





**THE ADVENTURES OF THE TECH TRIO**

BY H. WINK + D. O'MALLEY

AS YOU WILL RECALL, WE LAST LEFT LIEUTENANT SQUIRREL RACING TOWARD PASADENA.

**ZOOM!**

SQUIRREL MOBILE

**CAN HE GET TO THE PRINTER BEFORE THE 12:00 DEADLINE?**



THANKS, KID, I'D RATHER TAKE THE TECH'S MONEY THIS WAY, ANYWAY!

HEY! LET'S GO TO ROMAS!

GOSH! WHAT A NICE MAN!



# Beckman and Ramo To Cut Programs

by Etaoin Schroedlu

Things aren't as good as they might be, but they are better than they looked last December and January.

That's the opinion of Jerry Willis, the Manager of Caltech's Public Events Office, the people who bring you all those events in Beckman and Ramo Auditoria.

Last December 6, Dr. Robert Oliver, Chairman of the Caltech Faculty committee on Programs, circulated a memo citing the overworked Public Events staff and requesting a budget increase to allow additional people to be hired. The alternative, Dr. Oliver claimed, was a substantial reduction in the number of events that could be put on in Beckman and Ramo next fiscal year.

**B-man Peters Out?**

This proposal was not favorably received by the Caltech Powers-That-Be, but any rumors of Beckman's imminent demise are considerably overexaggerated. The budget for public events will be about the same this coming year as it has been this year. Jerry Willis anticipates some cutback in the number of events that will be scheduled. "We've been competing with ourselves too much lately; there have been too many things going on for our audience to be able to support," he said. "We've just been doing too much the past few years." Apparently the program cutback option will be easier than trying to pry money out of Caltech to hire more people.

What about the distress signals being flashed a few months ago? "Things don't look as bad now as they seemed to be in December and January," said Willis. In December the Office had to accept the resignation of Tom Lehman, the Production Manager and a mainstay of the extraordinarily dedicated Office staff for several years. Lehman has continued to do some work

for the staff since then, and "everybody has been bit-ting and piece-ing" to get the job done. It has worked, as regular Beckman and Ramo patrons would agree.

**No Way**

What will the programs be which are to be cut? Nobody has decided yet. The obvious choices are the big money-losers (most events in Beckman and Ramo lose money) and the events which require a great deal of staff time. According to Willis, cutting out the high-loss programs won't be undertaken if it doesn't have to be. Staff time is a more important resource, but it can't be generalized. "We would certainly be willing to spend a great deal of time on a program if there wasn't much else going on then," said Willis.

The staff is always on the lookout for ideas ("We're all kooks here") and is more than willing to hear from people with questions or gripes about the programming ("Call us!"). "We feel that it is very important to have programs that the students are interested in," said Willis.

That's our Public Events staff, doing an important job for the Caltech community.

