



photo by Dash

CHARGE!!!

Guns of October Sound; H₂O Used as Artillery

Berto Kaufman and Art Johnson

Water War One of 1968 broke out on the evening of Wednesday, October 9. At or about 7:15 p.m. a Lloyd House expeditionary force began to challenge Fleming House, loudly and at length. Fleming responded by a move to repulse the invaders, whom they unfortunately mistook for Dabney House residents. After scattering the force holding their courtyard, the Fleming corps launched an attack on Dabney which soon degenerated into a series of short, small skirmishes in which several persons from each side distinguished themselves. Lloyd House guerrilla units were involved. Some Lloyd House spokesmen claim that this phase of attack was mainly Lloyd's, having cut through Fleming to Dabney, but both Fleming and Dabney sources deny this emphatically.

By 7:40, the brilliant Fleming military commanders had discovered the source of the original attack and had formed an alliance with Dabney against the aggressors. The main F/D column made a frontal assault on the Lloyd advanced positions on the Olive Walk while a squad of Fleming commandoes took the Page House roof and subsequently the strategic Page-Lloyd Bridge. This brave group met some resistance at the Lloyd.

Meanwhile, on the ground, the Battle of Lloyd's Front Door was in progress. During the first ten minutes of this epic encounter, the first prisoners on both sides were captured; an unidentified Fleming trooper, who quickly made a daring escape, and Dave Brin of Lloyd, who was showered by Fleming and then released.

At 8:05 negotiations between Ricketts and Dabney were concluded and the former, formerly nonaligned, joined the fray against Lloyd. The Second Battle of Lloyd's Front Door ensued, surpassing even the first in its fury, but the combination of Ricketts and F/D was too strong even for Lloyd.

Brin, war hero???

A sudden charge from Lloyd, however, proved it was not all over. A tremendous sweep led by David Brin dove straight into the thickest part of the F/D lines, scattering them in all directions and driving through at least eight meters. A quick turning movement by Ricketts on the Lloyd left flank saved the day by threatening to cut off completely the attack force. The Lloyd charge was forced to scatter, retreat, and regroup at their previous lines, Brin in particular was inundated as he withdrew. A Fleming spokesman characterized the charge as "useless" and said that it "accomplished nothing." Brin, he felt, was "reckless" and "a lousy shot." Brin himself disagreed on all counts. He felt he had provided "time for supplies and reinforcements to reach the front," as well as a moral victory in that "three houses [Fleming, Dabney, and the Blacker volunteers] ran before Lloyd." (On Saturday, October 12, he was cited for bravery by the men of Lloyd in a touching ceremony in which he was thrown into Millikan Pond.) One prisoner was taken in the attack, an unidentified Lloydman who refrained from giving a statement as he was carried away to Dabney.

Fleming-Dabney, having noted the nominal Blacker participation in the Lloyd Campaign, then decided to move on Blacker. (Blacker spokesman deny the allegation.) Ricketts, not wishing to become embroiled in the squabbles of its erstwhile allies, took no part, but granted free passage to both parties, Blacker and the F/D axis. Special Operative Bob Lewis (Fleming) managed to shut off part of Blacker's water supply. Blacker held its own courtyard successfully.

Turn, turn, turn

The Axis then unpredictably turned on Ricketts. In the most spectacular charge of the evening, Ricketts repulsed the numerically superior Axis forces.

(Continued on page 7)

ARP-in

ARP Clears Air on Smog

Saturday, October 12, an orientation meeting for the ASCIT Research Project was held to map out future work. After a short address by Dave Perasso, Jim Beck spoke on the Research Center and Mike Garet on the project proper.

According to Beck, the Research Center is an extension and

generalization of the project, a permanent funding and coordination base for several projects. Funding is both "a major purpose and a major hangup" for the Center, which has applied for an \$18 thousand Ford Foundation grant and should know the outcome in a week or two. Some projects already suggested are

research into means of improving the Defense Department, the U.N. and other international bodies, elementary education, providing means for undersea living, and more—and the Center is still open to suggestions.

Garet stressed the importance of public information in implementing the project's findings. He feels that many, if not most people think there is no solution to smog. There are, or soon will be, solutions, however; he spoke of carpool arrangements, electric cars, and steam cars especially. Informing the public of these and others was a recurring theme at the meeting.

Perasso pointed out the difficulties in such advertisement, as well as in affecting governmental agencies, on which private pressure groups often have more effect than the public interest. He is optimistic about the final outcome of the project, however, and feels it is already serving a useful purpose within the Institute. In this connection he spoke of the "family groups," joint sessions in which members of the various work groups could communicate on a personal, as well as academic level.

Lengthy discussion of solutions to the air pollution problem, technical problems, social barriers to implementation, and implementation methods followed. Solutions suggested included car inspection services and subsequent repair of pollutant-causing damages (according to Perasso, present methods could reduce pollution 20% at \$3 per car), a rapid-transit system, carpool arrangements on a wide scale, steam or electric cars, afterburners, fuel improvement (removal of tetraethyl lead), and/or special city-planning criteria for pollution control. All of these, or almost all, have technical problems involved. After some discussion, ten working groups for discussion and planning were decided on; carpool, inspection

(Continued on page 3)

Y Planning Group Asks What's Wrong With Tech?

by Alan Stein

There were at least 100 problems discussed for every problem solved at the YMCA planning conference, held at Kenneth Rhodes' home last Sunday. This does not imply the Y is not tackling the needs of Caltech, but rather suggests the scope of the discussions that took place. Although the results of this conference will not turn Caltech into a paradise, much was done to discover why Caltech is not, at present.

The entire morning was spent in small group discussion. The purpose of this was not so much to suggest what could be done to improve the campus, but to describe the problems facing the student body. The 30-odd individuals present at the conference commented on such areas as the problems of small schools, Caltech's relation to the community, the curricula, and the possible extensions of sensitivity. The latter was a major topic of discussion.

Tooling around

After an hour in small groups, general discussion took place among all. These discussions were greatly helped by the guidance of Wes Hershey, Pat Davis, and Burt Housman. The most important conversation centered around the question, "If Caltech is to become a more diversified, humanistic university, should it do so within the framework of

traditions and ideals that already exist, or should the Institute be changed so that these diversifications are the main goals of Caltech?" Other discussion dealt with Sensitivity Training and its place in the Caltech way of life; "Is S.T. simply a tool of philosophy, or a philosophy in itself?" Neither of these questions has a simple answer, but the discussion of both will help to guide Caltech in the coming year.

