

We couldn't print it
upside down
If we tried

California Tech

Associated Students of the California Institute of Technology

... we don't
But if

Volume LXX

Pasadena, California, Thursday, February 13, 1969

Number 17

Offshore Drilling Sea Life Study for C.O.O.P.ers

by John Bennett

Twenty-three students met at the end of last week in a nearly spontaneous response to the disastrous Santa Barbara oil slick. They formed a working Committee on Offshore Oil Pollution (COOP) and appointed chairmen of five subcommittees. These committees will investigate matters of Ecology, Chemistry, Geology, Engineering, and Political Action. For instance, they would like to know the basis for choosing a particular chemical emulsifier and its effect upon the phytoplankton population. They may also review the decision to drill on unsettled geology. They are interested in the effectiveness of political action by Santa Barbara residents and conservationists.

Oil, Oil Everywhere

Last Sunday, a few of the students went to Santa Barbara. They interviewed local residents, Union Oil, Coast Guard, and wildlife officials. The officials were pleased that Caltech students were interested and offered to meet with them again, when the immediate crisis had cleared.

It was obvious that in moments of crisis, they had lost their indignance toward student committees. They were anxious for ideas. High demand—little supply. As long as student interest remains, COOP assistance will be offered.

And Nary a Drop

In the next days, COOP will consolidate the several proposals for action, and actively recruit additional members. It plans to work with the ASCIT Research Center, using its staff and funds. Money and laboratory facilities are forthcoming, and several faculty have given their approval and advice.

If you are interested in COOP activities, leave a message for John Bennett in the Dabney B box, or meet with Robert Kramarz in Blacker. They will help you implement your ideas.

Dabney Hall Hosts Modern Print Exhibit

An exhibit of the works of four noted print makers is the first art event of the year presented by the Caltech Faculty Committee on Programs and the newly-formed Institute Committee on the Arts.

The show is running from Feb. 7 through 27 in Dabney Lounge and is open to the public. It features prints by Leonard Edmondson, Shiro Ikegawa, Ynez Johnston, and Ben Sakoguchi.

Finger

Dabney Lounge has been turned into a functional art gallery for the print exhibit by the extensive use of background panels and lighting which will also be available for future exhibits. Dr. J. Kent Clark, chairman of the art committee, said the transformation was possible because of a recent grant to the Caltech Fund for the Arts by Mrs. Vir-



If you didn't get it last week . . .

First Buchman Lecturer To be Nobel Biologist

Dr. Har Gobind Khorana, Nobel Prize-winning chemist renowned for his imaginative research in biological chemistry, has been named the first Edwin R. Buchman Memorial Lecturer at Caltech.

Khorana, co-director of the Institute for Enzyme Research and the Conrad M. Elvehjem Professor of Life Sciences at the University of Wisconsin, is a guest of Caltech through Feb. 13. His visit will culminate with the Buchman Lecture which will be open to the public in Beckman Auditorium starting at 8:30 p.m. tonight.

In the Wise

In his lecture on "Current Work on the Total Synthesis of Genes for Transfer Ribonucleic

Acids," he will explain his efforts to build by chemical means a segment of DNA that will produce fully active transfer RNA. DNA—for deoxyribonucleic acid—is the basic material of heredity in living cells. Transfer RNA serves as a template for the DNA instructions in building proteins outside the cell's nucleus.

For his efforts toward solving the genetic code, Khorana was named co-recipient of the 1968 Nobel Prize for Medicine and Physiology. His contribution was mainly in the synthesis of short, biologically active chains of DNA with known sequences of bases.

Words of

A native of Raipur, Indiana, Khorana received his bachelor's degree in 1943 and his master's degree in 1945 at Punjab University, Indiana. He received his Ph.D. in 1948 at the University of Liverpool, England.

The Buchmann Lectureship—sponsored by the Division of Chemistry and Chemical Engineering—honors the memory of Dr. Edwin R. Buchman, a research associate at the Institute from 1938 until his death a year ago.

The Shah

A native of Valley Falls, N.Y., Buchman was known for his role in the first commercial synthesis of vitamin B-1, thiamine, the anti-pellagra factor. He also aided in establishing a strong spirit of cooperation among members of the Division of Chemistry and Chemical Engineering and the Division of Biology.

United States and many other countries, and their work is in important museums and collections. They all live in Southern California, which is now considered a major center of the print maker's art.

Bell To Play Mack In Threepenny Lead

Clark, Rydjeski Win 2nd
Leads in ASCIT Musical

Bob Lewis, director of the ASCIT Musical, **The Threepenny Opera**, last week announced the cast for this year's production. Final tryouts were held on January 29. Rehearsals will begin soon for the show, which will be presented May 23 and 24 in Beckman Auditorium. Nearly 40 Teckers and girls from Pasadena area schools received parts.

The Threepenny Opera is a social satire of beggars, thieves, and prostitutes in 19th century London. The plot focuses on the experiences of Captain Macheath (Mac the Knife), London's most successful highwayman, whose

weakness for women is nearly his ruin. This leading role of Mac the Knife went to Bob Bell, a freshman in Ruddock. Bell is a baritone soloist for the Glee Club and has participated in a number of high school productions, including **My Fair Lady** and **Camelot**.

Grad Gets It

Grad students at Caltech have always been encouraged to take part in the ASCIT Musical and this year one has a major role. Denis Rydjeski, a grad student in biology, will play the part of Jonathan Jeremiah Peachum, the miserly organizer of the London beggars. Rydjeski is also the Resident Associate of Ruddock House.

Francis Clark, a freshman from Lloyd, will portray Tiger Brown, the chief of the London police. Clark has had numerous parts in high school and community productions. The role of the ballad singer, who performs the popular "Mack the Knife," went to David J. Smith, also a freshman. He has participated in a number of light musicals including **Music Man** and **Oliver**.

Westridge Takes All

The principal female roles in **The Threepenny Opera** have been filled by girls from Westridge High School and Pasadena City College. The part of Polly, the daughter of J. J. Peachum and one of Macheath's "wives" will be played by Margaret Agnew, an art major at Westridge. Marcy Gerke, a PCC sophomore, will play Peachum's wife. Both of these girls have had considerable experience in drama and singing at their schools.

Graft, Corruption

Lucy Brown, the daughter of the police chief and Polly Peachum's chief rival for the affections of Mac the Knife, will be portrayed by Hedy Cortese, a junior at Westridge High. Shari Friedland, who had a leading role in last year's musical, **The Castle**, will take the part of Ginny Jenny, Macheath's favorite prostitute. Shari has also had experience on radio and television including the narration of an NBC special on Marina del Rey.

In addition to these leading roles, over 30 other parts have been cast, primarily those of policemen, beggars, prostitutes, and thieves.

Pilot's Training Given Reservists in AFROTC

The Caltech detachment of Air Force Reserve Officer Training Corps (AFROTC) still has many openings for pilot candidates. The two-year program leads to a commission as a second lieutenant and is followed by one year of pilot training in preparation for a flying career. Educational delays are often granted for students in science and engineering to allow them to complete graduate studies.

