



—Dick Hackathorn

Dr. Louis T. Rader, Vice President of General Electric Company, emphasizes a point during his talk in Winnett Lounge on Monday afternoon.

## Rader Of GE Talks On Automation and Society

Beckman Auditorium was the scene of a rather lively panel discussion during yesterday's ASCIT assembly hour, as Drs. Hallett Smith, Simon Ramo, Louis Rader, panel members, and Gilbert McCann, moderator, investigated the general topic "Computers and Humanity." The format of the program included a short introductory statement by each of the panelists, followed by a question-and-answer session in which the audience was invited to participate.

### Rader Airs Views

Rader, vice president of the General Electric Company, opened the discussion by defining automation as "anything we do to increase the productivity of our people." He then discussed the possibility of automation as a source of unemployment, by pointing out that in those four industries which have introduced the greatest amount of automation over the past decade, employment has risen 51 percent, whereas employment has dropped by 7 percent in those four industries which have automated least. Rader attributed this seeming paradox to the fact that automated industries have been best able to compete in the world markets.

### What the Future Holds

Ramo, of the Thompson-Ramo-Woolridge Corporation and next Y leader of America, concentrated his remarks on possible future developments in the field of computers. He envisaged a vast national network of information storage which would have many amazing capabilities. Doctors, for example, would be able to feed in information about their patients and get back answers that could otherwise have been obtained only by consultations with thousands of other doctors.

Smith, chairman of Caltech's Division of the Humanities, felt that "every new machine is a challenge and also a reward." He recalled the fact that in the seventeenth century the telescope and microscope were considered

inhuman, and urged that we accept our new technology as the means to creating a better world. He concluded with a warning that a computer is only as good as the information which is fed in.

Rader spoke on "Science, Industry, and Psychology" last Monday afternoon in Winnett Lounge. After searching for some subject matter to fit the title, he settled for a broad review of his business career and managerial policies, then opened the floor to questions.

The most interesting point brought out is that Rader will

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## Drama Club Picks ASCIT Play; Readings Next Week

The Drama Club proudly announced today that the ASCIT Play will be Tennessee Williams' **A Streetcar Named Desire**.

As every young boy should know, the ASCIT Play is produced on the first weekend in May by the Caltech Drama Club. In past years the Club has done Williams' **Camino Real**, Saroyan's **The Time of Your Life**, Shaw's **Man and Superman**, and Pirandello's **Six Characters In Search of An Author**.

This year the Club, now the proud possessor of a new director, Bob Liberman (no relation to the infamous Beaver) has decided to move boldly into the field of psychological drama and produce Williams' tale of decadence, love, and deceit in New Orleans. Liberman has considerable previous experience in the art of directing, having worked in New York and in Southern California for several years, and he is quite familiar with **Streetcar**.

Typical Caltech enthusiasm, combined with the inimitable and always classic performance of

# Tech Hosts Computer Debate

"The argument will indeed be real!" By this stroke of impassioned oratory Dave Close, chairman of the Caltech Computer-Controlled Debate Tournament, confirmed that Caltech will chalk up a "first in forensics" with the debate tournament scheduled for Friday and Saturday, February 19 and 20.

The unprecedented task of Booth Computing Center's 7094 will be to set up six complete preliminary rounds, matching the participating teams so that no team meets another from its own school, so that all teams within one general geographic area meet an equal number of teams from other areas, and so that no team is judged by the same judge — a coach of some participating college — twice, or by any judge having some connection with either team.

### Headquarters in Dabney

Within seconds after the command "start" a master schedule of the first six rounds will be typed out on the high-speed printer. This schedule will be posted in Dabney Lounge, debate headquarters. All debates, according to Herb Booth, debate advisor, will take place in Dabney.

Following these preliminary

As of Tuesday night, the ASCIT election race stood as follows: **President, John Walters; Vice President, Gordon Myers vs. Ed Robertson; Secretary, Dave Close; Treasurer, Eric Young; BOC Secretary, Martin Smith; IHC Chairman, Leonard Fisher; TECH Editor, the team of Tim Hendrickson, Bob Berry, and Norton Greenfeld; Rep-at-Large, Greg Brewer vs. Jon Haviland. There were yet no nominations for Athletic Manager, Activities Chairman, or Social Chairman. Candidates may still be nominated, until Monday.**

the yearly Lucky Pierre, should make this year's ASCIT Play a thing to remember.

### Early Start

Club President J. K. Evans proudly announces that he has conned lovable Wayne Ryback into acting as producer for this glorious epic. Actually, Ryback volunteered, but to avoid any stigma being attached to his temporary lapse of sanity, Evans has agreed to say that he talked him into it.

Naturally, none of this is going to happen until third term. However, in an amazing break with tradition, the Drama Club has taken the first steps to insure that things are actually going to happen.

The major parts in the play will be cast this term, and most of the spade work will be completed, so that with the opening of third term, rehearsals can begin in earnest. In line with this policy, readings for parts will begin next week.

### Come Out, You!

In order that everybody can

(Continued on page 4)

rounds, the computer will select the eight top teams for the three elimination rounds. Selection will be made on the basis of each team's win-loss record, each team's ratings, the difference between each team's ratings and its opponents' ratings, and the opponents' win-loss record.

Close emphasized that "all debates are open to visitors — including Caltech men." He added that "interested Techmen may help in several ways": They may earn free tickets to NBC Studios by providing rides for out-of-state debaters to the studios Thursday and Friday evenings, February 18 and 19; volunteer to be timekeepers for the debates; or invite out-of-state debaters to the Student Houses for dinner Saturday night. "Each House would have about three guests," estimated Close.

### Emmys for Winners

The rounds of debate are scheduled to begin at the follow-

ing times: Friday, at 12:00, 1:30, 3:00, 4:30; Saturday, at 9:00 and 10:30 a.m. Quarter-finals begin at 2:00 a.m. Saturday, and semifinals at 4:00. The final round will be at 7:30 in Dabney Lounge, followed by an award assembly. The awards, it was rumored among the tournament committee, will be presented by some Hollywood star.

Thus far some 40 colleges from 10 states have indicated that they will send teams to the Caltech Computer-Controlled Tournament. Out-of-state teams include the Universities of Arizona, Illinois, Nevada, Oklahoma, Oregon, Portland, and Texas; Kansas State at Fort Hayes; Washburn University in Kansas; Abilene Christian University in Texas; and Gonzaga University in Washington.

California State participants include UCLA, UCSB, USC, California State Colleges, Clairmont, Loyola, Occidental, and University of Redlands.

## Notices

### HONOR KEYS

Deadline for all honor award information letters is Saturday, February 13. Anyone who would like to be considered for an honor award should submit a letter to J. C. Simpson in Ruddock indicating the activities in which he has participated and his degree of participation in each. These letters must be submitted before the above deadline.

### NEW HOUSE MOMS

All those with an eager heart and a willing spirit, or otherwise interested in applying for the position of Resident Associate in the Undergraduate Student Houses for the academic year 1965-66, should contact the Master of Student Houses before March 5. All applicants must be graduate students (in their second year of graduate study or beyond), or members of the faculty. For further information call at the Office of the Master of Student Houses or phone Ext. 541.

