

Special Students' Day Issue

New exhibits arranged to liven up old tours

By Jim Crosby

This Saturday Tech will again be host to 800 senior high school students, a few junior college men and their teachers during the Institute's third annual post war Student's Day.

Most of the visitors have been nominated by department heads in their schools as outstanding science students who would be interested in seeing a technical

institution like Caltech. The program has been so organized that the 800 can see something of the research that is carried on here, and what facilities there are for it. Most important, they will be able to find out what undergraduates at Tech are like if they get out and talk to their guides, their hosts in the student houses during lunchtime, and anyone who looks as if he might live here.

No way out

The morning program will take the visitors to many parts of the campus where vastly different types of activity are going on. They have no choice as to what they can see since elaborate traffic control has already been worked out by Dr. Wilbur Varney, faculty chief for Student's Day, and Jack Behnke, undergraduate manager. Meet-

ing in the student houses, guides will take groups of 20 around the campus to some exhibits in all of the departments between the hours of nine am and noon.

Blowhards

Many new exhibits are featured for the first time this year. The most notable is that the visitors will be allowed into Guggenheim, the aeronautics building, for the first time to see the

subsonic, supersonic and hypersonic wind tunnels; something that even a lot of Techmen have not been allowed to do.

The hydrodynamics lab has come up with three new demonstrations. Torpedo research and cavities on underwater projectiles will be shown in the hydro lab located in the southwest corner of Guggenheim. Where the Island of Guam used to be in the open air hydraulic structures lab, a new model has been built and currently is under study.

The Chemistry department also offers three new exhibits in electron diffraction, electron microscopes and radioactive carbon dating. Chemical engineers will demonstrate the problems encountered in the design of equipment for handling hydrocarbons under high pressure and temperature.

Other new exhibits are to be found in: Biology; Plant Tissue Culture and Biochemistry; Electrical Engineering, Wireless lamp; Geology, Radioactivity in Geology; Mechanical Engineering, Jet Engines, and Physics, the new cosmic ray lab.

Big gap

Naturally these are not the only demonstrations given during the morning as the programs for Student's Day indicate. The world's largest electron accelerator is Tech's synchrotron; some of the earliest developments in analog computation were undertaken in the analysis lab here; a great deal of work has been done on earthquakes by both the Civil Engineering and Geology departments. Since Techmen spend a quarter of their time in humanities courses, the humanities division is showing off the public affairs room which stacks up against the best.

Finally, the YMCA's Student Life at Caltech given this year by Tom Stockebrand gives the prospective Tech student an idea of what life here really is with more fact and less gloss.

In the accompanying articles on the afternoon program the California Tech is trying to amplify the titles of the lectures as given in the programs for the day. Each student visitor can only see three while ten are offered. It is hoped he will read these articles and thereby be able to make the most of the three hours in the afternoon.

Pendulum features French philosophy

The fourth issue of PENDULUM is being distributed this week. The feature article in this Autumn issue introduces a new French philosophy which has had no significant publicity in the United States prior to this publication. The philosophy, Lettrisme, advocates a new approach to the production of cin-

(Continued on Page 6)

Interview Schedule

We have several Christmas openings. Are you interested?
Salesmen for men's shoes.
Salesmen for men's furnishings.
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Salesmen for Rose Parade programs.
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For further information contact the Placement Office, 120 Throop.

CALIFORNIA TECH

California Institute of Technology

Volume LIV

Pasadena, California, Thursday, December 4, 1952

No. 9

Annual fall awards banquet Monday in Brookside Park

Steak, football stories and sports awards will spark the annual shindig starting at 6:30

By "Moose" Henderson

It's steak time again! The annual Fall Awards Banquet will be held next Monday, December 8, at Brookside Park.

The festivities will commence at 6:30 pm when the traditional steak dinner will be set on the table. The steak will be further supplemented by plenty of rolls, butter and milk. After chow everyone will sit back and puff on their cigars and listen to the bull as it commences under the direction of Dr. J. Kent Clark.

Pro-ball stories

The main speakers will be Don Paul and Tom Fears and they will add to the stories with tales of pro football. The coaches will follow with what jokes and stories are left as they introduce their teams who have valiantly defended the good name of Tech throughout the term. The affair will bust up at about 9:45 so that those in training can hit the sack and those few who study can get back in the pit.

You can get your ticket from your team manager or from John Gee, John Merrill, Ralph Miles or Moose Henderson.

For those out for athletics this term tickets are \$1.50 while for others they are \$2.50.

Art prints display in Dabney lounge

On Thursday, December 4th, Mr and Mrs. Herbert B. Palmer, under the auspices of Dr. Weir, Master of Student Houses, will once again bring their collection of prints and reproductions for exhibition and sale. The exhibition will take place at Dabney Hall Lounge from 10 am to 6 pm and then move to Blacker House from 7:30 to 10 pm.

For those who are planning (Continued on Page 6)

Campus Calendar

THURSDAY, Dec. 4
3:00 Varsity Basketball, Redlands Tournament at Redlands
7:30 S.A.E. Meeting in 206 Dabney
FRIDAY, DEC. 5
2:00 Varsity Soccer vs. U.C.L.A. at Caltech
7:30 Friday Evening Demonstration Lecture in 201 Bridge
SATURDAY, DEC. 6
8:00-4:30 STUDENT'S DAY
10:00 Conference Cross Country (Varsity and Frosh at Mt. San Antonio J.C.)
7:00 Varsity Basketball, Redlands Tournament at Redlands
SUNDAY, DEC. 7
8:00 Chamber Music Concert

Courage subject of McKinney essay

"The meaning of courage" will be the subject of the 1953 McKinney English Essay Contest to be sponsored this spring by the Caltech Humanities Division, announced Prof. G. R. MacMinn. A first prize of \$75 and a second prize of \$50 will be awarded.

