

## Draft, Deferment Is Forum Subject Bradbury Discusses Need Of Creativity in Writing

Dr. C. W. McCormick, associate professor of civil engineering and member of a local draft board, spoke Wednesday, January 30, to the YMCA Dinner Forum in Chandler. Distracted by the noise of the football players' dinner in the next room, McCormick explained the series of deferments and exemptions available for those who otherwise may be drafted.

McCormick emphasized that before age 26 one of two things must happen: an individual is either drafted or he has a deferment. McCormick noted that there were no two ways about it — one of the two would occur. In answer to those who stated that their home draft board quota was filled by volunteers, McCormick added that quotas were adjusted so that the draft age is about the same throughout the country.

McCormick also strongly emphasized the point that all deferment or other actions are entirely at the prerogative of the individual. On its own initiative, the board will take no actions except to draft an individual. The actions of deferment must be repeated by the individual each year.

During the talk and in the question period and discussion periods afterwards, McCormick discussed the various types of deferments. Once an individual is deferred to age 26 (his twenty-sixth birthday), under the present policies, he will not be drafted.

The most important student deferment is the 2S student deferment. McCormick said that "the word has filtered down" that students are to be treated easily in general. The Selective Service Qualification Test, according to McCormick, is no longer necessary nor even important for deferments. Thus, students who are reasonably passing can, in general, expect to receive a 2S deferment.

Other deferments are 1D, for members of reserves, 1S, sta-

### Chinese Scrolls Displayed In Dabney Lounge

A series of 26 Chinese scroll paintings has been put on display in Dabney until February 15. They are the works of the staff and students of New Asia College, Hong Kong.

The exhibition and distribution of the works is organized by the World University Service, as a contribution through cultural interchange to mutual understanding between East and West.

A wide variety of styles and compositions is found in the collection. Traditional Chinese painting emphasizes the use of brush and ink and a mastery of calligraphy is necessary for this type of artwork. Six of the scrolls are done by faculty members, the rest by students of the Fine Arts Department.

Subjects of the scrolls include "Lotus," "Bamboo in Ink," "Peaks Rising One Upon Another," "Hermit Under the Pine," "Pine Tree and Bird," "Orchids on the Rock," and "A Cataract."

tutory student deferment to the end of the academic year; 4F, not qualified for mental, moral, or physical reasons; 1Y, not qualified physically except in case of war or national emergency (a new classification); and 3A, hardship or married with child.

2A is the occupational deferment for jobs in the national health, safety, or welfare. An individual can usually get an occupational deferment if he is working under a defense contract. McCormick added that most boards would agree that teaching would qualify here, but it is still a discriminatory matter with the board.

McCormick stated, with regard to 2A deferments, that one registrant's company wrote to the board that the individual was a critical member of the "Skybolt" project.

Deferments for conscientious objectors are 1AO, non-combat, and 1O refuse to serve. McCormick stated that he was willing to grant 1AO's with little question, but considered deeply before granting a 1O. For conscientious objectors, there is a special hearing officer who assists the board in reaching a decision.

The Federal Government never requests deferments, but often Peace Corp members or foreign service employees are granted them. McCormick emphasized that Peace Corps service does

(Continued on page 3)



Ray Bradbury, science fiction author, is shown in a portrait. Bradbury spoke on campus yesterday.

Science fiction writer Ray Bradbury spoke yesterday in Dabney Lounge on "Creativity in the Space Age." The talk, given during the 11:00 assembly hour, was presented by the ASCIT-Alumni Assembly Committee.

Bradbury began his talk by giving a little background on his life and career. He first became interested, he said, in science fiction when he began reading *Amazing Stories* when he was about 7. He then moved up to Buck Rodgers when he was 8 and began writing science fiction at 12. He continued this interest, and it gave him quite a reputation in high school as the girls didn't seem to appreciate the fact that he was writing 25 years ahead of time. Now, he says, with the advances in the space age, he likes to say "I told you so." He admits he's not modest, preferring to be a "method sadist."

#### A Blasphemous Age

In explaining his ideas on this age, Bradbury stated that this is the most dynamic and blasphemous age in history, dynamic because of the tremendous pace at which science is progressing, and blasphemous because we are working against God in the light of activities of 100 years ago. A century ago people would not have dared to tamper with death, old age, or other things which science is constantly changing.

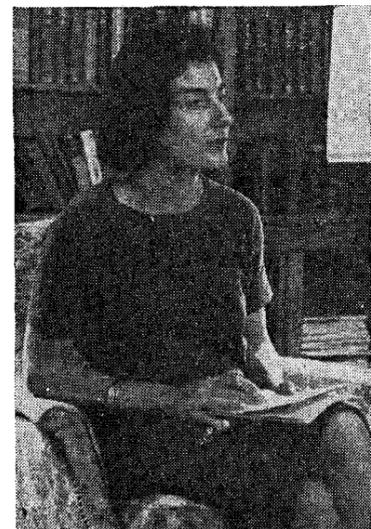
Bradbury mentioned Herman Melville and Jules Verne as the two "most American" writers in history, because they both dealt with the blasphemy he mentioned. Melville, however,

(Continued on page 3)

## Reporter for 'Realites' Blacker Makes New Record In Reduction

BY RODGER WHITLOCK

After spending last Saturday night at a French grad student's party, Sunday with various faculty members, Monday at the Feynman lecture, and lunch with the great man (Exhausteeng! according to Feynman) Miss Danielle Hunnebelle, a reporter for the French magazine *Realites*, arrived at the Athenaeum Library Monday afternoon to be interviewed by the staff of the *California Tech*. The result was more an interview of the *Tech* staff by Mademoiselle Hunnebelle. For 45 minutes, we were asked questions on all facets of



—Photo by Ken Brown

Danielle Hunnebelle pauses in her interrogation of *Tech* staff. She continued after a "tres bien."

students life.

Firstly, she asked about the Student Houses, whether living on campus was usual, how students are assigned to the Houses, etc. She was rather amazed by both the number of students that live on campus and the fact that students can live off campus. After several collisions with the language barrier (mitigated as it was by her command of English), we finally explained the methods of our acceptance by Caltech. She found the full faculty member interviews of prospective students intriguing, and asked about other contacts between students and faculty members. Here again she was interested in the ease with which such contacts can be made: frosh honors, dinner guests, or just walking into a faculty office. Particularly interesting to her was Richard Karp's description of conferring with Ray Owen on the breeding of paradise fish. At first she asked, "For eating," but finally got the situation right, "Oh, for marriage!"

#### Danielle on Tech

After the 45 minutes, we asked her a few questions about her impressions of Caltech. Several things had impressed her. She felt that the Institute was one of the most peaceful places she had ever been, comparing it to the village of Assisi and to a Buddhist monastery she had visited in Bangkok several months ago. Particularly noteworthy to her in this respect,

(Continued on page 3)

BY KRIS DAVIDSON

Eminent physicist Dr. R. P. Feynman acted as Judge and Grand Marshall last Saturday, as a team of six Techmen set an official record of 11:38 for reducing a standard class A upright piano for passage through a 20-cm. aperture according to R.S.G. (Reduction Study Group) rules. Records, official and unofficial, were also set for classes B and C in the upright division. The events took place before a small multitude in Blacker Courtyard, from 2 to 4 p.m., under the auspices of the R.S.G. The pianos were old and had no musical capabilities.

Feynman, in his opening remarks, expressed confidence in "that unique combination of brains and brawn which characterizes the Caltech student." This confidence was soon justified as the "A" team conducted a demonstration on a substandard piano, formerly owned (and partially reduced) by Mr. J. Durante of Beverly Hills. Experienced Captain Pete Mazur, dextrous Action Man John Sorvari, lightning-swift Pin Man Steve Teigland, skillful Axe Man Bruce Carter, hard-swinging Mauler Joe Bocklage, and ace-in-the-hole Orifice Officer Ed Robertson demolished the piano (which lacked an Action, and hence was substandard) and passed it through the eight-inch aperture for an unofficial class C record

(Continued on page 5)

## Notices

### PHYSICS CLUB

Dr. Rudolf Mossbauer will address the Physics Club at 8 p.m. tonight at Dr. Lauritsen's home. His topic will be "Remarks on the Physics of a Spurious Effect."

### FROSH DINER'S CLUB

Dr. Robert Kouach of JPL and Caltech's Seismological Lab will speak on the "Moon Probe Seismograph" at the Frosh Diners Club, 6:30 p.m., Monday, February 11.

### BIOSTRATIGRAPHY SEMINAR

This week's biostratigraphy seminar, held Tuesday night at 8 p.m., was on "Paleozoic Atrypoid, Retzoid & Athyroid Brachiopods." Earlier in the afternoon the Service League held another well baby conference. Unfortunately, James Burkett Hartle, having passed his last doctorate examination, has no plans for another in the near future.

### CANDIDATE'S PUBLICITY

Candidate's statements for ASCIT offices, BOC secretary, *Tech* editor, and IHC president are due in the *Tech* office at 9 p.m. Monday evening. They must be double-spaced, typed and on a 60 space line. For length and other requirements, contact the *Tech* editors.