Many Air Force Officers have been able to combine their flying and scientific or engineering careers as aircraft designers, test pilots, and even astronauts. For example, Col. Frank Borman, commander of Apollo 8, received his master's degree in aeronautical engineering at Caltech and has just been appointed as deputy director of flight crew operations at NASA's Manned Spacecraft Center in Houston.

Undergrads and grads with 20/20 uncorrected vision are eligible. Pilot candidates can receive 40 hours of flying lessons locally, and possibly a private pilot's license at no cost through the Flight Instruction Program while still in ROTC.

There are only two weeks left in which to take the physical exam and aptitude test in order to qualify for next year's class. No formal obligations are assumed until actual enrollment in the program next October. More information is available from ROTC, Building T-1 near the gym, extension 2391.

Anyone Having Information on
Students Who Cut Up Last Tech
Contact Al Stein or John Forbes

Mission: Impossible -- Caltech
Will Be Shown
Sunday, Feb. 16, 10 p.m.

Editorial

How Not to Use
A Newspaper

This is the last editorial to be produced by this team of editors. No longer will you gentle readers have to tolerate our rabid opinions and grammatical atrocities; they will be someone else's. In any case, we wish the best of luck to the next team of editors.

Since this is our last effort, we are going to be a bit heretical and tell you what the **Tech** is not good for. And one of the things that the **Tech** is not good for is communication. I don't mean the "there will be a meeting at . . ." sort of communication, nor do I mean the "exclusive interview with . . ." stuff. The **Tech** is very useful when a small group wants to communicate with a large group. Otherwise, the ideal of good communication is better served by other means.

Caltech has very good lines of communication between individuals. This is a fact. Most Caltech people make poor use of these lines. This is also a fact. The next time some student tells you how hard it is to talk to faculty members, or even trustees, ask him how hard he has tried. There are exceptions, but almost all the people here are willing to communicate, if someone tries to communicate with them.

If you have a complaint about some specific facet of Tech existence, don't publish it in the **Tech**! Instead, go see the people in charge of that aspect of our existence, and talk to them about the problems. They are the ones who can help you, not the editors of the **Tech**. This applies to faculty and employees as well as to students. A personal confrontation is more effective than an anonymous hate letter. Just so, a discussion between two or more people will be far more effective than an impersonal letter to the editors. Sure, it's a lot easier to publicize a problem, instead of searching out those who can solve it, but it's a lot less effective.

The next time you have a complaint about the structure of a course, or the lack of student-faculty interactions, or the stupidity of grad students, or the stupidity of undergrad students, be sure to write the **Tech** a letter. But the next time you want to solve a problem, be sure and communicate it effectively!

Alan Stein

Towering
Eyeful

Dr. Faustus

by David Linker

Of man, and God and Satan; these are the subjects dealt with in Marlowe's "Dr. Faustus" presented at the Ahmanson Theatre by the Royal Shakespeare Company.

The play begins as Faustus is deciding what field of study he should devote his life to. He has studied in the fields of Medicine, Law, Physics, Theology, and Necromantics (magic). He decides to go into the field of Necromantics to satiate his desire for power and knowledge. After being initiated by two great magicians, Valdes and Cornelius, he summons up a spirit.

How Many Souls in a Dollar?

The spirit he summons is named Mephistophilis, and explains to Faustus the mechanics of sorcery. All demons are under the jurisdiction of Lucifer, and you must make a deal with him to gain the obedience of the demons and to gain powers. Unfortunately for Faustus, the only rate of exchange is a human soul, so, Faustus signs away his soul in exchange for 24 years of service from Mephistophilis, to satisfy his every wish.

These years Faustus enjoys to the fullest, visiting far away parts of the world, transported by Mephistophilis, and becoming a famous sorcerer. He is honored by kings, and plays havoc at the Vatican by becoming invisible and playing pranks.

(Continued on page 5)

Kelp Forests
Attacked By
Sea Urchin

Sewage dumped in the sea— allied with the appetite of the lowly sea urchin—provides the probable reason for the gradual decline of Southern California's valuable coastal seaweed forests.

Treated sewage from metropolitan areas appears to be keeping an abnormally large population of abnormally small sea urchins alive—and hungry for the seaweed called kelp, two scientists reported today.

"We know these sea urchins are responsible for destroying some of our largest kelp beds, and our research now indicates the sewage may help keep them alive once their preferred food—kelp—is gone," said Dr. Mary E. Clark, a research fellow in environmental health engineering at Caltech.

Her research is part of an effort to restore the extensive kelp forests that once flourished along the Southern California coast, providing an important habitat for sea life and chemical products used by many industries. This task of saving the remaining kelp and restoring the former beds is directed by Caltech's Wheeler J. North, professor of environmental health engineering.

"Under normal conditions," Dr. North explained, "the kelp beds provide food for the sea urchins, and when the kelp supply diminishes, the urchin population also decreases, maintaining a balance that allows the kelp to grow back.

"Under present conditions, however, once the kelp is gone, the ever-present urchins never let it grow back. Something is keeping the sea urchin popula-

(Continued on page 5)

Flick Guide

Legion of Indecency Ratings

by Bob Enestein

G—Generally for fairies and other sweet people to watch

M—Mostly unfit for viewing by healthy red-blooded viewers

R—Raunchy, a good place to take a Physics quiz

X—Xtremely clever place to take a date if you can't get her hot by conventional methods

*—Enestein award of honor.

A movie you must see either for its quality, or lack of it.

DRACULA HAS RISEN FROM THE GRAVE (G)

*—Horror flick not starring Ralph Williams

SKIDOO (M)

LSD plays the hero of this mess

ROMEO AND JULIET (G)

*—Great acting, good plot, bad dialogue

A MAN AND A WOMAN (M)

*—see it in a drive-in.

BARBARELLA (R)

*—Jane Fonda proves she is the sexiest girl in any world.

BELLE DE JOUR (X)

See it if Catherine Deneuve turns you on.

CANDY (R)

See the movie, then read the book, or else you will be very disappointed.

FACES (R)

Strange flick with great character acting.

FUNNY GIRL (G)

The closest you'll ever see a Jew and an Arab.

GONE WITH THE WIND (G)

See it now or wait another fifteen years.

I LOVE YOU,

ALICE B. TOKLAS (R)

*—Beautiful Leigh - Taylor Young outshines Peter Sellers in a good comedy.

ICE STATION ZEBRA (G)

Could have been worse—but not much.

LONESOME COWBOYS (X)

By Warhol, need I say more?

OLIVER (G)

One of the more palatable musical comedies.

ROSEMARY'S BABY (R)

You'll either love it or hate it.

THE BOSTON

STRANGLER (R)

Inaccurate plot but Tony Curtis might win an Academy Award.

THE FIXER (M)

Contender for picture of the year honors.

THE GRADUATE (R)

*—Have you not seen it at least twice?

THE HEART IS A

LONELY HUNTER (M)

Another contender for picture of the year.

THE KILLING OF

SISTER GEORGE (X)

Features the screen's first genuine nipple kiss.

THE LION IN WINTER (M)

Peter O'Toole and Katherine Hepburn might win Oscars.

THE SERGEANT (R)

John Philip Law gets his first real screen kiss.

YELLOW SUBMARINE (G)

No smoking in the theater.