It was generally agreed that Caltech is not diversified enough. Suggestions were made on methods to allow the undergraduates to meet grad students, T.A.s and faculty as individuals rather than as depersonalized concepts. It was also agreed that the Institute did need some changes of major order and Joe Rhodes suggested the possibility that it might need a general overhaul.

Four fold way

A brainstorming session took place after lunch to suggest solutions and programs for the Y. The suggestions included marathon sensitivity conferences of only one day in length, the offering of courses in black history and the arts, and community service programs. As a result of this session, four major interest groups appeared; Personal Growth, Curricular Campus Affairs, Non Curricular Campus Affairs, and Public Community Affairs.

The suggestions of these groups will result in the Y's basic programs for the coming year. Not all of the ideas considered at the conference can be incorporated into these programs, but it is clear that once again, the Y's main purpose will be to broaden the spectrum of experiences available at Caltech. And such broadening will range from humanities to parties, and from public service to sensitivity.

Rhodes Speaks at Uni Conclave

Joe Rhodes is in Norman, Okla., this week, the only U. S. college student body president invited to attend a conference on university affairs held by J. Herbert Holmon, the new president of the University of Oklahoma.

Rhodes is giving a talk on "The University and the City" and will join a discussion group which includes the presidents of Oberlin, Dartmouth, Antioch and Webster colleges; the presidents of the universities of Iowa, Utah, Notre Dame, and Cornell; Mayor John Lindsay of New York City, heads of national foundations, and various newspaper and magazine editors.

He was recommended to the Oklahoma University president for inclusion in the conference by members of the U. S. Department of Health, Education, and Welfare, who financed the summer research project.

Notices

RIDE FOR GRE?

Need a ride to Cal State, Oct. 26 to take GREs? Please contact Jim Ishida, Rm. 138, Page.

WAR IS HELL

Mass (we hope) meeting organized by the Caltech Anti-Vietnam War Coalition, a non-exclusionary group, Thursday at 4 p.m. Location to be announced on signs located on campus bulletin boards. Help build a viable anti-war movement on this campus. Organize for Oct. 26th.

(Continued on page 2)

Caltech to Have Its Own Fanny

Dear Students,

In next week's edition of the *California Tech* I will be starting a special column. In my column I will provide answers to your questions concerning any of your problems. If you have personal questions you would like to have answered and choose to remain anonymous, I will supply advice in this column both for you and your friends at Cal Tech who may have similar problems. I am looking forward to hearing from you soon.

Fondly,
Fanny

Everybody has a problem. What's yours? For a personal reply write to Fanny, c/o *California Tech*, Winnett Center, California Institute of Technology, and enclose a self-addressed, stamped envelope.

Editorial

Little T, Rah!

Derry Hornbuckle gets our belated plaudits for the unsurpassable job he did on this year's **Little T**. The varied and many changes in format he has introduced make the finished product much more readable, and hence more useful to the owner. Changing the size makes it easier to stack with the rest of one's paperbacks. The section on other campuses is a good summary of Tech folklore, usually handed down from soph to frosh, captured in print by an amateur anthropologist. Unique in this edition of the **Little T**, Derry presents us with bus schedules and route descriptions — compiled for the first time in the history of the human race. His list of restaurants is less than complete, but is a fairly good list all-in-all (though he fails to mention the best Chinese restaurant in Pasadena Sang's Inn — unpaid ad). For the social animals, the Girl's Phone Numbers section is more complete, and closely allied to the dating habits of Techers than in the past. Instructions for using the campus dialing system, and the list of handy campus extensions, is an invaluable aid in foiling Bell Tell and getting the message through. The only complaints we have are with regard to the undergraduate directory, but even this was better than in years past. Although the book arrived later than usual, it was the printer's fault and not Hornbuckle's. We hope that future editors of the **Little T** will follow Derry's example and do half as well.

Dave Lewin
Alan Stein
Jim Cooper

Towering Earful

by Carroll Boswell

There wasn't much to say when Arlo Guthrie released his second album. I mean, it was just assumed **Alice's Restaurant Massacre** was the height of his career. (And the beginning.) There was no where to go but down.

We were wrong.

In his second album (recorded live at the Bitter End Cafe), Arlo Guthrie has not only managed to rival, but to surpass **Alice's Restaurant**. The album is much broader in perspective than his first record. For instance, he journeys a step or two into the country and western with "Try Me One More Time." Written by Ernest Tubb, Arlo dedicates it to President Johnson. It is typical in some ways of his political satire although less in the style of **Alice's Restaurant**.

In another direction, he takes a small step into the field of Indian music in "Meditation (Wave Upon Wave)." The tablas was played excellently in this song by Ed Shaughnessy. Also,



Arlo Guthrie reaches his height as a guitar player in this song. In all of his songs, his principle strength is his simplicity.

Undoubtedly the best songs on the album are "The Motor Cycle Song" and "The Pause of Mr. Claus." In these, he shifts the spotlight from the draft to the police and FBI almost as if in reaction to Chicago convention. Although both are extremely humorous, the author was able to retain all of the message of both songs. Arlo Guthrie is possibly only rivaled by Bill Cosby, who is, of course, in a completely different field of entertainment.

Unfortunately, the remaining songs are largely redundant. Sometimes they tend to get boring although it can be said for this album that the tendency is more controlled.

On the whole, Arlo is an excellent and highly recommended album. As Arlo himself says, "You got to sing it with enthusiasm, like you just squashed a cop."

NSF Fellowships

The National Research Council has been called upon again to advise the National Science Foundation in the selection of candidates for the Foundation's program of graduate and regular postdoctoral fellowships. Panels of outstanding scientists appointed by the Research Council will evaluate applications of all candidates. Final selection will be made by the Foundation, with awards to be announced on March 15, 1969.

Graduate fellowships will be awarded for study in the mathematical, physical, medical, biological, engineering, and social sciences, and in the history and philosophy of science. Awards will not be made in clinical, education, or business fields, nor for work toward medical or law degrees. Application may be made by college seniors and graduate students working toward a de-

gree.

Postdoctoral awards are open to individuals for study or work in the mathematical, physical, medical, biological, engineering, and social sciences, and in the history and philosophy of science. Applied and empirical studies in the field of law which employ the methodology of the social sciences or which interrelate with research in the natural or social sciences may be proposed. Applicants must have earned, by the beginning of their fellowship tenure, a doctoral degree in one of the fields of science listed above or have research training and experience equivalent to that represented by such a degree. In both programs, all applicants must be citizens of the United States and will be judged solely on the basis of ability.

