

Blacker's monster glares at world from PCC's pool.

High School Swarm Descends Upon Tech

Caltech's undergraduate body will be more than doubled this Saturday, when 1200 Southern California high school students and teachers invade the campus during that study in unprecedented chaos — Student's Day, this year directed by Dr. Richard Sutton.

Commencing from a bleary 8:30 a.m., the vast immigration from 225 schools within a 150-mile radius of Caltech will register and have their pedigrees taken in the Student Houses.

Tourista Americana

Following registration, the students will spend the rest of the morning on tours. A vast militia of student guides will lead them on one of ten different tours, each one embracing seven exhibits — a procedure thoroughly set up to accommodate the most bizarre interests of typical high school students.

There will be, however, no synchrotron or JPL exhibit this year; all emphasis is on the debut of Caltech's pride and joy, Booth Computing Center and the new IBM 7090.

In order not to shortchange anyone on that necessity of Caltech life, Saga food, lunch will again be served in two shifts. As an instance of distorted perspective, miserable Techmen will be served lunch at 11:30 in their respective house courtyards in order to make room for the infinite line of hungry high school students pouring in at noon.

To aid in the digestion of the Saga food and the material of the morning tours, a little promotional hard-sell is planned: Dr. DuBridge addressing the students, and Dr. Feynman the faculty in the Athenaeum.

Feelthy Pecktures

For the remainder of the afternoon, from 1:45 to 4:30, the students will participate in a series of three lectures. Space exploration is once again the predominant theme of the sixteen differ-

ent lecture topics, with JPL presenting "Electrical Space Propulsion," Dr. Horowitz speaking on "Biological Exploration of Mars," and Dr. Wyld discussing "Temperature Measurements of Jupiter and Venus."

Snow, too, promises to be slung about in profuse abundance; for example, Dr. Martell's "Communications Theory — Seeking Nothing in Randomness," or in a more subtle guise, "Lattice Points" by Dr. Apostol. And if all these topics fail to enrich the susceptible high school student and convince him that Caltech is truly the school of his dreams, it is reputed that the lecture "Lettuce Points" will be given by Saga.

Rousselot Tells Birch Stands

John Rousselot, District Governor of the John Birch Society, spoke to a packed crowd at Dabney Lounge, November 27, on the aims and principles of the Society. Opening the meeting with a dramatic silent moment of prayer for the late President Kennedy, Rousselot read a statement by Robert Welch, National Director of the Society, deploring the event and linking it to the Communist menace.

Rousselot was interrupted numerous times during this statement and during his speech. The talk outlined the ideas and principles of the society, which included: waking the American people to the Communist menace, and generally instilling the principles of Americanism in this nation. He then stated that the immediate aims of the society had among them both the opposing of speakers who were actually in but not identified with various organizations, and the furnishing of speakers who were "strong Americanists."

(Continued on page 2)

Labor Leader Ralph L. Helstein Tells Union's Role In Integration

"Discrimination is both divisive and dangerous to the Labor movement and is irreconcilable with the basic tenets of unionism," said Ralph L. Helstein in his speech yesterday in Dabney Lounge. Mr. Helstein is the YMCA's first guest this year in its Leaders of America series and was very well received in his initial address.

Before a disappointingly small crowd, Helstein spoke on the role of "Labor in the Race Struggle." He began by stating that he felt that Labor has not concerned itself sufficiently with race problems.

A submerged Nation

The race problem in America today, he said, may be likened to "an underdeveloped nation within a nation," one anxious to throw off its colonial yoke and assert its independence. At the very same time, he continued, another revolutionary movement, that of automation, is eliminating vast numbers of jobs without creating, as it promised, new positions to replace the old. Civil rights desires "cannot be fulfilled unless jobs are available."

Jobs Are Needed

Helstein commented that both problems are very real — that at this very moment a child is being born in Chicago. And chances are 3 out of 4 that he is being born while his parents are

on relief, this being the third generation to be burdened by the relief problem, a system degrading both to the individual and to the community.

The labor movement in America today, Helstein continued, cannot be truly called a movement. For in the last few decades the Labor union has become institutionalized and has become as devotee of the status quo. In this step, Labor has deserted its traditional role.

UPWA A Leader

He spoke with pride, however, of the fact that the United Packinghouse Workers have from their very beginning been intimately dedicated to the elimination of discrimination. In all contracts written by the UPWA there is a clause which expressly forbids discrimination. And while other unions have had difficulty in the South, he pointed to the UPWA's success in that region.

For this stand, the UPWA has suffered losses in membership, social acceptance, and has been branded by many names, including Communist. But, he said, this policy has developed within his union an articulate Negro voice.

Challenge In The South

He related many of his experiences in the South and felt that definite progress was being made toward changing ingrown

attitudes. He agreed with Comedian Dick Gregory that "When the Negro wins his freedom it will be done in the South." For there a legal segregation exists while in the North there exists only a de facto segregation glossed over by many layers of hypocrisy.

Talks Tonight

Mr. Ralph L. Helstein, President of the United Packinghouse, Food and Allied Workers, AFL-CIO, will give his major address, "Automation — The Crisis," at 8:00 p.m. in Dabney Lounge tonight (Thursday, December 5).

Mr. Helstein is a recognized national authority on the subject of automation and its impact on the labor force and the national economy. He is regularly called upon to speak at leading academic institutions, at governmental and trade union conferences, and on national television documentaries. The UPWA has been a pioneer union in trying to meet the challenge of automation, with innovations such as Technological Adjustment Pay.

Will Discuss Folk Songs

Mr. Helstein will comment on various folk songs of the labor movement, as sung by Clabe Hangan, Friday at 3:00 p.m. in Winnett Lounge. "The Spirit of Protest" will be traced from the

(Continued on page 3)

Hit 'Em Whar They Bend

Comedians Steal Banquet

BY DON GREEN

Last Monday night Caltech's stalwart athletes celebrated the cessation of fall sports at the Institute in the Annual Fall Sports Awards Banquet. As usual, the "sumptuous repast" was held in Gwinn's "Restaurant" to the consternation of civil righters everywhere.

The awards section of the evening's program, following dinner, was emceed by Professor J. Kent Clark who by means of a devastating analysis proved beyond a shadow of a doubt that Shakespeare spent his "mysterious seven years" as an Elizabethan football coach.

Straight from the Arce

The speaker for the evening was Bill Arce, the Athletic Director and Baseball Coach of Claremont-Harvey Mudd. He related his experiences while a missionary of baseball science in the "wilds of Holland." While on sabbatical leave from CHM he served as coach of the Dutch All-Star Baseball team for fifteen months, the team that captured the European championship.

The program then proceeded to the sports awards for fall. Head Coach La Brucherie reviewed the football season, bemoaning the injury string which snapped a fine season just as it began. Captain Charles Vinsonhaler was presented with the Wheaton Football Trophy, awarded for scholarship, attitude and moral influence.

Two special football awards were announced, instituted as annual awards this year. The player voted by the team as demonstrating the Outstanding

Ability was Junior half-back and defensive end Barry Dinius. Senior Bob Christie was selected as the player who demonstrated the best Spirit and Attitude. Andy Kampe and Lee Myers received awards as the outstanding sophomores on the squad.

All-Conference

It was also announced that five Techmen had been selected to the All-SCIAC '63 Football Team. Selected to the first defensive team were guard Kampe and end Dinius. Given honorable mention were Lee Myers, line-backer, Tom DeKlyen, offensive

(Continued on page 5)

DuBridge Tells Tech Progress To Trustees

President Lee A. DuBridge told the Board of Trustees in his annual report of the Institute's contribution to space science, future campus plans, Caltech student career trends, and the financial affairs.

DuBridge noted the success of the 1958 development program which raised 19.5 million dollars to construct 18 buildings. He said however, "The plans of 1958, carefully as they were drawn, are inadequate for 1964 and future years." Therefore a new program is being begun. The first unit of this program is now complete, the Willis H. Booth Computing Center. DuBridge stated that the second unit, the electrical science and engineering laboratory has been

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Notices

NOTICE!

Contrary to allusions in a previous issue of the **Tech**, there is no, we repeat, **no** connection between the large-nosed, potbellied Fodems and Lloyd's large-nosed, potbellied president.

CHAMBER MUSIC

The Schoenfeld Trio will perform works by Hadyn, Ravel, and Dvorak in a chamber music concert, Sunday, 8:15 p.m. in Dabney Lounge.

XMAS XHIBIT

A Christmas exhibit of serigraphs by Sister Mary Carita of Immaculate Heart College will be on display in Dabney Lounge until December 28.

HELP!

The **TECH** still needs YOU, only more than ever. Consider not what the **TECH** does for you, but what you do for the **TECH**. If the answer is zilch, come down to the office Monday evening and we will help you remedy this sorrowful situation.

