

News Briefs

Gall To Speak

Mr. Norman Gall, American Universities Field Staff expert on Latin American affairs, will be at Caltech this week. He will give a talk today (Thursday) in 127 Baxter at 4:00 p.m. on "Problems of the Squatter Areas of Caracas."

Mr. Gall has been a freelance journalist in the Latin American region since 1964. In 1967 he studied at the Woodrow Wilson School of Public and International Affairs at Princeton.

About the ASCIT Assessment

Due to a misunderstanding at registration, the forms for signing out of ASCIT were not readily available. If you wish to sign out of ASCIT, you may do so either at Student Accounts in Business Services or at Flora's office in Winnett.

Bridge Tournament Happening Saturday

There will be a duplicate bridge tournament in Winnett on Saturday March 31 at 7:00 p.m. All are welcome and there are no entrance fees or prizes.

Fibonacci Club Meets March 31

The Caltech chapter of the Fibonacci Club will meet Saturday in Clubroom 1. The latest developments in H matrix theory and practice will be explored. Also, D matrices will be reviewed. All members are welcome—closed to others.

Olive Walk Noon Concert

Maggie, an acoustic group from Oregon will be playing tomorrow. Come listen to some very good sounds.

Y Lounge Noon Discussion Series

Dr. Adrian Mayer, M.D., UCLA instructor in anesthesiology at Harbor General Hospital, will be informally discussing "Medicine as a Career" Tuesday, April 3 with interested students.

Brass Ensemble Organized

A Brass Ensemble will be meeting Mondays at 7:30 p.m. in 318 Baxter. Additional players are being sought. For further information contact Bill Fornaciari, 449-8928 or x1687, 208-41.



NANA MOUSKOURI, the highly-acclaimed Greek ballad singer, will appear in Beckman Auditorium on April 7. This performance promises to be a sell-out, so contact the Caltech Ticket Office without delay. Photo by Music Center

Trespassers Arrested

by Gavin Claypool

Two 19-year-old non-Techems were arrested late Saturday afternoon by campus security for trespassing in the Winnett Game Room.

Both suspects had been encountered by Security before Saturday, and had been strongly directed to keep off private property, which Caltech is.

The pair had gained access to the game room with a game room key, officially checked out to a Caltech sophomore. This student reports that his key was lost over a month ago and that he has no idea what happened to it.

Security was notified after a Techem, who objected to the non-Techems' presence in the game room, came up to the Winnett Center office. Sgt. Wiley, the first officer to the scene, asked the suspects (who were playing pool) for their student identification. When neither could produce any, they were ordered to spread eagle against the wall and were promptly cursorily searched and handcuffed. Another security officer

Walter Askin Talks on Art

Thursday, March 29, Walter Askin will speak on his work and the development of his ideas over the last five years. A selection of his work is currently on display in Baxter Art gallery. The lecture will be in 125 Baxter at 4:00 p.m.

had arrived by then, and the pair was taken in for questioning.

The two suspects will appear in Pasadena Superior Court about the middle of April. They were released without bail under a new "springing" system.

Law Professor

Levine Comes to Tech

A distinguished professor of law, Michael E. Levine, has been appointed Henry R. Luce Professor of Law and Social Change in the Technological Society, President Harold Brown has announced.

At present Levine is on leave from the USC Law School as a visiting professor of law at Duke University. He is concerned with the application of law to economics and technology and will participate at Caltech in studies on the impact of science on society through technology.

"Mr. Levine is an outstanding man in this new field of the social sciences in which Caltech is expanding," Dr. Brown said. "We are grateful to the Henry Luce Foundation for making the appointment possible and we share its concern over introducing an understanding of law into the context of American scientific and technical education."

Abstract Models

Levine, who sees law as a purposeful, organizing force in the whole spectrum of human endeavors, is interested in applying abstract models to social problems. At USC he designed and managed its law center's part of the Sea Grant program.

Upon graduating from Yale Law School, he worked as an attorney for the Civil Aeronautics Board. He became special assistant to the task force on Economic Growth and Opportunity for the U.S. Chamber of Commerce. Subsequently he took a position as law and economics fellow at the Univer-

Faculty Board To Consider Myriad HSS Proposals

by Gavin Claypool

Two proposals are awaiting action by the Faculty Board which could alter the present format of the 108-unit HSS requirement.