THREE IN THE ATTIC (R)

*—From American International—need I say more?

2001: SPACE ODYSSEY (G)

No dropping in the theater.

Letters

Hall Calls For
Faculty-Student
Coffee hours

Gentlemen:

I sincerely hope that the student-faculty coffee hours will be resumed. These hours were very successful in providing an informal basis for meetings between faculty and students. This is a simple way to improve relations between students and faculty, and I am sorry that it has fallen into neglect.

Yours sincerely,
Marshall Hall, Jr.

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3-month old 40 watt AM-FM stereo receiver \$85, Large Speakers \$30 each, Garrard turntable \$35, Sony tape deck \$65, Headphones \$10. 839-2216.

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—does not exist! It's a myth. An illogical American dream. Is this a harsh judgment? Hardly. Every man, if he's smart, looks for the best possible deal. It's only human nature to search for the unrealistic, the unobtainable. —but there is a best job for you. One which fits your abilities, education, temperament, ambitions. So why wear yourself out running helter skelter all over the country on job interviews. Our professional staff of 20 career specialists will familiarize you with the broad spectrum of American Industry . . . then you can choose from more than 400 Fortune 500 Companies who are relying on us for their staffing needs with local interviews. ENGINEERING, MGMT, FINANCIAL, SALES, MARKETING . . . trainees through presidents. —simple, you bet! And our one stop computerized career service is absolutely free. We are 100% Employer retained. Resume's always welcome. Please phone for a confidential interview.

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CIVIL ENGINEERS
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DEPARTMENT OF HIGHWAYS

Highway engineering is a rewarding career and the State of Washington is an exciting place to work and live. Every phase of highway civil engineering is employed in the Washington Highway Department.

Representatives from the Washington Department of Highways will be on the California Institute of Technology campus Wednesday, February 19, 1969 interviewing civil engineers. Interested students please sign up for an interview at your campus placement office.

Acad. Affairs
J. Feinberg

Ed. Note: This campaign statement is being rerun because part of it was cut out of many of last week's **Tech** by person or persons unknown after the papers had been delivered to the Houses.

After 2½ years at Tech, I can appreciate the education being offered here as few others can. Because of this, thought I can see many ways in which our education can be improved, also as few others can.

Experiments have been conducted in seminar-style teaching, usually in conjunction with lounge type classes. Having been a member of Dr. Dean's infamous Ma 5 seminar class last year, I know the strong advantages as well as the disadvantages of a seminar. But my conclusion is that the seminar taught class can be a tremendous improvement over the traditional lecture system. As Director of Academic Affairs, I will try hard to expand this mode of teaching.

A second improvement can be made by offering more interdisciplinary courses. As one who straddles two science fields, I know how rough it can be having interests which don't quite fit with any option. As Director of Academic Affairs, I will do my best to encourage more joint offerings in fields like biochemistry, astrogeology, and mathematical physics at the undergraduate level. The availability of double majors should be expanded concurrent with a lowering of individual option requirements in such cases.

The third improvement which I envision is the development of an upperclass research program. Other schools offer an honors research elective in which a student can work either individually or with a professor of choice. How such a program could be worked at Tech is a decision for the students to make. But the program should be developed.

(Continued on page 5)

California Tech

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ASCIT Treasurer Steve Patt

Ed. Note: This campaign statement is being rerun because part of the text was cut out of many of last week's Tech by person or persons unknown after the papers had been delivered to the Houses.

It goes without saying, I think, that many students this year have begun to feel that ASCIT is drifting further and further away from them. The attempt to abolish mandatory ASCIT dues is a clear manifestation of that feeling. Students feel that they are not "getting their money's worth" out of ASCIT. I am running for the office of Treasurer because I am one such student, and because I feel that things do not need to remain as they are.

Trying to make ASCIT relevant to more and more students, as opposed to making it more and more relevant for a few students, is not going to be an easy job. Far too often the genera-

tion of new ideas is hampered by ties to the past. I am not bound by such ties, however, and because of this I feel that I can be an asset to next year's BOD.

So far I have given no indication of why I specifically want to be ASCIT Treasurer—why not President? Basically, I feel that finance is where my talents lie, and it is the way in which I can contribute the most to ASCIT. Right now, I am not for abolishing dues, raising dues, lowering dues, or anything else. But I am for a thorough study of the status of ASCIT dues as well as of the questionable class dues and for giving these matters a fuller debate than was allowed this year.

This, then, is my general philosophy. I feel that I can help in the effort to make ASCIT more relevant to all the students. For these reasons, I ask you for your vote.

Steven Patt

"Fourth?"

by Robert Geller

For this week's column we have decided to make a change of pace by considering five bidding problems. These problems will also be commented on by a panel consisting of George Bosworth, Bill Delaney, Dave Gubman, and Kevin Savage. In addition the reader can see how successful I am in curbing my sarcastic tongue in commenting on the panelists' opinions.

The Problems

(A) Match-points, neither side vulnerable, the bidding has gone:

South	West	North	East
1 D	3 NT	4 C	Pass
?			

You, South, hold:

S K 9 4 2, H 7 3, D A K J 9 2, C 5 4

What call do you make? (West's 3 NT shows a long runnable suit).

(B) Rubber Bridge, North-South vulnerable, the bidding has gone:

West	North	East	South
Pass	Pass	Pass	?
You, South, hold:			

S 7 6 5, H A 4, D J 9 7 2,

C A K Q 4

What call do you make?

(C) Match-points, neither side vulnerable, the bidding has gone:

South	West	North	East
1 NT	Pass	Pass	2 S
?			

You, South, hold:

S A 7, H K 10 8 3, D A K 6, C Q J 8 6

What call do you make?

(D) IMP Scoring, both sides vulnerable the bidding has gone:

East	South	West	North
3 C	Pass	Pass	Dbl
Pass	3 H	Pass	3 S
Pass ?			

You, South, hold:

S A 5 4, H J 6 3 2, D 8 6 5 3, C 6 2

What call do you make?

(E) Match-points, neither side vulnerable, the bidding has gone:

East	South	West	North
1 S	2 C	4 S	5 C
5 S ?			

You, South, hold:

S —, H A 5, D A J 10, 8, C A 10 9 8 6 3 2

What call do you make?

(Continued on page 8)

Banker Larkin New Trustee

Frederick G. Larkin, Jr., prominent Southern California banker known for his work in civic, charitable and business affairs, has been elected a member of the board of trustees of the California Institute of Technology, Dr. Arnold O. Beckman, board chairman, announced today.

Larkin, 55, is chairman of the board, chief executive officer and chairman of the managing committee of Security Pacific National Bank. Prior to assuming the position of chairman, he had served as president since 1961. In October, 1967, he was named chief executive officer and chairman of the managing committee.

In previous associations with Caltech, Larkin was a charter member of the Institute's President's Council, a group formed to intensify and broaden communications between administrators of higher education and leaders in business and industry. Charter members were drawn from various parts of the nation and were requested to keep in close touch with Caltech's activities and problems and give advice. Larkin also is a member of the California Institute of Technology Associates.

A native of Seattle, Larkin joined the banking firm in 1936 as a research assistant. He is a graduate of the University of Washington and Stanford University.

