Today Is

The CALIFORNIA Tech

Add Day

Volume LXXVIII Number 4 Pasadena, California Friday, October 15, 1976 Twelve Pages

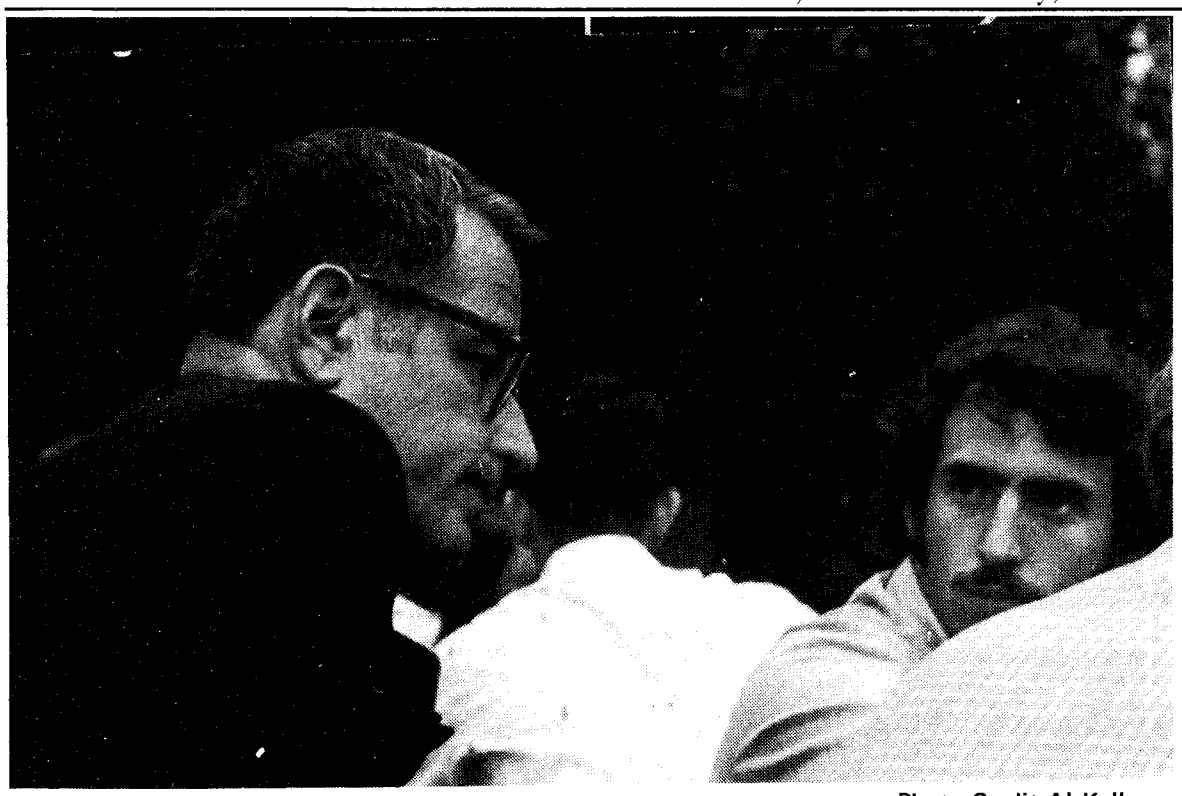


Photo Credit Al Kellner

One of the very best.

HAROLD BROWN

by Gregg Brown and Bert Wells

This interview was conducted on October 8, 1976.

Why are We Here?

Tech: The first question and probably the primary one is "What do you feel to be the purpose of Caltech?"

Brown: Well, historically, one can look at it from a historical point of view, but I'd prefer not to, I think the thing to do is to ask "What do we try to do here?" I think that we are a unique institution in terms of the combination of a large research institution with a small student body, which includes both undergraduate and graduate students. This combination, I think, is what in some cases makes it difficult for people outside to understand what we're like. They know Caltech as a great source of research, of new knowledge, of new disciplines even, and they're always surprised when the answer to their question about how many students there are here is given. I think that the small number of students doesn't mean that those students aren't an important component. In a real way, I think that Caltech has had as much influence through its students as it does through the research that is done here, because the students then go out and then start new schools of their own and do research or their own. One can adduce a long list of eminent graduates of Caltech who have been here as undergraduate students or have been here as graduate students or even as post-docs, not really students here at all. In molecular biology, for example, almost all of the people who have contributed to molecular biology in the past twenty-five years have been here at Caltech but many of them not as undergraduates or graduates, but as post-docs. So, Caltech is a source of research, and it's a source of people. It's in this that its functions are complementary. I believe that Caltech also is unique in the quality of the work it does in a narrow field. We are in a series of narrow fields, a series of targeted fields. We are not and I don't think we aspire to be a general purpose University. It has been said that we are a university of science and I don't think that quite puts it right, either, because that perhaps underestimates the contributions that are made from Caltech's work in engineering and technology, and of course when you include the Jet Propulsion Laboratory which is a research part of Caltech that is a peculiar combination of science and technology.

In a way, there's some science for its own sake there; in addition there's a substantial technology, but for the sake of science, that is to say that technology that produces spacecraft and sends them away to other planets is indeed a technology of an advanced and, in a way, of an applied kind. But its purpose is to get knowledge and that makes it in the service of science. I'm not sure I've answered your question, but I think I've described Caltech.

Tech: You mentioned that Caltech is unique. How many people outside Caltech realize this, and in particular, before you started becoming familiar with Caltech, as you probably did about the time we were looking for a president, did you feel that Caltech was unique?

Brown: It's true that I had only visited Caltech once or twice before I came out here to talk with people about the possibility of my becoming its president. That was in the fall of 1968. But I already knew quite a lot about Caltech because I knew a very large number—not a large fraction, but a large number of the people from Caltech. I had known Bob Bacher, who was our provost for ten years, and I knew Lee DuBridge, although not nearly so well, and I'd known Charlie Lauritsen, and I had known, until his death Clark Millikan . . . Bob Christy, so I knew a fair amount about Caltech. And of course I knew its scientific reputation. There were some other things I didn't know: I didn't know how small it was, either. I shared the popular confusion of results with

Continued on Page Four

On the Third Floor

Millikan

The Caltech Library extends a warm welcome to new students and faculty. Did you know that there are about forty libraries and reading rooms on the campus? This is a special characteristic of library resources at Caltech. There is actually no real central library collection. Even the collections in the Millikan Memorial Building are mostly individual subject collections.

There are some centralized collections and library services in Millikan. The Reserve book service is on the first floor, for books and publications which have been assigned for specific reading by professors. Here you will also find a collection of records and some listening equipment.

On the second floor is the general reference collection and the union card catalog of holdings in most campus libraries. Readers' Services Librarian Rod Casper and his staff will be glad to help you find your way to the various collections. On this floor you will also find an extensive collection of telephone books and indexes to Caltech dissertations. The interlibrary loan office is here, for the convenience of faculty and graduate students.

You can sign up here for the intercampus vehicle which operates between Caltech, USC, and UCLA. It also stops at the Norris Medical Library (Part of the USC School of Medicine, located near the County Hospital) and the Clark Library (part of the UCLA system but located elsewhere, specializing in 17th and 18th century English civilization).

On the fourth floor is the Humanities and Social Sciences Library. This has many books of general interest, like a small public library. Here you will also find a large collection of college catalogs and information on scholarships and grants.

On the fifth floor is the government documents collection. Mrs. Casebier will be glad to help you find specialized information in your subject field. Here also is the microform center. Many publications are now available on microform, and we have readers and printers available. This microform room is closed at 5 p.m. and on Saturdays and Sundays (due to lack of staff), so arrange to visit it during regular weekday hours. This floor also has humanities journals.

The upper floors are science oriented:

Continued on Page Ten

Here Comes MacBride

Roger L. MacBride, the Libertarian Party candidate for President, will deliver a major speech entitled, "1776–1984, Can the Family and Community Survive Big Government?" at Monrovia High School Auditorium, Monrovia, California, Wednesday, October 20 1976 at 8:00 p.m. Admission is free.

MacBride s Monrovia appearance follows the October 8 Saturday afternoon NBC T.V. special on the Fight for Survival of the Samll Incorporated Community in Southern California, which featured Monrovia and its city officials.

MacBride is especially concerned about the condition and continued viability of small communities. "Federal Urban Renewal is a fraud on the people," he says. "There are alternative, private, and more economic methods of providing housing for all people without Washington's coercive taxation."

MacBride is known as the co-creator of the popular T.V. series, "Little House on the Prairie.' He is a graduate of Princeton University, harvard Law School, and a Fulbright Constitutional Law Scholar. He is an attorney and currently operates a farm in Virginia.

MacBride has been active in politics in Vermont, a Virginia Elector, and is the author or editor of six books on diverse subjects such as the Electoral College, treaties, and the Constitution, and *A New Dawn for America—The Libertarian Challenge*..

"He is a consistent and persistent advocate of the free market in all areas of human

Continued on Page Eight

All the News That Fits

Flu Clinic

Available to all Caltech personnel, students, and spouses on the Spouse program is Influenza B–Hong Kong Strain flu vaccine. The flu clinic will be at the Health Center on Oct. 22, 1976 from 9 a.m. 'til noon and from 1 p.m. 'til 3 p m. Appointments for the flu clinic are advised.

Watch for locations listed in local papers for Swine–A Influenza Flu vaccine administrations.

Fellowship Deadline

The deadline for submitting applications for the Churchill, Danforth Luce, Marshall, and Watson Fellowships is *October 22*. If you have any questions, come to see the Deans.

Missing Tapes

Will whoever borrowed the tapes for lessons one through four of the elementary Russian course please return them to the language lab in Dabney Hall.

Parry! Riposte!

The Editorial Page

Editorial Policy

The first signature of an editorial indicates the author of that editorial. The following signature, if any, indicates the approval of the other editor. If both editors sign the editorial, that opinion represents the opinion of the *California Tech*. A dissenting editor may write an editorial opposing the views presented in the main editorial.

In general, column writers have complete freedom as to the content of their columns. No column shall be eliminated from any issue of the Tech solely because of the opinions presented in that column. Column writers represent only their own opinions and not necessarily the opinions of the *California Tech*.

