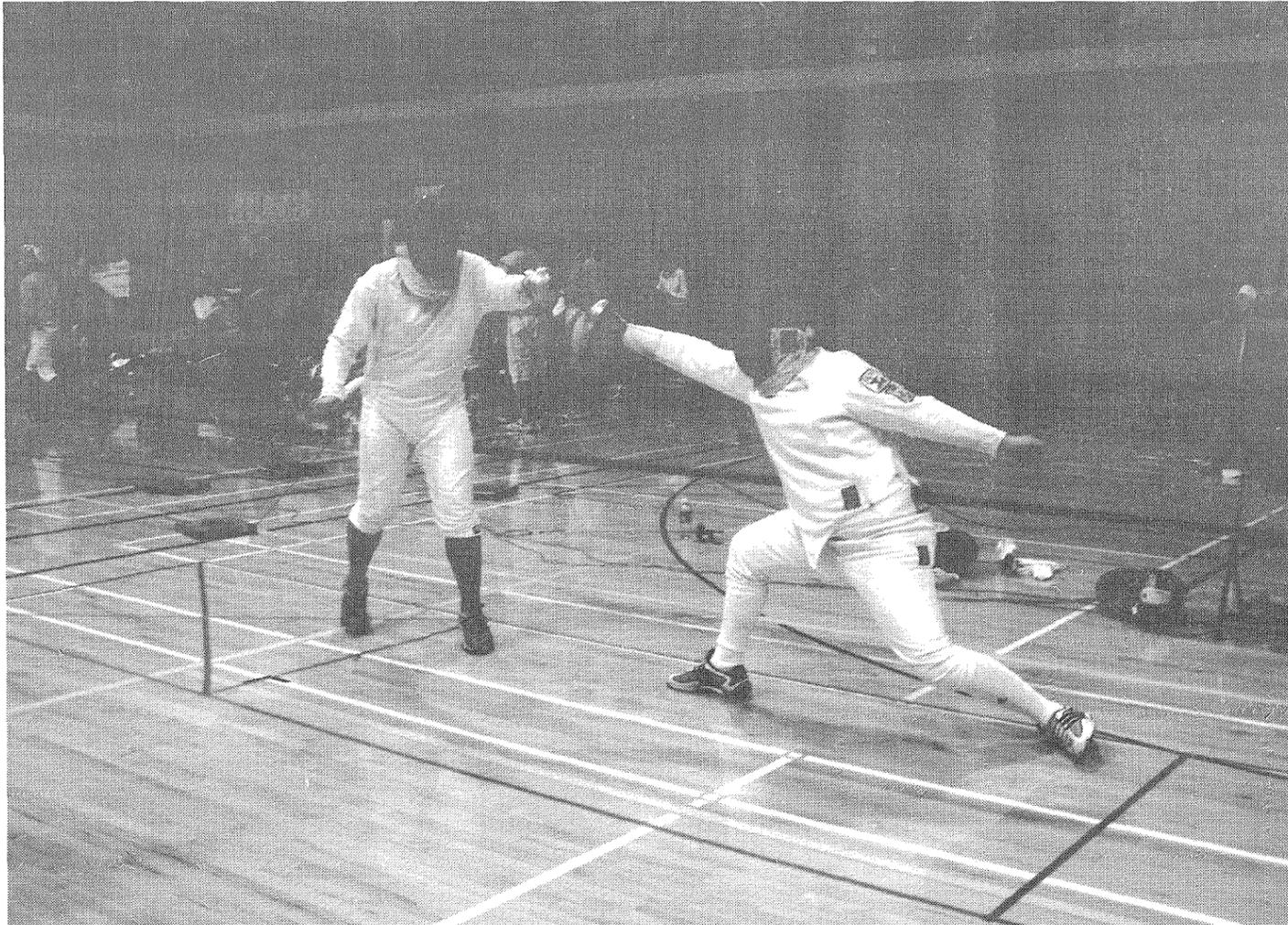
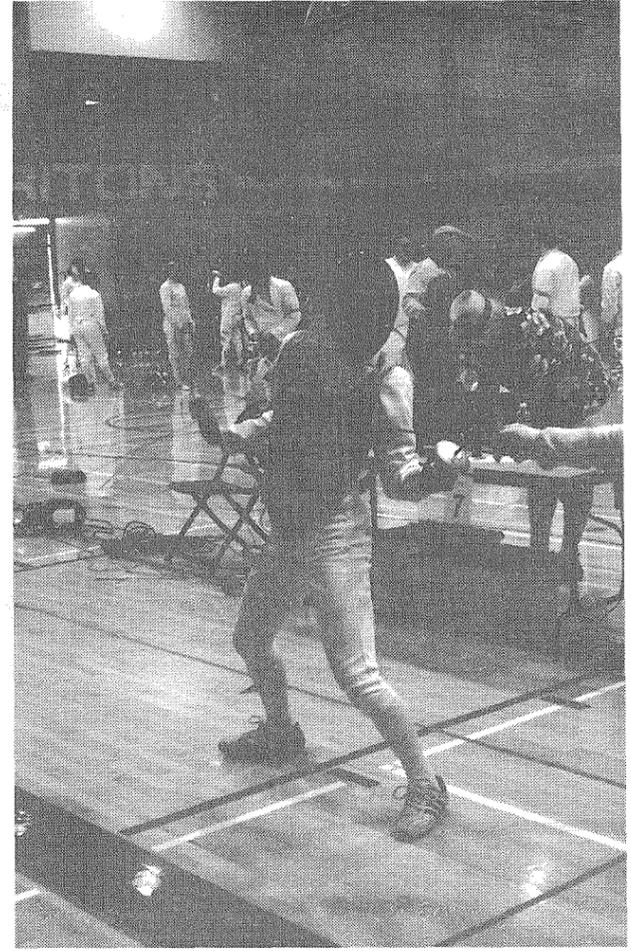
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