Applicants for the graduate

"Fourth?"

by Robert Geller

Today's hand illustrates the great different styles of sacrifice bidding in rubber bridge and match-point pairs. The gain of a sacrifice at rubber bridge is measured strictly by the difference between the amount the opponents set the sacrifice and the score they would have received had they been allowed to play in their contract. At match-point pairs, the result of a sacrifice is determined by the results at the other tables in the game. In duplicate games each pair receives one-match-point for every other pair holding the same cards which receives a lower score, and half a match-point for each other pair they tie on each hand. Small differences in score are much more important in duplicate than in rubber bridge. No rubber bridge player will chortle with glee after sacrificing 500 to prevent the opponents from making a vulnerable game, while in duplicate down 500 might be a top score on the board. Conversely, going down 500 to prevent a non-vulnerable game would not be a great loss in rubber bridge, while in duplicate this result would probably at best be a tie for bottom score.

On with the Show!

The effect of match-point scoring and the unfavorable vulnerability stopped East-West from reaching a makeable five club contract with only fourteen points in high cards between them. At any other vulnerability

Art Show

Paintings, sculpture, graphics, and ceramics by six members of the art faculty of Occidental College are on display in Dabney Lounge on the Caltech campus. The exhibit from the neighboring college will be shown through November 2.

The artists are: painter Robert Hansen; sculptor George Baker, an Occidental alumnus; print-maker Ernest Rosenthal; James Jarvaise, who will show "leaf paintings" and three-dimensional painted aluminum constructions; and Jack Dalton, painter and serigrapher. Dalton is a specialist in art education and teaches art at South Pasadena High School.

The exhibit is open to the public Monday through Friday from 9 until 5, and Saturday from 9 until 12.

awards will be required to take the Graduate Record Examinations designed to test scientific aptitude and achievement. The examinations, administered by the Educational Testing Service, will be given on January 18, 1969, at designated centers throughout the United States and in certain foreign countries.

The annual stipends for Graduate Fellows are as follows: \$2400 for the first year level; \$2600 for the intermediate level; and \$2800 for the terminal year level. The basic annual stipend for Postdoctoral Fellows is \$6500. Dependency allowances and allowances for tuition, fees, and limited travel will also be provided.

Further information and application materials may be obtained from the Fellowship Office, National Research Council, 2101 Constitution Avenue, N. W., Washington, D.C. 20418. The deadline date for the submission of applications for graduate fellowships is December 6, 1968, and for regular postdoctoral fellowships, December 9, 1968.

East would have made a higher preempt than three clubs, and West would have "sacrificed" at five clubs. However, East and West did not want to risk going down 500, when the opponents could score only a little more than 400 for a non-vulnerable game.

The other interesting aspect of the bidding was North's raise to four hearts. Although North's trumps were too short to provide any ruffing strength, North knew that South's line of play would be drawing trumps and discarding losers on the diamonds. The doubleton king, while useless for ruffing purposes, was more desirable than even four small trumps for drawing trumps. In making his raise, North was aided by the fact that he played negative doubles of overcalls, a device which has rapidly been accepted as standard by a majority of American experts. (A negative double of an overcall shows scattered values which are insufficient to make a free bid, and, at high levels, four card support for the two unbid suits.) North's free bid showed that he held a strong hand, and almost certainly at least a five card heart suit, opposite the doubleton king would be more than adequate.

After East won the ace of

Talk Style Talk

"The Dramatic situation is not alive in our culture."

Dr. James Thorpe, director of the Huntington Library and Art Gallery, made this statement about the modern English Language and its dramatic nature in the first of the Caltech Lecture Series for fall 1968. Dealing with the topic "Responding to Style," Dr. Thorpe outlined the elements of style and attempted to summarize the proper method of analyzing the style of the various literary periods.

The major part of the lecture was devoted to a comparison of archaic style of the King James Bible and the Modern English Edition. Selecting the individual elements of syntax, structure, diction and usage, Dr. Thorpe read selections from both translations and compared them. After reading one selection, the modern version, Dr. Thorpe referred to the laughing which followed: "To repudiate one's own language is to repudiate one's own sensibility." In the opposite manner, he continued by rejecting the assertion that archaic style was wordy: "Each particular form of redundancy in a language is its own style, its own humanity."

Dr. Thorpe concluded the lecture by ribbing at the mature adults who try to emulate the "young" way of talking "Most of us would like to be part of Sock-It-To-Me. . ."

Dr. Thorpe received his Ph.D. from Harvard University in literature, and joined the staff of the Huntington Library after a position as lecturer and literary critic at Princeton. Next week, Dr. Robert E. Ireland, professor of organic chemistry at Caltech, will speak on the topic "From Hither to Yon," the story of the synthetic organic chemist. The lectures are at 8:30 p.m. at Beckman Auditorium, Monday evenings. Admission is free.

clubs, his only play was to shift to a spade. Obviously, whatever spade losers South had were about to disappear on the diamonds. Therefore it was essential to take as many tricks as possible, before South could gain the lead and draw trumps. West won the ace and queen of spades and continued with a third spade, promoting a trump trick for the defense. If South ruffed with the king, West's jack of hearts would win the setting trick; otherwise East would take the setting trick by ruffing with the three of hearts.

North (D)

S 7 6
H K 2
D A K Q J 9 7 3 2
C K

West East
S A Q 10 5 3 2 S 9 4
H J 7 6 H 3
D 10 4 D 5
C Q 8 2 C A J 10 9 6 5 4 3

South

S K J 8
H A Q 10 9 8 5 4
D 8 6
C 7

East-West vulnerable

North	East	South	West
1 D	3 C	3 H	Pass
4 H	Pass	Pass	Pass

West led the two of clubs.

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More Notices

(Continued from page 1)

WESTSIDE

We're having a meeting tonight (Thursday) at the Westside Study Center to plan some tutoring program — a rap session about what we want to do, what Westside students want and don't want, about times, places, and coordination. Are you interested? Come to 1355 N. Marengo, 7:30-9:30 tonight. Contact the Y if you need a ride.

TOTEM MEETING

The first meeting of this year of Totem, the Caltech literary group, will be held at 7:00 p.m., Monday, October 21, 1968, in the Lloyd Conference Room. Anyone interested is urged to attend.



—photos by Dash

ARP Orientation meetings come in large sizes

... and small economy sizes



photo by Dash

"... a better go at family groups "I'm not going to tell you what ... setting up our own organization."you're going to do ... You tell me."

"Money is a major hang up ..."

ARP-In

(Continued from page 1)

systems, computer correlation of experimental data (much of the data from the summer work is still unprocessed), public education, photochemistry, lead poisoning, stationary sources, the Research Center, non-internal combustion engines, and rapid-transit, traffic control and city planning.