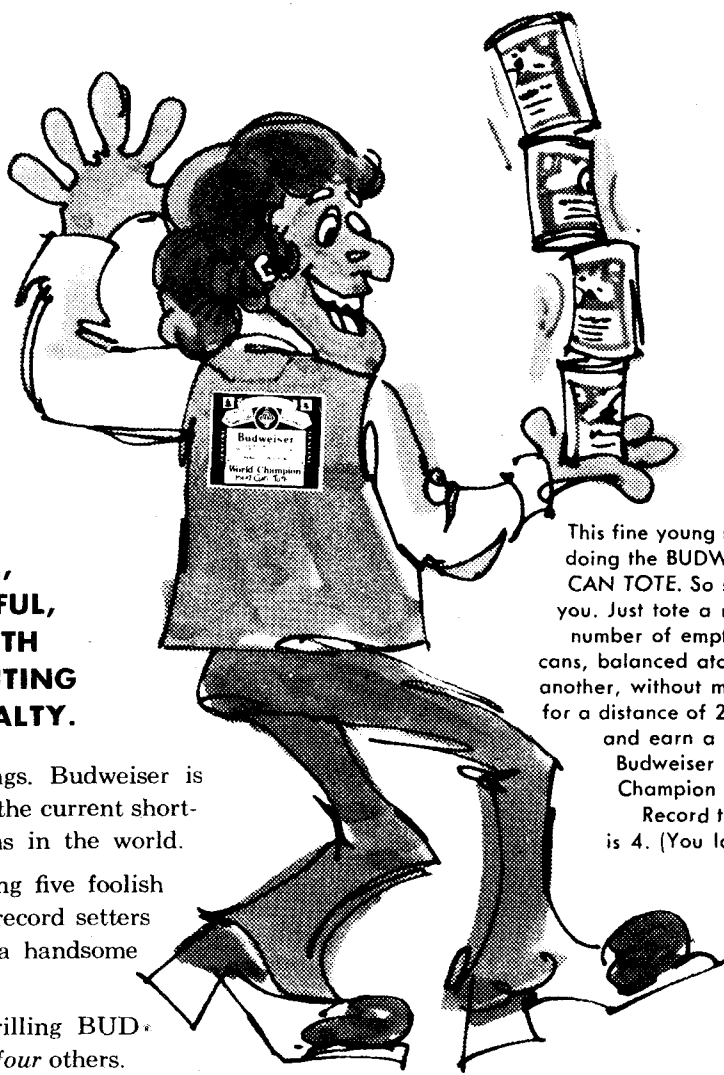
## Baxter Art Gallery Still Goes Strong

The work of painters Walter Askin and Ben Sakoguchi and sculptor Max Finkelstein is on display at Caltech's Baxter Art Gallery now through April 12. The exhibit hours are Tuesday through Saturday from 10 to 5, and Sunday from 12 to 5.

Askin's work is in art institutions both here and abroad, and he is the winner of countless awards. The painter, who also has a wide reputation as a teacher, is showing recent large paintings along with lithographs

Continued on Page Six

# IF YOU HAVE AN UNUSUAL TALENT, YOU HAVE WHAT IT TAKES TO BE A BUDWEISER WORLD CHAMPION!



**EARN THIS TERRIFIC PATCH, 7"X6", COLORFUL, WASHABLE, WITH SPACE FOR WRITING IN YOUR SPECIALTY.**

This fine young man is doing the BUDWEISER CAN TOTE. So should you. Just tote a record number of empty Bud cans, balanced atop one another, without mishap, for a distance of 25 feet and earn a dandy Budweiser World Champion patch. Record to beat is 4. (You laugh?)

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Budweiser is sanctioning five foolish events in which world-record setters can win prestige plus a handsome patch.

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(Maybe you've detected that this is not an official, rigid-rules "contest." But it is a lot of fun, even if you can't break the records. You can, though, can't you?)

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NO PROOF OF PURCHASE REQUIRED. OFFER VOID WHERE PROHIBITED BY LAW. ALLOW FOUR WEEKS FOR DELIVERY. OFFER EXPIRES DECEMBER 31, 1973. ANHEUSER-BUSCH, INC. • ST. LOUIS

It may not help, but at least the pizza tastes good.

# ROMA GARDENS

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## Mandel: "There is no question that these courses have proved themselves . . ."

While there can be little question of rivalling the larger universities in our literature and language offerings, it is important that Caltech maintain a program of at least minimum respectability in this area. Nor would it be amiss to plan a modest expansion for the future into areas of major importance which are not covered at all at this moment.

### Maintaining the Present Program

It needs to be emphasized that the Foreign Language program at Caltech—as in other universities—has two components. First there is instruction in the language itself; and second, there is instruction in the literature of a foreign country or area.

This second component has itself been significantly subdivided in recent years. First there are literature courses in the foreign language itself. Second there are literature courses in translation. The field of Literature in Translation is developing at a rapid pace throughout the United States, largely because interest in foreign cultures has remained at a normal high level even as enrollment in the languages themselves has dropped.