The first proposal, drawn up by the Division of Humanities and Social Sciences, reduces the number of units of required "H" courses from 54 to 27, and eliminates the required 27 units of English. The balance (81 units) would be selected from almost all of the courses offered by the Division, with about twenty exceptions.

Ec 100 Loses

Under the revised requirements, the following courses would lose HSS credit: Ec 100, Ec 110, Ec 121, Ec 122, Ec 130, Ec 131, Ec 132, En 151, L 131, SS 131, SS 140, SS 141, SS 142. The language courses L 102, L 130, and L 152 (Elementary French, German, and Russian, respectively), would no longer receive retroactive credit for completing a second year in each language.

The chairman of the Humanities and Social Sciences Division, Dr. R. A. Huttenback, explained that the change was to ease the constraints imposed on students in choosing their 108 units. The courses not receiving HSS credit were classed as such because of their econometrical and/or vocational nature.

It was the opinion of the Division—although not an unanimous one—that English was not unique with respect to other humanities courses, and so the proposal included elimination of the 27-unit English requirement.

On the Other Hand . . .

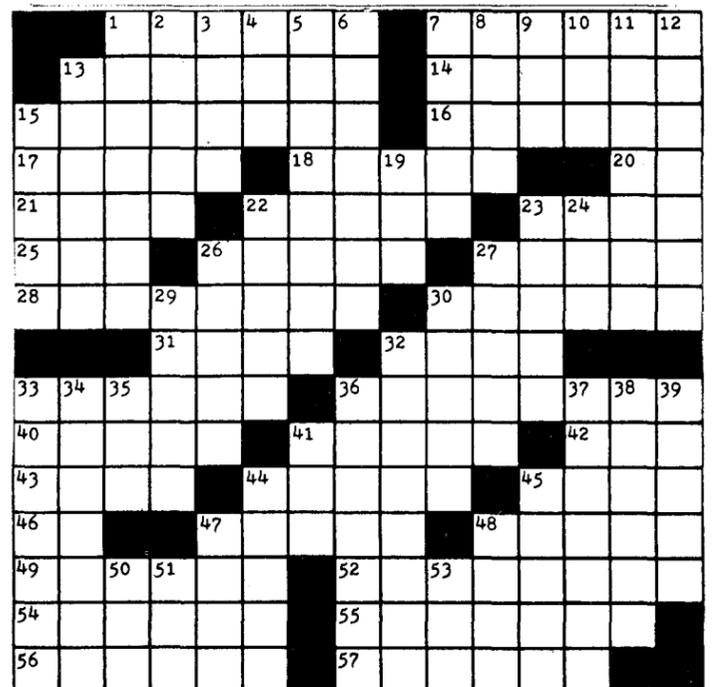
The faculty Curriculum Committee has recommended that the 108-unit requirement be broken down differently, with 54 units coming from courses labelled English, History, Philosophy, Music, or Art, and the other 54 from any of the courses offered by the Division. Credits toward the latter number would be restricted in the area of business economics and management to 27 units.

The committee felt that the fields of English, History, Philosophy, Music, and Art were removed enough from science and engineering to give students a reasonable breadth in their undergraduate education. Since there is a wider variety of courses included in those five areas than included in those for the Division's 27 units, the higher unit requirement was considered justifiable.

Unlike the Division's proposal, which excludes most economic and language classes, the committee's recommendation excludes only reading courses. Even such reading courses could be granted HSS credit if both the instructor of the course and the Division Chairman agree that it meets their criteria for such credit.

Dr. Huttenback feels that he could accept the Curriculum Com-

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ARTIST'S CONCEPTION OF new student house to await Class of 1977.

Third Term Calendar

April 13	ADD DAY
April 14	Last day, removal of "E" or "Inc" grades
April 20	Freshman Option Choices Due [tentative]
?	Senior Ditch Day?
April 28	MID-TERM
May 4	Class Elections [unofficial]
?	Senior Ditch Day?
May 18	Pre-registration for first term, 1973-74, due
May 18	DROP DAY [all undergraduates and graduates]
May 26+	Senior FINALS
May 28	Memorial Day [Institute holiday]
June 2+	FINALS
June 8	Commencement

Editorial

The Ides Of March

The Ides of March have passed, and evil times are upon us. The food is terrible. The middle east seems on the verge of open war. The war in Vietnam continues without end or hope. Millions of people all over the world live on the verge of starvation. And most terrible of all, third term has begun.

