



"Sacred Cows . . .

California Tech

Associated Students of the California Institute of Technology

... Make the Best Hamburger."

—William Thomas Killeen

Volume LVIII

Pasadena, California, Thursday, December 8, 1966

Number 11



Lloyd House participants in Ye Olde Red Mountain Derby smile for posterity immediately prior to the start of Sunday night's footrace. For story see page 2.

EPC Polls Sophomores In Annual Math 2 Rebellion

The annual Math 2 gripe session (at least it seems to have become an annual event) is now well under way. In response to the rumblings of mutiny which resulted from a statement in the EPC minutes that Math 2 seemed reasonable this year, the EPC polled sophomores in the course. **The returns show . . .**

The results indicate the same problem that always seems to plague the math department. non-math majors do not, as a rule, like the theory and abstraction that mathematicians love. Of the 50 that returned their polls, 34 thought too much theory was being taught, 11 thought about the right amount, and one thought too little theory. Most of those who replied to a question about the usefulness of the course were unable to say for certain. Math majors complained that it duplicated Math 5, while non-math majors complained that the presumably useful applications were not being taught. The general consensus was that it

might be useful.

... the natives are restless

A suggestion that the course be split into two sections, one theoretical and one applied, as was done last year, received a 42 to 8 vote of approval. Of those who were in favor of splitting the course would probably join the theoretical section. Second term last year, the theoretical section, taught by E. C. Dade,

who lectured first term, had about 10% of the original class.

Memorization midterm

The anger aroused by the midterm was almost entirely centered on the amount of memorization required. Of the three roughly equal parts of the test, one was memorization of a list of definitions given out before the test, and another was the

(Continued on page 3)

Molasses Used For Seamless Metal Tubes

Dr. Charles Babcock, Jr. of the aeronautics department has announced a major step in the understanding of techniques for the construction of thin-walled rocket boosters. Thin metal shells three times as strong as any developed in previous experiments were one result of a series of experiments for the National

Aeronautics and Space Administration.

In the past, missile and spacecraft designers had to be conservative in their strength estimates because of the lack of clear explanations between theory and application.

Did they try corn likker?

According to Babcock, previous attempts to explain the low strength of actual, as opposed to theoretical metal shells, "had not matched carefully all the assumptions used by the theoretical analyst in most cases, so it was like comparing apples with oranges." Instead of applying the theory of ideal shells to real ones, the Caltech group proceeded to construct, with the help of some blackstrap molasses, shells as free of imperfections as possible. The shells were made by plating copper onto a wax mold,

(Continued on page 5)

Levick Describes Rabbit's-eye View

by Cook

Dr. W. R. Levick of Berkeley recently gave an interesting lecture entitled "What the Rabbit's Eye Tells the Rabbit's Brain". It was concerned with sophisticated behavior in the rabbit's visual streak. The streak is an elongated area present in the rabbit's retina in the same approximate position as the fovea centralis is in the human retina.

RXF equals torque

In the retina as a whole, there are several types of visual centers. On and off center-concentric centers detect local contrast and fast-movement detectors detect rapid motions. On-off direction selective areas fire when a

shadow or bright spot moves across in either of two perpendicular directions, but do not fire when the spot is moved in any other direction. On-direction selective areas are similar in action but fewer in number.

Are you with me?

When the visual streak is stimulated in the same way as the rest of the retina, very little activity is observed. The reason for this seems to be that the active areas are surrounded by inhibitory fields. When both the field and the area are stimulated, no effect results, since the impulses cancel out. To get a response, the spot used for stimulation must be small and moved slowly. In addition to the standard types of centers, there are at least three other types exclusive to the streak. There are cells which respond to the orientation of non-symmetric spots moved across them. They appear to be modified concentric units with an incomplete inhibition ring. There are other types of cells which seem to respond to edges rather than total cross section. There are cells which maintain a constant discharge except when stimulated. All kinds of stimulation seem to turn the cells off.

Levick has done quite a bit of work in the field of retinal research. The data he has collected on the rabbit's retina has thrown light on the evolution of visual characteristics in various animals. At the conclusion of his lecture, he speculated on the possible significance of the different types of visual centers.

Bridge Tourney Planned

The annual Intercollegiate Bridge Tournament will be held in Winnett Student Center Friday evening, January 6, tentatively.

This year's tournament will differ from previous years' in that the first round will be an ordinary duplicate tournament, with hands dealt at random at the table. The second, regional phase will consist of twenty-four par-point hands.

Two finalists will compete in games of between four and eleven tables for the regional phase of the tournament: the top pair in each direction of a Mitchell game will qualify.

Last year's Caltech winners were P. N. Shankar and J. L. Firkins, who netted the First Over-all honors (highest score among those from Smogland); and Louis Newman and Paul Lee, who stole the first North-South honors (again this is out of those competitors from Caltech). The Institute was well represented last year, having 11 tables fighting for the glory of our beloved monastery.