The *Tech* welcomes all letters, whether or not they agree with editorial opinion. Letters are edited (or left out) solely on the basis of space, decency, and the desire to represent opinions in proportion to the amount of mail received. As with columns, the opinions stated within letters are not necessarily those of the *California Tech.*

Copy Policy

Effective Friday, October 15, 1976, absolutely no copy other than newsbriefs will be accepted for publication in the *California Tech* unless the author's name appears on the material. After submission of the material, the author's name may be withheld or a *nom de plume* substituted if such a request is made and if circumstances indicate that that is a reasonable course of action. No article will be printed with the author's real name if the author objects to such publication, but we do require that the *Tech* have a record of its contributors.

Al Kellner
Carl J Lydick

Letters to the Editors

Stay Off Pot

To whom it may concern:

We (the members of Ricketts House) are now involved in the major undertaking of reconstructing the Pot in our courtyard. Several hundred man-hours of work, centered on a fund-drive of the alumni of the House, have brought in the necessary capital to begin work on the replacement.

We are going to great pains to insure that the new Pot, to be made of concrete, will resemble the old one in size, shape, color, and overall appearance. Once the project is completed (probably within two months), we would like it to stay that way.

In other words: please do not interfere with the reconstruction in any way. Several stages of the work to be done are critical for good results. Also, after the job is finished, please leave the new Pot alone.

This letter is *not* a challenge: it is a warning. If anyone does anything to the new Pot, either while it is being worked on *or* after it is finished, they will be liable for possibly expensive repairs, and they will be considered by the House to have taken unfair advantage not only of its current members but also of more than a hundred of its alumni. The latter have donated an average of more than ten dollars apiece, and we would like to stay on good terms with them.

We want to put the new Pot back into the condition the old one was forty years ago, and have it stay that way: unpainted, clean, and not the target of any interhouse rivalry. We will sincerely appreciate your co-operation.

—Alan Silverstein
For Ricketts House

The CALIFORNIA Tech

Friday, October 15, 1976

Volume LXXVIII

Published weekly except during vacation and examination periods by the Associated Students of the California Institute of Technology, Incorporated. The opinions expressed in all articles are strictly those of the authors and do not necessarily reflect the views of the editors or of the corporation.

Editors in Chief
Al Kellner
Carl J Lydick

Editorial Staff
Managing . . . . . Henry Fuhrmann
Features . . . . . Gregg Brown
Sports . . . . . John Loo

Business Manager
Ken Kroll

Publications Darkroom Chairman
Dave Wheeler

Writing Staff
Dick Beatty, Dave Calloway, Kevin Drum, Shevaun Gilley, Judy Greengard, Chris Harcourt, Rock Howard, Morris Jones, Tom McCabe, Nick Smith, Brett van Steenwyk

Photography Staff
Pam Crane, Joe DiGiorgio, Ray Gildner, Ken Li

General Staff
Alan Boyar, Flora Boyer, Stan Cohn, Mark Gubrud, Michael Suzuki

Circulation Managers
Mike Frisch
Aileen Stone

The California Tech publications offices are located in Winnett Center (105-51), California Institute of Technology, Pasadena, CA 91125. Telephone: 795-6811 X2154 Printed by News-Type Service, 1506 Gardena Avenue Glendale, CA. Represented for national advertising purposes by National Educational Advertising Services, Inc. Second Class postage paid at Pasadena, California.

Subscriptions . . . $1.50 per term
. . . . . .$4.00 per year
Life Subscription $100

If you're not desperate yet, you will be...

SOONER OR LATA

In your now no doubt desperate search for diversion, I'm sure that at least six of you (in the appropriate units) have discovered the Listings in *Calendar*. Congratulations. A more comprehensive index is not easily found. This week, for example, under the general heading of *Stage* there appeared over one hundred offerings. This group as a whole represents a breadth of topic and general accessibility unapproachable by the major houses such as the Ahmanson or the Shubert.

I say accessible not only because these theaters are scattered all over the L.A. area, but also because tickets are almost always available. It is, after all, rather easy to become lost in the jungle of promotion disgorged by large-budget productions. Search no more! The Los Angeles Theater Alliance is an organization of thirty-two of these smaller theaters, and it serves not only in the capacity of champion (strength in numbers, no?) but also promotion and ticket sales.

The LATA offers a subscription series of tickets to any five of the thirty-two member theaters for $17.50. If you are a student the series is a mere $15. If you're not a student, weep not! (Neither should you rejoice, for it's not nice to gloat.) You too can buy the series for $15—this Saturday and Sunday from 10:00 a.m. until 6:00 p.m. at the LATA Theater Faire and Bazaar, a free event at the Los Angeles Mall (Temple and Los Angeles Sts.).

This fund-raiser for the member theaters is probably academic to those of us attending the Dead party at the Shrine. For the rest, however, there will be booths selling acquirables and munchies, strolling players, street dancers, madrigal groups and fencing demonstrations from one of the members, the Globe Playhouse (The Shakespeare Society of America), and ongoing entertainment and improvisation by the member theaters on an open stage on the Mall.

Among the members at the bazaar are La Mama Hollywood, whose highly acclaimed *Skyjack '76: Entebbe* (which, incidently, is free; there's a hassle-free plate for contributions from those who can near the door) has been involving audiences as hostages, Synthaxi's Theatre, where Brecht's *The Elephant Calf* and Ionesco's *Improvisation* directed by Cyndi Turtledove can be seen, the Megaw Theater, where Elmer Harris' *Johnny Belinda* plays, the Melrose Theater Assn., Nosotros, and the Open Circle Theatre. Information about the bazaar, the members and the LATA is to be had from the LATA itself between the hours of 11:00 and 4:00 by calling 463–3121.

If you want theatre close to home, be patient. Spectrum 12, Ferenc Molnar's *Olympia*, opens in Ramo (at the south end of Baxter) next Friday, October 22 at 8:00. For the measly sum of $2 for Techers (and don't forget the $1 rush) you can have an engaging look at imperial Vienna just before the fall—a look which somehow reminds one of Los Angeles today.

—*Chris Harcourt*

Anya Offers Soft Music, Natural Lighting

by David J.E. Callaway

Man's quest for truth and beauty in his world is one of his few stable aspirations. Caltech presents the obvious scientific search for truth, and combines it with a small involvement with the beautiful. One of the better parts of this involvement is Anya Fischer's "Art Studio Workshop", which happens Saturdays during the term between 1 and 4 o'clock in the Blacker-Dabney basement.

Since its start 3 years ago, the workshop has been very successful. It's truly a "college-level" course—thoroughly developing all media of drawing and studying color. It's success has been noticed by the Caltech community as well — according to Ms Fischer, more people came to the workshop's exhibit in Dabney Hall last May than to the gallery in Baxter Hall.

"Caltech is a wonderful place to teach art", says Ms Fischer. "Students here have a great span of attention—they're not 'fly by-nights'—they often work on one drawing for hours. They think hard on a little space, a piece of drawing paper. It's wonderful to have this kind of student." Her students work in a very relaxed atmosphere, with primarily natural lighting and soft music. Several of the students admit this is very important to them, but that without Ms Fischer it would probably not work. It s the "high point" of the week to many, which Ms Fischer attributes to the fact that her students can "be themselves" here—an outlet she considers very necessary.

"Physical outlets like athletics are fine," she says, "but people also need a mental outlet. The only spot they have is here. If a person relaxes, they find they are able to do science better, and this makes them better for science."

Unfortunately, the workshop is very short of money—it has only enough to operate one semester. As each cultural island at Caltech disappears, it leaves the place a little more lifeless (if this is possible). So—contribute!

Harold Brown Interview

Continued from Page One

size. I'd known about some of the work at JPL. I'd known Pickering. So that I was, I think, fully aware of Caltech's scientific reputation. It's only since I've been here that I've come to realize fully some of the distinctions that I haven't had a chance to go into, but which I think follow from the small size. People here know each other. At a faculty meeting, maybe a quarter of the faculty will be there, which sounds small, say compared to the number of people who vote in elections, but it's enormous compared to the fraction of faculty that turn up at a faculty meeting elsewhere. I've only become aware since I've been here that most of the faculty are sufficiently in love with their own work that they are reluctant to take a very deep role in what might be loosely described as Institute politics, so that Institute politics hardly exists in the sense that University politics at other places exists. An active faculty member, active in research and teaching, really makes a tremendous sacrifice when he devotes some of his time to administrative responsibilities. That's a common expression elsewhere, but I think people don't really mean it elsewhere. They really do mean it here. I think that I wasn't aware, for example, of the existence here of the honor system. And the degree to which, at least in academic matters, it appears to work very, very well. I've seen difficulties that have occured in some other places—particularly the service academies: the military academy, the Air Force academy . . . the Naval academy doesn't have one . . . that have occured with honor systems, and I am even more impressed, therefore, with the way that it appears to work successfully at Caltech. And I think that's something you only know by being here.

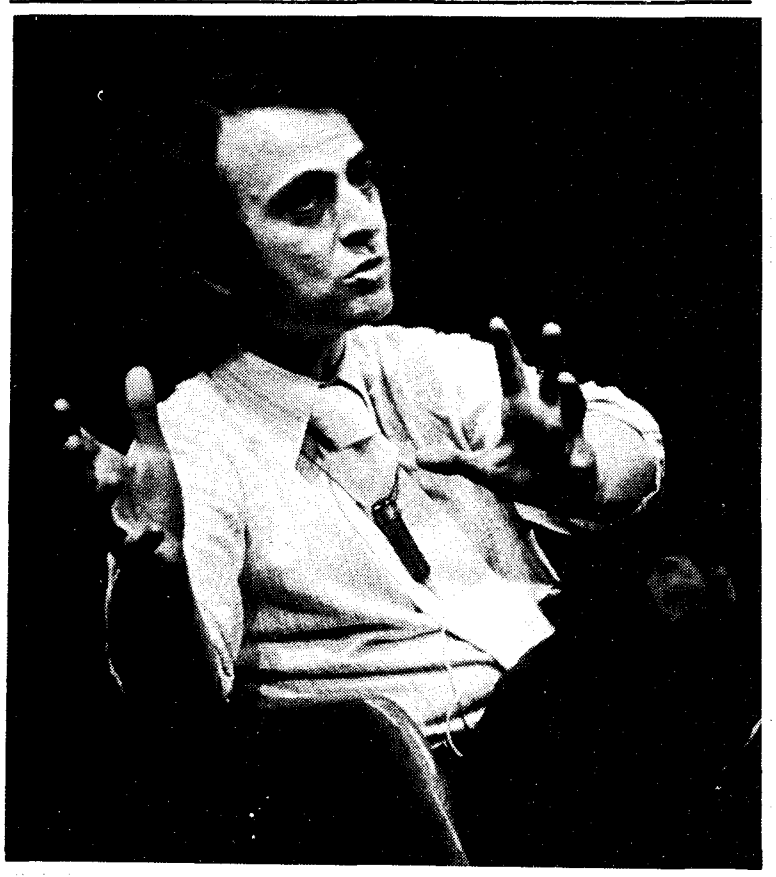
Tech: You speak highly of the small size of Caltech and that's understandable, yet it's also a source of people. Do you see any plans to increase the undergraduate student body? Have we reached the ideal balance? In '72 you said 800 is too small, maybe 1000 is right. We're around 1000 now . . . .