Before the assembly broke for

lunch and subsequent group meetings, Joe Rhodes, ASCIT president, spoke on the value to the Institute of the project. He feels the Research Project and Center constitute "a major revolution in university education," although "To change a university you don't beat it to death." The Research Center are changing the Institute by building it, not by destroying it.

In the section meetings after lunch further discussion of specific problems led to suggestions and plans for projects and experiments. The carpool group will carry on its summer work with Lockheed Corp. and spread out, to a city-wide public network if possible. Work may soon start on a "dynamic scheduling" service entailing a backup system to call on it one's carpool should be missed on a given day. The non-internal combustion group are, quite simply, going to build another type of car. Attention is being given to steam,

specifically. The public education group plans, among numerous other things, to call a convention or congress of the several fragmented smog-control groups in the area. Most of these, it seems, have fixed on a single solution to push for: one for rapid-transit, one for carpooling, one for different engines, and so on; and the hope is that these will see the complexity of the problem and work together towards the "multiple solution" research has already shown to be necessary. At least such a gathering will be a demonstration of the great dissatisfaction with the problem as opposed to the far too common apathy. Much legal action is needed, and legal action grows from public pressure. The Research Center is branching out into projects on, in addition to those mentioned, world food pro-

(Continued on page 7)

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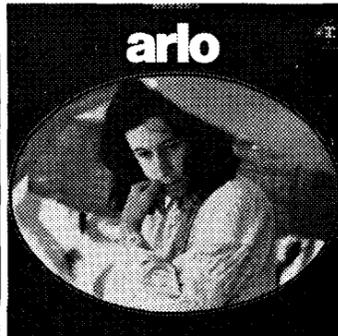
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Frosh Squashed

by Larry Westerman

Well, Initiation Week has ended, albeit somewhat curtailed by certain administrative remarks. The frosh have been variously subjected to showering, locking-outs, stack-outs, and other rigmarole generally termed "good fun" by the upperclass sadists who inflict it. Looking back however one can see some good coming out of all the confusion.

Take showering, for example. Some frosh refused to be showered, and, depending on the house, if they did so politely, they were generally left dry. For the frosh who did participate in this custom, they have gained a new sense of belonging, of being a member of the group. They know that every upperclassman in the house variously went through the same ritual, and they have a common sense of oneness. Certainly no real physical damage resulted from showering, and it was all done in a spirit of fun.

Then came the first interhouse challenge. Although not strictly an initiation activity, it gave the frosh their first opportunity to participate together as a house group. Though participation was not as full as could be expected, it was a worthwhile activity.

Several other initiation stunts can be recounted. Take the diligent welcome given to Ruddock frosh by the sophomores. All the frosh were locked out of their rooms by the simple expedient of reversing all the lock plates. Although this was carried to an extreme, it is this kind of activity which brings about a coalescence of frosh opinion and activity (mainly against the sophs).

Or take the water fight. It was probably the first college water fight for most of the participating frosh, and although it too went a little too far, it had its brighter moments.

By far, however, the most useful purpose of initiation is the introduction of the frosh into the mysteries of house tradition. Take the Blacker House trivia test. Designed to test the frosh's knowledge of house folklore and legend, it encourages him to find out about all phases of house history. This is the true purpose of initiation; it should provide a common basis for freshman class spirit and enthusiasm, and it should introduce the new undergraduate to the great and wonderful mystery that is college life at Caltech.

Zip Slipping

by Flip

If you're a Tech undergrad, chances are you have noticed lately that mail from home (or any other place, for that matter) doesn't seem to be taking the most direct route from sender to receiver. That is, dear reader, Monday's airmail note arrives about Friday afternoon.

According to Mr. Paul Bradford, director of the campus mail room, the problem of delivery delay is a very real one. Small, irritation misunderstandings of the workings of the mail service by the users (mainly dumb Tech undergrads) have almost ground the gears of the post office to a halt.

More often than not, mail to the student houses is improperly addressed. This has become Mr. Bradford's number one Excedrin headache. He explained that all mail to Techers should include the student's name and house, as well as "Caltech, 1301 E. California Boulevard, Pasadena, California 91109." First class mail addressed simply to Caltech sometimes spends a day or more in

the Throop mail room before finding its rightful owner.

Darbs have a particular problem, due to the existence of Dabney Hall up campus. Mail addressed simply to "Dabney" goes to Dabney Hall first, so diligent Darbs should inform their correspondents that "Dabney House" should be explicitly displayed on all mail.

A New Vamp?

The mail room is also planning to revamp procedures for handling the summer mail of students. Where previously all mail that was not first class was held until fall, this year the student must either notify the mail room that he will guarantee forwarding postage for all mail, or part with all that valuable junk mail that in past years has accumulated for him in Blacker basement. Says Bradford, "By the screening out of all circular mail, and the forwarding of newspapers and magazines for which the student has guaranteed postage, the possibility of any first class letter being inadvertently held all summer in Blacker basement will be avoided."

Subscriptions cause particular problems, since they are both bulky items and expensive to forward (forwarding a Playboy costs 28c). With 3000 pieces of mail delivered to the Institute and an additional 600 to 1000 items delivered to the houses daily, summer forwarding of subscriptions is next to impossible. Suggests Bradford — subscribe to periodicals for only nine months. Alternatively, notify all publications of a change of address at least six weeks before the end of third term.

Naughty, Naughty

There have also been instances of parcels mailed improperly as fourth class "book rate" postage. Anyone considering mailing fourth class should check with the mail room first to make sure that he is not violating postal regulations. You readers wouldn't want to violate postal regulations, would you?

Maybe if everybody heeded these suggestions I might get the letter I mailed myself from home in August. Or was it July?

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DuBridge Eyeview of Tech

This is the text of remarks by President Lee A. DuBridge at the New Student Camp of the California Institute of Technology on September 26, 1968.

A university advances knowledge—and helps its students to learn to advance knowledge. This requires laboratories, libraries, shops, seminar rooms, observatories, many secretaries and technicians, lots of money and hence many bookkeepers, accountants, payroll managers, purchasing agents, as well as architects, plumbers, carpenters, gardeners, janitors—and all the rest.

A university, to perform its purpose, must be an organization so that the whole process of the advancement and diffusion of knowledge can take place in a way that is purposeful, orderly and efficient, not chaotic and ineffective.

Life is short; the process of learning is long and painful. If we do not make it efficient, directed and purposeful, life will be over before learning has really begun. That is almost true at best!