SEXY CRYSTALS

For all those who were snowed into curiosity by last week's feature story, this week's Friday Evening Demonstration Lecture topic is "How Atoms Arrange Themselves In Beautiful Patterns in Complex Metal Crystals," given by Dr. Sten O. Samson. See it this week only, tomorrow night at 7:30 p.m. in 201 Bridge.

TAYLOR MOVES

The Residence & Dining Halls Office has moved from Lloyd to the small building on San Pasqual St. behind building T-4. Students are encouraged to bring all complaints to this new location with undiminished gusto. You will be welcomed as into your own home.

Editorials

Welcome!

This Saturday is Student's Day and it is traditional for the editors of the **Tech** to write a short editorial welcoming the visiting high school students and reminding them that they are at a school that is in the frontiers of research in almost all scientific fields.

This is indeed true. As an incidental fact, Caltech and MIT receive so much government R & D contract money (second to the University of California) that they have been criticized in Congress. But then Congress has often been criticized at Tech.

Today, the visiting high school students will see some of what the government's money has been spent on.

Today, however, is not the end for all of the visiting students. A good many are probably thinking of Caltech for their College education. For those students it would be best to get more than just "a little glimpse of what a center of education and research looks like."

Despite the flashing exterior of exhibits and the emphasis on research, Caltech is still primarily an educational institution. It is hard to get a clear idea of the learning and courses here from the lectures presented, but they will give you some idea.

But perhaps the most important thing to learn about is student life. It is quite easy to get a good idea of what it is like to live at Caltech. The most important part of this is learning about the Student House, that peculiarly Caltech institution that is far more than a dormitory but not quite a fraternity. The Houses play a major part in the lives of Techmen, and are pretty interesting places to visit. Take a few minutes, then grab a Techman and have him show you around.

While you're at it you can ask him about the opportunities for learning and recreation outside of science. The range of extra-curriculars, sports, and special activities are extraordinarily large. It would be best to try and grab a junior or senior, and if you can't get anyone, try your guide.

Welcome, and enjoy your day.

—J. C. Simpson
Don Green

Asia - Pacific Scholarships Are Offered

The East-West Center Scholarships for Asian and Pacific area and language studies at the University of Hawaii are being offered to American students. These scholarships are each valued at about \$8,500 and include round-trip travel costs and a small personal allowance.

American students receiving grants will join students from 27 Asian and Pacific countries at the University of Hawaii for studies of Asia or the Pacific Islands, as well as for various social and cultural activities. However, the most unique part of the Center grant will be a three to six month field study in some Asian or Pacific area.

Anyone interested should write the Director of Selection, Institute for Student Interchange, East-West Center, c/o University of Hawaii, Honolulu, as soon as possible. The deadline for applications is January 1, 1964.

Chem E's not only analyze the scum of the earth, but are the scum of the earth.



As an extra special, super dooper treat this week we have a genuine book review, of a folk song book, that is. The title is "Young Folk" in large white gothic letters and "song book" in little black ones; it has an attractive, mostly yellow and orange cover, and sells for \$2.95; it's published by Simon and Shuster, as can be easily ascertained by looking at the first page; it's blank except for the little man who's striding along scratching his stomach.

Hyper Ethnicism

This book's reason for being is to bring the songs (a few selected ones at least) of some hyper-ethnic folk singers — Joan Baez, Bob Dylan, Jack Elliot, the Greenbriar Boys, the New Lost City Ramblers, and Peggy Seeger — to the struggling public.

Having seen several of these performers I wondered just how they would go about it, and I was pleased to see that some real honest effort had gone into the preparation. Usually song books like this, such as the many, many put out on the Kingston Trio, ignore the fact that most amateur folk song singers accompany themselves on a guitar and show only piano accompaniment, with chords occasionally written in. However, the writers of "Young Folk Song Book," while not going as far as I'd like to see, have tried to give a good idea of how the pros use their instruments.

De Capo

For one thing they admit the existence of the capo, and when a song calls for its use, the actual chords that are being played, along with the way it would be played with the capo in the designated position, are both written. Sample directions would be: 1) Capo on 3rd fret, 2) actual chord C, 3) played as an A. All these are given in

Physics Defended Again

Editors:

I would like to comment on Professor Leighton's letter of last week. I have no way of directly evaluating Professor Leighton's statements about Feynman Physics since I was not involved in the course. However, in his last two paragraphs Professor Leighton has lucidly stated the single most important failure in the academic sector of Caltech life: "... understanding is needed on both sides. A teacher has a morale problem too. He needs interest and encouragement from his students to do his best."

A large majority of Caltech classes are characterized by monologue. This monologue is symptomatic of the fact that most students are not personally involved in the excitement of learning. The responsibility for this classroom monologue can be placed largely upon the students. I can remember a freshman English class when Professor Langston said he was tired of talking and would not say another word until someone else made a comment about whatever we were studying. We must have waited five minutes in silence.

Too often the Caltech student waits for the course or the teacher to arouse his interest, and makes no attempt to do this himself. How can we expect

learning to be an exciting experiment if we make no attempt to be actively involved? How do we expect to find any value at Caltech if we approach our main activities passively? To most Caltech students the academic segment of Caltech is not exciting. But the remedy lies in student self-motivation and student involvement. At Caltech the weakest link in the bond between teacher and student is the Caltech undergraduate's complacency and lack of initiative to make his academic life at Caltech exciting.

Tom Latham

'63 Asilomar Will Be Held Next Month

BY VIC SIRELSON

What is Asilomar? Asilomar is a geographic corner of the sand and cypress area of the Monterey Peninsula. Asilomar is also the name of a YMCA-YWCA Conference (described in outline in last week's **Tech**), to be held from December 27 to January 1. As a conference, Asilomar stands for diversity — to raise the questions of meaning in the midst of academic life; to discuss the "meanings" found in modern pluralistic society; to cause education to be a personal growth of minds; to create a sense of world responsibility; to explore the nature of the various complexities that make up the "self"; and to delve into the moral responsibilities and concerns of students in present times.

Asilomar offers these things in seminars, fireside chats, recreation on the beach, and in guided meditation and reflection in the response periods. There is this and more.

Contact the Caltech YMCA, ext. 555, for details and information on registration procedures and financial assistance.

More Rousselot

(Continued from page 1)

A question period followed in which Rousselot was asked to defend many of the positions that he had taken during the speech. The audience made many unprompted statements and hissings noises during this period. Rousselot stated in the end that the issues that were brought up were areas in which honest controversy could be tolerated, and that was the only way the differences would be settled.



By Steve Schwarz

Who's Afraid of Virginia Woolf?

Ever since I saw **The Zoo Story** a couple of years ago I have been of the opinion that Edward Albee is the most promising playwright now writing in English. Many people have thought the same, and **Who's Afraid of Virginia Woolf** has been eagerly acclaimed in New York, both by the critics and at box office. Now that the road company is at the Biltmore Theater we have a chance to see for ourselves how Mr. Albee has developed. Perhaps it is just a case of having been led to expect too much, but I came away thinking that Albee might be just of our age after all, and not for all time.

The Plot

Who's Afraid is, in form at least, an old-fashioned "straight" drama. Four screwed-up people — a middle-aged history professor, his wife (daughter of the college president), a young biology professor, and his mousy wife — get together in a room, drink a lot, and bare their souls. They have lots of problems, and Albee sort of brings them out, one after another, sometimes hinting, sometimes with what the ad-writers might call "daring frankness." This is the kind of play where you're expected to come out arguing about whether Nick is impotent or Honey has birth fears or George has an Oedipus complex. It might be described as the same kind of personality freak show that started to line Tennessee Williams' pockets about the time he discovered money. Apparently the world at large isn't tired of it yet, but I am.

Is it the gossip instinct that makes people want to learn the seamy malformations of private

lives? Or the urge to feel better off than someone? Or simple prurience? The subject of man's weaknesses is certainly a legitimate subject, especially when they're taken one at a time; **Death of a Salesman** is an excellent play. What is the difference? Miller's hero is a man with very familiar, very simple, human weakness; the character has universality. Albee's play is a catalog of loathsome clinical abnormalities. In Miller's play Willy Loman's weakness is made the cause of a touching personal tragedy; in Albee's the entire time is taken up by simply letting us know what the troubles are. **Who's Afraid** is as moving as a textbook. So much for the plot.

Wittiness

What then is good about **Who's Afraid**? It's witty. Anyone who has seen Albee's one-acters will agree that as writer of monologues Albee has no equal. Who can forget the speech about the dog in **The Zoo Story**? **Who's Afraid** bristles with clever lines, and some of them are funny. There are a few little monologues that are up to Albee's standard. I doubt that they are the reason for the play's success, but for them praise is due. Unfortunately Albee hasn't yet learned how to string his monologues together into a whole long three acts. **Who's Afraid** is dreadfully static. The characters sit or stand together in the room and talk; action is confined to walking out of the room and coming back in. Albee's attempts to relieve the stasis are clumsy. On one occasion a character smashes a bottle to provide an exclamation point for his line—

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NMSC Selects DuBridge As New Director

President Lee A. DuBridge was elected to the Board of Directors of the National Merit Scholarship Corporation. His election was announced November 20 by Hermon Dunlap Smith, chairman of the board of the corporation.