Brown: No we're not. There are in fact 860 this year, which is more than there's ever been. I'm not sure what the right size is, and I'm not sure that the right size is always the right size, that is, always the same size.

I am also convinced that there is not much point in making a substantial expansion in size unless the quality can be preserved. That is, you have to try to get something better out of it. Now what is there better? Well, to a first approximation I suppose if you don't change the quality the effect is linear in the number of people. To some extent one can hope that a small increase in size will produce more people who will work on the newspaper or be on the football team, and therefore allow you to do things which otherwise might not be of critical size. In addition, one could also do something different, and that is to try to introduce a very different sort of person to the Caltech environment. That has often been suggested, and I guess at the beginning I thought that might be a good idea. Now I am inclined to think not. Because I think that diversity, although it has its advantages, is also a source of real problems. The conflicts get worse the more diversity there is. I think we are therefore faced with a real problem of how you give our students, and to some degree our faculty, although they're better able to reach out for it themselves, access to different kinds of experience. It's been said that students learn more from each other than from the faculty, and that means the less diversity there is in the student body, the more limited their learning experience is. What I've tried to do and what may have succeeded to some extent is to bring in different kinds of people from the outside and expose students to them. Having Trustees visit the student houses is an example. You're never going to get another student like that, although you may get a student who's potentially something like that. The Y has a program that tries to do the same thing. We have visiting scholars, who are often outside of science and technology. I don't delude myself that this means that all Caltech students are going to be exposed even to this limited outside influence. Because all you can do is make it available, you can't make people undergo the interaction. But I'm now convinced thet we're more

Continued on Page Six

Small size means efficiency and contact



Carl Sagan talks on Mars

Photo—Pam Crane

Silicon Giraffes?

Vikings Win

by Alan Silverstein

According to Gavin Claypoole, "it was pretty darn close to a full house." Ex-*Tech*-Editor Ed Schroeder, upon seeing me jotting down my first quotation of the evening smirked and said to also-ex-*Tech*-editor Gavin, "Well, at least he spelled your name right," to which the latter shot off quickly, "If he's going to quote me like that, he might as well spell my name wrong."

The conversation there in the front rows of Beckman Auditorium last Tuesday evening proceeded to make evident the coincidence that Gavin was planning to write up Dr. Carl Sagan's talk about Mars, also (though not for the *Tech*; he's graduated on to bigger and better things). I wondered what the article I might produce could be titled, at which point Ed (Etaoin Schroedlu) Schroeder wryly remarked "Well, if Gavin's quote weren't so long, you might use it for a kicker."

Starting an article, I've discovered in the several years I've written for the *Tech* is the hardest part of writing it. Thanks, Gav and Ed, for your clever suggestions on how to start this one—based, no doubt, on many combined years of editing experience.

Dr. Sagan, of course, was far more polished start-to-finish in his presentation than the above paragraphs could ever be. Only a few minutes late, my thrilling conversation with Ed and Gav was interrupted by the start of the evening's program, entitled, "Viking and Mars". Carl Gilray, the Caltech Y Student ExComm president and thereby a legitimate representative of the Y (which sponsored the event: do you know how much it costs to rent Beckman for a few hours?), introduced Dr. Bruce Murray, CIT Professor of Geology and more notably and recently the Director of the JPL. Dr. Murray, the evening's host, then turned the show over to Dr. Sagan, who, in addition to being deeply involved in the Viking mission is also a Professor of Astronomy at Cornell and a noted author.

The gist of his talk, which lasted nearly two hours (including a few Q&A s at the end), was a slide-show-discussion of the results of the Viking project to date. Unusual as well as well-publicized views of the Red Planet were shown, and a good deal of info was disseminated, most of which the competition (*i.e.*, UPI, AP, the *Times*, *etc.*) certainly received but never saw fit to print.

I will now take you on a brief tour through Dr. Sagan's talk, as I remember it and jotted it down at the time. I caught at least a few of the amusing and/or profound things he said word-for-work and will do my meager best at quoting him, intermixed with a lot of other neat tidbits he nentioned but I couldn't get literally because, after all, when the lights are out for slides, it s dark in there . . . .

First, Dr. Murray had a few words to start off the evening. The Viking mission has been "an exciting exhibition" of the power of modern technology, he said.

Continued on Page Seven

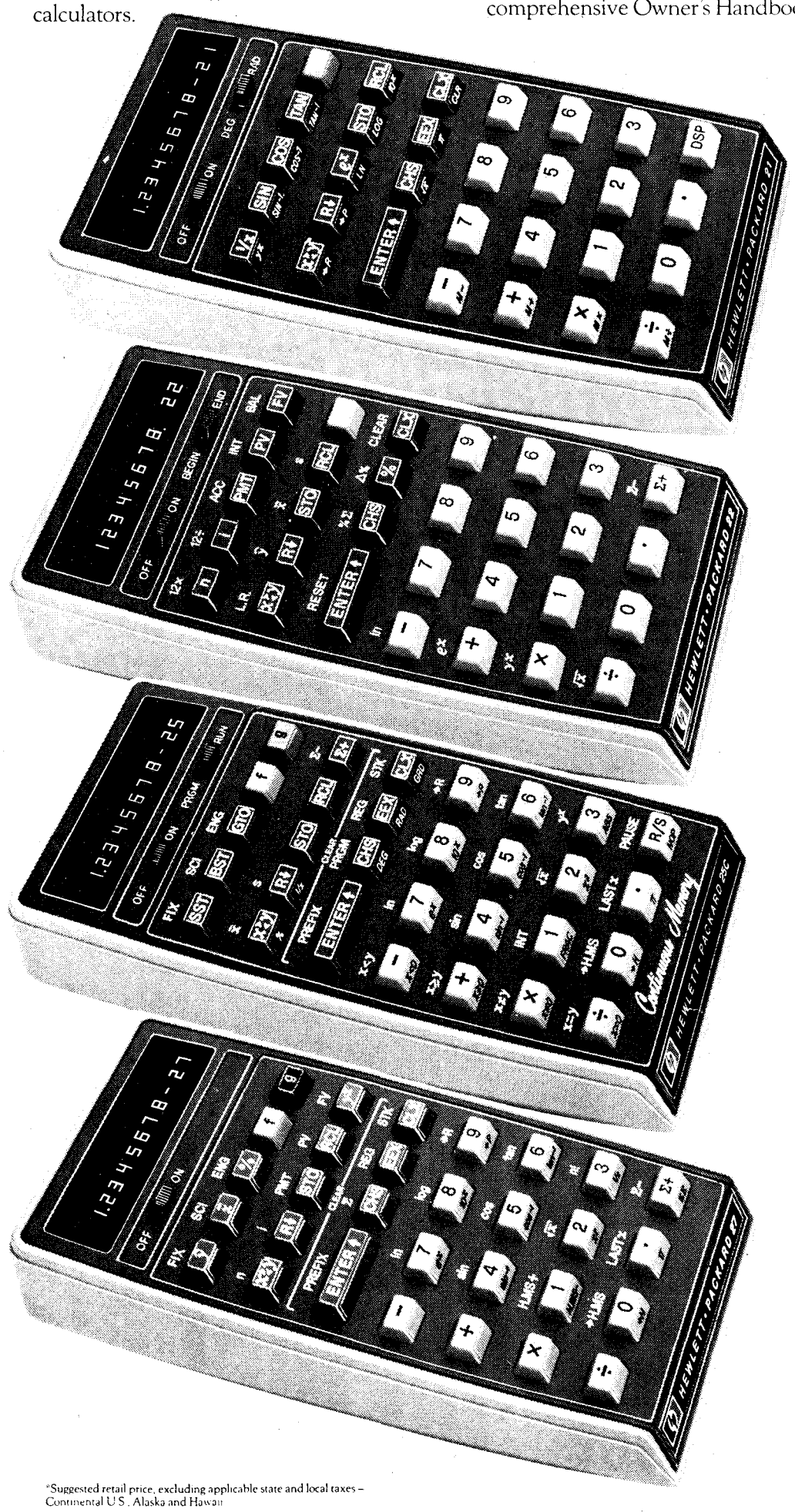
The Hewlett-Packard first family of calculators are in a class by themselves.

Hewlett-Packard built the world's *first* advanced pocket calculator back in 1972. And led the way ever since.

Today, Hewlett-Packard calculators are recognized as The First Family by more than one million owners worldwide. Including Nobel Prize winners, USA-USSR astronauts, explorers, educators, scientists, businessmen, and students. Here's why:

First family design.

Hewlett-Packard *was* first—and continues to lead—in the translation of state-of-the-art technology into advanced calculators.



First family performance.

Hewlett-Packard means the kind of performance that includes RPN logic with four-memory stack, a full range of advanced functions, and much, much more.

First family reliability.

When you buy a Hewlett-Packard calculator you get one year's protection on parts *and* labor. And a two working-day turn-around on most repairs.

First family support.

Every calculator comes with its own comprehensive Owner's Handbook. In addition, a complete selection of optional accessories increases the versatility of the calculator of your choice. Hewlett-Packard offers more because Hewlett-Packard's got more to offer.

Free booklet while supplies last.

"What To Look For Before You Buy An Advanced Calculator" helps you make a wise purchasing decision. Pick up your free copy at your campus bookstore. Or telephone **800-538-7922 (in Calif. 800-662-9862)** toll-free for the name of your nearest dealer.

HP-21 Scientific. New low price—$80.00*

The HP-21 makes short work of the technical calculations even so-called "non-technical" courses require. If you need a calculator that does more than simple arithmetic—this is it—especially at its new low price.

- 32 built-in functions and operations.
- Performs all standard log and trig functions (in radians *or* degrees).
- Performs rectangular/polar conversion, register arithmetic and more.
- Addressable memory.
- Two display modes: Fixed point and scientific.

HP-22 Business Management. $165.00*

The HP-22 easily handles the kinds of calculations you face in business courses today, in management tomorrow. Breeze through business math calculations. Build existing statistical data into reliable forecasts. If you're going into business administration, this is the calculator for you.

