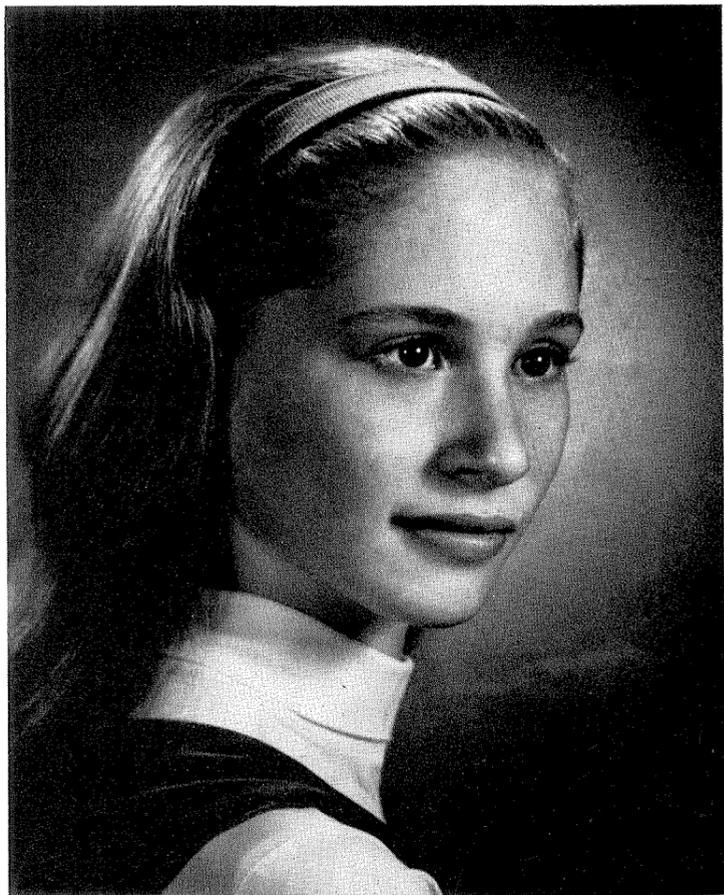


Freshman Grades Defunct



—Foto by Fung

Rebecca Penneys, 17-year-old piano prodigy, will appear in a Chopin recital next Wednesday, in Dabney Lounge.

Y, Rebecca Penneys To Give Chopin Recital

Miss Rebecca Penneys, a talented 17-year-old pianist from Beverly Hills will give an all-Chopin recital in Dabney Lounge on Wednesday, November 11, at 8 p.m.

Miss Penneys, returning from a tour which took her to Bloomington, Indiana; Pontiac, Michigan; Detroit, Michigan; and Philadelphia, Pennsylvania, soon will be a contestant at the Warsaw International Chopin Festival. On tour, she was widely acclaimed by music critics.

Miss Penneys made her first public appearance at the age of ten at the Westside Jewish Community Center under the auspices of the "Musicians in the Making." Since her debut, she has given highly acclaimed recitals in south-

ern California. Albert Goldberg of the *Los Angeles Times* wrote in May, 1963: "Miss Penneys is a slip of a girl who scarcely looks her 16 years . . . she has an innate flair for her instrument . . . She has exceptional talent."

(Continued on page 3)

I H Themes Told

BY BART GORDON

As the time for Interhouse draws nearer, four more Houses have followed Page's example and have decided on themes for the dance. Dabney and Blacker have held meetings but have not, as yet, reached a final decision on their themes.

Annual Y Finance Drive To Begin Next Week In Houses

BY DICK HACKATORN

The Annual Y student Finance Drive will be conducted next week, Nov. 9-13. This year's goal is \$2,700, which represents an important six percent of the Y's budget. Ed Bauer, Y Treasurer and chairman of the Finance Drive Committee, will have solicitors in the house alleys to contact the students personally.

Contributions may be made in cash to the solicitor or as pledges to be deferred to next term's Institute bill. As a little incentive, the house with the highest contribution per student will be treated to a dinner served by numerous, young, good-looking female waitresses.

This will be the only time dur-

ing the year that students will be asked for their financial support of the Y. It is therefore crucial that students give serious thought and consideration to the amount which they give in support of the Y's yearly program. Also, students are reminded that outside contributions depend greatly upon student donations. Y membership is free and open to all who want to participate in its activities and services.

This weekend two small conferences have been scheduled at the beach. On Wednesday an All-Chopin Piano Concert will be given. Many more programs are in the making; so take advantage of them and give generously to the Y.

BY MICHAEL MEO
The Caltech faculty, by a voice vote last Friday afternoon, approved the elimination of grades in freshman courses. Yesterday during assembly hour a meeting of the freshman class was held to officially announce and explain the decision. Dean Strong presided, and speeches were given by Professors Owen, Huttenback, Clark, Apostol, Vogt, and Waser.

Owen, chairman of the ad hoc Committee on the Freshman Year, recalled his inspiring talk at frosh camp five weeks ago.

He reiterated the concept of the ideal student, and noted that once in the harsh reality of life at Caltech students were more or less forced to work for grades. Not only was the grade in any particular subject an important goal, but the overall GPA dominated studies. The hope that led to an overwhelming approval by the faculty, he said, is that the year of adjustment will be a change for the better for the student and faculty.

The two-year trial of the pass-or-fail system was instituted to

give the student a freedom of choice in his studying. Owen saw it as analogous to the honor system, not done to allow students to get away with all they could, but to approximate the surroundings found in scientific vocations. Owen concluded with an anecdote relating the new system to a choice of feed in a pigeon loft.

Huttenback welcomed the change in history and said that a subjective grade on a paper will no longer be necessary, and more qualitative annotations will be included when the papers are handed back. The major essays, finals, and mid terms will continue to constitute almost all of the grades, he said, and day-to-day quizzing will be left to the discretion of the instructors.

Clark affirmed Huttenback's words of welcome, said that lazy profs will now be forced to write down what's right and what's wrong with a paper. The only danger was seen in those sadists of the department who will be tempted to raise the failing-passing level, but the freshmen were assured that this would be guarded against.

In mathematics Apostol announced that the six best weekly tests will be the basis of a grade in Math 1, and those whose scores are very good will be exempted from the final exam. Numerical scoring will be retained in the weekly tests and the final;

(Continued on page 2)

Townes Brings Another Nobel Prize to Tech

BY LES FISHBONE

Last Thursday, Dr. Charles H. Townes became the eighth man associated with Caltech to win a Nobel Prize. Gaining the honors in physics, he was in Pasadena at a NASA manned space flight conference when told of the news.

The award, shared with Professors Nikolay Basov and Aleksander Prokhorov of Russia, is "for basic research in quantum electronics which has led to the construction of oscillators and amplifiers according to the maser-laser principle." Townes was first struck by the idea that extremely short microwaves could be controlled by atomic or molecular activity while in Washington, D.C., in 1951. After four years he was using the stimulated emission from ammonia molecules to control an extremely sensitive atomic clock. Since then, masers and lasers have found uses ranging from high-capacity information carriers to welders for eye surgery.

Previous Tech Winners

Previous Nobel Prize winners from Caltech are R. A. Millikan in 1923, Thomas Hunt Morgan in 1933, Carl Anderson in 1936, Edwin M. McMillan in 1951, Linus Pauling in 1954 and 1963, William Shockley in 1956, and Donald Glaser in 1960. An interesting sidelight is that Professor William Smythe, who retired from the physics department last year, taught five of these men; and the amazing thing about this is that he never wanted to become a teacher!

Townes will receive his award from King Gustaf Adolf in Stockholm on December 10, the anniversary of Alfred Nobel's death.

Townes, born in Greensboro, South Carolina, received his BS and BA from Furman University, his MA from Duke in 1937, and his PhD from Caltech in 1939. During World War II, he worked in radar bombing and navigation techniques at Bell Telephone Laboratories in New Jersey. He later became professor of physics at Columbia, where he made his famous discoveries; now Townes is Provost at MIT.