O, woe, ill begotten earth, for dark days are upon us.



from the cerebrum

by Etaoin Schroedlu

Once again, discussions for expanding the size of the undergraduate student body at Caltech are in the wind. The most recent state of proposals began with President Harold Brown's comment in a recent *Engineering and Science* interview that he felt a small increase in the undergrad student body, to about a thousand total students, would be a good thing. Discussion has continued, with student Phil Neches endorsing that view in the final meeting of the Ad Hoc Committee at the end of last term.

I am myself not convinced that the proposed increase is a good thing (or a bad one). I do feel that there are some points which call for public consideration before such a policy is to be adopted.

Join Caltech

Tech is, of course, noted for rigorous admissions standards. Would these standards be watered down by choosing a class designed to produce, say, 275 or 300 entering frosh instead of the current 225? Probably so, to some degree, but the evidence is not clear. My experience on the Admissions Committee was that a committee member would generally feel fairly certain in his own mind about a rank-ordering of the applicants before him, but when, in fact, someone further 'down the list' was admitted (for whatever reason), his subsequent performance was difficult to distinguish from the rest of his peers. Students on the committee would often see the record of one of their peers and say, "He was only on the waiting list

here, why, he's one of the best students in my class!")

On the other hand, the idea of using these additional spots to get 'interesting' or 'exciting' or 'socially concerned' people may be questionable. I'm not sure it does either Caltech or the students in question any good to bring in a bunch of marginally-qualified students to provide Caltech with the sort of intellectual diversity and vitality it ought to provide itself. (Is Caltech's preoccupation with importing 'exciting' people perhaps a sign of our incapacity to produce 'exciting' people ourselves?)

And See the World?

Phil Neches has suggested that increasing the number of undergrads here would increase the number of people in the extracurricular activities, which would be a good thing. This sounds logical, but that does not guarantee that it would be true. There are, after all, more students here now than there were five years ago or so, but it is far from clear that there are more students 'doing' things. Surely the determinants of student activism are more complicated than simple numbers.

One concern I have heard voiced about having more undergrads concerns teaching loads. It seems abundantly clear that financial constraints on the Institute will, at the least, keep the number of professors at Caltech from increasing very much in the next several years. If Caltech wishes to move in the direction of more flexible curricula, more

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THE CALTECH FORUM

Add Spanish

In the recent controversy over the language curriculum at Caltech the issue has been whether or not to cut back on the department. In the modern world where contact between different language groups is forever increasing, the Humanities Division is ill-advised to do anything but *expand* the language offerings. Of critical importance should be the addition of a Spanish course to the language offerings.

I have inquired into the possibility of a Spanish course at Tech and have been told "How ridiculous; no technical literature of any value is published in Spanish." Nevertheless there are three compelling reasons why a course in the Spanish language and its literature should be initiated.

First of all, there is a large and ever-increasing number of Spanish speaking people in the United States and particularly in California. If we wish to better understand and communicate with our Spanish-speaking citizens there is no better way than learning their language and culture.

Second, there is the fact that Spanish is the second most-widely spoken language in the Western world. The fact that little technical literature is published in Spanish is not likely to remain true for much longer in view of the number of people and countries and the amounts of resources involved.

Finally there is the brilliant literary tradition in the Spanish tongue. There were brilliant poets and playwrights in the Spanish world before Shakespeare's *n*-times great-grandparents were around. The concept of the prose novel depends a lot on the early work of Spanish authors who were some of the first to experiment with it. Such writers as Mark Twain owe a secret debt to an unknown Spanish author who got the

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Undermines Science?

I was shocked to see two Institute students stop in the middle of the campus to read the sonnet published in the last issue of the *Tech* and to engage in a heated discussion of poetic technique, for such conduct brings to sharp attention a dreadful state of affairs. Too many students are spending their time on such frivolous and ephemeral things at the expense of more serious subjects; and their selfish and short-sighted course can end in nothing but disaster for themselves and disgrace for the Institute.

Few persons are entirely aware of what is actually going on, and I feel it is my duty to warn them of the insidious forces which are undermining the school. For instance, the works of Edna St. Vincent Millay, that disgrace to American womanhood, are avidly read by many, and a large number of students are more familiar with the sonnet form of Donne than they are with the laws of Newton. There are students in this school who have even read every volume of that vile piece of French decadence, *A la Recherche de Temps Perdu!* Literature is not their only vice, for they dissipate their time and energy discussing Ravel, and Stravinsky, Matisse and Picasso.