Juniors and Seniors

Only Juniors and Seniors will be eligible to participate in the event, which will require essays of about 1200 words on the meaning of courage. Ideas for the essays are to be drawn from the assigned reading. This year's novels for assigned reading are Stephen Crane's *The Red Badge of Courage* and Ernest Hemingway's *The Old Man and the Sea*. Ibsen's play *An Enemy of the People* and *Laches*, a dialogue by Plato, are also part of the assigned material. Prof. MacMinn suggests that this reading can be done during Christmas vacation.

Due in April

The essays will be due April 13, 1953. They will be judged by a committee from the English Department and the four best ones will be selected. The four finalists will present the substance of their essays orally at an assembly to be held early in May, and the winner will be decided by a group of judges chosen from the community. Contestants will be judged on the quality of their essays and the effectiveness of their oral presentation.

Further information about the contest is available from Professor G. R. MacMinn of the Caltech Humanities Division.

YMCA gives scholarchips for Asilomar

In order to assure the best possible representatives from Caltech at the Asilomar student YMCA-YWCA conference this year, there will be a number of scholarships available for those who otherwise might be unable to attend. There are six full scholarships of \$35 each, awarded by Dr. DuBridge for Freshmen, Sophomore or Junior students; and several other partial scholarships open to any undergraduate

Coed

The conference, which is intercollegiate as well as coeducational, will be held at Asilomar which is near Monterey, from Dec. 28 to Jan. 3. It is a wonderful experience, as any of those who have been there before will enthusiastically maintain.

Anyone interested in a scholarship, or in Asilomar in general, should see Wes Hershey as soon as possible, and not later than December 9.

Feynman lecture features tour of world of the atom

"Atoms in Motion" will be the topic of a talk by Dr. Richard P. Feynman, world-renowned professor of theoretical physics. In his talk he will explain, by the kinetic theory of matter, how the atoms and molecules act in certain common conditions. To us a desk or a glass of water seem to be very static things when actually they are very dy-

amic, with the atoms and molecules in constant rapid motion.

Atomic people

Dr. Feynman will imagine his audience to be the size of an atom and then tell them what the world around them looks like. At first there seems to be no order at all, with each molecule going its own way. It is only when one takes in a broad-

er view that there appears a very definite order and system of action.

Dr. Feynman will discuss what happens when water evaporates, telling how each atom jumps into space. He will also cover other various temperature and pressure effects, such as boiling and freezing. The action of matter at temperatures at and near absolute zero will be brought out. Also what happens when a crystal dissolves in a solvent.

Student Day

On this third annual Student Day, the staff of the California Tech would like to extend a hearty welcome to all the visiting firemen here today (that sounds dull enough to start with). Caltech is all decked out in its best to impress any future Techmen. You will hear all the virtues of Caltech extolled; you'll hear lectures, talk, more lectures, gossip, and just plain bull about what goes on at Tech; each department is putting on demonstrations and giving talks about its most spectacular and interesting (?) feature.

These demonstrations and lectures may be interesting after all, but they are not all of Caltech. The real Caltech is in its people. Get to know them and you know most of what Tech is. You are eating lunch with us in the Student Houses; take that opportunity to get acquainted. All the students here have ideas about Tech and they will probably be glad to tell you about them. Actually you are not even going to get much out of reading this paper, so get into that bull session over there, that's where Caltech really is!

President's message

Graduate instruction in undergraduate classes has been the major topic of discussion at Student Faculty meetings for the past two months. During these two meetings a considerable amount of time was devoted to discussion of the Loveberg report of 1950 on this topic and of the actual efforts that have been made to insure and maintain the high level of graduate instruction. Classroom visitation by the faculty member in charge of the course has been the policy of the past two years. This program has had its shortcomings in not being enforced. The action taken by the Student Faculty Relations Committee was to recommend to the Faculty Board that classroom visitation to classes taught by graduate students be carried out by all departments once each term. The alternate method of instructor rating sheets instead of personal visitation was also recommended. The meaning of these recommendations is that once each term students in classes taught by graduate students will have the opportunity through the personal visitation of the faculty member in charge or through a suitable instructor rating sheet to rate their instructor by praise or complaints. Both methods allow complete freedom of expression, so don't be afraid to speak out. Be accurate and honest.

John Gee.



Department of Things We Feel Could Have Been Said More Simply:

... the width of the monitor should be not less than twice the height of its windows, nor should the height be more than half its width.

Also in this department we feel we should include the word "Vilipendency" which appeared in last week's letter in the Tech. Anyone that uses a sesquipedalian word such as that should be shot. We should like to posit a lemma for letter writers, namely, simplicity is best.

Any one who thinks that the typesetting on this paper could be improved certainly has a legitimate grip.

Yummy!

Tickets are now going on sale for Luke Boganovic's coming astronomical, gastronomical performance. It seems poor Luke made the sad mistake of vowing that if a certain party finished the copious quantity of food before him, he (Luke) would gladly eat the certain party. Said party came thru, and now Luke has a free meal coming. Don't play with your food Luke, EAT!

The Grand Award for casualties sustained in action went to Achilles Rocchio this week. This hero, while serving as a dam

for the vast human tide of Freshmen chasing for some strange reason) a brake drum down the olive walk last Wednesday, had the foolhardiness to stomp on one of the latter's head. The doctor believes Jack will eventually walk again.

The cad!

Choke of the week: During a tour of the ME engine lab, a Junior who will remain nameless (due to the fact that we do not know his name) had his finger caught by a butterfly valve while examining the carburetor of the new Cadillac engine. This indecent behavior seems to have been punished since he has not been seen since, although the compression ratio of one of the cylinders has been undergoing strange fluctuations. Serves the Cad right.

Dear Editor:

Even though we realize our style is the acme of journalistic perfection, it cannot withstand the repeated brutal indiscriminate attacks of your blue pencil. If you must mercilessly wipe out a predicate, the least you can do is eliminate its bereaved subject.