Any discussion concerning the FL program at Caltech must heed the above distinctions.

To begin with, it appears to be settled that Caltech will continue to offer two years of instruction in French, German, and Russian.

The following recommendations apply to this part of our program:

- Both the first and the second year of instruction should be offered every academic year.
- Sections must be kept under 20 students; it is universally recognized that language instruction ceases to be effective when large groups are taught in a body.
- Full credit should be given to the students for these arduous courses. The compromise of retroactive credit for students who have taken the full two years is marginally acceptable. But the current proposal of eliminating credit for the first year under any circumstances should be rejected outright.
- After many years of instruction by part-time teach-

ers who came to us from other colleges, we succeeded in establishing a FL group of our own. Hardly was this achieved when cuts were demanded, so that now we are again faced with the prospect of having to invite part-timers from the outside. It is obviously desirable that our language instruction be done by our own faculty members, with undivided time and undivided loyalty. For the time being, 2 instructors in German, 2 instructors in Russian and 1 instructor in French are needed to carry out the program at its present level.

So far, then, I have dealt with the two-year language program.

This program should be supplemented, as it now is, by advanced instruction into the third and fourth years, though not necessarily every academic year, as the demand arises. This work is part of the normal load of our language staff.

Since third and fourth year language instruction begins to involve literature at a serious level, this part of the program merges with the second component of the FL program, that of instruction in foreign literatures.

Foreign literature in the original language is probably well enough served for the time being by the third and fourth year instruction just mentioned.

Of greater significance is the recent program of Foreign Literature in Translation, which is threatened with extinction, and which needs urgent consideration.

We must go back and point out that in the latter part of 1972 the English group at Caltech, recognizing that the so-called English Literature offerings had for a long time included courses, for instance, the Classics, the Bible, and a scattering of works in many literatures, decided to call itself henceforth the Literature group. Our courses will be listed as such in the next Catalogue. At the same time, we decided to integrate the FL personnel into our group, and we hope eventually to be known as the Literature and Language group of our Division.

As we had finally secured the services of an authentic Caltech Language group, and as four out of six members of this group were young doctors in these

fields actively engaged in research, we felt that the time had come to expand our rather parochial offerings by inaugurating a modest but extremely important program in Foreign Literature in Translation: courses to be taught by our fully qualified professionals. For the first time in the history of Caltech, our students could now look forward to a series of courses, varying from year to year, in which the major works of several foreign literatures were being systematically taught. For the first time in the history of Caltech, a student might take a course in the Russian novel, or German Romanticism, or the Literature of the Age of Louis XIV. And these courses were to be, and currently are, listed side by side with the advanced courses of our erstwhile English group, and they are fully credited toward a major in Literature.

The courses in Foreign Literature in Translation are, once again, part of the normal load of our 5 or 6-member Language group. The strongest recommendation to be made here is that this program be maintained, funded, and staffed.

When the Literature in Translation Program was initiated, enrollments were small, though no smaller than in many other courses whose lives are not threatened. By now, however, the enrollments are fully normal. There is no question that these courses have proved themselves, and that to void them would be to inflict a serious cultural setback on Caltech.

## II

### Planning for the Future

While maintaining a FL program which requires a staff of 5 to 6 persons, we should not dodge the fact that serious gaps remain in this field. I am not making any suggestions which would place Caltech on a par with its larger rivals, but even as a small-scale institution, we should offer, I do not say every year, but now and then, and on a regular cyclical basis, courses in other literatures, or more broadly, in other cultures, than the ones we have covered hitherto.

I recommend that we work toward a situation in which, during every academic year, an invited professional of high standing spend one or two quarters within the HSS Division to teach a course in some major field where we cannot provide the expertise. Such areas as Oriental Literature in Translation, Spanish American Literature in Translation, Scandinavian Literature in Translation, or Italian Literature in Translation, readily come to mind. Regular cycles of such courses would enrich the fare of our students enormously, certify our cosmopolitan standing, and bring a number of stimulating new personalities to our campus.