In 1956, Larkin became a member of the bank's central loan committee, and in 1960 he was elected a senior vice president. The following year he was named to the firm's administrative and executive committees and became a member of the board of directors. Later in 1961 he was elected president and became a member of the managing committee.

In community and civic activities, Larkin is a director of the Music Center Operating Co., president of the Southern California Symphony - Hollywood Bowl Association, a director of the Hospital of the Good Samaritan, a trustee of Occidental College, and a director of the Episcopal Home for the Aged.

Grad Student Gets \$200 Gift

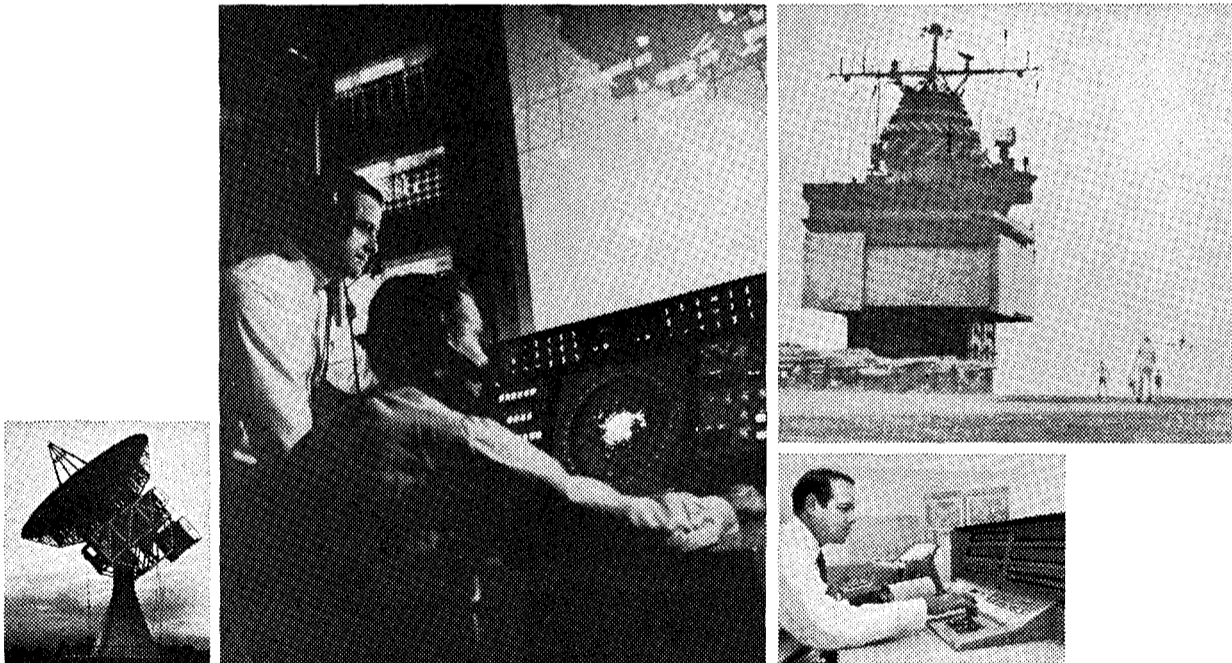
A Caltech graduate student from India has been cited for his contributions to the research field of homeostatic control systems in 1968.

Ramachandra Srinivasan has been recommended by Profs. Roy Gould and Rangasami Sridhar of the electrical engineering faculty to receive a gift of \$200 from the Metabolic Foundation of Los Angeles. It is given annually to the Caltech graduate student who has done the most outstanding work in this field during the previous year.

Srinivasan has been investigating the coupling effects between the glucose and fat loops in normal man. The faculty members state that his work has furthered quantitative understanding of the homeostatic control system of metabolism, and has extended the methods used in modelling physiological control systems.

The student, son of a Madras, India, lawyer, received his master's degree in electrical engineering from Purdue University, and expects to receive his Ph.D. from Caltech at the end of the present academic year.

Hughes announces new openings on the TECHNICAL STAFF.



Assignments exist for Engineers graduating in 1969 with B.S., M.S. and Ph.D degrees in ELECTRICAL ENGINEERING.

HUGHES-FULLERTON Engineering Laboratories assignments range from research to hardware development and operational support of products and systems in the field. Our current activities involve the advanced technologies of phased-array frequency-scanning radar systems, real-time general purpose computers, displays, data processing, satellite and surface communications systems, surface-to-air missile systems and tactical command/control systems.

For additional information on the opportunities offered at HUGHES-FULLERTON in Southern California—and to arrange for a personal interview with our Staff representatives, please contact your College Placement Office or write: Mr. D. K. Horton, Supervisor, Professional Staffing, HUGHES-FULLERTON, P. O. Box 3310, Fullerton, California 92634.

On-campus interviews
February 28



Harrison Brown On Poverty...

A strong attack on poverty and its offspring—hunger, deprivation and ignorance—is being made by American and foreign specialists who work together to solve developing nations' pressing local problems, Dr. Harrison Brown of Caltech said Monday night (Feb. 10).

Brown, professor of geochemistry and science and government, is foreign secretary of the National Academy of Sciences. Speaking in the fourth talk of the Caltech Lecture Series, he declared:

Jungles In Kansas

"It should be obvious you can't transplant a Kansas wheat field to the Amazon Basin and expect it to succeed. The problem of growing crops in Brazil has to be solved in Brazil, by Brazilian methods and by Brazilians. What we can do is help them build a research and development effort that serves as a base for problem solving."

Brown said the academy's program makes it possible for American scientists, engineers and economists to work with their counterparts in developing countries, to work toward establishment of research and development capabilities. Cooperative programs are under way in Taiwan, The Philippines, Indonesia, Brazil, Peru, Colombia and are being started in Argentina and Korea.

"A good example of how this works is Taiwan," Brown added. "Several years ago the Chinese Academy of Sciences asked for help in planning the island nation's future in science and engineering. A joint team was formed that looked at the needs of Taiwan in the light of future needs and the resources available."

5 Per Cent Returned

"One thing they noted was that Taiwan doesn't offer any graduate education in science and engineering, that the Chinese were sending 2,000 of their best graduates abroad annually for higher degrees. The problem is that only some five per cent of these people returned."

"Clearly, one of the first things to do was start a program of graduate education. Now there are six major graduate research and training centers in Taiwan, and we've accomplished the first reversal of the brain drain."

Brown said the experience with Taiwan "led to the invention of a workshop approach in which foreign scientists, engineers and economists meet with their American counterparts. This combination of knowledge results in specific recommendations."

Research Council

He said the result in Peru was formation of a research council in the government; in Colombia a science policy council was formed, plus formation of a small science foundation in the Ministry of Education.

"In Brazil," Brown said, "the workshop approach resulted in a program for strengthening the national research council and for bigger research and development budgets. We are now working out a joint program for development of high level graduate research and education in the field of chemistry. Four Caltech professors—Drs. George Hammond, Robert Ireland, Harry Gray and Aaron Kuppermann—are involved in this program, and if it works for chemistry in Brazil, it should work in any country in any discipline."

Not All Classical Solutions

Explaining the need for problem-solving ability based on research and development, Brown said that much of America's economic growth can be explained by the normal classical inputs of land, labor and capital—but not all growth can be accounted for this way.