Lovingly,
The Beak

Peyton can

The fame (or is it notoriety) of the Vatican has spread far and wide; Friday evening before last two local lovelies phoned this den of iniquity, stated they were lonely, and coyly asked if there was anyone around who could do anything about it. Johnny

(Continued on Page 4)

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California Tech
Published every Thursday during the college year except during examinations and holiday periods.
California Institute of Technology
1201 East California Street, Pasadena, Cal.
Subscription rates: \$1.50 per year.
Entered as second-class matter Nov. 22, 1947, at the Post Office in Pasadena, California, under the Act of March 3, 1879.
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GRAD CRIER
by Jerry Hershman

Certain aspects of the graduate teaching assistant situation are interesting and important to the entire student body. This column will be an attempt to answer the question of whether the grad assistants expend the necessary effort to satisfactorily perform the jobs assigned to them. The teaching jobs vary from merely grading papers to being responsible for almost all the teaching of an entire course, such as sophomore physics. The success the assistants achieve is measured solely by student response. The present inquiry indicated that favorable student response was a sufficient incentive for the assistants to spend extra time, when called for, on their jobs.

Previous to their duties at Caltech, most of the grad assistants have had very little teaching experience. All of those questioned (approximately fifteen ranging through the fields of chemistry, physics, mathematics, geology, biology and aeronautics) said that they were doing their best to remedy this lack of experience by diligent preparation of subject material. None professed to be using his lack of experience as an excuse to get by with a shoddy job. To the contrary, all said that their order of precedence in their school work was teaching duties before either course work or research.

In one case, this entailed spending 24 hours a week on a job, sophomore physics, that paid for a maximum of 12 hours per week. The freshman chem instructors reported that they dutifully made themselves available during stipulated office hours for personal tutoring. Several assistants said that in planning lectures they did their best to think of examples and asides which would add some life to the lectures—something which many

(Continued on Page 6)

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SEC'S AT TECH

By Bernie Schweitzer and Tom Taussig

As many well-informed Techmen already know, this week's lovely can usually be found guarding the front desk of the Placement Office, in Throop Hall.

The name of that little blonde behind the counter is Donna Rogers. Donna is a good girl to get acquainted with, in view of the wonderful opportunities provided by the Placement Office (plug for the Placement Office).

A newcomer to this coast, Miss Rogers comes from the corn country, calling Omaha, Nebraska, her home. After graduating from high school in 1951, she spent a year at Duchesne College in Omaha. Donna then came out to California for the summer, and liked it so much that she decided to stay. That was this summer, and Donna is still at her original job, at Caltech.

The word goes, that Donna, who has been to both the ASCIT and Interhouse dance, is a terrific dancer. The most she will say is that she "loves to dance,"



but "didn't learn to dance in Omaha."

Five hours a week, in the evenings, Donna has Spanish classes at PCC. A serious student herself, Donna says she admires the Caltech student for his serious attitude toward his work. "There is quite a difference between Tech," says Donna, "and Duchesne."

Debaters setting records this year

One of the less frequently heard about, yet very active extracurricular activities at Caltech is the forensics program, encompassing debating, interpretive reading, extempore speaking, discussion, and many other types of oratory. Under the sponsorship of Dr. Lester McCrery, the forensic teams have already won several interscholastic tournaments which they won with the outstanding record of four undefeated teams.

Won again

At Santa Barbara, two weeks later, Caltech again took first place by having contestants receiving the grade of excellent. The events included in the meet discussion and interpretive reading were oratory and extempore speaking.

The individuals participating in the interscholastic activities include Jim Short, Tom Bergeman, Bob Ryle, Martin Roth, Jim Enright, Kim Malville, Miles Nesman, Ray Orbach, Bill Lindley, Myron Black, Marvin Bienstock, Sig Porter, William Ribble, Gary Boyd, Paul Lindfors, Van Bluemel, Irwin Rubenstein and Leon Shameson.

Choke!

He: I suppose you dance?
She: Oh yes, I love to.
He: Great, let's do that instead!

Blacker

The highlight of social activities this weekend at Blacker House will come tonight with the Blacker off-campus dance. Recent events in the Blacker social program have included the Arabian Night theme adopted for the Interhouse dance and a successful mountain party.

Blacker's social program provides entertainment on all weekend nights and activities on many weekend afternoons.

Dabney

This Friday the Darbs will send their envoys forth to return with some Whittier lasses for the exchange dance. To help make the evening more profitable, the picture taking will be repeated.

Saturday night presents the dilemma. Sign up lists are up for both the barn dance at Mountain Oaks and Turners party. Stocky's German influence is still prevailing, for the choice of menus at Turners is between wienerschnitzel and sauerbraten in keeping with the German atmosphere of the party.

* * *

Ricketts

With the end of the semester rolling around, the Ricketts Rowdies are going all out for one last fling this weekend. Rowdies and dates accompanied by the illustrious crew team are traveling to Mountain Oaks for dancing and other activities. The crew being all set to do battle with the team from Fleming House in the last barn dance of the year.

Music will be furnished by Eddie Jackson; refreshments by the Rotgut Brewing Co. All signs point to a large turnout and a crazy time for all.

LETTERS

"I would like to thank, on behalf of the Caltech YMCA all those who worked on the Y finance drive, as well as those who gave so generously. Approximately \$2450 of the goal of \$2600 has now been raised, and not all the solicitation cards have been turned in yet.

"Those I especially want to thank for their support in making the drive a success are faculty solicitation chairmen Ken Lunan and Kai Kristensen; class chairmen Jerry Pixton, Miles Nesman; Leon Shameson, and David Stevens; and Leo Baggerly, graduate. Also those chairmen Al Helgesson and Van Walkley, with Dave Clark, George Moore, and Bill Gardner, as well as Bob Stanton on publicity."

Irwin Rubenstein

THE SPACE BEAVER

By WALT LEE ASF

The December Astounding, now on sale, contains **The Tiniest Time Traveler** by David Fox, Feynman's interpretation of the positron as an electron traveling backwards in time is considered.

The January, 1953 issue—on sale December 17, 1952—will feature Poul Anderson's first real long yarn, **Un-Man**. Also included will be "The First Power Pile," data on the new nuclear reactor at the Argonne Laboratories that produces more fissionable material than it uses and produces power at the same time.

teriological warfare.