This year's director will be Bob McDonnell, who directed the Intercollegiate Tournament twice before, as well as last year's In-house Bridge Tournament, won by Lloyd House.

All undergrads and most grad students may qualify for the second round. Ineligible players,

however, may enter the first round.

The entrance fee is one dollar per person. In the past ASCIT has paid half this fee for ASCIT members. To sign up or for further information see Myron Mandell or Paul Lee, Page House, or Louise Hood in Winnett Center.

Thompson Foresees Important Studies In Language Analysis

"What's in the brain, that ink may character?" asked William Shakespeare in one of his sonnets, and Dr. Fred Thompson asked the same question Monday night in the final fall lecture of the series. Thompson, trained in mathematics, is a researcher in semantics, and holds the post of Professor of Philosophy and Applied Science, under joint sponsorship of the Division of Humanities and the department of Applied Science.

Thompson discussed the problems of semantics and syntax in regard to understanding, the problems of saying exactly what one wishes to say. Everyone has had the problem of expressing his exact feelings or emotions, and is aware of the limita-

tions inherent in language. Semanticists hope in the near future to combine recent discoveries along with advances in linguistics in the formulation of precise language analysis and construction. Such precision is already available in the "language" of mathematics, and there are hopes for expansion from this type of descriptive syntax to richer forms more applicable to the real world.

Proper language

Emile Post, a famous mathematician, proposed that all language could be produced by a series or rewrite rules, whereby each element of language may be rewritten according to a set formulation. These rewrite rules

(Continued on page 2)

Notices

MOBIL ECONOMY RUN

The Office for Industrial Associates is looking for students to assume leadership positions for the 1967 Mobil Economy Run. The Chief Observer must be a senior who is at least 21 years old, and in addition 7 House Leaders are needed.

Interested students should submit their names to the Industrial Associates Office, Room 7 Throop, no later than December 15. A committee including Dean Foster Strong, Dean Paul Eaton, Dr. Robert Huttenback, and Mr. Richard Schuster of the Industrial Associates office will make the selections.

TRAVEL!

Maps of the steam tunnels are now available from David Hermyer, Rm. 43 Ricketts.

Editorial

Student Ghettos

Every year a new frosh class is introduced to the rigors of Institute life. The eager arrivals are not spared any detail of the Spartan life: 30 hours of class a week, including no less than 12 hours of labs, all of which conspire to doom them to the unholy blasphemy of academic life: the eight o'clock class.

To help the frosh through these trevails, the Institute has decreed that all frosh, whether married or single, should spend at least one term in the Student Houses. There is quite a bit of method in this madness; the newcomers have the benefits of consultation among themselves and with their wiser, more experienced upperclassmen.

As time passes the greenhorns become seasoned veterans. What is left in the Houses for them after this change has been effected? The pros and cons of the problem's sociological aspects have already been extensively discussed in previous **California Techs**. We would now like to say something about the physical conveniences of the Houses. For example, although one is not ordinarily interested in hearing his neighbor's voice in the wee hours of the morning, the paper-thin walls dividing adjacent rooms in the New Houses make his soliloquys impossible to ignore.

During the hot spells which punctuate the seasonal weather from October to May, it would be nice not to have your radiator contributing to your discomfort. Although each room has its own radiator which can be adjusted independently (at least, almost independently) of the will of the masses, the hot water pipe which feeds the radiator is there to stay. Countless numbers of protests have been lodged in many directions about the heating system. These are usually fruitless, however, since turning the heat off in **one** House means turning it off in **all** of the Houses, thanks to a "miracle" of modern engineering design. Hence, while the ideal room temperature for homo sapien males remains at 68 degrees Fahrenheit, the Tecker is lucky if he can approximate Stygian temperatures. The windows are virtually useless due to their diminutive size and the general lack of gale-force winds in the LA area.

Then there is the question of rent. The House dwellers pay approximately \$45 each month for **half** of a room which is slightly larger than the average bedroom. When this rent and the few fringe benefits of cleaning and linen are compared to the costs and similar benefits of off-campus living, the outside resident is getting the better buy in both living area and comfort.

Unfortunately, it is too late to change the Student Houses (barring seismic catastrophe or nuclear war). But when they **are** rebuilt in the distant future, let up us hope the designers do a better job.

—John Middleditch

Dubridge Lauds New Technological Gains

"Many people seem to assume these days that technology is the enemy rather than the friend of people. What a shortsighted view." President Lee DuBridge directed his comment to the Board of Trustees in his annual President's Report and continued to explain that technology has been a major factor in creating the high standard of living in the Western world. "It is in those areas of the world that technology has not yet touched that poverty and suffering prevail."

DuBridge covered the Institute's academic and financial affairs, placing stress on both the contributions and limitations of science in the solution of world problems. Although the technological benefits are incalculable, he realizes that with its successes come many intricate problems concurrent with economic, political, and other social dilemmas.