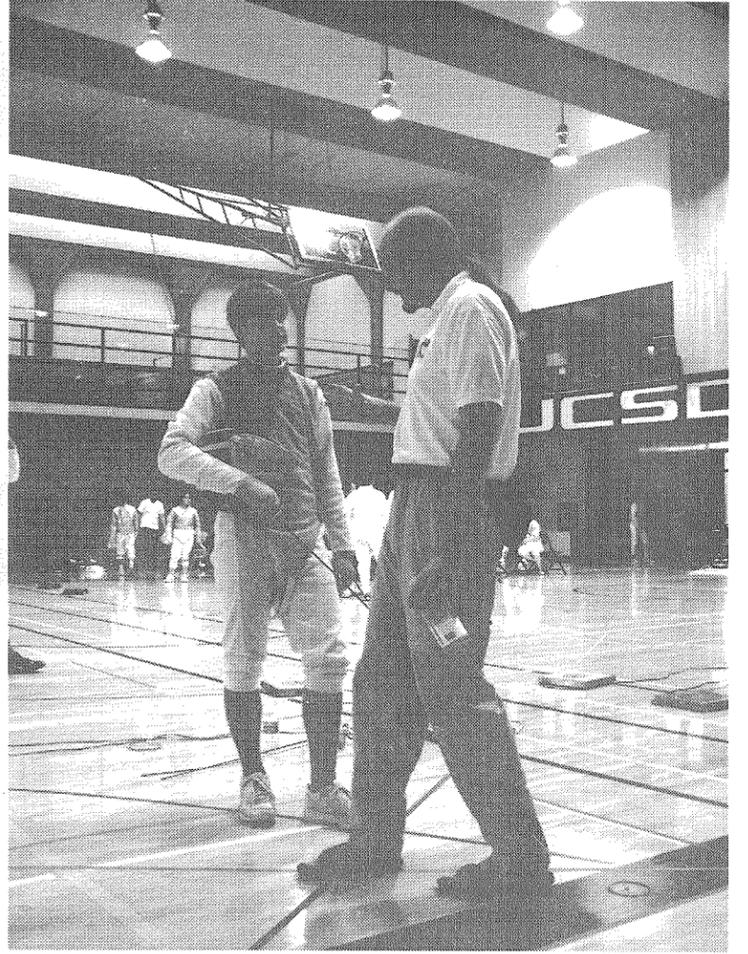
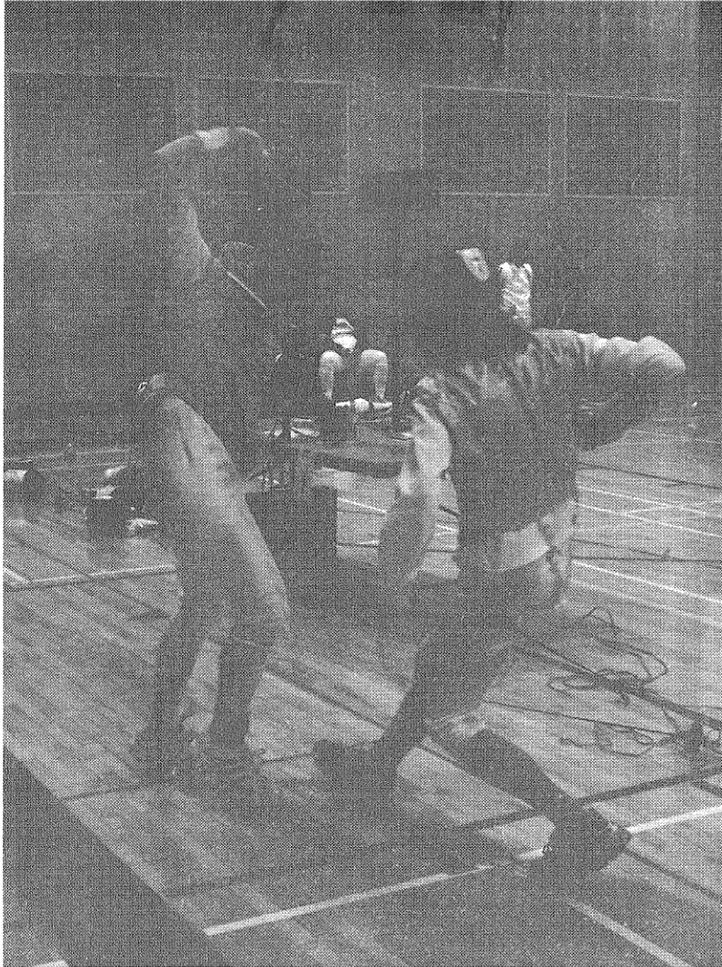
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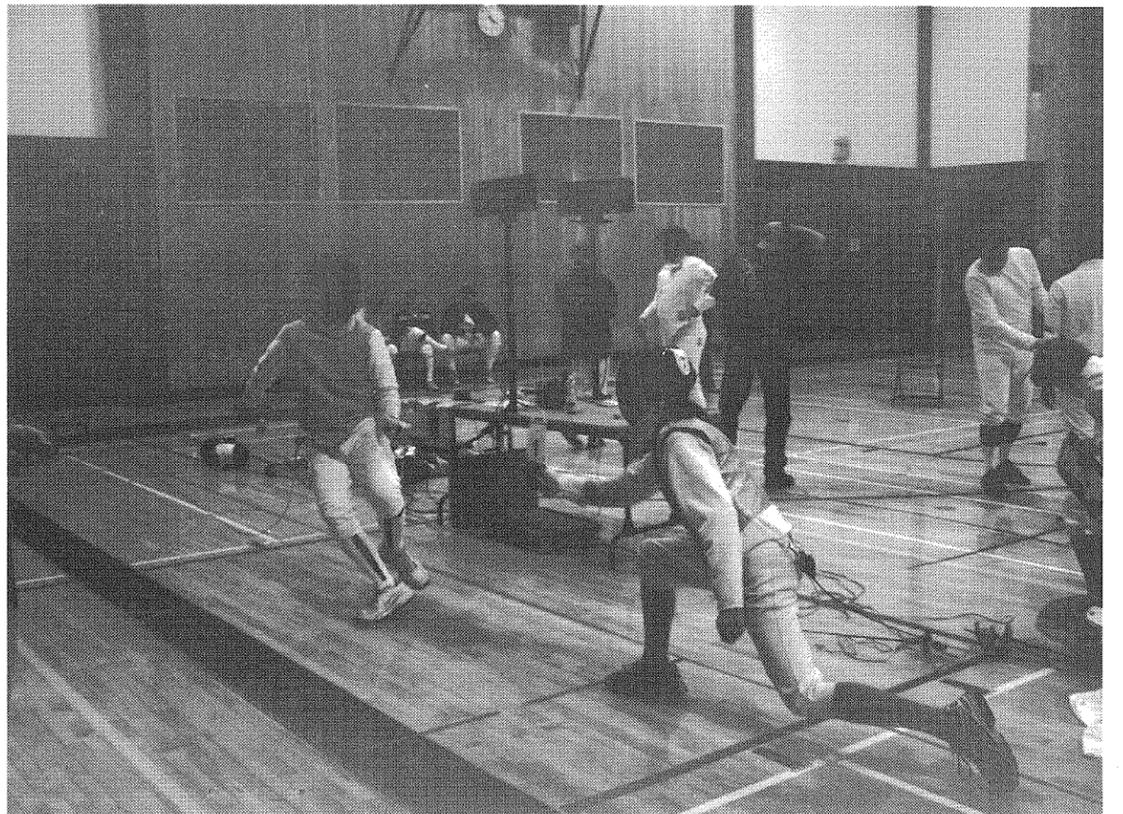