It doesn't take him long to adjust and he's right in there pitching . . . for Corporal Gary, and at first, "Nineteen," an immune girl friend. The continuous struggle to survive carries him from one end of the country to the other with hair-raising results, with the eternal goal being the safe, clean side across the Mississippi River.

As in Tucker's *City in the Sea*, the book has a thematic quality (Continued on Page 5)

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History and future of 200" scope is Astro lecture

The Astronomy Department Presents

This year the program of the department of astronomy will include many exhibits of interest to the scientifically minded, plus a talk by grad student Dale Vrabec

During the afternoon a one-hour talk entitled "The History of the Telescope" will be given by grad student Dale Vrabec. This will include a brief resume of the development of the telescope, touching upon such interesting points as the growth

of Mt. Wilson into the astronomical center that it is today.

The major part of the time, however, will be utilized in a discussion of the three-year operational history of the Mt. Palomar 200-inch reflector. What is being done with the world's largest telescope? What is the latest word on the red shift, on interstellar gas, on the composition of the stars, on the structure of the metagalaxy? What can we hope will be accomplished in the near future at Mt. Palomar?? These are some

Old Dorm gets turkey dinner too

Most of the boys in the Old Dorm attended a Thanksgiving party given by Mrs. Florence Llal, manager of the Coffee Shop, last Wednesday evening. They feasted upon turkey and all that goes with it, and all appreciated the change from the usual regime of eating out or cooking for themselves. Thus students from many foreign countries were initiated into the celebration of a holiday uniquely American.

of the questions which Dale Vrabec will try to answer to everyone's satisfaction this Saturday afternoon.

Egad!

"A rag and a bone and a hank of hair," mused the waiter as he gazed sadly at the day's menu.

Gad!

A big-time gambler had just died. The funeral was well attended by his professional friends. In eulogy, the speaker said, "Spike is not dead. He only sleeps." From the rear came a voice, "I've got \$100 that says he don't wake up."

The Monte Carlo Method feature of math lecture

Contrary to popular opinion, mathematics is more than the arithmetic which trips us up

every time we buy something, or the algebra which enables us to solve the problems originally proposed by the Phoenicians of Egyptians. It is not a dead science or a mere recitation of discoveries made 2,000 years ago by the Ancient Greeks or at best 300 years ago by Europeans. Mathematics, far from the above, is rather a dynamic and rapidly growing science.

This topic will be the emphasis of Dr. Bohnenblust's lecture this Saturday on Student's Day. To illustrate this dynamic spirit of modern mathematics, he has selected the following problem:

Measuring Girth

To compute the perimeter of any convex curve. (A curve is said to be convex if the straight line joining any two interior points, P1 or P2, is completely contained in the region bounded by that curve.) (See Fig. 1.) For example, the region bounded by an ellipse is convex.

The theorem Dr. Bohnenblust will propose is that L, the perimeter, equals (pi) x (the average width of the curve). (Any width is determined by measuring the perpendicular distance of any two parallel lines L1 and L2, each tangent on opposite sides of the curve.) The average width is determined by selecting a set of random widths and averaging them.

It is clear that this theorem holds in case of a circle, where c' equals (pi)d equals (pi)2r where 2r, the diameter is the average width of the circle. Dr. Bohnenblust will illustrate the theorem for the case of an equilateral triangle.

Solids, too

The theorem will be further extended to space in the case of a convex body (An ellipsoid is an example of a convex body) where the situation is likened to a beam of light impinging upon a convex body and noting the area of the shadow cast upon a screen perpendicular to the light. The theorem states that S, the surface area of the body equals 4 x (the average size of the area of the shadow cast upon the screen). See Fig. 2.) The students will see a demonstration of parallel light beams impinging upon a tetrahedron, the shadow of the tetrahedron being cast upon a perpendicular screen. Dr. Bohnenblust will illustrate that s equals 4 (the average area of the tetrahedron cast upon the screen), thus confirming the theorem for this case.

There are two methods for computing the perimeter and surface areas for the above cases.

The first method is the systematic method in which we could subdivide and pass to the limit, a process known as integration. This method was known to Newton, almost 300 years ago (Continued on page 5)

Fig 1

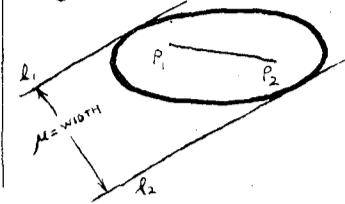
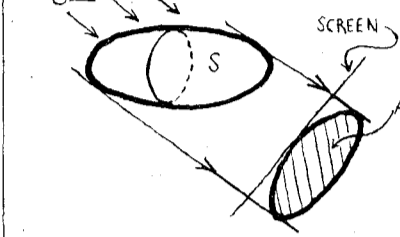


Fig 2



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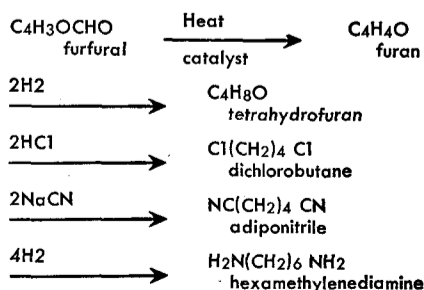
Roger Jones, B.S. in Chem., Haverford College '52 (right), and operator check temperature control in the conversion of furfural to furan.

Among the most interesting fields for engineers at Du Pont is the design of plants and equipment.

It takes ingenuity of a high order to translate a small-scale laboratory operation into all-out commercial production. Design engineers cannot always use purchasable equipment to scale up research findings, even with considerable adaption. About half of the time at Du Pont, entirely new equipment must be designed because of the novelty of the process developed by research.

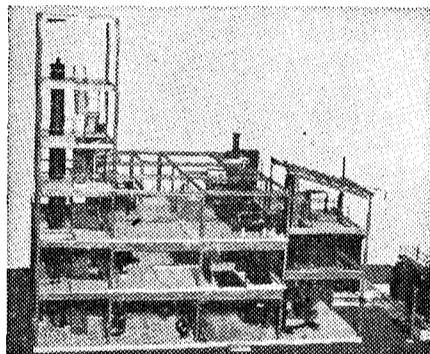
For example, a number of unusual problems were involved in designing the equipment and plant for a process in which hexamethylenediamine, one of the intermediates for nylon, is made from furfural, derived from such agricultural by-products as corncobs and hulls of cottonseed, oats and rice.