Candidate's pictures for next week's *Tech* will be taken at 9:30 p.m. Monday in the *Tech* office. All candidates should be present at this time.

## Editorials

## The Time Is Here

There is a new device on campus that probably all students are already familiar with. As a hint, it is cylindrical and has a note on it reading "Sloan Automatic Valve—efficient and sanitary—do not touch."

Now that we have gotten someone curious—and Rabinowitz mad—let us proceed to the subject at hand: ASCIT elections. It turns out that, as usual, our pomposity on this voluminous subject has not been completely exhausted (who said we weren't cultured?).

First, and definitely most important, there are still a number of blanks on the ballot and several offices that have only one candidate. As an example, at the time of this writing the position of IHC president (one that will probably have a BOD seat) has no candidates.

To put it simply, there is absolutely no reason why this should be so. There are enough qualified candidates on campus to contest all offices—as evidenced by the fact that with the same size student body many years ago all offices were contested. We have found in our year as editors (now being highly experienced master journalist) that the "not enough time" excuse really does not apply.

Second, and also important, are some of the amendments to the bylaws that are printed in this issue. Three proposals are of interest. First is the proposal to formally recognize the Assembly Committee.

We would like to point out (not strongly—that would only serve to get the proposal passed with a larger majority) that the proposal suggests that the Assembly Committee be formed and does not even make the Activities Chairman a member of the committee! Perhaps an assembly is not an activity, perhaps the BOD is afraid to give the Activities Chairman a few duties to go along with his office. At any rate, this appears to us to be something that should be included in the amendment if it is to be adopted.

The proposal to raise the **Tech** editor's salary is also not unreasonable. Not only does this give the **Tech** editor the same remuneration as similar offices, it raises the salary from about 12 cents an hour to about 18 cents an hour. Although this may be an unprecedented raise, somehow it doesn't seem out of line. It may even assist to get candidates for the office.

We have already noted our support for putting the IHC president on the BOD.

To those ever-faithful readers and chronic complainers who have made it to the end of this editorial, may we suggest that you see Steve Green in Fleming if you are interested in running for an ASCIT office?

—Richard Karp  
J. C. Simpson

## Stern Talks To Freshmen

Professor Alfred Stern spoke to the Frosh Diners' Club on "History in the Light of Philosophy" based on his new book "Philosophy of History and the Problem of Values," Monday night in Chandler.

Stern explained that history can be defined in two ways. One is sequence of events; the other is the narration and explanation of events. History that happened exists only as it is narrated. History as a reality no longer exists. Philosophy, Stern said, is interested in the whole field of reality. Therefore the philosophy of

history is the attempt to find historical reality. As an example, he gave the case of someone like himself who fought in both world wars and would have a different interpretation of the reality of those wars than does the documentation. Historical knowledge is based on documents.

History can have general laws that explain historical events from preceding events, but these "laws" cannot predict future events. Science must be free from value while history must be evaluated by individuals who have definite opinions.

PROPOSED  
BYLAW  
REVISIONS

The following by-laws amendments have been approved for inclusion on the February 19 ballots:

I. A proposal to place the IHC chairman on the BOD, necessitating the following by-laws changes:

**Article IV, Section 1:** General officers — Insert "an Interhouse Committee Chairman," between "a Social Chairman," and "and a representative at large."

**Article IV, Section 9:** Insert the following section 9 and re-number the following sections accordingly — "Duties of the IHC Chairman. The IHC Chairman shall be a member of the Board of Directors. He shall call and preside over meetings of the Interhouse Committee. He shall be chairman of the honor point committee. He shall be responsible for liaison between ASCIT and the various House organizations."

**Article VIII, Section 1:** Nominations — Insert "Interhouse Committee Chairman" between "Social Chairman" and "Representative-at-Large."

**Article XII, Section 3:** Honor Point Committee — Insert the IHC Chairman, who shall serve as chairman," between "consisting of" and "the athletic manager."

II. Formal recognition of the Assembly Committee, involving the following addition to the by-laws:

**Article XII add section 6:** Assembly Committee — There shall be an assembly committee whose chairman shall be appointed by the BOD. The other members shall be appointed by the chairman. It shall be the duty of this committee to organize present programs for the 11:00 Assembly Hour.

III. Redistribution of the duties of the old position of Business Manager:

Add to **Article IV, section 5:** Duties of the treasurer — "He shall receive and present to the BOD the mid-term, term, and annual reports of the ASCIT publications. He shall have direct charge of the corporation offices and all corporation property.

IV. Transfer of yell leader section: Re-number **Article IV, Section 10** to **Article XII, Section 5**.

V. Increase the salary of the **California Tech** editor to \$300, making it more nearly equal to the compensation of the **Tech** business manager, **Big T** editor and business manager, and **little t** editor.

**Article XVI, Part A, Section 4:** Replace "Two hundred dollars (\$200.00)" by "three hundred dollars (\$300.00)."

Drugs Sundries Cosmetics Tobaccos  
**CALIFORNIA REXALL  
PHARMACY**  
555 S. Lake SY 2-3156  
Breakfast Lunch Dinner

welcome to the  
**Campus  
Barber Shop**  
in Winnett Center  
all haircuts \$1.75  
**Three Barbers to Serve You**  
8 to 5:30 Monday - Friday  
Paul A. Harmon

## Junior Travel Prize

Causey Relates Travel  
Prize Tour of Europe

**Editor's note: This is the second of two junior travel prize reports. It will be published in two parts, this week and next week.**

BY R. L. CAUSEY

One day in London, and a man sees rain — six weeks, and he hates to leave. But just one day it was — at first — and then off again to Oxford and the High Street traffic jams caused by black-gowned and noisy students drinking champagne even before the test results are made public, quite a change from the blue book blues of some U. S. colleges. Yet Bill Bauer, a former Caltech student who's presently a Marshall Scholar, imparts the sad news: in one Oxford year there have been two suicides. I, the word mangler, probably would suffer from claustrophobia all closed up within a spiked wall surrounded by busy motorcycle infested streets, not to mention the ghastly racket of European compact cars.

But Bill was more than nice; he acted as private guide and bitter buyer. He explained, that in many ways, he prefers the Oxford educational system over that of his former school. At other times I talked with various deformed literature students in Oxford pubs, receiving praise of highly questionable value for my writing.

Finally after about three days I headed off again. This time the destination was Glasgow; or, rather, Rouken Glen, a better place outside the city. The trip was uneventful except for a pouring rain and a faceless wind across the moors, and an almost-missed connection with the tricky trains of a dying socialized railroad.

**Scottish Experiences**

Fortunately the weather in Scotland was tolerable while I was there, a rather rare event, I understand. My stay was with distant relatives, who showed me, among other things, the birthplace of Bonny Bobby Burns. One's appreciation of this

poet's genius is certainly vastly amplified when he sees where Burns was born. The human desire to sing is easily stifled, but it's inspiring to know that some will sing in any conditions.

After Scotland came more rain and crumbling castles in the Cumberland Lake District. I think that I shall always call Wordsworth the "wet poet" from now on.

Then there was Eire, and the beginning of one of the most unusual experiences of the entire summer. There are three fundamental things to remember about the Irish: they fought the British, they're Catholic, and they've suffered extreme poverty for as long as they can remember.

Because the Americans also fought the British, the Irish are extremely partial to Americans. Because of their Catholicism, which is of a very puritanical variety (except when it comes to Irish whiskey), they have suffered censorship, excess population; and, in general, a kind of repression which has seemed to give them the highest percentage of expatriots among their brightest men to be found in any nation of the modern world. Finally, because of its population problem and the huge rocks in its fields, Eire is one of the very few countries to decrease in population through emigration during the twentieth-century.

**Irish Troubles**

Today Britain and Eire manage to get along with each other rather well; nevertheless, Eire still has its grudges and problems. There is today only a handful of modern buildings in the Republic of Ireland. The Dublin slums of Sean O'Casey fame still exist; and, of course, there are still rocks in the fields. Conditions are improving, but the marriage age is still one of the highest in the Western World, and the population is only now beginning to stabilize.

(Continued on page 5)

Announcing  
**SPECIAL CALTECH  
STUDENT EXCHANGE TICKETS**  
SEE YOUR HOUSE SOCIAL  
CHAIRMAN FOR TICKETS

"Bold...daring..."

—Bosley Crowther, N.Y. Times

"Remarkable... a masterpiece!"

—Philip K. Scheuer, L.A. Times



STARRING

**MONTGOMERY CLIFT**

**SUSANNAH YORK · LARRY PARKS**

**SUSAN KOHNER · EILEEN HERLIE**

FERNAND LEDOUX · DAVID McCALLUM with ROSALIE CRUTCHLEY · DAVID KOSOFF

JOSEPH FURST · ALEXANDER MANGO · LEONARD SACHS

AND CO-STARRING  
**ERIC PORTMAN**

Screenplay by CHARLES KAUFMAN and WOLFGANG REINHARDT · Story by CHARLES KAUFMAN

Directed by JOHN HUSTON · Produced by WOLFGANG REINHARDT · A UNIVERSAL PICTURE

EXCLUSIVELY

Continuous Daily from 7 p.m.