Dr. Oscar Mandel . . . English

# AD COMM COMM

## Dean: "Prescriptive in academic spheres leadership in the areas of social relations"

Undergraduate education at Caltech is pretty darn good! Academic standards and achievement are high. Most of our graduating seniors would qualify for a master's degree at any university, including Caltech. There is a good deal of contact between students and staff, especially during the junior and senior years. However, many concerns remain. Here are some of mine together with suggestions for corrective action.

**1. Academic Requirements.** Present academic requirements have become outmoded as we have widened and expanded our options. Does Biology need Ma 2bc? Does Economics need Ph 2? Do the faculty really know the content of our required courses? **Suggestion.** Give options more leeway to plan programs to meet the individual needs and interests of students. Express Institute requirements in blocks of units instead of individual courses; W units of Humanities, X units of mathematics, Y units of laboratory science, and so on. Options would be free to make their own requirements.

**2. Academic Spirit.** Our academic climate is prescriptive, especially so in the first two years. "Learn this today, do these homework problems tomorrow, pass this quiz next week." While this regimen keeps students busy with challenging problems posed by staff, I believe it tends to stifle or postpone the expression of creativity and lulls us into accepting a high level of mediocrity in place of true excellence. It creates a testing rat race, and indeed, during midterm week many courses grind to a halt. It encourages students to judge courses by their administrative slickness and creates the belief that course content and educational goals are equivalent to exam content.

**Suggestion.** Structure standards to reward independent work and creative ideas within the framework of each course. Recognize that a basic goal of education is the formulation of new problems and principles. A good idea should be worth more than a perfect test score. Abolish midterms. Create undergraduate seminars and make participation in such seminars a Caltech trademark. Incidentally a shift from the testing rat race cannot be achieved unilaterally in one

course, since the pressures from other courses will absorb any local relaxation of the pressurized schedule.

**3. The Quality of Student Life.** While we are prescriptive in academic spheres, we are hopelessly permissive and abdicate leadership in the areas of social relations and personal life styles. Many of our students are cripples in communication, self-expression, and the social amenities.

**Suggestion.** Achieve a better balance between life in classrooms and life in student houses. Much of this responsibility now rests on the Caltech Y. Their activities should be encouraged, supported and enlarged. In addition we should use more Resident Associates and expect them to do more for the quality of student house life.

**4. A Matter of Degree.** We should give academic rewards for our high standards. Is a BS degree enough? Remember, most of our seniors are taking graduate level courses.

**Suggestion.** Make it easier to achieve a MS and a BS concurrently. Permit dual application of credits toward each degree.

**5. Admission and Attrition.** The present rate of attrition of our students is about 35%. This is too high to justify the historic Caltech principle of selecting a few outstanding students, giving them a premier education, and waiting to see them blossom into preeminent scientists. It is impossible to identify those high school students who will succeed at Caltech until we have seen them perform here. Indeed, until a student has experienced our academic life he cannot himself know whether he will prosper here. It would be relatively easy to accomplish this mutual selection process at the end of the sophomore year at Caltech. But under our present mode of operation there is no honorable way for a student to leave Caltech before his graduation.