- Combines financial, mathematical and statistical capabilities.
- Performs complex time-value-of-money computations including interest rates.
- Performs rates of return and discounted cash flows for investment analysis.
- Performs extended percent calculations, accumulated interest, amortization, etc.
- Ten addressable memories.
- Full decimal display control.

HP-25C Scientific Programmable with Continuous Memory. $200.00*

The HP-25C is our keystroke programmable. It can solve automatically the repetitive problems every science and engineering student faces. What's more, Continuous Memory lets you retain programs and data even when it's turned off.

- Continuous memory capability.
- 72 built-in functions and operations.
- Keystroke programmability.
- Branching, conditional test and full editing capability.
- Eight addressable memories.
- We also offer the HP-25, (without the Continuous Memory feature) for $145.00*

HP-27 Scientific/Plus. $200.00*

The HP-27 is for the science or engineering student—whose course work extends into business administration. The reason: It features every pre-programmed scientific function we've ever offered, plus comprehensive stat and financial functions. Thus the name: Scientific/Plus.

- 28 pre-programmed exponential, log and trig functions, 15 statistical functions, 10 financial functions—53 in all.
- 10 addressable memories—20 memories in all.
- 6 selective clearing options gives flexible use of memories.
- Fixed decimal, scientific or engineering display formats.

HEWLETT hp PACKARD

Sales and service from 172 offices in 65 countries.
Dept. 658H, 19310 Pruneridge Avenue, Cupertino, CA 95014

616/30

*Suggested retail price, excluding applicable state and local taxes—Continental U.S., Alaska and Hawaii

BROWN

Continued from Page Four

likely to be able to get that kind of diversification in our environment by bringing in people from the outside than by expanding our student body to include fine arts majors, for example.

I haven't really answered your question about numbers, and I do want to answer it, I don't want to sound like a presidential candidate in a debate by answering a different question, but I still think it may make sense to go up to a thousand in the undergraduate student body; but I worry that doing so might decrease the quality of education here by making it too crowded, by losing this sense of intimacy and interaction that I think students on the one hand among themselves and on the other with the faculty and even with the administration now have. How do we then make sure that we don't lose that? I think the answer is that any expansion we do ought to be made slowly. In other words, you make the expansion, and you look at it and you see what effect it has. I think that before we reach a size where such possible drawbacks become acute, we'll see signs of it and we'll react accordingly. I don't think it's possible by constituting a committee to talk about it or by trying to make calculations or by writing down the factors, you know: student housing, meal service, size of classes, intricate combinatoric mathematical theorems and so on to deduce at what point the advantages of small size will be lost. It can only be determined experimentally and since I think it would be foolish to try an experiment in which you have to suffer the full consequences before you can undo it, I think that the right way to proceed is by making a gradual expansion and in fact that's what we've been doing. To some extent that's been forced by faculty insistence, which I think is correct, that the freshman class not be so large as to jeopardize

Gradual expansion

quality. The faculty insists on it; I agree with it and I think that by doing that we have automatically made sure that we have not expanded too quickly. We've gone up to 860 from about 800 in about four or five years I guess, I don't have the numbers in front of me, and that's a couple of percent a year. I think that's slow enough that we can see what's happening if it's negative before it's happened in any disastrous way. That's not

Watch it.

automatic, you know; it can be happening and you can fail to look at it, but I don't think we'll do that.

Tech: How about such means as sophomore or junior level transferees to take up the attrition rate in the freshman class?

Brown: I'm all for that, I think it's a very good idea and in my statements up until now I've not meant to confine what I mean to one method or another. I think that we are not, and I don't think we are going to be one of the institutions that when it admits a student, automatically admits an obligation to graduate that student. There are schools, very good shcools–Harvard is like this in fact–that do take that attitude. I think we can't because I think the biggest, but not the only reason for attrition here is that some students decide

Attrition too large.

they don't want to really be in sciences or engineering. Well, if you're at Harvard, and went in as a scientist or an engineer and you decide that you don't want to be one, you don't have to leave Harvard You don't quite have to leave Caltech either but if your change of heart or intention is strong enough you're really quite likely to Few people leave here for academic reasons–I'm sorry–for reasons of academic performance; most leave it for loss of interest, some leave it for other psychological difficulties. This is a very competitive atmosphere as well as being a rather narrow one, and it s also, I think, because of its small size a rather confining one for some people. Some people want to be anonymous, I think you can be anonymous at Caltech but only by dint of accepting certain psychological strictures that some people don't want to take. So we're always, I think, going to have more attrition than some of the big, good, private undergraduate schools, and I think that just as a matter of efficiency, we owe it to society to use our facilities efficiently. I think we ought to expand our upperclass

Cure? Upper class transfers.

admissions program–trouble is, that takes work. It takes work not only on the part of the admissions office but also It takes work not only on the part of the Admissions Office but also people. I've seen some pretty good upper class transferees.

Tech: You spoke of restricting the additional students to Caltech to essentially the same type of student we have now, how do you view the 'typical

Continued on Page Nine

ROCK on ROCK

As part of the vibrant entertainment section of *The California Tech*, "Rock on Rock" is back with more chatter about the latest platters to titillate the palates of all you rock-and-roll-hungry Techers. This week's review features some releases from the early part of last summer.

Firefall by Firefall

Most debut albums have to be judged by their musical content and approach as opposed to their polish and technique. This is not so for the debut album by Firefall which is notable mostly for its precision. The reason for this is that all of Firefall's members have gained experience in name bands such as Spirit and the Flying Burrito Brothers.

The sound of Firefall falls into the easy listening category of rock. The music is dominated by three and four part harmony a la Crosby, Stills, Nash and Young Unfortunately, the material is much less challenging and interesting that the CSNY standards. Still, the overall impression I received from the album was favorable because of the musical cohesiveness displayed by the group and because of a few cute touches (such as some neat fake endings) that the band creates. With some improvement in material this band may become fairly popular.

Wired by Jeff Beck

After his stunning *Blow by Blow* album, Jeff Beck must have felt he had reached the pinnacle of rock guitar music. So in his latest album, *Wired*, he makes a neat sidestep into the rapidly expanding field of jazz rock. To assist him he calls upon a noted jazz musician, Jan Hammer.

As may be expected the sound is quite different from previous Beck offerings. Frankly, I'm a bit disappointed. The lack of any solid musical ideas leaves Jeff little to do but attempt to mark time with his guitar leads. The unusually appropriate title describes the result which is an energetic record that wanders around rather aimlessly. Then again, some people may simply choose to call it jazz.

Red Tape by the Atlanta Rhythm Section

Being born and bred a good

Continued on Page Ten

Hurschler Collection

Despite the trauma of disinterest which at one time threatened the demise of Baxter Art Gallery, interesting, if not pleasing exhibits are now on display for your perusal. The year's first show has come and gone, obscured by those first few weeks of mass insanity that mark the beginning of the term. Nevertheless, a critical appraisal is still in order.

On exhibit until the past week was a representative set of tapestries form the Hurschler collection. Exhibited were the works of artist-weavers from 16 countries, including the United States. The contemporary tapestry as an art-form is little known in most parts of the world and few people in this country have ever seen any. In an attempt to cast light upon this form of expression, J. L. Hurschler began collecting and exhibiting 12 years ago, at the height of a renewed interest in the art-form.

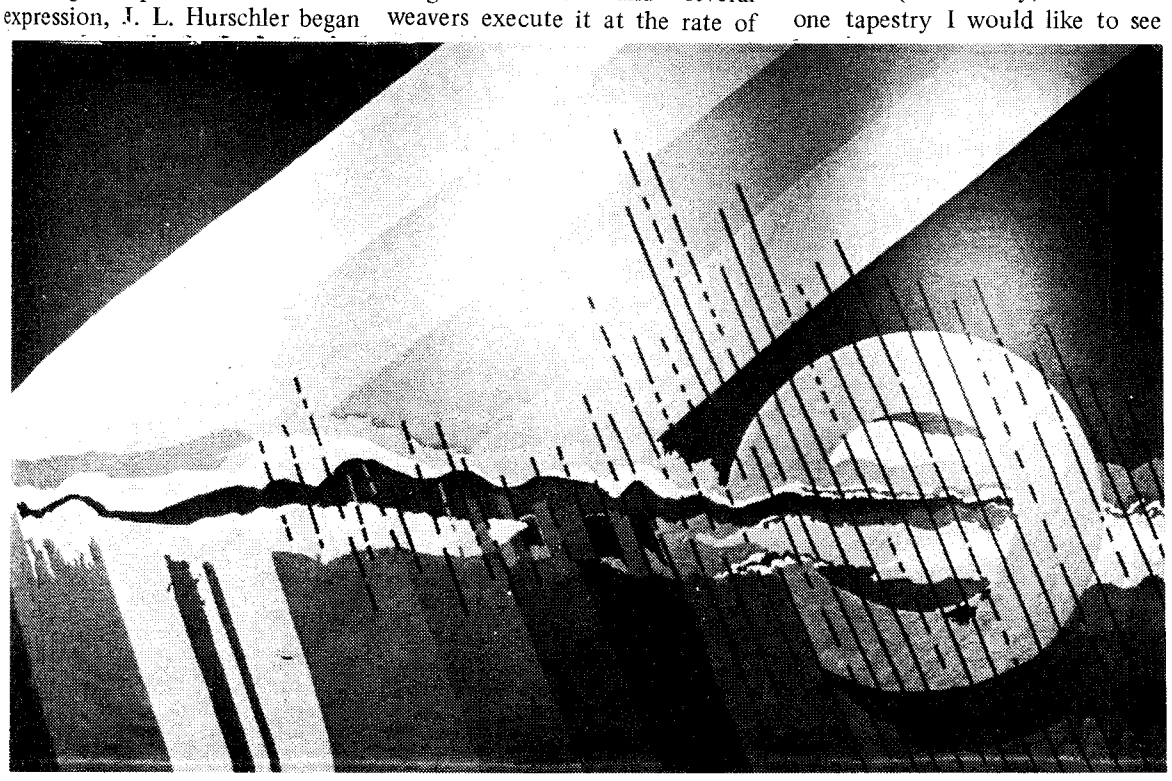
Tapestries were first woven by the Copts in Egypt around the beginning of the Christian era. After flourishing for centuries in Europe, tapestry-weaving declined in the 18th and 19th centuries, owing to a lack of interest on the part of the artists themselves and the aristocracy, principal patrons of the tapestry. At the beginning of World War II, artist-weavers once again began producing tapestries, both traditional in nature and abstract, experimental designs. Two famous weaving centers now exist, in France and Portugal, where the traditional method of artist design and weaver execution is employed. A full-sized color design is made and several weavers execute it at the rate of about one square yard per month

The tapestries on exhibit varied both in size and scope of subject. "On the Way to the Sun," a masterwork of swirling sun colors covers 126 square feet. "Houdah " a piece done in 1973 shows the evolution of ideas toward the non-traditional. It is a three-dimensional hanging network of various fibres, and was eye-opening to say the least. Other works fall more easily into the very loosely defined concept of the tapestry. Subject varied from vivid, pastel-like dreamscapes and abstractions to stark studies in texture, to rather quaint woven-pictures. "Paisagem Possival" clearly pays homage to the wave of abstract concepts which marks much of the art of the 60's (incidentally, this is the one tapestry I would like to see hanging on my wall). "Jan IV" and "Jan III" are texture-pieces–here the artist makes use of the varied textures of different fibres to give life to his work. "Zoo" is the most traditional of the pieces in the exhibit. All the characters from a child's fantasy-world, lions, tigers, *et. al.*, are carefully woven into this rich tapestry from Egypt.

