

"And we shall play a game of chess,

THE CALIFORNIA TECH

Pressing lidless eyes and waiting for a knock upon the door."

VOLUME 85

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NUMBER 11

"Sing Noël"

A fine performance

The Caltech Glee Clubs, Chamber Singers, Chamber Orchestra and Double Brass Choir gave another fine performance in the annual "Sing Noël" at Beckman last weekend.

Both Glee Clubs have shown a definite improvement by concentrating more on the quality of their voices than the volume. Only the Hallelujah Chorus, inserted into the program as a "brief surprise," seemed unnecessarily weak. Perhaps if it had been part of the official program, it would have inspired more practice and greater enthusiasm. Of course, it is always hard to hear when everyone stands up in front of you.

Included in the evening were some excellent solo parts. Notably, Jacqueline Fernandez of the Chamber Singers sang a beautiful "Riu, Riu, Chiu." Also, Susan Cave was most impressive as the Shepard Boy, especially considering the difficulty of the aria.

Chris Brennan gave a very pleasant narration, although his part overburdened the second half. He never forced a word, instead inviting the audience to forget their surroundings and personally enjoy the little vignettes of song and play.

Unfortunately, the orchestra and brass choir did not match the voices in success. This was not so much due to quality of play, which was fine, but rather to the uneven distribution of instruments. There were far too many brass, especially trumpets, and these drowned out the much quieter strings. The violins in particular could barely be heard, which was a shame considering the beautiful string parts of the Hallelujah Chorus. Of course, more strings could not be added, as the stage was quite overcrowded already.

Also, although it is not fair to compare an annual event with its predecessors, a little more originality in the begin-

ing and end seems appropriate. It is not always necessary to enter with those high-tech candles and conclude with "Silent Night" and a similar exit, although M.E. Caldwell's arrangement of Gruber's original "Still Nacht" is beautiful.

At the conclusion of Saturday night's performance, the entire stage received a well-deserved applause, especially Don Caldwell and Chris Brennan. It is a shame that Monica Roegler, conductor of the Women's Glee Club, did not appear to acknowledge the applause which was just as much directed towards her.

As a note on upcoming events, Preethi de Silva will be performing this Sunday in Dabney lounge at 3:30 pm. This free concert is a rare chance to hear the fortepiano, a beautiful sounding keyboard instrument almost entirely forgotten. This performance marks the beginning of the thirty-fourth season of chamber music concerts in Dabney lounge.

—Chris Meisl

Basketball up 4-3

Two wins; Loss to Alumni

by Ath Man at Large

The Caltech Beavers basketball team raised its record to a stunning four wins and three losses with victories over LIFE and Pacific Christian Colleges sandwiched around a tough loss to the Alumni.

The Beavers, again supported by an enthusiastic home crowd, defeated LIFE last Friday, 65-58, pulling away to the victory after LIFE pulled to within one point at 49-48.

Jim Helgren led the Beavers with 17 points, a total good enough to make him the early leader in the NAIA District III scoring race. Stewart Peebles netted 13 points and Chris Kyriakakis added 12. Ed Zanelli, slowed by a toe injury, nevertheless combined with Peebles and John Krehbiel for some late free throws to cinch the victory.

The next day, the Beavers fell to the Alumni, 63-55. Ed Zanelli scored 16 points, while Peebles and Helgren netted 10 each. Bill Gustafson grabbed seven rebounds, and Peebles and Dave Wertz snagged five each, but for the third year in a row the huge Alumni front line dominated the inside and thereby gained the victory.

Greg Blaisdell, Ken Hansen, and Roger Noll combined for 33 points, and Gary Tornquist and Steve Schneider assisted in the domination of the area near the basket. In the second half of the doubleheader, the Alumni reserved eked out a one-point win over the Beaver JV squad.

The Beavers came back strong against Pacific Christian on Wednesday, racing out to a

45-13 halftime lead and kept up the pressure for a 78-27 victory. The Beaver fast break was again in high gear, delighting the home crowd. While Stewart Peebles (21 rebounds), Bill Gustafson (9), Jim Helgren (8), and Chris Kyriakakis (7) dominated the boards, Ed Zanelli set sail for the other end, getting most of his 25 points off the break.

