



SCENE FROM THE EARLY 20'S, as the infant California Institute of Technology embarks on a fifty-year building program. Photo by Todd Boroson.

Corridor Of Mirrors Opens Sunday At Ramo

by Marc Donner

Last Week, we reported a "Corridor of Mirrors" show in Ramo to run roughly concurrent with the Virgil Fox concerts. That show (actually a sculpture) is called "Infinite Images": a corridor of ever-expanding space by Domingo Alvarez. The sculpture will be in Ramo from Sunday, October 8 through Saturday, October 14.

Alvarez, a professor of design at the Universidad Central in Caracas, Venezuela, is also known as an architect and urban planner. He began to experiment with mirror sculpture in 1964 and has moved to successively bigger and better sculptures in recent years. "Infinite Images" was so extraordinary that ABC-TV sent cameras to cover the New York opening of the Venezuelan sculptor's work.

In case any of you are interested in building your own corridor of mirrors, here is what

- you need:
- A corridor 24 feet long, 7½ feet high and 4 feet wide, closed at both ends by doors;
 - 4 sheets colored mirrorpane 6 feet by 7½ feet;
 - 2 sheets mirror 4 feet by 7½ feet (doors);
 - 4 sheets mirror 6 feet by 4 feet (floor);
 - 4 sheets mirror 6 feet by 4 feet (ceiling);
 - 24 linear feet carpet lining 4 feet wide under glass floor;
 - 36 strips of glass 7½ feet high by 7-1/8 inch wide;
 - 36 neon tubes 7½ feet long (18 blue, 9 red, 9 green);
 - flasher box for neon lights.
- I won't tell you how to build the corridor itself — go see it in person. It only costs 25¢ for Caltech students. While you're there you might meet the sculptor, but you'd better brush up on your Spanish and/or Italian — he speaks no English.

Video Equipment Available To Techers At Beckman

by Patti Horne

An expansive idea is floating around this campus right now and I'm pushing it. Alright all you new and returning students, this is modern times, this is 1812. October 3, at noon in the Athenaeum, a small group of people got together to discuss what should happen to some modern equipment Mr. Frank Capra donated to the Institute. Seems like no one is interested. The equipment? Included are

Continued on Page Five

News Briefs

New Emergency Number

The new phone system now has a special emergency number. IF YOU HAVE AN EMERGENCY AT ANY TIME, DIAL 50.

Leakey Lecture To Be Cancelled

Because of the death of world-renowned anthropologist Dr. Louis S. B. Leakey, the lecture scheduled for October 17 has been cancelled. The rest of the series will be held as scheduled. The Public Events Ticket Office will refund all

Massey On Murray On Mars

The Red Planet In Transition

by Philip Massey

Mars has had an atmosphere only for the last few hundred million years was one of the new conclusions Dr. Bruce Murray stated at last week's physics colloquium, "A New View of Mars."

Mars has long been pictured in the literature as an old, used-up world, one that might have had water and life but which now contained little moisture and perhaps only artifacts of some ancient and long-dead race. At the very least, Mars was pictured as dead geologically. Instead, Dr. Murray argues that Mars is a planet in transit from an inactive Moon-like planet to a geologically active one.

The Mariner 9 photographs have shown four very large

volcanos, all clustered geographically. Nix Olympica is the largest and stretches some three hundred miles across, making it larger than the largest Earth volcano shield, the Hawaiian islands. Yet Nix Olympica and the other volcanos (North, Middle, and South Spots) are all very young: their surfaces show little sign of the impact craters which are numerous elsewhere. Their age is, at oldest, a few hundred million years. In the same area there is a huge 1500 mile long, 60 miles across, and four miles deep canyon, which is also of the same age.

The south polar cap of Mars is composed of carbon dioxide over-lying a residual deposit of solid water (also known as ice, in the vernacular). When summer

comes to the south the carbon dioxide sublimates but the water ice remains.

The water ice exists in plates on top of one another, with vertical drops between plates. There are few impact phenomena, and these plates could not have been forming over any sort of long period of there would be many, many more of the things. The surrounding laminated terrain extends up only as far as seventy degrees south latitude, and these features can be only tens — not even hundreds — of millions of years old.

Murray argues that since the laminated terrain features are dependent upon the presence of carbon dioxide, and the features are not very old, perhaps the

Continued on Page Five

The CALIFORNIA Tech

Volume LXXIV

Pasadena, California, Thursday, October 5, 1972

Number 2 3

Tutorials Available

Schaffing ASCIT???

To Interested Freshmen

by Etaoin Schroedlu

There is something new in Caltech education this year. Various Tech profs, research associates and graduate students are offering their services as tutors in informal, non-credit tutorials for small groups of interested freshmen. The total program, thought up 'over lunch one day' this summer by Caltech professors Dan McMahon and Jerry Pine, now includes about fifty freshmen in over twenty different tutorials, including those subjects taught by Biology Division instructors under Bi 23.

Tutorial subjects were chosen by mutual interest of the instructor and the freshmen (and upperclassmen in Bi 23). Among the subjects are molecular lasers, chemical engineering aspects of environmental problems, and elementary particles — high energy physics. The number of students in each tutorial ranges from one to six, and involvement is obviously optional.

The program is described by Dr. Pine as 'experimental' at this

Continued on Page Five

BOD Holds First Meeting

by Bob Schaff

Anyone who was at the ASCIT Board meeting last Tuesday at 4:00 would have realized that school has definitely gotten back underway. The sweet pleasures of summer have given way to the insanity of classes, committees, meetings and all the other trash that bothers our fearless leaders on the ASCIT Board.

After some preliminary appointments (including Publications and Student House Dark-room Chairmen), attention was turned to the important business at hand. Someone furnished the information that a very "gung-ho" frosh (under the name of H. Dickerman) was asking for money for the purpose of arranging a party with a contingent of Scrippsies — two hundred Scrippsies, to be exact. Joe Morin immediately jumped to the idea that any frosh who could produce 200 Scrippsies

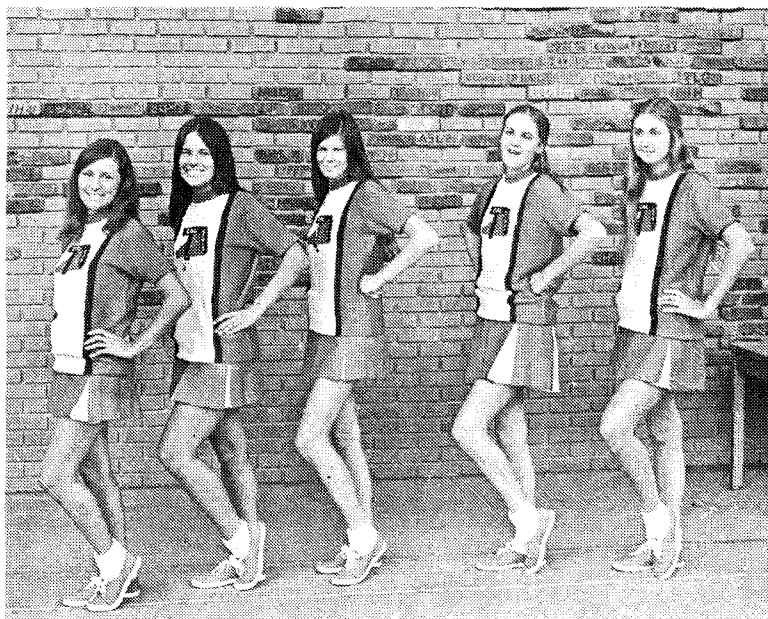
should be appointed Social Chairman. Hmmmmm...