Fortunately, we can easily detect the cause of this sad condition and set about to remedy it. I believe the offenders are not entirely culpable, but that they are victims in a part of a misguided campaign which the Humanities department has been conducting and is part of a far more sinister force. This evil influence is shown by the great interest in Russian novels displayed by many students and is part of a deep-laid Bolshevik plot to discredit American science and to spread Russian propaganda. We must act quickly to stamp it out!

If *The California Tech* will

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Union Urges Boycott

There are 165 courageous people at the Dow Chemical plant in Bay City which has been on strike for 14 months. They would like to enlist the aid of your newspaper and members of the student body so that we may survive. Dow Chemical is using its unlimited resources in an attempt to destroy us economically and eliminate the collective bargaining process of our Local Union which is 14055 of the United Steelworkers.

Many workers and their families have suffered unlimited hardships in the loss of income and personal property which they have had to sell in order to feed their families because Dow Chemical refuses to resolve an unjust labor dispute provoked by Dow Chemical and its local management.

In the interest of humanity we ask that you print this letter in your college paper and that the student body aid us by refusing to buy Handi-wrap plastic food wrap and Ziploc bags which are made at the Bay City plant.

If there are individuals or groups on campus who would like to aid us in this humane endeavor, please contact me at the address which is given below. We request that they boycott the above mentioned products which

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Editors-in-Chief: Gavin D. Claypool
Eric H. Eichorn
Dennis L. Mallonee

Associate Editors:
Peter W. Beckman
Philip M. Neches

Feature Editor: Steve Sweeney
Photography Editor: Ray Feeney
Sports Editor: Bob Kieckhefer

Staff: Marc Donner, Paul Harper, Patti Horne, Philip Massey, Dick O'Malley, Ed Schroeder, Etaoin Schroedlu millikan troll.

Photographers: Todd Boroson, Dave Brin, Gerald Laib, Phil Neches, A.J. Owens, Dave Peisner.

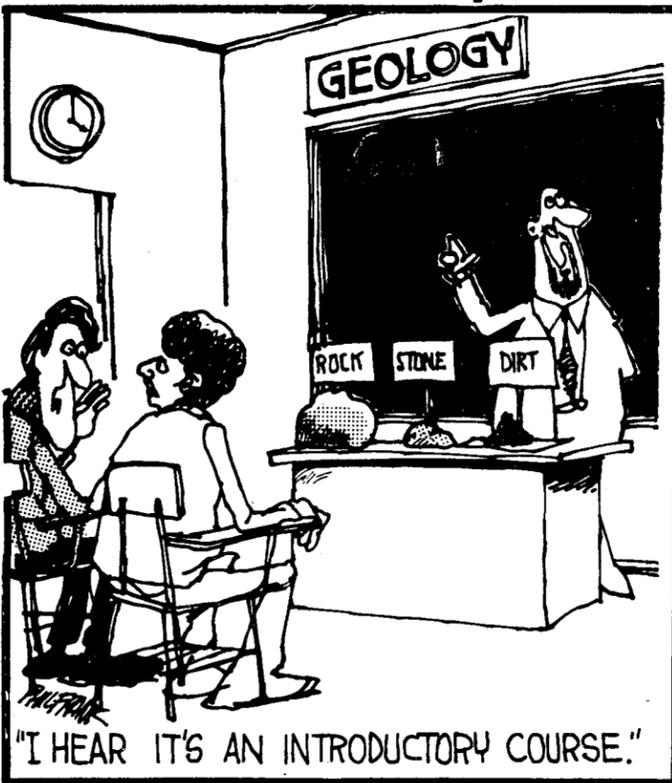
Business Manager: Dave Peisner
Associate Business Manager: Marvin Mandelbaum
Circulation Manager: Rob Olshan

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FRANKLY SPEAKING

by Phil Frank



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THE ASCIT FRIDAY NIGHT MOVIE

CANDY

This Friday in Baxter Lecture Hall at 7:30 and 9:30 p.m.

Admission: 50¢—ASCIT members and their guests; \$1.00—anyone else

NEXT WEEK:

THE LANDLORD

THE ADVENTURES OF THE TECH TRIO

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!



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?)

Breathe easy, Earthlings. Budweiser is doing something about the current shortage of world champions in the world.

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

In addition to the thrilling BUD CAN TOTE, there are four others. Get details at your favorite beer store where you see the gaudy "Budweiser World Championship" display!