Cold shoulder

In what he called "a brief look over the shoulder," DuBridge made a resume of the significance of Caltech's 75th year and stated that "the total ingenuity of man needs to be applied to the challenge of making this planet a better place to live, and Caltech joins many universities in trying to meet

this challenge."

Astronomy is

In the field of research, DuBridge covered many of the subjects in which commendable progress has been made. The 60-inch telescope planned for Palomar Observatory will be the most modern photometric telescope built to date and will perform functions that will admirably supplement the Hale 200-inch. In radio astronomy, the high precision capability of Caltech's Owens Valley Observatory will be augmented by a new 130-foot radio telescope now being built at the same location. **the proper study of mankind**

DuBridge feels that the Institute is prepared to push forward rapidly in the molecular analysis of the structure of genes which will lead to major steps in the breaking of the genetic code. A better understanding of behavior patterns may be attained through studying the molecular basis of the behavior of nerve cells and "prospects for the future are most exciting."

DuBridge also reported on the finances of Caltech and announced that net assets increased from \$149 millions to \$163 millions and that its endowment fund asset increased from 74 to 78 megabucks.

Letters

Totem Epitaph

by Mike Henerey

As the first assistant to Gary Stonum, the editor and re-founder of **Totem**, I was disappointed that he found Tech so intolerable as to choose Viet Nam. Fortunately he made it into Reed at the last minute, and now describes it as heaven on Earth compared to our present abode.

Steve Alfin became editor after him, as I was flunking out, and I remained second in command. As Gary was before him, Steve is now my best friend. Alas, though, now Steve says **no** plan (at all) is better than the Tech plan.

There is no Totem. R.I.P.

ASCIT Board Tightens House Subsidy Policy

Editor's note: This letter was adopted unanimously by the ASCIT Board at their December 5th meeting.

Editors:

Every year the ASCIT Board has given each Student House \$100 to help defray the cost of Interhouse Dance with the understanding that each House would put forth a good effort. \$300 of the money is a gift of the Alumni Association as a gesture of support and thanks for having been invited to attend. The Alumni have asked that this be administered by the Board. The remainder comes from student dues. The express purpose of the gift is to encourage the Houses to make this an outstanding campus-wide social event which Alumni and townspeople, as well as members of the Caltech Community, can attend.

Ricketts and Lloyd found wanting

In the past the Board has felt that all Houses have put in an adequate effort to justify the \$100 gifts. This year, however, the Board feels that the efforts by Ricketts, and to lesser extent, Lloyd, were not adequate to remain within the spirit of the gifts. The Board has voted to provide \$100 to all Houses **this year**. It was also its unanimous opinion, however, that Houses which put forth this little effort next year should **not** expect a \$100 gift.

The Board feels that the overall results are of prime importance, rather than the exact number of people working or total expenditure, in living up to the expectations of the Alumni and others.

No outsiders

The Board strongly discourages the introduction of outside organization as a major part of Interhouse, as was done by Lloyd this year.

The Board want to emphasize strongly that the purpose of the \$100 gifts each year is to help the Houses as much as possible to put on a truly memorable event. In view of this purpose and the Board's obligation to the Alumni, the Houses implicitly bind themselves to put forth a reasonable effort. The Board hopes that this year was only a temporary exception and that all Houses will continue to fulfill this commitment in the future.

The ASCIT Board of Directors

Bacchanalley Drinkers Disgrace Patron Saint

The notorious Lloyd House alley challenge, the Red Mountain Derby, was used to settle the mutual animosities between the adjacent upper-floor alleys of Penthouse and Bacchanalley Sunday night. Led by frosh Bill Atwood, Penthouse triumphed over Bacchanalley by a score of 67½ to 58½ (man-laps).

Ran out

The Derby, which consists of an indoor cross-country race punctuated with a compulsory eight ounces of fruit of the vine each lap, used up said fruits at a fearful rate. Supposed to last 30 minutes, it exhausted the supply of red rot-gut ten minutes ahead of schedule, and the contestants were forced to continue without the aid of liquid solace.

Your friendly editor

In addition to the superhuman Bill Atwood, the Penthouse team was also complemented by Jeff Garvey, Jeff Haemer, and Mike Meo. Bacchanalley's losing team was comprised of Jim Woodhead, Norm Whitley, Walt Gish, and Bill Ring. To get the race off to a bang-up start, a one-gun, .75 calibre salute was fired; the alleys stank of sulphur (and other things) all night. Atwood set a new record, running 18 laps before the mountain dew ran out and ten more afterwards. The team of three

frosh and a junior beat a team composed of four juniors.

Haemer is alive

The major contest was between Meo and Whitely, fighting each other hard for first place. Meo took an early lead, but Whitely's cool chugging style beat him; the two were quite disturbed when they learned that Atwood had won. Haemer passed out, thus providing considerably less trouble than Garvey, who pounded on the wall for two hours bemoaning the imminence of his death. Woodhead maintained that he had a "super-stomach," which served him well during the race, and helped him sleep for half an hour while soaking in a shower stall. All contestants seem to have survived the ordeal despite protests that they wouldn't.