Pickering Tells Of Ranger 7's Moon Pictures

BY HANK SUZUKAWA

An unequalled chance to see the latest and most dramatic of America's space achievements drew a large crowd to the fourth of the Caltech Lecture Series in Beckman Monday night, as Dr. William Pickering, director of JPL, presented a lecture on the Ranger 7 spacecraft. Originally from New Zealand and a graduate of Caltech, Pickering has been working with the Ranger series since 1959.

Pickering began by explaining some of the more basic of the problems confronting the program to take pictures of the moon's surface from the Ranger spacecraft. These included problems of the trajectory and velocity of the capsule, the time of the launching, the guidance of the system, and midflight corrections after the trip had begun. Making extensive use of slides, he broadly explained how these

(Continued on page 5)

Notices

MONEY IS NEAT

Now that we have your attention, there will be a meeting of the Caltech Newman Club this Monday, Nov. 9, at 8 p.m. in Winnett Clubroom 1. The topic will be "Commissioning the Apostolate: Baptism, Confirmation, Holy Orders."

FREEDOM SINGERS AT CLAREMONT

The Freedom Singers, an outstanding folk singing group, will be performing at the Claremont Colleges on Sunday, Nov. 15, at 2:30 p.m. At \$1.00 per person, this is a real cultural opportunity. Tickets are available at the Y.

SENIORS

Senior photographs for the **BIG T** will be taken on Nov. 10, 11, and 12. Come to the **BIG T** office (Winnett Center) between 7:15 and 9 p.m., wearing white shirt, (preferably dark) jacket and tie.

YET MORE DRAMA

The Drama Club will meet at Ricardo Gomez' house, 3181 Glenrose, Altadena, on Wed., Nov. 11. Gather in Lloyd Conference Room at 7:30 for rides. Guaranteed to be entertaining or double your boredom back.

SNCC CONFERENCE IN SAN FRANCISCO

The Student Non-violent Coordinating Committee Western Regional Conference will be held in San Francisco November 13, 14 and 15. Robert Moses, head of the Mississippi Summer Project and Harvard philosopher, will be the principal speaker. Anyone interested in being a member of the Caltech delegation to this conference, let the Y know. The cost is a mere \$2.00.

DON'T FORGET

Dance class Thursday, 8 to 9 p.m.

Editorials

Responsibility In No Grades

The faculty has decided to drop frosh grades. The arguments pro and con have been heard around campus and in the **Tech** for the past two weeks. It is quite clear that there are advantages and disadvantages to the new system. However, now that the plan is being tried for at least two years the success or failure of the plan lies with the frosh.

No matter how good an advisor system is established, the ultimate responsibility belongs with the frosh. The frosh already are hearing comments from upperclassmen such as: "Hell, why study, you don't have any grades." A serious drop in studying and in consequence a loss in comprehension of the subject will be the fastest way that the plan could fail. The only people that a sloughing of work would hurt would be the frosh themselves when they get to the sophomore year.

Another responsibility will be added to the instructors. That is to keep their courses interesting. A big assumption made in adopting a no-grade plan is that the frosh have a natural enthusiasm when they come here and that this plan will help retain this feeling. Here is where the individual instructor has a responsibility. How many times has a man come out of a lecture saying it was completely inconsequential garbage? How many times has one sat through one hour of "hair" which does not mean anything but one hour of filled lecture time? We are certain that all upperclassmen have experienced these types of lectures.

We are not idealistic enough to believe that these lectures will spontaneously disappear. We do hope that the faculty will make every effort to keep the interest high in all the frosh courses. We also hope that the frosh can keep their self control and will conscientiously work to make the frosh "grading" system successful.

—Wally Oliver
Stuart Galley

The Critical Ear

BY MAC

Miles Davis: Jazz on the Screen
(Fontana—MGF 27532)

Another album of movie music, this one by the most outstanding modern jazz trumpeter, is a re-release of some sets recorded in late 1957 in Paris. The tracks are from the French film, "Elevator to the Scaffold." This is neither mere mood music nor a jazz treatment of pop tunes. These songs, written and played by Miles, are valid artistic works. They convey real mood and feeling to the listener.

Focus

Played by the extremely lyrical Davis, this music has some truly great moments in it. With his sidemen — Barney Wilen, tenor; Rene Urtreger, piano; Piere Michelot, bass; and the American expatriate Kenny Clarke, drums — Miles takes advantage of this opportunity to demonstrate the tremendous solo work of which he is capable. In the horn solo on "L'Assassinat De Carala," Miles plays with a striking beauty and sadness not matched in any of his previous recorded work.

An interesting sidenote on the way the music was recorded: the group didn't just sit down and record the music. Rather they prearranged the timing and then improvised from the written score as the film was projected on a screen before them. Their ability to react to the mood and feeling of each scene probably helps to make this album as good as it is.

Bof' Us?

Filling up half of the second side of the album are three songs from the French film, "The Women Disappear," which are written in part or in whole by Art Blakey. They are played by him and his Jazz Messengers. Unfortunately the Messengers — Bobby Timmons, piano; Jimmy Merritt, bass; Benny Golson, tenor; Lee Morgan, trumpet; and of course Blakey on drums — are much better on

their usual hard-bop numbers than on these subdued movie themes.

Gifts and Messages: Roland Kirk
(Mercury MG 20939)

The word that characterizes Roland Kirk's music is joyful. He plays really swinging music in a chaotic and abandoned way. First a little explanation is in order about the instruments he uses. In this particular album he plays tenor, flute, kazoo, strich and manzella; the last looks like a forerunner of the present day saxophones. He plays this imposing array both singly and in various combinations. Although it may seem odd to a few people to see

(Continued on page 5)

String Trio To Perform In Tech Chamber Music Series

The K-R-B String Trio will perform Sunday, November 8, in the second concert of the Caltech Chamber Music Series. The program will start at 8:15 p.m., in Dabney Lounge, and will feature three classical arrangements for string by Beethoven, Hindemith, and Mozart.

Whence K-R-B?

The musicians comprising the trio are Jacob Krachmalnick, on the violin; Harry Rumpfer, viola; and Boris Blinder, cello. The title, K-R-B, is derived from the first letters of the last names of the artists. This will be the first per-

Tech Faculty Leads Nation In Salaries

If the salary paid to its faculty is a valid measurement of academic excellence, Caltech is second to none in the U.S. as an institution of higher learning. Based on statistics released recently, by the American Association of University Professors, the Tech faculty was paid \$2311 for each undergraduate during the 1963-64 school year; this is tops in the nation. Among the other leading colleges and universities, Claremont-Harvey Mudd was a distant second (\$1736), followed by MIT, the University of Chicago, and Princeton.

In paying an average total salary of \$14,222 to each of its professors, Caltech, along with Harvard, Stanford, and the University of Chicago, was one of only four schools in the country to exceed the \$14,000 mark on the absolute pay scale. The A.A.U.P. also gave Caltech special recognition for showing one of the highest percentage increases over last year in wages paid to its faculty.

Outcome of Mudeo Still Much in Doubt

Doug Holford, Junior Class president, is worried. He reports that although competitive bidding to determine the winner of the Mudeo ends Sunday night, the sophomores have not yet made any "efforts at friendship."

He has, however, been approached by frosh (bearing gifts). To further spur the sophomores he announced that there definitely will be a frosh-soph hop second term and that the losers of the bill. Although this dance November 10 mudfest will pay hasn't existed for several years, Holford doesn't want "to see old traditions die."

Poison the Judges

The Junior Class officers are reasonable men, according to Holford. "But everyone has his



A Shot in the Dark

Theatre critics have long made it a habit to concentrate their talents upon the rich arty films of their generation, much to the neglect of lighter productions. This review shall stand as an exception since I wish to extend my highest praise to Peter Sellers' latest production, **A Shot in the Dark**.

One could not label such an effort a "great" film contribution; it is simply the most enjoyable film experience since that Terry Thomas classic, **Make Mine Mink**. **Structure**

The film's structure could be most aptly termed an "antiplot." It is a stunning satire upon the absurdity of the murder mystery thriller. In the blinding confusion of the film's conclusion, the viewer is even left ignorant of the original murderer. Black gloves stalk black gloves in a zany medley of absurd episodes.