### TICKETS NOW ON SALE

for "An Enemy of the People," Ibsen drama to be staged by the Bishop's Company in Beckman tomorrow. Come to the Y office and pick out your own seats. Students \$1.

### MORAL CORRUPTION

will be shown in the Republican campaign movie **Choice** Saturday evening at 7 in Culbertson.

### HELP!!

Despite reports to the contrary, the Caltech Computer Debate Tournament will not be completely automated. Anyone who would like to serve as a timekeeper (no experience required) for the rounds of debate on February 19 and 20 should contact Gary Scott, 796-4918, or leave a note in the S box in Lower Throop.

**WHAT MAKES THE BRITISH RUN** or "British Politics and the Recent Election" will be the topic of Prof. David Elliot at the Y Dinner Forum tonight at 6:30 in Chandler.

### BLEED!

The Red Cross Bloodmobile will be on campus Wednesday, March 3. Sign up to donate your blood with your house representative before February 22. If all else fails, see Eric Young in 103 Ruddock.

### CONTINENTAL BASEBALL

Caltech's Cricket Team, undefeated last season and winner of the California Cup, is in need of new

blood. Every member of the Caltech community—from freshman to professor emeritus—is eligible to play. All those with either experience or interest (or a taste for tea) are asked to contact R. A. Huttenback at Ext. 541.

### IF I KNEW YOU WERE COMIN'...

Undernourished Techers with a sweet tooth will take double delight in the Bake Sale to be held by the Caltech Junior Women's Club. Save up your pennies and hurry down to the Olive Walk tomorrow between 9:30 a.m. and 1 p.m.

### PHOTOGRAPHY CLUB

Culture! Art! Fun! Money! If you have a camera, join! For more information, see York Liao in 56 Blacker, Kim Gleason in 42 Dabney, or Dennis Weaver in 3 Fleming.

### CHRISTIAN FELLOWSHIP

Professor Fuller of Fuller Theological Seminary will speak on "The Authority of Scripture," Friday noon in Chandler. All welcome.

### CALIFORNIA COLLEGE REPUBLICANS

There will be an open meeting of the California College Republicans next Monday, February 15, at 9:00 p.m. in the Y Lounge. This meeting is open to all interested students.

### RAISE LOOT

for FM non-commercial station KPFK. Wear threads as if it were in the twenties. Live Dixieland, lots of interesting cultural peeps and also some kooks. At the Happy Haven, 6309 Monterey Rd., Highland Park, Saturday, 8.

### YOU ARE WRONG

if you think that a trip to Europe requires a lot of money! To find out how cheap and enjoyable it is contact Gabe Moretti in Ricketts. But hurry; the offer is limited and the demand high.

### DON'T FORGET SNOW

Party, weekend of fun, frolic, and other diversion. Get a date; tell your House social chairman that you won't miss it.

### ALL CANDIDATES

Should be in Clubroom 1 Monday night after the BOD meeting to have their pictures taken for next week's **Tech**. Also be prepared to write a campaign statement. The exact length will be set Monday night.

### FROSH:

Bonner, Greasy, 6, tomorrow.

## Editorials

## Progress . . .

The Faculty-Student Relations Committee met on Tuesday to mull over the student grievances concerning the Beckman Auditorium charges. Unfortunately little was accomplished in concrete help for the students' cause, because the Committee by itself hasn't the power to change things.

A suggestion will be made to Dean Eaton's Beckman Committee that student labor be used in all possible instances at student-sponsored events before paying for B & G labor. A reevaluation of the amount of the use fee is to be made in the light of known operating costs. This might result in a raising or lowering of the fee. Also, the possibility of a sliding scale for a use fee based on the amount of profit made by a student activity was discussed. The Beckman Committee will be urged to base fees on whether a profit was made and not on whether admission was charged.

What is needed is a firm decision on the part of the Beckman Committee to waive the use fee for student use of Beckman. Very few student uses of Beckman would ever make a profit. Only if a profit is realized should the student activity help pay for a part of Beckman's maintenance expense.

Looking back on the affair one wonders exactly what caused all the clamor. Certainly we do not believe anybody in the Institute administration deliberately made the "use fee" an inflexible rule enforced to rape the student. We put the blame on bureaucracy. A small group of administrators was put in charge of running an auditorium. This group has increased its size and complexity, and of course its inflexibility. This last fact seems to be typical of bureaucratic rule. The students are not the only ones to feel its effect.

Bureaucratic empirebuilding may be a driving force in our economy, but we don't like to pay for it.

—Wally Oliver  
Stuart Galley

## From Other Campuses

By Jace

A new tradition is arriving at Georgetown University in Washington, D. C. Each year the Georgetown Philodemic Society (debaters you troll) borrow the college dean's car to drive down to Wake Forest. For the third time in the last three years the debaters have wrecked the dean's car on their return from Wake Forest. The accident, which caused about \$200 damage to the dean's Mustang, was not the fault of the debaters, but it will be interesting to see how transportation to the debate is arranged next year.

Georgetown is having success in other areas also. Georgetown, at one time a football power, dropped football in 1950. Interested students, however, have now organized an informal football club, not supported by the school, to play games with whatever opposition it could find. The club's only game this year was a 28-6 win over NYU's club before 8000 paid spectators.

NYU, another club school, also played Fordham, once a national power, before a crowd of 13,200 in New York (and national news coverage). Both these schools dropped football over 10 years ago. Maybe if we quit the sport here for about 10 years or so, Tech could re-institute the sport and finally get football the student support it deserves.

Football being very closely related to ROTC, we now switch to Georgia Tech where the **Technique** recently printed an article criticizing the ROTC program. Among the better points was the statement: "The military mind is a mind that can write notices such as:

"All those listed below, with the exception of persons already notified, should disregard the notice previously posted, unless having been instructed otherwise."

Confusion reigns in other parts of the Georgia Tech campus too. The **Technique** staff was recently surprised when they received the rating for their first semester

papers from Associated Collegiate Press. One of the criticisms in the rating booklet was: "No 28, Pg. 2 — The name is Wright, not White." Wondering how a judge who must rate so many newspapers could catch a misspelling, the staff members looked up the article. It was a story about the paper's last ACP rating, and Mr. Wright (not White) was their judge and evidently indignant at his misidentification the **Technique** lost its "All-American" rating. The whole story, by the way, was printed under the headline "Better Wright than White."

If you are a collector of unusual sweatshirts (such as the multi-colored monstrosities in the book store) you may be interested in the latest fashion. The Antioch College Bookstore is now selling replicas of the Antioch team football practice jerseys for campus wear. Each one, however, bears the number 69, and the ad caption reads "Take Your Pick, 69 or Flashy Maroon." There's no doubt as to what a Techman would pick.