Steve Watkins then began a heard rending tale of all the things he hadn't had the time to do as ASCIT Pres. He suggested that Morin and company take them on as pet projects that have no home. (Darbs are always giving homes to the homeless.) Among other things, there was talk of a Tech bus, and community employment programs for Juniors and Seniors in fields related to their studies.

Seeing as how things had calmed down a bit, Rik Smoody decided to step in and effected his own particular brand of confusion. As always, looking for money, he related a story of eight poor little song girls — dear to the heart of all true Techers — who, out of their own pockets, had bought uniforms to match their noble spirits (does this sound like a eulogy?), that they

Continued on Page Three

"Sing a Song . . ."



HERE THEY ARE AGAIN.

Photo by Ray Feeney.

tickets for the October 17 lecture.

Applications for NSF Grad Fellowships Here

National Science Foundation Graduate Fellowship Applications are available in 10 Dabney. For details on requirements, see the following news brief.

NSF Money For Needy Grads (73)

Students applying for National Science Foundation Graduate Fellowships are required to take

Continued on Page Two

Down the Tubes

Undergrad Housing Problem Analyzed

by Etaoin Schroedlu
[Author's Note — This column will exist in various combinatorial states with my colleague millikan j. troll's Throop Beat (soon to be renamed). We will both attempt to give you timely and informative news reporting and commentary on campus activities. Suggestions are invited.]

One of the perennial controversies on campus, concerning availability of undergraduate housing, is in the news again. The couple of dozen freshmen unable to be placed in the undergrad Houses were selected by the current policy of random choice. A decade and a half ago, before the New Houses were built, the policy was to give priority to those coming from farthest from campus, on the grounds that a Pasadenan or Southern Californian could more easily locate housing on his own than someone from New York or Florida. It seems to this author that the earlier policy was more reasonable.

Lonely Crowds

In any case, significant numbers of entering Techers have been cast adrift upon the local community to find housing as best they can, a procedure which seems far more likely to benefit local landlords of varying probity than either the students or Tech. One Institute administrator, when asked why Tech did not assume greater responsibility for locating suitable housing for entering students, replied that other universities did not provide such a service. This reply begs the question, Tech, being small, could provide such service if it wanted to.

A further possibility is to give freshmen, rather than upperclassmen, priority in obtaining space in the Houses. This suggestion obviously met with little approval from the undergrads on the Housing committee, who are upperclassmen rather than entering freshmen, but upperclassmen are certainly more capable of handling the problems arising in arranging for off-campus housing.

Co-ops & Apartments

A better idea would be for Tech to add enough housing units to its current stock to allow everyone who wanted to do so to have a place in some sort of Institute housing. There

are no plans for building new undergrad housing. (In fact, when I saw the master plans several years ago, they called for one hundred years of occupancy in the Old Houses, which aren't halfway there yet.) However, there is the possibility of Tech addition various properties to its housing portfolio, if the money can be spared from other needs (which is very questionable).

The problem won't get better unless the Institute acts or the housing demand cycle moves away from interest in remaining in on-campus housing (which has happened at various times in the past, often coinciding with room and board increases). The chart of figures in Lyman Bonner's office shows that the last couple of years have had about as optimal an on-campus population as could be expected, or arranged.

My informers tell me that last week's Tech estimate that San Pasqual Street may be closed to traffic by this spring is far too optimistic. The last time Caltech had a street closed off, Michigan Street where the new Behavioral Bio building is going up, the process of gaining municipal approval took three years. So Techers will have to continue risking life and limb crossing San Pasqual, until the PHWH&RR or some other public-spirited group installs a solid crosswalk from Jorgensen to Baxter.

Note to undergrad social science majors: at last word, the catalog requirement of a term of SS 142 will be removed in favor of a strong recommendation that the full-year course be taken. This may be as well, since the catalog had the wrong uniting and term for SS 142a.

The Caltech Y -- We All Need It

by Etaoin Schroedlu
"A YMCA at Caltech? You must be kidding. Who needs it?"

If the above is a paraphrase of your opinion on the Caltech Y, get with it and drop in on the Y to find out what they're really like.

Our Y, sometimes described as "the political activist group on campus," offers a large number of regular services to Techers. There is the 24-hour-a-day Y workroom on the second floor of Winnett Center, where there is a Xerox machine which disgorges copies at 5 cents a shot, various typewriters and copying machines (when working), and supplies of paper for use in the machines. All payment is on the Honor System.

The Y lounge, with its stereo system, is available to groups by appointment and individuals for lounging in. For record fiends, there is also a Y record club, with over 200 albums at present. Membership is \$2.00 per year, and there is a small charge on

albums taken out — see the Y staff for examples.

Money for Techers

For those of us who don't seem to have quite enough money, the Y offers some particularly useful services. Techers can obtain almost instantaneous \$25.00 loans for 30 days at no interest, and personal checks will be cashed for any amount as long as the cash lasts each day. In a slightly different vein, the Y operates a used book exchange (at no profit to itself) where Techers can shop around for cheap prices on last year's textbooks (Humanities books are often found) or bring their old books to leave; if a buyer shows up, the former owner receives the purchasing price, which he set.

The Y is currently working on a few special programs, including the Friday Olive Walk

Continued on Page Three

Letters

Chavez On Prop. 22

Dear Editor:

Last spring, circulators from public relations firms hired by California's agribusiness industry came onto your campuses with petitions for placing Proposition 22 on the ballot. They told you that this initiative would benefit farm workers, and that it had the approval of the United Farm Workers Union. Many of you signed these petitions, thinking that by doing so you were helping the union in its struggle for dignity and justice for farm workers.

You were gravely misled. Proposition 22 is a rich man's law against a poor people's movement. It has only one purpose — to destroy the Farm Worker's Union by denying it the right to organize field workers to strike, and to boycott. The only beneficiaries of this initiative would be the corporate agricultural interests whose profit margins would be increased at the ex-

pense of fair wages and decent working conditions for the workers.

The growers in this state are mounting an expensive media campaign to push for enactment of Proposition 22. On behalf of the members of our union, I ask for your help in defeating it. We need your vote. We need your talent and time to help reach the consciences of California voters.

The farm workers are confident of your response.

— Cesar E. Chavez
Director,
United Farm Workers

[Ed. Note — In a letter accompanying this open letter, the local headquarters for the No on 22 campaign is listed as 1411 W. Olympic Blvd., Los Angeles, Calif. 90015. Students interested in assisting the campaign may call Kathleen Lyons at (213) 381-1136 for further information.]

News Briefs

Continued from Page One
the Graduate Record Examinations on December 9. Applicants must be U.S. citizens and beginning grad students by fall 1973, or have completed not more than one calendar year of fulltime or parttime study by fall 1973. Awards are for master's or doctoral work in the mathematical, physical, medical, biological, engineering, and social sciences. The deadline for applications is November 27. Winners of the annual stipend of \$3,600 will be announced on March 15, 1973.

Hebrew Classes
Being Organized

Caltech Hillel is organizing Hebrew language classes for any member of the Caltech community is interested. An organizational meeting will be held at the Hillel table in the back of Chandler at 12:00 noon Monday, October 9.



SMOODY, BEWARE.

The CALIFORNIA Tech

Thursday, October 5, 1972
Volume LXXIV Number 3

Published weekly except during vacation and examination periods by the Associated Students of the California Institute of Technology, Incorporated. All rights reserved.

The opinions expressed in all articles are those of the authors and do not necessarily reflect those of the editors, the newspaper staff, or the corporation.