**Suggestion.** (This idea comes from Gary Lorden who is not responsible for its present formulation!) Establish a two-step four year program leading to the MS degree. Most of our seniors now do graduate level work. Under the new plan we would admit freshmen to a program leading to a Diploma in Science to be awarded to all students upon the successful completion of two

## Eat Basketballs!

	East Court	West Court
Monday, April 2	Ricketts vs. Ruddock	Fleming vs. Blacker
Tuesday, April 3	Lloyd vs. Dabney	Page vs. Fleming
Wednesday, April 4	Lloyd vs. Ruddock	Page vs. Blacker
Thursday, April 5	Dabney vs. Ruddock	Fleming vs. Ricketts
Friday, April 6	Blacker vs. Lloyd	Page vs. Ricketts
Monday, April 9	Ricketts vs. Dabney	Ruddock vs. Blacker
Tuesday, April 10	Blacker vs. Dabney	Fleming vs. Lloyd
Wednesday, April 11	Ricketts vs. Lloyd	Ruddock vs. Page
Thursday, April 12	Blacker vs. Ricketts	Dabney vs. Fleming
Friday, April 13	Lloyd vs. Page	Ruddock vs. Fleming
Monday, April 16	Dabney vs. Page	

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Dr. Richard Dean . . . Math

years of academic work. At the end of this program a student would, if he wished, apply for admission to a master's program leading to the MS degree. This program would, in most cases, be accomplished in two more years, making a total of 4 years for the MS degree. This timetable is very much within the bounds of those recommendations which would conclude college work in three years.

On the other hand, if a student did not choose to continue in the masters program he would apply elsewhere to continue his undergraduate work. His Diploma would certify that he had successfully completed two years of College work.

For us, the important feature is that we could decide, on the basis of two years of work done here, whether a student is ready for advanced work. Those who were not admitted to the MS program would have an honorable termination of their Caltech work as recognized by their Diploma.

**Español**  
Continued from Page Two  
picaresque novel off the ground with "Lazarillo de Tormes." Modern Spanish language literature is also of the highest as evidenced by the winning of a Nobel prize for literature recently by a Chilean poet.  
I think I have presented some powerful refutations to the argument against a Spanish course at Tech and I urge the students and faculty to give it the most serious consideration.  
—Marc Donner  
Page

## Kevles: "... Incontestably bright, ... poorly prepared . . . outside of math and science."

Since the question of the humanities requirement has occupied so much of the committee's time, I would like first to submit my thoughts on that issue for the record. Then I would like to take up the distinctly separate matter of the reform of the undergraduate program.

To turn to the humanities requirement, since the development of the modern university in the United States a century ago, educators have generally advocated three groups of studies for undergraduates: liberal education; scientific education and training; and vocational training. The Caltech curriculum provides ample scientific and mathematical education and training. What is at issue is how the requirement for studies in other fields shall be used. Totalling 108 units, that requirement allows little room in which to crowd the studies which contribute to the larger education, as opposed to the professional training, of Caltech undergraduates. Accordingly, I believe that the 108 should be reserved exclusively for the kind of liberal education that is sensible in the Caltech context. That means excluding such vocational courses as business management. It means including mainly courses in history, philosophy, English, the arts, and such social sciences as anthropology and psychology which are, for the most part, non-mathematical in methodology and approach.

My main reason is that, on the whole, our undergraduates sorely need as much in the way of liberal education as we can give them. Though they are incontestably bright, many Caltech students are poorly prepared in fields outside of mathematics and science. Whatever the reason, many Caltech undergraduates display a lamentable lack of knowledge, sophistication, and facility in fields outside of science and mathematics; some do not know how to read a book perceptively or write a lucid sentence. If we would do more than provide out students with first-rate professional training, it is imperative that we ask them to complete a rigorous course of liberal studies. Mere "broadening" courses like learning to play the piano will not do the job. Our students must be forced to intellectual engagement with alternative ways of looking at the world, to problems of values and identity, to what is unique as well as what is not in human experience.

I do not believe that we would be hamstringing our students too much by reserving the 108 units for liberal studies. In light of the number of free electives in virtually every option, it would seem that students have ample opportunity to take courses in the mathematical social sciences or business management. Besides, Caltech graduates who enter industry will usually find their employers ready to underwrite or even provide courses in business management. No, we would not be

hamstringing our students by insisting upon a heavy dosage of liberal studies. We would probably be doing them a favor. Many people tend not to recognize the value of liberal studies until they are older, and then they have little or no time to pursue them.