In this conversion, these steps are involved:



Here are some of the special problems that were encountered:

1. Design of equipment with close temperature control for converting furfural to furan. The design finally settled on employs a large number of tubes containing a catalyst, with a coolant circulated around them. Special sequence



Scale model of a part of the plant where adiponitrile is made from furfural.

timers were devised for operation of the valves controlling production and regeneration cycles.

2. Design of high-pressure agitated autoclaves for the hydrogenation of furan to tetrahydrofuran.

3. Selection of corrosion-resistant equipment for the hydrochlorination of tetrahydrofuran to dichlorobutane at high temperatures.

4. Design of a unique five-step distillation train to obtain high-grade adiponitrile without trace impurities.

Although most of these problems involve a great deal of chemical engineering, also needed on the designing team were mechanical, electrical, civil, metallurgical and industrial engineers. Thus design work at Du Pont is open to men with many types of training, and there is abundant opportunity for all.



E. W. Griffin, B.S. in M.E., Duke; M.S. in Ind. Mgt., Georgia Tech '52 (right), instructs operator in handling of vapor-light horizontal vacuum filter used in separating adiponitrile from sodium chloride.

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CAMPUS BREWINS

(Continued from Page 3)

Peyton, playing it very cool, managed to sneak out without tipping off his alley buddies and sallied forth to accommodate the (Continued on Page 5)

FRENCH cuisine

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High potential lab to shower million-volt sparks in show

Bolts of man made lightning will streak and thunder across the dim interior of the High Potential Laboratory this Saturday afternoon at three different times: 1:30, 2:30, and 3:30 pm. Almost everyone will have the chance to see the fireworks in one of Tech's most popular and spectacular demonstrations to be presented this year by Mr. J. E. Conner and his grad assistants. Blue and white corona discharges will be set up by the million volt transformers on busbars which run the entire length of the High Volt Lab. The hair-raising sparks will seem almost

too close to those on the second balcony. Using the same transformers, a spark between two diverging wires will climb majestically to the ceiling in the Jacobs Ladder exhibit.

The two million volt surge generator will be used to vaporize copper wire, split blocks of wood to fragments and make a huge spark jump between two spheres. These are the noisy exhibits, and also the ones most resembling lightning bolts in action.

Perhaps the most thrilling demonstration will consist of drawing a spark from a discharge point above the cascade transformers up to the steel beams of the ceiling. The final gap is about forty feet long, and it really crackles.

Xtals to be revealed at chem lecture

Crystal structure will be the subject of the talk by Dr. B. Gunnar Bergman.

The introductory section of this lecture will attempt to cover the general field of the nature of crystals, the differences between crystalline and non-crystalline materials, and the methods of formation.

The determination of crystal structure, on which Dr. Bergman has done much work, will be covered next. Mention will be made of methods of determination such as electron diffraction, and most important of all—X-Ray analysis.

In conclusion there will be a discussion of several interesting classes of crystals. Several scale models of specific crystals will be available to illustrate the points under consideration. The inorganic crystals will be illustrated by sodium chloride and others, the metals by copper and iron, and then there will be some general remarks on some of the simpler organic crystals.

"Incomplete grade" to mean just that

In an attempt to avoid the indiscriminate use of the grade **Incomplete** the Faculty, on November 24, 1952, voted to change the rule governing this grade to read as follows: "The grade of **Incomplete** is given only in the case of sickness or other emergency which justifies the non-completion of the work at the usual time. An **Incomplete** will be recorded only if the reasons for giving the **Incomplete** are stated by the Instructor on a form which will be sent with each grade sheet and only if, in the opinion of the appropriate committee, (Freshman or Upper-class, for undergraduates and Master of Science Candidates and Graduate Study for those working for Engineers or PhD degrees) the reasons justify an **Incomplete**. If, in the opinion of the appropriate committee, the **Incomplete** is not justified a **Condition** will be recorded."

L. W. Jones, Registrar

CAMPUS BREWINS

(Continued from Page 4) desperate damsels alone. What happens when Oxy hears, Johnny?

Also on this Friday evening a few of the Blacker men ventured forth to an intimate house party high in the Griffith Park after the dance. (Need some help boy??)

Lately several members of Fleming have come under the notice of the little men on motor-time-honored engineering technique referred to as medium-

MONTE CARLO METHOD

(Continued from Page 4) and is the more familiar method.

Aha!

However, there exists a more modern technique, used in modern mathematics known as the "Monte Carlo" method, so called because it is a random method. This is the method Dr. Bohnenblust will illustrate in his solution of the two problems, namely, average a number of random selections and take the result to be something like the value we are looking for. In the limit it is the exact value.

The lecture will demonstrate to the students that mathematics is dynamic rather than static, still thriving, and is one of the most rapidly expanding sciences.

Yawn!

The neighbors were complaining of the racket Mrs. Jones' husband was making. "All the time he goes around cackling like a chicken," they griped.

"I know," Mrs. Jones said. "We get tired of it too. Sometimes we think he's not in his right mind."

"But can't you do something for him? Can't you cure him?"

"Oh, yes, I suppose we could. But we do need the eggs."

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Frozen fruit feature of liquid air demonstration

The effects of extremely low temperatures on all kinds of bodies will be shown in the now famous Liquid Air Demonstration. Along with the many familiar demonstrations of these effects, many new and more spectacular illustrations are planned by Mr. Earl Jacobs, who is in charge.

Many materials which are soft and malleable at room temperature become hard and brittle while at the temperature of liquid air, -183 degrees C. It is this phenomenon which serves as the basis of most liquid air

demonstrations. The effects of these low temperatures on organic materials and metals never fail to interest any audience. Also, other effects such as the "cyclone" effect and the "paramagnetic" effect serve not only as interesting demonstrations, but provide scientists insight into the basic properties of molecules at low temperatures.