### More Rader

(Continued from page 1)

not hire anyone for a high position unless the applicant takes a battery of psychological tests. Rader feels that these tests help tremendously in deciding a person's possible worth to the company, but of course the results of the exams must be used carefully and wisely. Tests are worse than useless if they alone are used to decide "go" or "no-go."



### The Shaggy Gorillas Minus One Buffalo Fish

Leading the Round

### Pradel & Dominique

Comico dramatic  
Parisian Pantomime

### at the ICE HOUSE

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

### The Times Square Two

Outrageous!

## Houses Begin Rehearsing For Interhouse Sing

Interhouse Sing time is upon us. The event will be held March 4 in Beckman, and although some Houses have been exercising their hot throbbing larynxes for two weeks already, others aren't yet organized.

Dabney is one of the early ones, hoping to improve on last year's poor showing. Stacy Langton will direct three sea chanties: "Old Man Noah," "Eight Bells," and "Away to Rio." Also, there are tentative plans for a Russian folk song. To boost their rating, the Darbs will attempt to snow the judges with a feminine accompanist.

Lloyd is back in the race, 40 strong, after not participating last year. They will sing a Negro spiritual, "Somebody's Knocking at Your Door," as well as "Lloyd House Song," which according to Mike Meo, their frosh conductor, "is a drinking song, demonstrating that the men of Lloyd have lots of virility."

### Die Lieder Stinken

Blacker will also enter a four-some in the quartet competition, under the leadership of Bob Sweet. They will sing a Bach wedding cantata, "Der Herr Segne Euch," and two of the "Liebeslieder Waltzes," by Brahms.

Blacker is the only House to have set up a quartet so far. Singing will be Frank Pate, tenor; Greg Bourque, lead; Bob Sweet, baritone; and Wayne Pitcher, bass. They will present "Jeepers Creepers," "Thank Heaven for Little Girls," (a la Humbert Humbert) and "Lida Rose."

Ruddock's chorus has been cut to 30, following last year's whole-House effort. According to John Turechek, conductor par excellence, the cut was made "because some of our people are tone deaf." The men in blue will sing "Honor! Honor!" a Negro spiritual, "On Great Lone Hills" (the chorus from "Finlandia"), and "Der Herr Segne Euch." As you may have noticed, Blacker is also singing this one. This situation may change before long.

After being chased through the halls of Page by a mad Whitlock, this reporter finally reached Bob Schor, Page's director. Schor reports that they have begun practice on "All Ye Saints be Joyful," by Katherine Davis, and "Out of the Depths I Cry to Thee," by Will James.

Ricketts, under direction of Tom Oberjat and Niles Puckett, will sing "sam was a man," an e. e. cummings poem set to music by Vincent Perischetti, "Regnum Mundi" by Jacob Handel, and "Soon-A Will Be Done," a Negro spiritual.

Not to be outdone by Blacker, Ricketts also will have a quartet. It will consist of frosh Peter Rumsey, baritone, and Greg Kourilsky, bass; and seniors Tom Oberjat, first tenor, and Niles Puckett, second tenor.

Contrary to rumor, Fleming will begin practice next Monday. According to conductor Gordon Myers, they will sing the appropriate "Drinking Song" from **The Student Prince**.

## The Critical Ear

BY TOM GREENFIELD

For some not very singular reason I have a predilection for African music so you will, I hope, excuse some more BS. I call your attention to several records in the field which should be of general interest, especially the folk oriented, and some discs for those whose taste is more various and exotic.

Of Miriam Makeba, **Time** had this to say: "From Johannesburg . . . the most exciting new singing talent to appear in many years." Everybody should at least have heard of her by now and, speaking as one of the growing number to have heard her perform live, I'd say that **Time's** is a cautious testimony. Miriam Makeba radiates an audience—enmeshing warmth which could only be described as captivating. Her voice is at times sleek, mellow, innocent, mysterious, guttural, sophisticated, and always vital, true, untainted, pregnant, and sublime. She is a consummate artist.

### Song of Xosa

Her first album, **Miriam Make-**

ba (RCA Victor LPM/LSP 2267), has her now-famous "Click Song" in which she exhibits the extraordinary oral feat which gives the song its popular title. There is also the authentic and original version of "Wimoweh," really "Mbube," which is undoubtedly the most exciting band.

When you have heard this you will undoubtedly want to acquire more of her records (she has an enormous and diverse repertoire). I advise **The Voice of Miriam Makeba** (Victor LPM/LSP 2845) next as it is her latest release, and I think it is superior overall to a third of hers I have heard, **The Many Voices of Miriam Makeba** (Kapp 1274; (S) 3274).

Here is an extraordinary record I don't think many will have had a chance to hear: a musical, **King Kong** (London 5762), after a real-life South African Boxer who rose to fame and was then brought to trial after knifing his girl, who had gone over to a rival gang. Pleading guilty, he demanded that the judge sentence him to death — "to teach people not to go

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## Athletic Council Considers Changes In Eligibility Rules

Caltech was advised in January that the SCIAAC was considering major revisions in the eligibility rules. The new proposal, briefly summarized, would give students four years of eligibility, permit freshmen to play on varsity teams, and give each school the option of fielding one or two teams with the restriction that the second team be composed only of frosh.

The matter, which could seriously affect sports at Caltech, was referred to the Faculty-Student Athletic Council, and a special meeting was called on January 26.

### Athletic Council

Before going further it might prove informative to state just what the Athletic Council is. Meeting about once a month, this committee, composed of faculty and students, provides a general sounding board for opinion on such matters as proposed conference rules changes, or any complaints or suggestions concerning improvements in the athletic program.

Attending the last meeting were Drs. Corcoran (chairman), Huttenback, and King; Mr. Musselman; Coaches Emery, La Brucherie, Preisler, and Kampe.

### Jocks

After a lengthy debate it was agreed that the proposed changes would be a disadvantage, and that they might lead to a general deterioration of frosh sports in the conference. The Council made the following suggestions for Dr. Corcoran to put before the Conference Athletic Committee in order of preference: (1) retain the status quo, (2) make a varsity team using freshmen ineligible, (3) prohibit the participation of frosh on a varsity team if a second team is fielded, or (4) change the present rules to permit a varsity and a junior varsity.

The proposed changes and Caltech's suggested modifications will be considered by the Conference Committee later this month. The results of this meeting may affect sports in the conference for years to come.

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H5 Notes

# Gallagher Lectures On Modern Arab Politics

Concluding his lecture stay at Caltech, Charles Gallagher of the American Universities Field Staff continued his speech of last week on "The Arab World Today" in 155 Arms Tuesday. The Harvard graduate, who specializes in African and Middle Eastern affairs, commented that he'd been hissed eight or nine years ago, when he began his first speech at Caltech. To make him feel more at home, a low hiss spread through the room.

"I just wanted to say how much more enlightened this group is than your compatriots eight years ago."

"Hsssssss . . ."

Gallagher, author of **The United States and North Africa**, noted that the limited, traditionalist middle class no longer is the sole factor in Arab politics. A new emerging class, opposed to the xenophobic, provincial small businessmen, has arisen and seized power in several nations. Elsewhere it is a powerful and growing threat to the traditionalists.