With such apparent diversity among artists who design tapestries, it is unlikely that the art-form will stop evolving and become a remnant of the past. But non-artists must acknowledge the aesthetic warmth that the tapestry can bring into their world, and see it as a woven expression of some facet of man's existence.

–Z-One

On the way to the sun Josef Muller



Paisagem Possaival Antonio Charrua

Photo–Al Kellner

Sagan on Mars

Continued from Page Four

"Many of us, including myself, had some doubts whether it could be pulled off.' Dr. Sagan, he explained, has not only helped analyze the results of the latest Mars mission, but is also partly responsible for the popular interest in science that allowed the mission to take place at all.

Both of them are interested in the search for extraterrestrial intelligence, Dr. Murray said. One reason to start looking for non-human broadcast signals is that we ourselves have been broadcasting our presence, primarily at TV frequencies, for more than thirty years. "I've often wondered what that might mean to future communications," he remarked.

Dr. Sagan took the stage and began by saying that he would be presenting a few of the highlights of the project results: "It's been an exceptionally rich mission so far," he said. Tens of thousands of photographs alone may be received before it is over.

The Cornell astronomer quickly mentioned some ways that Mars has been important in our own scientific development. For example, its existence in a highly eccentric orbit may have led Kepler to his Three Laws. It wasn t until 1965 however, that we first saw the planet at better than several hundred kilometer resolution, with the Mariner four, and then six, seven and nine missions.

The first slide showed the Viking spacecraft during a pre launch checkout: "You can see a couple of organisms in the vicinity, which will serve to give you an idea of the scale," Dr. Sagan said, referring to two naked apes in clean-room clothing. (His odd and provocative perspective was revealed many times during the evening.)

Viking was the first Mars probe to clearly show its craters (the planet s, not the vehicle's, fortunately) in a whole-Mars photo, which was stunningly projected in full color ("a little too green") the size of the Beckman screen (maybe that s one reason why Beckman costs so much to rent?). A picture being worth a thousand words (or a million bits), rhere's no way to describe the glory (yes, magnificence) of some of the photos shown that evening It's not quite the same feeling as looking at an 8X10 glossy. (Pity the poor workers at the Image Processing Lab, JPL, who say they "can t see the picture for the pixels '.)

But, diverting digression–the slides continued One fabulous recent shot showed Phobos (the inner moon) as it has never been seen before. A significant number of linear and parallel striations appeared to cross its pockmarked surface (Dr. Sagan called them "stretch marks"). The best hypothesis so far is that they are caused by grazing collisions by rocks in the same orbit as the moonlet, which are in turn the ejecta of other collisions of smaller rocks with The Big Rock. Lots of rocks all going around and around in a cosmic sand blaster? Nifty (if it's true).

So far, nothing has failed on any of the *four* spacecraft we now have operating across the Solar System, except for the uncaging of one seismometer (on V1).

Dr. Sagan pointed out many features of Mars in photos taken from orbit, and compared them liberally with other planets we've seen close up notably our own. "Comparison of the two planets will almost certainly illuminate both " he said and I've not yet firgured out if that was intended as a pun.

For example, the lobate craters seen on Mars have been observed nowhere else in the Solar System but in the Antarctic regions of the earth. Hence, it is suggested that that the surrounding flow arms may be the result of rocks riding on melted permafrost.

It has been noticed that "dark areas like to have channels in them more than light areas." Could the light regions be dust-covered? In any case crater counts indicate that the larger channels are about *one billion* years old.

Some interesting gases (argon nitrogen, krypton, and xenon, among others) have been discovered in reasonable abundance in the Mars atmosphere. For a number of reasons, their presence and isotopic ratios indicate that there was once a quite respectable atmosphere of other gases, now boiled off or something. A guess would be that it was perhaps a minimum of ten times as dense as today (or about 70 millibars)-- a sufficient pressure to explain channel production by running water.

In some sense Dr. Sagan followed the mission chronologically in his slide show. He talked about the decision that had to be made about where and when to land V1: "It obviously would not have been a great birthday present to the U.S. to *crash* on the Fourth of July!" He also showed what he called "perhaps the last artist's rendition of what the Martian surface *might* look like" as seen during the landing. As long as people remember the Viking mission, "you'll never again see a picture of Mars that looks like that. There are, as it turns out, nasty looking rocks, but not like those nasty looking rocks."

Then, there were photos shown which were taken after the first landing, including a few mind boggling color views (a little bit more staggering when seen nearly life-size). These included the one showing the U.S flag and the Bicentennial symbol-- "It's an extremely patriotic spacecraft. No doubt about which country it came from!"

At one point this little gem was laid upon the rivetted audience (oh, yes, the Rivet are coming, which has nothing or at least very little to do with this

Continued on Page Eight

Bergman Gimmicks Open Cinematech

by Mark Gubrud

Scene: A starkly beautiful Scandinavian coastline. The waves beating against the rocks give the feeling of timeless struggle between forces balanced against each other. The camera focuses in on the face of a young woman staring blankly over the sea. Cut to images of film jamming in a projector; jarring, harsh noises; faces superimposed over each other; a boy reaching his hands into space, trying to touch an illusion; Christ being nailed to the cross . . . .

These and a variety of other cinematic gimmicks helped to create the mood in Ingmar Bergman's *Persona*, shown along with Sergei Eisenstein's *Alexander Nevsky* at Cinematech's season opener last Saturday.

As in all of Bergman's later films, the dialogue in *Persona* seems somewhat grandiose and contrived until one realizes that this is in fact how people talk. If all the philosophizing sounds a bit clumsy and trite at first, it is only because no other filmmaker has ever had the courage to show us so accurate a reflection of ourselves.

As a story, *Persona* is really quite simple: A young nurse (Bibi Anderson) is assigned to care for a middle-aged actress (Liv Ullman) who stopped dead during a performance of *Elektra* and has since cut herself off from life, choosing to remain passive and silent. The two go off to a beach cottage, and there an intense interplay of personalities takes place. The Ullman character never says a word but begins to respond by listening and cooperating. The nurse begins to project her own feelings on to the actress, and soon begins to hate both herself and her patient.

The unifying theme of the film seems to be the struggle of opposing but unequal forces until an equilibrium is reached. Between the two personalities, this struggle is played out to an almost violent conclusion. By the end of the film, the actress has become at least partially reconciled to life, presumably due to the influence of the nurse. But the nurse, always the weaker of the two characters, has become frigid, depressive, and sadistic. An equilibrium has been reached, but the weaker of the two forces has had to give more.

Personally, I feel that film is not quite up to the usual Bergman standard. It relies too much on gimmicks—bizarre images, surrealistic lesbianism, even a repetition of an entire scene—to achieve its effect. It has neither the artistic perfection of his earlier romances and dramas nor the power of his more recent works, which deal mostly with the problems of being a modern, middle-aged Swede. Probably it represents a transitional work, made before the newer techniques were perfected.

As for *Alexander Nevsky*, it is only slightly interesting as a window on how limited the possibilities of filmmaking were in Stalinist Russia. As a film in its own right, it is a waste and a bore, standing at roughly the artistic level of D.W. Griffith's *Birth of a Nation*.

But still, Bergman is Bergman, and *Persona*, by any other standard, is a masterpiece. If Cinematech shows only one more film of its quality this season, it would be worth seeing the whole series to find out which film that is.

The Cinematech Schedule for the rest of the fall term is as follows:

Oct. 16—*Adam's Rib*; *Pat and Mike*

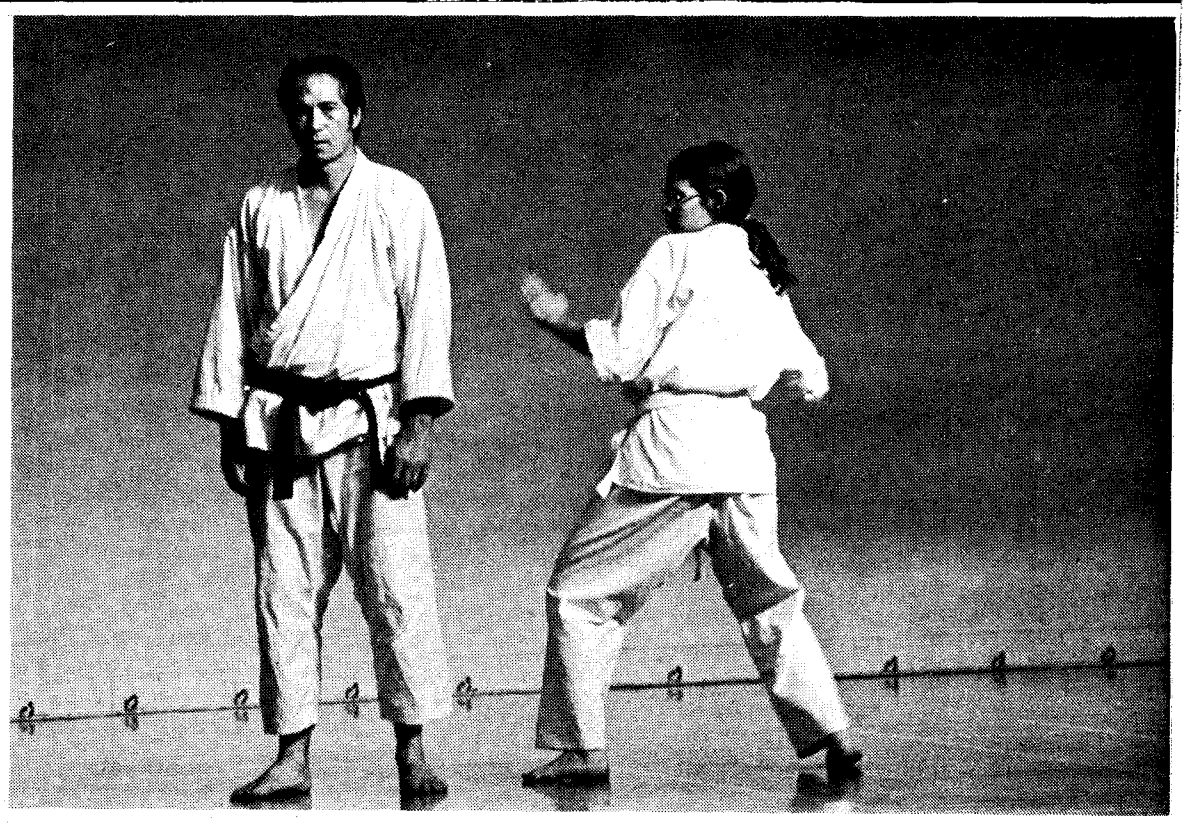
Oct. 23—*The Lodgers*; *North by Northwest*