The National Merit Scholarship Corporation is a nonprofit corporation established in 1955 through grants from the Ford Foundation and the Carnegie Corporation of New York. It conducts the nation's largest independently supported scholarship program.

President DuBridge has been President of Caltech since 1946; before that he served at the University of Rochester. Dr. DuBridge's appointment was named with several others to fill vacancies that resulted from expired terms.

About 1,500 Merit Scholarships are awarded annually in a nationwide competition conducted through the high schools. The awards are financed by the Ford Foundation and 175 sponsoring business corporations, foundations, colleges, unions, professional associations, trusts, and individuals. Caltech students hold the highest proportion of Merit Scholarships of any school in the United States. Approximately 10% of the student body have been awarded these scholarships.

Norstad Describes NATO Task, Goals

In an enlightening lecture and question period Tuesday evening, General Lauris Norstad delved into the aims of the North Atlantic Treaty Organization, inserting his own disarmament proposal. General Norstad, former Supreme Allied Commander of NATO and current president of Owens-Corning Fiberglas Corporation, listed these aims: 1) to live at peace with all peoples and governments, 2) to promote stability in the North Atlantic Area, and 3) to unite for the preservation of world peace. In Norstad's opinion the responsibility for the common defense must be a collective one. The success of the organization is evidenced by the fact that no world war has erupted since its conception shortly after the second world war.

Norstad proposed that a solution to the arms problem must have the following criteria. It must be recognized by worldwide public opinion (acceptability by the U.S.S.R. being only one factor), should not cause any nation feel it is making a sacrifice, and finally, should provide a basis for further understanding in the disarmament field. The two components were a mobile ground inspection and an aerial inspection — both to record and report each nation's progress in weapons development, making

no actual reduction of forces or limitation of weapons. Norstad predicted that, if NATO continues to grow, his proposal could become a reality.

DuBridge

(Continued from page 1)

Three more buildings which are not financed yet but are being planned are a chemical physics building, a humanities building, and a high-energy physics and space science laboratory. DuBridge said, "A major effort to secure the funds for these new buildings . . . is now underway."

DuBridge stated that Tech's net assets increased by 14 million dollars to a total of 124 million dollars. Campus operations expenses were \$17,889,000 with an income of \$17,905,000. That is a profit of \$16,000. The largest government research grant was from the Atomic Energy Commission for \$2,019,000. Others include U. S. Public Health Service, Office of Naval Research, and the National Science Foundation. Gifts from private sources amounted to \$3,274,000. Among the contributors were the Ford Foundation, Industrial Associates, IBM, American Cancer Society, RCA, Alfred P. Sloan Foundation, and the California Associates.

DuBridge reviewed to the Trustees the scientific achievements of Caltech. He spoke of the usefulness of the 200 inch Palomar telescope and of the advancement made by Robert A. Millikan and Professor William Fowler. DuBridge noted the success of JPL's Mariner II Venus probe. He speculated on the existence of life on Mars.

More Audience

(Continued from page 2)

an ancient trick that has "this is supposed to be a thrilling moment" written all over it.

It's Not Shakespeare

Perhaps the most damning criticism is that because I'd read the punch line in a review, the whole big buildup and climax fell flat. Now jokes are supposed to have punch lines; but a good play doesn't rely on one startling revelation for its effect. Does one enjoy Othello any less, knowing that Desde-

mona and Othello die at the end?

Well, Albee hasn't been writing long, and the tricks of putting together a coherent play he'll probably learn. So far his wit is not profound, but he'll never lack for entertainment value. What worries me, as I said, is his choice of subject matter. If he turns his talents to serious theater subjects and tries to think, he might conceivably approach Bernard Shaw. But at the rate he's going he's headed for wealthy oblivion.



DECK THE HALLS

The time has come to think of Christmas shopping, for the Yuletide will be upon us quicker than you can say Jack Robinson. (Have you ever wondered, incidentally, about the origin of this interesting phrase "Quicker than you can say Jack Robinson"? Well sir, the original saying was French—"Plus vite que de dire Jacques Robespierre." Jack Robinson is, as everyone knows, an Anglicization of Jacques Robespierre who was, as everyone knows, the famous figure from the French Revolution who, as everyone knows, got murdered in his bath by Danton, Murat, Caligula, and Al Capone.

(The reason people started saying "Quicker than you can say Jacques Robespierre"—or Jack Robinson, as he is called in English-speaking countries like England, the U.S., and Cleveland—is quite an interesting little story. It seems that Robespierre's wife, Georges Sand, got word of the plot to murder her husband in his bath. All she had to do to save his life was call his name and warn him. But, alas, quicker than she could say Jacques Robespierre, she received a telegram from her old friend Frederic Chopin who was down in Majorca setting lyrics



to his immortal "Warsaw Concerto." Chopin said he needed Georges Sand's help desperately because he could not find a rhyme for "Warsaw." Naturally, Georges could not refuse such an urgent request.

(Well sir, off to Majorca went Georges, but before she left, she told her little daughter Walter that some bad men were coming to murder Daddy in his bath. She instructed Walter to shout Robespierre's name the moment the bad men arrived. But Walter, alas, had been sea-bathing that morning on the Riviera, and she had come home with a big bag of salt water taffy, and when the bad men arrived to murder Robespierre, Walter, alas, was chewing a wad of taffy and could not get her mouth unstuck in time to shout a warning. Robespierre, alas, was murdered quicker than you could say Jacques Robespierre—or Jack Robinson, as he is called in English-speaking countries.

(There is, I am pleased to report, one small note of cheer in this grisly tale. When Georges Sand got to Majorca, she did succeed in helping Chopin find a rhyme for "Warsaw" as everyone knows who has heard those haunting lyrics:

*In the fair town of Warsaw,
Which Napoleon's horse saw,
Singing cockles and mussels, alive alive o!)*

But I digress.

We were speaking of Christmas gifts. What we all try to find at Christmas is, of course, unusual and distinctive gifts for our friends. May I suggest then a carton of Marlboro Cigarettes?

What? You are astonished? You had not thought of Marlboros as unusual? You had regarded them as familiar, reliable smokes whose excellence varied not one jot nor tittle from year to year?

True. All true. But all the same, Marlboros are unusual because every time you try one, it's like the first time. The flavor never palls, the filter never gets hackneyed, the soft pack is ever a new delight, and so is the Flip Top box. Each Marlboro is a fresh and pristine pleasure, and if you want all your friends to clap their hands and cry, "Yes, Virginia, there is a Santa Claus!" you will see that their stockings are filled with Marlboros on Christmas morn.

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* * *

The holiday season or any other season is the season to be jolly—if Marlboro is your brand. You'll find Marlboros wherever cigarettes are sold in all fifty states of the Union. You get a lot to like in Marlboro Country.

From Other Campuses

By Jace

Not wishing to break with tradition, this column will begin again this week with Rensselaer. Dependable as ever RPI lost its last football game of the season, 44-3, to a Rochester Institute of Technology team featuring sophomore fullback, Ted Fink. Oh, well, at least they can kick field goals.

Rensselaer has also instituted a unique idea in the frosh physics lecture. Each student is given a switch to indicate whether the instructor is going too fast or too slow, and the switch operates lights on a panel in front of the instructor. That might not be a bad idea for Tech's new physics courses, providing some provision is made for the glare originating from an extra bank of lights.

Dial 9 for Oxy

MIT too, is showing originality, in tampering with the phone system. Some students have gone so far as to actually make long distance calls on lines belonging to a local radar installation and some other camp fires. This is truly a shocker, but MIT Tech readers were assured that justice is being done as "two or three students are expelled each year for abuses of the phone system."

Turning from phones to bears, a logical connection, we will consider the charges brought against Smokey the bear by The Guardsman at the City College of San Francisco. "Ever since the Animal Decency League gave him a pair of jeans and an old Mountie hat, he's been romping around the hills shaking his shovel at anyone trying to keep him off.

The Truth

"But let's examine motives. Could Smokey be covering up something besides burnt-out campfires? In his fanatical efforts to stop happy campers from blazing up the forest, could Smokey be hiding his own hidden desires and transgressions?

Might it be possible that his docile bruin in long pants actually is a pyromaniac? Perhaps those pockets in his jeans are hiding the big fellow's Ronson.

"After all, someone has to keep Smokey in a job. And who sparks all those fires that are attributed to lightning? In closing, let us say that there is still hope we may be delivered from this forestry dictator. Remember, forest fires do wipe out bears!"

While we're in San Francisco USF Gets Gas

we should drop in on Santa Clara for that paper's comments on the proposed change of USF's team names to the "Gray Fog."