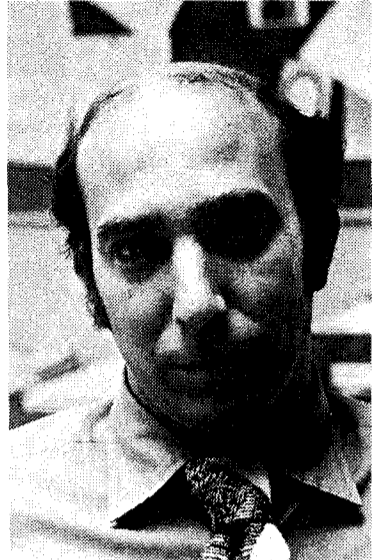
Let me make clear that I am no purist on this subject. I do not hold courses in liberal education in any sense superior to those in other fields. I simply believe that Caltech undergraduates need them more than, say, courses in the mathematical social sciences, which in methodology and approach resemble the courses in the technical sector of the curriculum. At the same time, I wholly applaud the eagerness of some of our undergraduates to pursue studies in vocational training and the mathematically analytic social sciences. But let me point out a paradox. On the one hand, there is already room for such courses in virtually every option. On the other, our students complain about lack of time for non-scientific courses.

The trouble is, it seems to me, that the atmosphere and values which dominate at Caltech encourage all students to cram as much mathematics, science, and engineering as possible into four years, to use their allowable free curricular time to advance their professional training. Perhaps what is necessary is a change in the undergraduate environment at the Institute, which brings me to the question of the reform of the undergraduate program.

Why do all our students feel compelled to cram as much professional training as possible into their four years here? In part, I believe, it is because of the prevailing wisdom, which is fostered to a considerable extent by the faculty, that learning as much science in the undergraduate years is indisputably desirable. This wisdom really amounts to no more than a myth; it may or may not be true. Certainly it is conceivable that one may become a first-rate scientist by pursuing a general education as an undergraduate, then following a program of professional specialization in graduate school. In any case, Caltech's belief in this myth accounts, so far as the undergraduate program is concerned, for the uniqueness of the Institute as an institution of higher learning.

But we must ask: Considered from the point of view of our undergraduate program, is that uniqueness necessarily good? I contend that it is not, not in the case of every undergraduate.

Consider the following two major points. First, the demands of getting through the intensive Caltech undergraduate program tend to make for a regrettably homogenous student body, socially, culturally, and intellectually. This homogeneity diminishes the vitality of the educational environment. Students tend to learn at least as much from their peers as from faculty,



Dr. Daniel Kevles . . . History

but at Caltech, talking to one's peers is too often like conversing with the mirror. In all, Caltech's unique undergraduate program has the deleterious side effect of producing an unhealthy degree of sameness in outlook and values among the undergraduates.

Second, many students capable of making it through the existing Caltech undergraduate program discover, once here, that there's more to life, including the life of the mind, than science. They develop an eagerness to explore other areas of knowledge, but they are limited by the heavy demands of the scientific curriculum. Many, perhaps most, still wish to become scientists, engineers, and mathematicians. But feeling boxed in by the curriculum, they begin to resent science. Moreover, discontent with the lack of diversity among the student body, they grow to dislike Caltech. Some develop psychological problems. Others, including some of the best, leave for other universities, which is a cost that neither they nor the Institute community should have to bear.

Can this situation be changed? Yes, I think so. But we must first recognize that not all the students who come to Caltech will, after they have been here a while, want to study sciences as intensively as is now required. Some will want to become scientists and engineers at all; they will want a solid grounding in science and mathematics while aiming for careers in law, business, medicine, or other academic disciplines. We should not only welcome these other groups of students. We should do all we can to get and keep them here.