"A large component of the remaining growth can only be accounted for through our research

and development. For instance, economists say the money spent on agricultural research since the advent of the land grant colleges 100 years ago has led to increases in productivity that have brought a return of about 100 per cent per year, which is a fantastic return.

"This is not an isolated case, either. The Japanese, who started a similar program at about the same time, also achieved a return on their money of about 100 per cent annually."

False Beliefs

Brown said it is widely believed, falsely, that western technology can supply all the answers for developing countries. He explained:

"India and Japan are both rice-producing countries, but the Japanese get three times as much yield for their effort. The answer is in saturation fertilizing, and the obvious answer for India is to copy the Japanese example—except that it doesn't work. Such fertilizing practices kill India's rice strain, and the Japanese variety won't grow in India. The real answer is for the Indians to develop their own variety of rice that can take the fertilizing and the climate. This requires a firm foundation for research and development."

Failure of Prudence, Justice Cited in Half-Airfare Ruling

WASHINGTON, D.C.—Representative Arnold Olsen (D. Mont.) today charged that elimination of airline youth fares would "encourage thousands of young people to resume the illegal and dangerous practice of hitch hiking or to attempt long, exhausting automobile trips, frequently in unsafe vehicles." He argued that no one would benefit from a discontinuation of youth fares.

Olsen said a Civil Aeronautics Board (CAB) ruling against the half-fare standby tickets for persons under 21 "failed to combine prudence and justice, the compatible format necessary to formulate any dictate of society, according to Oliver Wendell Holmes."

The CAB ruling, written by Examiner Arthur S. Present, judged the special fare discriminatory to adult passengers. If upheld by the five-member Board, youth fares will be dropped in 30 days. In a letter to CAB Chairman John H. Crooker, Olsen asked that the Tuesday decision be reviewed and rescinded.

"I fail to see how permitting

a young person to fly half fare on a seat that would otherwise go empty discriminates against regular passengers," Olsen asserted.

Continuing, Olsen argued that "prudent justice in this situation would be influenced by the facts that most passengers over 21 are restricted by personal demands or schedules from flying space available; that a change to include all age groups in the standby fares would mean havoc for the reservation system; that the revenue loss resulting from elimination of the existing regu-

(Continued on page 9)

Shaft Strikes Back At CAB Utah Rep. Dance Introduces New Themes, Effects

FIGHT THE CIVIL AERONAUTICS BOARD

Write to any or all of those listed below to protest the elimination of Student Rates and Youth Fares.

CAB Chairman:

Charles S. Murphy
4740 Connecticut Ave.
Washington, D.C. 20008

CAB Vice Chairman:

G. Joseph Minetti
5106 Brookeway Drive
Washington, D.C. 20016

CAB Member:

Whitney Gilliland
4150 - 41st Street, North
Arlington, Va. 22207

CAB Member:

John G. Adams
3415 - 34th Street
Washington, D.C. 20016

Civil Aeronautics Board:

Universal Building
Washington, D.C. 20428

To your Senators:

The Hon. John Doe
Senate Office Building
Washington, D.C. 20510

To your Representatives:

The Hon. John Doe
Housing Office Building
Washington, D.C. 20515

ALSO Check with Western Union. They have special rates for sending telegrams to political officials.

by Alan Lederman

Question: What has twenty-two legs, lives in Salt Lake City, wears leotards, has family ties to a Caltech professor, and deserves its great reviews?

Answer: The University of Utah Repertory Dance Theatre (RDT).

In a special Beckman performance for students and teachers of dance, the RDT previewed some of its newest dances, as well as presenting some of its staples.

"A Terse History of The United States of America" was the most amusing and enjoyable dance of the evening. Using a strobe, the company gave the illusion of successive frames of a movie of America's history. Parodies of events from Columbus to the present were presented. "Nocturn" was a dream-like sequence which I suspect was meant to symbolize the nocturnal love of man and woman. "Fatal Birds," a sequence of graceful flight was choreographed outside the company but nevertheless done very well.

(Continued on page 6)

IF you want more copies of this list contact Jeff Ochsner in Ruddock (225) or John DeVries at 1385 N. Hill (794-8564).

What? "America Hurrah"

by Jean-Claude Van Itallie

at the

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ACADEMY MEMBERS: Your Academy card admits you
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Feinberg

(Continued from page 2)

oped.

The Director of Academic Affairs will probably wrangle himself a seat on the faculty Academic Policies Committee. It is important to be able to work with or against these people and not to be intimidated. I am personally acquainted with many of the 14 faculty members of this committee and can honestly say that I will not be afraid to actively promote my ideas or those that others offer as I come around and visit the seven houses.

Jerry M. Feinberg

Notices

INFERNAL TRIANGLE

This Saturday at 8 P.M. the Caltech Film Group will present, in Culvertson (L.A. Times' spelling): **Jules & Jim and Breathless**. Only a dollar!

Vote!



by Boule

For those of you who didn't show up at the Ice House this week, you missed a good show.

Russ Kirkpatrick opened the show with a little Dylan, a little Beatles and a lot of Kirkpatrick. Not attempting to imitate the styles of his benefactors he uses the music to tell his story and explain how he sees life.

Kirkpatrick will be back this weekend along with Jerry Speed-racer (also known as Jerry Commoner, a popular songwriter) and Chuck Mitchell.

This will be Mitchell's second appearance in the last few months, and this is no doubt due to the excellent show he put on during his last stay. He makes use of many of the songs of Kurt

Weill to open up the audience to a night of rare and beautiful music.

Such is the show for next week, last week it was the Expedition of Dillard and Clark, taking off with Doug Dillard and Gene Clark (late of the Byrds). Adding the help of a mandolin, electric bass, and an occasional fiddle they presented their own idea of what country music should be. This idea was such that even the most avid rock fanatic would appreciate the combination of the best of the Dillards with the best of the Byrds.

The Ice House is on Mentor, just north of Colorado. Show up this weekend and enjoy a damn good show.

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Save Seaweed

(Continued from page 2)

tion constant even though their preferred food has disappeared. The result is that baby kelp plants are devoured before they can mature."

"First," Dr. Clark said, "we've determined that the sea urchin population living near sewage outfall systems tend to be abundant, even though their normal food supply—kelp—is scarce or missing. This population, however, appears to consist mainly of smaller urchins."

Her research reveals the creatures are able to obtain much of their daily nutrient requirement by absorbing through their skin some types of dissolved organic matter—especially amino acids—found in seawater. Amino acids are the building blocks of proteins.

"Sea urchins have a very high rate of absorption in relation to their body weight when compared with other creatures," she said. "This is because the urchins have a very high ratio of surface area to body weight. This surface includes the urchin's round body, its many spines and the elongated organs called tube feet.

"The point is that concentrations of amino acids and other dissolved materials are four to five times greater near a sewage outfall than at some more distant spots. We measured the content of seawater near an outfall at the Palos Verdes Peninsula and compared it with water samples taken near the coast at La Jolla.

Fausting Good

(Continued from page 2)

Slurp!