Tech office, Tuesday, 3 a.m.
Meo: "Let's go."
Middleditch: "We can't."
Meo: "Why not?"
Middleditch: "We're waiting for Boone's article."
Meo: "Ah!"

Tech office, Wednesday, 3 a.m.
Meo: "Let's go."
Middleditch: "We can't."
Meo: "Why not?"
Middleditch: "We're still waiting for Boone's article."
Meo: "Oh."

They'll Make Words as Easy as Math

(Continued from page 1)

may be displayed in a "net" of interrelating concepts of unlimited complexity. As an example, Thompson used the phrase, "The companies in the home ports of ships in London." Ships in London, may be replaced by the names of ships connected on the grid to the name London. Each ship is associated with a location on the grid entitled home port. Thus, home ports of ships in London may be replaced by

names of cities. Each city may be rewritten by the name of every company in its bounds, and the rewrite is complete.

Each person does this rewriting unconsciously in his mind, but more complex situations yield easily to the process where mere mental compilation would be difficult. But although much progress is being made, Thompson expressed doubt as to the eventual success of making spoken thought precise and definitive. As he says, "the music of spheres may not be written on tablets of clay."

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Y Finance Drive Will End Soon

As of Saturday, December 5, results of the YMCA Fund Drive for undergrads stood as follows:

Blacker	\$208.99
Dabney	377.82
Fleming	253.82
Lloyd	156.53
Page	262.00
Ricketts	191.00
Ruddock	157.50
off-campus	75.00
Total	\$1682.34

Returns, especially for off-campus students, are still quite incomplete. Judging from how fast the cards came in last year, the drive may still reach last year's total of \$2300 for undergrads.

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H5 Pierre Describes British Woes At Hands of US

by Len Doberne

"The British bomb was aimed more at Washington than it was at Moscow," concluded Andrew Pierre, in the last of this term's H5 lectures on the topic the "The British Nuclear Force: Politics and Technology." Pierre was born in Austria, raised in France, educated at Amherst and Columbia, worked at the Institute of Strategic Studies in London, and is presently with the Hudson Institute. His talk was basically a history of British nuclear weapons development and attitudes.

Congress blows the job

During WWII, the British were considering the use of atomic weapons. At that time the US speculated on atomic power for peaceful purposes, but became convinced in 1940 that the bomb was feasible, and a joint research effort was launched here in the US. In various secret pacts, the two governments agreed to full collaboration on military and peaceful aspects of nuclear power after the war. However, in 1946 the Congress, unaware of some of the agreements, passed the McMann Act which in effect stated that the US had discovered the secrets and would not share them.

At this time England was in a dangerous position. The US seemed to be going into a state of isolationism: it cancelled lend-lease one week after the war ended. Sixteen months after the McMann Act, the British decided

to manufacture their own bomb. They still considered themselves one of the greatest world powers, and felt that not to build a bomb would be to retreat from power. After their bomb was built, the US made several amendments to the Atomic Energy Act which allowed sharing nuclear secrets with nations already possessing the bomb.

Because of this episode, the British recognized the need for having the bomb as an independent deterrent. They were fearful that the US might not use the bomb when she felt it was needed, and her own nuclear retaliation to aggression could trigger a larger, more effective retaliation by the US.

US welves once more

The British have long looked to the US for help in delivery systems. At first, they shared in the Blue Streak program and when this program was cancelled, the Labor government was in trouble. Later, the Nassau conference, which had been called to discuss such matters as the Congo, became centered about the cancellation of the Skybolt program. They first rejected, and then accepted, the Polaris program, which is now being replaced by the Poseidon missiles which will be launched by the Polaris submarines.

Pierre sees the continuance of the independent British nuclear force or an independent Anglo-French nuclear deterrent.



by Fishbone

Starting with the inferior social status of women during Shakespears day and touching on the developments in the institution of marriage since then, John Houseman's production of "The Honourable Estate," starring Nina Foch, climaxed its anthology of dramatic glimpses last weekend at Beckman Auditorium with the West Coast premiere of Samuel Beckett's play "Happy Days."

With Houseman himself narrating, Theo Marcuse and Jon Drury playing the male roles, and Norma Crane, Betty Harford, and Joanne Linville supporting Miss Foch, the first half of the show ranged from a reading of Christopher Marlowe's vision of "Helen of Troy" to an enactment of the famous door-slamming scenes of Ibsen's "A Doll's House" by Marcuse and Miss Linville.

Who is the stronger?

Perhaps the most poignant vignette of the first half of the production was a modern adaptation of a Strindberg play. A vain, gabby woman meets an old girl friend whose lover she has stolen. The gabby woman regales the silent one about her husband for a while, and then confesses that she really can't live with herself. She gives the silent woman her husband's (the stolen lover) telephone number and then leaves. But the silent woman was no friend of the chatty woman, nor of her old lover. She rips up the slip of paper.