To this end, we shall have to stop insisting that all our students make the same enormous progress in science in four years. Why, after all, should every Caltech graduate be worthy of a master's degree in his field at commencement time? To repeat, one can become a first-rate scientist by postponing accelerated specialization until graduate school. Some critics of this view may charge that allowing some students to make less progress in science than they do now will lower the quality of the undergraduate program. In my opinion

these critics are mistaken. It is misleading to measure the *quality* of the learning by the *quantity* of science learned. Caltech undergraduates will receive a high quality education if, in whatever field, they pursue a high quality course of study.

Translating these thoughts into a specific proposal for the reform of the undergraduate program, I recommend that the Institute make available an alternative four-year undergraduate curriculum. The chief feature of this curriculum would be fewer requirements in science, mathematics, and engineering and correspondingly more opportunities for work in other academic areas. The scientific courses taken under the alternative system might will be the same as those now offered. But we need not insist that every student master all of Physics 1 and 2, Math 1 and 2, and Chemistry 1 in the first two years. Why not permit some students to learn the material in those and some additional technical courses in four years? They would certainly graduate from Caltech with considerable scientific education, indeed, with enough of it, if they designed their course of study wisely, for admission to graduate school in a technical field.

Apart from making Caltech a more attractive place for students who can now make it through the admission process, the establishment of the alternative curriculum offers some hope of diversifying the undergraduate body. In fact, without such an alternative course of study, diversification seems utterly hopeless. So long as we keep demanding that every student who comes to Caltech must be primarily qualified to master math and physics at an intensive pace, the vast majority of the undergraduate student body will look, act, and think like mathematicians and physicists. But if we offer an alternative course of study, we can also alter the criteria for admission. And, to anticipate my critics again, I contend that such alteration does not require a reduction in standards of intellectual quality. It only requires the recognition that there are other kinds of brightness, including academic brightness, besides a high aptitude in mathematics. Moreover, the presence on campus of extremely bright students whose primary interests lie outside of technical fields would, in an important sense, probably raise the intellectual quality of student life.

To summarize, then, I urge that we retain the currently prevailing intensive course of scientific study for those students—they would likely to be a majority of the undergraduate body—who wish to pursue it. But I also urge that we establish an alternative curriculum for those students who decide that they wish to become scientists at a slower pace and those who, while wanting a decent scientific education, wish to pursue different careers. By doing so, we will make Caltech an intellectually more vital place for our current students. We may also well succeed in achieving some diversification of the student body, with considerable benefits for the undergraduate environment.



## Antigone Opens Beckman's Third Term Schedule

by Marc Donner

Welcome home all you trolls and other assorted creatures. This term for your flicking enjoyment the people (please note) at Beckman Ticket Office have arranged a rather respectable collection of tempting delights.

First to catch the eye is the National Shakespeare Company of New York's presentation of *Antigone* at 8:00 p.m. on Saturday, March 31 in Beckman Auditorium. In the course of its ten (to date) annual tours, this non-profit organization has performed for over a quarter of a million people per season in colleges and universities across the country.

In *Antigone*, written in about 440 B.C., the conflict between Creon, the king, and his niece Antigone is usually interpreted as the classic statement of the struggle between the individual conscience and the central power of the state. In 1943 Jean Anouilh saw this conflict as relevant to the German occupation of France and made his

celebrated adaptation of the play for the French people. Director Louis Criss also sees *Antigone* as a very contemporary play for our time and will visualize this timeliness in the sets, costumes, and dramatic approach of this production. (Caltech students \$1.50).

### Joy Blackett Performs

For your listening enjoyment the second of the Young Concert Artists—West will give a recital in Ramo Auditorium on Friday, April 6. Mezzo-Soprano Joy Blackett, first winner of the National Opera Award, will sing a program including songs and arias by de Falla, Scarlatti, Schumann, Mozart, Mahler and Purcell.