The Beavers were also effective in their half-court offense, finding the open man, who was usually either Peebles (18 points), Helgren (12), or Kyriakakis (12), over and over. Tom Heer succeeded in impressing his "woman", as he hit several outside shots and combined with Zanelli (four steals each) to frustrate the Pacific Christian guards as they attempted to set up their offense.

The story of the evening, however, was the Beavers' outstanding team defense. Numerous blocked shots and good defensive rebounding held Pacific Christian to 13 points in the first half, and when Coach Mike Poizner challenged Caltech to hold them under 30 points for the game, the Beavers started out with a vengeance in the second half. Forcing the visitors to shoot from the outside, the Beavers held them scoreless for the first 14 minutes of the second half, while scoring about 30 points themselves.

All in all, it's been an outstanding first part of the season for Caltech, and the Beavers hope to continue their winning ways against Christ College at 7:30 pm on Wednesday, January 4 here at Tech.

Supercomputers at Tech

Little Nodes Solving Big Problems

Caltech News Bureau

A new class of supercomputers, capable of outperforming the largest computers in use today at a small fraction of their cost, is under development at Caltech. According to the developers, in only a few years their efforts could result in a computer that would fit on a desktop, have the computing power of 50 Cray-1 computers, but cost a fraction of the current price of one Cray-1.

Already operating at the Institute is The Cosmic Cube, an experimental machine with the equivalent power of one-tenth of a Cray-1, but at one-hundredth the price—about \$80,000.

The Cosmic Cube, like the other systems under development, is known as a "homogeneous machine," because it consists basically of a large number of identical computers, called nodes. Each of the 64 nodes in The Cosmic Cube execute programs concurrently, and each can send messages to 6 other nodes in a communica-

tion network based on a 6-dimensional cube, or hypercube.

This concurrent architecture is in sharp contrast to almost all of today's computers—so-called von Neumann machines—which operate on a problem sequentially, making one calculation after another.

The Caltech concurrent computation project is being led by Associate Professor of Computer Science Charles L. Seitz and Professor of Theoretical Physics Geoffrey Fox.

Seitz and his students have developed the architecture, technology, and designs for these machines over the past several years. Fox recognized the capability of these machines for demanding scientific computations, and he and his students began studies to apply them to a wide range of scientific problems. They persuaded other Caltech and JPL scientists to explore further applications of these machines for their research problems.

"The key to applying such a concurrent processor system to scientific problems lies in decomposing the problem into segments, such that each processor has charge of a single segment," said Fox. "Also, where possible, one aims at local decompositions such that one segment need only 'know' what neighboring segments are doing.

"For example, astrophysicists using the machine to study the evolution of the universe might place each processor in charge of calculating how a certain number of stars might behave in response to gravity. Similarly, meteorologists might divide the atmosphere into large cubes and assign each node the task of calculating what goes on inside each cube.

"In such cases, the problems must be formulated so that each computer spends most of its time calculating and only a few percent of its time communicating," said Fox.

"The node elements being used in The Cosmic Cube are not in themselves individually powerful," said Dr. Seitz, "having approximately the same power as is found in other of today's microcomputers."

"Physically, the machine occupies about six cubic feet, making it fit on the averagedesk, and uses 700 watts of power. Because continued progress in the microelectronic technology will allow us to shrink the node elements, we expect descendants with more nodes to remain physically small

machines. Not until the computers reach the 100,000-node range do wiring limitations hinder expansion," said Dr. Seitz. "Using technologies now in development, the architecture should enable computers that possess 1,000 times the power of a Cray-1.

"Future more powerful supercomputers in this class will exploit the progress in microelectronics both by making the nodes more powerful, and also by making machines that use larger numbers of more highly integrated or simpler nodes," said Dr. Seitz. Currently under development to explore this second approach is a chip called "Mosaic." The Mosaic element does with a single chip everything a 78-chip Cosmic Cube node does, and faster, but has only 4K bytes of memory.