In any case — over the past 500 years — organized universities have evolved and have survived. They have not followed the same pattern in different parts of the world or at different times. In Italy, Germany, France, England, in Asia, Africa, Latin America, and the Middle East universities exist of varying kinds and qualities. Some are excellent, some terrible.

We need not worry now about universities abroad. Let's look at the American species.

American Universities

Even though American universities differ vastly among themselves in most every respect, they do all have about the same organizational structure. The structure has four essential parts:

1. A governing board—a Board of Regents or a Board of Trustees.

2. An administration — President, vice presidents, business officers, deans, division or department heads, etc.

3. Faculty—the teaching and research staff organized in some way (various ways!) with officers, committees, rules, regulations, by-laws, and operating procedures.

4. Students. These are, in a sense, the "paying guests" of the institution. They must be fed, cared for, and given some opportunities to participate in the learning process. The students, too, usually have some organization established for dealing with student activities.

All universities have these organizational elements. How they operate and the relations between the elements may vary greatly . . .

Board of Trustees

The governing board—at Caltech it is called the Board of Trustees—is that body which, from the legal point of view, is the university. It is the corporate entity which is authorized to

receive and spend money, own property, pay taxes—or be exempt from certain taxes—have rights under the law and exercise powers granted by law—such as the power to confer degrees. (Only the governing board of a properly chartered college or university may legally grant degrees.)

Since a major function of the Board is to receive, invest, raise and disburse money, to supervise business, legal and accounting operation, to oversee the financing, construction and operations of buildings, and to be legally accountable for the affairs of the Institute, the Board is properly composed largely of business and professional men with extensive experience and proven ability in business, industry, law, engineering, medicine, etc.

At the California Institute of Technology the Board is responsible for \$210 million of assets and for raising and spending \$30 million each year. Clearly, men of great experience and of utmost integrity are needed for this task.

The Board members serve wholly without compensation. They even pay all their own travel expenses to and from meetings (even if they live, as some do, in New York, Chicago, Houston, San Francisco or other distant points).

Determines Policy

The Board determines policy as to the general nature, size and purpose of the institution. But to carry out this purpose it employs a President and a chief business officer. These men are responsible to the Board, serve at the pleasure of the Board (i.e., they may be summarily fired if they do not satisfy the Board in the performance of their duties).

The Board will normally seek the advice of the faculty in hiring or firing the President. But the Board must have the final authority because the Board cannot properly carry out its legal functions if it does not have a president fully responsible to it—and a president in whom they have full confidence.

Because American universities normally have a "lay" board — i.e., composed of business men rather than professional educators — it is traditional that the Board delegate to the President and the faculty the responsibility for carrying out the academic program.

The Caltech Board does not presume to supervise courses, curricula, academic programs, admissions, requirements for degrees, etc. It delegates these matters to the President and to the faculty and the faculty establishes its own organizational structure to deal with these matters. The Board retains final authority for policy and it properly retains final authority for appointments to the faculty. And, of course, they have final authority to see that expenses do not exceed income.

Things Work Well

All of these things work very well—they have worked pretty

well in America for the past century—as long as there is mutual confidence and trust, mutual respect for the rights and responsibilities of other parties, mutual agreement on the goals of the university, universal devotion to the welfare of the institution.

But when irresponsibility, distrust, suspicion, disloyalty, disunity appear, the university may be torn apart. The university is not a police state, not a dictatorship. Nor is it anarchy, or chaos. It is based on the shared belief that **disciplined devotion to the ideals of scholarship and learning** is the common bond that unites the various elements. Mutual trust, mutual confidence, integrity of purpose constitute the glue that holds a university together. If the glue is gone, the university may well fall apart. A university is very vulnerable. Built on trust, it can be destroyed by distrust, by disunity—by the determined efforts of a dissident minority.

But when built on unity of purpose, a university has enormous strength, enormous resilience, enormous adaptability to change. Universities seldom die: many are hundreds of years old. This brings me to the role of the student.

A Paying Guest

The student is to a university what a paying guest is to a hotel, what a client is to a lawyer, what a patient is to a hospital, what a customer is to a supermarket—what a pupil is to a teacher—all of these.

At a university the graduate and undergraduate students keep the institution from becoming a sterile research institute. They give life, purpose, continuity, freshness, youth, vigor and continued life to the whole operation.

Provided the student enters the halls of learning anxious to learn.

Provided the student recognizes that the teachers know more than he does, but they are anxious to help him.

Provided the student knows that the teacher can not make him learn—has no desire to force him to learn—that it is the student's business to extract every ounce of knowledge and help he can from the teacher—that he, the student, comes to a university, rather than to a college, not to be taught but to enter actively into the process of the advance-
(Continued on page 5)

Would You Teach Mathematics to Grad Students?

Dr. William Johntz, head of project SEED, gave a demonstration Wednesday, October 10, of the discovery method of teaching in Kerchoff Laboratory.

The letters SEED stand for Special Elementary Education for the Disadvantaged, a program started by Dr. Johntz in Berkeley, California to help improve the education received by disadvantaged children in the United States. A study of two Berkeley junior high schools showed a 70 per cent difference in scores on an achievement test between a school with disadvantaged children and a school with white, middle class children, although the faculty and facilities were almost identical. Dr. Johntz feels that the main problem of the disadvantaged child is that he feels inferior, and therefore behaves that way regardless of his natural ability. Most federal programs, according to Dr. Johntz, have failed to provide a way for the disadvantaged child to attain a goal which will give the child a sense of self-confidence. By teaching abstract algebra to elementary children Dr. Johntz provides a way for the disadvantaged to prove their ability in a status category; one that will give them self-confidence. The teachers in Project SEED spend one period a day with a class teaching them mathematics by the discovery method. These teachers are proficient in mathematics, most have their Ph.D.

Dr. Johntz believes that the main reason for its success is that it generates an excitement and sense of discovery in the student which is lacking in normal teaching methods. He stated that given time the discovery method could change the basic teaching process in colleges and universities throughout the world.

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DELANO, Calif. (CPS) — "In the souls of the people, the grapes of wrath are filling and growing heavy, growing heavy for the vintage."

So runs the final sentence in a chapter of John Steinbeck's "The Grapes of Wrath." What was true almost 40 years ago is still true this month as a strike by California farm workers spreads into a nationwide grape boycott.

Farm workers in the U.S. are still forced to lead lives geared not to advancement but to bare survival. A California grape worker does not have to face the dilemma of whether to buy loafers or hush-puppies for his children—he must worry about having enough money to get shoes of any kind for the members of his family.