"With the possible exception of Galloping Gaels, there is only for an athletic team worse than the Dons. Now the boys and girls . . . want to call themselves the Gray Fog . . . we wouldn't be surprised if the next name they pick is the Cozy Slime, the Smelly Garbage, or the Cheap Perfume.

"The USF boys claim that this name's indicative of their fair city. If this is true, why don't they call themselves The Slums?"

In reply to the assertion that a gray fog is "unstoppable, unconquerable," the columnist professes the fact that "gray fog is nothing but hot air that has been cooled off."

The columnist doesn't restrict

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Helstein

(Continued from page 1)

labor movement of the 1930's (which Mr. Helstein experienced as an officer of the National Recovery Administration and as a labor lawyer) to the civil rights movement of today in which it is so prominent.

Mr. Hangan is the Folk Music Director for the National Conference of Christians and Jews, and a staff member of the L. A. County Human Relations Commission. The featured performer at many coffee houses, a guest performer at the Troubadour, this "ethnic folk artist with a penetrating individual style" derives his greatest pleasure from performing for youth groups.

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Sophomores lose tug-of-war in Mudeo.

Wind Tunnel Enjoys Long History

An electric motor built for a World War I submarine has helped solve major aerodynamic problems for all varieties of aircraft, including those that take off vertically, as well as for automobiles, trucks, buses, radar antennae, and even a shingle roof.

Hoo Boy! 750 HP

The 750-horsepower motor provides energy to generate winds up to 200 miles an hour for Caltech's venerable 10-foot wind tunnel in which, nowadays, are being tested models of a wide variety of vehicles in addition to those of airplanes, for which it originally was built 34 years ago at a cost of \$250,000.

The tunnel has resolved configuration problems for more than 600 types of aircraft for more than 40 American and foreign companies, and for six governmental agencies. Such key U.S. World War II aircraft as the P-36, P-38, P-40, and P-51 pursuit planes, the B-17, B-19, B-24, B-25, and B-29 bombers and the PBV reconnaissance amphibious planes all were aerodynamically groomed in the tunnel.

Oh, Really? The tunnel was designed in the mid-1920's by Clark B. Millikan and A. L. Klein, then graduate student and research fellow, respectively, in accordance with basic concepts furnished by the late Dr. Theodore von Karman, the "father of aerodynamics." It was named the GALCIT tunnel, GALCIT being an acronym for Guggenheim Aeronautical Laboratory California Institute of Technology.

Tau Beta Pi Lures Fifteen To Their Doom

Twelve Seniors and three Juniors became members of the Caltech chapter of Tau Beta Pi at the chapter's fall initiation which was held November 24th in Culbertson Hall. The initiation was followed by a banquet for members and their dates at the Westward Ho Steak House. The fall initiation brings the membership of the California Beta Chapter here at Tech up to twenty-three.

The new members are: Seniors Bob L. S. Ching, David L. Colton, Steven M. Barber, Ray E. L. Green, Thomas W. Latham, Tom Lubensky, Terry S. Mast, Richard P. McGehee, William S. Meisel, Guthrie Miller, Howard K. Ono, George N. Reeke; and Juniors — Ivars Ambats, Richard C. Essenberg, and Edwin P. Swatek.

That's Not Gneiss

Geology Division Research Studies Always Expanding

BY STUART GALLEY

Contrary to popular belief, the endless basements and sub-basements and tunnels and labs that honeycomb the buildings here on campus are not just mock-ups used for snowing eager high-school students and frosh. Countless projects are always in progress in basic and applied research that we (who tread so close to them) know so little about. Not to be among the dross of other disciplines, the Division of Geological Sciences also carries its research into the field, about as close to Mother Nature as possible.

Dr. Robert P. Sharp, Chairman of the Division, recently granted

an interview with this writer, during which he described some of the research endeavors currently being carried out by members of the Division.

A New Science

One of the newest fields of study on campus is planetary science. Roughly, planetary science does for other bodies around us what straight geology does for the earth, but Dr. Sharp admits that the field is "kind of impinging on planetary astronomy." Despite the failure of two Ranger spacecraft (that carried seismographs from Tech) to land on the near side of the moon, the effort to effect such a landing is still under way. A seismograph would give about the biggest yield of important information of any instrument that could be landed; moonquakes and meteoritic impacts would give clues to the interior of the moon by the shock waves they produce that are picked up by the seismograph. Whether or not the moon has sources of heat

(Continued on page 8)

Debaters Score In WSA Meet

BY A. SZMUCK
Pronounced Schmuck

Sophomore Dave Close received third place in men's extemporaneous speaking at the Western Speech Association Tournament at Humboldt State College over the Thanksgiving weekend. Another Caltech sophomore, Sean Solomon, entered the final rounds of competition in extemp and was awarded a Certificate of Excellence.

This tournament is the 1963 Championship of the W. S. A. which is the largest forensic organization west of the Rocky Mountains. Sixty-four speakers from fifty-six schools took part in men's extemp. States represented were California, Oregon, Washington, Utah, Montana, Idaho, Arizona, Nevada, and North Dakota.

Caltech's junior debate team of Roger Davisson and Gary Scott and the sophomore team of Solomon and Close each compiled a record of four wins against three losses in debate.

This weekend the freshman team of Dan Metlay and Mike Robel will represent Tech in debate at the Western States Alternate Tournament at L. A.

The tunnel takes up a good part of the five floors of Guggenheim. Like other wind tunnels, this one moves air at various velocities past the scale model of an object to test its aerodynamic properties. This simulates the motion of vehicles through still air or the flow of wind past stationary objects.

Yes, Really!

The tunnel is shaped somewhat like an enormous tire inner tube that is slightly flattened at top and bottom. It occupies a space that is 46 feet high, 25 feet wide and 100 feet long.

The inside tunnel diameter ranges up to 20 feet. The section in which the models are tested is ten feet long and ten feet in diameter.

A three-bladed propeller 15 feet in diameter generates the stream of air, which is directed around the corners of the continuous tunnel by sets of turning vanes that minimize turbulence through the test section. Two banks of vanes contain circulating water to cool the air.

Ho-Hum

Although it is ten by ten feet, the test section is too small to

(Continued on page 8)

ELECTRONICS RESEARCH

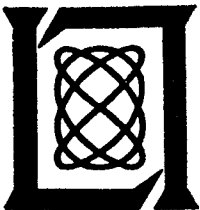
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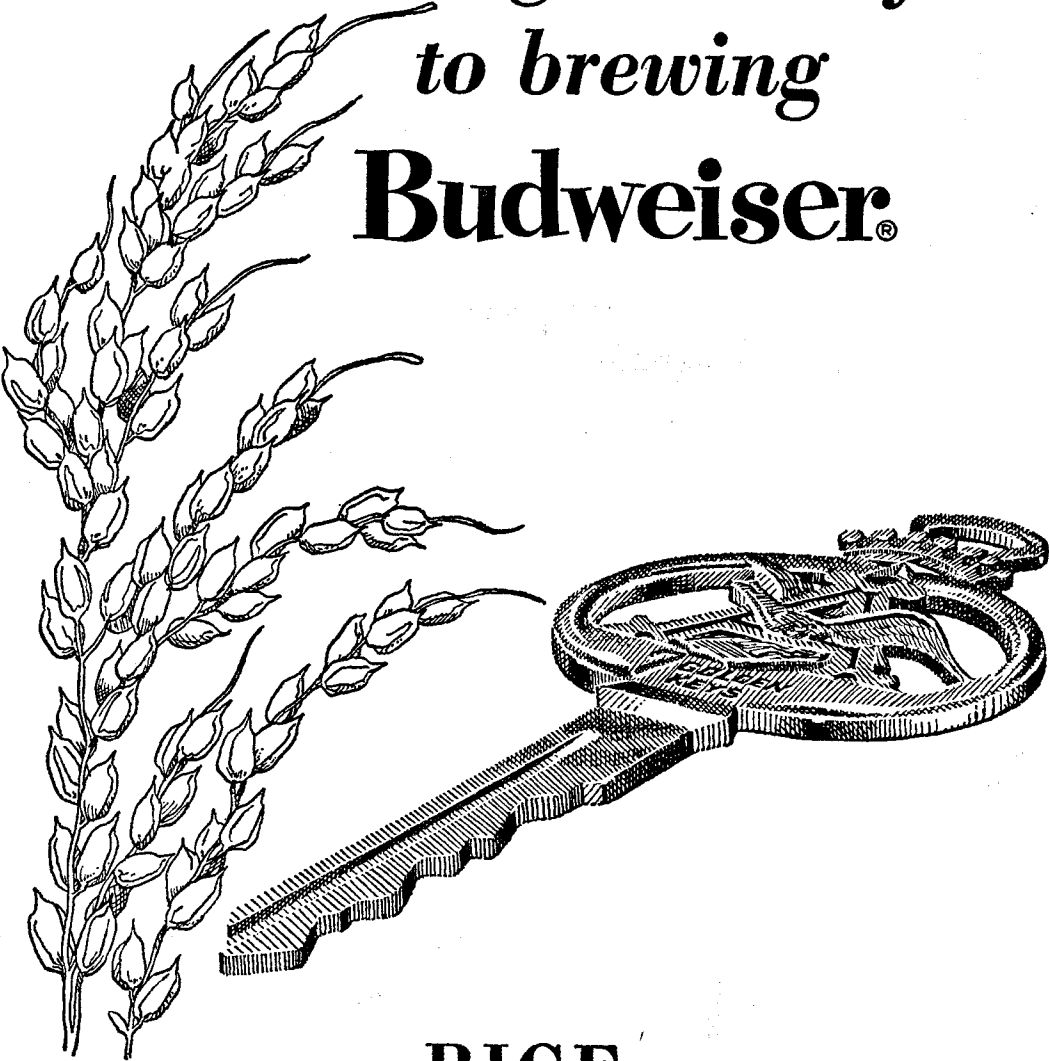
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Toward A Better America