"Also being developed under ARPA sponsorship is a 1,024-node system using Mosaic chips," said Dr. Seitz. "This system will have the power of a Cray-1 for many

computing problems, but at a small fraction of the Cray's price tag. The 1,024-node Mosaic will be completed and in use in about two years. It will cost about \$250,000 to develop and build, but mass production could drastically lower the cost of such a supercomputer.

"If such a system were mass-produced as is add-in storage for mainframe computers, and assuming a conservative selling price of \$50 per element, a 1K Mosaic-based system could sell for \$50,000," said Dr. Seitz.

In addition, the Caltech scientists are planning to construct a 1,024-node processor using more modern microprocessors and a megabyte of memory per node. This system would have the power of about 50 Cray-1's, and cost about \$2 million, a fraction of the Cray's price tag.

"The power of these nodes will allow the computer to be applied to a wide variety of scientific problems, including all those that we have currently investigated," said Dr. Fox.

ASCIT Notes

Kavounas Resigns; WATS Needs Help

Greg Kavounas resigned for personal reasons from his position as BOC secretary. The resignation became effective midnight December 5, 1983. The Excomm appointed Tim Allen, a BOC representative-at-large, to serve as temporary BOC secretary until elections occur in January.

ASCIT desperately needs help with WATS line billing. If you have just 6-12 hours between now and January to help with billing, you could help us reopen the WATS line sooner. If interested, contact me at x6236, Les Grate in Ricketts, or Paul Filmer in Page.

—Candi McCoy

the gadfly

No. 6

An examination of student life at Caltech The Holiday Spirit

This term, I happen to have only one final to take. That means several things: a longer Christmas vacation, very heavily weighted weekly homework assignments in my other classes, and therefore, lots of hard work all through the term. Of course, the last two points are probably true of all those who have five finals to take, but...

The fact that I have a longer vacation means much to me because it is in those moments away from Caltech that I get the best feel for what I accomplished at Caltech and why. The school schedule is also intense enough that any chance I get, I yearn and embrace freedom and escape. Finally, it puts me in a healthier, rejuvenated mood for my return. Maybe that's why my academic performance has always been best second term. (I'm too dazed to perform well first terms even though they are preceded by a yet longer vacation.) Perhaps that is also why third term is burnout time for everyone. Third term begins essentially only one week after second term ends. We get one day off each during second and third terms.

While realizing that this rush is a result of the administration's noble attempt to fit three terms in the space of other schools' two, I also realize and feel that this three term effort is being achieved at too great a cost. With three intense whirlwind-education terms to deal with, (intense because one semester's work or more is being compacted into one trimester) I have little time left free from work directly related to my classes. I was told of the great research opportunities here, but how am I supposed to find those twenty hours a week I need to seriously devote to a lab? If there was one fewer term, I would have plenty more time to do that research or join that soccer team or seriously have time to *understand* my class notes rather than just quickly picking out what I need to do the homework and keep up with the weekly homework grind.

At MIT, a whole slew of 4-week seminar classes are offered in all fields between first and second terms. They are an excellent example of positive teaching. Often we find ourselves interested in a field that is not our major and want to know something about it. At Caltech, the closest I can come to getting that kind of "cultural" exposure is by taking the bottom level course offered in their field. Here, "bottom" level courses in some options are at the caliber of AMa 95, EE 14, Ch 41, etc. They are all difficult and not at all geared for those who are simply interested. In addition, if I do decide to take Ma 5, I have to pay the price of competing with serious math majors, making it even harder.

The seminar classes, however, do not involve gory details or long homework assignments. I would be strictly with other introductory level students, and I would not have to sacrifice actual

term time since it is offered between terms. The seminars recognize that I have a layman's interest in the topics and they cater to that. If I find it really interesting, then I have the option to take an actual course in it. If it turns out not to be so interesting after all, then I am not the least bit worse off for it, and that's the way it should be. Finally, at MIT, it also allows students to spend time with friends in a relatively non-academic setting working purely with their interests and curiosities.