At present, many grape workers earn less than \$1,800 a year. Even if a worker were able to work 40 hours a week every week of the year, he could only earn \$2,386 annually — approximately one-half the average wage for all Californians.

In the 1930's, America's workers won the right to organize and bargain collectively through the National Labor Relations Act. In 1968, farm workers remain excluded from this act. To overcome this handicap and win the benefits enjoyed by other workers—minimum wage, collective bargaining, fringe benefits—the farm workers of Delano, California, voted to go on strike for union recognition three years ago
(Continued on page 7)

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DuBridge Cont.

(Continued from page 4)

ment of knowledge—his knowledge, everyone's knowledge.

Student's Task

It is the student's task to make professors give. You've paid for the privilege—now make them work! It won't be easy! But that's what they are here for.

Now there are some things about a university other than courses and credits and grades and teachers and study and learning. There's not much more but there is something!

There is sleeping and eating. There is physical exercise.

There is recreation—talking, dating, singing, dancing, hearing music, seeing plays and movies.

There is extracurricular learning. You may learn as much outside the laboratory and classroom as inside. From your friends, from the books you read, from the lectures you hear, the bull sessions you have—you will learn—learn—learn.

To manage the non-curricular aspects of their Caltech experience the students have estab-

lished certain organizations and traditions—and the faculty and administration encourage and foster these. ASCIT, the Caltech "Y", the Board of Control, the student house officers, the athletic program, etc.

Many Other Things

These, and many other things, are yours—yours to run and/or yours to enjoy.

Take part in them — and become a part of the community that is Caltech. Keep it a coherent community — a unified community — a community devoted to scholarly ideals, a community devoted to the welfare of people, a community dedicated to the ideal that scholarly people are the world's most precious resource — and that you can become one of those whose intellect and leadership can make the world a better place.

Now in a couple of weeks, many of you, maybe most of you, are going to be absorbed — even submerged — in the kind of life you are now entering. You will work. You will be discouraged. You will wonder why science and math can be so complicated — even so dull. You will

find drudgery, boredom. You will get so far behind in those problems and reports that you know you will never make it. You may not make it!

But, I plead with you, every week or two, sit back and remember that every scientist or engineer on earth once went through the same experience. And remember — the more trouble you have now — the more you will learn and the less trouble you will have later.

And remember—you are a part of a glorious institution: Caltech is really a fabulous place. Caltech is at the center of what is going on; it is where the action is.

What is your favorite subject? Math, physics, astronomy, chemistry, biology, geology—EE, ME, aeronautics, computers — high temperatures, low temperatures, the inside of the earth, the inside of the sun, the surface of the moon or Venus or Mars, bridges, dams, transistors, lasers?

You name it and Caltech is there.

Caltech is not only there—but Caltech may have pioneered the field.

Basic supersonic aerodynamics started here.

The study of cosmic rays started here.

The alpha-helix of the protein molecule started here.

Modern rockets began here.

Modern seismology started here.

The 200-inch telescope is here—and so are a dozen other unique astronomical instruments. (For 60 years Pasadena has never had only the second largest telescope; once it had the largest, the second largest and the third largest)

Nuclear structure, the nature of DNA, the biological role of proteins and enzymes, the structure of the center of the earth are all concepts and subjects which have been pioneered here. What makes a star shine? How were the elements created? What is a quasar? A pulsar? Who saw the first positron? The first meson? Who proposed the expanding universe? Ask someone at Caltech!

But this is all past history: are we just sitting on the glories of past achievements? Let's look around:

Does anyone know any more about nuclear reactions in stars—or has anyone added so much to our knowledge—as Willy Fowler?

Carl Anderson still heads the Physics Division—though he earned the Nobel Prize over 30 years ago.

If anyone knows any more about nuclear theory, gravitation, quantum electrodynamics, color vision or freshman physics than Dick Feynman, no one has found him.

The founders of molecular genetics were George Beadle and Max Delbruck. Max is still here, joined by Bob Sinsheimer, Jim Bonner, Ray Owen—and a few others.

Pauling proposed the modern theory of the chemical bond and he and Corey discovered the basic protein structure—the alpha-helix. Pauling has gone, Corey has just retired—but their students and followers Roberts, Dickerson, Gray, Hammond, keep Caltech in the chemical forefront of the world.

Gutenberg founded modern seismology. Richter learned how to put numbers on earthquakes. Some younger followers—Clarence Allen, Don Anderson keep the seismo lab a lively place. Gerry Wasserburg and Leon Silver elucidate the earth's history and Robert Sharp tells us of the geology of glaciers—and of Mars.

Are more practical matters of interest to you? I hope so—for I trust half of you may end up being engineers—putting scientific knowledge to use for the benefit of people. Airplanes? Ask

Sechler, Liepmann, Lees . . . Lasers? Transistors? Plasma? Ask Langmuir, Gould, Wilts. Earthquake resistant structures? Ask Housner and Hudson. Metals and alloys? Ask Don Clark, Pol Duwez. Computers? Ask Gilbert McCann. Smog? Ask Haagen-Smit and McKee. Sewage disposal? Ask Norman Brooks. I could go on and on.

Take up a copy of the catalog. Go down the list of professors. Ask not only what they teach. Ask what they do. Ask them what they do. They'll probably tell you!

I'll tell you this: every professor is on the faculty because he was judged to have exhibited unusual talents both for teaching and for creative research. They are here because this is a university—where creative research and creative teaching are encouraged. You are here to sit at the feet of some of the leading scientists and engineers of the nation.

May Follow Style

Some of you may follow a current style and ask whether the education you are getting here is relevant to the modern world. The answer, in a sense, is NO. You are not here to take courses on crime, racism, Vietnam, urban decay. You are here to come into contact with knowledge and with knowledgeable people. You are here to learn how to gain new knowledge and how to put knowledge to work. Isn't doing that, in fact, the only way to solve the world's problems? Isn't that what "relevance" means?

Don't waste a minute of your valuable time. You are engaged in doing the most important thing a young man can do: prepare to be an intelligent and useful adult.

Towering Eyeful

by Carroll Boswell

Beckman Auditorium opened its Kinetic Art Show last Tuesday night with six excellent films. They represent the best of this modern art.

Phenomena by Jordan Belson began the evening. It was a phenomenon. Belson shows his genius in shifting designs and patterns of colors, expressing mood and emotion directly through the senses without need of speech. He was followed by **La Vita (Life in a Tin)** by Bruno Bozzetto. In his unique animated film, he shows clearly the "life within the tin." It has the humor only truth veiled in colors can have.