In the end, his soul is taken in a psychological hell, excellently played by Eric Porter as Faustus, then, the gates of Hell open, and his corporeal body is swallowed in.

The subject was cataclysmic, with the characters grasping at the bowels of Hell. The acting was incomparable, with truly superb performances by Faustus and Terrence Hardiman as Mephistophilis. The sets were fantastic, showing the stark but holy inner sanctum of the Pope, as well as the gates of Hell. The Company will perform for about ten more days at the Music Center. "Faustus" is the performance of a lifetime; don't miss it.

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MERCY (Medical Emergency Relief Care for Youth) is three well-staffed medical camps to treat suffering children from Biafra.

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Into the Incinerator

It's Election Time Again At Theoc . . .

by Jim Cooper

Soph Edward B. Barrelmaker of the Mythological Institute of Theocracy gazed with interest at the line-up of candidates for student body offices.

"Here," he thought to himself, "are my future student leaders, and it is very important that I listen to what they have to say."

The first candidate was speaking: "If I am elected president of ASMIT, I pledge to use all ASMIT funds to buy off all faculty members, so that we will never have to worry about grades again."

Barrel, Barrel

At this point, the candidate was interrupted by laughter and wild cheers. Barrelmaker couldn't understand why everyone was so jovial when they should be listening seriously.

He turned to his neighbor and said, "Hey, how come everyone is laughing so much? Doesn't everyone realize that the candidates' speeches are very important?"

"Boy, Barrel, you sure are dumb," replied his neighbor. "Don't you know that this guy is

a non-serious candidate for office?"

Sound a Note

"But isn't he an official candidate and won't his name be on the ballot?" Barrelmaker asked.

"Yeah, sure," said the neighbor. "But don't you understand that a lot of people have disliked the way ASMIT has been run in the past and so some candidates run just to express their disapproval, or sometimes just as a joke?"

"So who actually gets elected?" Barrelmaker queried.

"Why naturally the one who's going to follow closest to the last administration."

"Then you mean that I really don't have a choice? That I can only either vote for someone carrying on similarly to the last administration, or I can vote for someone who was running as a joke?"

"Now you're catching on, Barrelmaker."

"But how do you know whether someone is running as a joke or not?"

Go to Head

The neighbor looked puzzled. "You know, that's something I've never really quite figured out. I don't really worry about it, though," he said.

Utah RdT Previews Ideas

(Continued from page 4)

Esteemed Member Present

Neither "A Terse History of The U.S.A." nor "Nocturn" nor "Fatal Birds," is officially in the company's repertoire. The company will return to Salt Lake City and continue rehearsing these until the world premiere later this year. As a human interest note, Professor J. Kent Clark's daughter Kay Clark is an esteemed member of the troupe.

The RDT is on the forefront of modern dance, and many people are watching its progress carefully. From the Friday preview performance, it seems clear the reviews the company can expect for its newest additions will exceed even those it has now; so that one can expect yet greater

critical acclaim and greater artistic success from the RDT.

Carnation Gives Protein

Support for Caltech—where pioneering research into the nature of proteins has been under way for many years—has been pledged by the Carnation Co., a major processor of dairy foods.

A contribution of \$150,000 was pledged by the large concern, which processes and markets many types of protein-rich foods. The gift will be added to Caltech's development program, and will be used mainly for teaching and research.

The Carnation Co. was an early supporter of work done at Caltech to determine the structure, chemistry and actions of protein molecules, including the proteins found in milk products.

Student Airfare

(Continued from page 4)

lations could mean increased fares for all passengers; and that present youth fares contribute substantially to the cause of education."

The Montana lawmaker said he views the youth fare as a "bright spot in a world that generally discriminates against young people. The safest driver in the world has to pay twice as much for car insurance if his age happens to be 22 or 23," Olsen said.

Persons under 21 cannot vote," he continued, "persons under 25 cannot serve in Congress; persons under 62 cannot receive Social Security retirement benefits; persons under 35 cannot be President of the United States; persons over 21 cannot enter our military academies; and persons over 18 cannot serve as pages in the U.S. Congress. In each of these cases," Olsen said, "there is some age discrimination."

Olsen said he does not argue that all these regulations should be changed. "There are prudent considerations supporting some of them. However, I do argue that there is equally prudent support for retention of the student fares."

Urging continued emphasis on

education, Olsen cited the air fare as "an important factor in easing the travel burden of thousands of college students. I believe it has been in the spirit of the increased attention our government has given to improve education in the last ten years. On the local level, too, we have all seen the parallel example of special prices to encourage young people to attend cultural events."

"Further," Olsen went on, "travel alone is a form of education. Thousands of young Americans—students and non-students—have been enabled by the youth fare to see much more of their country. They have benefited from the current youth fare arrangement, and it has not been at the expense of full-fare passengers because space available seats are empty seats."

Concluding, Olsen asserted that "strict, imprudent application of the non-discrimination (Continued on page 8)

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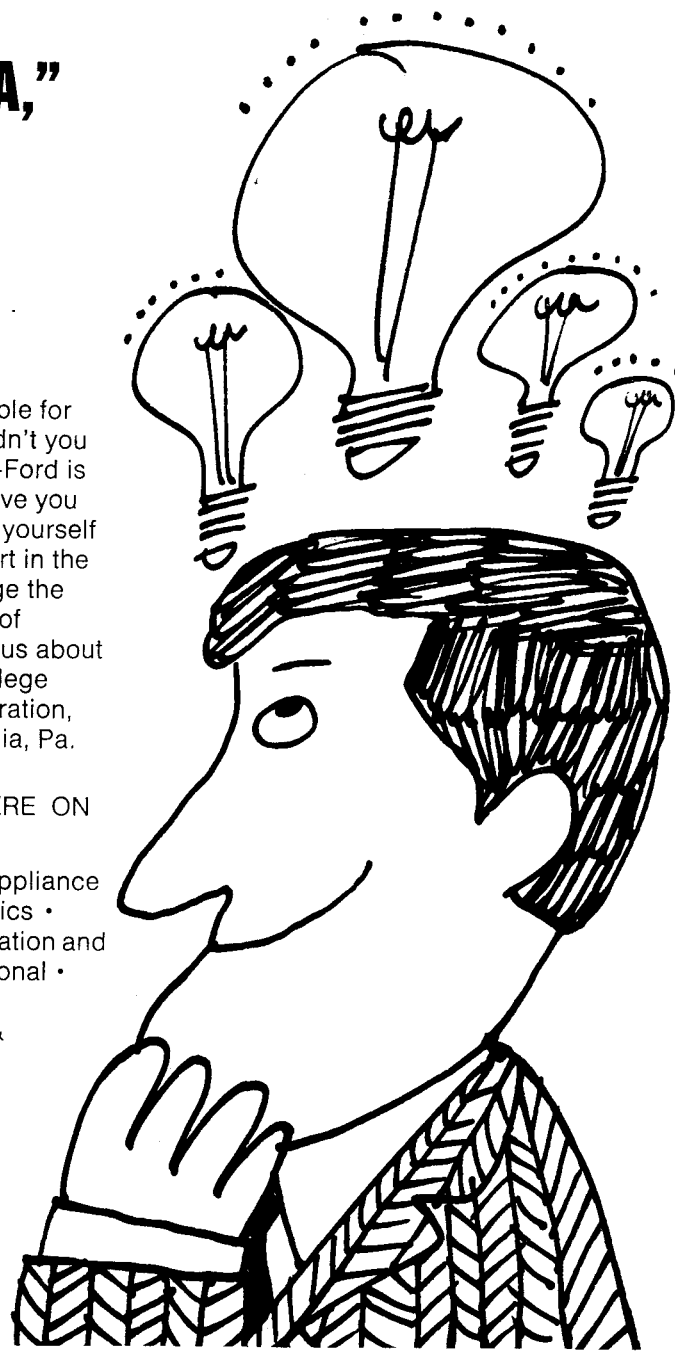
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Wrestlers: 2 in First Three

The Beaver wrestlers took two of their three matches last week. They downed LA Trade Tech by 36-10 and defeated Azusa-Pacific, 23-16 and lost to Biola, 32-17, in a double dual meet.