Sadly, at Caltech, such a seminar program probably will never and can never be implemented. There is no five-week winter break to put it in and the professors would probably refuse to teach them. One reason is that most profs tend to be jealously possessive of their free time which they reserve for research. Some teach grudgingly and openly tell their students that they would really rather be doing something other than teaching. Another reason might simply be that they feel they are wasting their time instructing a seminar class, and it would not be a masochistic enough experience for the students.

But even if such a program cannot be implemented, additional vacation or holiday time is necessary and would be beneficial. At least one could do research or seriously have time to travel somewhere if inter-term breaks were longer. No human is a machine that can operate relentlessly at such a high level for thirty weeks. Cancelling classes for midterms week or adopting a one-holiday-a-month policy would be helpful improvements.

To make time for the extra breaks, either we have a shorter summer vacation (which I'm sure is highly unpopular) or have one term less and spread out to a semester system. Such a system would be more conducive to education anyway. After all, with thirty weeks presently and with six of them specifically designated as exam weeks (20% of the time), I wonder whether too much time isn't spent on evaluation rather than the education of students.

Some professors here are so concerned with covering the right amount of material that they never stop to think about the quality of their teaching, which is on average very low among the technical profs. Consistent turkey winners are assigned classes to teach each term and there are instances where a rare prof cares to take time out for the students and ends up falling from favor with his department for neglecting his grant money collection or paper publishing. Excellent lecturers are very much the exception rather than the rule here. And if not very high teaching quality exists, then what is the purpose of generating large quantities of it?

Of course, the purpose of the institute is research first and foremost, but maybe for Christmas this year, someone sitting in the many ivory towers that be at Caltech will admit just for a second that the students deserve a little more consideration. And just maybe, that someone will make a New Year's resolution to do something about it. No one is looking for sympathy or an easier school, just a school that teaches with reasonable attitudes and expectations.

-Lily Wu

letter

1's, 0's, A's

To the Editor:

A long time ago, (circa '76) at a rotation meeting in Lloyd, Chris Vestuto realized that vivid debates over whether a particular frosh was a "1" or a "0" benefited neither the frosh nor the house. He proposed that we confine our ranking discussions to those frosh in the top third, giving everyone else a non-numeric rating such as "A". There was initially some concern that this would put us at a disadvantage in frosh pick, such that we would tend to be left with the dregs. Chris thought that people who had not been publicly branded behind their backs may in fact turn out better than if they had. Some thought that the "A" rating would tend to gradually degrade, until it was equivalent to the old "0". Chris thought that we should make an effort not to let that happen, and that it was still worth a try.

We adopted his proposal, watered down so that "A" was reduced to the bottom half, and with private notes to the president listing personal undesirables in lieu of open discussion. I thought this was one of the most civilizing steps we had taken, even if we hadn't gone as far as Chris had wanted. I don't believe that

continued on page 3

The Caltech Y Fly-by

Friday...December 9

Noon Concert—It is never too late to enjoy 'August'. Relax to the euphony of the last noon concert before Finals.

Art Workshop—Yep, you can still be creative (one last time). 3-6 pm in the Y Workshop.

Saturday...December 10

...DECOMPRESSION... 8 pm to 1 am, Winnett Lounge. More fun, food and frolic featuring a live magician from the Magic Castle from 9-11 pm both nights. Quit troling and experience the festivities. Guaranteed enjoyment.

Sunday...December 11

Decompression continues from 8 pm to midnite. Do not be left out.

A MERRY CHRISTMAS, HAPPY NEW YEAR and a HAPPY HANUKKAH to all of you from all of us at the Caltech Y.

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THE CALIFORNIA TECH

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The Inside World

Blacker: Walter, Gaston, and Matthew made a Pantry run on Saturday, only to discover, once they got there, that they had all forgotten their wallets!! Better luck next time, guys. Main alley got a surprise when Charles decided to take matters into his own hands and filled the entire alley with cottage cheese (small curd).

Aside from that, not much happened in Aird house this week. Bernard brushed his teeth. Andrea made a humorous announcement. Franklin cancelled his *U.S. News and World Report* subscription. Someone turned the fire in the fireplace off, but Larise managed to get it working again. No one knows what happened to Naomi.