Egad!

"I was shot through the leg in the war."

"Have a scar?"

"No thanks, I don't smoke."

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An apple used to do the trick,
But grades don't bother me—
I give my prof this one sure tip
That L.S./M.F.T.

Edward Siegel
University of Florida



FOR A CLEANER, FRESHER, SMOOTHER SMOKE...

Be Happy-GO LUCKY!

PENDULUM

(Continued from Page 1)

ema works as well as other interesting ideas.

Subscriptions are for sale in the book store, at 75c for the three issues of this school year, or single issues can be obtained there in the future for 30c

ART PRINTS DISPLAY

(Continued from Page 1)

holiday gifts, there will be an opportunity to make purchases at a special discount of 20% on all sales of \$2.50 and over. (On rare, out of print reproductions and original prints, the discount is 10%.)

GRAD CRIER

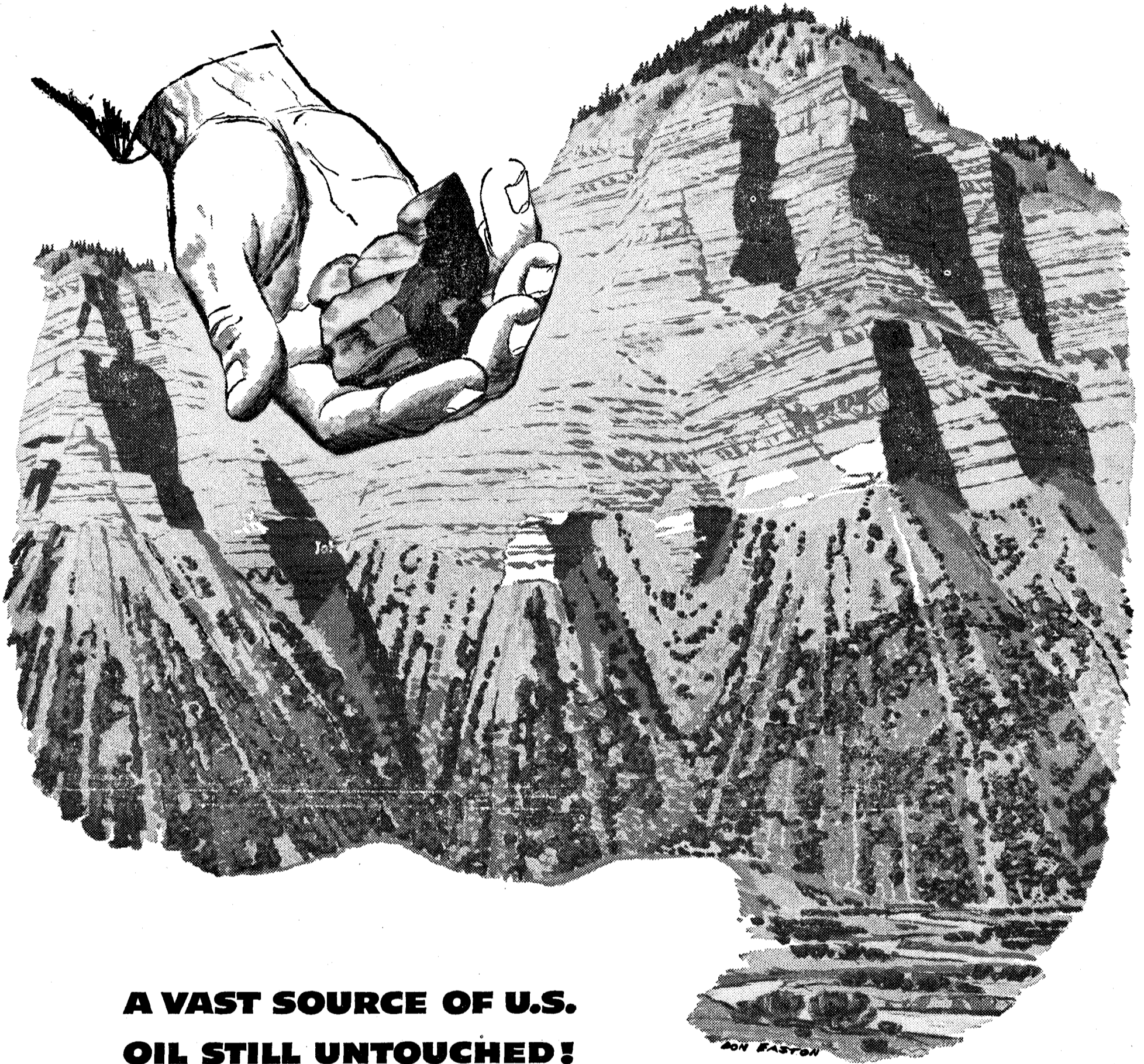
(Continued from Page 2)

lems, even after consulting with several assistants and professors. A classic story of a "goof-off assistant" concerns the budding young physicist several years back who told his class at the beginning of the term that classical physics was quite dull and that the students would be

better off if they learned it themselves. He decided to spend all the class time teaching something more interesting which the students would never study in a physics course without his guidance—semantics

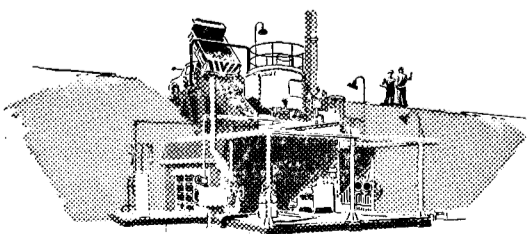
Since several departments

(Continued on Page 7)



A VAST SOURCE OF U.S. OIL STILL UNTOUCHED!

1. Many Americans have probably never heard about oil shale—one of our country's greatest natural resources. Shale is a rock formation that contains kerogen—a solid that breaks down into oil and coke when heated. There are a number of shale formations in the U. S., the richest of which is in the Green River Basin of Colorado and Wyoming. This single 1000-square-mile deposit contains *three times as much* oil as the total proven crude oil reserves of the U. S.!