Oct. 30—*Faust*; *Night of the Living Dead*

Nov. 20—*Babes in Arms*; *His Girl Friday*

Nov. 27—*Before the Revolution*; *After the Fox*

Dec. 4—*Stagecoach*; *The Ballad of Cable Hogue*



Take that, you apathetic bastard. Photo—John Lo

MacBride Doth Come.

Continued from Page One

action not just the economic. His call to get the Government off our backs and its hands out of our pockets is but dimly echoed by the major candidates,' says Bruce Staller, Monrovia resident, and a Southern California Coordinator for the Mac Bride for President Committee.

This will be the Libertarian Candidates' only public appearance in the San Gabriel Valley.

Prior to MacBride's Monrovia speech he will meet with local dignitaries of the San Gabriel Valley at a place to be announced soon.

The evening speech follow the noon appearance befo Town Hall Forum of MacBrid and his running mate Dav Bergland Newport Beach a torney, at the Biltmore Hot Los Angeles.

The Libertarian Party w formed almost five years ago a is on the ballot this year in 3 states, including California. D to California's stringent ball requirements, th MacBride/Bergland ticket appea on the California ballot as a independent.

THOSE SILICON-BASED GIRAFFES WILL DO IT EVERY TIME

Continued from Page Seven

story): the pressure of the Martian atmosphere has been decreasing since the first few days we were there, when we heard weather reports from Chryse which included high temperatures below 0 F, pressures of 7 millibars, and "chances of rain: zero." It seems (or is theorized) that the polar caps are freezing up the atmosphere as the summer comes to its annual end This had better be the case or 'the pressure will go negative about next July sometime.'

It would seem that the wind streaks in the Mars soil are laid down by the fastest winds only, and agree in direction on a local as well as global scale. No surprise there.

It was hoped that we might be able to see some macroscopic evidence of life on Mars, like 'a cactus, a tree, or a giraffe." So far, "we've seen nothing from the morphology of life." Nothing has moved since we landed.

On the other hand, we've seen at ground level only about one-ten-millionth of the Martian surface, in places picked especially for their blandness.

The mineral mixture of the surface, as analyzed on-board the Viking landers, is "just not like anything on earth" It resembles, however, iron-rich clay with gypsum in it.

Towards the end of his talk, Dr. Sagan discussed results of the biology experiments. In sum they've been the opposite of what was "expected": no organic materials, strange activity in odd proportions, and best (worst?), a degree of consisten in the control tests that wou normally separate life from d (so to speak). The news med has been sharp on this one issu " 'Why are you afraid to s there is (no) life on Mars?' th have started to ask.' Dr. Sag added that it seems they thi that "the idea of carrying t American public along witho deciding the issue is *unfair*.'

An (optimistic?) note: 'T negative organics analysis resu are nowhere near the sensitivi of the biology experiments Many earth based experimen remain to be done; the rig results could decide the matt

The evening concluded wi some comments about the po sibilities for Martian rover robo (similar to the Viking lande but with tractor treads, perhaps which could "go to their ow horizons every day." We ha toys smart enough to keep fro falling off the edges of table hence "the technology exists t build rovers that aren't to stupid"

Some questions followe mediated by Dr. Murray. Wi minimum ado (and because I w out of paper for taking note the punchline to one answer w stand alone: "If a silicon-base giraffe walked by, we'd see with the cameras."

Well, maybe.

BROWN

Continued from Page Six

Techer' if we shall call him that, or does he even exist?

Brown: I wonder if there is a single picture of a Caltech student that would be recognizable to the bulk of Caltech students. There are several different styles of student, both in intellectual terms and social terms. It seems to me there is a large fraction of Caltech students who are very very able in theoretical work, mathematical work, in ability to reason; good scientists in other words. Many of them are not in the least bit interested in technology or applications and there's a group that is very gadget oriented, hardware oriented, and so on. Then there is a group that is very able at science some of whose members as I indicated turn out to be more verbally inclined who turn to History or English, or if they're not so sure they want to be in the verbal business they go into Economics instead. There is another dichotomy one could draw an infinite number of dichotomies, the student that really isn't interested in extra-curricular activities at all, and works very hard on classes; and there is a different group that is interested in athletics, or the student newspaper or the Glee Club there is a disciplined group, they often go into the Glee Club, and a less disciplined group that go to work for the Y.

Some work. Some don't.

I really find it hard to—it's hard to find an adjective that describes the Caltech student except bright. That really does describe all Caltech students, some of them work hard, some of them that don't work so hard—some of them in recent years, an unfortunately large fraction perhaps, get turned off intellectually by—in the first year—perhaps by how hard they have to work, perhaps by the discovery that there are others that are just as smart. My sense is, perhaps you know better than I, that maybe that's not as bad in the last couple of years as it was before.

Tech: What advice would you give to somebody going into the sciences?

Brown: I'm afraid this will sound like a bunch of tired old aphorisms—I guess aphorisms or truisms are used so often because they are true. First, don't stay in an area or a job unless you like it or are convinced you're going to like it. I like it here very much otherwise I wouldn't be here. Second keep your options open—don't be too confined by somebody else's idea of a pecking order. If something else interests you, and you can be good at it don't be turned off by somebody else's intellectual snobbery. Third unless you are positive that you are going to be one of the very best scientists, laboratory or theoretical, and maybe even then try and find out during your undergraduate career about things other than science, something about matters other than scientific, because one way or another you are going to be part of a group, at least part of a research group, perhaps part

No man is an island.

of an academic community, perhaps part of a business or industrial community, perhaps part of our government community, and there are going to be other inputs to what you are doing besides science, mathematics, and technology. You're no good unless you're good at what you're doing so if that's what you're going to be in, you'd better get the best possible education along those lines. If you're at Caltech you'll do that; there's not much worry about that; but you may not get such a good education, unless you work at it. I think it's available here, but it has to be looked for, it has to be worked at, about working with other people, living with other people, integrating non-technical inputs into what you do and thinking about what the consequences are of what you do; in other words, interacting with the outside world which may be a big outside world or a small outside world but is likely to be a world outside the laboratory. In other words, any laboratory world, any academic world is going to interact with the larger context in which it is situated. Whether that comes from taking courses,

Larger worlds exist.

whether in the humanities or in the social sciences or in business or in organization of in management or whether it comes with interaction with other people in extra-curricular activities or student activities or student house activities, I can't say. It's all of this, this is the universe and you have to pick some things out of this. Having said that, I want to add one more thing: it's possible, maybe even good, but it's certainly not necessary to sit down and write all of these things down and make a plan for yourself of the ones you are going to pick out. You can't control the world that well, a lot of the things that are going to happen to you, you can't plan for or you won't know about. They ll be opportunities that you couldn't have expected. Stay loose, and be guided by the thought to go where it is interesting.

Stay loose.

Public vs. Private

Tech: Most private universities are now faced with the problem of funding and they face the public universities which are turning out a high grade of student, at quite frankly, a lot less money. We've spoken about the size of Caltech and that's obviously a great benefit. What does Caltech have to offer to battle the public institutions?

Brown: The only thing that we can offer is quality, and the advantages of small size, which are real to the student and in terms of the work that gets turned out. I think one has to ask the question with respect to a bigger object, what is it that we offer society, what is it we offer the student, or what is it we offer a faculty member—.

Tech: Could you answer those separately—?

Brown: I'll try. I think to a student, what we should be

Continued on Page Ten

Eighth Place in recent Page House car rally in a four-cylinder Pinto isn't bad, Gush.

Photo—Chris Wheeler

Continued from Page Nine

offering, and I think we do, we don't offer it to every student, and we don't do it all the time, it depends on how it works out. Our intention, and I think our frequent delivery, is of a higher quality education. It does cost more money, it costs somebody more money. Now at Caltech most of that money is not paid by the student or even by his family. It comes from private donors who are providing the current funds or in the past provided an endowment which enables us to recover some of the funds with which we pay for these things, and partly it comes as an indirect benefit of being surrounded by research, much of which is funded by the federal

To some: quality education.

government. So I think we offer the student, not every student, but many of them, advantages in terms of the quality of the faculty, the quality of the research and the small size itself, which for those students, which I think are the great majority at Caltech, more than compensates for the difference in tuition between this school and a public university. We've tried to keep our tuition lower than that of most of the private universities, whose quality is such that they're really competitive with us. I guess we and the University of Chicago are the only ones where the tuition this year is less than four thousand dollars, amongst the group that I think of as competitive with us: MIT, Princeton, Yale, Stanford and so on, That's still a lot more than is paid at a public school, and

A diference in quality.

somebody else, namely the taxpayers of the State of California, are making up that difference in cost—in part. The other part I think is made up in difference in quality. I think that we do provide a better environment for most of our students than even the best state universities. Let's say the University of California at San Diego as a comparison; I use that one because at least in the beginning it was deliberately modeled on Caltech, it was going to be the Caltech of the University of California system. It retains some of those features, but it has suffered quite a few

BROWN

changes. Now, how about the comparison with private schools. With respect to private institutions we can say the same thing, there is no tuition difference or, indeed, the difference is in the other direction. We don't offer the scope that many of them do, and we've already discussed that. In some ways it's an advantage, and in some ways a disadvantage. It removes distraction and it removes opportunity.