Sat., Sun. & Hol. from 1:30 p.m.

**BEVERLY HILLS  
MUSIC HALL**

Wilshire at Doheny · CR 4-6869

## California Tech

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

## Editors-in-Chief

Richard Karp, J. C. Simpson

## Managing Editor

Alan Hindmarsh

## News Staff

Buzz Bernstein, Clem Chase, Walt Deal, Don Green, Ken Kimball,  
Wally Oliver, Dave Price

## Feature Staff

Rodger Whitlock, editor

Jim Hole, Jon King, Craig Murphy, Gerry Steiner, Rodger Whitlock

## Sports Staff

Tom Latham, Editor

Thor Hanson, Bob Lieberman (Honorary), Dennis McCreary,  
Dave Ollis, Jim Sagawa, Dave Seib

## Business Staff

Lee Molho, Manager

Circulation: Howard Monell

California Tech, 1201 East California Blvd., Pasadena, California.  
Member of The Associated Collegiate Press  
Second Class postage paid at Pasadena, California  
Printed by Bickley Printing Co.  
Represented nationally by National Advertising Service, Inc.  
Subscriptions: \$1.00 per term, \$3.00 per year. Write: Circulation Manager.

## Bradbury

(Continued from page 1)

destroys this blasphemy, personified by the whale, while Jules Verne is really more American, and "plugs into the juice of the universe," by operating his remarkable submarine.

Bradbury also stressed the fact that, in science as much as anything else, the gathering of facts was not enough; imagination was necessary in their application. He said the ability to put ideas into plans and forms of two or three dimensions is most important and because we have this ability we are a robot society: "2 to 3 billion people served by 40 to 50 billion ideas fused into machines." This is the aspect of science fiction in which Bradbury likes to work.

### Methods of Writing

In explaining how he wrote his short stories Bradbury remarked that they were composed to a major extent in an emotional process. He thinks that one should think only before and after the creation, the period of creation itself should be an emotional instinctive process. He said that he presents himself with all the facts necessary, then doesn't think about them, and when he gets an inspiration he sits down in this "emotional period" to compose the story. Bradbury commented that he felt this intuitive process was very important, and that people should learn to be comfortable with it.

He said that his "reason for being alive is to explain this age to you in metaphorical terms," so other people will see what the age means. "The space age means, for me, our chance for immortality" in extending our race forever, he stated, and "the regeneration of mankind to infinity" in conquering the universe.

In an amusing question and answer period, one person pointed out that he had to heat Bradbury's book "Fahrenheit 451" to over 500 degrees before it burned. Bradbury countered by stating that, when writing the story, he had called Caltech to find out but no one could tell him, so he called the fire department for this information.

## Interview

(Continued from page 1)

was the contrast between the rest of L.A. and the campus. (Apparently, Miss Hunnebell has lots more of Caltech to see.)

Another thing that greatly impressed her was the intellectual versatility of the faculty members; having spent seven hours talking with Matt Sands of the physics department and an hour with Professor Feynman, this is understandable. Miss Hunnebell noted that the student body is very obviously all male, considering not only the composition of the audience at Monday's Feynman lecture, but their dress. Apparently, in comparison with students at Stanford and Berkeley, our dress is not very careful; this was attributed to the absence of women on campus, producing an attitude of "really care." She also commented on the large percentage of students who wear spectacles, stating that she felt it to be the highest ratio in the world of wearers to non-wearers.

Miss Hunnebell will be on campus until tomorrow. The article about Caltech will be published in June, in an issue of *Realites* devoted to science. Other articles written by Miss Hunnebell include one on NASA and an interview with Robert J. Oppenheimer.

# Theologians Visit; Hold Discussions

Eight theological students from California seminaries have been living on campus this week, from last Tuesday through tomorrow, in the Student Houses and meeting various members of the Institute community as part of the YMCA theological student visitation program. This event, made possible by the sponsorship of the Danforth Foundation, takes place during second term every other year. The purpose of the visit, according to the committee in charge, is to first give Techmen a chance to meet and discuss questions of interest with some students whose ways of thinking are free from the influence of science.

Schools represented by the visiting theological students are Pacific School of Religion, San Francisco Theological Seminary, Church Divinity School of the Pacific, Hebrew Union College, Southern California School of Theology, and Fuller Theological Seminary. From the Pacific School of Religion is Roger Ridgway, who is staying in Lloyd Ruddle House is hosting

Bill Doty and the Graduate Houses are hosting Burt Mack, both from San Francisco Theological Seminary. Barry Bloom from Church Divinity School of the Pacific is living in Dabney. Ricketts House is host to Barry Kogan from Hebrew Union. Dave Himrod will be living in Fleming, and Ned Bachman in Page House both being from Southern California School of Theology. Don Freeman from Fuller will be staying in Blacker.

The visiting students are participating in a number of sundry activities, both planned and unplanned. Primarily they are eating their meals in the Houses and holding general bull sessions with members of the House. In addition they have been meandering about the campus, seeing many of the laboratories and sitting in on a number of classes and lectures. There was even some serious talk among the visiting students about sitting in on Feynman's sophomore physics lecture today. Highlighting the program this evening

## Bigger Draft

(Continued from page 1)

not satisfy military obligations. As incidental facts, McCormick stated that one must get permission to leave the country from his draft board, and the board will issue a permit if permission is granted. Immigration officers are supposed to check for these permits.

In addition, McCormick mentioned that some employers "claim" that their employees get deferments. No employer can

will be the visit of each of the visiting students to the home of a faculty member for dinner and discussion. Barry Bloom and Burt Mack will be at the home of Dr. Ray Owen; Ned Bachman and Barry Kogan will be the guests of Dr. Jesse Greenstein, Don Freeman and Rodger Ridgway will be guests of Dr. Beach Langston; Dave Himrod will visit Dr. Jon Mathews; and Bill Doty will be at the home of Dr. Robert Wayne.

make such a claim, and it is not necessarily true.

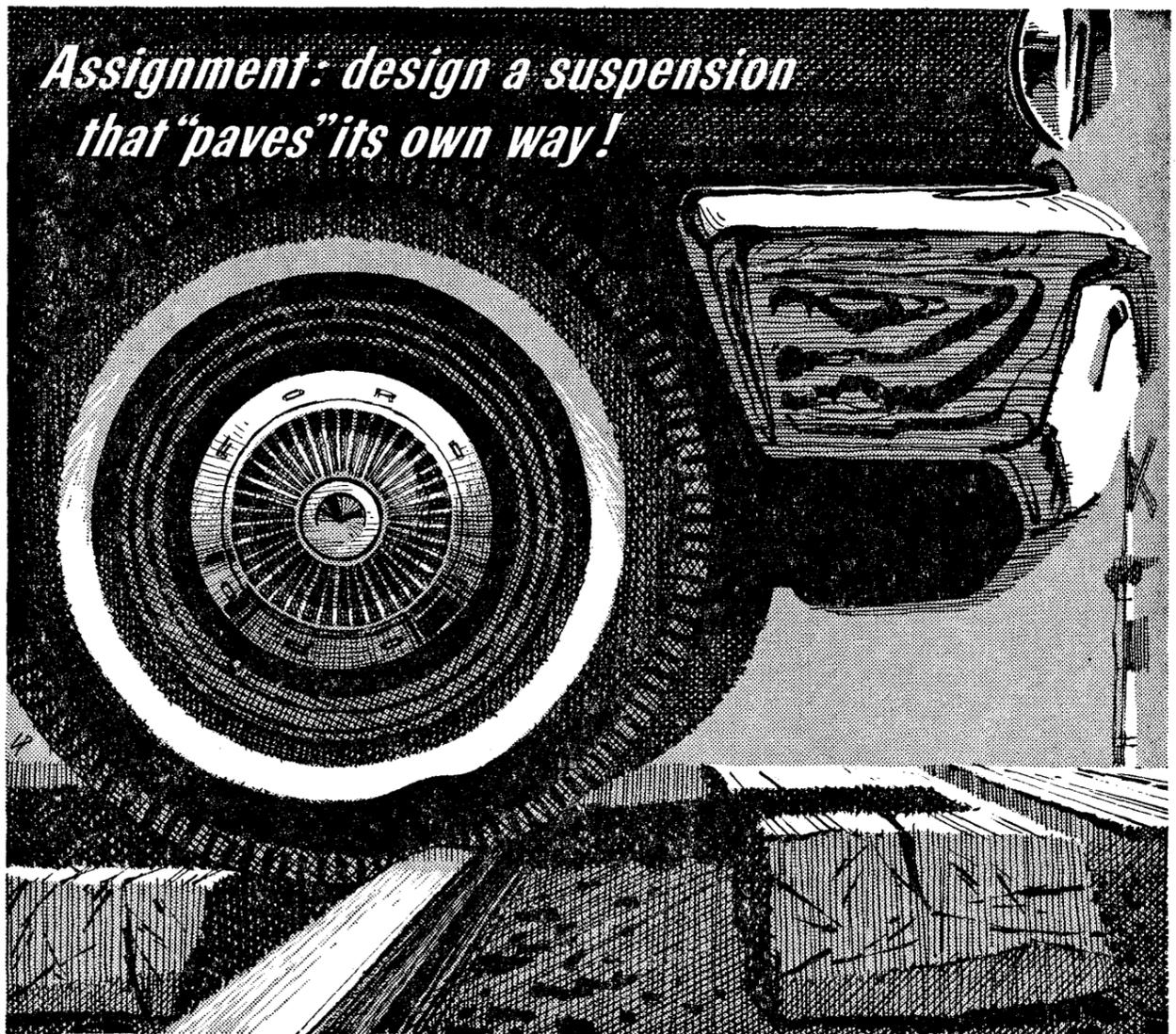
There are always appeal measures if one wishes to appeal a decision. An appeal must be made in writing within ten days of when the classification has been issued. The process of the appeal is that first, the board reviews it and corrects any errors; second, the appeal is forwarded to the State Board of Appeals; and third, if there is any disagreement at step two the individual can carry his appeal to the president.