Do one, beat the record, tell us about it on a postcard and get your marker pen ready for inscribing your particular specialty beneath where it says "World Champion."

(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?)

TO GET YOUR BUDWEISER WORLD CHAMPION PATCH (EVEN IF YOU DON'T SET A RECORD), JUST WRITE YOUR NAME, ADDRESS AND WHAT YOU DID ON A POSTCARD.



SEND IT TO

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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

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

ROMA GARDENS

BEER & WINE ITALIAN CUISINE

PIZZA SPAGHETTI RAVIOLI

PIZZA TO GO

DISCOUNTS ON LARGE ORDERS

1076 E. Colorado 449-1948

OPEN 5 TO 12 SUNDAY THRU THURSDAY 5 TO 1 FRIDAY AND SATURDAY

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:

a. Both the first and the second year of instruction should be offered every academic year.

b. 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.

c. 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.

d. 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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S . . . "



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.

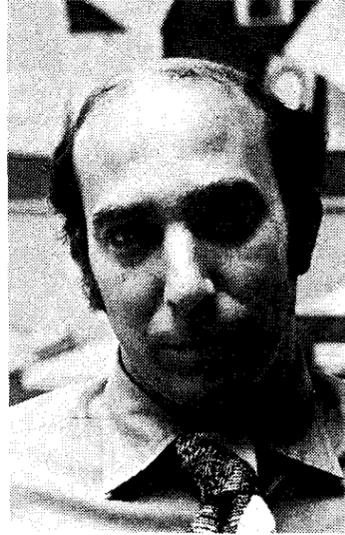
Let me make clear that I am no purist on this subject. I do not hold courses in liberal education in any sense superior to those in other fields. I simply believe that Caltech undergraduates need them more than, say, courses in the mathematical social sciences, which in methodology and approach resemble 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.

University of California

Too Much Research?

"The research emphasis of the University of California has been over-emphasized to the detriment of undergraduate education, some graduate education and the needs of the state," concludes a special legislative study on the role of research in California higher education. The summaries of argument for and against heavy involvement in research seem to favor the proposition that research does adversely affect teaching and education," said Lewis B. Mayhew, professor of higher education at Stanford University, in a report to the Joint Committee on the Master Plan for Higher Education.

Research A Brain-Drain

"On the one side it is argued that research whether supported by a department or separate grant, has drawn the best minds away from teaching... Even when faculty members teach, they resist out-of-class contacts with students because they interfere with research and consultation... Outside funding of star research workers has allowed them to ignore or reject institu-

tional educational goals. And the educational effectiveness of research-oriented universities is called into question by studies of graduates of liberal arts colleges who achieve far better on a number of measures than do graduates of most research-oriented universities."

The study continues, "... academic values such as institutional loyalty and responsiveness to student desires seem to have been eroded, especially during the 1960's... [some] departments—supplied with an outside economic and political base—seem to have been somewhat indifferent to institutional guidelines. The fact that the large research-oriented institutions experienced the greatest intensity of student protest during the late 1960's may be related to the research and consulting preoccupations of the faculty... With many professors, each dealing with his own specific research or the research of a limited number of close colleagues, there simply is no time or energy to relate with other elements of the campus community."

Support Causes Expansion

Prior to World War II, universities conducted large-scale research in only a few areas. Faculty members, for the most part, engaged in research on their own time and in spite of heavy teaching loads. However, cooperation between universities and the government during the War led to rapid expansion of university-based research. Additionally, foundations and businesses began to allocate large sums for this purpose.

Unlike professors at the California State University and Colleges and the California Community Colleges, all professors at the University of California are expected to engage in research. This expectation is reflected in the teaching load of UC faculty. A 1972 audit by the State Department of Finance suggested that classroom contact hours of four campuses ranged from four to six hours per week and

implied that these loads allowed considerable time for departmental and contract research.

The Plan

Mayhew said that California's Master Plan which established UC as the state's primary research agency "conceals reality and forces the University into an unnecessary preoccupation with research on the part of all fulltime faculty." He commented, "There is much textbook writing and sheer redundancy which is classified under the heading of research... Faculty members at no major university are all productive scholars and institutional policy should reflect that fact."

"It can be seriously doubted that the number of those who do underlying work of significance would be as large as 50 percent of the faculty. It should be made clear that there are no data to support these impressions—but the impressions do persist... A more relaxed policy which would allow creative research workers to do their work while others would be allowed to develop their careers through teaching and service could be viable and could improve the teaching contacts of those who chose not to concentrate on research."