With respect to faculty, I think Caltech clearly provides better facilities than almost any other university, public or private, in the areas in which our faculty work. I can't say that's true for every faculty member, but it is by and large true, that they have probably more space, probably better equipment, probably better colleagues, and that has an effect too. That may be the most important thing of all. I don't know how this will look when it appears in the paper, but—to some extent the faculty is faced with the same thing as the students are. They're thrown in to the midst of people who are very very competitive and very, very good. But by the time you're a faculty member you're probably used to it and the psychological shock isn't as great. The rewards are very real. There are rewards and risks at both levels, but I think by the time you're a faculty member, I think the balance has clealry shifted to the rewards. One looks at the surveys that are made, and our physics, our biochemistry faculties are generally agreed, and others, to be at or very near the top. And that I think is a big advantage to faculty. And a third one I think is a relative absence of distraction from administrative problems. Almost everybody except our division chairmen, who are greatly burtested, shall we say, by the need to be active researchers and almost full time administrators. Everybody else is not prevented from being in the administration, doing a lot of paperwork, but at least relatively, compared to other places—not to some ideal, but to other places—shielded from that, and I think that is very attractive to many faculty. They have the option of participating, but they don't have to participate in non-academic matters. To society, I think I'll come back to what I said at the very beginning, what Caltech offers is its research output, its knowledge that it produces, and the people that it produces, and I think the is unmatched. I believe that in science and technology in particular and intellectual activities in general, the very best, and I don't mean those with the highest IQ but the people who have that combination of intellect, perseverence, dedication, vision, ability to relate one thing to another, and the ability to get along with people just well enough to get the work done; that combination of qualities, that produces high quality output in that area **the very best, one of the very best, is worth twenty of the second best, and twenty thousand of the mediocre. That's what Caltech offers.**

Comment

The record of the interview was terminated at this point because of a malfunction in the tape recording equipment supplied by Hardy Martel. Dr. Brown went on to talk extensively about questions involving the success of the Environmental Quality Lab and the Independent Studies Program and his involvement with issues on a nationwide scale.

Since this interview was agreed to on the basis that it would be transcripted from a tape of the interview, we feel it unfair to submit Dr. Brown to the interpretation of our memory, particularly in the examination of his opinions of issues outside Caltech.

During the recorded part of the interview Brown presents a conservative approach to the administration of Caltech, favoring some expansion but in a manner that he feels will insure against loss of the quality of education that in his opinion is Caltech's main advantage.

His concern about the high attrition rate at Caltech is obvious throughout the interview, but Dr. Brown appears proud of the education offered to those students who are able to accept it. He was quick to point out on all occasions that those students who leave the institute do so mostly for 'personal reasons', not by actually flunking out.

With surprising emphasis Dr. Brown points out necessity of knowledge outside of science, unless you are sure you are going to be the very best, in order to survive in society. He recognizes the need for diversification at Caltech, but seems unwilling to allow radical changes in admission policy in order to achieve this diversity. Instead he relies on the importation of extraordinary people in many fields, from those personalities presented by the Y program, to the visitation of trustees to the student houses.

Dr. Brown places his faith in the student who is able to realize that science cannot be the sum-total of his existence, and actively seeks diversity in his education. Whether a majority of incoming students are able to do this is open to debate, but we hope they will be able to when they leave the Institute.

Rock

Continued from Page Six

Southern boy, I don't mi recommending music whi doesn't really get a fair shake the vines of Hollywood Rig now one of the hottest southe boogie bands is the Atlan Rhythm Section. With ea album this band has improv and now *Red Tape*, their fif product must be rated as superior effort.

A quick listen shows that t ARS is obviously influenced b the hot country and rock ban like Marshall Tucker and Char Daniels. Another influence is t Texas sound especially the o Bob Wills western swing soun Finally, the blues feeling of Th Allman Brothers Band is ca tured very well in both the guit and voices in the band.

Red Tape contains a song th may become to them wh "Whipping Post' was to th Allman Brothers or "Free Bird is to Lynyrd Skynyrd "Anoth Man's Woman" is the title of t ten minute cut that shows th band at its very hottest. With blazing lead guitar that brin back memories of good o Duane Allman and a perfe blues touch to end the song th Altanta Rhythm Section h produced a masterpiece tha threatens to make them th number one Southern rock ban And that, my friends, is n snow.

Library Guide

Continued from Page One

6 – Engineering
7 – Mathematics and Physics
8 – Chemistry
9 – Biology

Each floor has its own card catalog and there is a librarian on the 6th floor, Mrs. Lyons, and on the 8th floor, Mr. Roth.

In the basement is the photo-duplication facility. The staff there can also provide cheap but excellent binding for your term papers, dissertation, etc. This room is open from 8 a.m.–4:30 p.m., Monday–Friday. A self-service copying machine is located on the first floor.

The charge-out of books you want to borrow is on the first floor. In order to avoid long lines you can fill in the new edge-notched circulation card on the floor where you find your material. Then bring the card and book to the ground floor. The attendant will ask you for your Caltech I.D. card, which establishes your right to borrow. If you are not carrying any books or briefcase, you will not be stopped.

The Millikan Library is a natural magnet for students from other schools, ex-Caltech students and alumni, employees of local companies, etc. We do our best to discourage these people from using the facilities, especially evenings and weekends, so that members of the Caltech community will have priority of access. It is primarily for the purpose of stopping these non-Caltech people from taking library materials that the library is asking everyone for their I.D. By using the present charge-out system we are trying to stop the heavy loss of books and journals through unauthorized removal.

Many library users are under the impression that no one else is interested in the special material that they want to use. In the past they have felt justified in "taking" the material until they were through with it, sometimes three or four years! In fact, others *are* interested and expect to find the material in the library or properly charged out to a user. So the library acts as the proper intermediary to maintain records of who has what. If everyone cooperates, we hope you will be more successful i finding what you want.

If you come from some othe college or university, you will b pleasantly surprised to find tha we have fewer rules and penal ties. For example, we do no charge a fine for books returne late. We do make a charge fo books that you do not retur after due notice or books tha you lose, since the budget i inadequate to buy replacements

We do not have security gate which detect unchecked books as you will now find in many libraries. We trust you and assume you have good intentions Our staff is very understanding and reasonable, and you should have no difficulties if you are considerate of your fellow Caltech library users and check out the books properly and return them on time.

If you have any questions, suggestions or comments, I will be happy to meet you and talk with you. We want to be of help to you in your library usage.

Mrs. Johanna E. Tallman,
Director of Libraries

Beavers Lose
THREE IN A ROW

by B. Bible

Caltech soccer suffered three consecutive losses as Whittier, Pomona-Pitzer, and Claremont-Harvey Mudd maintained their traditional league dominance.

On Wednesday of last week Whittier dealt a crushing 4-0 defeat to a smog-saturated Caltech team.

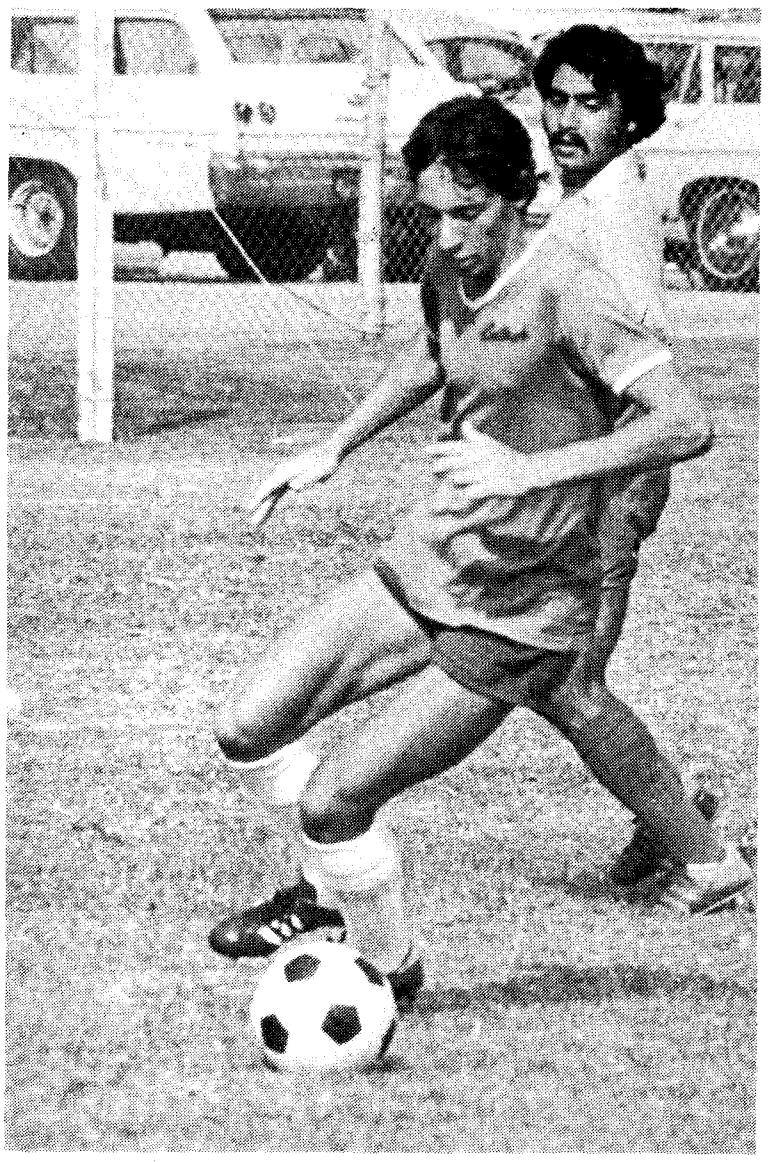
The Beavers managed to get off ten shots with several missing an open goal by inches but the six credited saves of Whittier's goalie managed to shut us out. The four Whittier goals came from Guiterrez, Brenes, Wales, and Touar.

Pomona-Pitzer also held us scoreless managing to score five of their 33 shots, while their goalie was credited with one save for our sole attempt. The five goals came from Thanopoulis (2), MacAulay (2), and Thomas.

Finally this Wednesday after three consecutive shutouts the Beavers managed to capitalize on a penalty early in the second period of the Claremont-Harvey Mudd game, as Jim Hickey fired in a free shot. Yet, the resulting momentum and Caltech dominance in the next few minutes could not match that of CHM with all three of their goals coming from Goldstein, while Lee and Stark each booted in another one to sew up a 5-1 victory.

This brings the season record to 3-4-1 with all the easy teams still seft on the schedule.