The best film of the evening was surely **Happiness**. Lothar Spree, although he limits himself to about a minute, creates a remarkable classic. His deep insight into human nature is self-evident. For a moment he can define all our thoughts about happiness without words. And then shows us how wrong we are.

In the field of black comedy, Jan Svankmajer has brought about a truly different kind of film. In **Ravickarma** he used only two puppets, various toys, and one hamster. Although the puppets have the lead, the hamster makes many very relevant comments.

Miracle by Istvan Ventilla, was not as good. The principal complaint I have against it is the way he handled his material. His subject was really interesting although he seemed unable to handle it properly. At times, it was rather boring.

In general, the evening was well worth the dollar and the couple of hours. Unfortunately, I missed the last five films because of a prior appointment. I can only assume the second half was as good or better than the first half. And two more Tuesday nights to look forward to.

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October 30

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BEAVERS LOSE

by D. Dixon

The Caltech offense could not get started and Azusa Pacific downed the Beavers, 27-0 last Saturday at the first home game of the season.

Caltech played a fine first half and held Azusa to just 6 points. This score came at the end of the first quarter on a long pass. Azusa went for two points but were stopped. The Beavers then marched downfield and moved into good field position on an 18 yard Burton-Martin pass. Burton attempted a field goal but it was wide. For the rest of the half the Caltech defense played except for one set of downs. The defensive line was able to contain Azusa runners which shows a remarkable improvement. However, the pass defense was terrible, the line did rush hard and the Azusa quarterback often had 10 seconds in which to get the ball off. Also the secondary men left their men wide open

and allowed Azusa to pass. The Beavers were lucky that the half ran out because Azusa was very close to scoring.

The second half started off with a twenty-five yard kick-off return by Burton. Burton then threw an interception. The defense held and forced Azusa to punt. Azusa, however, recovering Stormo's fumble of the punt. The defense again held. The offensive line blocked poorly and Burton threw another interception. This time Azusa scored and added a two point conversion. Burton, on the first set of plays, fumbled on the Beavers twenty. Azusa again scored but did not convert.

The Beavers went into the fourth quarter on their only sustained drive of the game. This drive was highlighted by Burton's running and his passing to Martin. Tech was on the Azusa five with first and goal but could

not score. Azusa held and showed Tech's offensive weakness. They then marched from the two to score on a long pass just as the game ended.

Caltech's offensive team played poorly. The line did not block well and Burton was often forced to run from his pocket. He was brought down ten times by Azusa for losses. Also, Martin did not bother to run his patterns when the pass was not to him. This allowed Azusa to key on him and know where the pass was going. This helped to cause some of Burton's losses. However, even with all of the mistakes Coach Gutman commented that this was the hardest hitting in any game that he has seen.

Tech comes up against Pomona this Friday afternoon at 3:00 p.m. at Tournament Park. Pomona is a strong team with excellent runners. Yet Tech plays surprisingly well against them. However, look for Pomona to win 24-6.

TECH Sports

Water Polo-ers Win Six With Total Team Effort

by Mike Stefanko

After last year's dismal 5-15 record, it was generally acknowledged that it had been a "building year" for the Caltech water polo team. Such a statement is often an excuse, but this year the all-new, powerful Techers have proved what a little building can do.

Tech has combined swimming, ball control, tight defense, and teamwork to produce a 6-2 record going into Wednesday's game.

Behind the amazing goalkeeping of sophomore Ken Hanson, and the defensive play of Bob Hall, Mike Stefanko, and Mabry Tyson, the offense of even the quickest opponents has been consistently stymied. Tech's scoring punch is packed by seniors Gregg Wright and Larry Hunt, soph Larry Watkins, and super-frosh Ed Miko-

wicz. With substitutes like Charles Fisher, Tom Davis, and Steve Sheffield the team is exceptionally strong.

After crushing Riverside CC in the season opener, 12-4, Tech lost a tight game to a quick Santa Ana squad, 4-3. As ball handling and quick response improved, Tech marched to wins of 4-3 (over the Alumni), 9-6 (Cal. State L.A.), and 7-4 (Mt. SAC).

Meeting perennial champs CHM in the opening round of the SCIAC Tourney Tech couldn't find the goal range and lost 3-2. They came back to win the next two, 6-5 and 6-4. The team was weakened by colds and eagerly await their next encounter with CHM.

This Sat. 2:30 p.m. San Francisco State plays Tech at the Alumni Pool.



photo by link

Page handed out a chariot race challenge that was accepted in the usual fashion by five of the houses. However, only two houses showed up, Fleming and Ruddock, to challenge Page. The chariots were made from a variety of materials, including hula hoops and highway signs, and all had baby carriage wheels. The race began with a Le Mans start and Ruddock took the lead in the 440 yd. race and never relinquished it. Fleming kept close pace but were disqualified due to the fact that their chariot did not finish intact.

Pomona Outplays Tech

This past Saturday, the Caltech undergrad soccer team lost to Pomona by the score of 4-1. This makes the team 1-1 so far for the season, after the previous week's victory over Rio Hondo.

In the Pomona game, Caltech was outplayed by a strong and fast team. Once again, one goal for the opposition was scored due to errors by the defense, as both the center halfback and goalie misjudged a ball. Overall, the Tech offense was not strong, making fewer shots than usual, and not breaking through the Pomona defense. The lone Tech goal was scored by Jerry Eisman, during the third quarter. Dick Burton played well, and made a number of excellent plays on both offense and defense, but did not receive sufficient help. Five freshmen played for Tech in the game, and for the most part they showed promise, but

they will need some seasoning before they can play their best in this league.

Caltech's play has suffered from injuries to two of last year's players, Bruce Penrose and Ralph Graham. Ralph's speed and endurance were sorely missed last Saturday, and Bruce Penrose might have helped bolster Tech's sagging defense.

Harriers Run Over UCSD and CHM

The Caltech Cross Country Team went to Mt. San Antonio College Friday, expecting to beat Claremont-Harvey Mudd and to get a crack at the difficult, hilly four-mile course. Half of their expectations were realized, as Lane Mason pulled away from the field, leading Caltech to a 19-38 victory on an obscure, ex-

tremely short course. Tardiff, Smith, and Higgins took the next three places, and Hermeyer completed Caltech's scoring in 9th.

The victory pointed out the weak spot for Coach LaBrucherie—the big gap between the fourth and fifth runners. Hopefully, Hermeyer and quickly improving Paul Johnson can close the gap while the first four runners continue to improve.