Comprehensiveness?

Mayhew says one possible alternative would be to transfer some research installations to federal control and to eliminate those programs which seem farthest removed from the central mission of the University. "At the same time, it [the Legislature] might call into question the need for comprehensiveness [development of graduate programs and research activities] on all UC campuses. It could be argued that Berkeley, UCLA and Davis should be supported and the others, even though they have expanded research interest, could be cut back to the educational missions comparable to the State University and Colleges."

Mayhew said the Legislature could also consider establishing a state science foundation. It would be a statewide equivalent to the National Science Foundation and would coordinate research programs, furnish funds for basic research, and formulate statewide policy toward science.

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Art Gallery

Continued from Page Three completed during a residency last year at the University of New Mexico's Tamarind Institute. They relate to two themes, the stage and the sky.

Sakoguchi was featured in Baxter Gallery's first full-scale show. A printmaker and a painter, the Pasadena City College art teacher has received national recognition for his ability. His work is seen regularly in a variety of galleries and art institutes. Sakoguchi's representation in the Baxter show is one "mosaic" painting made of 4 x 4 foot panels which can be put together in different order. Sakoguchi's work teems with objects and people.

Max Finkelstein's sculpture is in many public and private collections. Some pieces have been selected by the Museum of Modern Art in New York for loan to several American embassies. He has described his work as "the aesthetics of precision." To him, machined aluminum, computers, automated products, and the poetry of space are elements of particular interest, as are squares, rectangles, hexagons, and circles.

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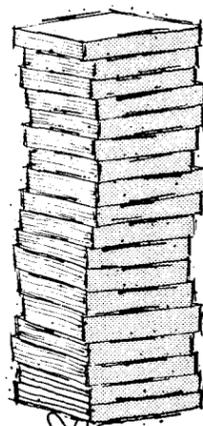
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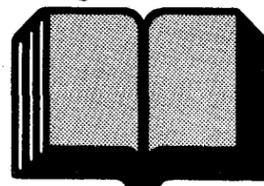
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Antigone Opens Beckman's Third Term Schedule

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.

H, FH, ≤10 . . .

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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Continued from Page Two

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Page House Wins Volleyball, Takes 9½-Point Lead

by Bob Kieckhefer

Page House swept to first place in Interhouse Volleyball last term, widening its lead in the Interhouse Trophy standings to 9½ points. The Page Dudes, led by Ben Chun, had a 6-0 record, with the only blemish being a loss to Fleming in one game of their three-game set.

Fleming, led by Chris Cooper, finished second in the standings when they lost to Page in the final game of the final set of the season. The Flems easily defeated every other house except Dabney, when the set went to three games.

Ricketts' third place in volleyball moved them into fourth place in the Interhouse Trophy standings. The Scurves relied upon good teamwork in posting their 4-2 record.

The Fall of the Rudds

Ruddock placed fourth in volleyball this year, a substantial drop from a share of last year's three-way tie for first. Dabney's team had the potential to place higher than fifth, as shown in their victory in one game against Fleming, but weak performances against Ruddock and Ricketts resulted in a 2-4 record.

Blacker moved ahead of Lloyd in the Interhouse Trophy standings by beating the Lloydies in a three-game set.

There will be three interhouse sports this term. Basketball games will start this Monday, the

Interhouse Swimming Meet will be held April 24, 25, and 26, and football games will be played from May 14 to 29, if it ever stops raining.

The volleyball won-lost records:
 Page 6-0
 Fleming 5-1
 Ricketts 4-2
 Ruddock 3-3
 Dabney 2-4
 Blacker 1-5
 Lloyd 0-6

Interhouse trophy standings:
 Page 210.5
 Fleming 201.0
 Ruddock 122.5
 Ricketts 117.0
 Dabney 112.5
 Blacker 69.5
 Lloyd 63.0

Shakespeare Films

The third annual William Shakespeare Film Festival will take place starting Saturday, April 7, at the Monica I theater in Santa Monica, and the Esquire Theater in Pasadena.

The series features ten filmed plays: *A Midsummer Night's Dream*, *The Taming of the Shrew*, *Henry V*, *Romeo and Juliet*, *Julius Caesar*, *Hamlet*, *Othello*, *King Lear*, *Macbeth*, and *A Winter's Tale*.