Are These Men Or Gods? Junior Class Officers Lauded

BY THE EDITORS

—I'm the queerest young fellow that ever you heard.
My mother's a jew, my father's a bird.
With Joseph the joiner I cannot agree,
So here's to discipline and Cavalry.

—James Joyce, Ulysses

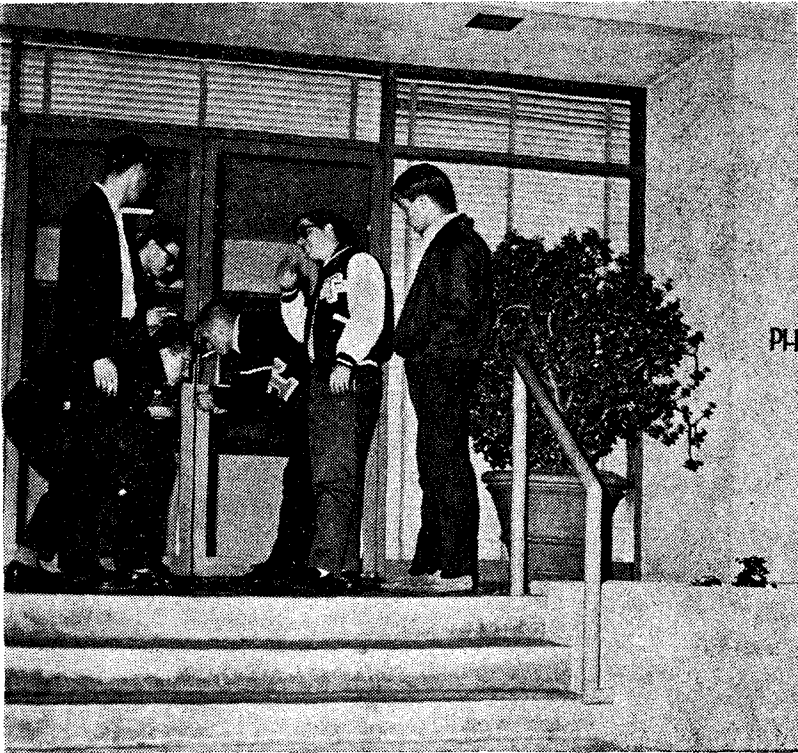
Such may be posterity's judgment of the Junior class officers of '65, but nevertheless their deeds have been indelibly carved in the quagmire of Time. However, we come not to bury these stalwart men, but rather to praise them. For praise them we must.

In that putrid rotting bog of Caltech, these men alone stand above the wallowing mire to provide the impetus to those affairs that make Caltech what it is. These men stand far above their fellows, and their diligent works are felt far beyond the confines of the noble Junior Class. Their efforts stretch far into the multitudinous fields of student body activities, athletics, Church, Mother and Home. And it must be admitted that all these would fail without their ardent, nay unceasing, support.

Their accomplishments stand too numerous to list and so we proceed on to examine in more detail each of these marvelous men.

This fine group is led by one Guy Jackson, a true gentleman of the South, noble in bearing and distinct in character. Starting at the bottom as freshman class vice-president, in two short years he has risen to the heights of the Junior Class Presidency. Said Guy, "My aim has been to provide an honest and democratic administration for the Junior class, and, of course, to serve Caltech."

John Beamer, wearied by his intense efforts for two years as president of the Class of '65, retired this year to the office of



Junior Class Officers and stalwart newspaper editors investigate prospective office space from which to direct their world-encompassing activities. Notice that they are undaunted by any obstacles (such as locked doors, armed guards, etc.) in their efforts to better serve the Junior Class.

Executive Vice-President where he has served as a Brain Trust to the many varied activities of the Junior Class. John, a pillar of society and Chem E, is almost solely responsible for the unsurpassed social prowess of his class.

Waving the pen of power, Secretary Neal Wright has undertaken the vast task of recording for posterity the great epic of the Junior Class and its far-sighted leaders. It is rumored that Neal is the real power behind the throne — instrumental in all far-reaching decisions of that august body — and he alone guards the written record of those closed-door sessions which shape the destiny of the Junior Class, the school, and ultimately the world.

Gary Scott, while nominally

only the Treasurer of the Junior Class, in fact exerts considerable power behind the many heretofore undisclosed financial enterprises of the Junior Class. A financial wizard in his own right, weaned on the Wall Street Journal, he has taken upon himself, at great personal financial sacrifice, to direct the intricate financial destiny of his class with an unfailing acumen.

While athletic manager of the Class of '65, Bob Scott has been personally responsible for the complete domination by the Junior Class in all phases of Interhouse, Intercollegiate and International Sports.

Editor's Note: The preceding has been a paid political announcement. Information as to rates for similar eulogies may be gained from either of the Editors.

Blech, Blech, Blech

(Continued from page 1)

tackle, and Christie, offensive backfield.

Then the program turned to the more serious awards. Mike "The Butcher" Rosbach received the much coveted Trainer's Award for being the most durable football player on the squad. Mike earned his just reward by surviving over 200 grueling minutes of varsity football without so much as a bandaid. His teammates still remember his courageous voice as he clenched his bloody hand — "Keep that %&#\$ with his '&'#\$% tape away from me."

Enema of the Week

Doc Alley presented the kibitzer-of-the-Year Award to Coach La Brucherie — a "Handy Dan Docter Kit" carefully wrapped in old Jim Murray columns. Lee Myers received the new Hypochondriac Award for obvious reasons.

Coach Mack reviewed the

Cross-Country season with his four-fifths varsity squad and made special mention of the fine frosh season which promises a good future for the varsity.

Coach Web Emery then introduced his water polo squad which earned a fine second place finish in the conference. Mike McCammon who led the fine Caltech defense all year received the Coach's Trophy — a large beautiful silver "plate."

The Soccer Coach, Lee Andrews, rose and proceeded to plead for an appearance in the Spring Awards Banquet since the soccer season has not ended yet.

Parting Shot

The remark of the evening was one by Vinsonhaler, who quipped: "I never realized how sensitive this team was about our passing attack until I heard the players in Liebermann's vicinity saying 'Please hand off the butter.'"

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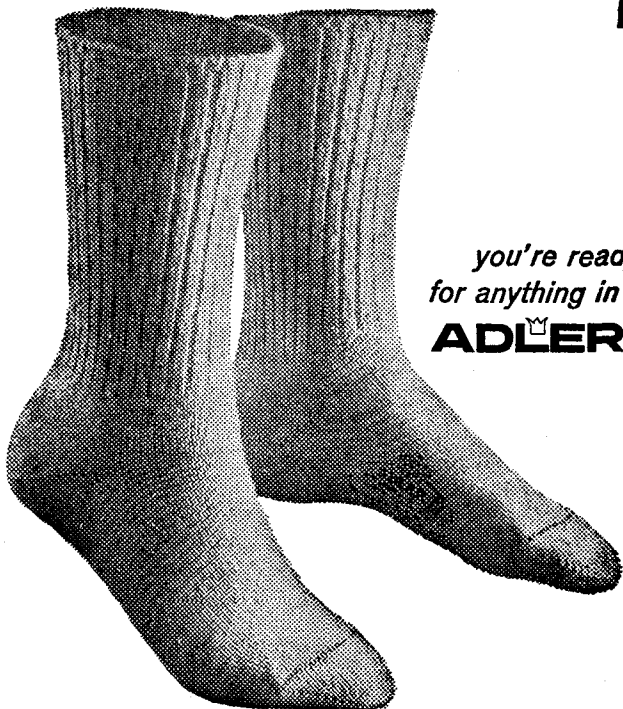
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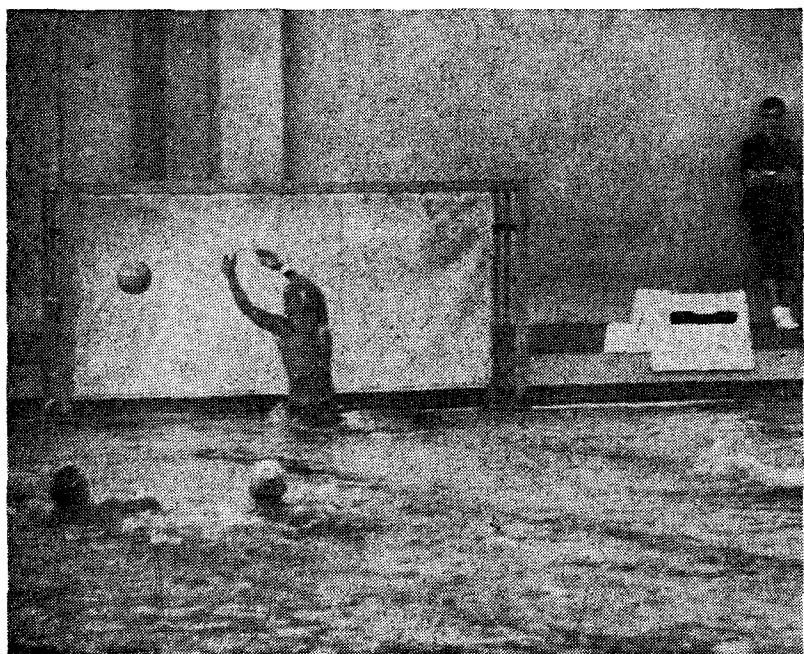
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SPORTS