An individual can request a personal appearance at his draft board which must be granted if requested within ten days of the issuance of a classification. At other times this is the prerogative of the local board.

If an individual is drafted, the chances that he will get a good position (consistent with his education) are, according to McCormick, "very good or very bad;" that is, either someone spots him or he ends up in the infantry.

### UNITARIAN PUBLIC FORUM Fred Warner Neal

Professor of International Relations And Government, Claremont Grad. School  
Speaks On "U. S. FOREIGN POLICY AND THE SOVIET UNION"  
Friday, February 8th - 8 p.m.  
First Unitarian Church, 2936 W. 8th Street  
Donation \$1.00 Question Period

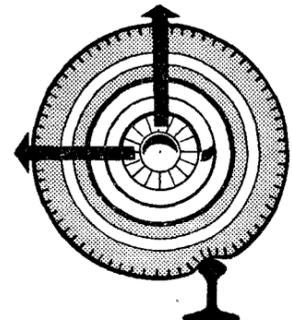


### Result: "Cushion Recoil" provides a dramatically smoother ride in 1963 Ford-built cars

The challenge given Ford engineers was to design suspensions that would permit wheels virtually to roll with the punches—not only in a vertical plane but fore-and-aft as well. Conventional suspension systems provide only a partial solution to road shocks by limiting wheel recoil to an up-and-down motion.

The solution? Exclusive Cushion Recoil suspension design in all Ford-built cars for '63! Cushion Recoil, with cushioning action in a fore-and-aft plane as well as vertical, smoothes the jars and jolts of rough roads, adds to your comfort, safety, and driving pleasure. Even the thump of freeway tar strips is reduced, and on deeply rutted roads you experience better control of the car. Furthermore, your Ford-built car is spared the wear and tear of road-induced vibration.

Another assignment completed—one more example of engineering excellence at Ford and new ideas for the American Road.



**SOAKS UP ROAD SHOCK.** Exclusive Ford Motor Company Cushion Recoil action moves back as well as up for a smoother ride.



MOTOR COMPANY  
The American Road, Dearborn, Michigan

**WHERE ENGINEERING LEADERSHIP BRINGS YOU BETTER-BUILT CARS**

## 'Big T' Meets Major Deadline

The 1963 **Big T** has met its second major deadline on time and has only one more to go, according to Jack McKinley, **Big T** editor. The second deadline included about 67 pages and was last Monday, February 5, at 10 a.m.

There were 28 pages of the Senior section handed in, 10 pages of the Sports section, and about 29 pages of the Houses section. Senior editor is Al Hindmarsh, sports editor is Dave Hewitt, and McKinley is editing the Houses section.

The total number of pages completed is now 128, including 5 introductory pages, 16 faculty pages, 32 activity pages, 12 sports pages, 30 senior pages, 31 House pages, and 2 advertisement pages.

Sixty pages remain to be submitted at the final deadline of March 29. If this deadline is met, the 1963 **Big T** will be issued on time about June 1, 1963, for the first time in many years.

## Strobe Lasers Developed

Detailed observations of many extremely rapid phenomena, such as the damaging collapse of microscopic bubbles against ship propellers, are possible for the first time because of a stroboscopic laser light developed here at Caltech.

Dr. Albert T. Ellis, associate professor of applied mechanics, has converted a laser's random pulses into uniform, repetitive pulses of up to 500,000 a second with power in the beam equivalent to about 20,000 hundred-watt bulbs.

"This will provide enough light for the extremely short exposures necessary in taking motion pictures of very fast events," Ellis explained. "The instrument also will enable us to use the laser pulse, in effect, as a camera shutter for filming at the rate of up to 500,000 frames a second. Exposure times as short as one billionth of a second are possible."

### Dirty Pictures

The resulting film can be pro-

(Continued on page 8)

## WHAT'S NEW IN THE FEBRUARY ATLANTIC?

"How Not to Teach Teachers": The training of American teachers is "unwieldy, slow-witted, bureaucratic . . . a failure," says James D. Koerner in this incisive, critical analysis.

### ALSO

J. B. Priestly: Reminiscences about the author's service in World War I

"Lampedusa in Sicily": An Atlantic Extra by Archibald Colquhoun

Archibald MacLeish: On hatred exhibited in racial conflicts

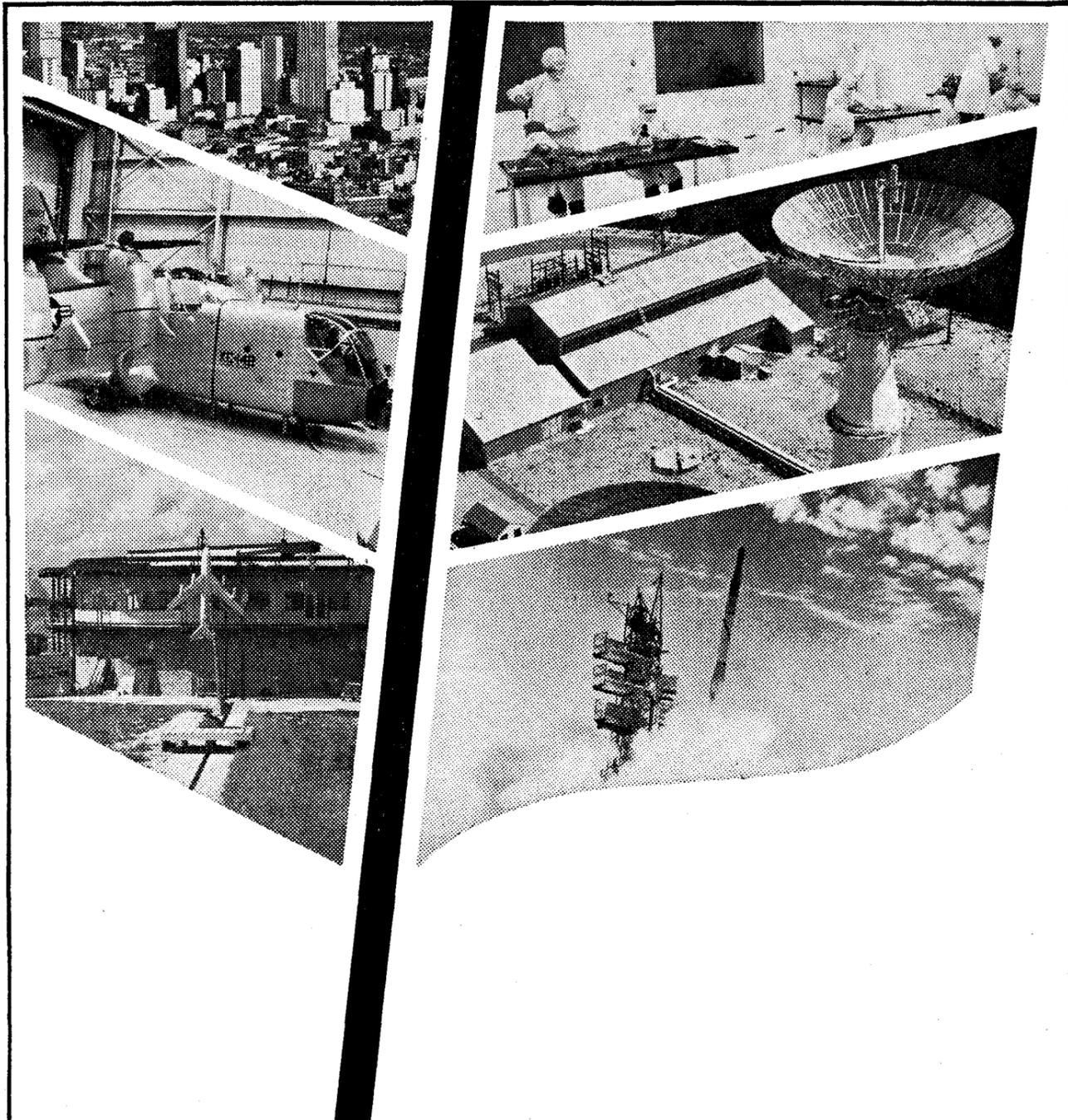
W. D. Snodgrass: A new poem

"The Indiana Dunes and Pressure Politics": William Peoples

The pursuit of excellence is the everyday job of the Atlantic's editors be it in fiction or fact, poetry or prose. In ever-increasing numbers, those in pursuit of academic excellence find in the Atlantic a challenging, entertaining and enlightening companion. Get your copy today.