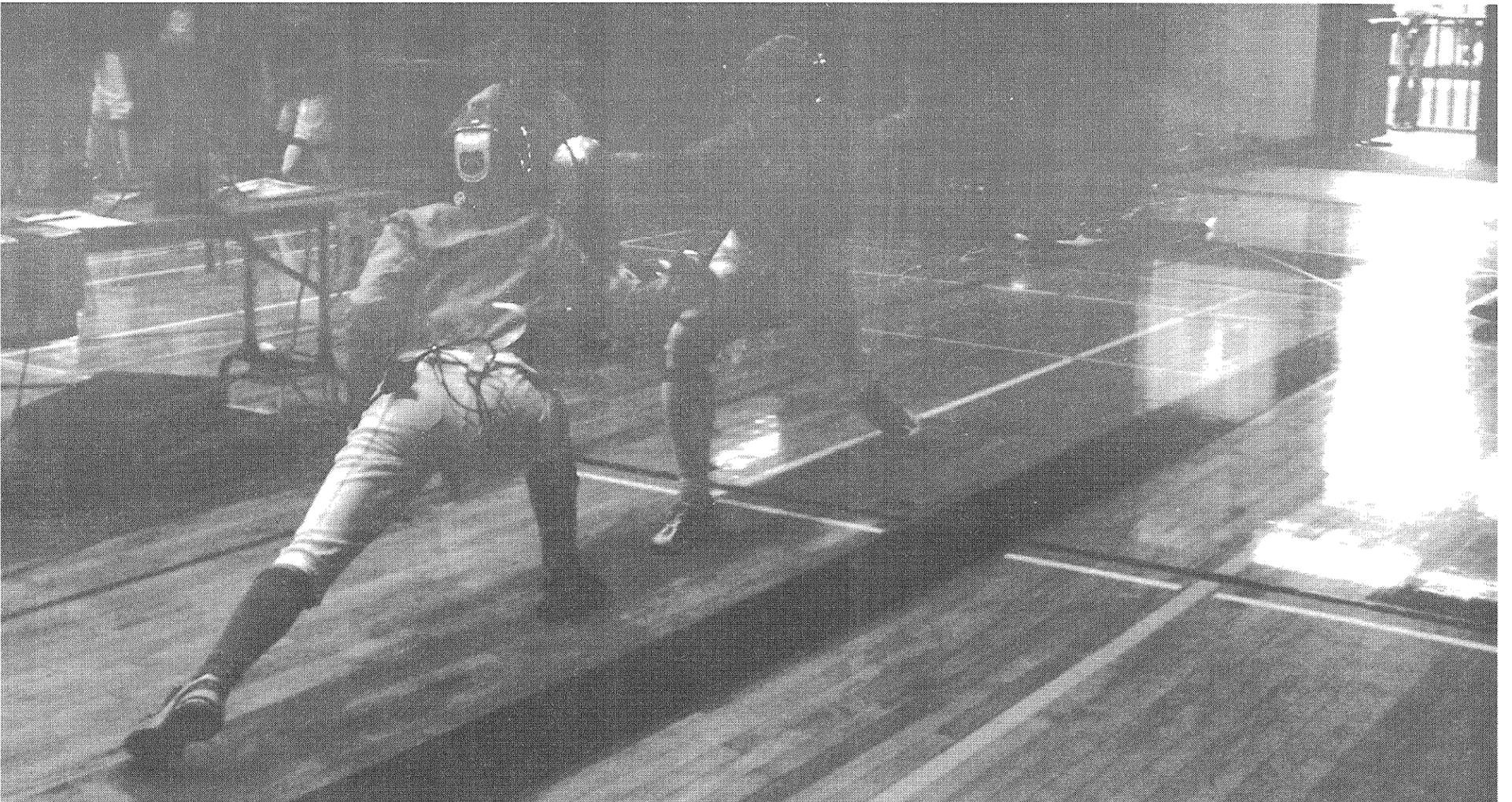
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G.L.O.M. - Greg's Life of Misery