Beckett's play too long

Beckett's play explores a marriage which is totally devoid of romantic love. The wife is buried to her arms in a mound of earth representing the vast superficiality of her life; as the action progresses, she sinks lower and lower. Her husband is still able to crawl around

and sustain their marriage from a practical standpoint, yet whenever he tries to ascend the mound surrounding her, he fails. "Oh, happy days!" cries the wife, oblivious to sexual desires.

Cool line

During the entire play she had been perplexed by an inscription on her toothbrush. Only near the end of the action can she read it successfully: "fully guaranteed, genuine, pure hog's bristle." "What is a hog?" she asks her husband. She hears just what she wants, "A male swine, castrated for slaughter."

Poly sci Expansion Bruited by Smith

The Rockefeller Foundation has given \$200,000 to Caltech to initiate a teaching and research program on the impact of science and technology on society, President Lee A. DuBridge announced recently.

The first emphasis in the new Caltech program will be the development of substantial work in political science, said Dr. Hallett Smith, chairman of the Humanities and Social Sciences Division.

"This is because we regard the governmental aspects of the problem as central and inescapable.

"In recent years," Smith continued, "we have observed a marked increase of student interest in such problems as government policy and decision-making, economic development and social change, national security and foreign aid. This resulted last year in the creation of undergraduate majors in history, English, and economics.

"We will offer a major in political science as soon as an adequate staff can be assembled," he declared.

cause there will be a new instructor second term, but the results will be brought to the attention of the math department.

The EPC is planning to conduct a course-instructor evaluation poll for all courses early next term. This poll will be similar to the one three years ago. All students who are taking or have taken a course will be given the opportunity to evaluate it.

EPC meetings are held Thursdays at 7:00 p.m. in Chandler. Anyone is welcome to come and make himself heard.

EPC Polls Math 2

(Continued from page 1)

proof of three out of fifteen theorems on the same list. The complaint of too much memorization was voiced by those at all levels of understanding, especially those who understood all or most of the material. One student replied that a monkey could have memorized the proofs and definitions. The final is going to be of the same sort.

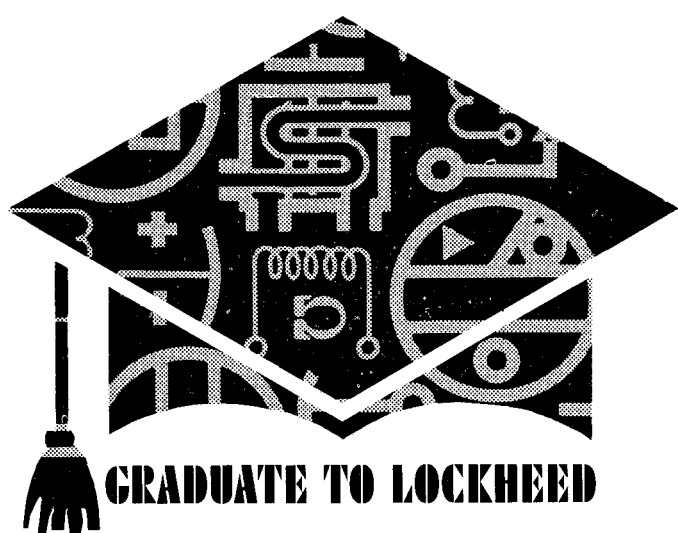
The EPC is not contemplating too much action on this poll be-

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FLICK GUIDE

ACADEMY 1003 E. Colorado 796-3191 Admission: \$2.00 (\$1.50 before 5:00) w Fox student card.*	Friday and Saturday: Shameless Old Lady — 7:00, 9:48 Short feature — 8:40 Circle of Love — 8:55
The Russians Are Coming — 12:30, 4:45, 9:15 1000 Clowns — 2:40, 7:00, 11:20	STATE 770 E. Colorado 792-7139
COLORADO 2586 E. Colorado 796-9704 Admission: \$1.00 for students	Friday and Saturday: Zorba the Greek, The Visit, starting at 7:00
Friday and Saturday: Texas across the River — 6:41, 10:19 Arabesque — 4:51, 8:28	UNITED ARTISTS 606 E. Colorado 681-6577 Admission: \$1.50 w United Artists student card. \$1.75 w out.
CROWN 129 N. Raymond 796-3131 Admission: \$1.25 w Statewide student card, \$1.50 without.	The Blue Max — 7:14, 10:06
Friday and Saturday: Rage — 2:47, 6:38, 10:32 Glass-bottomed boat — 12:45, 4:36, 8:30	UPTOWN 2316 E. Colorado 793-4330 Admission: \$1.25 w Uptown student card,** \$1.50 w out
ESQUIRE 2670 E. Colorado 793-6149 Admission: \$1.50 for students	Friday: Hotel Paradiso — 7:00, 10:45 Yellow Rolls-Royce — 8:40
	Saturday: Hotel Paradiso — 3:20, 7:03, 10:48 Yellow Rolls-Royce — 4:50, 8:46

*If you are bereft of a Fox student card, one can be bought, included in an admission price of \$2.00. Good for six months.
 **An Uptown student card can be purchased under following plan — first night: admission plus card, \$1.50; second night: admission, free; following nights: admission, \$1.25.