This new class is made up of Western-educated intellectuals, liberals, military men, professional men; almost everyone of a progressive outlook. They have made it impossible for constitutional democracy to survive in the Islamic world, for a divided

country cannot muster the consensus necessary to rule.

**Tyranny of the Powerful**

The heritage of the Caliphate hinders free thinking on many subjects, but especially politics. Theocratic rule for 1200 years has not only ossified new scientific thought, but the legal fictions invented to explain the breaking away of various parts of the Caliphate also led to the doctrine, "He who holds power, holds power legally." The Caliph was Caliph because he had organized a good coup; everything else was secondary. The tyranny of the powerful is a permanent fact of life in the Arab nations, even though the Caliphate no longer exists.

One very famous Arabian proverb says, "A hundred years of tyranny is better than one day of anarchy." The whole concept of freedom, as defined by liberals of the West, is almost nonexistent in the Middle East after over a millenium of authoritarianism and the rational, modern approach to solving problems requires free, individual thinking more than reliance on tradition. The Arabian states, said Gallagher, with the exception of Tunisia, suffer a dearth of free thinking as a result of a theocratic concept of the state.

**Division and Subdivision**

Gallagher then moved on to more practical grounds — how can we classify the nineteen countries of the Arab world? How are they similar? How do they differ?

One method is to divide them politically into monarchies, dictatorships, and the like. This is a valid, correct method, only it doesn't say much. A second way evaluates the countries by income. Here, the entire bloc, except for Lebanon and the oil-rich such as Kuwait, becomes a

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# Y To Sponsor Canon Green Talk Tuesday

Often called "England's greatest living orator," the Rev. Canon Bryan Green of Birmingham will spend a few hours with Caltech students this coming Tuesday during his two week visit to Southern California. Sponsored by the YMCA and the Episcopal Chaplaincy at Caltech, he will speak in Winnett Lounge at 12:30 p.m.

Long familiar with American university life, Green has generated massive gatherings at Princeton, Yale, Stanford, Penn State and USC, to name a few, with his forceful presentation of the Christian faith. Enthusiastic reactions include this one from a Yale student: "One of the reasons for his success in schools and universities is that he makes people realize that to be a Christian you need not give up your intellect."

**Strange Words!**

During Green's previous visit to Southern California six years ago, his dialogues at USC on a Christian's Sex Morality, Free Love, and Changing Values stimulated the Los Angeles Herald Express to report on the Anglican Vicar's unorthodox vocabulary and sense of wit.

Green's many books and articles include **Being and Believing**, in which he writes, "Few people would now say that what a man believes is of less importance than how he acts. Experience of totalitarian faiths has compelled us to recognize anew that how a man behaves depends in the not-very-long run upon what he believes. Social life for free beings calls for ethical restraint. But experience shows that men discipline themselves not in submission to restrictive commands but in response to vital faith and in the process of creative living."

where  
are  
you  
going  
?

Men go where their thoughts take them. The journey to Truth is a revelation of Spirit — the kingdom "within you." Hear this lecture titled "Where Are You Going?" by ELBERT R. SLAUGHTER, a member of the Board of Lectureship of The First Church of Christ, Scientist, in Boston, Mass.

**Christian Science lecture**

8:00 P.M., Thursday, February 11, Dabney Hall of Humanities  
Sponsored by Christian Science Organization on campus.

# Greenstein Explains Universe

BY JUAN LARGO

"What is it like to be working in an abstruse and useless science?" asked Professor Jesse L. Greenstein of the frosh last Friday evening in the latest Frosh Forum. "We are the last escapist," said Greenstein in describing his scientific motivations in his speech entitled "No Place for Man in the Universe."

Greenstein received his education at Harvard, worked later at the University of Chicago, and finally came to Caltech. Now a staff member of the Mount Wilson and Palomar Observatories. Greenstein explained why he went into science instead of the family business. "It (business) was just something nice and easy to rebel against."

What does it feel like to be an astronomer? Greenstein explained that he "doesn't feel like an astronomer most of the time." A person should develop a "social conscience and outside interests," he said, pointing out the obvious fact that Caltech is not very helpful in this respect.

**Fun, Fun, Fun!**

As far as his part-time scientific studies are concerned, Greenstein explained that after a while it was "hard to imagine having fun

in anything else." "The universe," he said, "gives us complete release from genuine ordinary human problems." To Greenstein, this is a "comforting and ennobling thought."

On man's place in the universe, he explained that "We don't belong in the universe; but we are also a natural consequence of it." After a long series of rough mental calculations, Greenstein came to the conclusion that the universe is also populated by "many highly organized things." However, we cannot depend upon these things to be friendly, much less to try to save the earth from its eventual death by fire, as some fatheads would like us to believe. The only thing that will save us will be "good engineering."

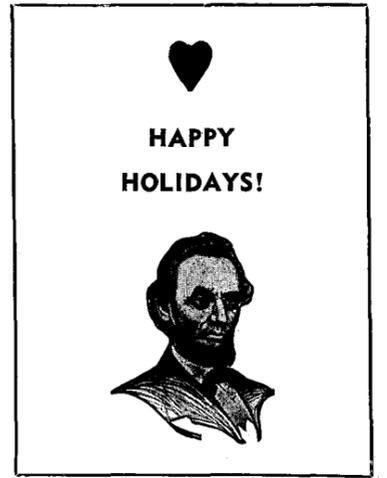
**Greenscum**

Due to the highly organized things, there is no reason not to believe that there are electromagnetic messages "flying around." However, Greenstein feels that our efforts at interstellar communication should be limited to "passive listening." Someone hearing us might decide that we are an "obnoxious and green scum on a very useful planet."

Concerning the birth of the

stars, Greenstein said that these were formed by the gravitational collapse of huge galactic clusters of gases. The heat evolved due to this contraction is great enough to start a thermonuclear fusion process.

In this struggle for birth, a star must compensate in some way for the loss of angular momentum around the center of the galaxy caused by this contraction. It is postulated by astronomers that the planets were born from the momentum compensation of our own sun.



Tom Thomsen wanted challenging work



He found it at Western Electric

T. R. Thomsen, B.S.M.E., University of Nebraska, '58, came to Western Electric for several reasons. Important to him was the fact that our young engineers play vital roles right from the start, working on exciting engineering projects in communications including: electronic switching, thin film circuitry, microwave systems and optical masers.

Western Electric's wide variety of challenging assignments appealed to Tom, as did the idea of advanced study through full-time graduate engineering training, numerous management courses and a company-paid Tuition Refund Plan.

Tom knows, too, that we'll need thousands of experienced engineers for supervisory positions within the next few years. And he's getting the solid experience necessary to qualify. Right now,

Tom is developing new and improved inspection and process control techniques to reduce manufacturing costs of telephone switching equipment. Tom is sure that Western Electric is the right place for him. What about you?

If you set the highest standards for yourself, enjoy a challenge, and have the qualifications we're looking for — we want to talk to you! Opportunities for fast-moving careers exist now for electrical, mechanical and industrial engineers, and 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. And be sure to arrange for an interview when the Bell System recruiting team visits your campus.