Visit G.L.O.M. on the web at <http://www.its.caltech.edu/~citcappy/>

By Nathan Lau

Amenities

By JEFFREY PHILLIPS

As Techers, we look forward to few great joys in our lives: the inter-house parties, ditch day, or just staying up to grab the first morning donut. Between these wellsprings of joy lies a desert of solemn degradation; classes, research, and everything in between strip away layers of our skin like a whirlwind. A foreign legionnaire has between himself and the elements only the amenities he is provided.

The Foreign Legion allows pariahs to leave troubles for a life of adventure, so they take their canteen, rifle, and rations with thanks. But we are college students in high demand, and we have come to expect a lot more than MRE's, muskets, and metallic water. Indeed, it was the amenities that Caltech is known to offer that eventually cemented many of my classmates' decision in coming here. Every Alumnus I talked to billed Caltech as a school that took care of its students.

Caltech developed and maintained this reputation, along with all the extra services that includes, long after many other schools had dropped similarly costly programs. Caltech provided complete linen and towel service, for instance. I would assert this is mainly due to it's unique student body. There are few enough students that addressing their needs is not the logistical nightmare it would become at a large university. In addition, most Techers are over-sheltered morons where the troubles of the real world are concerned; it is no wonder that weekly cleaning service is one of the few remaining Caltech amenities. For countless years, Caltech has been going above and beyond to entice prospective students, relieve the burden of the undergrads, and leave the deep-pocketed alumni to reflect warmly on the reason they didn't learn how to wash sheets until grad school.

Over the time I've been here, I have witnessed the steady erosion of services Caltech is willing to allot to its undergraduate body. There is no longer free soap in the pool

shower room. We are expected to pay for parking now every month to cover the cost of a parking structure originally covered under the institute budget. Laundry rates have gone up, and two years ago all the remaining free machines in off campus Caltech housing were replaced. The brief all-you-can-eat program in the South Kitchen, introduced to balance dining loads as Chandler was being remodeled, is conspicuously absent from the new dining plan, though not from its website. The dinner kitchen now frequently runs out of certain foods by the time my house is served. They took away the damned sheets before I had time to grab myself a toga.