If you would like to take

Cerebrum

Continued from Page Two

intellectual interaction between teacher and student, the instructors at Caltech will face increasing demands on their time just from the number of students here now: an increase of substantial percent of the current student body might be very difficult to handle. And I, for one, place a higher value on the improved teaching goals above than on a higher number of degrees produced.

A Student House

There is also the matter of the undergraduate Student Houses. As everyone must be aware, the Houses are not capable of meeting *current* demand unless conditions in them are so uniformly atrocious that a very large percentage of returning Techers choose not to live on campus. My own experience has also been that Houses with large numbers of freshmen and relatively few upperclassmen do not seem to work out. The Houses

themselves have generally criticized the policies which in the past few years have admitted as many as 225 freshmen.

Caltech, of course, is branching out into various alternatives to the Houses, including the new co-ops. There is talk of Tech buying an apartment house for use by undergrads, similar to the one at 1001 E. Villa currently occupied by graduate students. Trying to provide housing for an extra two to three hundred students would fairly obviously place a severe strain upon the Institute.

Faculty and administrators might be inclined to overlook the importance of the houses in undergraduate life. At least one administrator has suggested that it is not Caltech's business to provide housing for undergrads who want it—after all, no other college does it. However, not all learning, even at Caltech, goes on in a classroom, and unconcern with the social aspects of undergrads' lives is not necessarily a productive attitude. A great deal

of Caltech's total effect on students, for better or for worse, comes about in the houses. I also suspect that, by and large, students who move off-campus tend not to be as active or involved in affairs at Caltech and elsewhere as those who live on campus (see above comments on extracurricular activities.) Strong, or at least viable, Student Houses (or co-ops or whatever) are an irreplaceable asset, which would be jeopardized by unplanned increases in the student body.

Is Not a Home

It is not clear why administrators want more Techers. I doubt that increased tuition fees (or even alumni donations, if we take the very long view) would provide much surplus after the costs of renovating and expanding the physical facilities of Caltech are calculated. Tuition is a small part of our operating budget, and most additional students, as most current ones, would be receiving scholarship aid. Added 'manpower' and diversity in the student body would be nice, but unless we just want 300 more of the same students we have now, we would do better to address ourselves to structural changes in Caltech's undergrad program and environment.

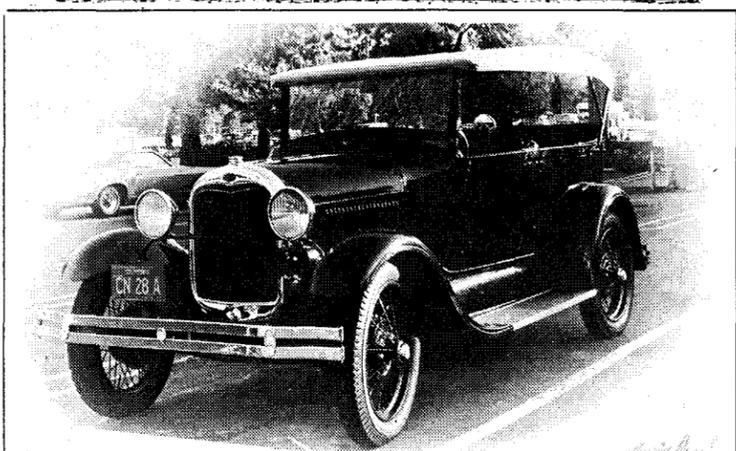
Eat Tennis Balls!

Thursday, March 29		
3:00 p.m. Varsity Tennis	Pomona-Pitzer	Home
3:00 p.m. JV Tennis	Pomona-Pitzer	Away
Friday, March 30		
12:30 p.m. Golf	Pasadena College	at Brookside
Saturday, March 31		
12:00 noon Baseball	Whittier (2)	Away
1:00 p.m. Track	Claremont Relays	at CHM
1:30 p.m. Varsity Tennis	Redlands	Home
1:30 p.m. JV Tennis	Redlands	Away
Monday, April 2		
1:00 p.m. Golf	Redlands	at Brookside
Tuesday, April 3		
3:00 p.m. Varsity Tennis	Claremont-Mudd	Away
3:00 p.m. JV Tennis	Claremont-Mudd	Home
3:00 p.m. Baseball	South Cal. Coll.	Home
Thursday, April 5		
1:00 p.m. Golf	La Verne	Away

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