**Western Electric** MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM  
AN EQUAL OPPORTUNITY EMPLOYER  
Principal manufacturing locations in 13 cities □ Operating centers in many of these same cities plus 36 others throughout the U.S.  
Engineering Research Center, Princeton, N.J. □ Teletype Corp., Skokie, Ill., Little Rock, Ark. □ General Headquarters, New York City

# Rush-Hour Smog Can Dull Drivers' Senses

Carbon monoxide from Southern California freeways rises during peak traffic periods to levels that can dull the alertness of drivers, Dr. Arie J. Haagen-Smith, smog research pioneer and professor of bio-organic chemistry at Caltech reported recently.

"Traffic situations may occur in which concentrations of carbon monoxide could reach a dangerous peak," he added in a report published in the California State Bureau of Air Sanitation's "The Clean Air" quarterly magazine.

The report is based on data obtained with a new carbon monoxide analyzer developed by Beckman Instrument Company. Prototypes of the instrument were installed on a sedan and a sports car which Haagen-Smith and a National Science Foundation student of his, T. W. Latham, drove in eight freeway trips duplicating those taken by persons commuting between Pasadena and Los Angeles during peak traffic hours. The devices gave continuous records of the carbon monoxide levels of the drivers' environment.

## CO Fnrils

The trips were made on the Pasadena Freeway between Pasadena and the vicinity of Exposition Park in Los Angeles; the over-all average level of carbon monoxide on the trips was 37 parts per million (ppm) of air. In heavy traffic moving at less than 20 miles an hour the level rose to an average of 54 ppm, with peaks up to 120 ppm. The levels dropped rapidly a short

distance from the freeways and from heavily-traveled streets.

"Normal" Los Angeles air contains 10 to 12 ppm of carbon monoxide. The State Health Department has determined that 30 ppm is an "adverse" level and that 30 ppm for eight hours or 120 ppm for one hour is a "serious level of pollution."

"If a commuter spends two hours at the higher exposure level found in the study," Haagen-Smith reported, "the carbon monoxide level of his hemoglobin would be approximately that cited by the State Health Department for the 'serious' level." Air-conditioning does not help, Haagen-Smith added, because an air-conditioner does not filter out carbon monoxide.

## Cars Make Smog

"Thorough study should be made of the effects of high carbon monoxide levels on the alertness of motorists and on their ability to drive," Haagen-Smith recommended. "These investigations should include the respiratory cripples as well as the healthy drivers."

"Automobile exhaust control is the answer not only for eye-irritating smog but also for the reduction of the carbon monoxide level we are exposed to," he added. "Some people still seem to think that all the smog comes from industry. However, practically the only uncontrolled source of carbon monoxide is the incomplete combustion of gasoline, which throws into the Los Angeles area atmosphere 9,000 tons per day of this respiratory poison."

# Christian Science Lecture

"Where Are You Going?" is the title of a Christian Science lecture coming to Caltech tonight at 8:00 p.m. in Dabney Hall.

Elbert R. Slaughter will be the speaker. He says that everyone is on a mental journey to somewhere, and his lecture is described as an exploration of the journey to "spiritual reality" which must take place within the consciousness of every individual. The lecture is sponsored by the campus Christian Science Organization.

Slaughter is currently on a tour of the continent as a member of the Board of Lectureship of The First Church of Christ, Scientist, in Boston, Massachusetts. He is a native of Texas, and attended Southern Methodist University. Once a lumberman and vice president of a savings and loan association, he resigned from business in 1945 to devote full time to the Christian Science healing practice. He resides in Dallas.

## African Ear

(Continued from page 2)

about killing." The judge, finding extreme provocation as a mitigating factor, sentenced him to 15 years, but shortly thereafter he committed suicide.

With this dramatic plot the production could hardly fail, but the music is incredibly potent and caustically animated besides. The raw harmonies of fertile Africa combined with simple but keen melodies and furiously pulsing beat evoke instantaneous response. In fact I guarantee you've never encountered anything like this. Come over to 216 Ruddock and I'll play this for you with pleasure!

# Gates Lectures on Navigation

"Go to the next galaxy, turn right, and follow your nose. You can't miss it; it's the first nova on the left." Space navigation will NOT include instructions like this. Dr. Clarence R. Gates, chief of the JPL Systems Division, gave the audience in Beckman Monday night a clear picture of what problems space navigation does cope with.

First Gates reviewed the characteristics of the inner planets' orbits, comparing them with earth's orbit. The major point brought out was that the planets travel in much the same plane, and according to Kepler's laws. Then he developed the requirements for getting a vehicle to a destination. The current Mariner flight to Mars was used as an example.

## Earth to Mars

Suppose you wanted to go to Mars. When and in what direction would you go? Because we don't have any rocket efficiency to waste, we want to use the lowest energy path possible. This path is an ellipse, with its low point the distance at launching

from the earth to the sun, and with its high point the distance of Mars from the sun. You take off travelling parallel to the earth's motion, and time your departure so that when you get to the high point of the ellipse, Mars is there waiting for you. The trip would take about 260 days.

There are some common-sense constraints on take-off. You don't blast straight up and out, for you spend a lot of your energy hauling up fuel, which constitutes about 90% of the rocket's weight. Instead, you get just out of the atmosphere, and then travel parallel to the surface until orbital velocity has been reached. Now, your rocket coasts for a few minutes until its direction of travel is parallel to the earth's motion about the sun. Then the rocket engine fires again to give the velocity needed to escape from the earth's gravitational attraction. This velocity is about seven miles per second, but gravity eventually slows the vehicle down to about two miles a second. Now you sit back and relax for eight or nine months.

The last problem is keeping the spacecraft on course. Because of weight limitations, a minimum of navigational equipment is carried on board. Instead, the vehicle's velocity with respect to the earth is very accurately measured by the doppler shift of its radio transmissions. By this means the craft's position may be measured to within 100 miles at a distance of 100 million miles.

To correct the spacecraft's position, a low-thrust rocket motor is provided. This rocket, weighing about 2% of the total weight of the vehicle, can correct for up to a half-million mile aiming error.

# IH Track Meet Today

Barring inclement weather, the Interhouse track-and-field meet will be completed by tomorrow afternoon. The track preliminaries were scheduled for yesterday, the field events are to be run off this afternoon, and the track finals will be contested tomorrow.

Each day's activities will start at 4 p.m. The usually dull preliminary heats were run in the sprint events with lane assignments being given according to the finishes.

Today's menu should provide some exciting moments, especially in the weight events. The events include the long jump, high jump, pole vault, shot put, discus, and javelin.

The finals are usually the most interesting from the spectators' point of view. The fans will be able to see a 1320-yard run, 330-yard dash, 120-yard high hurdles, 100-yard dash, 660-yard run, 220-yard dash, 220-yard intermediate hurdles, and a 4-man 880-yard relay.