— Sigmund B. Fernmeister
Dabney: Ecclesiastes 3:9-13.

Best of luck on exams, and enjoy the holidays.

— *The Spirit of Dabney*

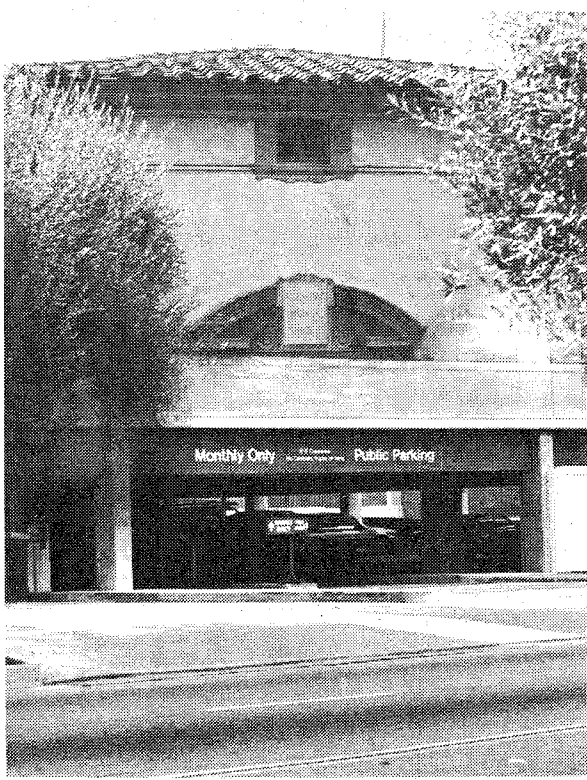
Fleming: Last Saturday was the Fleming Penthouse Party, and oh what a party it was. Thanks to the Social Team, Mark Ross, and the Alley 4 Bar for a great job. Thanks also to other houses for sending females.

Wednesday, Fleming increased its Interhouse lead by taking the swimming title thanks so great efforts by all involved, especially Coach Dave Watkins (new record, 50m. fly). By the way, Page: Fleming has three first places, and you don't have any. Well, at least you've scored in Discobolus.

Yogurt Party tonight at 10:00 pm in room 58 for all real men. Events include Viking Style yogurt, team yogurt eating, and, for the courageous, the infamous yogurt bong. BYOY.

Merry X-mas or Happy Hannukah or whatever. See you all after the break.
— Showermaster

All others: No entry.



FLEMING TRANSFORMED Photo by Steve Baxter

Computer Prostitution

A part-time job is available for a student. Experience with the C language and UNIX* are very desirable, as is experience with troff. If interested, contact Sam Sjogren, 373 Lauritsen, ext. 6660.

*UNIX is a trademark of Bell Labs.

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from page 2

Lloyd suffered in frosh picks that year. If some of our lower picks were lower than they otherwise would have been, no one seemed to notice, and with more attention paid to our top picks, we may have done better there. Over the next few years, the "A" rating slipped somewhat. By '79, when those who had witnessed the original proposal had either graduated or flamed, "A" seemed to have stabilized somewhere around the bottom third, with a bit of a stigma associated with it, and though of as more of a time saving measure. I don't know how much of Vestuto's proposal is alive now. I hope some people remember what it was about.

— Dean Inada, 74084

P.S. Random assignments seem unlikely to eliminate the barriers between houses, unless they were changed every year. This would create enough barriers within houses to obscure the ones between.



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announcements

Art Auction for Kids

The Children's Center at Caltech (formerly the Child Education Center) is sponsoring an Art Auction on Saturday evening, December 10, 1983, in Chandler Dining Hall. Admission is free.

We invite you to come at 7:00 pm, enjoy some wine and cheese, and view a collection of signed and numbered lithographs, etchings and serigraphs, as well as a varied

selection of water colors and oil paintings. In addition to many lesser known artists, such artists as Rockwell, Dali and Neiman will be represented.

At 8:00 pm the Auction will begin. Most of the pieces will sell for between \$30 and \$200. Two door prizes will be given away. You may show your support for the Center just by attending: we are guaranteed a certain amount of money if there are 250 adults present when the auction begins.