ON SALE NOW



### TARGET OF OPPORTUNITIES | LING TEMCO VOUGHT

Opportunity for professional advancement, on-the-job orientation and engineering challenge . . . you'll find this and more with Ling-Temco-Vought. From the first you'll work with experienced technical personnel in an engineering climate that encourages imagination and spontaneity. And because LTV is one of the nation's most active participants in almost every phase of the challenging aerospace, communications and military electronics fields, you can determine the type of promising position which will contribute most to your professional growth. ■ Get first-hand information on LTV's projects and products by picking up our brochure at your Placement Office. Then talk to our representative. Ask him about the company's extensive resources, education assistance and liberal company benefits. Ask too, about Dallas—a modern city noted for its warm, sunny climate. Then review LTV's ground-floor growth opportunities for graduates holding degrees in Aeronautical, Mechanical, Industrial, Electrical and Civil Engineering or Math, Physics and Metallurgy. ■ Schedule an appointment with our representative or write College Relations Office, Ling-Temco-Vought, Inc., P. O. Box 5907, Dallas 22, Texas. An equal opportunity employer.

**LTV** LING-TEMCO-VOUGHT, INC.

Dallas Area Divisions: CHANCE VOUGHT CORP./TEMCO ELECTRONICS/TEMCO AEROSYSTEMS/CONTINENTAL ELECTRONICS

CAMPUS INTERVIEWS

FEBRUARY 13, 1963

## Budget Problems?

If you pay over \$20.25 for  
VG1A/2 Ionization Gauge Tubes

contact

# R.W. THOMPSON ASSOCIATES

Telephone

849-6228

Also Representing

R.I.D.L. Pulse Height Analyzers  
CRYOGENICS INC., Instrumentation

## Travel Prize

(Continued from page 2)

The majority of people riding a bus bless themselves every time it passes a church, and the one thing one can be certain to find in every little village is both a church and a pub.

The question should now be immediate. What did a young poet find in Eire? He found that it was the most friendly and honest country of any he visited in Western Europe. The peculiar social and economic conditions of Ireland produce a most unsophisticated and uncosmopolitan atmosphere; the result is a hardy welcome to strangers and the desire to give them the best of what one has. This meant mostly unlimited pints of Guinness stout, but also free rides and a stay in a private home.

But hospitality wasn't all to be found in Ireland in June of 1962. Martello Tower at Sandycove, near Dublin, experienced a revolutionary and permanent revisit of the ghost of James Joyce, as the tower was opened on Bloomsday, 1962, as a Joyce

## Piano Reduction

(Continued from page 1)

of 15:06.4.

After inspection of debris, Feynman examined the second piano and officially announced 68 keys to be in operating order, placing it in class B. At the report of Head Timer Al Huber's official .45 calibre pistol, the impressive "B" team, consisting of Larry Anderson, Al Holm, Guy Jackson, Dave Large, and Dave McCarroll, under the able leadership of Capt. Bob Serafin, began work with a LeMans start. In a dazzling display and co-ordination, this team set a class B record of 22:43.6, including a 10-second penalty for transgressions of bounds.

These momentous occurrences, however, served only as a prelude to the unparalleled class A event. Feynman examined the reduction subject, a Hallet & Davis, and verified the presence of 83 functioning keys. This fact was superbly demonstrated by pianist Rob Gordon (R.S.G.) who delighted the audience with his spirited rendition of a Fugue by an anonymous eighteenth century Lithuanian composer. Meanwhile emcees Ponzy Lu and R. W. Diller interviewed selected "A" team members with results which should not be dwelled upon here.

At this point the proceedings were only slightly marred by the presence of a very small group of anti-reduction pickets, including two notorious liberal agitators.

The reducers took their places and began the reduction accompanied by Rubinstein's Chopin from speakers in the balconies above. The Action was taken out immediately, and then they attacked the sounding board. The fracturing of the frame was trivial, and the last key flew through the aperture in 11:23, which, with a fifteen-second penalty, and after determination by Feynman of only 0.37 kg. of debris not passed through the aperture, resulted in an official record of 11:38.1.

The best-known previous record, an unofficial 14:03 set by Darby College of Technology, was achieved only through use of an oversized aperture and possibly a substandard piano and illegal tools.

Difficulties with rules are soon to be ended, since the Reduction Study Group has announced plans to distribute copies of the upright division Piano Reduction Rules throughout the nation in the next few weeks. Meanwhile, those interested may contact the R.S.G. through its headquarters, now located in Blacker House.

Museum. Needless to say, the funds for opening the museum were not raised by contented Irishmen. The happy culprits were John Huston, Sean O'Casey and T. S. Eliot. Old washing women of Dublin felt quite a shock and even the young couple who gave me a lift to the tower declined to look inside. As **Newsweek International** reported on July 2, 1962, "It would have amused him (Joyce) to hear that just before the fanfare on Bloomsday, 1962, Irish censors banned 24 books."

### Controversial Play

In spite of all the fuss over the museum, even more controversy arose over a stage adaptation of "Ulysses" called "Bloomsday," which was presented in the Eblana Theatre, Dublin, a theater which is characteristically in the basement of the only really modern building in Dublin, the new bus station. For a few days, at any rate, the Pearl Bar, the chrome-plated pub of **Irish Times** writers, buzzed as much about "Bloomsday" as the Common Market and the forthcoming Irish Derby.

Thus Ireland in 1962 was an active country, but not nearly as active as England, so naturally I took off first for Wales.

But South Wales, where I was, is mostly full of clouds and

machines, and therefore not too interesting. I did learn from an acquaintance who runs a "chemist shop," that modern, American-type super-drugstores are now beginning to be found in Cardiff. These of course, require a change in shopping habits for the mothers who are accustomed to leaving the little ones in their "prams" right out on the "pavement" in front of the various specialized shops. The latter change, of course, will eventually necessitate a mild sociological revolution, since high-speed, free-suspended, balloon tire prams will cease to be a status symbol in the limbo of neglect. Perhaps this is for the best, however, for it will probably decrease the high rate of baby snatching.

Interestingly enough, it was in the Cardiff Y — an ancient soggy building — where I met the first of the many African students I was eventually to encounter in Britain. These, like the others, were studying on government scholarships, were from Ghana and Nigeria, and were interested in economics and political science (they quizzed me on American history and government to the very end of my mind's resources). Also like most of the others I was to meet,

(Continued on page 8)

## From Other Campuses

by Richard Karp

Last week, there was a report here about the action that the administration of Stanford University took when it decided that the ASSU (Associated Students of Stanford University) could not take stands on controversial issues. The action taken was that the university must decide, in advance, that the stand would be acceptable.

There still has been no definite punitive action or anything else done by the Stanford administration. The president of the University wrote that "Student government at Stanford operates under a Constitution which is approved by the President of the University and the Board of Trustees. This Constitution provides for a legislature which exercises its jurisdiction over all student organizations... subject to the regulations of the University'."

The president feels that this is sufficient support. In the same issue, however, there is a report by the student legislature. The legislature voted 15-4 to support the "right of any group of students, properly identifying them-

selves, to speak out on public issues." The impasse continues.

### Let's Go Gang!

In case someone is interested, here are the latest activities of ex-etaoin shrdlu award winner, the **Tiger Rag** of Wasco Union High School. Here is the editorial reprinted verbatim:

"The results are in. Student opinions have been stated in a democratic manner. We've thought, we've contemplated, we've reasoned. We've done our best to give an honest evaluation of our school.

"But, are we really going to see some changes made at Wasco High? Are traditions going to be cast aside in order to bring in needed improvements? Will some toes be stepped on in the process of improving our school program?

"Certainly these things are to be expected. But are they going to stand in the way of essential changes?"

C'mon gang, let's clean the campus.

Also in the same paper is a (Continued on page 8)

We're looking forward to meeting you



We'll be on the campus on the dates listed below, ready to give engineering and science seniors information on space-age careers in a dynamic industry.

If you are looking for a company offering assignments on programs of unique interest and career potential, you'll be interested in the advantages Boeing can offer you.

Boeing, for instance, is a major contractor on such advanced programs as the Saturn S-IC first-stage rocket booster, the X-20 Dyna-Soar manned space glider, the solid-fuel Minuteman ICBM, and the Bomarc defense missile system. Boeing is also the world's foremost designer and builder of multi-jet aircraft, including the eight-jet B-52H missile bomber, the KC-135 tanker-transport, the C-135 cargo-jet, and the famous Boeing 707, 720 and 727 jetliners. In addition, Boeing's Vertol Division is one of America's leading designers and builders of helicopters.

Research projects at Boeing are under way in such advanced fields as celestial mechanics, solid state physics, nuclear and plasma physics, flight sciences, space flight and propulsion.

Expanding Boeing programs offer exceptional opportunities to holders of B.S., M.S. and Ph.D. degrees in aeronautical, mechanical, civil, electrical-electronic and industrial engineering, and in engineering mechanics, engineering physics as well as in mathematics and physics. Assignments are available in Washington, Pennsylvania, Kansas, Louisiana, Alabama, California and Florida.