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The California Tech Publication
Offices: 115 Winnett Center 105-51, California Institute of Technology, 1201 East California Boulevard, Pasadena, California 91109. Telephone: (213) 795-6811, extension 2154.
Printed by News-Type Service, 125 South Maryland Avenue, Glendale, California. Represented for national advertising purposes by National Educational Advertising Services, Inc. Second class postage paid at Pasadena, California.

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Ingersoll Tells It All

by Dennis Mallonee
[Ed. Note — Dr. Andrew Perry Ingersoll, associate professor of planetary science at Caltech, became an instant success at freshman camp when he talked about his problems with Albert Dickey and faculi. *The California Tech* secured an interview with Dr. Ingersoll, which is condensed below.]

Tech: The first thing I notice is that you have the same first two names as a wine-taster in Montana that my father knew.
Ingersoll: Andrew Perry?
Tech: Yes. Has this had any influence on you?
Ingersoll: No, my mother's maiden name was Perry, and Andrew comes from my father's side.

Professoral Background
Tech: Oh, well. The only things I have on you right now is that you received your B.A. at Amherst in 1960, your Master's at Harvard in '61, Ph.D. in '66, Assistant Professorship in '66, and Associate Professorship in 1971. So if you could, I'd like you to run over your professional career for some background material.

Ingersoll: Well, I was a physics major at Amherst, and I entered Harvard in a program they had for physicists where I could do meteorology and oceanography and still get a Ph.D. in Physics. I don't know why I liked meteorology and oceanography. I *did* like the idea that it would someday lead to some

research relevant to human life. I guess I also like nature. I guess I liked classical mechanics, too, as opposed to atomic and nuclear physics. So, I went into that field for several reasons. My thesis was completed in the summer of '65.

Tech: What was it on?
Ingersoll: Well it was on geophysics. It was a problem in thermal convection in a fluid, and the idea was that it would be relevant to some atmospheric or oceanic problem. But it was a laboratory situation, only distantly relevant. It was a very well-controlled laboratory situation to which I compared some theory and experiment.

Tech: Do you think it might have some relevance to geology?
Ingersoll: Only in a kind of general way. If you understand fluid processes, you'll understand some situations involving them. But basically it was a little too abstract for my taste, although it was a well-posed theoretical/experimental problem. I did a nice experiment, and I compared it with some theory.

I came *here* with the desire to work more with real data. I'm still not considered a real data man at Caltech, but I have at least gotten involved. I'm not a data gatherer, I'm interested in the objects I'm looking at. My approach nowadays is to select a problem, like, oh, some problem involving the atmosphere of Mars. Then I try and find out whatever I can about the problem, and if it doesn't involve

what I was trained in, if it turns out that in order to answer the questions, I've got to learn about something that doesn't involve fluid mechanics, well, I'm going to do that. In other words, I like to pose the question first, and then amass the necessary tools afterwards, rather than getting the tool, then looking around for questions that I can answer.

Tech: You mentioned "relevance" here and at freshman camp, but it's now an over-worked word, and it's hard to tell exactly what you mean — relevant to what?

Ingersoll: Well, that's right. Actually I'm quite happy with the relevance of my work; I think I get a kick when my eight-year-old son gets interested in planets. I used to think that relevance had to mean a better mousetrap, or that something had very practical engineering value, but now I think if there's real popular appeal to what you're doing and a large number of people are interested, there's also relevance: cultural relevance. I believe in the planets for that reason. I mean I believe in research on the planets for that reason. They are appealing objects that a lot of people are interested in. So, even though I don't have any hopes that we're going to colonize the planets in the near future, even though I don't see planetary research of immediate practical value, there are just questions that people have asked about the planets for thousands of years. We can

answer them now.
Tech: Get them out of the way and then go on to other things?

Ingersoll: Well, yeah, they're questions that a lot of people are interested in. As for faculi, I just stumbled into them. Someone said, "Why don't you look into this question of solar oblateness and see if it's really valid — whether Dickey's interpreted his results correctly or not?"

Tech: I'd like to give you a leading question.
Ingersoll: Okay.

Tech: Was the general purpose of your articles to prove that Einstein's theory wasn't wrong in this area so that it could be used with assurance on this planet?

Ingersoll: No, I'd say the reason I was interested in having some connection between my own research and general relativity is because general relativity is one of the most beautiful theories that there is.

Tech: You have a poet's soul?

Ingersoll: Well, yeah, it's an aesthetic theory because it's so economical. I said this in freshman camp. You get a lot of mileage out of some very simple assumptions. You can produce a whole lot of exotic phenomena from some very straight-forward assumptions. So I was attracted to Einstein's theory because of the sort of logical beauty of it. I'm not really a general relativist at all.

The other half of it was that

I was attracted to the controversy. Someone said, "Well, look, there's this guy, Dickey, who's trying to prove Einstein wrong." So I was attracted to it first because I figured that anything involving relativity was an important area of research. And second that there was such a great controversy raging about the solar oblateness, and I said, "What fun! We'll get into a real controversy."

Tech: So far, this has been pretty standard stuff for an interview with a professor, associate or otherwise. In checking over past *California Tech* issues, I've found that professors like to talk about the *work* they're doing. What do you do when you're having fun?

Continued Next Week (?)



THE MUDEO IS COMING
Caltech Y

Continued from Page Two
Concerts every other week. This week, October 6, Casey Anderson will give a concert from noon until 1:00 p.m. He was a big hit here last year. (The concerts are free, in case you hadn't heard).

Fischers All!

The organizational meeting for a Chess Club at Caltech will occur this Saturday at 7:30 p.m. in Clubroom Two, as a Y-approved project. (A group at Tech has to be approved by somebody official before it has a claim to Student Center space. The Y can also provide this service.) Interested chess players are invited to bring their sets and clocks this Saturday, or to call Greg Beall (X2181, 212 Page) or the Y for details.

The Y staff, Wes Hershey, Walt Meader, Janet Stapel, and Barbra McCandless, are waiting at X2163 and on the second floor of Winnett to help you. If you have any questions or problems or ideas, stop by and talk them out.

BOD Meeting

Continued from Page One
might cheer on the mighty Beaver as he dammed the streams of Pasadena. Smoody followed this story with another charade of how he, as Junior Class Pres., was going to be responsible for the Mudeo — something about needing money to pay the water bill. Heedless of the fact that ASCIT is probably down to its last platinum nickel, the Board voted Rik \$300 for his performance.

Finding no one willing to follow Smoody's act, the Board adjourned for lack of dramatic talent. Their next show is scheduled for Tuesday, Oct. 10 at 4:00 in Winnett Lounge.

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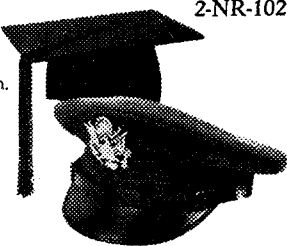
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Cooled by Refrigeration

A Grandfather Clockwork

Violence Is Golden

by Phil Neches

Many people spend their lives wondering what the future holds in store for the human race. Some of them see only sweetness and light: utopias in which the ills of human conduct have somehow been eradicated. Others have more nightmarish visions, such as George Orwell's 1984 in which doublethink becomes a way of life, doubletalk the only means of communication, and freedom a hollow oldspeak.

If Orwell has predicted 1984 correctly, then one can easily imagine that Anthony Burgess correctly predicted 1983 in his novel, *A Clockwork Orange*, which Stanley Kubrick has brought to the screen. Burgess's utopia-gone-wild seems far less subtle than Orwell's in that freedom has been overextended rather than eliminated.