The movie contains nearly every standard comic situation in the repertoire. The spinning globe claims another Seller's hand as it does in the **Pink Panther**. The only stunt of Sellers that I failed to anticipate was the placing of a still-burning lighter into the pocket of his trench coat. Even that episode, I'm sure, has been done before.

But the brilliance of Peter Sel-

By Don Green

lers is not in what he does but how he does it. With the timing of Benny and the finesse of Chaplin, he develops every situation to its maximum potential. Three entire minutes expire as Sellers proceeds to the inevitable climax of his billiards contest.

The film itself is directed with Sellers-like precision, never overplaying a scene, always driving toward the absurd without crossing the limit of taste. Elke Sommers is her usual delightful self, and the supporting roles are developed with skill. Particularly distinctive is Sellers' assistant inspector who performs the role of the classic straight man without uttering a coherent syllable.

Other Things

Those desiring a "deeper" examination of life should make a point of checking the current attraction at the Coronet Theatre in Hollywood. Under the title of "The World of Ray Bradbury," the author, one of the most original of his era, presents three of his short fantastic plays.

His contribution to television last year, a Hitchcock production of the play "The Jar," was perhaps TV's finest moment. Once the superficial preoccupation with the realm of "scientific fantasy" is discarded, Bradbury emerges as one of America's most talented writers, a contemporary Edgar Allan Poe with a sense of humor. Such a combination is difficult to match.

NO More Grades
(Continued from page 1)

the weight of the later depending inversely on the quality of the former.

In math 1.5, on the other hand, the weekly scores are to be recorded as P or F, with six "P's" constituting successful completion of the course. Math 2 will be graded, since it is a sophomore course.

Vogt commented that the new setup made the notoriously easy physics course even more trivial. One must try to flunk to get a "F," he said, and the same will be true from now on. Selected students will be exempted from the final exam, but it is up to the individual troll to convince his instructor of his eligibility for exemption, because someone doing excellent work might be required to take the final just to see how high he can score.

California Tech

Published weekly during the school year by the Associated Students of the California Institute of Technology, Incorporated.

Editors-in-Chief

Stuart Galley, Wally Oliver

Managing Editor

Rick Briggs

News Staff

Les Fetting, Les Fishbone, Barton Gordon, Tim Hendrickson, Ralph Kimbrell, Michael Meo, Craig Nelson, Dick Tezak
Photographers: Bill Boyd, Bob Geisenhainer, Jules Kline, Larry Ruzzo

Feature Staff

Bob Berry, Editor

Phil Laipis, Sports Car Editor

Don Green, Tom Greenfield, Tom McKenzie, Bill Orr, Jeff Pressing, John Rouse, J. C. Simpson, Hank Suzukawa

Sports Staff

Steve Blumsack, Editor

Peter Balint, Larry Dillehay, J. K. Evans, Mike Hunsaker, Gary Ihas, David Jackson, Ted Jenkins, Gary Ratner, John Tucker

Copy Staff

Norton Greenfeld, Editor

Gary Schnuelle, Bob Schor

Business Staff

J. C. Simpson, Manager

Circulation: Stewart Davey

Rodger Whitlock, Mascot

California Tech, 1201 East California Blvd., Pasadena, California 91109.
Member of The Associated Collegiate Press.
Represented nationally by National Advertising Service, Inc.
Second Class postage paid at Pasadena, California
Printed by Bickley Printing Co.
Subscriptions: \$1.50 per term, \$4.00 per year. Write: Circulation Manager.

Beethoven's 32 PIANO SONATAS

PLAYED BY LILLIAN STEUBER

Sunday, Nov. 8th, 1:30 p.m. (Box Office opens 1 p.m.)

Opus 26; Op. 49, no. 2; Op. 2, no. 3;

Op. 78; and Op. 101

AIR CONDITIONED

SY 3-6140 * MU 4-1774

ESQUIRE THEATRE

2670 East Colorado Blvd.

SF Company To Present Opera

BY JOHN ROUSE

Will Calaf win Princes Turandot? Can Manrico defeat the evil Count de Luna in their rivalry for the hand of Leonora? Go to the opera this season to find out. And be prepared for an evening or two of the world's best and most loved music.

The San Francisco Opera's 1964 Los Angeles season opens tomorrow night at the Shrine Auditorium, with a performance of Puccini's *Turandot*, starring Birgit Nilsson and Pilar Lorengar. There

will be 21 performances of 16 different operas and Carl Orff's *Carmina Burana*, performances being given almost daily through November 29.

Huttenback Comes Through

A large number of Techmen will have an opportunity to see an opera during this season, due to the efforts of Dr. Huttenback to secure four tickets for each performance. These tickets were distributed among the Houses, so that each House got tickets to about a dozen performances. Dr. Huttenback was most kind to arrange for these tickets; this attempt to inject a little culture into our lives is well appreciated.

This season's operas include Giuseppe Verdi's *Aida*, *La Traviata*, *Il Trovatore*, *Otello* and the world-renowned *Nabucco*; Wagner's *Parsifal*; Bizet's *Carmen*; Beethoven's *Fidelio*; Strauss's *Die Frau Ohne Schatten* and *Der Rosenkavalier*; Smetana's *The Bartered Bride*; Mozart's *Le Nozze di Figaro*; and Leoncavallo's *I Pagliacci*.

Tickets

La Traviata is sold out already, but tickets for the other operas may be purchased at the ticket agency in the Berry and Grassmuck Music Store at 279 E. Colorado. Schedules for performances are posted around campus, and may be obtained at the ticket agency. Prices range from \$3 to \$8; order a week or two ahead of time to better your chances of getting a seat.

To get to the Shrine Auditorium, go south on Harbor Freeway until Exposition Boulevard. By then the location of the auditorium is obvious. Go to Figueroa, and turn left onto Jefferson. The auditorium is at the corner of Jefferson and Royal, with plenty of parking space. And plenty of good music.

Morebecca

(Continued from page 1)

Miss Penneys' guest recital, presented by the Caltech Y, will begin with the Polonaise-fantaisie in A-flat, opus 61. Other works to be included in the program will be the Sonata in B flat minor, opus 35, Ballade in F major, opus 38, and Nocturne in E-flat major, opus 55. Interspersed between these works will be six preludes, three mazurkas, and four etudes.

Interhouser

(Continued from page 1)

around a flooded courtyard is Ruddock House. Their central theme is Polynesia. Plans call for the lounge to be decorated as the inside of a grass shack and the dining room to be a dance floor outside the shack. The island scene will be rounded out by several tiki idols and a volcano. In addition, a raft will travel on the water to transport couples across the courtyard.

There WILL be a Frosh-Soph Hop!

"Can I move ahead at IBM?"