You'll work in a small group where individual ability and initiative get plenty of visibility. You'll enjoy many other advantages, including an opportunity to take graduate studies at company expense to help you get ahead faster.

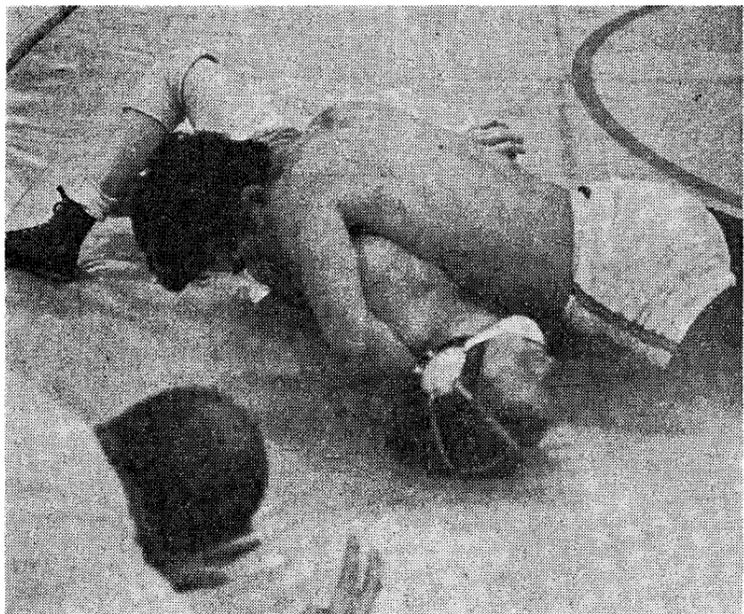
Drop in to your Placement Office and arrange for an interview. We're looking forward to meeting you!

Wednesday through Friday morning — February 13, 14 and 15

**BOEING**  
An equal opportunity employer

Divisions: Aero-Space • Military Aircraft Systems • Transport • Vertol  
Industrial Products • also Boeing Scientific Research Laboratories

# SPORTS



—Photo by Ken Brown

Akira Yoshida tightens a pin hold in match with Long Beach J. V.

## Wrestlers Lose to Long Beach State J. V.

In their second match of the season, the Caltech wrestling team was defeated by a strong Long Beach State J. V. team 24-11. The Long Beach team brought only 8 men, and was therefore forced to wrestle some of them twice in this semi-official match. Greater experience and conditioning more than compensated for Long Beach's manpower disadvantage.

Akira Yoshida, Andy Kampe, and John Letcher scored the 11 Caltech points. Yoshida controlled his man during the first period, and pinned him with half a minute left in the second. Kampe and Letcher both wrestled Salt Boggs of Long Beach. Kampe won 9-3, and Letcher 5-3. Co-captains Tom Latham and

Doc Speir both lost to W. H. Butler, Latham first 10-9, and then Speir 11-10. Dave Falconer was ahead of his opponent at the end of the first period, but lost 17-6 as the Long Beach wrestler piled up points on predicaments. Frank Rhame held the score in his match even until he was pinned in the last half minute. Dick McGehee and Larry Wolfson were also pinned. Wrestling exhibition bouts were Walt Paciorek, Dan Paxton, and Ken Kosai, who also lost.

Caltech's weakest point was conditioning. However, the wrestlers are determined to remedy this before their next match which is with Claremont Harvey Mudd.

## Conference Leaders Down Caltech

BY DENNIS McCREARY

First place Whittier and second place Occidental easily dumped the Beaver hoopsters in two home games last week.

In winning Saturday's night's contest, 99-66, the Whittier Poets put on a demonstration of speed and shooting skill which showed why they are the league leaders at present. Whittier's speed was impressive as their guards stole the ball on several occasions and easily scored on the fast break. Also, the Poet's Steve Hayes showed why he is one of the league's top scorers as he hit seven out of eight shots for 14 points in the first ten minutes of the game. He helped the Poets run up a large lead, so that the

## Tech Swimmers Defend Crown

Ever since the beginning of second term the waters of Alumni Pool have been churning as Caltech swimming teams prepare for the 1963 season. The turn-outs have been large and the workouts performed with enthusiasm as last year's SCIAAC champions prepare to defend their title in May against improved conference opponents. Leading the returnees from last year's squad are seniors Jim Shaw and Pat Manning, and Juniors Tom Crocker, Duygu Demirlioglu, Elliot Harry, Dave Lambert, Mike McCammon, Dave Seib, and Art Turner. Up from last year's frosh team are Ted Jenkins, Ken Kunen, Pete Ryan, Jerry Nelson, Mel Stephens Warren Peascoe, and I Lok Chang. The team will sorely miss the services of ace sprinter Bruce Chesbro, who will leave school during third term to go to Europe. The return to action of Junior George McBean and Senior Alan Huber, who are currently recovering from assorted ills, should greatly strengthen the team.

The freshman team has also enjoyed a large and enthusiastic turn out. Particularly impressive to this date have been Larry

(Continued on Page 7)

Whittier coach took the first string out of the game and put in the second string. The Poets led at halftime, 47-27.

In the second half the Whittier coach put his first string back in the game. This time Hayes' shooting wasn't quite as hot as it was the first half, but he still managed to pick up five more baskets for a game total of 24 points. Although on the surface it would seem to appear that the Techmen didn't play very well, actually they played a pretty good game. Their only problem was that they had the ball stolen by the Poets on too many occasions. This gave Whittier quite an advantage as they got off many more shots than the Techmen and cashed in on a lot of them. The shots the Techmen did manage to get off they made good as they hit on 47% of their attempts. High scorer for Caltech was Joe Weis, who made 12 out of 18 shots from the field and hit two free-throws to bring his game total to 26 points. The other high scoring Techman was Dick Burgess who got 17 points.

### Oxy Game

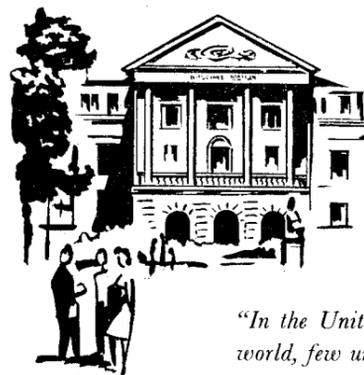
The Oxy Tigers played a different style of ball from Whittier. Although they used a fast break, they didn't have quite the speed that Whittier had. And where Whittier likes to shoot from outside, the Tigers liked to drive in and shot from in close, especially since they have big 6' 10½" center Doug Willsie

who can grab just about any rebound that is not too far out of his reach. Willsie was also a threat from in close as he towers above defenders and shoots a jump shot or hook with either hand. For the last two years he has consistently been one of the top percentage shooters in the league, averaging over 50% last year. Against Caltech Willsie had a field day as he scored 20 points and pulled down numerous rebounds. The first half of the game Oxy ran up an 18 point lead as the Techmen found it hard to hold onto the ball and lost it to Oxy on several occasions.

In the second half the Techmen regained some of their composure and showed the kind of ball they are capable of playing. This time the Tigers only outscored the Beavers by two points, a great improvement over the first half. For both halves the Beavers shooting percentage was around 50% so that it was the stolen balls which determined the outcome of the game. For the Beavers, Joe Weis was the high point man with 18. He currently has an 18 point average in league play and if he is not the top, at least he is very close to being the leagues top scorer.

Coming league action sees Caltech at Redlands on Feb. 8, and Caltech at Whittier on Feb. 12. In a non-league action, the Beavers host UCR on Feb. 9. All game times are at 8:00 p.m. with the Frosh preliminary at 6:30.

make the most  
of your summer



AT  
THE  
UNIVERSITY  
OF  
WISCONSIN

"In the United States, and indeed the world, few universities rank as educational institutions of outstanding achievement and influence. The University of Wisconsin is one of these."

- advance your credit standing at one of the most distinguished universities in the United States
- choose from among 8 sessions, 60 institutes, and 600 courses in 80 departments
- combine lakeshore living with a full range of academic offerings and leisure-time learning activities

Dean L. H. Adolfsen, Extension Building, Madison 6, Wisconsin: I am interested in the 1963 summer program at Madison, so

- Please send me your 1963 bulletins on summer study, including course catalogs and guides to student services and accommodations.
- I can't come to the campus this summer, so please send me your catalog describing Wisconsin's famous correspondence instruction program with more than 400 learn-at-home courses in 50 fields of study.
- Please send me any special information on offerings in:

1963 SUMMER SESSIONS  
THE UNIVERSITY OF WISCONSIN  
at Madison on Lake Mendota

Engineers & Scientists

## Discuss Current Openings with RAYTHEON

### CAMPUS INTERVIEWS

February 22, 1963

See your placement director now to  
arrange an interview with the Raytheon representative.