For the third time this season, the Caltech cross country team swept the first four places, this time beating U.C., San Diego Tuesday at Brookside Park. Lane Mason won easily in 23:01, his third overall victory, as he has been the team leader by large margins. Ratchford Higgins took second, beating Tardiff and Smith

for the first time, in 24:00. Hermeyer (8th) completed Caltech scoring. Gagliani (10th) and Johnson (11th) added to the UCSD score by beating the fifth UCSD runner. Final score: Caltech: 18, UCSD: 39.

Tech Sports

FOOTBALL

Fri. 10/18
Pomona here (3:00)

CROSS COUNTRY

Fri. 10/18
Occidental there (4:00)

WATER POLO

Sat. 10/19 (V) San Francisco State here (2:30)
Wed. 10/23 (V) Claremont-Harvey Mudd there (4:00)
Wed. 10/23 (JV) Claremont-Harvey Mudd there (5:00)

SOCCER

Sat. 10/19 (V) Claremont-Harvey Mudd there (10 a.m.)
Sat. 10/19 (open)
UCLA here (10:30 a.m.)
Wed. 10/23 (V) Cal Poly (Pomona) here (3:00)
Wed. 10/23 (JV)
Cal Poly here (4:30)

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Water War

(Continued from page 1)

The Ricketts courtyard was completely cleared, and Dean Ballard, cited twice for bravery during the Lloyd campaign and leader of the occupation forces, was captured by Ricketts. An accident occurred in the Ricketts courtyard, however, and Ballard sustained some injuries that, though not serious, were extremely painful. Ballard bore these quite well, and withdrew to safety

with the aid of the Rickettsmen. Just then, an overzealous Blacker freshman, attempting to pot-shot at the Axis forces through the Ricketts front doors, allowed these to be breached, and Ricketts, wary lest another accident occur, put up no resistance to the occupation.

Renewed Lloyd activity recalled most of the Axis occupation forces to the field, the rest retiring under renewed Ricketts fire. Some Ricketts volunteers took the field as well. Once again

the Lloyd forces fled the field, only to reappear at the east door as the Fleming-Dabney forces came by on their way to Ruddock, to which they had transferred their attention. The Axis forces shouted challenges to Ruddock, the Lloyd forces appealed to Ruddock for help, but Ruddock would not appear. Finally, the Axis, after an unsuccessful peace parley with Lloyd, retired for supplies.

Lloyd then marched on Page, and the returning Axis forces

(much reduced) joined them, as did volunteers from Blacker and Ricketts. Page, however, barricaded its doors and would not even admit newsmen for a statement. Lloyd tried a subsurface route into Page but were thwarted by the effective, if oversuspicious, Page security forces. These, however, could not stop Special Operative Bob Lewis, who succeeded in entering and attempted to open a door to his comrades, but was caught in the act. He did manage to escape

from Page.

Thus, at 9:20, the battle died away as the forces drifted off into the night, leaving only a few frustrated Blacker House members shooting off their mouths and ammunition equally and looking for someone to fight. By 9:30 even they had gone home. Water War One of 1968 ended, leaving only wet ground and Page's musical challenge to Lloyd.

CESAR GRAPE

(Continued from page 4)

this month.

Since the turn of the century, attempts had been made to unionize the farm workers in California, but all of them had failed. This time, however, under the leadership of Cesar Chavez, director of the United Farm Workers, farm workers have succeeded in winning collective bargaining agreements for the first time in history. Several major wine companies in California have signed agreements with their workers.

But the strike is now in its 43rd month, and the workers are still out. Some victories have been won, but the goal of total union recognition is still far in the future.

In an effort to put additional pressure on growers during September—the peak of the grape harvest—and to win nationwide support for the strike, the UFW is devoting most of its energy this fall to enlarging and publicizing a nationwide boycott of table grapes by supermarkets, individuals and companies.

The workers say they are seeking four things with the strike: a minimum hourly wage at all times of the year, sanitary working conditions in working areas, a seniority system to protect workers of long standing, and an end to harassment through the appointment of stewards who would represent any worker who felt he had been treated unfairly.

ARP-in

(Continued from page 3)

duction and population control, Mexican-American education and cultural understanding, and teaching in the university.

While there was an excellent turnout, more volunteers are always welcomed. For a list of the orientation and planning meetings of the various groups, the Research Center office is in 67 Crellin.



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tion they worked on in college.

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so many people have found the move from their campus to ours a natural and rewarding one.

Perhaps you'd like to consider the same move. Make an appointment to see us when we're on your campus (see below), or write to Dr. W. D. McIvers, College Relations, Room 7001-J, TRW Systems Group, One Space Park, Redondo Beach, California 90278. TRW is an equal opportunity employer.

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TRW Systems Group is a major operating unit of TRW INC. (Formerly Thompson Ramo Wooldridge Inc.), where more than 70,000 people at over 250 locations around the world are applying advanced technology to electronics, space, defense, automotive, aircraft and selected commercial and industrial markets.

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“I’m pretty much the IBM Corporation in the eyes of my customers,” says Andy Moran. “That kind of responsibility’s not bad for an engineer just two years out of school.”

Andy earned his B.S.E.E. in 1966. Today, he’s a Marketing Representative with IBM, involved in the planning, selling and installation of data processing systems.

Plenty of business experience

“Engineering was my first love,” Andy says, “but I still wanted good business experience.” So far, he’s worked with customers involved in many different computer applications, from engineering to business. His contacts go from data processing managers all the way up to the president of his largest account.

“At first I was a little nervous about working at that level,” says Andy. “But then you realize you’re trained to know what he’s trying to

learn. That gives you confidence. You’re helping him solve his problem.”

With his working partner, the data processing Systems Engineer, Andy has helped many customers solve their information handling problems. “I get a broad overview of business because I run into every kind of problem going. Sometimes I know the solutions from experience. Other times I need help from my manager.

“That’s one of the best things. My manager is more of a backup than a boss. He’s there when I need him. Usually, I pretty much call my own shots.”

Andy’s experience isn’t unusual at IBM. There are many Marketing and Sales Representatives who could tell you of similar experiences. And they have many kinds of academic backgrounds: business, engineering, liberal arts, science.

They not only sell data processing equipment as Andy does, but also IBM office products and information records systems. Many of the more technically inclined are data processing Systems Engineers.

Check with your placement office

If you’re interested in the opportunities for engineers and scientists at IBM, ask your placement office for more information.

Or send a resume or letter to Harley Thronson, IBM Corp., Dept. C, 3424 Wilshire Blvd., Los Angeles, Calif. 90005. We’d like to hear from you even if you’re headed for graduate school or military service.

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