TECH Sports

Wrestlers Impress Despite Two Losses

The Caltech varsity wrestling team opened its 1966-67 season against Biola. Consisting almost entirely of freshmen, this year's matmen made a strong showing at this home meet.

Ken Higgins, wrestling at 137, earned Caltech's first points of the evening. He completely dominated the match but was unable to get the pin and had to settle for a decision. Another frosh, Alan Beagle, had less trouble with his 177-lb. opponent, pinning him in the first period. Tech's other pin came during the 191 lb. contest when returning sophomore Joe Devinsky put away his man in the second period. Until then, this match had been rather even with neither man on top for any length of time. In the heavyweight event, Jim Woodhead, a junior, although outweighed by 20 lbs., had little trouble in winning a decision.

Although Biola won 30-16, Caltech's showing in their first meet gives much promise for the future. The team's strength was evident in the heavier weights, and with a little experience it

will be a formidable opponent for anyone.

Despite a raging downpour on Saturday the wrestling team traveled 120 miles to meet UC San Diego. UCSD has many competent returning veterans and may prove to be one of the strongest opponents of the year. Consequently, San Diego dominated in most of the matches and won 44-5.

Caltech's only points were earned by ex-football star, Alan Beagle. Wrestling at 177 again, Beagle pinned his opponent early in the second period. This was Beagle's second consecutive pin in competition, giving him a perfect record so far this season.

Even though the score doesn't show it, the Teckers showed signs of improvement and many of the matches were quite close. As examples, Joe Devinsky (167) was defeated by his lack of riding time, as was Doug Mason (191). Rusty Keys a frosh who lettered in high school, was completely dominating his opponent until the referee mysteriously called Keys pinned???

Cross Runs Wild in Meet

Running at an Oxy intrasquad meet Thursday, Pete Cross bettered his own Caltech 2-mile record. His time was an outstanding 9:26.8, 14.7 seconds better than the record, but it was only good enough for fourth. Caleza, an Oxy freshman, ran in 9:10.3, and two other frosh also beat Cross. (Do they recruit?)

•Running in the Rose Bowl 10-mile handicap, Cross and frosh Dave Hermeyer were the only runners from Caltech. It was the first time Hermeyer had run 10 miles; he completed the race in 65 minutes. Cross ran a person-

al best of 53:45, the third best time of the day, but large handicaps given to other runners kept him from getting an award. Cross was offered a 3-minute handicap, but he had too much pride to accept. Gary Sailors of the Culver City Track Club had the best time of the day: 51:58.

Being very dedicated, Cross will run again this Sunday, this time in the Western Hemisphere Marathon in Culver City. (A marathon is 26 miles, 385 yds.) Prayers for his health and GPA would be appreciated.

Basketball Team Opens Season; Shows Promise for Next Term

The varsity basketball team started the season on a bright note, winning two of their first three games. The game on Thursday saw Caltech scoring an impressive 107-75 victory over Life College with three players having over 20 points. On the following night the team traveled to Southern California College only to lose to strong opposition 69-85. Meeting Life again on Tuesday, the Beavers once again won easily 91-69.

In the first game the team took ten minutes of the game to warm up, but managed to end the half with a 15-point lead. Coming back for the second half they got hot and hit 65 percent from the floor. Jim Stanley was high scorer with 26 points; Terry Bruns and George Fox both had 23. The team also shot well from the freethrow line, making 27 of 32 attempts.

Friday night the situation was quite different. Southern California College, having one of the highest-scoring small college teams in the country last year, had more height, bulk, and numbers than Caltech and subsequently ran the Beavers, who had only two substitutes, into the ground. Bruns came through with his usual fine effort, but his 25 points were not enough to turn the tide.

Caltech started the second game against Life with a big flurry and jumped off to a 48-27 lead at the half. But the shortage of players proved a difficulty once again. The team got into foul trouble early in the second half and their effectiveness was cut down so they could just keep even with Life in scoring. By the end of the game Bruns and Jim Pearson had fouled out and three other players had four fouls each. But the big margin rolled up in the first half was more than enough for Tech to win. Bruns was again high with 26 points, while Stanley pumped in 21 more.

The coaches picked junior Terry Bruns of Ruddock as the outstanding player of the week. In three games he has hit a total of 74 points and also has an average of about 12 rebounds a game. Bruns, as Coach Preisler said last week, is probably the best Tech center of the decade.

According to a true authority

on Caltech basketball, the man who has seen more games than anyone except the coach, the janitor, this is the best team he has seen in his years here. The team shows much promise and spirit. The new freshmen, Tom Bicknell and Bruce Threewit, have already shown enough talent to help the team. Sophomore George Fox is starting and shooting well. These are the only additions to the team, as seniors Pearson and Ed Hsi plus juniors Stanley and Bruns return from last year's team. The team is hoping that 6' 5" Cliff Tedder will get in shape so that he will be able to help them next term.