Raytheon offers challenging assignments for BS and MS candidates in EE, ME, Mathematics and Physics. Openings are in the areas of:

**RADAR, INFRARED, MISSILE & SPACE SYSTEMS, COMMUNICATIONS & DATA PROCESSING,  
SOLID STATE, SONAR, ELECTRON TUBE & COMPONENTS TECHNOLOGY,  
MICROWAVE ELECTRONICS, MANUFACTURING & FIELD SERVICE ENGINEERING**

Facilities are located in New England, California and Tennessee. If an interview is not convenient on above date, forward your resume to Mr. G. W. Lewis, Manager of College Relations, Raytheon Company, Lexington 73, Massachusetts.



An Equal Opportunity Employer

# Ricketts Wins Football Title; Lloyd Leads Trophy Competition

As expected Ricketts won the football crown and nearly doubled their point total in the Interhouse Trophy competition to move into second place. Lloyd House retained its first place position in the trophy race by taking a third in the football.

Ricketts played Ruddock a week ago Tuesday and won 20-12. Ruddock's defense played exceptionally well against the Scurves, holding them to their lowest score of the season. Ruddock's offense also deserves mention for scoring two touchdowns against a Ricketts' defense which had allowed only three other touchdowns this season. Ruddock took fourth place.

On the last day of season, Fleming took a close game from Page, 19-13. Playing without team leader Bob Christie, Fleming trailed cellar-dwelling Page at the half, 13-7. The Flems scored in the third quarter on a long drive to tie the score and won the game via a long pass from Roger Korus to Don Green.

Blacker House played Dabney

on Wednesday and lost 12-7. The Darbs captured fifth place, as Blacker took sixth.

The final interhouse football standings are:

	Won	Lost	Tie
Ricketts	6	0	0
Fleming	5	1	0
Lloyd	3	2	1
Ruddock	3	3	0
Dabney	2	4	0
Blacker	1	5	0
Page	0	5	1

Interhouse track competition follows closely on the heels of football, the preliminaries in some of the track events were held yesterday. Today the field events are scheduled and on Friday the finals of the track events take place.

Interhouse trophy competition:

	Trophy Points
Lloyd	57
Ricketts	49½
Fleming	42
Ruddock	30
Blacker	28½
Page	27
Dabney	18

Wherever you go you look better in  
-ARROW-

After you're married awhile, they say, you begin to look alike. Why wait?

## Dabney, Page Tie Discobolus Football

Dabney tied Page in Discobolus football Sunday afternoon, 13-13, to keep possession of the Discobolus trophy. The first half was dominated by Page as the Dabney offense proved totally ineffectual. Jerry Thomas at center caught a series of short passes from John Mowrey to spark the Page offensive drive. Both Page touchdowns were made on running plays with Mowrey carrying.

Dabney was held at bay until the fourth quarter by outstanding defensive play on the part of Lee Myers at linebacker and Tom Resney at safety. In the last quarter, Dave Barker finally completed a long pass to Bob Scott in the end zone for the first Darb touchdown. Then with only minutes left the Green Men came roaring back behind Barker's running to set up a short touchdown toss to Jerry Gowen in the left flat.

The standings now are:

House	Trophy Points
Dabney	11
Lloyd	11
Ruddock	10
Blacker	9
Ricketts	6
Fleming	2
Page	3

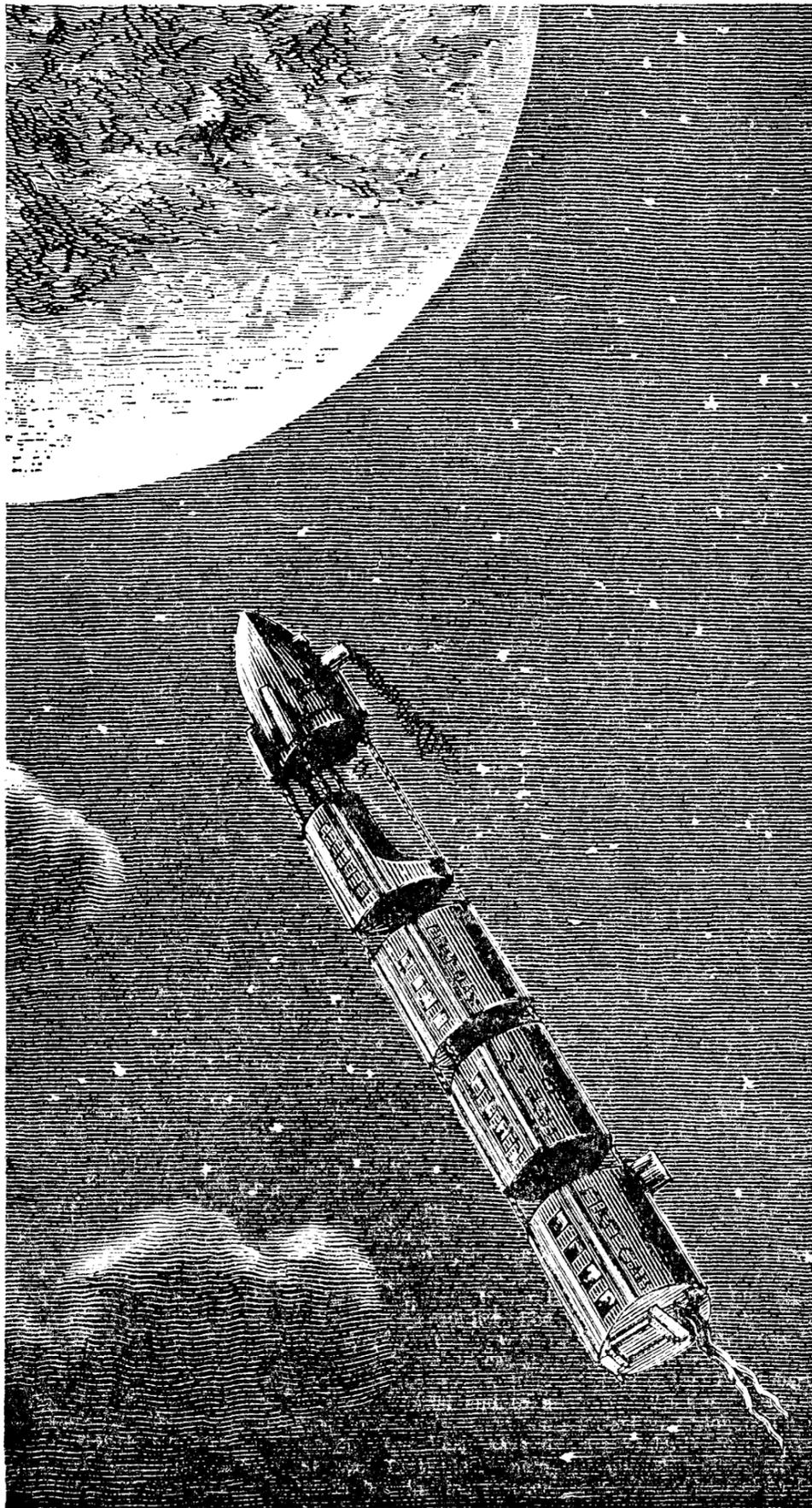
## More Swimming

(Continued from page 6)

Andersen, John Walter, Bill Owens, Pat Miller, and Steve Deicheleemann. In addition to several good individual performers there is a great deal of depth which should combine to make this year's frosh team one of the finest in several seasons.

Several members of the squad will participate in a developmental meet this weekend in Beverly Hills. Intercollegiate competition will begin Feb. 15 when Tech meets El Camino and PCC at PCC. The squad will have its first chance to appraise league competition during the Conference relays on March 2.

**Charmack the Magician**  
P. O. Box 118  
New York 9, New York

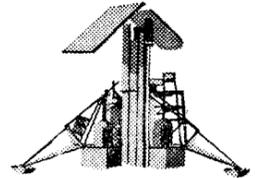


ELECTRONICS  
ENGINEERS  
& PHYSICISTS:

**If space  
is your future,  
your career  
is with Hughes**

IN ASTROSPACE  
IN AEROSPACE  
IN TERRASPACE  
IN HYDROSPACE

As far back as 1890, Jules Verne visualized excursion trains to the moon. Today — 73 years later — Hughes offers you the opportunity to play an important part in man's actual conquest of space.



Help us soft-land the SURVEYOR on the moon — or work with us on exciting advanced projects such as:  
TFX(N)—Guided Missile System  
MMRBM—Mobile Mid-Range Ballistic Missile (Integration, Assembly & Checkout)  
SYNCOM—Communications satellite  
BAMBI  
ARPAT  
ANTI-MISSILE DEFENSE  
PLASMA PHYSICS & ION PROPULSION  
ADVANCED FIXED-ARRAY RADAR SYSTEMS  
LASER & MASER RESEARCH & DEVELOPMENT  
NUCLEONICS & MOBOT\* SYSTEMS  
SOLID STATE MATERIALS & DEVICES  
DATA PROCESSING & COMMAND-CONTROL

B.S., M.S. and Ph.D. Candidates  
Members of our staff will conduct

**CAMPUS  
INTERVIEWS**

**February 11 and 12, 1963**

Find out more about the wide range of activities, educational programs and relocation allowances offered by Hughes. For interview appointment or informational literature consult your College Placement Director. Or write: College Placement Office, Hughes, P.O. Box 90515, Los Angeles 9, Calif.