None of these losses are tragic, but, together, they add up to a whole lot of ill will. Caltech's response to tension over cutbacks generally boils down to the rising cost of services, usually with the addendum that our tuition pays for only a fraction of the cost the institute incurs in teaching us. My tuition has gone up every year in disproportion to inflation, so what, I ask, is that extra slice going towards if not to offset a disproportionate increase in the cost of the services I enjoy? If I'm being written off as a loss, at least lose a bit more and make me happy.

Students are first in line for cutbacks because professors and staff will outlast any opposition we can muster. Few will remember in 2010 that Techers once parked for free. Indeed, few remember the true Interhove today. Caltech is taking candy from the proverbial baby, and I think it's time we bit its hand. Cut this article out and mail it to your favorite Caltech administrator along with your view on the matter, no postage necessary if mailed to a Caltech mailbox. Let these people whittling away at the little snowflakes that make this hell a little bit cooler know that cuts cost students more in moral than they save the institute money.

Rantings from that Drunk Guy in the Corner #1: CDS fho' Hqruthuh Gha Booghie – now with actual words.

By JON SENN

How often do you go to a restaurant, pay \$12 for food you didn't enjoy, and repeatedly go back for the same mediocre food? What about a steakhouse filled with the dense smoke of burnt beef, or a restaurant without the freshest food, or one that is always out of the items you actually do like? These are characteristics we might tolerate from a fast food shack or a diner, but not a moderately priced restaurant. Why do we treat CDS differently?

For over \$12.50 a night, we are provided with food that is mediocre at best and not always fresh. Nearly every student finds Chandler lunches far tastier and better prepared. Yet CDS charges us more for our dinners and denies us other options.

In Page House, dinners are particularly crappy: nearly half the time on Thursday, the Page dining hall is filled with smoke from the kitchen's burning meat. The time when the smoke drifted into Chandler, security was required to clear the area and lock the doors for health reasons. By the time Page has dinner, CDS runs out of anything widely regarded as decent, typically including steak, soups, mostly clam chowder and chicken noodle, chicken parmesan, assorted salad bar items, cookies, soft serve ice cream, some of the better cakes and pies, and even green eggs and ham.

Yes, the food is sub-par, but so what, if you don't like it don't buy it, right? Wrong. Students who wish to live in the houses are automatically charged for CDS dinners unless they have specific health or dietary requirements preventing them from eating CDS. Anyone who doesn't want CDS just because of the taste, price, time of day, etc. will not be let off of their board plans as long as they live in a house. The rationale behind this so-called forced service is that CDS cannot operate as efficiently on a smaller scale and would be forced to raise prices.

If someone from Avery chose to eat in a house for dinner every single weeknight, they would spend \$35 for a dress dinner, \$14.50 on each of 5 steak dinners, and \$12.50 on the other 49 regular dinners, for a grand

total of \$720, leaving them with \$450 declining balance for non-dinner food. But anyone in another house only gets \$421.25 declining balance for non-dinner. But didn't CDS tell us that the reason we're forced to pay for every single house dinner is so that we can pay less for our dinners? Why are we charged more for our own houses' dinners than are students in Avery, who have a choice of where to eat every night?

What you might not know is that CDS actually makes a PROFIT preparing our dinners. We pay \$1,267 per term for board, yet Avery's board plan only has \$1,170 of declining balance. Presumably they are given the same amount of money as we are. For what purpose does CDS seize this \$97/term from each of us? During rotation this year, students on board were automatically charged \$10 per lunch each day, even though we're provided less than \$8 per weekday for non-diner food. Many students in the north houses weren't even told they were automatically charged, and most students who did know were still double charged for many lunches that week. According to Ryan Farmer, this plan was adopted due to supposed requests from students in south houses, and CDS decided \$10 was a fair price. Who claims it's fair to charge us more than our declining balance allocates per day? The only explanation for such behavior is an attempt by CDS to squeeze more profit out of the undergrads.

Due to recent budget problems, administration proposed extending the required CDS board plan to 7 days a week in order to better subsidize the other CDS food programs with less support from the general budget. If you're against this and haven't signed a petition stating so, email smatacus@caltech.edu.

Rather than extending the CDS contribution to our board plans, I propose that we limit or eliminate its presence in our dinners. I'm sure a multitude of companies in the Pasadena and Los Angeles area could cater our dinners cheaper and with a better product. Even fast food

delivery is both cheaper and tastier than most CDS dinners, and could easily serve part or all of our dinners as many nights a week as we desire.