Against LA Trade, the Beaver heavyweights came through as Cox (160), Woodhead (167), Devinney (177), Beagle (heavyweight) and Johnson (Heavyweight) all won their matches by pins. Morris (123) won by forfeit while Hornbuckle (130) and Lewis (145) won their matches. Barber (137) and Taylor (152) were pinned.

Beagle and Woodhead won their matches against Azusa by pins. Cox won by a forfeit and Hornbuckle and Lewis also won. Morris and Devinney lost on points while Barber and Taylor were pinned.

Only three Beavers won against Biola. Morris (115), Woodhead and Reagle (191) won their matches, the last two by pins. Lewis and Johnson battled to ties. Cox lost his match on points while Langill (123), Hornbuckle, Barber, and Devinney were pinned. The 152 lb. class was forfeited.

Hoopsters Trounce Pacific-Christian

Last week was brightened by the second of the semi-annual clobberings of Pacific Christian 100-68 on Tuesday, but things returned to form as Tech lost to Pomona 87-67 on Wednesday and Claremont-Harvey Mudd 90-59 on Friday.

The victory over PC was purely a case of physical superiority and experience as Tech outrebounded the opposition 78-44 and outshot them 40% to 30% by consistently putting in second shots and penetrating the man-for-man defense for close-in attempts. Not of little help, for a change, was the free throwing. With a nearly equal number of attempts, Tech hit a phenomenal

92% while PC only managed 50%. The dramatic improvement can probably be attributed to the relaxed mood in which the Beavers are able to play this game. High scorers were Dennis Carrie (25), Tom Heinz and Ken Hanson (19), and Bruce Ault (10). Hanson hit the boards for 27 rebounds to eclipse his previous season's record of 22 as Heinz contributed 13.

The loss to Pomona was purely a matter of superior offense and some loose refereeing under the boards as Tech got but two fewer field goals and had one less turnover but received only 17 charity tosses to Pomona's 37 while converting 41% to their

64%. Inability to force the outside shot attempt again made the difference as 80% of Pomona's baskets were made from within five feet while Tech's offense was balanced. There was no case of letdown apparent as the half statistics were as balanced as those of the game, with Tech being outscored by ten points in both. High scorers were George Fox (19), and Heinz (18) with Hanson collecting 12 rebounds and Heinz 9, despite fouling out in the second half, to lead the SCIAC in rebounding average.

Trailing by only 9 points at halftime, the Beavers again unaccountably fell apart in the opening minutes of the second half and found themselves behind by 20 at Claremont, with half a game yet to play. Physically a match for the Stage, Tech was only slightly outrebounded but turned the ball over more often the way it hurts. With faulty passing and handling and CHM fast broke more than a few times for easy baskets; and was out-

(Continued on page 8)

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CHM Swimmers Drown Beavers In Dual Meet

Claremont Harvey Mudd drowned the Beaver swimmers in a dual meet by the score of 85-28. The team was led by senior Dick Wright who remained the only undefeated member of the Tech team by winning the 200 backstroke and taking second in the 200 IM. Sheffield swam to second place in the 1000 free and in the 200 fly.

Steve Johnson gained seconds in both the 1-m and 3-m diving events. Kalisvaart was third in the 200 free and in the 100 free. Mikowicz took a third in the 500 free, while Rude was third in the 500 free. The Beaver breaststrokes came through as Tyson and Stefanko took second and third in the 200 breast.

Rugby Game Close Fought; First Defeat

by Alan Cope

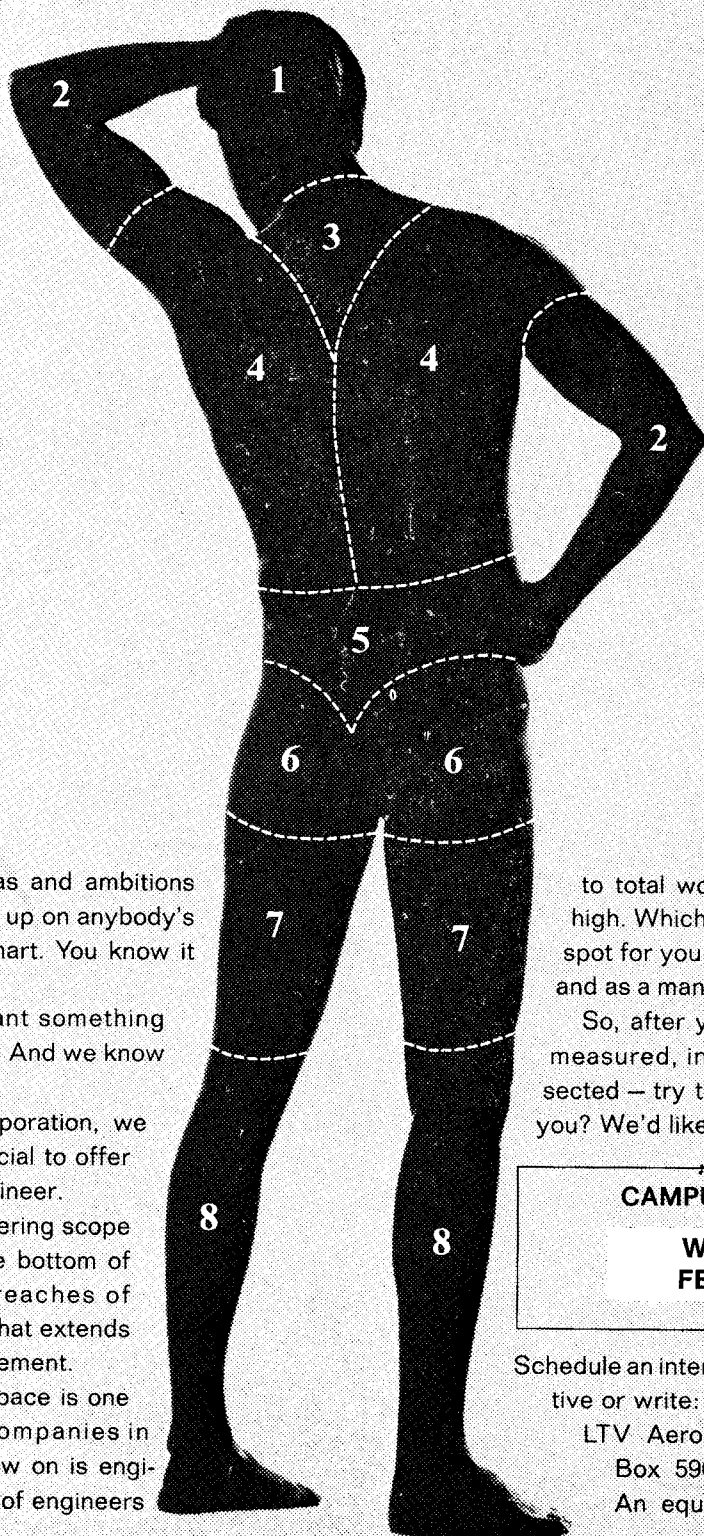
On Saturday, the Rugby team went down to their first defeat of the year. Unfortunately, the occasion was the team's first league game of the season and against San Fernando Valley State College, last year's league champions.