In London of the near future, we find Alex and his gang of droogs, who exercise their freedom to rape, beat, plunder, maim, and otherwise make a nuisance of himself. Alex might just be the product of his environment, one where every positive human value has been eliminated, leaving only the mean, petty, brutal, and vicious half of human nature behind. Alex is, if anything, a better man than his victims.

About the first third of the film chronicles Alex's merry escapades, in scenes which shock, nauseate, repel, yet enthrall the viewer. His gang invades the home of a writer, stomping the man to near-death, then raping his wife before his helpless eyes, all to the tune of "Singing in the Rain." After all, a little Saturday night party is good clean fun, right boys?

Eventually, Alex falls into the hands of the government [calling them the law is an exercise in doublethink], and finds himself in prison. Alex finds prison intolerable, and will do anything to get out. The government proves willing as well, since the murders, ruffians, thieves, and such are taking up too much space in jails which will soon teem with political prisoners.

So Alex volunteers for what might politely be described as brainwashing. While forced to watch films of gang rapes, beatings, wars, and other of Alex's favorite recreations, he is given a drug which induces deathly nausea. True to Pavlov, after two weeks of this, any

thought of hate, anger, or lust leaves Alex physically ill.

Thus "reformed," Alex can return to society "as decent a lad as you would meet on a May morning." That his problematical soul has been aversion conditioned out of him seems to bother nobody but the prison chaplin, but who listens to him?

In the next several scenes, Kubrick spares no segment of his hypothetical society: all have been reduced to the same state of brutality as the old Alex. His parents kick him out. Drunk old men mob him. The police [his former gang members, who do exactly the same thing as before, except now have the added protection of the blue uniform] nearly kill him. Finally, he wanders, sick and miserable, back to the house of the writer he nearly killed before. Not recognizing Alex as his assailant, the writer takes him in, hoping to use his conditioning as a political weapon against the government (the writer is a member of the opposition).

However, the writer recognizes Alex, and forces him to attempt suicide by playing Beethoven's Ninth. Now what might Beethoven's glorious Ninth, one of the crowning achievements of creative human intellect, have to do with this sordid story? Well, Alex grooves on Beethoven, almost as much as he enjoys rape. However, his brainwashers use Beethoven's music, which some have called Beethoven's turning to God, as background for their horror-show movies. Consequently, Beethoven makes Alex as sick as, say, a nice bloody dismemberment.

Alex makes his exit through a third story window, but survives anyhow. In the hospital, he not only recovers physically, but also recovers his "free" state of mind — whether the fall undoes his brainwashing or whether it is done at the behest of the government is not certain.

So the story has come full circle. Except the opposition party now rots in Alex's old cellblock, and the government controls through its paid ter-

rorists, nominally called policemen.

This bleak utopia has replaced law with mere government, freedom with mere license, love with mere sex; in short, has replaced humanity with bestiality on all levels. The film fascinates while it horrifies: without intellectualizing it becomes too realistic, too possible, and altogether too close a prediction of trends in our society.

The film benefits from technical virtuosity at every stage of production. The music all comes from the classical repertoire, which must have saved Kubrick a great deal on royalties. Henry

Purcell's ornate and pompous "Music for the Funeral of Queen Mary" becomes an insidious, sinister wail in the transistors of Walter Carlos's synthesizer. The editing may well be the best job done for any film. And Malcolm McDowell brings the curious, absurd, frightening, yet almost pathetic character of Alex home to the audience.

A Clockwork Orange is calculated to disgust. It should leave one with a sinking feeling in the pit of one's stomach for the prospects of mankind. Perhaps the most frightening thing about the film is that audiences find it funny.

OutFoxed?

A Bright New Revelation

by Phil Neches

The light show may be emerging from the dark ages, in a manner of speaking. Once the sole province of the 135+ decibel rock concert, light shows are decreasing in complexity, and increasing in artistic sophistication.

At least, that impression stuck with me after I talked to Josh White, who designed the light show which will accompany Virgil Fox at Beckman this coming Wednesday, Friday, and Saturday. Josh will give a seminar on Thursday, October 12, on the problems and possibilities of the art of light which will be open to all Virgil Fox ticket holders, and anyone else who wants to go.

Light shows have suffered, Josh explained, from being tied down to the location. "More involvement with a single performer" was needed. But at New York's Fillmore East, groups came and went, but the light show people stayed, with the result that each new group [including Virgil Fox] represented "just another job."

Revelation Lights, which will accompany Fox, tries a different strategy. Rather than waiting for groups to come around looking for light people, Revelation

Lights travels with Fox. Artist in sound and artist in light live, work, and travel together.

Also, Revelation Lights will be simpler than many common light shows. Because the light show is totally improvised during the performance, the light man must know the resources and limitations of his tools. "You have to start by thinking small," said White. "Keep it simple — use only what you can handle."

How can the rock-spawned light show adapt to classical music? "Light belongs with all music," believes White. "The music of Bach has been around longer than lights," making it "less of a challenge — more of a responsibility [for the light man] to develop an understanding — a feel — a love — for the music. It's not just the 'other half' of the experience."

Like classical music, a good light show should be abstract. "The audience makes its own links between the abstract images on the screen and the music. In a

Continued on Page Six

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Spectrum Productions

A Prismatic Effect

by Marc Donner

Last week this author mentioned an article about Spectrum Productions to be published in this edition of the *Tech*. Between then and now I've interviewed two fascinating people: Oscar Mandel, the producer, and Shirley Marneus, the director. Both of them were very helpful and supplied a lot of information about a group much ignored, and unjustly so, on the Caltech campus.

Oscar Mandel and Shirley Marneus, together with a set designer named Barry Frost, formed Spectrum in early 1972 as a non-profit, tax exempt corporation purposed to "produce unusual plays of high literary merit." Spectrum Production 1 (SP1) was Moliere's *Amphitryon* in March; and SP2 will be Bertolt Brecht's *Mr. Puntila and His Servant Matti* which will run five nights starting October 24. SP3 will be Ionesco's *The Unpaid Killer* to be presented in February of 1973.

Spectrum Productions has a couple of other goals, besides just producing unusual plays. They want people to see these plays and not have to spend \$15 to \$30 for a pair of tickets. The high pricing of tickets in commercial theatre cuts a large number of potential theatergoers out of a lot of good productions. Also, Spectrum wants to experiment with plays. Commercial theater is so expensive to produce that commercial producers cannot afford to put on anything except tried and true money-makers. The only groups which can afford to experiment are those "little theater" groups, like

Spectrum, whichre willing to run at a loss. The actors and actresses in Spectrum's productions are professionals working without pay. They gain experience and exposure in these productions, not cash. Actors' Equity actors, prohibited by their union from acting without pay, are not permitted to act in these productions. (Part of the reason for the prohibitive cost of commercial productions these days is the stranglehold Equity has on the producers. Equity was originally formed to protect actors from exploitation by producers, but it quickly priced itself out of the range the small, poorer producers could afford to pay. This marked the beginning of "little theater" and experimental theater.)

Puntila was written in Finland in 1940 where Brecht was living as an exile from Hitler's Germany. Later that year he crossed Russia and the Pacific and ended up in Los Angeles. Despite the turmoil of this period in his life it was the time of the writing of his greatest plays: *Mother Courage, Galileo*, and *The Good Woman of Setzuan*. *Puntila* is one of his best satires, even though little known, and is based on a Finnish folk tale. It was only this year that an English translation was published and to date it has not been performed professionally on the U.S. west coast.