The Children's Center at

Caltech is a non-profit educational organization providing part- and full-time day care for children from Caltech and community families. The Auction is a fundraising event and all checks will be made payable to the Center. We invite you to visit us at school—293 S. Chester (corner Del Mar) 793-7308.

For further information on the Art Auction, contact Margaret Hershey Lester at 797-5830.

50 Confessions To Go Radio Research

Some 50 copies of Robert Huttenback's *Confessions of a Genial Abbot* are available at the Dean's Office for pick-up by undergraduate students who live off-campus. The book is free, thanks to subsidies from the MOSH, the Dean's Office, and the Caltech Y.

Robert Huttenback was the Master of Student Houses at Caltech from 1958 to 1968. This book, his brief "memoires" of that period, offers a fascinating and often amusing look at the student houses during that period. Also, through it, one detects the evolution of the House System and Rotation to their present forms.

Again, this offer is for off-campus undergrads only. Each of the Houses should have already received some forty copies of the book.

The National Radio Astronomy Observatory will have a number of research assistantships available to qualified undergraduate and graduate students of astronomy, physics, electrical engineering and computer science during the summer of 1984. The students will be assigned to work closely with one of the staff scientists on various radio astronomy programs in progress at the Observatory. This may involve observing, data reduction and analysis, equipment development, or theoretical study. **Application Deadline: February 1, 1984.** For applications and information, contact the Career Development Center, room 08, Parsons-Gates, x6361.

New Zealand

Stan La Rue will personally narrate his film, "New Zealand," tonight at 8 pm in Beckman Auditorium. This is one of the series of Armchair Adventures travel films.

"New Zealand" covers the major cities of Auckland, Wellington, Christchurch and Dunedin. La Rue also visits the attractions of Rotorua, Lake Taupo, Tongariro, Mount Cook, the Southern Lakes and Milford Sound, offering a look at the people of these areas and the major industries.

La Rue has traveled to New Zealand many times, thus providing him with a broad knowledge and understanding of the country and its people.

Tickets are \$6-5. They are available at the Caltech Ticket Office, 332 S. Michigan Ave. For further information, call 356-4652.

Tennis, Anyone?

Team tryouts will be held January 3rd through 7th from 4 to 6 every afternoon.

Baroque Piano Man

Caltech's free Dabney Lounge Chamber Music Series opens Sunday, December 11 at 3:30 pm with a concert by fortepianist Preethi de Silva. Works of the Baroque and Classical period will be featured on the program, including compositions by Bach, Mozart, Haydn and Mützel.

De Silva will perform on a fortepiano based on an instrument made in 1796 in Vienna. A native of Sri Lanka, de Silva is currently on the faculty of Scripps College in Claremont. She is also a composer and the founder-director of Con Gioia, an early music ensemble performing chamber music of the 17th and 18th centuries on historical instruments.

Admission to the concert is free of charge and no tickets are required. For information, call 356-4652.

MU 20 Moves Up

MU 20—Music and Dances of India, taught by Harihar Rao, will be taught on Thursdays at 7:00 pm rather than 7:30 as originally scheduled.

TALK TO DRAPER

Friday, January 13, 1984
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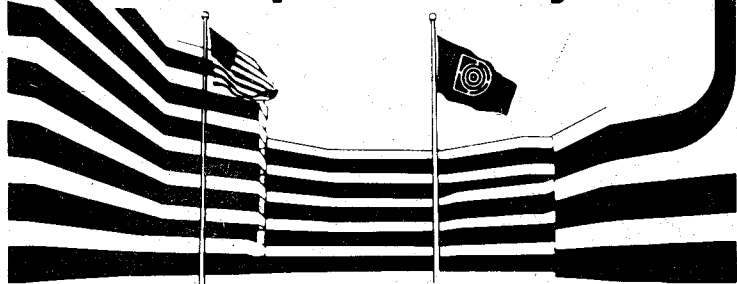
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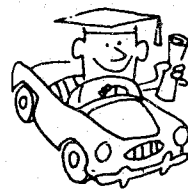
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