The game was closely fought for most of the time, but toward the end of the game it was clear that the bigger and stronger Valley State forwards were in control. The Caltech backs showed some imaginative touches, but the ball rarely got back to them and when it did it was under the pressure from the Valley State defense.

Caltech opened the scoring when Peter Dodds dove over for a try following a well judged kick ahead by John Speight. Harry Hyland added the extra two points with a good kick, but was unlucky later in the first half to narrowly miss with two good penalty goal attempts. Valley State matched the Caltech score just before half-time, and then in the second half scored two more tries, one of which was converted to make the final score 13-5 in their favor.

Next Saturday at 2 p.m. U.C. Riverside visits the Caltech Field, but this time it is hoped that Caltech will be a little less hospitable.

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CAMPUS INTERVIEWS

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Answers To Geller's Bridge Midterm

(Continued from page 3)

Solutions

(A) What's your partner doing? He can't have a long club suit, because West has that. (West would possibly have chosen to make a less hasty choice of contracts with a long heart suit.) So clearly North is cue-bidding, showing a two-suiter in the majors. It seems reasonable to show your preference for spades. Let's turn this over to the panel.

GUBMAN: "Four diamonds. You are too weak for four spades." How is North going to know that you have four spades unless you tell him?

SAVAGE: "Four spades. If my partner bids at this level without supporting my suit, I must assume he has a good six card suit or else a two-suited hand. My assumption is that East's suit is hearts . . ."

DELANEY: "Four spades. If West had a major suit, he would have bid it rather than three no-trump. My partner's club bid must be asking me to bid a major."

But BOSWORTH: "Pass . . . If partner had a good hand he'd be more aggressive." How?

Can You Pass?

(B) The panel is evenly split on this question. Either pass or one club could be right. I will content myself with pointing out that at this vulnerability, aggressive action is clearly called for at rubber bridge. Now let's see what excuse the passers have for their pussilanimous choice.

GUBMAN: "Without a major, at this vulnerability, I will certainly be outbid. Pass."

Certainly?

SAVAGE: "If bidding strong notrumps I would pass."

DELANEY: "One club. Even opposite such trash as S J 10 x x, H K x, D A 10 8 x x there will be an excellent play for three notrump."

How do you plan on bidding it, Bill?

BOSWORTH: "One club, at rubber bridge. Take it easy." Weak notrumps, anyone?

Limit Bid

(C) For the first time there is relative agreement among the panelists. Only Bosworth fails to double: "Pass. What else?"

KipnisMimers Play Friday

On Friday, February 14, at 8:30 p.m. in Caltech's Beckman Auditorium, Pasadena, Claude Kipnis will present his mime theater of Israel. "Men and Dreams," the mime show created and performed by Claude Kipnis with Rita Hachtmann and Rudy Benda, is the poetic product of the new Israel in the universal language of pantomime. A former student of Marcel Marceau in Paris where both were born, Kipnis' work has also been compared to Charlie Chaplin's and while eminently worthy of the comparison, Kipnis is fresh and unique. The Kipnis repertoire is all encompassing. He pokes fun without bitterness. His targets can be the hobo or the cabinet minister; he "kills time with a young hood" and in "The Story of An Apple," Eve and The Serpent are the all-star cast.

Tickets are on sale now to the Kipnis Mime Theatre coming to Beckman Auditorium. Call 793-7043 for information.

SAVAGE: "Double. They probably can make two spades and we may have a partial in hearts or clubs. Partner can pass with a spade stack. I would pass this hand if vulnerable."

DELANEY: "Double. If partner passes . . . you should have a good set."

GUBMAN: "Double. Playing negative doubles my double promises a four card heart suit."

Weak Hand

(D) Again the panel is almost unanimous. Only Savage seems to realize that partner might have overcalled immediately with a weaker hand. You simply cannot afford to pass up a potential vulnerable game at imps. Even if four spades goes down they will bid it at the other table. What will you say to your team-mates if four spades is a make? Three panelists felt differently.

BOSWORTH: "Pass. He can't be that strong."

DELANEY: "Pass. If partner

can make four spades he would have bid it."

GUBMAN: "Pass. My partner would bid four clubs with the really strong hand needed to make game opposite my cards."

But SAVAGE: "Four spades. This sequence is very strong compared to an immediate overcall of three spades. The ace of spades is an entry to take a finesse which in view of the preempt should be onside."

No Help

(E) Again the panel is split. I feel that it is only fair to allow the panelists to speak for themselves on one problem.

SAVAGE: "Pass. This is a forcing pass."

GUBMAN: "Pass. Assuming six clubs won't make, I must get at least an average this way."

DELANEY: "Six clubs. If you can't make six clubs, you probably can't set five spades either."

BOSWORTH: "Six clubs. You might make, and five spades might make quite a few."

Tech Basketballers Win

(Continued from Page 7)

shot 44% to 37% from the field. Tech hit 58% to Claremont's 50% from the free throw line but was awarded less than 2/3 as many attempts as SCIAC officiating once again asserted itself as among the worst in college basketball. Scoring was well balanced with Ault leading with 13, mostly on 15 to 20 foot set shots with Gary Koenig adding 10 from drives and rebounds. Heinz led the rebounding with 11 as Han-

son and Tom Bicknell contributed 7 apiece.

While the Varsity was trouncing Pacific Christian, the Frosh beat Rio Hondo 92-73 on 36 points from Pool with Meadows adding 17, MacInnes 15, and Waddington 10, then lost a heartbreaker to Pomona 64-62 as a last second shot missed. Pool again led all scorers with 26 with Meadows contributing 19 and MacInnes 14. Giving away at least 3 inches of height at every position, the Beaverbabes were convincingly outrebounded and lost to CHM 93-35 as Pool hit for 21, most in the second half.

On Friday the team travels to UCSD for another trouncing and then on Saturday attempts to turn off one of the NAIA's leading scorers a LA Baptist then plays its next to last league game against Oxy on Wednesday.

CAB No-Fare

(Continued from page 6)

ruling would threaten half-fare tickets for youngsters between 2 and 12 years of age (reservations can be made for such tickets), for military personnel, and several other special fare categories now properly and prudently provided by the airlines."

Olsen called upon the Congress and the Nation's parents and young people to assist him in carrying his protest to the CAB.

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February 28, 1969

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