Brecht's style will disconcert some; he seems to delight in building up emotional tension to a climax and then destroying it with a well-placed incongruity. In the words of Dr. Mandel, "... we are asked to enjoy it like connoisseurs of fiction — relishing

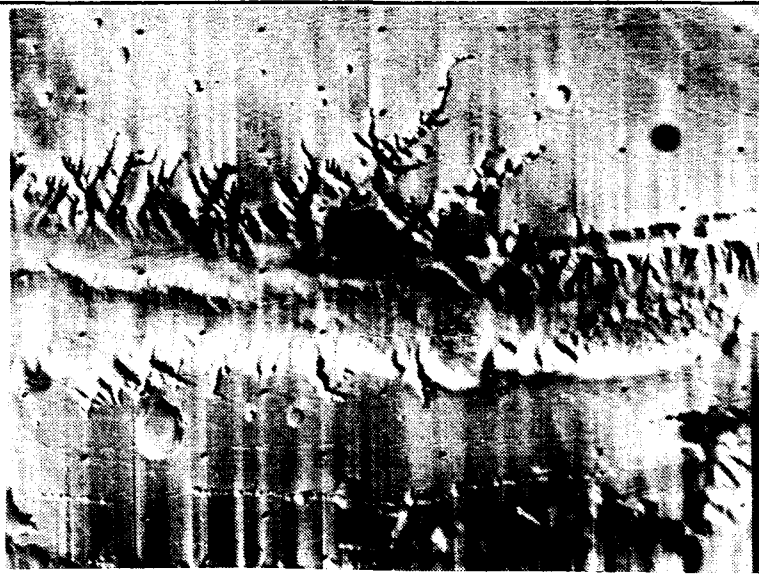
Mars

Continued from Page One
Martian atmosphere is equally young. Of course, this leaves the question of where did all that carbon dioxide appear from.

Well, it's known that the Earth went through a period when there were numerous volcanos that supplied gobs and gobs of carbon dioxide to our air. Volcanos are produced by this outgassing. The output from Nix Olympica itself would be sufficient to explain tens of percents of Mar's present atmosphere, and it is by no means the only volcano around. Perhaps Mars started out like the Moon, and it has just recently started to boil inside and form volcanos. It would account for the lack of any signs of middle history: there are things that are a few billion years old, and things that are — at most — a couple hundred million years old, but nothing in between. Perhaps Mars is only now going through the terrain-producing features that Earth went through much earlier.

here, criticizing there — so that we can apply our rational minds..."

Shirley Marneus, as director, supplied a wealth of information about the cast of *Puntila*. About one half of the cast also performed in the spring Spectrum Production. Jon Post, a Caltech student, and William Cozart, a faculty member, and Mary Eichbauer, the wife of a faculty member, make up the representatives of the Caltech community in the cast. There are many well-trained, capable and experienced actors and actresses and this production of *Puntila* promises to be an excellent one. Prices are low — see the ticket office for tickets.



Pseudo-stream system in Tithonius Lacus, 300 miles south of Martian equator, is actually caused by crust deformations and wind action. Photo courtesy of your friendly, neighborhood Mariner dealer.

Video Equipment

Continued from Page One
all but the essential element for ½-inch video taping. (Essential to editing in a polished manner only, but this piece is not beyond reach.) The missing ingredient is an editing unit, which can be borrowed, rented, &/or confiscated with the right information and people of acquaintance.

The reason no one wants such is that it seems as though one, Chuck Newton, put a hell of a lot of work last year into making this equipment accessible at no cost to the student, and was left high and dry. No one wants the equipment now, because bad handling causes large repair bills. Since at this time no one was overseeing the use of this stuff, it got mishandled frequently, & was therefore costly to own.

Some students, such as Steve Watkins, were inventive enough to use the VTR equipment as the medium for a term project. Their findings included the fact that one probably will put more time into videotaping their project

than writing it up, but they got one hell of a learning experience out of the deal, and they did get credit for the work. I think that more students would use the facilities if they knew they could get credit, since this institution is so credit oriented.

Well, OK fellas and gals, the equipment is available to you now through the Beckman offices. If this is indeed the 20th Century, let's use some 20th Century techniques for presenting 20th Century ideas.

If the problem is that you haven't the faintest idea of what I'm talking about, call me, I'll help you do what you want. You can also talk to:

Jim Weal, distributes the equipment out of Beckman;

Steve Watkins, did a term project last year & got credit for it;

Bob Webber, helped teach the VTR class last year and is interested;

Bill Cassell, director of Public Relations is using the VTR equipment now.

I am Patti Horne, ext. 2451, Art Director of the Environmental Quality Lab, and I'm anxious and willing to help any student find out all they can about this media.

Well, Techers, got any ideas? ????

Tutorials

Continued from Page One
stage; response to the program will be gathered at the end of the quarter. Eventually the program may include offerings for upperclassmen as well as freshmen, if that former body casts off enough of its traditional apathy.

Any student or faculty member with an idea for a tutorial is invited to send word to Dr. Pine in Downs-Lauritsen.

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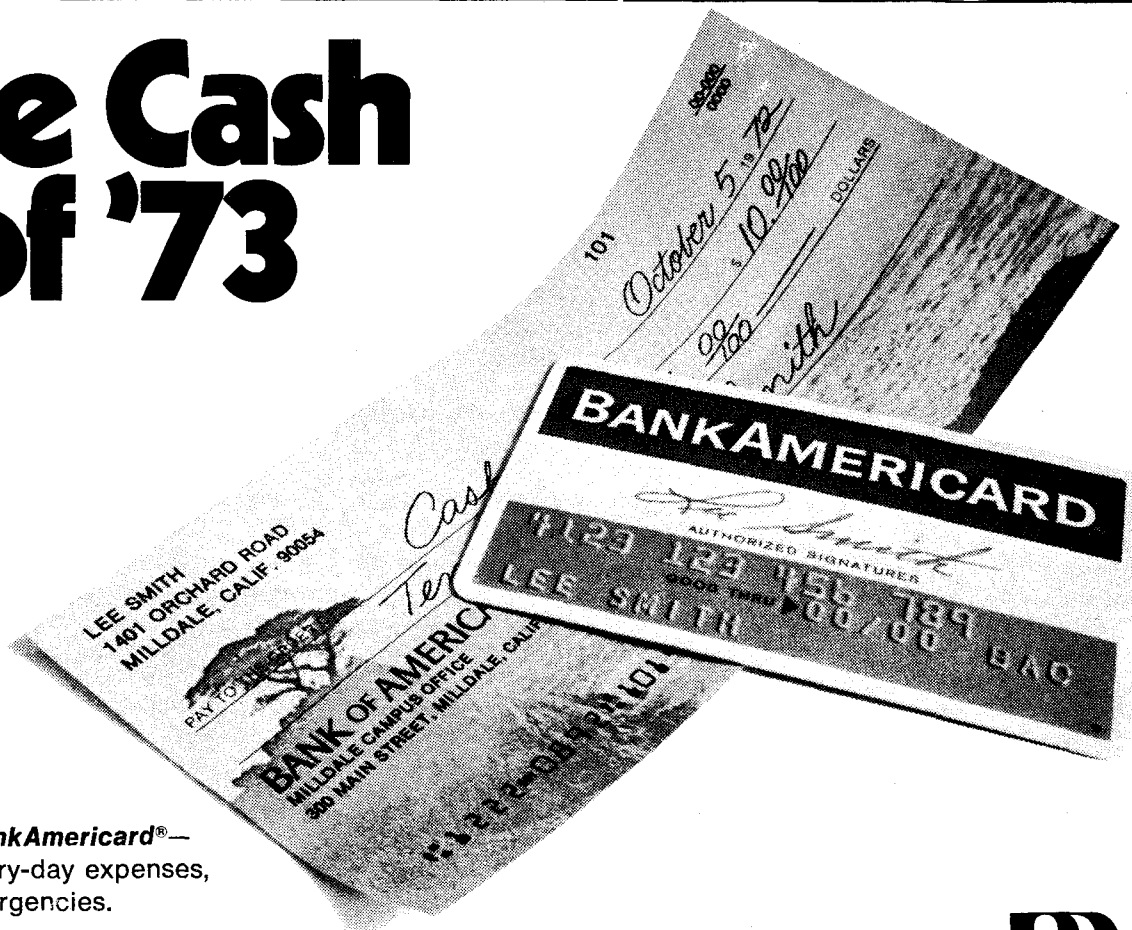
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State Scholarship Applications Available From 109 Dabney

Undergraduate college students who are in need of financial assistance to continue college should file a State Scholarship application. Approximately 11,200 new State Scholarships will be awarded in April 1973 for use in 1973-74. Most of the new scholarships will be awarded to high school seniors but approximately 1,700 will be available for currently enrolled college students who are not already in the State Scholarship Program.