## H5 Surprise Quiz Next Week!

(Continued from page 3)

part of the underdeveloped segment of the nations of the world, with problems very similar to those of Latin America and Asia.

The Arab world can also be divided into those countries with a national identity and those amorphous conglomerations held together more by inertia than by strong patriotic ties. Moroccans pride themselves in being citizens of Morocco, for example, but Syrians look upon their borders as the artificial inventions of ignorant Western politicians at Versailles after World War I.

## Falsies!

Another criterion, Gallagher's favorite, is the categorization of countries into those which are more or less stagnant and those which are genuinely attacking the

problems facing them. Only Egypt and Tunisia qualify, because only these two have backed up their words with rational planning and action.

The problem of industrialization is more complicated, according to Gallagher, than how much aid we or the Russians give. He formulates it in time, space, and velocity, all encapsulated in motivation: how much time will it take for such-and-such a sized country to progress a certain amount, given its motivation? Gallagher's final word was a warning against false optimism. Out of 40 all-expense scholarships to Europe recently offered by Libya to its secondary school graduates, only four were accepted. If motivation is lacking, money won't help.

# CFD Costume Ball And Elke

Techers are invited to see Elke Sommer (pant, pant) and Glen Ford (pants, pants) at the California Fashion Designers' 16th Annual Mardi Gras Costume Ball. The snowy event will be held at 9 p.m. in the International Ballroom of the Beverly Hilton Hotel, next Friday, February 19.

In case you don't want to watch Elke Sommer all evening, dancing, costume awards, and the presentation of the "Model of the Year" award could occupy your time. Although regular admission (black tie requested) is \$7.50, including two free drinks, students appearing in costume and bearing their student body cards will be admitted for only \$2.50 (not including drinks, but including Elke Sommer).

To urge you on to greater heights of costume design in the theme of "Out of this World," \$1000 in prizes will be awarded in the categories of Most Amusing, Most Original, Most Beautiful, and Sweepstakes.

## Morse Desire

(Continued from page 1)

get a chance to read for a part, there will be four casting sessions. It is not necessary that one appear at all of them, but you gotta make it to at least one or you're out of it.

Readings will be next Monday and Tuesday, at 7:30 p.m. in Dabney Lounge, and on Wednesday and Thursday, Feb. 24, and 25, at the same time and the same place.

Everybody take notes now. If you want to be in the ASCIT Play third term, you better come out and read for a part now. If you think you're gonna flunk out, that's all right — come out and read anyway: 'cause if you don't flunk out and you didn't read, you will never forgive yourself for missing the opportunity to play a streetcar.

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# SPORTS



BY J. K. EVANS

Much as I hate to admit it, some people think there are other things in the world beside football. These people are of course Wrong Thinkers and will eventually be set straight when the Millennium comes and us football players are raised to our much deserved exalted position of authority above the common rank and file of the everyday basketball-baseball-soccer-etc. player.

However.

At the moment.

I must admit there are too many of them finks who think other things are more important. They have too many votes. So occasionally I have to write about one of those lesser pastimes.

But I do it under duress.

Duress is this girl I met last month at an exchange . . .

Meanwhile . . .

But I digress, as the fellow said.

This week we will discuss basketball shoes.

The first basketball game was played in a barn and the proper shoes were the kind that didn't stick to the floor too much. Otherwise you might get bogged down in a pile of youknowwhat and that would be the end of your basketball career and they would put you in a pine box and carry you away (basketball shoes first) and lay you to rest in forest lawn. For \$149. Cheap.

Later the games moved to nice wooden floors and it was better to stick to the floor, because if you didn't, you might fall down and break your lollipop.

(Blush!)

Anyway, the shoes had to be sticky. First they tried glue. Then they tried horse puke. Then they tried library paste. Then they tried Emko. But none of them worked. It was very sad, and the year after that they died.

It was a lovely funeral, but there weren't enough people there

(Continued on page 6)

## Varsity Hoopsters Edge Biola, 73-72

The Caltech varsity basketball team won a thriller from Biola Saturday night on the home court, 73-72. During the first half, an unusually vociferous and enthusiastic visiting rooting section vied with a small but mighty Tech crowd, and cheered their team to a one-point lead at the half.

The second half saw some inspired calls by one of the refs. A call on three seconds in the key foiled a Biola forward alone in the forecourt, just as his teammates had won possession of the ball and were passing to him.

Later, to even up a call which put Blair out of the game, the inspired ref called exactly the same fifth foul on Biola's no. 33.

Tech built up an impressive three-point lead during the second half, only to see Tucker miss a crucial foul shot. In the last few minutes Biola was too desperate to play the rules, as Tech clung to the one-point gap that was never closed. High scorers were McCreary with 25, Blair with 14, and Holford with 12.

Most faked-out player was Eddie Hsi, who thought he had done something wrong when the ref stopped his blissful dribbling to remove a stray toy balloon descended from the rafters.

## Swimming

In its first meet of the season, the Caltech swim team was defeated by Santa Ana City College 65-29. Although some good initial performances were turned in by Caltech swimmers, in most instances Santa Ana was able to come up with the win.

The only individual win for Tech was Larry Anderson's triumph in the 50-yard freestyle with a 23.6 second effort. The freestyle relay team also won with a time of 3:55. Good times were also produced by Pat Miller in the breast, Rick Touton in the 100 free, and Ted Jenkins in the 200-yard free.

Today the team will meet PCC at 4 p.m. in the PCC pool, then on Saturday Caltech will host a double-dual meet for Cal State at Los Angeles and UCLA.

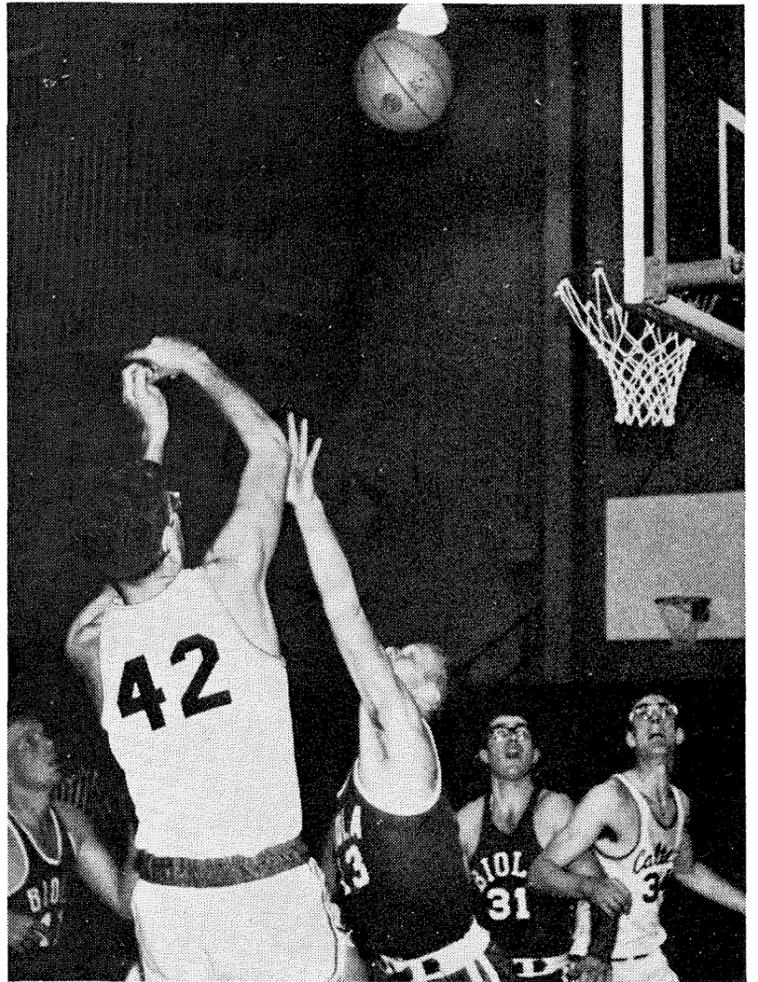
Also Happy

Chinese New Year!