—photo by John Williams

Oxy goalie tries in vain to stop Tech's first score in the championship-deciding game. Oxy took the SCIAC championship by downing Tech 3-2 in an exciting game.

Oxy Beat Webmen; Capture Title, 3 - 2

BY DAVE SEIB

In the final game of the season on Nov. 27, Caltech's varsity water polo team bowed to Occidental College 3-2. The Oxy victory gave them undisputed possession of first place in the Conference with an 8-0 won-lost record while Caltech finished second with a 6-2 record.

A fairly large group of spectators saw a tight defensive game unfold in Alumni pool. Oxy scored all its goals in the first half, leading 3-0 at half time. Tech came back to pretty much dominate the second half of the game but could crack the

Oxy defense for only two goals. The complexion of the game was almost changed when John Walter was awarded a penalty throw late in the game. Walter made the goal but it was ruled invalid by the referee. Walter scored one goal and Tom Crocker the other.

The team concluded the season with an 8-10 record overall. Most of the scoring was done by four individuals, Tom Crocker got 37 goals, John Walter 26, Dave Seib 19, and Rich Nielsen 14. Mike McCammon and Hugh Maynard led a defense that was perhaps the strongest aspect of the team.

Three of this year's starters plus goalie Mike Baskes, who improved greatly as the season progressed, will return next year to provide a foundation for a successful season.

The frosh team concluded a winless season with a 16-0 loss to Occidental. The team showed great improvement as the season progressed and many of the frosh will prove very valuable to the varsity effort in the coming years.

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Frosh Casaba Men Dump On Rio Hondo

The frosh basketball team got off to a good start Tuesday night as they dumped Rio-Hondo on the short end of an 80-72 contest. At the start R-H opened a 4-0 lead, but Gray Jennings and Ed Hsi got the team rolling and after eight minutes of steady shooting Tech went ahead for good. The Beavers quickly shot ahead with a 33-24 edge, which R-H pared down to 1 point at the half, with the score at 42-41.

In the second half Tech started hitting steadily, and for most of the time held a 10 point edge. Steady scoring by Hsi and Herb Jubin, coupled with a strong rebounding performance by Gray Jennings kept the visitors at a safe distance. Then with 4 minutes to go, and nursing a 16 point lead, the defense slacked and R-H made a big push and got within 8 points as the buzzer sounded.

Ed Hsi lead all scorers with 31 points. Herb Jubin made 17 and Gray Jennings had 10.

The undefeated frosh will continue their winning ways Friday night at UC Riverside. The first league game will be on Friday, January 10, against CHM at CHM.

Tech Gridgers Lose To CHM, 39 - 0

J. K. EVANS

Claremont-Mudd's Stags, led by All-Coast halfback Bob Ellis, trampled the Caltech Beavers 39-0 Tuesday afternoon at Tournament Park. The Beavers were pretty much of a mess after the game, which produced more business for the Health Center than any three others. The Beavers weren't docile by any means, but the already-lengthy injury list and the usual size discrepancy added up to a solid wallowing.

Tech defense had its brilliant moments, as a CHM drive was halted on the CIT 12, but the overall effect was not exactly devastating as CHM rushed for 264 yds. to CIT's 161. Pass offense left a lot to be desired — CHM passed for 212 yds, completing 7 of 13, while CIT completed 2 of 9 for —4 yds and had three intercepted, one going for 25 yards and a TD.

The CIT offense could not get rolling and could not sustain a drive. Much of Tech's yardage came on a 55-yard breakaway by Dinius, who led CIT rushers, with 65 yds. in 6 carries. Nobody else could get any running room.

Injuries Costly

This closes out Caltech's football season. The Beavers sport a won-lost record of 2-6. Both wins came at the beginning of the season, when prospects looked good; then the injury bugaboo struck. A list of out-for-the-season and missed-game injuries includes 8 knee injuries, a broken leg, a broken finger, a case of mononucleosis, a calcium deposit, and two temporary-amnesia cases. Add such annoyances as 4 shoulder-separations, a dislocated finger, water

on the elbow, and two strained backs, and it is a wonder anybody survived. But survive they did — three players, Rosbash, Dahlen and Hewitt, went through the entire season without using so much as a bandaid to repair themselves.

Some interesting season statistics: The beavers outgained their opponents on the ground, 1410 yds. to 1215; but in the air, it was Beavers 63, opponents 1014. The Beavers completed 12 of 50 passes, but had another 13 intercepted. Opponents were penalized twice as much, losing 415 yds. while CIT lost only 191. And the Beavers were outscored only by a factor of two, 189 to 86, instead of a factor of five or six as in the past seasons. That's an average score of 23-11, whereas last year the average score was 30-7.

Individual Leaders

On the individual side, Evans led the team in rushing with 323 yds in 56 carries for a 5.4 average. Liebermann led in total offense, with 343 yds in 140 plays for a 2.5 yd-per-play average, scoring with 36 points, and passing with 11 for 42, for 62 yards and 9 interceptions. Scott led receivers with one catch for 27 yards. Hall averaged 30.7 yds on punts and Hanson averaged 41.9 on kickoffs.

Notable: Thomsen led rushers

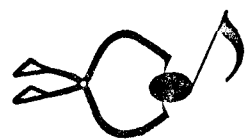
with a 7.8 yd-per-carry average on four end-arounds. Hall had the worst rushing average, a —15.0 (he was smothered twice on punt attempts after bad centers). Thomsen caught 6 passes for —4 yards. Sherman threw one pass (the last play of the season) and it was intercepted.

It was not a bad season, as Caltech seasons go, but it was not what could be called a good one. It was certainly an improvement on last year and several years before that. It started out to be a good year, but the team was cut down in the prime of life by illness and infirmity. C'est la vie. We'll get 'em next year.

Play by Play

CIT received and punted. CHM drove to CIT's 12 where the Techmen made a goalline stand and took over, driving with Dinius' 55-yd gallop to CHM's 17 where Evans fumbled and CHM recovered. A pass went for 40, a pass interference penalty put the ball on CIT's 2, and CHM's QB drove in. The kick was good; 7-0. CIT received and punted. CHM drove to CIT's 31 and fumbled, DeKlyen recovering. CIT punted to CHM's 33. The QB picked up 27, then they drove to the 1 where the QB rolled in. The kick was no good; 13-0. Liebmans' first down pass

(Continued on Page 7)