State Scholarships can be utilized at any accredited four-year college in California, plus the California Maritime Academy. The awards range from \$500 to \$2,200 at independent colleges, \$300 to \$600 at the University of California, and are in the amount of fees charged to

students at the California State University and Colleges (approximately \$160). In addition, students planning to attend a community college during the 1973-74 academic year may have their scholarships held in reserve for them until such time as they attend a four-year college. Those who will be under age 30 prior to October 1973 are eligible to apply. No age limit applies to those applicants who have had at least 181 days of continuous military service.

Applications are available in 107 Dabney and must be filed with the State Scholarship Commission by midnight, November 20, 1972. Scores on the Scholastic Aptitude Test must also be submitted as part of an application.

Humanities: New Professors, Courses, Option

by Mark Bails

Social Science has been recognized. Starting this year, both graduates and undergrads may select social science as a major according to Dr. Huttenback. The social science option was created for those interested in social science who don't want to specialize in an area such as economics or political science.

This new option is not all that the Department of Humanities and Social Science has hatched. As usual, new courses, including translation offerings which can be approached from either English or the Foreign Language, are being offered.

Most exciting is the addition of three new professors. Two are Political Scientists. John Ferejohn will be holding *Congressional Party Formation and Legislative Process*. This course, contrary to the catalog, is being offered first term. *Strategy in Politics* is one course being hosted by the other new political scientist, Morris Fiorina. His other course, *American Electoral Behavior and Party Strategy*, seems to be claiming fewer students than might be expected considering that this is an election year. Rounding off the Social Science arrivals is Ben Zablocki. *Collective Action and Decision Making*, an offering in Anthropology, is currently being taught by this sociologist.

Have a question about these courses? Like to sign up for one? These professors are eager to help you.

"Foreign Area Problems"

AUFS Sponsors Seminar

by Paul Harper

For those interested in foreign affairs, a special political science course will be offered second term as part of a program with the American Universities Field Service (AUFS).

Titled "Seminar in Foreign Area Problems," the class will feature three lecturers on Western Europe, India and Bangladesh and South America.

The AUFS is a non-profit organization which is affiliated with eleven universities across the country. Those people who become associates of the Field Staff spend long periods of time abroad in countries that they have particular interest in and knowledge of, collecting, evaluating, and reporting data. At intervals, they return to the United States to disseminate

information about the politics, economics, and social trends of foreign countries on the campuses of the sponsoring universities.

The classes here will be set up as informal talks by the three Field Staff associates. They are: Jon McLin, who is stationed in Brussels; Marcus Franda, based in New Delhi; and Thomas Sanders, who is concerned with Latin America.

McLin will be on campus January 8-12; Franda, January 17-26; and Sanders, February 12-16. Each man will hold two seminars.

According to Dr. Peter Fay, who is Caltech administrator for the class, students will work in spurts, with much activity when the AUFS associates are here, and comparatively little during the interims. There may be some supplementary work, however, in the form of individual study.

The AUFS also runs a population study in conjunction with Caltech, and as a result, the population problems of the areas in question may tend to be somewhat highlighted, but Dr. Fay stressed that overpopulation will not dominate the seminars.

THE CALTECH CHAPTER OF Z.P.G.

Graduate Record Exams; Better Late Than Never

Undergraduates and other students preparing to go to graduate school may take the Graduate Record Examinations on any of six different test dates during the current academic year.

The first testing date for the GRE is October 28, 1972. Scores from this administration will be reported to the graduate schools around December 4. Students planning to register for the October test date are advised that applications received by the Educational Testing Service after October 3 will incur a \$3.50 late registration fee. After October 10, there is no guarantee that applications for the October test date can be processed.

The other five test dates are December 9, 1972, January 20, February 24 (only the Aptitude Test is administered), April 28, and June 16, 1973. Equivalent late fee and registration deadlines apply to these dates. Choice of test dates should be determined by the requirements of graduate schools or fellowship sponsors to which one is applying. Scores are usually reported to graduate schools five weeks after a test date.

The Graduate Record Examinations include an Aptitude Test of general scholastic ability and Advanced Tests measuring achievement in 19 major fields of study. Full details and registration forms for the GRE are contained in the 1972-73 GRE *Information Bulletin*. The *Bulletin* also contains forms and instructions for requesting transcript service on GRE scores

already on file with ETS. This booklet may be ordered from: Educational Testing Service, Box 955, Princeton, New Jersey 08540; Educational Testing Service, 1947 Center St., Berkeley, California 94704; or Educational Testing Service, 940 Grove Street, Evanston, Illinois 60201.

Want To Teach?

Danforth Fellowship Offer

Inquiries about the Danforth Fellowships, to be awarded in March 1973, are invited, according to Dean of Students James Morgan (210 Dabney), Caltech's representative.

The Fellowships, offered by the Danforth Foundation of St. Louis, Missouri, are open to men and women who are seniors or recent graduates of accredited colleges in the United States, who have serious interest in college teaching as a career, and who plan to study for a Ph.D. in a field of study common to the American undergraduate liberal arts curriculum. Applicants may be single or married, must be under thirty years of age, and may not have begun any graduate or professional study beyond the baccalaureate at the time application papers are filed.

Approximately 100 Fellowships will be awarded in March 1973. Candidates must be nominated by Liaison Officers of their undergraduate institutions by November 1, 1972. The Foundation does not accept di-

rect applications for the Fellowships. The GRE should be taken in October.

Danforth Fellows are eligible for four years of financial assistance, with a maximum annual living stipend of \$2,700 for single Fellows and \$2,950 for married Fellows, plus tuition and fees. Dependency allowances are available. Financial need is not a condition for consideration.

The Danforth Foundation, created by the late Mr. and Mrs. William H. Danforth in 1927, is a philanthropy concerned primarily with people and values. Presently the Foundation focuses its activities in two major areas, education and the city. In these areas the Foundation administers programs and makes grants to schools, colleges, universities, and other public and private agencies.

SCUBA Club

To Dive for Lobster At Doheny Beach

The SCUBA Club will be having beach dives every weekend this term. There will also be boat dives approximately once a month. Starting things out will be a Day/Night dive on the Sea Packer this Friday.

On Sunday, October 8, we will have a beach dive at Doheny Beach at 9:00 a.m. There are rumors that lobsters frequent Doheny, so this should be a good place to herald the opening of bug season. As usual, we will provide beer and wine after the dive. SCUBA Club members can now get air fills for 50 cents at Sports World, if you have your membership card. Club dues are \$5 a year; for information contact Kathy Ellison (extension 1801) in the basement of Steele.