Is Now Year

of the Snake!

According to the National Merit Scholarship Corporation, MIT is the most popular college among high school seniors. Things don't change very much in the passing of one year. MIT is definitely the most popular college among Caltech frosh.



—Kim Gleason

While Max Elbaum's shot heads for the basket, Terry Bruns gains position for the rebound.

## Frosh Return To Their Winning Ways, 88-57

BY LEX ELBONE

In a fierce battle between the men of science and those of religion, the Caltech frosh basketball team triumphed over Biola, 88-57, last Saturday night. Finally realizing their potential, the Beavers completely overwhelmed the opposition; it was a team effort with scoring balance and lots of hustle.

The first half saw the starting team slowly build up an 11-point lead with Max Elbaum leading the rebounders, Jim Stanley the scorers, and Craig McAllister the foulers. At intermission the scoreboard read 41-30, Tech. During the final period, the reserves, led by Les Fishbone at guard (yuk-yuk), demonstrated the team's depth by continually increasing the lead until the final buzzer.

This victory somewhat soothed the frosh after the previous night's loss at Redlands, 90-58. But here the score does not quite tell the story, for the frosh, using Coach Keith Jensen's new one-three-one zone defense, played on even terms with that conference power the entire second half. Sparked by the aggressive

rebounding of Terry Bruns, the frosh really seemed to have come alive, only to be thwarted by the remarkably accurate outside shooting of the Redlands five.

It seems as though the Beavers are on their way to a blazing finish after a trying start.

## Page Whips Fleming In Discobolus

BY JOSE'S MOTH

Exploding with five runs in the first and four runs in the second, Page went on to trounce Fleming 13-9 in a Discobolus softball game played Monday.

The outcome never really was in doubt, since six of the nine starters played on the football team that overwhelmed Ruddock 14-7. The game was decided in the first two innings when the Fleming infield had a little trouble getting warmed up, committing numerous errors.

Tom Resney scored twice in the first two innings while going hitless the entire game. In fact, Page batted around in the first inning and very nearly repeated the act in the second, while retiring the first nine Fleming batters. After the third, Fleming settled down and the last four innings were reasonably well-played, except for occasional lapses on both sides.

Two of the funniest twitches were base-running errors. Fleming's Randy Harslem was surprised to discover Dave Jarvis sitting on third when he tried to move over on a ground ball to first. Then, Page's Bob Weatherwax, used to running in spikes, fell down trying to stop after sprinting to third on a foul pop fly.

Page will defend the trophy against Ruddock in track-and-field this coming week.

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In the year of Mothra, in the second month, on the third day, in the evening time of that day, in the House of Buttock which was in the city of the crown, and likewise the selfsame seat of beneficent and scheissessent Beak-live-for-ever, did two angels sent from Sappho of Mytilene appear unto a certain grog brewer of the House, seeking to quench their enthusiasm. Disguising their Mytilenic accents, they ministered unto him, saying, "shew us the way to someone-or-other in the House of Nonesuch, that we may appear unto him ex machina." The honest grog brewer, perceiving no room in the inn, did lead the angels forth in quest of the Grail or whatever other euphemism is in use by the people of the land.

Having traversed several cubits, and being in the shadow of the Athenasium, the enthusiastic angel-Walkueren did set upon the rosy-cheeked frosh with cries of hojotoho and heiaha. He fled sore afraid, and they pursued, only to be discovered by two more Buttock frosh, namely Alee and the Great Plains Surfer-Mole. These did the angels bid follow them to their chariot, proclaiming their enthusiasm, one did go, and the other did fall by the wayside and repaired to the Great Hall to deliver confused tidings to fellow froshlings and the nobles assembled.

**From the Land of Lesbos**

Meanwhile the spirits of Sappho had placed GPSM in their chariot, and were communing, despite spectators, who stood the cast of a stone away and marveled greatly. One Dungbutt did sneak up and record for all eternity on a plate of silver the events which were taking place.

Then the chariot rose and sped off, pursued by Yorick Fung. The account of GPSM of the events in the great flaming chariot are herein recorded. He spake and said unto the angel, "Although I am possessed of the alpha and the omega, I am not yet in possession of the aleph-null. To consider myself worthy, I must therefore be cleansed."

The angels replied, saying that GPSM was as worthy as a surfer boy without KRLA could get. Whereupon an angel stepped down from the red-hot chariot for a weed, and congress was called into session. Whereupon the remaining angel cried in a large voice, saying "I am the angel of Sappho of Mytilene; therefore get thee behind me."

This proclamation displeased the GPSM, and he departed from the vehicle, only to see the other angel mount up again. Thence he returned again unto the House of Buttock, and all were amazed at his sayings.

NEWS BULLETIN: Chief Justice of the Supreme Court Earl Warren ruled today that poison in coffee is just grounds for divorce.

**Other**

Rain on our fair campus is a wondrous thing, and it brings

**OTA ETAOTEATO**

(Continued from page 5) because they didn't advertise it in the **Herald-Tribune**. Only the people who read the **Tech** went.

Finally they tried foam rubber, but guys kept grabbing it, so that didn't work. Then at long last they decided on Furry Yak Shoots.

So nowadays your shoes don't slip on the floor; that's because they papered it with non-skid.

various wondrous creatures out of hiding. Not the least of these is Gabby Bareskin, who, true to his name, was preparing to run from his cave in a birthday condition, to enjoy the falling manna, when his jolly playmates managed to clothe him in a raincoat, so as not to catch his death. Thus unorthodoxly attired, though to the random night-lit eye not so striking, he circumnavigated the campus, even stopping at the **Winnett Sexchange for a leer or two**.

NEWS BULLETIN: The Vatican announced that it was not improper to kiss a nun, just so long as one did not get in the habit.

# Wrestlers Win Another

BY G. B.

The Caltech wrestling team celebrated Section M night Tuesday by defeating the San Fernando Valley State College wrestling team 24-11. Section M night (I don't want to mention any names) was a rousing success as attested to by one of its members who observed with amazement, "Our section is better represented here than in English."