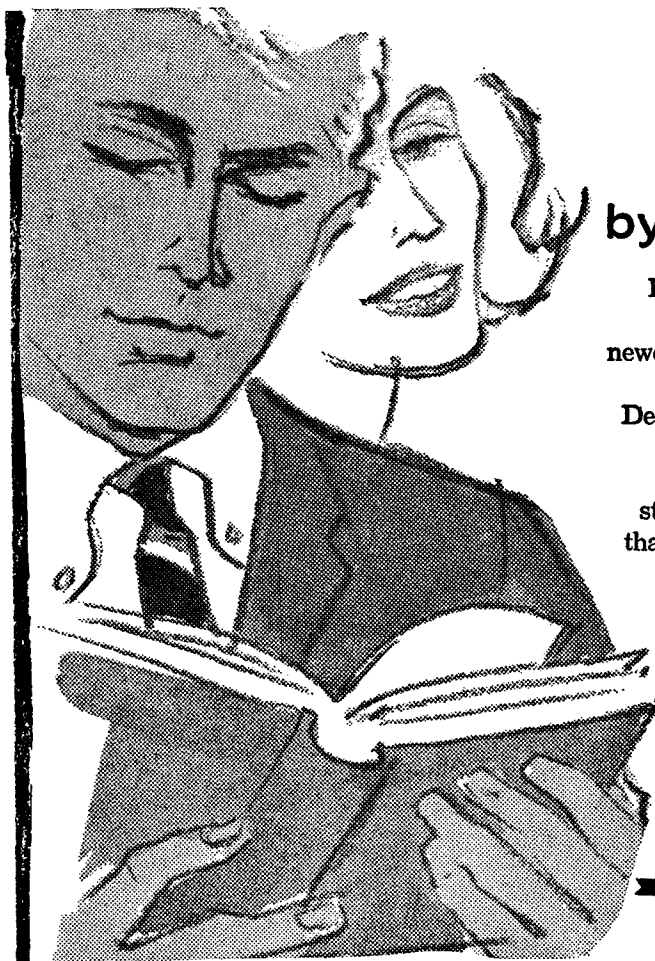


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Tech Basketballers Drop One To Life Bible College Quintet

Caltech's varsity basketball team got off to a slow start in the 1963-64 season by dropping their first two contests. Monday evening at Scott Brown Gymnasium the Beavers were downed by Life Bible College, 63-58, when a last-minute rally fell short, and Tuesday afternoon they lost to Upland College by a score of 65-57, again on their home court.

In Monday's game the Techmen, after trailing through most of the first half, outscored their opponents in the final minutes of that period and led at half-time by 29-27. During the first portion of the second half, however, they encountered a scoring slump, and were down by as much as ten points with as little as five minutes remaining in the game. A sudden surge of fast-breaking tactics combined with improved outside shooting narrowed this gap to four points with one minute of playing time remaining, but the Beavers were unable to further close the margin.

Hampered in the game against Life College by the absence of starter Dick Burgess, the varsity cagers relied on forward Joe Weis to carry much of the scoring load, and Weis responded with some accurate field-goal shooting to tally 24 points. Other high scorers for Caltech were Gary Dahlman with 14 points and Dennis McCreary, who made all of his 12 points on free throws. Life College featured a balance attack with four of their starting five scoring ten or more points.

Against Upland College the Beavers led throughout most of the first half, but a late surge

by the opposition put the Beavers behind at the intermission by a 31-28 count. They continued to trail closely during most of the second period, tying the score or taking a one-point lead on several occasions, and with one minute remaining they found themselves two points behind. Forced to press the stalling Upland five, the Techmen lost more ground until the final margin became eight points.

High-point man with 19 markers was Caltech's Dick Burgess, who also led the team on the boards by snatching 15 rebounds. Joe Weis and Gary Dahlman each scored 13 points, and Volker Vogt hit ten for the losers. Upland's high scorer was center Jeff Solomon with 17 points, followed by Jim McCoy and Andy Sandquist with 14 and 12 respectively.

The varsity will have another chance this week to score its initial victory of the season when it completes a heavy first-week schedule at the University of California at Riverside Friday night. Game time will be 8:15 p.m.

More Gridders

(Continued from page 6)

was intercepted. A pass went 37, then CHM bogged and tried a field goal from the 27, no good. CIT punted, and CHM passed for 25 as the half ended.

Second Half

CHM received; shortly a pass went for 43. Then the QB was thrown for —15 and they punted. Tech punted back and on the first play CHM fumbled, CIT recovering. The Beavers drove to the CHM 30 and lost the ball on downs. CHM drove to the CIT 31, where a halfback scampered the rest of the way. A line buck for PAT was no good; 19-0. Tech received and punted to CHM's 15. CHM drove to CIT's 21. The QB was thrown for —14, and penalties of 5 and 15 put the ball on the 47. From there a pass was good for the TD. The kick was good; 26-0. CIT received. Liebermann lost 5, then threw to CHM's linebacker on the 25; he galloped over for a TD. Kick no good; 32-0. CIT received and Christie fumbled on CIT's 21, CHM recovering. CHM drove for the TD in four plays. The kick was good; 39-0. CIT received and Sherman threw an interception as the game and season ended.

Yet More Jace

(Continued from page 3)

himself to USF though; he also offers some comments on cheerleaders. Commenting on cheer leader's costumes: "The school colors are shot through the costume in streaks, the name of the school is presented on the front in neon lights, and a big, purple bronco is pictured as prancing around of the back. Some times the whole ridiculous costume is topped off by a huge purple garter, which could have no other purpose than to hide varicose veins.

"Remember the Biblical story when Joseph was given a hideous, multi-colored coat? His brothers beat him up, threw him in a pit and sold him to Egypt. That might not be a bad idea."

A Good Idea

The best ad of the week award (given this week only) goes to the Antioch Record, where one intrepid advertiser printed the following gem:

"Please go to Jakes Party Pantry and tell Jake how happy you are that he is advertising in the Record again and that you think this is a very funny ad but that it is only 2 column inches in size and you think it would be a much funnier ad if it were ten column inches."

Simpson Bites

Quote of the week goes to a Political Science professor at USF who remarked, "There's

(Continued on page 8)

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Brewins



Although it may perchance be a little late, Beak would like to relate some happenings in the House of Albert; one fine day the sun rose. Shining in through a retchant hovel window, its softly gleaming quanta perceived, nay activated, the softly gleaming bod of our boss, Simpleton. Ma nishtano? Because it was Stupid's birthday, that's why. O well, there he lay in bed; snorth he. Came the Saga breakfast (urp, urp, urp). Up. Came the maid (mop, mop, mop).

And still he lay there, un-

touched, dry (except behind the ears), peaceful, asleep, bloated. Ah, Jahn Charls, a fate belay you.

Came the Saga lunch (urp, urp, urp, urp, urp). Came the maid again (mop, mop, mop, mop, mop, mop). Came the mob (mob, mob, rutabagas, potato chips, havis gabbel, cheese-and-crackers). Came the Simpleton (twitch, twitch, twitch, twitch, twitch, twitch). Came the water (deluge, deluge, deluge, deluge, deluge, deluge). Poor Simplepuss. (As someone once said, the

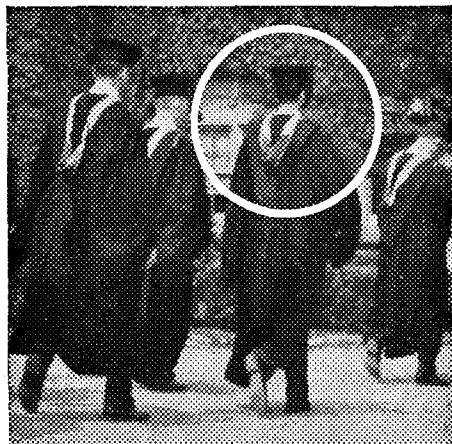
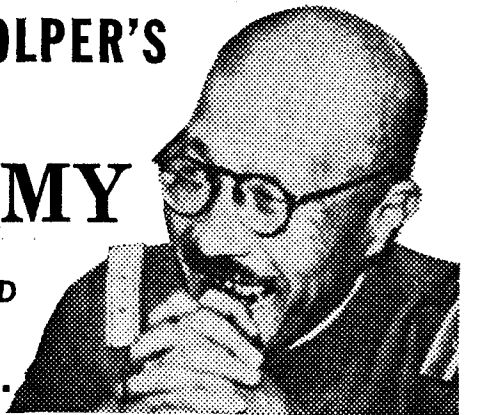
editor of the California Retch is all wet. So true, so true.) Aside from all this, nothing.

Bigotry is Fun, Perhaps, No?