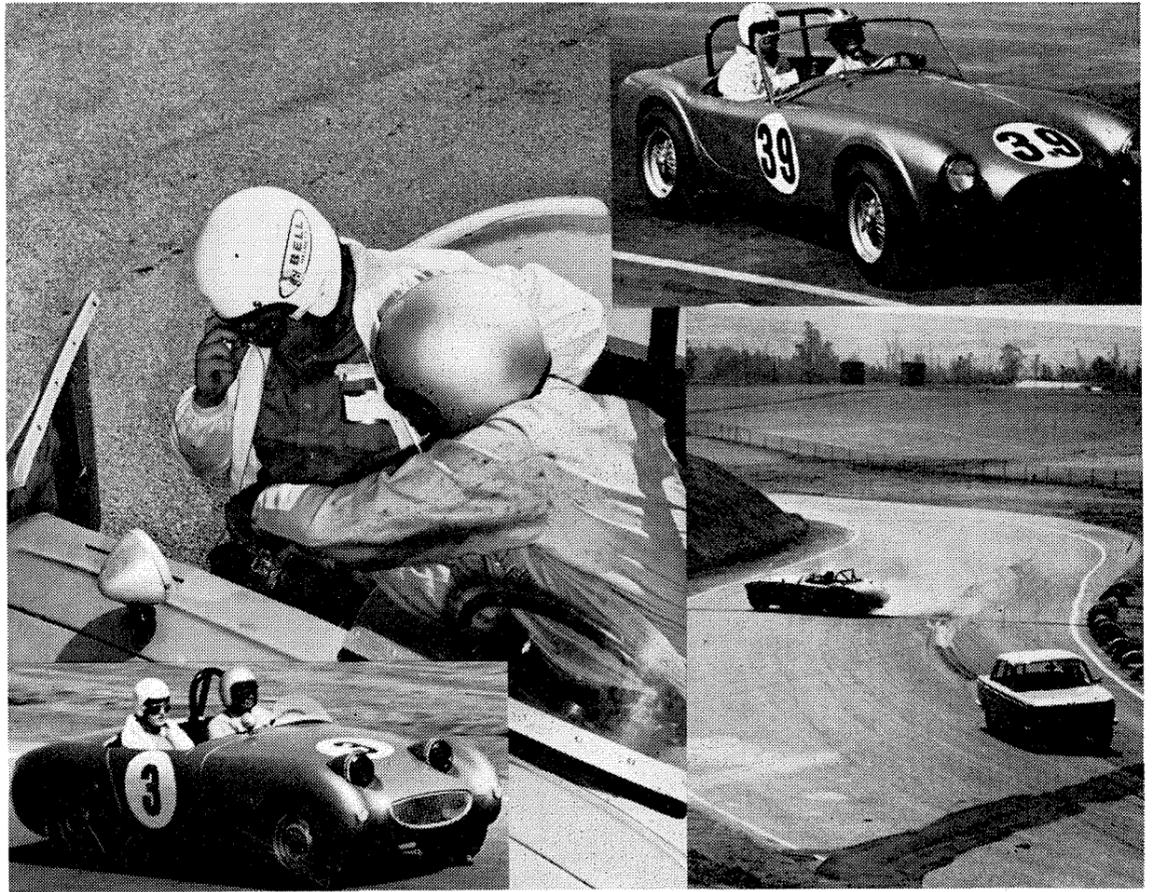
There are a variety of ways to advance at IBM. Your progress is tied to your own individual interests. Technical management, professional achievement, educational advancement—all are possibilities for you at IBM.

As a new graduate considering IBM, you have your choice of Development, Manufacturing, Programming, or Marketing. You'll need a degree in the sciences, engineering, mathematics, or business administration.

See your college placement officer for assistance, literature, and an appointment with the IBM interviewers. Or write directly to Manager of College Relations, Dept. 882, IBM Corporate Headquarters, Armonk, New York 10504. IBM is an Equal Opportunity Employer.

Interviews January 12-13

Applied Mathematics, Applied Mechanics, Data Communications, Digital Computers, Guidance Systems, Human Factors, Industrial Engineering, Information Retrieval, Marketing, Manufacturing Research, Microwaves, Optics, Reliability Engineering, Servomechanisms, Solid State Devices, Systems Simulation, and related areas.



—photos courtesy of Sports Car Graphic

Tech editor Walliver prepares for his first ride in the Shelby school Sprite (above), then takes off (lower left); later he graduates to bigger and better thing, the Cobra (upper right). Not content with sitting and riding, Laipis wrenches control from the driver (lower right).

Tech Visits SCG, Riverside

BY PHIL LAIPIS
Sports Car Editor

Tech Editor Walliver and I, in search of new and better things to tell our Tech audience, recently went to Riverside International Raceway, to learn all about sports cars and sports car races. We were two of thirty college newspaper editors who made the pilgrimage, which was sponsored by Sports Car Graphic Magazine. The

editors sat in on a special session of Carroll (the guy who builds Cobras) Shelby's School of High Performance Driving, conducted by Pete Brock, chief instructor for the school, and special projects chief for Shelby.

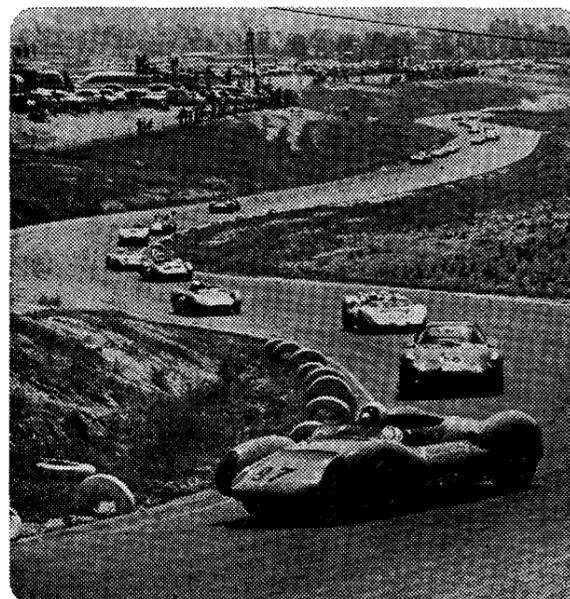
Grab Bar Practice

After lessons in how to go faster than the other guy and still stay on the road, the class left the blackboard and went out

on the track. The practical experience started with a racing Sprite and several laps around the Riverside track, to get the feel of things. The practical experience got hairier, as the instructors and SCG staff switched to bigger and faster machinery to demonstrate the fine points of pushing a car to the limits of adhesion.

(Continued on page 5)

SPORTS CAR GRAPHIC MAGAZINE PRESENTS THE...



1ST ANNUAL
★
★★★ American
road race of
champions! ★

SPORTS CAR CLUB OF AMERICA INTERDIVISIONAL FINALS
November 12, 13, 14, 15
RIVERSIDE INTERNATIONAL RACEWAY, RIVERSIDE, CALIF.

& ANNOUNCES A
SPECIAL TICKET
SAVING OF \$4.00 FOR
COLLEGE SPORTS
CAR ENTHUSIASTS!

FOURTEEN 45-MINUTE RACES! ALL SCCA CLASSES! ★ PRODUCTION: A-B-C-D-E-F-G-H ★ MODIFIED: C-D-E-F-G-H ★ FORMULA: VEE-JUNIOR-LIBRE!

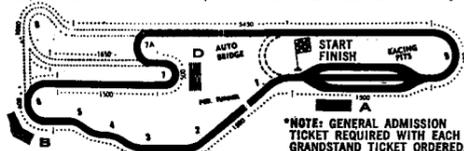
For the first time in the history of sports car racing, all six Divisions of the Sports Car Club of America will be combined in competition and brought together at Riverside for the Race Of Champions. Only by emerging as leaders in a series of hard-fought races within their own Division will entrants be invited to participate. Only the fastest and best prepared Production and Modified sports cars in the country will be running here.

At long last, East will meet West in a decisive battle to settle the old argument about where the fastest cars and drivers hail from!

★★★★★★★★★ USE THIS HANDY MAIL ORDER FORM FOR YOUR "AMERICAN ROAD RACE OF CHAMPIONS" TICKETS! ★★★★★★★★★★

SPECIAL OFFER!!! ALL 4-DAYS GENERAL ADMISSION PACKAGE FOR ONLY \$6.00 (Tax inc.)
SAVE \$4.00! OFFER GOOD THROUGH NOV. 10, 1964

| DAILY GEN. ADMISSION PRICES (Tax inc.) | RESERVED GRANDSTANDS* (A-B-D) |
|--|---|
| Thurs., Nov. 12 \$1.00 | \$1.50 (tax inc.) EXTRA, Saturday and Sunday only. Please indicate Grandstand choice. Children under 12 admitted FREE! Gen. Admission only. |
| Fri., Nov. 13 \$2.00 | |
| Sat., Nov. 14 \$3.00 | |
| Sun., Nov. 15 \$4.00 | |



*NOTE: GENERAL ADMISSION TICKET REQUIRED WITH EACH GRANDSTAND TICKET ORDERED.