2. However, the big problem has been how to extract the oil from this shale on an *economical* basis. Union Oil research men have been experimenting with shale oil extraction since 1943. One of their accomplishments was the development of a retort that can extract shale oil far more economically than any previous method.

3. This retort—along with improved mining and refining techniques—has reduced the cost of producing oil from shale more than most people realize. And each year the cost of finding and producing crude oil continues to rise. At some time, then, it is probable that oil can be obtained from shale at a cost competitive with crude oil.

4. When this will come about is anybody's guess. But one thing is certain: the American people can be sure that this natural resource of

theirs will be developed at the earliest possible date with the greatest efficiency *only if private enterprise* is left free to do the job. For our *competitive* private enterprise system has demonstrated time and time again that it can develop better products, for more people, at lower prices than any method yet devised by man.

UNION OIL COMPANY OF CALIFORNIA

INCORPORATED IN CALIFORNIA, OCTOBER 17, 1890

This series, sponsored by the people of Union Oil Company, is dedicated to a discussion of how and why American business functions. We hope you'll feel free to send in any suggestions or criticisms you have to offer. Write: The President, Union Oil Company, Union Oil Building, Los Angeles 17, California.

Anson, Tyler lead Tech into Redlands tourney

Basketball season really gets under way with the Redlands Tourney coming up today through Saturday. Caltech is paired with Whittier in the top bracket this afternoon. The other game in the top bracket is Redlands vs Chapman tonight. The bottom bracket pits Occidental against Westmont and Pomona against Pasadena Nazarene. If Tech can get by Whittier, the probable power in the SCIC this year, there will be smooth sailing to the finals. There the opponent will almost certainly be Nazarene.

Tyler improves

Leading the Beavers into the tournament will be last year's conference high-scorer, Fred Anson, at center, Jim Tyler and Dave Stevens at forward, and Art Britt and Bill Chambers at guard. Tyler has shown exceptional improvement over last year. He scored 18 and 19 points against Nazarene and Cal Poly respectively while Anson caged 20 and 21 in those two contests.

Tech beats Cal Poly

Led by "Thirty-point" Hopkins, Nazarene downed Tech in a spirited battle, 93-68. This is just about the best Tech has ever looked against the small school Coast Conference runner-ups last year. Snapping back from that defeat, the Beavers took a good one from Cal Poly, 65-45. Tech pulled away in the last quarter on Tyler's rapid-fire scoring. Chambers also looked good with 16 points to his credit.

Harriers win three in row

The victorious cross country runners moved in the final week with a record of three wins and one loss under their belt. The frosh also held the same record. Both face Muir this Tuesday, and also the Conference meet at Mt. San Antonio Saturday.

Gardner leads

Led by "Gutless" Gardner, Tech walked over Pomona, 23-37. The meet winner was Sam Calvin, followed by Gardner, Van Walkley, LaTourette, Ames, Crawther, and Patraw in that order. The other Sagehens trailed far behind. The frosh won a close one, 26-29. The team was composed of Lewis, Lindstrom, Whitteborn, Anderson, and Plambeck.

LaTourette captain

The Harriers also defeated Nazarene on Nazarene's home course last week. The frosh and varsity ran together with Lewis leading the pack. Gardner and Van Walkley were also in there. Afterwards the jubilant runners elected Jim LaTourette their captain and Lewis the frosh captain.

GRAD CRIER

(Continued from Page 6)

maintain a check on the assistants by having profs attend classes occasionally and by having weekly conferences with assistants, such a situation is unlikely at the moment. The conclusions of this study are that the graduate assistants take pride in their teaching jobs and make a sincere effort to do all that is required. Since they are a resourceful lot and as students are sympathetic to a student's needs, they achieve their purpose and enter into the true symbiotic student-teacher relationship with both the student's needs and the teacher's ego being satisfied.

All-SCIC selections

Three Techmen made the coaches All-Conference Team. John Goetten for a driving game at defensive guard, Neil Stefanides at offensive end (he was even better as defensive line-backer), and Gene "Surprise" Muehlburger at offensive tackle. Whittier's Ray Dezember who made both offensive and defensive teams also made All-Coast squad.

Over the wall

By John Wall

About this time of year most Techmen look back on the football and water polo seasons, and again set their mind that Tech never wins an athletic contest. Fortunately we who would do this are wrong, for there walks among us a team of champions: the soccer team.

The soccer team has beaten or been refused a challenge by every major soccer team on the coast. If this holds them through two more games, Tech will have its second Pacific Coast Championship team (this may be disputed by SF State who refused Tech's challenge for no apparent reason). It is hoped that this school can muster a few dollars to send the team to the national finals. Also a salute to the intrepid cross country squad which ended up with a lone defeat in a very rugged conference.

Next Monday is the sports banquet, so awards are in order for the football team. To Moose Henderson for the hardest blocking. To Ed Gehle and Eric Ward for the most improvement. To Bruce Kaiser for the most faithful. To John Kidder the prize for being the flattest footed pass-catching ace in the business. To Al Johnson and Jack Walker the prize for the hardest running. To Walt Pilant my respect for being the keystone of the offensive line. To Pat Fazio and Neil Stefanides for leading and for spirit. And to Ivan Meers and Pete Mehringer the thanks for their fine assists in scouting and coaching.

Most of all I raise my pen in salute to the seniors who have nothing but losses to remember, but whose fine spirit took the team through a tough season. The players in the class of '54 will have to go a long ways to fill the gaps left by such as Stefanides, Fazio, Walker, Tallman, et al.

CAMPUS BREWINS

(Continued from Page 5)

Hills overlooking lovely Forest Lawn cemetery. Bob Koster, who was reluctantly talked into attending at the last minute by friend Sam Wilkes, made off with one of the nicer femmes; Wilkes, in turn, spent most of the evening looking for his hat. The girls were impressed chiefly by the refusal of the lads to devour the sandwiches and other goodies prepared for them; which all goes to show that Tech men are hungry for the finer things of life.