A search on Donut for restaurants that already deliver to campus for under \$10/meal returns the following results: Café Boriquen, Chinatown Express, Domino's Pizza, Fredo's, Papa John's, Pataya, Pizza Hut, and President Thai. This variety of Puerto Rican, Chinese, Italian, Thai, pizza places, and probably many more places we could hire on a regular basis is so far superior to CDS that it's hard to comprehend why anyone would chose our current board plan. Papa John's has a fundraising program that has allowed Caltech students to order 2 large 1 topping pizzas for \$14.33 with delivery. Even without any further bulk discount, Papa Johns could provide us each with a whole pizza for more than \$5 less than a CDS dinner. With the remaining funds we are currently charged, CDS could provide us with a reasonable soup/salad bar or desert, probably still improving on our current dinner prices.

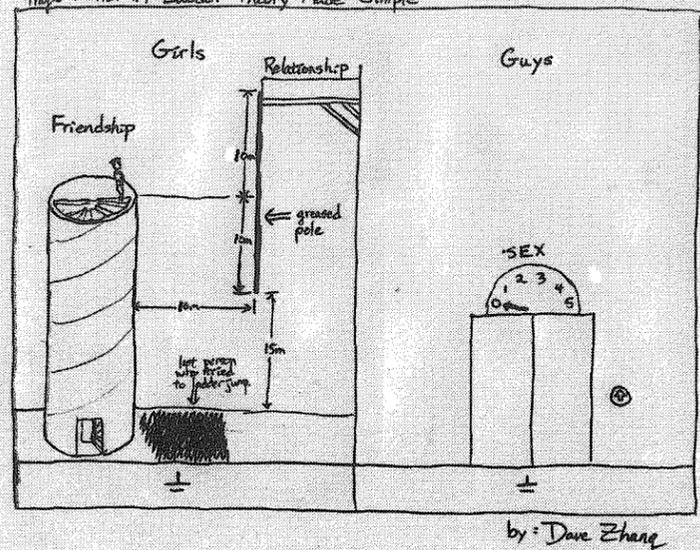
If Caltech were to use a delivery or catered solution, with a little bit of design we could implement a service in which individual students could log in to a website to select their own personal choices for each night, or even opt not to receive dinner on a particular night and have funds reimbursed to their declining balance accounts.

Richard Feynman had a wonderful relationship with the student body, and I think he would be outraged by the current abuse of his name describing our dining disservice.

In conclusion, CDS is bitches.

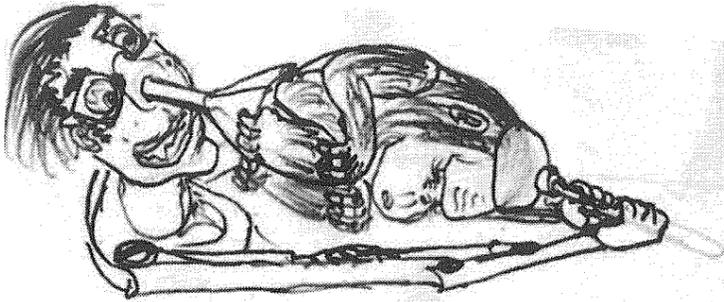
The preceding is a weekly column of rants written by a variety of pissed off Pageboys. ALL OPINIONS EXPRESSED IN THIS ARTICLE, EVEN THOSE HELD BY REAL PEOPLE, ARE ENTIRELY FICTIONAL. THE PRECEDING ARTICLE CONTAINS COARSE LANGUAGE AND DUE TO ITS CONTENT IT SHOULD NOT BE READ BY ANYONE. Send hate mail to senn@caltech.edu.

Fragile Filler #1: Ladder Theory Made Simple



STOP!

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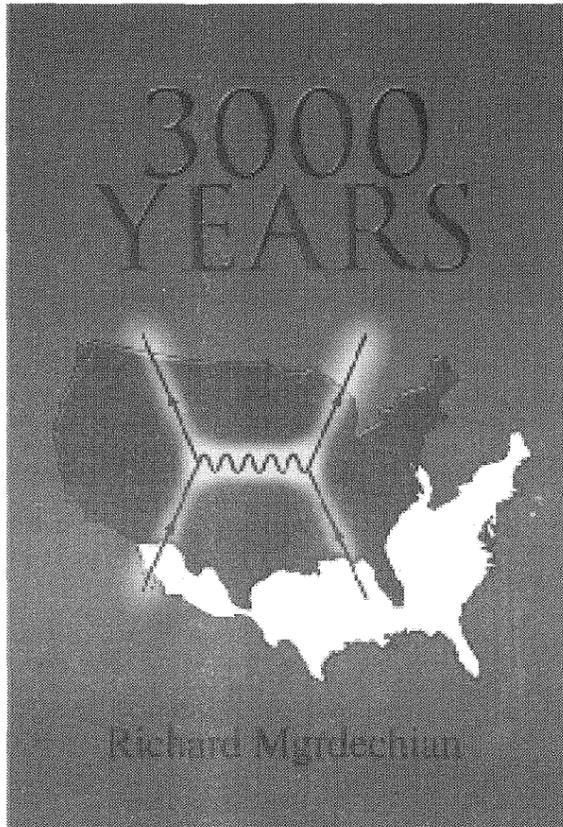