Sponsored by Riverside International Raceway & Petersen Publishing Company. Sanctioned by the Sports Car Club of America. Conducted by the California Sports Car Club Region of SCCA.

| SPECIAL 4-DAY GENERAL ADMISSION PACKAGE | | | | | COST |
|---|---------|---------|---------|---------|----------------|
| NUMBER OF TICKETS (\$6.00 ea.): | | | | | |
| DAILY GEN. ADMISSION | THURS. | FRI. | SAT. | SUN. | COST |
| | \$1 ea. | \$2 ea. | \$3 ea. | \$4 ea. | |
| NUMBER OF TICKETS: | | | | | |
| RESERVED GRANDSTAND SEATS* | | | | | SAT. SUN. COST |
| NUMBER OF TICKETS (\$1.50 ea.): | | | | | |
| GRANDSTAND CHOICE (A-B-D): | | | | | |
| TOTAL \$ | | | | | |

MAKE CHECK OR M.O. PAYABLE TO:
RIVERSIDE INTERNATIONAL RACEWAY
10000 Santa Monica Blvd., Los Angeles, Calif. 90067 ★ Tel: (213) 678-2990

NAME _____
STREET _____
CITY _____
STATE _____ ZIP _____ PHONE _____



"The guidebook is rather vague about this next pitch!"

Rockclimbers Climb Buildings, Rocks Tech Speakers Rise to Heights in Competition

BY TOM GREENFIELD

The Caltech Alpine Club is a flourishing organization seeking new blood (climbing at Caltech has a long and bloody past). In the style of the famed night climbers of Trinity College, Cambridge, many unique opportunities present themselves around campus.

Real climbing began here many years ago with the pioneering of the RUP Traverse (after the hairthin "realised ultimate reality piton," developed by Yvon Chouinard) on the Synchronon, a climb reopened by Green in 1963. For the unsuccessful climber this

involves a long pendulum into a plastic awning.

Go Southeast

"They've been climbing this campus for forty years," Bob Levin, the club's president, told me as he pointed out the interesting features of the southeast inside corner of Spaulding. Reasick, a grad climber famous for his pioneering of the "Vampire" on Tahquitz and the "Diamond" on Long's Peak, climbed this as an unprotected fifth class lieback, but for most it is only possible with a ten-inch bongbong or reasonable facsimile (car jack).

As we strolled around the campus, Bob drew my attention to four or five regular routes, throw-

ing in illuminating instructions such as: "After negotiating the clumsy corner, do a double mantle and look for easy climbing to the top." (This particular climb terminated with a forty-foot rappel down a ventilator shaft.) To demonstrate the quality of the climbs available right on our doorstep, one evening last week Bob took me up the beginner's chimney on Winnett. Notwithstanding the ardors of "sewing machine arm" and "crumbling friction" I eventually mastered the summit, and I must admit to the tremendous feelings of satisfaction that accompanied the feat.

Climbing Trip

At present, a four-day trip to Yosemite is planned over Thanksgiving, for which hikers, climbers and particularly drivers are encouraged to pool resources. There are two excellent practice areas for the rockclimbers less than an hour from here, and three exceptional rocks including Tahquitz and Dry Falls about two hours away. Attempts are being made, in conjunction with the Ski Club, to organize an overnight ski-tour next term, probably at San Geronimo.

(Continued on page 5)

Caltech debaters Nick Zabitchuck and Kermit Kubitz received Superior ratings in lower-division debate at the Pacific Southwest Collegiate Forensics Association Tournament held at San Diego State College, October 30 and 31. Zabitchuck and Kubitz compiled a record of four wins and no defeats at the tournament. Zabitchuck also received an Excellent rating in Impromptu at the tournament.

Also representing Caltech at the tournament among the 180 teams participating were the debate teams of Fred Lamb and Dave Close, and Roger Davisson and Gary Scott. Both teams participated in upper-division. In individual events, Fred Schultz and Dave Close participated in Extemp while Davisson represented Caltech on Impromptu.

Caltech will attend its next debate tournament at Loyola University on November 6 and 7.

Gates Sundial Explained

BY TIM HENDRICKSON

In the court between Gates Library and San Pasqual Street there stands an anachronism in this era of buzzing watches and atomic clocks: a sundial, Caltech's gift from the Class of 1939.

In the August 1927 issue of *Publications of the Astronomical Society of the Pacific* is a description of the sundial, designed by Dr. Julius Wangerheim, then a personal friend of Dr. Robert Millikan and Dr. William Munro of Caltech. So it was that when William Lawson, president of the Class of 1939, came to Munro seeking ideas for a class gift, Munro talked to Wangerheim; Wangerheim made drawings and offered to pay for the actual construction of the sundial.

As for the location of the sundial, Lawson recalled that the Senior Tree was "traditionally a popular meeting-spot." Evidently the Gates courtyard was the closest site where the sundial would be relatively free from shadow and disturbances.

An important feature of the sundial is that it reads standard instead of solar time. Thus, the sundial has two interchangeable time plates, which must be switched at each solstice — June 22 and December 22. This thankless job has been undertaken since 1950 by Fred Birri, supervisor of the central shop.

Wesley Hertenstein, director of physical plant, described how the builders of the sundial at the Caltech shop took the liberty of improving on Wangerheim's design.

Instead of trapezoidal time plates held in position by small clamps, the sundial finally sported rectangular plates which slid into its cylindrical base.

This adaption — as well as the suggestion of a classical base for the sundial — was most likely carried out by Russell Porter, the noted amateur astronomer and

aficianado of sundials whose famous drawings of the Palomar Telescope may be seen today in Robinson.

In a letter to Millikan dated October 5, 1940, the baffled Wangerheim could only make the ironic complaint, "... you can build a 200-inch telescope, and yet get stumped on a sundial..."



Work with a group worth standing out in.

The more competent your co-workers are, the greater your satisfaction when they admire something you've done. And the better your chances are to learn so you can move on to additional responsibilities and rewards.

Boeing's world leadership in the jet transport field is an indication of the calibre of people you'd work with at Boeing. The forward-striding attitude responsible for this leadership has, since 1916, provided a steady succession of pioneering achievements: first twin-engine, retractable-gear, low-wing, all-metal airliner; first four-engine, pressurized airliner; first modern, high-performance bomber; first large swept-wing, multi-jet bomber; and, of course, America's first jetliner, the 707, and the 720 and three-jet 727. (Right now we're designing a variable-sweep wing supersonic transport.)

Boeing is one of the nation's major manufacturers of heavy transport helicopters (Vertol), and for more than two decades has pioneered most of the world's applications of the small gas turbine in aircraft, industrial, marine and vehicular fields.

And the space age? Boeing's contributions here include major contract responsibility for the Minuteman ICBM and NASA's Saturn V Booster — the launch vehicle destined to send America's first lunar landing team to the moon. We're also working full blast in all other phases of space flight, including a manned earth-orbiting laboratory and a lunar orbiter.

Projects underway in Boeing's extensive Scientific Research Laboratories encompass basic and applied research in celestial mechanics, solid state

physics, nuclear and plasma physics, terrestrial and space flight sciences and allied human factors.

Engineers and scientists at Boeing work in small groups, under supervisors picked for ability to inspire and promote the ideas of their associates. Individual initiative and ability get plenty of exposure that way. (The company encourages graduate studies at leading colleges and universities near Boeing installations.) Boeing is an equal opportunity employer.

We're planning to interview engineering and science seniors and graduate students on campus on the date listed below. So drop in at your campus placement office and arrange an appointment. We'll be looking forward to meeting you.

Monday and Tuesday — November 16 and 17

BOEING

Divisions: Aero-Space • Airplane • Vertol • Turbine • and Boeing Scientific Research Laboratories

WHAT'S NEW IN THE NOVEMBER ATLANTIC?

Canada: A Special Supplement discusses segregation, the new Canadian leadership, Canada's struggle for unity, her authors and painters. Timely articles on: *What Is Canada?*, *Can French Canada Stand Alone?*, *The Trouble with Quebec*, *Canada as a Middle Power*, *Education: Past and Future*, *The Dilemma of the Canadian Writer*, and other subjects.

"Pomp and Circumstance: C. P. Snow" by Robert Adams: An appraisal of Sir Charles' writings, his new book, *Corridors of Power*, and his contribution to the two-cultures dialogue.

"Labor's Mutinous Mariners" by A. H. Raskin: A report on the rivalry between Joseph Curran of the National Maritime Union and Paul Hall of the Seafarers International Union.

Every month the Atlantic provides a platform for many of the world's most articulate and creative men and women. The result is always entertaining and informative, often brilliant, occasionally profound. More and more, the Atlantic is finding its way into the hands of discerning readers. Get your copy today.