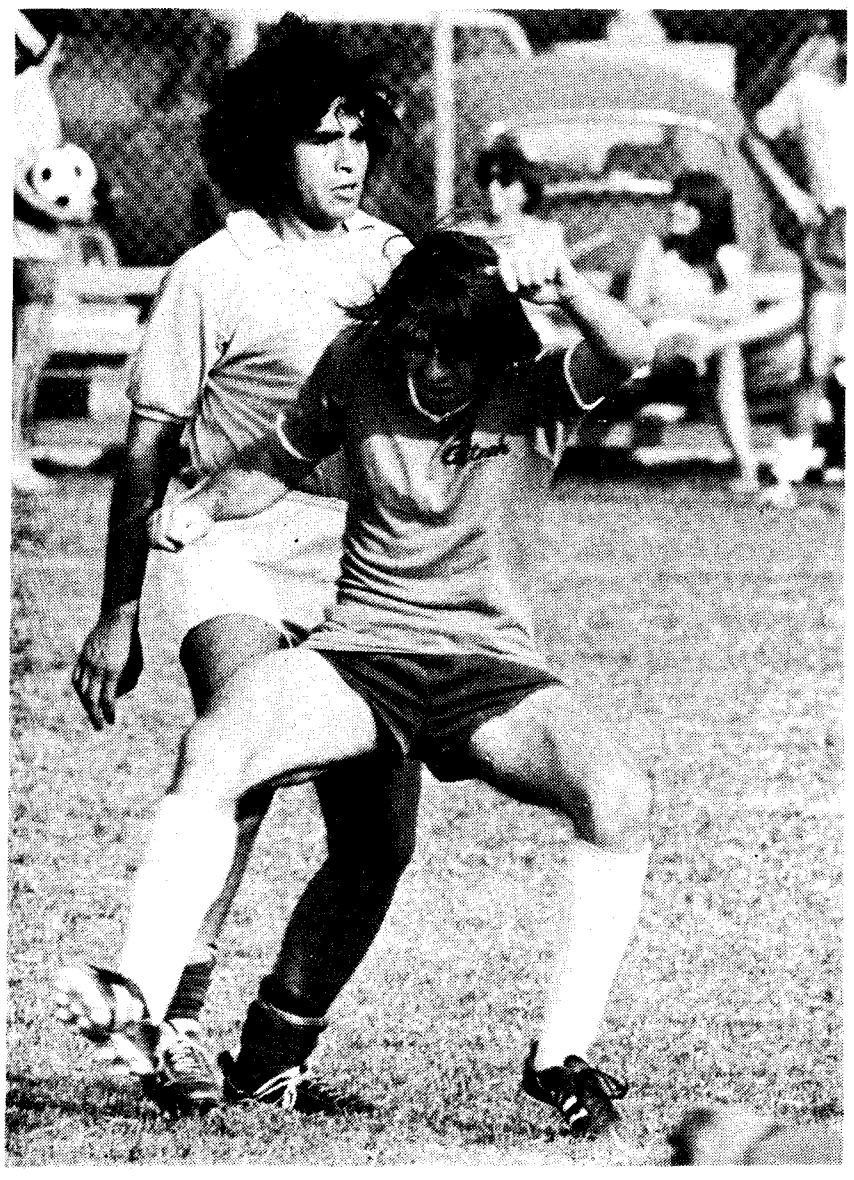
Tech and Pomona race for ball



Beaver in total control

Photo Credit

John Loo



Become a tenor—it's a simple, painless operation

I'll get you guys for last week!

Beavers descend upon Stag quarterback

Bonfire Next Week

by Doug Tally and Marc Wold

The Caltech football team opened its season on Monday by traveling to Claremont to meet the Claremont-Harvey Mudd Stags. Looking forward to perhaps one of the most difficult games of the season, Caltech came fired up and ready.

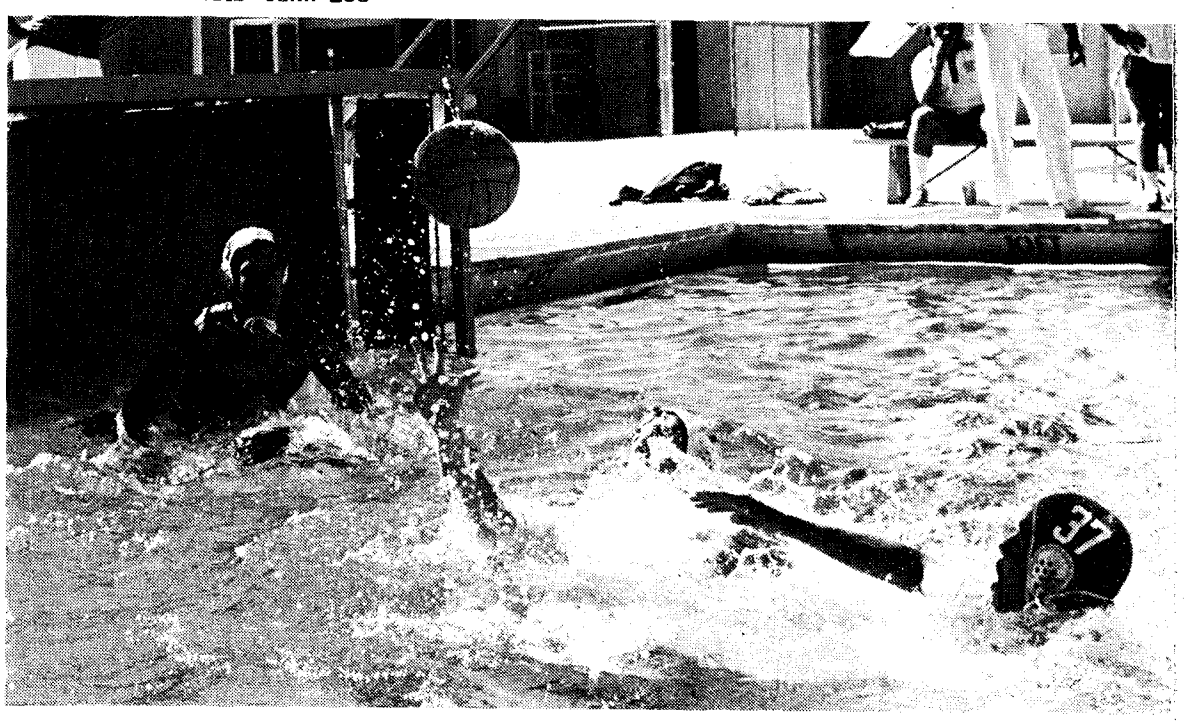
For the first two quarters, Caltech showed their bonfire potential by holding the Stags to essentially no yards save for one long pass play which set up the only score of the half. The Caltech defense forced many fumbles and sacked the CHM quarterback six times in the first half. Tech's offense, unfortunately, could not mount a sustained drive against the extremely run-oriented Claremont defense. When forced to go to the air, quarterback Mark Fortunato received excellent protection from the offensive line, but a good Stag secondary succeeded in shutting down any consistent passing attack. Being mostly a hard-hitting defensive battle, the halftime score was 7-0 in favor of Claremont.

The start of the third quarter went very much like the preceeding two with Clatech coming out on top honors for outstanding defensive linemen.

On the whole, Clatech's showing was much better than the final score of 41-0 might indicate. Bonfires are definately in the making as Tech continues its schedule. Tomorrow night Caltech will be at Pomona-Pitzer in an attempt to bring their record to 1-1.

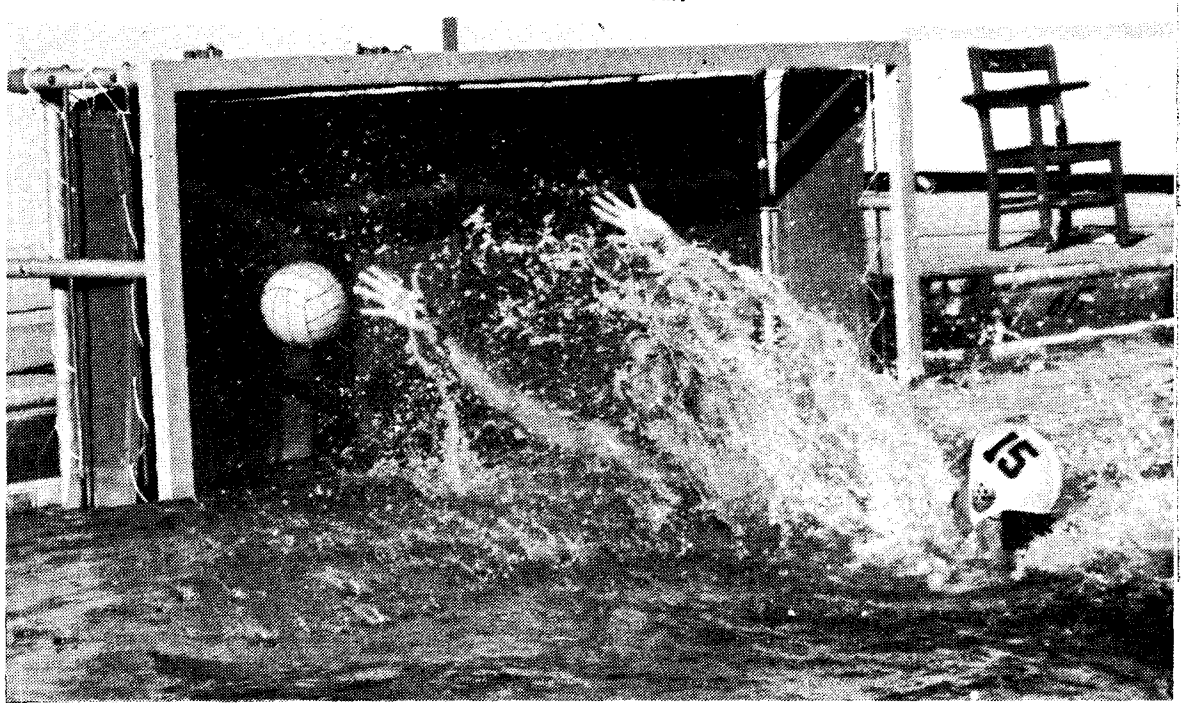
SPORTS

Photo—John Loo



Goal? Goal!

Photo—Tom Snyder



Photos—Tom Snyder

Second Class Postage paid at Pasadena, California. *The California Tech* is published weekly except during examination and vacation periods by the Associated Students of the California Institute of Technology, Inc., Winnett Center, Caltech 105–51, Pasadena, CA 91125.