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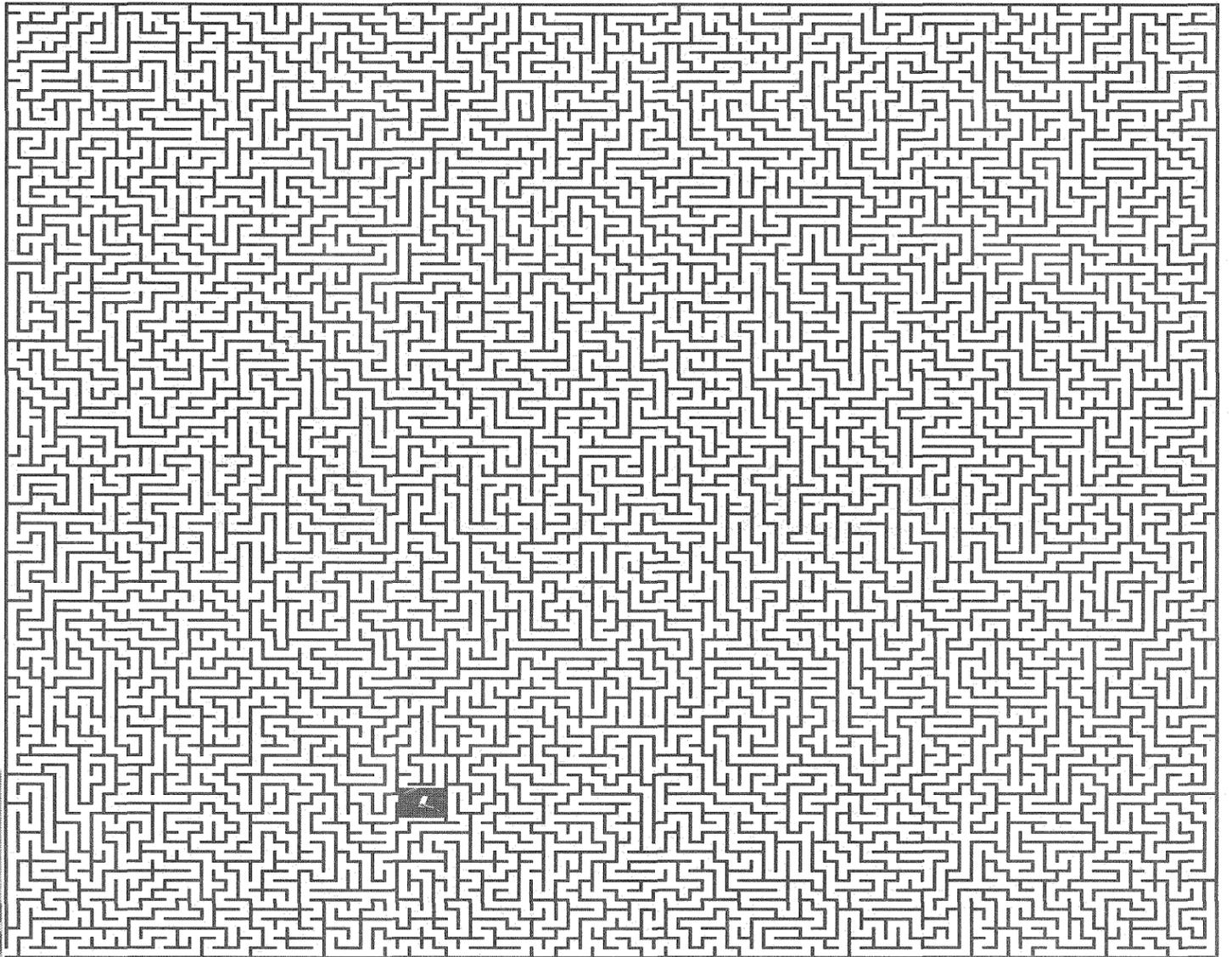
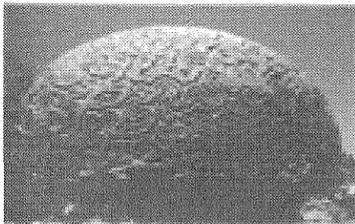
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SUPER ACTION FUN CHALLENGE!

Help Brainy the brain coral find his way to the mysterious parking ticket of power! Brainy the brain coral has a bomb strapped to him which will explode lest he reach the mysterious parking ticket of power within three minutes. His endocellular fluids will be on your hands...



Evidence of Global Warming: Reef or Madness?

Continued from Page 1

The *D. dianthus* is especially useful because it lives a long time, can be dated very precisely through uranium dating, and also shows the variations in carbon-14 (or radiocarbon) due to changing ocean currents. The carbon-14 all originally came from the atmosphere and decays at a precisely known rate, whether it is found in the water itself or in the skeleton of a coral. The less carbon-14 found, the "older" the water. This means that the carbon-14 age of the coral would be "older" than the uranium age of the coral. The larger the age difference, the older the water that bathed the coral in the past.