ON SALE NOW

More Pickering

(Continued from page 1)

problems were met and overcome. Once the basic problem of getting the Ranger to the moon was overcome, more detailed systems, such as the cameras, had to be perfected. The Ranger carried six television cameras, two of which sent back pictures every five seconds while the other four sent pictures of smaller areas back every 1½ seconds. As the Ranger got close to the moon's surface, the resolution of the cameras exceeded the best obtainable on earth by a factor of 1000, and many very small craters, never before seen by man, were easily distinguished.

As a conclusion, Pickering showed a series of the 200 pictures taken by the "A" camera from 17 minutes away from the moon until the impact on the moon's surface.

More Laipis

(Continued from page 3)

After lunch and some technical explanation of the morning's rides, the practical experience got hairier still as everyone got a ride in the school Cobra. By now, though, everyone felt more comfortable, and there were fewer hands reaching for the grab bar as the rear of the car slid out around a turn, or as the right front wheel went off the track into the dirt as the Cobra passed a slower car on the inside of a turn. Each of the drivers followed the same "line" around the course, and each of them drove with a smoothness and precision that is unfortunately rarely seen on the street.

Great Race

The other, and to SCG major, purpose of the day's events was to acquaint everyone with the details of the American Road Race of Champions, to be held

at Riverside later this month. Those Techmen interested in sports cars should make an effort to get to this race. There will be 14 races, representing each of the different displacement classes. In each race, there will be 18 of the country's top racing drivers; three from each of the country's six geographical divisions.

There will also be displays by all of the sports car manufacturers, exhibiting cars, speed equipment and accessories. The racing will be very fast, and very close, with excellent drivers and sports cars you can identify with. See the Sports Car Graphic ad in this issue for details as to when and how much. It's going to be a good race; y'all come.

Criticaler

(Continued from page 2)

a grown man blowing three instruments at the same time, just

listen to the music and don't worry about how it is produced. This would be a musical example of the end justifying the means.

It is in this oddness that half of the charms of Roland Kirk lie. The laughter and slight tinge of mocking he puts in the music make this a pleasantly satisfying album.

Kirk is accompanied on the album by Horace Parlan on piano and an anonymous bassist and drummer. Parlan manages to play reasonably good solos on two of the tracks: "Tears Sent by You," and "My Heart at Thy Sweet Voice."

If you ever get the chance to see Roland Kirk in person, I urge you to do so. Watching him play one, two, and three instruments simultaneously is a fascinating experience; you may also be pleasantly surprised at the music produced.

Because It's There

(Continued from page 4)

If anybody is interested in this remarkable opportunity to get away from illusions and face reality as a man, go see Bob Levin or Jeff Wise (114 Ruddock), or, for more responsible information on Sierra Club activities, climbing and hiking, see the real expert, Professor Chuck Wilts, 29 Spaulding.

welcome to the
Campus Barber Shop
 in Winnett Center
 haircuts \$2.00
Three Barbers to Serve You
 8 to 5:30 Monday - Friday
 Paul A. Harmon



Advt. for Falstaff Brewing Corp. of San Jose, Calif., who believes that everything should be made with loving care—including splendid beer.

Webmen Lead Conference

The varsity water polo team finished the first round of conference play with an unblemished record by defeating Oxy's Tigers Tuesday afternoon at the Alumni Pool. Last week found the Webmen defeating both Redlands and the University of the Pacific.

The Webmen won their most

important game to date against Occidental by using the strategy that had given them their previous conference victories. Cautious, ball-control play enabled the Beavers to score 4 goals while holding Oxy to 2 tallies. Although Tech made very few mistakes during the game, the Tigers took

many shots at goalie Mike Baskes, who made several excellent saves. The fine defensive play in the first half provided the margin of victory.

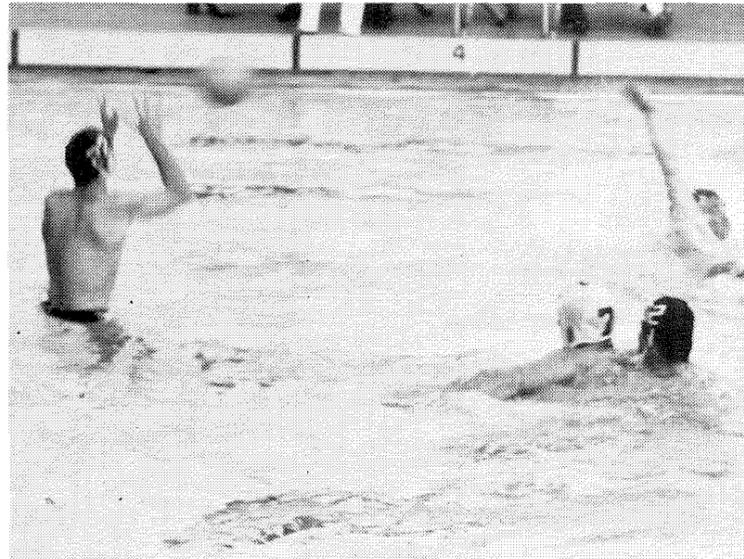
The Scoring

The first period ended with Tech leading 1-0 after Walter drove a right-handed hook past Oxy's goalie. Nielson scored a goal in the second period to boost the lead to 2-0. The teams exchanged goals in each the third and fourth quarters as Nielson and Walter counter-acted Mikkelsen's 2 goals. Walter's second hook and Nielson's outside shot clinched the victory.

The game against Redlands last Friday afternoon proved to be the most frustrating of the three games; Tech finally won 6 to 5. The team was hampered by poor officiating resulting in Jenkins fouling out after six minutes of play. Walter and Maynard left the game early in the fourth quarter after each had received his fourth foul.

Decided Beforehand

Caltech jumped to an early lead by scoring three goals in the first half while holding Redlands



Mike Baskes blocks a shot by a Redlands player to preserve the Caltech victory over Redlands.

SPORTS

Gridders Score CLC For Three Quarters

They almost made it. The CIT Beavers kept fans on the edge of their nerves for 45 minutes of fine defensive football before the roof fell in and Cal Lutheran swept to a 33 to 9 victory Friday night at the Rose Bowl. The Beavers led 2 to 0 at halftime and held a 9 to 6 advantage going into the fourth quarter, but at that point the frustrated Kingsmen exploded for three touchdowns in four minutes and hermetically sealed the coffin into which all sportscasters had laid CIT and from which the Beavers so valiantly tried to escape.

The notable characteristic of the game was the punt. All CIT's scoring and two of CL's TDs were direct results of punts. Frazzini's booming kicks put the Kingsmen in the hole; a 65-yard quick kick rolled dead on the CL two-yard line, setting up an opportunity for Frazzini to tackle CL Q. B. Gaudio in the endzone for a safety and give Tech a 2 to 0 lead in the first two minutes of play. The lead held up all half, despite desperate efforts to score by both sides.

Beautiful Defense

Tech's fine defensive work through the first half gave hopes of a possible 2-0 victory. CL mounted numerous drives but all failed against the stalwart CIT defense. Mowery killed a drive by batting down a certain six-point pass; a drive that carried to the CIT 7-yard line stalled against the Tech forward wall and ended in a futile field-goal attempt. Bruising tackles by Josephson and heads-up pass defense by Scott killed a drive; vigorous pursuit by Ensey stalled another; and Kawal picked off a pass to stop a third, in addition to catching two short punts.

Tech's offense fared no better than CL's, though — in fact, it was pretty ineffective. CIT got only 15 yards on the ground and 20 in the air in the first half. Tech's yardage came on short plunges by Frazzini, a 13-yard ramble by Brennan, and short Chapyak-Frazzini aeriels. The Techmen also had fumble-itis and lost the ball twice by that route.

The third quarter saw the Kingsmen finally get their offense off its okole and drive 64 yards for a TD, after Harley recovered a CL fumble and Frazzini promptly fumbled it back to them. With the score 6 to 2, CIT punted and Frazzini's twisting kick was dropped on the one-yard line; it bounced into the endzone and Powers clawed his way

through an avalanche of bodies to recover for a CIT TD. Myers converted and Tech led 9 to 6.