Creating a new world with Electronics

**HUGHES**

HUGHES AIRCRAFT COMPANY  
An equal opportunity employer

\*Trademark Hughes Aircraft Company  
Bettman Archive



# Brewins



A scream echoes through the tunnels; maniacal laughter floats up from the manhole in front of Throop; math serpents almost fall into vast pit momentarily occupying the interior of Slow, as faint sparks leap through vast distances. Lightning plays nightly around the coupola, while great winged creatures are observed frequenting the upper stories of the Athenaeum. Finally, Monday night, the Quad is filled with a glowing nimbus, wavering to the eerie strains of an unidentified Tibetan temple melody in nineteen part atonal noise.

Yes, like Lazarus, Beak is rising from the dead. Tailfeathers, the impudent usurpor of the most illustrious column has been, Brethren, converted to pillows for the student pits.

Triumph! Might is right!  
**Tres Bien? Tres Bien!**

Madam-mosel Honeybelly, Anglis speaking tho' she be, apparently isn't in full control of the language yet; during the anti-inverse-quadruple-reverse-inwards-interview Monday with the ragriters, H.B. commented on the remarkable pallor of many Tekmen — on their pale carnations. No harm, mon amour, but even granted that we may be afflicted with carnation milk(iness), and

## Lasers

(Continued from page 4)

jected at any desired speed, slowing such events as high velocity explosions, shock waves and the collapse of cavitation bubbles so that they may be studied and analyzed.

Ellis' immediate objective in modifying the laser is to develop a system that can film the life cycle of cavitation bubbles. Their damage to ship propellers and pumps, a major problem for 100 years, is becoming more acute with the Navy and the shipping industry designing higher speed vessels. Ellis' investigations are supported by the Office of Naval Research.

Generated by churning propeller blades, the bubbles grow to about one-tenth of an inch in diameter and live about one thousandth of a second. The impact of millions of them, collapsing with the pressure of 10,000 to perhaps one million pounds per square inch, quickly eats away metal surfaces.

New propeller designs have reduced the damage, but not enough. The cavitation processes are not well understood. If they were, design improvements probably could be made and more resistant metals and alloys developed to withstand the impact, Ellis said. There is much research here on the problem.

Ellis and his former graduate student, Dr. Charl Naude, have developed a theory that the damage is caused by a jet of water that pierces the bubble opposite to where it is in contact with a metal surface. The jet strikes the metal with great velocity as the bubble collapses around it. With a multi-million-frame-per-second camera he devised previously, Dr. Ellis has obtained photographs of the jet in bubbles generated in still water.

## Travel Story

(Continued from page 5)

they showed an active interest in both Russian and American foreign aid for their homelands, as well as a projected future fear of segregation, were they to visit the United States. I'd like to talk to them now, after the infamous Mississippi-Meredith Mess. So go the blues in the Night and Day.  
(Continued next week)

some of us with acne, we do get out of doors. See Fleming courtyard on a fine spring day.

## Gamey Games

At a fine gurgling time last Saturday, certain members of Ratlick House attempted to make up between one another the lack of certain sub-species by various modes. Slubberis, Olly-Vere, Shirredwoman, and Surecht all attempted this marvelous feat of dexterity and unbelievable crudity. Final reports indicate no result, however.

## Rage Rages—Ancient Order Restored

Having, in an epsilonic manner, transubstantiated certain pseudo-Ludlow lithofacies and Athyroid Brachioplasts in order that the delta anti-functional S-matrix of order m-to-the-p might not be doubly anti-inverse mapped onto the plane of pseudo-reals, members of Rage House coolly calmly and collectedly de-collected further emphyplastic regions of the outer Mongolian boundary condition, with circular arcs.

## More Campuses

(Continued from page 5)

picture of 23 students who someone with dirty hands appears to have wandered through, marking their shirts. The headline reads "23 Green Hand." The story begins:

"On December 18, 23 freshmen were raised to the degree of 'green hand' at the regular meet-

ing of the Wasco Future Farmers of America . . . "The green hand degree is the first step in the ladder of success for any future farmer," according to Charles H. Craig, Ag instructor . . ."

The moral here is clear: You can step on some toes in the process of improvement, but beware of those with green hands (e.g. don't tread on them).

**FRENCH    SPANISH    GERMAN**  
**RUSSIAN    ITALIAN    JAPANESE**

**THE BERLITZ SCHOOL OF LANGUAGES**

PASADENA, 170 SOUTH LAKE AVE., SYcamore 5-5888

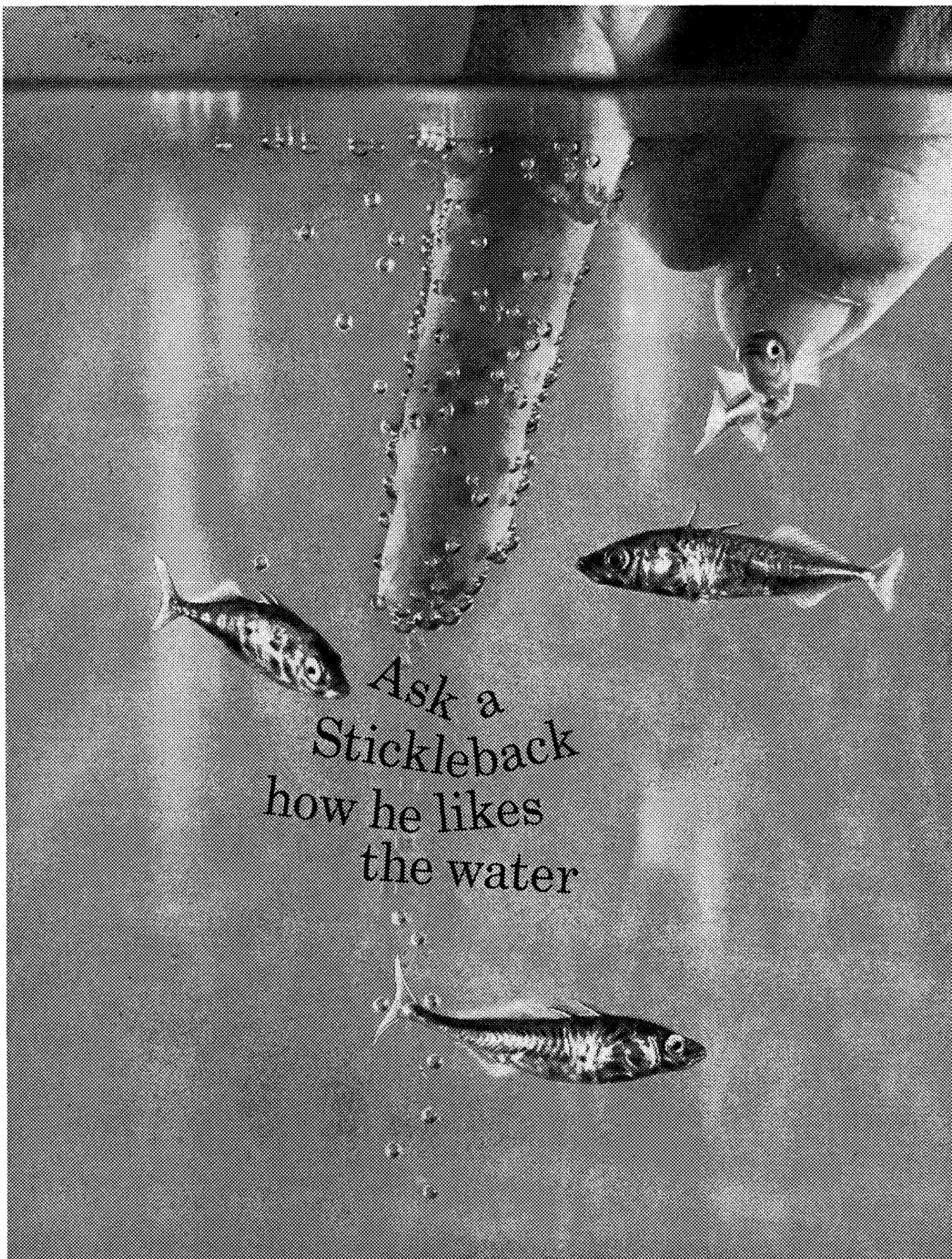
PRIVATE INSTRUCTION

SMALL CLASSES STARTING NOW

Native Teachers

Day or Evening

Free Trial Lessons



Who knows water better than a fish?

The fish we employ as water experts are tiny Sticklebacks. We pay them liberally in brine-shrimp, no salary deductions.

It's all because we use millions of gallons of water daily in our refineries. After use, it is treated with algae, bacteria, chemicals, sunshine and oxygen, to make sure the water is clean and pure when we return it to stream or sea.

As an ultimate safeguard, we let our Sticklebacks test the water, before it is released. If they like it, we know it will be happy water for any fish.

The object is to keep our streams and coastal waters pollution-free with abundant fish to nibble your hooks, and clean playgrounds for your water sports.

Many other industries which depend upon water are equally careful. Our common concern is to protect a priceless heritage.

Planning ahead to serve you better

**STANDARD OIL COMPANY OF CALIFORNIA**