In a perfectly tame and orderly environment, the deepest water would be the most depleted of carbon-14 because the waters at that depth would have allowed the element the most time to decay. A sampling of carbon-14 content at various depths, therefore, would allow a graph to be constructed, in which the maximum carbon-14 content would be found at the surface.

In the real world, however, the oceans circulate. As a result, an "older" mass of water can actually sit on top of a "younger" mass. What's more, the ways the ocean water circulate are tied to climatic variations. A more realistic graph plotting carbon-14 content against depth would thus be rather wavy, with steeper curves meaning a faster rate of new water flushing in, and flatter curves corresponding to relatively unperturbed water.

The researchers can get this information by cutting up the individual corals and measuring their carbon-14 content. During the animals' 100-year life spans, they take in minerals from the water and use the minerals to build their

skeletons. The calcium carbonate fossil we see, then, is a skeleton of an animal that may have just died or may have lived thousands of years ago. But in any case, the skeleton is a 100-year record of how much carbon-14 was washing over the creature's body during its lifetime.

An individual coral can tell a story of the water it lived in because the amount of variation in different parts of the growing skeleton is an indication of the kind of water that was present. If a coral sample shows a big increase in carbon-14 about midway through life, then one can assume that a mass of younger water suddenly bathed the coral. On the other hand, if a huge decrease of carbon-14 is observed, then an older water mass must have suddenly moved in.

A coral with no change in the amount of carbon-14 observed in its skeleton means that things were pretty steady during its 100-year lifetime, but the story may be different for a coral at a different depth, or one that lived at a different time.

In sum, the corals tell how the waters were circulating, which in turn is profoundly linked to climatic change, Adkins explains.

"The last 10,000 years have been relatively warm and stable—perhaps because of the overturning of the deep ocean," he says. "The deep ocean has nearly all the carbon, nearly all the heat, and nearly all the mass of the climate system, so how these giant masses of water have sloshed back and forth is thought to be tied to the period of the glacial cycles."

Details of glaciation can be studied in other ways, but getting a history of water currents is a lot more tricky, Adkins adds. But if the ocean currents themselves are

implicated in climatic change, then knowing precisely how the rules work would be a great advancement in the knowledge of our planet.

"These guys provide us with a powerful new way of looking into Earth's climate," he says. "They give us a new way to investigate how the rate of ocean overturning has changed in the past."

Robinson says that the current collection of corals all come from the North Atlantic. Future plans call for an expedition to the area southeast of the southern tip of South America to collect corals. The addition of the second collection would give a more comprehensive picture of the global history of ocean overturning, she says.

In addition to Robinson and Adkins, the other authors of the paper are Lloyd Keigwin of the Woods Hole Oceanographic Institute; John Southon of the University of California at Irvine; Diego Fernandez and Shin-Ling Wang of Caltech; and Dan Scheirer of the U.S. Geological Survey office at Menlo Park.

The Science Express article will be published in a future issue of the journal Science.

ASCIT Minutes

By PARVATHY MENON

November 16, 2005

Present: Warner Leedy, Kelly Lin, Peter Foley, Todd Gingrich, Dmitriy Kernasovskiy, Parvathy Menon, Michelle Wyatt, Jeremy Leibs, Wendy Xu

1. We need a new President for Caltech... Jeremy offers to take the job. An undergraduate committee has been assembled to (quote) "help" (unquote) in the search for a President. The committee will be comprised of Warner Leedy, Peter Foley, Parvathy Menon, and Ryan Farmer. A survey/email will be sent out soon to the student body to see what the students want in a President.

2. Would you like Peter to date your granddaughter? Send a pic to foley@caltech.edu, and he may get busy with your grandchild next.

3. There is a porn infestation in Dabney. Unrelated to Peter's fetish above.

4. Director of Admissions Rick Bischoff sadly informed us that due to the budget cuts that have been dealt to Admissions, they will have to shorten PreFrosh Weekend by one day this year (to 2days/2nights). PFW costs \$95,000, which is about 15% of

the administration's budget and one of the areas that will suffer cuts. Erica O'Neal and Margo Marshak (Student Affairs asst. VP and VP respectively) are super awesome and very supportive of the Admissions Department. Rick wants to emphasize that this decision is not a permanent one and it is possible that PFW will be returned to normal length in future years. Rick would like to talk to concerned students about the situation and invites anyone with questions or comments to talk to him or email him at rebisch@admissions.caltech.edu. Note that Warner will be sending out an email to the student body that will detail the cuts to PFW.

5. Yay Dima for getting a band to actually play at Caltech!! Now, Dima would like to help you help him. J He needs help with security, setup, other stuff – email him at dima42@its.caltech.edu and find out how you can help Jimmy Eat Caltech. Har har.

"...You little fruitcake. You little fruitcake. I said you are a fruitcake." –Democratic Rep. Peter Stark after Republican Rep. Scott McInnis told him to "shut up."

Parvathy Menon

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