Fourth Quarter Crumble

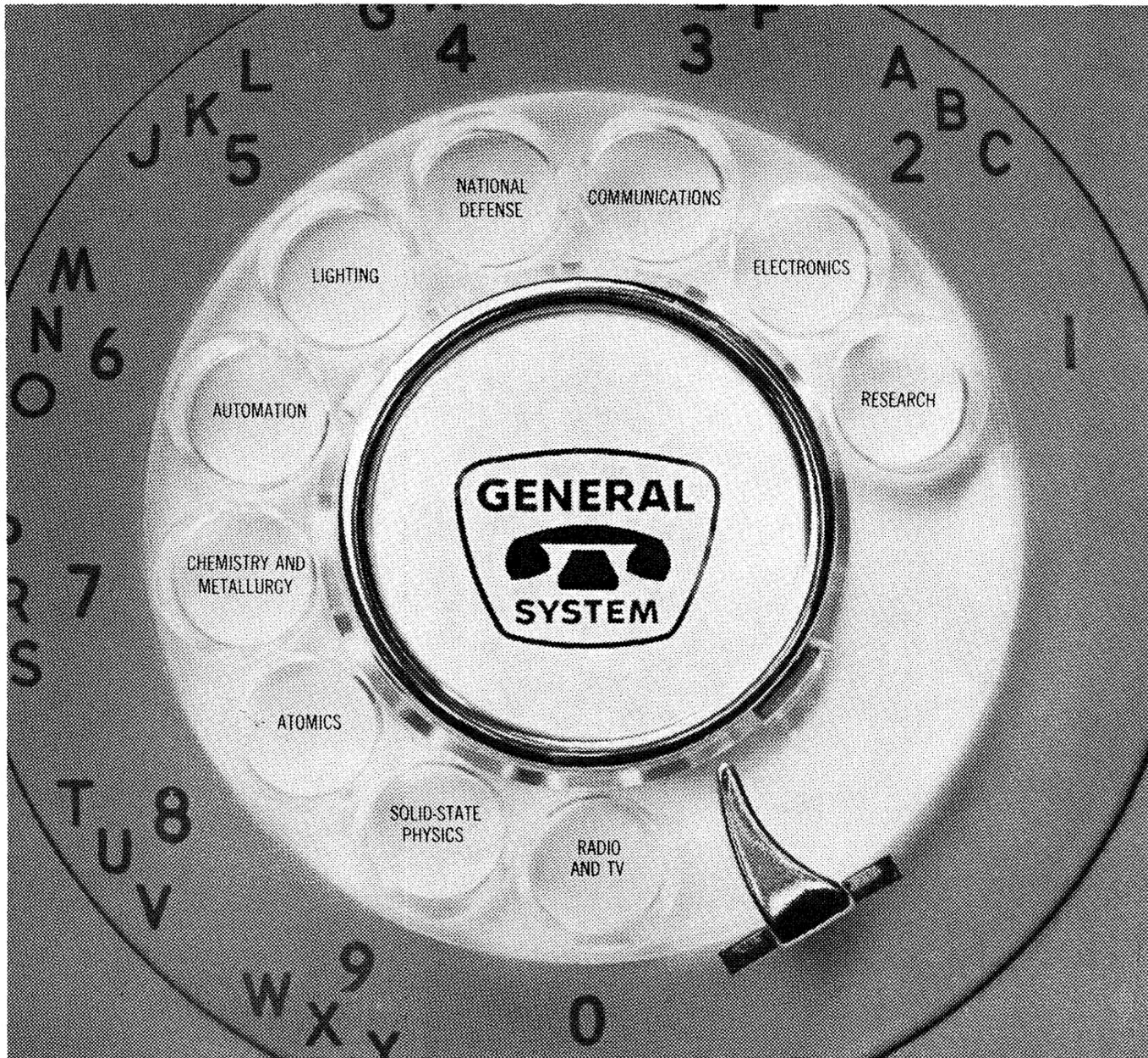
(Continued on page 8)

Harriers Split

The Caltech frosh cross-country team protected its perfect record last Friday afternoon, as they downed the Whittier freshmen in a meet on the home course. Once again the varsity attempted to post the first win of the season, but fell to the varsity team from Whittier.

Bill Putnam remained undefeated as he won the two-mile race in the respectable time of 10:36. Caltech then proceeded to embarrass the Poets by capturing the next four places, thereby sweeping the meet. Following Putnam to the finish line were Mike Meo,

(Continued on page 8)



DIAL GT&E FOR PROGRESS

At GT&E, we've made diversification pay off in all-around growth. That's because we've concentrated on related fields of operation. For instance, yesterday's metallurgical advance is today's improved semiconductor and tomorrow's superior communications system.

This technological chain of events fol-

lows through the entire GT&E structure and accounts for our continued progress in the field of total communications by sight and sound . . . radio and TV, voice and data transmission, automation and control.

Through research, manufacturing and operations, GT&E has become one of

America's foremost companies in terms of dollar sales, revenues, and diversity of products.

As a young and aggressive company with no limit to its growth, GT&E is an organization you may wish to think of in the light of your own future.



GENERAL TELEPHONE & ELECTRONICS

730 THIRD AVENUE, NEW YORK 10017 • GT&E SUBSIDIARIES: General Telephone Operating Companies in 32 states • General Telephone & Electronics Laboratories • General Telephone & Electronics International • General Telephone Directory Co. • Automatic Electric • Lenkurt Electric • Sylvania Electric Products

Tech Outkicks BIOLA Fleming Leads In Discobolus

The seemingly unbeatable varsity soccer team added another victory to its list Tuesday afternoon at the expense of BIOLA. After the varsity players had shut out their opposition, the jay-vees made it a perfect afternoon for Tech by outscoring the BIOLA junior varsity team by the close score of 2-1.

Rough Game

Although the varsity team won the contest 4-0, the men from BIOLA made a very respectable showing, as the play during the game was extremely rough. Nonetheless, the Beavers were in complete control of the game from start to finish. Tech com-

bined a good passing game with the ability to outrun BIOLA to enable Yilmas and Trishuk to score; Yilmas scored 2 important goals in the first half, putting Tech ahead to stay, and added another in the second half of play. Trishuk's single goal in the second half completed Tech's scoring.

The junior varsity team made another fine showing while defeating BIOLA's JV's. This game was quite similar in appearance to the varsity game despite the fact that the score was much closer. As was the case in the varsity contest, Tech dominated the game well enough to win by a single goal over a determined opponent in another rough, hard fought game.

Go Tech, Beat The Bruins

By beating Biola, the varsity maintained its perfect record this year. Combining this with the fact that the regular season has but a few weeks remaining, the chances for an undefeated season are high.

Fleming rolled on to two more Discobolus victories during the last couple of weekends to take a commanding lead in the trophy standings. Both contests were held "off-campus" as Lloyd succumbed in football and Ricketts in softball.

The Lloyd contest was held two weekends ago on a very muddy Polytechnic field. Last year's Lloyd football machine seemed to suffer due to the graduation of most of their first team. A seemingly endless supply of Fleming ends proved to be very important in the downfall of the 1963-64 Interhouse Football champs. The final score was a very lopsided 31 to 6.

Ricketts caused the Flems a few anxious moments last weekend. The game was held at Grant Park due to the softball (Continued on page 8)

Splash

(Continued from page 6)

scoreless. The game tightened a bit in the third quarter as Redlands scored four goals, Caltech three. The Beavers then held the Bulldogs to only one goal in the final period to achieve the victory. John Walter scored four goals, Nielson scored one, and Hugh Maynard added the sixth. Even if Redlands had been able to win the contest, it would have been a Caltech victory as Redlands was penalized for infractions of conference rules; the penalty was the loss of all conference games.

On Saturday afternoon the Beavers played host to the University of the Pacific team from Stockton. It turned out to be a bad trip for UOP as they lost to Oxy 7 to 3 in the morning and were nipped by Caltech 4 to 3 in the afternoon. Tech played its usual ball-control game and led the entire game. Nielson scored two goals, while Jenkins and Walter added one each to the cause. Fouling was heavy on both sides—UOP lost four men and the Beavers fouled out Jarvis, Walter and Maynard. Actually the game was no rougher than usual, but the referees were of a much higher quality. They called the play close, but they were consistent and kept the game well under control.