To get to Doheny Beach, go south on the Santa Ana Freeway. Just past San Juan Capistrano, get off on Pacific Coast Highway (1) and go back north about ½ mile. There will be signs for Doheny Beach. Drive north (don't go into State Beach) past the marina to the parking lot at the far north end of the road. Driving time is about 1½ hours.

Light Show

Continued from Page Four

good light show, the audience brings something to it."

Josh does not envision light show concerts with strictly visual experience in the fashion of conventional concerts which feature a strictly aural experience. "It would be just like a movie. Besides, it depends on the other senses. Also, it must be live," he said, to duplicate the spontaneity and audience involvement of a musical concert.

"Light as an art form is new. Individual artists is groups or by themselves are starting to emerge over just hippies doing lights — in ten years or so we may see virtuoso light artists."

In the mean time, we have Virgil Fox with *Revelation Lights*: an established virtuoso in an old art, working with a developing artist in a new art. "I'd be excited to see what they do next year," commented the young cynic White. Most of us will be excited enough to see what they can to this year.

THE UNIVERSITY OF MICHIGAN GRADUATE SCHOOL OF BUSINESS ADMINISTRATION

A representative of the Admissions Office will be on campus Monday, October 9, 1972, to discuss the Master of Business Administration degree program with students interested in management careers.

Appointments to meet with James B. Ardis, Director of Admissions, may be made through the Placement Office, Throop Hall.

The MBA degree program is a two-year course widely recognized as preparation for careers in the management of business, government and other organizations. College graduates with majors in liberal arts, humanities, social science, engineering, or other fields are eligible to apply if at least one mathematics course has been included in the undergraduate program.

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2. Discussion leader will be David A. Ehrenfeld with occasional guest speakers.
3. Group size will be limited to ten, except for the first session.
4. To sign up, contact Karl Bell at 795-6841, ext. 1383.
5. Cost \$10 for members of Caltech (All proceeds go to Z.P.G.) \$20 for all others
First two sessions are free!



WHAT DO YOU MEAN, no P.E. credit for showering? Photo by Dave Peisner.

IH Softball Games Start Next Week

Monday	Fleming	Lloyd	Varsity Diamond
	Ruddock	Page	Frosh Diamond
Tuesday	Blackner	Ricketts	Varsity
	Dabney	Ruddock	Frosh
Wednesday	Blackner	Lloyd	Varsity
	Dabney	Page	Frosh
Thursday	Ricketts	Lloyd	Varsity
	Ruddock	Fleming	Frosh
Friday	Page	Blackner	Varsity
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Home teams are listed first.

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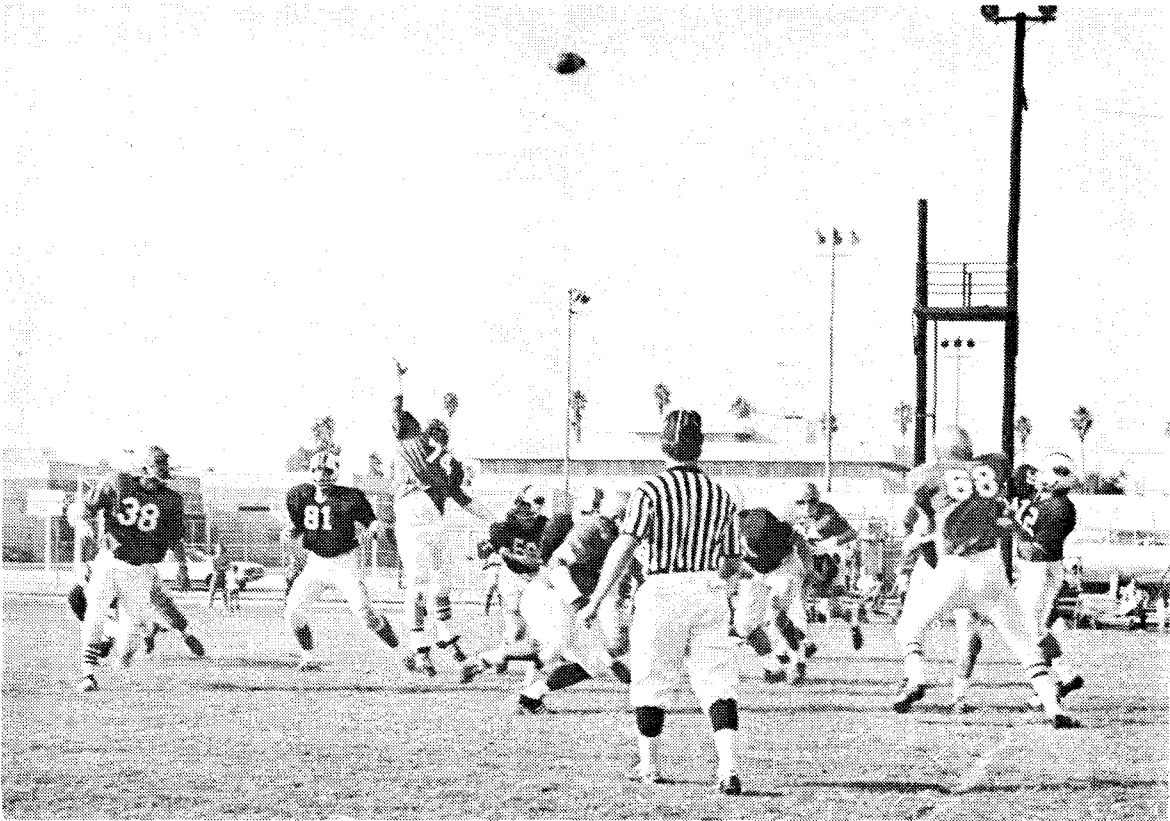
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FIRST FOOTBALL GAME TOMORROW. The Caltech Beavers will take the field away from the Claremont-Harvey Mudd jayvees tomorrow, with their first undefeated season since 1945 only five games away. If random street intersections are receiving a fiery baptismal tomorrow night, assume the undefeated season has gotten off to a good start, and bring your own hot dogs and marshmallows. Gutman's men have been working out for four weeks, and are now accustomed to the smog. But if you don't like the action, you can watch the song girls. Photo by Ray Feeney.

Water Polo Team Beats Loyola and Pierce; Record Now 2 - 1

By Bob Kieckhefer

Caltech's water polo team is now riding on a two-game winning streak, their longest since 1970. Yesterday afternoon they fought to a 6-4 victory over Pierce JC. Last Saturday they swamped Loyola University, 13-6, while most of the campus slept. These victories give the tankmen a 2-1 win-loss record.

Defensive Battle

Yesterday afternoon's game against Pierce was a tight defensive battle. Steve Bitondo's goal soon after the game opened put Tech ahead, but Pierce came back to tie the score 1-1 at the end of the first quarter.

Howard Bubb scored one goal and Russ Desiderio got two in the second period, giving Tech a 4-2 halftime lead. By this time a large home-team crowd had gathered to cheer on the Techers.

Desiderio and Bitondo scored again during the third quarter, completing Tech scoring for the day. During the fourth quarter, the team concentrated on defense, allowing only one goal and giving Tech a hard-earned 6-4 victory.

Too Early in the Morning

The Techers started slowly against Loyola and were behind 2-0 at the end of the first quarter. Loyola's captain fouled out before the quarter ended, however, spelling doom for his teammates. The Techers attacked the deep-end goal in the second quarter, and built up a 4-2 halftime lead.

Tech started working well as a team during the second half, and Loyola never regained the lead. As the home-team crowd cheered (yes, there were four spectators on hand), Russ Desiderio and Steve Bitondo fired nine shots past the Loyola goalie during the second half. Meanwhile Tech goalie Virgil Shields and the rest of the defense held Loyola to only four goals, with many stolen passes leading to

quick goals for Tech.