Meanwhile, the junior varsity has won one of their three games. They split two games with Rio Hondo and lost one to Southern California College.

In the first game the team had the services of Threewit, who is now on the varsity, but their lack of experience led to a 61-73 defeat. The team got rattled easily and turned the ball over much too often. Their shooting was fine, but they couldn't control the ball. Half the team got lost on their way to SCC, so Tech had to play the whole game with only five players. Even so they came close, and only lost 54-70. With the experience of two games behind them, the team finally played true to form on Tuesday and

(Continued on page 5)

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"DUTCHMAN," the filmization of the LeRoi Jones' stage production,

which James Powers of the Hollywood Reporter called . . . "The most shocking

play of the decade, or of all modern drama" . . . will have a special WORLD PREMIERE

ENGAGEMENT to qualify for Academy Awards nomination, at the LOS FELIZ THEATRE,

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This completely unprecedented film stars SHIRLEY KNIGHT and AL FREEMAN,

JR. and was directed by Anthony Harvey. The cinematographer was Jerry Turpin

and John Barry did the musical score.

Those of you who saw this controversial play at the Warner Playhouse last

year during its recordbreaking run would certainly want to know about this forth-

coming event, and those who failed to see it will, we sincerely think, be impressed

by the manner in which it has been fashioned into an epic motion picture.

MAY WE SUGGEST YOU MAKE A DATE TO SEE IT DURING THE HOLIDAY SEASON?

Hoop Stats

Name	FG	FT-A	Pts.
Bicknell	11	5-7	27
Bruns	26	22-29	74
Fox	22	1-1	45
Hsi	7	3-3	17
Pearson	15	8-17	38
Stanley	15	21-34	51
Threewit	7	1-1	15
TOTALS	103	61-92	267

Flems in Swim Romp

The time trials for the Inter-house swim meet were held on Tuesday amid driving rain. The weather was so bad that each participant had to wait in the gym for his race, run out and swim the race, and then rush back inside. It would have been sure pneumonia to stay out any longer.

After two hours of stiff competition, Fleming emerged head and shoulders above all the other Houses. They took three

firsts and placed at least one person in each final, two or three in some. Ralph Kimbrell had the best time in the 50 and 100 yd. freestyle races, and Tom Miller was first in the 50 yd. butterfly. Other best times were turned in by Spence Pearson of Lloyd in the individual medley, Jim McWilliams of Ruddock in the 50 yd. backstroke, and John Healy of Page in the 50 yd. breaststroke.

If everyone repeats their times in the preliminary trials, Fleming will win easily. Ruddock, Page, and Lloyd are so close together in their battle for second place that the relays will decide the final outcome. Dabney, Blacker, and Ricketts will probably finish in that order at the bottom of the standings. The meet starts today around 4:00 p.m.

The Critical Ear

by Auntie Kline

Chad Mitchell, former leader of The Chad Mitchell Trio, has finally released his first solo record after his separation from the group. The record, **chad mitchell/himself**, is an outstanding demonstration of Mitchell's solo talents. The songs on the disc are, by and large, not the folk songs which one would expect on the basis of Mitchell's earlier efforts with the Trio; however, this should not be a disappointment to his earlier fans.

Mitchell is now found singing mostly contemporary works, such as the Fred Neil composition "The Other Side of This Life" and the Fred Hellerman (formerly of The Weavers) song "A Quiet Room." He also sings a song from the 1930's... "Buddy, Can You Spare a Dime,"

a Rodgers and Hart song, "She Was Too Good to Me," and the old standard, "Over the Rainbow." One number, "Broadway Is a Tame Street," is reminiscent of some of the comedy-satire songs Mitchell used to do while with the Trio.

Chad Mitchell has an excellent, rich voice, and easily packs the necessary emotion into his selections. This is especially evident in "Marieka," a sad lament over a lost love, sung in a mixture of French and Flemish, in which Mitchell's singing carries the song's deep feeling across the barrier imposed by the foreign language.

All-in-all, the record is an excellent package, and is very easy to listen to. We hope we will soon be hearing more of Mitchell's solo talent. Buy the record. Snow your date.

We Won So We're Crowing About It

(Continued from page 4)

beat Rio Hondo 52-42. Outstanding player on the junior varsity has been freshman Bruce Ault,

who has scored 51 points and grabbed innumerable rebounds while also playing fine defense.

The practice games wound up with a game against Biola yesterday; the SCIAC season opens on January 6 with Caltech host-

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Musicale Provides Haven For Aficionados of Classical Taste

The Caltech Musicale, one of the less well known organizations on campus, presents an excellent opportunity for students to listen to classical music. Each member has a key to the Fleming listening room, and free use of its stereo facilities and recordings. There are no meetings, or duties for any member; the only Musicale activity is listening to music.