For all you vicarious voyagers there is the third Armchair Adventure on the 1973 season on Sunday, April 1. This is the round-the-world voyage of the Schooner *Yankee* personally narrated by Captain Irving Johnson. Included in this voyage are visits to (you guessed it) Pitcairn Island [the place where the Bounty mutineers colonized], Borneo, Bali and too many more places to list here. "This documentary is superbly photographed with the accent on the off-beat and unexpected."

## Murray On Mars: Wandering Poles

Circular geographic features around the Martian poles, looking in pictures like a stack of gigantic overlapping poker chips, may be evidence of periodic wandering of the planet's poles. So state Dr. Bruce Murray, professor of planetary science at Caltech, and graduate student Michael C. Malin, in the current issue of *Science*.

The possibility that the earth's poles have wandered has been the subject of considerable controversy and the question is still unresolved. Now, Murray and Malin suggest data from the spacecraft Mariner 9 point to the possibility that the poles on Mars have changed position numerous times over the last 100 million years. They believe the evidence is even stronger for polar wandering on the earth's neighboring planet than on the earth itself.

The plate-like features which Murray and Malin believe may be evidence for polar wandering are shown in Mariner 9 photographs as circular areas averaging about

200 miles in diameter with outward sloping edges. The edges of the plates appear as narrow, evenly spaced light and dark bands with smooth, gracefully sculptured, gently sloping surfaces, their banded appearance apparently resulting from a series of stair-like contours. "The bands are surprisingly uniform in terms of their width and the amount of offset from one another," Murray said.

These circular regions only appear within the area around the poles where carbon dioxide and water frost annually appear and disappear. Murray and Malin believe they may consist of what originally was atmospheric dust, trapped by frost and left as a fossil-like residue after the frost evaporated. If this is the case, then the center of each circle would represent a former spin axis of the Martian pole. "The surface of the plate-like areas is almost entirely free of craters," Murray said. "This suggests they are relatively young compared to other Martian features."

As supporting evidence for polar wandering on Mars, Murray and Malin allude to a large cluster of volcanoes near the Martian equator, discovered by Mariner 9.

Murray and Malin consider that the volcanoes may be evidence of a condition necessary for polar wandering—massive fluidity within the planet's mantle created by churning currents of molten material, rising and

falling, and occasionally breaking through the surface as volcanic activity. Huge masses of molten material, constantly changing position within the planet, would be necessary to force the pole to shift its own position in relation to Mars' stable outer crest, the Caltech scientists explained. They believe radioactive heating within the planet may only recently have reached the point where these processes of mantle convection have begun.

## Curriculum Changes

Continued from Page One

mittee proposal if the first 54 units were lowered to 27 units. In his opinion, students should have as wide a variety of courses as possible, and that restricting 54 of the units to English, History, Music, Art, and Philosophy would be too rigid.

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Concerning Freshman humanities, the committee has agreed with the Division that the requirement should be continued. "Freshman Humanities" have been identified by various means, the latest being any Division course numbered below 10. A proposal (separate from the two mentioned above) is now under consideration by the Curriculum Committee, which would—by extensive renumbering—make that description entirely correct. There would be a number of Political Science, History, English, and Music classes available for Freshman Humanities under the proposed plan. Ec 4ab, and all philosophy and psychology classes now numbered below ten would be upgraded numerically to make them ineligible.

Students would still be able to be excused from the Freshman Humanities requirement by scoring a 4 or 5 on the advanced placement tests, or by receiving their instructor's recommendation.

The next Faculty Board meeting is scheduled for April 9.

## Reading Sonnets?

Continued from Page Two

exert its influence to save the poor dupes all will be well. If this paper will refuse to gratify their morbid banity by refusing to print their puerile sonnets we may yet be saved. Otherwise Caltech will no longer be known as the home of brawny scientists but will be sneered at as the den of lily-sniffing aesthetes, a thing which would bring tears to the eyes of all honest men.

—Arnold Dempster

[Ed. Note.—Originally printed, April 28, 1932]

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## Dow Chemical

Continued from Page Two

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