Next Week's Sporting Events

| | | | |
|-------|---------|-----------|------------------------------|
| | | | CROSS COUNTRY |
| Fri. | Nov. 6 | 4:15 p.m. | Pomona at Pomona |
| | | | FOOTBALL |
| Sat. | Nov. 7 | 2:00 p.m. | UC Riverside at Riverside |
| | | | SOCCER |
| Sat. | Nov. 7 | 9:00 a.m. | UCLA at UCLA |
| | | | FROSH AND VARSITY WATER POLO |
| Fri. | Nov. 6 | 4:00 p.m. | Claremont-Mudd at Caltech |
| Tues. | Nov. 10 | 4:00 p.m. | Pomona at Pomona |

Perfect for the college man

FaraPress
Slacks
by **FARAH**

Never Need Ironing

"They're ironing while they're drying"TM

Styleright
FaraPressTM
Slacks

Never Wrinkle
Won't Wilt or Muss
Creases are Permanent
Colors are Fast
Feature Finest Fabrics
Wear Longer and
Stay New Looking

FARAH MANUFACTURING COMPANY, INC. EL PASO, TEXAS

Coming: November 17, 1964

HUGHES announces campus interviews for Electronics Engineers and Physicists receiving Ph. D. degrees.

Contact your Placement Office immediately to arrange an interview appointment.

*Or write: Mr. W. K. Walker
Research Laboratories
Hughes Aircraft Company
Malibu, California 90265*

Creating a new world with electronics

HUGHES

HUGHES AIRCRAFT COMPANY

U. S. CITIZENSHIP REQUIRED

An equal opportunity employer.



Brewins



"Bitchin' quote."

— J. C. Simpleton

It is the fall of the year; the corn is in the shock, and the frost is on the punkin, and the punkin's back upon the noble brow of Tech progenitor's name-sake. All Troupers may sleep assured during unbounded coffee breaks, for the Great grinning pumplekin is awake and watching over his charges.

Close inspection of the new mentor by the glass eyes of Saga's SpacePatrol crew reveals standard

Less Evans

(Continued from page 6)

CL, a bit perturbed, drove 67 yards for another TD despite the violent defensive efforts of Scott, McWilliams, and Brennan, and CL led 13 to 9 with one minute gone in the fourth quarter. At that point the idol's feet of clay crumbled and the whole image toppled. Tech received and punted and, behind beautiful blocking, CL's Cox ran it back 76 yards for a TD: 20 to 9 with two minutes gone. Again CIT could not move the ball; this time Frazzini's kick was blocked, and on the next play CL's Leubtow swept right end for 18 yards and another TD: 26 to 9 with four minutes gone.

Mowery went in at QB and engineered an attempt to salvage something; he almost made it but the pieces had been ground a little too fine. Running for his own first down and hitting Frazzini for 7 and Powers for 34, Mowery got the Beavers to the CL 7, but three passes fell incomplete and hope fell with them. Gaudio was still smarting from the safety; he cranked up and hit Mooney for 72 yards and a final TD to make it 33 to 9.

Beat UCR

CIT got off to a great start and played the best ball game of several years for three quarters, but the strain finally told. A team cannot allow 260 yards passing and 152 on the ground while picking up only 68 and 82 and still win. For a while it looked as if Tech were going to win without ever making a first down, but dreams are dreams and reality is harsh. But, crying aside, the notable point is that the Beavers have developed a very respectable defense. This week's opponent, UCR, is a team of the calibre of Tech's first opponent, LAPC, whom the Beavers beat 8 to 6.

blinking light characteristic of neighborhood roadway "watch out for the, uh — crash, bang — yeah, that's it" warning signs. And the way punkinhaid's hooked to Amos' skull-cap, it won't be rolling off until the first coming of Millipede Eighty-story Glass-and-steel Head-every-twentieth floor Silverfish Nest.

EEE — HA

Bletcher and Ratlick co-existed long enough for a rockin' boppin' swingin' knock-down drag-out rip-roarin' bell-ringin' lionroarin' rootin'-tootin' apple-bobbin' Geology-punchin' record-swingin' Judy-runnin' guys-chasin' Halloween orgy.

Impound Earl Warren

Dave C. Losebig, a Phage, felt the wrath of the omnipotent Beak, for profaning Chastity, Motherhood, Country, Flag, and the Bomb by selling a wierd concoction of Au-H2O and Red-blooded all-american-sody-pop for money (coin only, no funny money) to innocent and unsuspecting Techese.

To wit: big Losebig piled in planar pyramid cans of his illicit brew in window of his hutch. A group of educated thinking-men desirous of protecting freedom of expression by shutting up this

nut, snuck under window with Weberious B. Field, and caused it to seize hold of bottom-most brew container (glass being an excellent conductor of magnetic humours) and hauled can out of pyramid, causing large increase in entropy and landing the whole mess on the guilty schnook, who was locked in deep groundstate beneath window. Thus triumpheth some-one — not sure who — never could understand this column.

Discoboler

(Continued from page 7)

diamonds being watered down after Ricketts had reserved a field. A "Coliseum" type left field fence was a never-ending temptation to the batters. Jon Evans pitched for Ricketts, and helped his own cause by hitting two doubles to account for the only two Ricketts runs.

Fleming scored three runs in the five-inning contest on two home runs. John Vitz slashed an Evans' pitch into the tennis courts for two runs in the first inning. Jim Stanley added the decider with two out in the bottom of the fifth inning on a disputed clout into the bushes.

Hairiers Splat

(Continued from page 6)

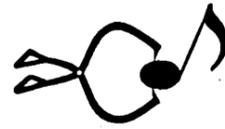
Dave Kolb, Dave Hammons, and Steve Poltrok. The final score was 15 to 44.

The Caltech varsity fared slightly better than the Whittier frosh. Pete Cross, in fourth place, was the first Tech finisher. The race had already ended in a three-way dead heat as a trio of Whittier runners strode across the finish line together after running the three-mile course in 16:16. Other Tech placers were Bob Miller, Larry Dillehay, Maynard Olsen, and Dick Essenberg in fifth, ninth, eleventh, and twelfth places, respectively. Tech accumulated 41 points in the meet, to Whittier's 19; however, cross-country, like golf, is won with the fewest points.

**SLAVA
Schmockskoy
Pitse!**

STUDENTS,
if you need
HELP
in fulfilling
your language
requirement-
inquire about
tutoring
services at
BERLITZ,
THE LANGUAGE CENTER

170 South Lake Ave.
SY 5-5888



THE ICE HOUSE

Presents:

**Don Paulin
The Trio
George McElvey**

folk music in concert
24 N. Mentor
Pasadena — Mu 1-9942
Hootenanny Sunday from 9 p.m.

Good reading



You're looking at the intelligent product of one week's work. (Some might be in your campus library.) They're technical bulletins written by some very talented scientists and engineers at the Jet Propulsion Laboratory. JPL people write over 500 such documents each year. Documents with titles like "Evaporation Effects on Materials in Space," and "Simple Guidance for Deep-Space Booster Vehicles." Pretty heady stuff.

But then designing spacecraft to reach the Moon and

planets is a pretty head-y assignment. And it takes a lot of bright people to make it happen. Where do these bright people come from? Better colleges and universities around the country. Yours, for example. Why not sign up for an interview with a JPL man? Besides working at the most fascinating job in the world, you'll also have lots of good books to read.

JPL JET PROPULSION LABORATORY
4800 Oak Grove Drive, Pasadena, California

"An equal opportunity employer." Jet Propulsion Laboratory is operated by the California Institute of Technology for the National Aeronautics and Space Administration.

ON CAMPUS INTERVIEWS: Contact University Placement Office for Appointment



CALTECH?

We're practically
next-door neighbors!

605 South Lake Avenue
Telephone 792-6121
Wm. M. McCullagh, Manager

Serving the five major counties
of Southern California

**UNITED
STATES
NATIONAL
BANK**