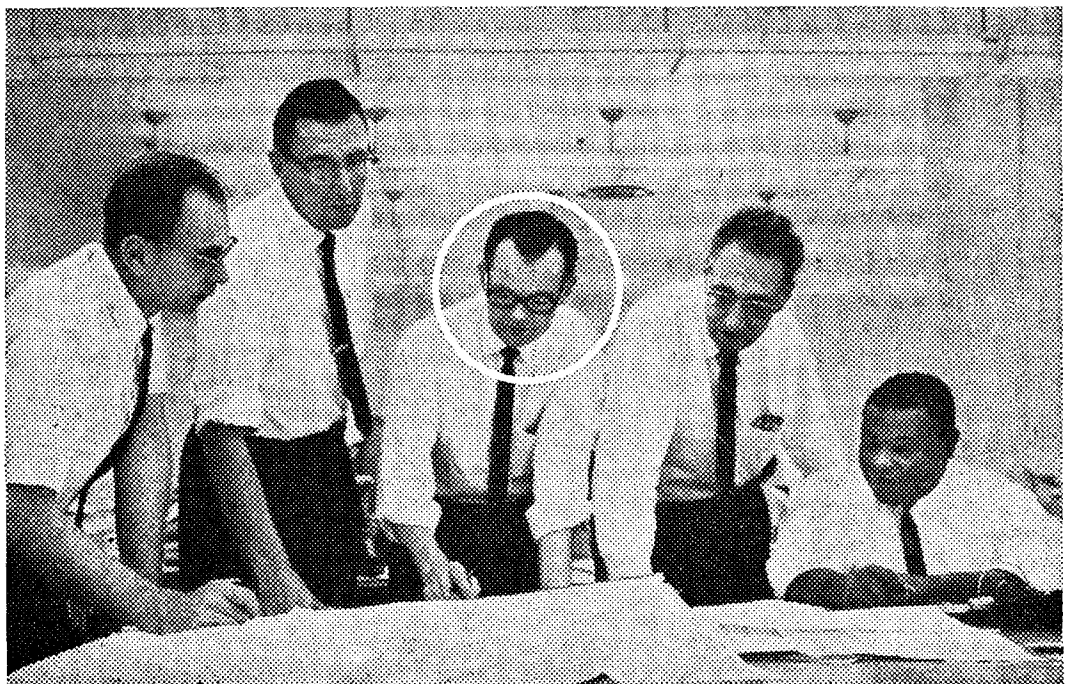
Are you between six inches and fourteen feet tall? Are you between zero and four hundred years old? Are you male or female? Do you have between one and six eyes, not more than three noses, and no more than seven ears? If the answer to all these questions is "yes", then you qualify for the biggest question of all time: "Are you a Jew?"

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John LaCost wanted a part in scientific progress



He has it at Western Electric

John LaCost received his B.S.E.E. from the University of Illinois in 1962. One of the factors which influenced him to join Western Electric was the quick manner in which new engineers become operational.

During the short time John has been with us, he has worked in several areas which are vital to the nation's communications complex. And with his future development in mind, John attended one of our Graduate Engineer Training Centers where he studied the front-line Electronic Switching System. He is currently working as a systems equipment engineer on such projects as cross bar switching and line link pulsing.

John's future at Western Electric looks promising indeed. He knows he will be working with revolutionary and advanced engineering concepts like electronic switching, thin film circuitry, computer-

controlled production lines and microwave systems. He is also aware of the continued opportunity for advanced study through the Company-paid Tuition Refund Plan, as well as through Company training centers.

How do you see your future? If you have high personal standards and the qualifications we are looking for, we should talk. Opportunities for fast-moving careers exist now, not only for electrical, mechanical and industrial engineers, but also for physical science, liberal arts and business majors. For more detailed information, get your copy of the Western Electric Career Opportunities booklet from your Placement Officer. Or write: Western Electric Company, Room 6405, 222 Broadway, New York 38, N. Y. And be sure to arrange for a personal interview when the Bell System recruiting team visits your campus.

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Wind Tunnel

(Continued from page 4)

accommodate full-scale objects. Models made of wood, clay, aluminum, steel, or fiberglass are built to scale and to fit within the test section. Airplane models range from one-fourth to one-fortieth full size. Auto models are one- to three-eighths full size and large truck-trailer rig models are one-eighth scale.

The models are instrumented so that pressure, wind velocities, etc., can be measured over many different parts of their surfaces. Pitch, roll and yaw characteristics are measured, as well as lift, drag and crosswind forces. The average test run on a model requires two weeks.

Twiddle-Dee-Dee

Sometimes a mixture of lamp black and kerosene is daubed on a model prior to testing. Or strings of cotton can be taped to the surface. The model is placed in the test section and the wind is turned on. Movie or still cameras can record how the paint is driven over the surfaces or the directions in which the cotton strings are blown. These will disclose the air flow and turbulence patterns.

Use Doughnuts

At present the wind tunnel is calibrating one of three spheres, each one foot in diameter, that will be placed 100, 200, and 300 feet above the ground at Goldstone on the Mojave Desert to determine wind strengths and directions. Caltech's Jet Propulsion Laboratory needs this information in locating and building giant 210-foot dishes for installations that will communicate with spacecraft.

Geology Wins

(Continued from page 4)

or radioactive energy in its interior might be determined from such data. In the field of planetary science are also projects to map the moon geologically, using photographs and radioactivity measurements taken here on earth, and to explore Venus using the distribution of temperature across its disk, with newly-improved techniques. Already the latter study has produced a possible direction for Venus's axis of rotation, heretofore unknown.

Tektite Studies

Tektites, hunks of fused silicate glass, are also objects of study. They are found in the Sahara, in Australia, in the Philippines, and elsewhere, but nobody knows what caused their formation or where they're from. Studying the ratio of the oxygen isotopes 018 and 016 found in tektites gives some clues about their formation and history. It seems that tektites have a quite constant ratio from one to another, indicating a common origin, and this ratio is at the end of the spectrum of ratios of other minerals. Attempts to fuse ordinary materials to give the observed isotope ratio have failed, indicating that tektites

may actually be extra-terrestrial, possibly coming from meteorites or even directly from the moon.

Seismology

Tremendous advances in the past two decades in techniques for recording earthquake waves have recently led to much knowledge about the mechanism of faulting that causes earthquakes. Strain gauges, 100-foot quartz rods, provide a means for measuring the stresses existing under the earth's surface, and eventually they may be used in predicting when earthquakes might occur. But an interesting by-product of their use is that they can also be used to record, like seismographs, very-long-period vibrations (resonant modes of the earth with about one-hour periods), a feat which was never before possible. Data from these gauges show that stronger earthquake waves are emitted in certain directions away from a fault than in other directions, and thus the direction of faulting can be determined, as it was for the 1960 Chilean earthquake. The speeds of propagation of faulting have also been uncovered from these data.

Prehistoric Biology

For 300 years paleontologists have been learning about ancient life by studying the morphology of fossils, by counting their toes

or measuring the lines on their shells. But Dr. Heinz Lowenstam is currently analyzing fossils chemically, after grinding them up. Because shells are not purely calcium carbonate, but also contain strontium and magnesium and organic materials, the Ca:Mg and Ca:Sr ratios reflect the environment of the organism: the pressure and temperature of the water it lived under, and the chemical makeup of that water. Dr. Lowenstam

has found that the chemistry of oceans half a million years ago was not too much different from what it is now. The organic material in the shell, used by the animal to form the shell, has sometimes revealed during what seasons it grew, or even how long it lived; this material may even give clues to the evolution of organic material itself, to how the basic structure of tissue has changed since life began.

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*Assignment: design a car for tomorrow...
 that could be built today!*



**Result: Allegro, an experiment in advanced automotive ideas
 that are practical for the near future**

Allegro means "brisk and lively," which certainly describes Ford Motor Company's new dream car, a handsome fastback coupe. More than that, Allegro has unique functional features that could be adapted for future production cars. (This has already occurred in the case of retractable seat belts!)

A major innovation is a cantilever-arm steering wheel with an electronic "memory." The steering wheel is mounted on an arm that extends from a center-mounted column. The wheel swings upward for easy exit, returns automatically to its former position at the touch of a button. Power adjustment enables it to be moved three inches fore and aft and five inches vertically. This, plus power-adjustable

foot pedals, permits use of a fixed seat design for low overall height.

Basically a two-seater in present form, Allegro has rear floor space that could be converted to carry two additional passengers. The car could be powered by either a V-4 made by Ford of Germany or by the domestic 144- or 170-cubic-inch Sixes.

Allegro is one of a series of Ford-built dream cars which will be shown at the New York World's Fair to test consumer reaction to styling and mechanical innovations. This will help determine which of their forward-looking features are destined for the American Road—as further examples of Ford Motor Company's leadership in styling and engineering.

More Campuses

(Continued from page 7)

nobody as individualistic as college professors — as a group."

To keep this column moving we'll switch to VPI where the Virginia Tech notes: "Irving Bently thinks that Radford girls are finally showing proper interest in Techmen's problems. He saw a proctor last weekend reading a booklet on "The Care, Treatment, and Rehabilitation of Alcoholics."

In the same paper: "A sign displayed on the Roses bench counter during hours when it is closed reads, "The Lunch Box is closed. Satisfaction guaranteed."

WHAT'S NEW IN THE DECEMBER ATLANTIC?

"Berlin: The Broken City": A Special 45-page Supplement. A border guard lieutenant, an East German textbook editor, distinguished Berlin novelist Gunter Grass and 7 other informed observers report on: *The Political Cabarets, The Young Germans, Why the Guards Defect, Writers in Berlin, Berlin's Economic Future*, and other subjects. Plus a photographic report on the rebuilding of Berlin.

ALSO

"The Supreme Court and Its Critics": Judge Irving R. Kaufman discusses the extent to which the Supreme Court appears to have taken on an educative function and how such change can be justified.

Stories and Poems by: Dudley Fitts, N. J. Berrill, Ted Hughes, Peter Davison, Muriel Rukeyser, Sallie Bingham, Jesse Hill Ford, Jeannette Nichols and others.

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