The Musicale began many years ago in Throop, but it eventually died. It was resurrected four years ago in a little room under Fleming, and now has a membership of between 80 and 100 graduate and undergraduate students.

Tom Beale of Page House, president of the Musicale, maintains the Musicale, instructs new members on the use of equipment, and directs the acquisition of records each spring from funds supplied by the Institute. A poll sent to Musicale members determines the new record selection.

Dr. Lagerstrom of the Aeronautics Department, the faculty advisor to the Musicale, rep-

resents the Musicale on the Faculty Music Committee, and makes sure of its yearly stipend from the committee. At present, the Musicale listening room has a few hundred long playing records, and several shelves of old 78 albums, all "classical" in variety. The room also has a stereo system which includes a Dynakit preamp and amplifier, rated at 70 watts, a Dual 1019 turntable, and two EMI speakers.

To join the Musicale see Tom Beale at the Musicale room between 7:30 and 8:30 on any Thursday night except the ones during finals. A key to the listening room, which you may use at any time, costs one dollar.

Eventually it is planned for the Musicale to have a room of its own in the new humanities building, all sound proof, and immune to the chilling notes of the band practice room.

More Strong Tubes

(Continued from page 1)

thereby eliminating seams and welds which weaken the structure. The group used molasses to prevent permanent deformation of the metal before the buckling point was reached. A typical shell, a copper cylinder 5/1000ths of an inch thick and eight inches long, can support more than a thousand pounds without buckling. A normal shell will buckle at only one to three hundred pounds.

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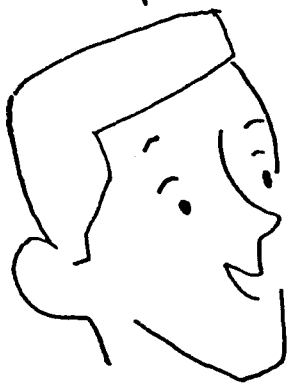
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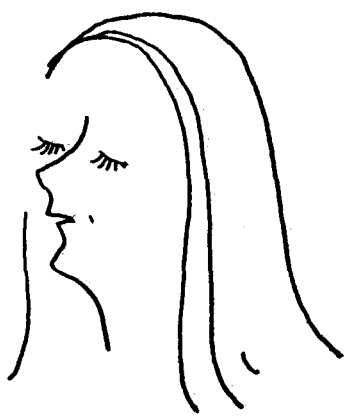
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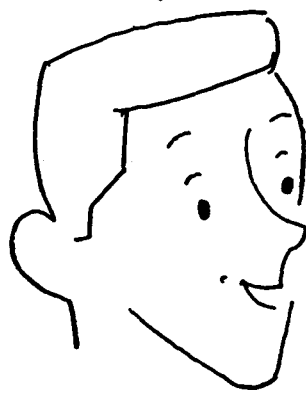
Like, I'm splitting, baby. I got a whole new bag for next year



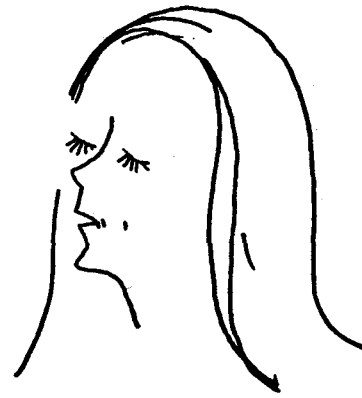
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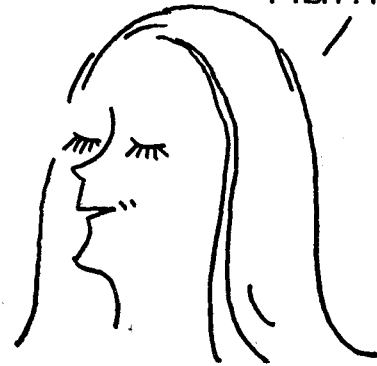
Swarthmore? **Must be YALE!** Colorado? Iowa? Texas Tech?



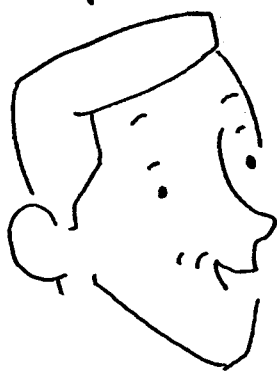
They're really making it in advanced research, class E relays and exotic metals...



Rice?... I know **TCU!** Brown? Not Bennington?! Hunter?



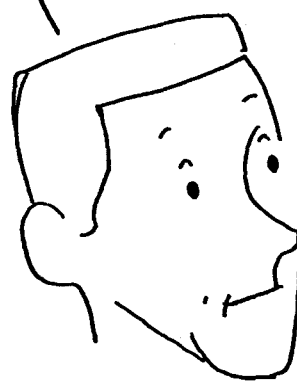
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