Science Over Religion?

By the final gun, Desiderio had scored seven goals, with Bitondo getting the other six. Everybody on the team got valuable playing experience during the game, as all the team's substitutes played during the fourth quarter and in a scrimmage following the game.

Busy Weekend Ahead

This coming weekend will be a busy one for the tankmen, as they are scheduled to play three games at the UC Riverside Tournament. They will get a taste of SCIAC competition there, as their first game is against Occidental and their second may be against Pomona. The next home water polo game will be against crosstown rival PCC next Wednesday at 4:00 p.m.



GOALIE VIRGIL SHIELDS waits for a shot in Saturday's game against Loyola. Tech won, 13-6. Photo by Ray Feeney.

Go See a Game!

Friday, October 6				
2:00 p.m.	Football	Claremont-Harvey Mudd JV	Away	
2:15 p.m.	Water Polo	UC Riverside Tournament	Away	
4:00 p.m.	Cross Country	Pomona	Away	
Saturday, October 7				
10:00 a.m.	Soccer	Claremont-Harvey Mudd	Home	
10:00 a.m.	Water Polo	UC Riverside Tournament	Away	
Wednesday, October 11				
3:00 p.m.	Soccer	Redlands	Home	
4:00 p.m.	Water Polo	PCC	Home	
Friday, October 13				
2:00 p.m.	Football	La Verne JV	Home	
4:00 p.m.	Cross Country	Claremont-Harvey Mudd	Home	
Saturday, October 14				
10:00 a.m.	Water Polo	Cal State Los Angeles	Home	
10:30 a.m.	Soccer	Occidental	Away	

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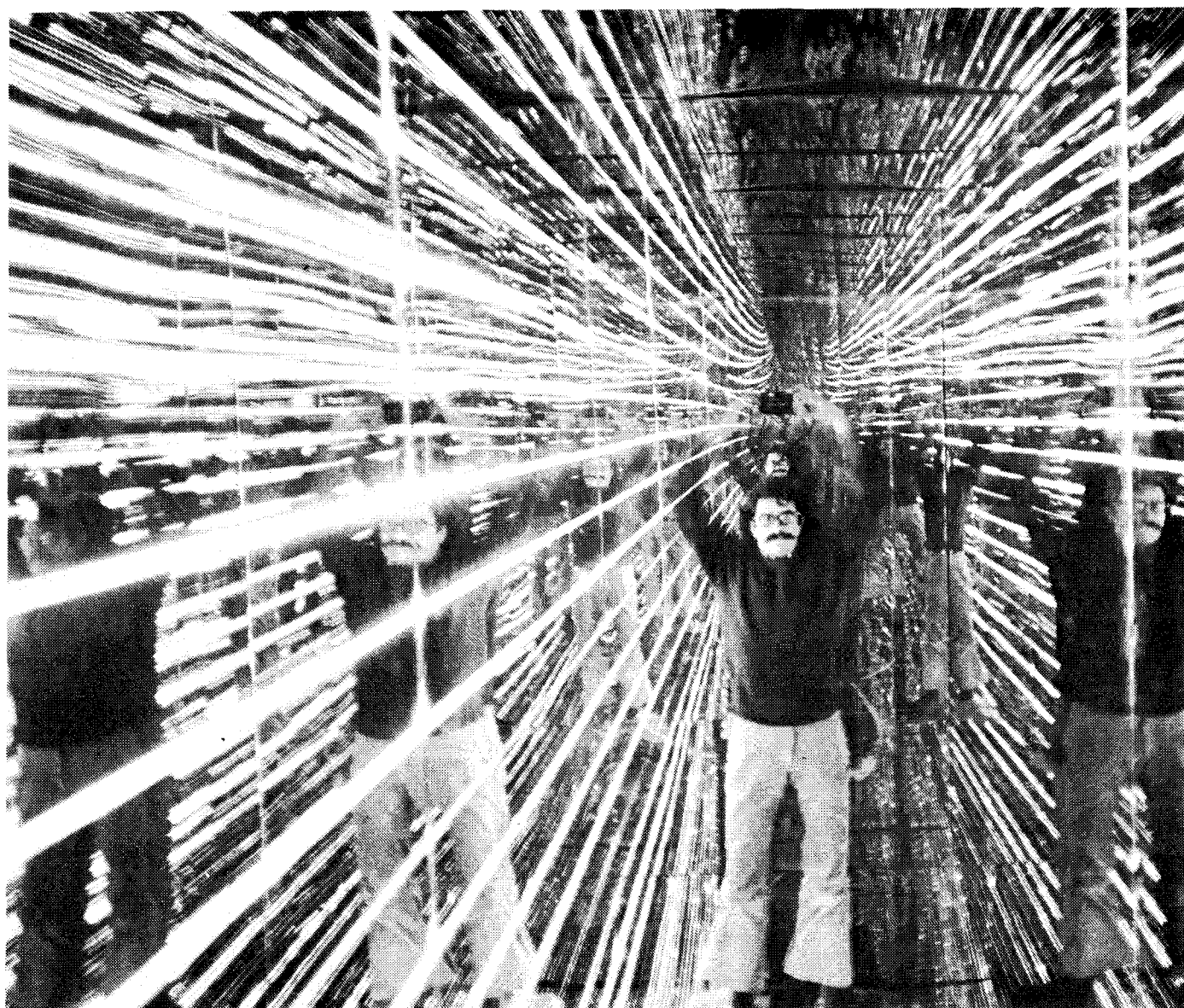
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INFINITE IMAGES- A CORRIDOR OF EVER-EXPANDING SPACE

This structure, by Domingo Alvarez, a Venezuelan architect-sculptor, succeeds in creating a total environment for the viewer. Built of mirrors and brightly colored neon lights, the world created inside the corridor appears unending. The visual experience is so extraordinary that ABC-TV News sent its cameras to cover the New York opening of this highly imaginative exhibit.

Domingo Alvarez is professor of design at the Universidad Central de Venezuela. In addition to architecture and urban planning, he has created a unique body of works fusing diverse media from painting to music. INFINITE IMAGES represents one facet of Alvarez' desire to make the viewer aware of himself as one of the elements of his own environment.

Exhibition hours: 10 a.m.—1:30 p.m.; 4 p.m.—8 p.m. (and 10:30 p.m. to midnight Wed., Fri., Sat.)

Exhibition price: 50¢ (CIT students, faculty & staff—25¢)

SUNDAY THROUGH SATURDAY, OCTOBER 8 THROUGH 14, 1972

on stage at Caltech's RAMO AUDITORIUM (Baxter Hall of the Humanities, San Pasqual, west of Chester, Pasadena)



Caltech Faculty Committee on Programs
and
SPECTRUM PRODUCTIONS
present

Puntila and Matti

by BERTOLT BRECHT

This is the long overdue West Coast performance of one of Brecht's funniest and sharpest masterpieces. Puntila, a Falstaff who owns land in Finland, is one of the glorious drunkards of the modern theatre — a villain who runs away with the show. Shirley Marneus will direct; Barry Frost is designer and technical director; Oscar Mandel is artistic supervisor. Included in the cast are: Leslie Thompson (Puntila), John Chilton (Matti), Marian Johnson (Eva), and Byron Mitchell (the Attache).

Following the performance on WEDNESDAY, OCTOBER 25, the audience is invited to participate in an informal, on-stage meeting with cast and director. Everyone interested is cordially invited.

Tues. through Sat., Oct. 24 through 28 at 8 p.m.
RAMO AUDITORIUM in Baxter Hall of the Humanities
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