With the spectator score 49-4 the match began, not on the beautiful blue and orange new

mat but the soggy, grey, old one. The gorgeous hunk of foam rubber (upon which it is rumored, a raw egg may be dropped from any height without breaking, surely a boon to egg-droppers) being brand new must stand for a week or so to cure. It should be ready for next week, which you blood-and-guts fans will appreciate, as red shows up real well.

Back in his usual form, the mighty Olive drew thunderous applause as he strode to the center of the mat and calmly accepted his forfeit victory. Hayamizu, however, was not so fortunate and was pinned by Owens after 36 seconds of the second period.

Faulconer, despite last week's warning, and again shaken by Rabin's amazing ability to last the entire first period, chose up position for the second period.

The second period was then a classic example of how to grind your opponent into the mat. Fortunately, this second period enabled Dave to rest himself a little and when the third period came around, he was able to pull a F-R (Faulconer Reversal), but not quite a F-R-P (Faulconer Reversal Pin), and won 9-1.

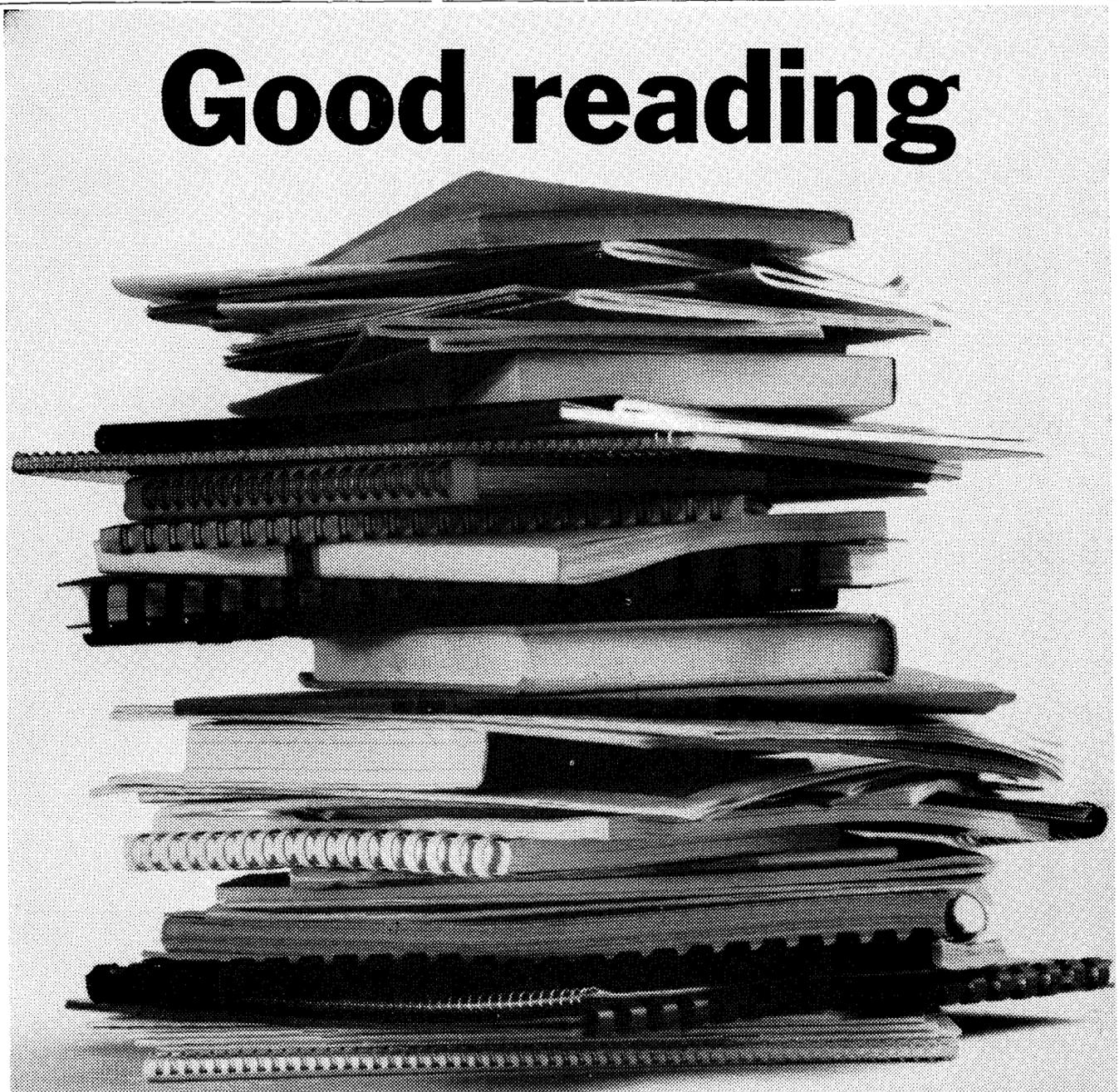
At 167, the feature event this week: Woodhead from Tech versus Wilson from San Fernando. Unfortunately I lack both the words and the ability to describe the action. It was one of the finest examples of wrestling I have ever seen. The moves of both men were executed with the speed and precision befitting UCLA.

Powell, ever the ham, wrestled Camillieri to a 6-2 decision. His acting talent became apparent in the second period as he was awarded a point for Camillieri's choking hold and graphically illustrated the effect of the hold for the benefit of the spectators.

Kampe, wrestling in the heavy-weight class as usual, had little trouble tonight. As you may or may not know, he is growing a little bushy beard and hasn't had a haircut for some time. His opponent, after sizing him up before the match, went to his coach and said, "I won't wrestle him until he talks!" Andy, of course, could not think of anything befitting the situation and remained silent. His opponent left and Andy won by forfeit to bring the final score to Caltech 24, San Fernando Valley 11.

## Next Week In Sports

VARSITY BASKETBALL			
Thur.	Feb. 11	8:15 p.m.	LaVerne at Caltech
Sat.	Feb. 13	8:15 p.m.	Pomona at Pomona
Tues.	Feb. 16	8:15 p.m.	Redlands at Caltech
FROSH BASKETBALL			
Thur.	Feb. 11	6:30 p.m.	LaVerne at Caltech
Sat.	Feb. 13	6:30 p.m.	Pomona at Pomona
Tues.	Feb. 16	6:30 p.m.	Redlands at Caltech
VARSITY TENNIS			
Thur.	Feb. 11	3:00 p.m.	Cal Poly (Pomona) at Caltech
Sat.	Feb. 13	2:00 p.m.	Redlands at Caltech
FROSH TENNIS			
Sat.	Feb. 13	2:00 p.m.	Redlands at Redlands
VARSITY SWIMMING			
Thur.	Feb. 11	4:00 p.m.	Paasdena City College at P.C.C.
Sat.	Feb. 13	2:00 p.m.	L. A. State and UCLA at Caltech
VARSITY WRESTLING			
Wed.	Feb. 17	7:30 p.m.	L. A. State at L. A. State



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

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

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## ON CAMPUS INTERVIEWS: February 12, 1965

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