Wholesale

Saturday before last Beak Beak braved the miserable monsoon to struggle up to the ASCIT affair and was amply rewarded by the sight of Earl Jacobs and his lovely demonstrating the (Continued on Page 8)



Soccer team upsets Cal-Poly and UCLA

Playing two highly favored opponents during the Thanksgiving period, Caltech's "miracle" soccer team emerged victorious in both encounters. On Saturday, Nov. 22nd, it was the entirely foreign manned Cal Poly aggregation from San Luis Obispo, and on the following Wednesday it was undefeated UCLA.

Fast start

The Cal Poly game started off fast for the locals as Wing Bob Wood pumped a nice shot into the corner; however, Cal Poly soon tied it up with a penalty kick, only to see Tech regain

the lead when Right Wing Doug Inglis scored two goals in succession, one on a truly amazing shot from the extreme right hand corner of the field, which bounced off the goal post into the net. Following the half-time intermission Cal Poly scored immediately, making the score 3-2 in favor of Tech. Cal Poly maintained the offensive throughout the second half, but the locals managed to emerge with the narrow victory.

Tough game

The UCLA game was a dog fight throughout, but the Tech (Continued on Page 8)

Tips-N-Tails

By Dick Millard

For its first major activity of the year, the Ski Club sent a delegation to Mammoth Mountain over Thanksgiving. Thursday morning found a rather sparse covering of packed powder on the upper. The beginners progressed so rapidly that some of the "old pros" began to worry about the competition. Saturday afternoon six of the group left for Snow Valley. Frey had his bad knee, Dick Johnson had a badly splintered ski, and the rest were getting fed up with the rocky lower slope, which by now was studded with broken edges. Ralph Kehle, old grad Dick Tracy and I stayed on in the vain hopes of some new snow. Saturday night we tried what seemed to be the craziest stunt of all, a midnight dip in the hot springs. You simply sit in the steaming water, with the vapor freezing in your hair, then dash out and try to dry off in the near zero weather before

(Continued on Page 8)

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TIPS AND TAILS

(Continued from Page 7)

too much of the water turns to ice. I know the description leaves you cold but it is great, especially when topped off with a hot buttered rum, courtesy of Art and Gladys Lavagnino. Next time you're in the area try it.

The best lift news of the season is that Mount Baldy will go into operation this winter. Bad weather can slow, but not stop, the completion of the \$350,000 development, including two chair lifts of about 3500 feet each, a skyline tavern, and numerous trails. Holiday Hill, Snow Valley, and Table Mountain have spent a total of \$250,000 on some much needed improvements, including a second chair lift at Holiday.

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SOCCER TEAM UPSETS

(Continued from Page 7)

team, playing on a field almost 40 yards longer than its own, was up to the occasion. Coach Huttenback in order to combat the superior speed and maneuverability of the UCLA forwards, was forced to play both his fullbacks and halfbacks on the defensive, this put additional strain on the Tech forwards and left a large hole in the middle of the field, but it did serve to stiffen the defense and suck the UCLA halfbacks up sufficiently to allow the Tech forwards to break away upon occasion. The first score of the day was by UCLA's Eddie Ortero who kicked from the corner. Tech almost tied it up a minute later, but had to wait till he end of the half for Bob Wood to squeeze in the equalizer. The rest of the game was a grim struggle with both sides seeing many scoring opportunities foiled by an alert defense. The game finally turned in Tech's favor in the last minute of play when a "hands" penalty on UCLA fullback D'Halluin allowed Renee Gutierrez to ice the contest with a penalty shot, the final score being 2-1.

CAMPUS BREWINS

(Continued from Page 7)

press-fit. Classic comment came from Morgan Oglivie who thought the dance was peachy keen because it was quote so well lit unquote. And speaking of being lit up, Carel Otte was there. Johnny Goetten dropped around a little later, having overslept a wee bit (he woke up at 8:45 pm). Rolf Hastrup was seen escorting his cute young cookie factory, and Fritz Trapnell spent the evening frantically searching for someone to double with him cycles, to wit: Ed "Hot-Rod" Gehle, for loud pipes, and more speed than allowed; Al "Flat-Out" Haire, for excess speed on Sierra Madre; Al "Got-to-get-there" Haber, for going through a red light. Jim "Full-Race" Tyler, steaming up Sierra Madre in the

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Techmobile, heard a clank followed by a loud roar. Muffler fell off. Thrifty Jim picked it up, threw it in the back seat, and went about his business. Steaming back down Sierra Madre, sans muffler, Jim passed a cop who, unable to stand the sight and sound of this apparition which thus disturbed his peaceful afternoon stopped this noble fellow. After carefully noting all all the mottoes on the CIT iron, said policeman politely inquired whether hero driver had a muffler. "Sure," said Jim with a disarming grin, "here," and hands the gendarme the muffler. Somewhat shook, the cop politely requested that he not operate the apparition so fast and loud in the future.

Personal Notice: Will Dick Lyon please get hold of Peggy? She wakes the boys in Alley 4 up at all hours trying to reach him.

John Gee has a little bet with the gal from Cal over who will get the best GPA. Loser foots the bill for a night at the Cocoanut Grove. Snake harder, John!

Marvin Biensock was elected by Fleming for a trip to Denmark to take advantage of the latest advances in medical science. Marvin will be recalled in a couple of years to fulfill a new house office

Rumor has it that Madman Pitton, with two insane cohorts

from Ricketts, is driving to Chicago for Christmas vacation. Who will trade a Weasel for a Studebaker for about three weeks?

The Beak is still looking for a Darb who studied over Thanksgiving. All he's been able to find is bleary eyes and various complaints about recuperating before finals.

Bob Gillingham is complaining about a wrenched back. He says he did it dancing with his 5-ft 2-in. girl friend. We wonder about that.

Purty Jim Latourrette went astray on his trip to Palo Alto with a carload of grad students. It seems that one of the fellows had an uncle who owned a vineyard and a winepress. Their stopover was for a little longer than anticipated—need we say more?

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Elizabeth Lydon DUKE '51

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