

Only 90 more
days

California Tech

Associated Students of the California Institute of Technology

Until
Coffeehouse.

Volume LVIII

Pasadena, California, Thursday, December 1, 1966

Number 10

Lawton Speaks On Conditions In Red China

Bringing a measure of relief to at least one frosh history section and a large measure of information to all who attended, the special humanities lecture on Thursday afternoon featured a recent visitor to Red China speaking about his trip.

Dr. Graham Lawton passed through Red China and the Soviet Union on his way to assume the post of Visiting Professor of Geography at UCLA. Lawton is a member of the faculty of the University of Adelaide, South Australia, where he is professor of geography. During his trip, he hoped to contact various scientific personnel, and was fortunate to start his trip very shortly before the current "Cultural Revolution." Accompanying his talk with slides he shot during the journey, Lawton revealed several misconceptions commonly held regarding life in China.

Stressing the point that he was allowed relatively wide freedom of motion, Lawton described the various communes, appearance of homes and people, lack of visible famine, and the general well-being of the citizens. Although by Western standards the level of living is low, it compares very favorably with India.

Lawton seemed distressed to report the intense propaganda directed toward Chinese youth against America. He made the point, however, that verbal attacks are made against American Imperialism, not against the American people.

Lawton is an excellent photographer as well as an accomplished speaker, and the slides themselves made the lecture all the more interesting. Several rolls of film were not available for showing, but those shown, covering the trip from Shanghai to Peking to the Great Wall, made the afternoon a memorable one.

Notices

SLEEP NOW, WORK LATER

Any students interested in discovering how to get a better job out of the placement office, shouldn't miss the group discussions scheduled next Wednesday, Dec. 7, 7:15 p.m., in Rm. 206 Dabney. Dr. D. S. Clark, Director of Placements, will give the inside story on offers, acceptances, procedures, handling of correspondence, and salary data.

JUNIORS, SENIORS, AND

Graduate students considering law school should make an appointment to see Professor William H. Dorsey Jr., the Chairman of the Admissions Committee at Loyola University, who will be here this Tuesday, December 5. Contact the Placement Office, Rm. 24 Throop.

MATH CLUB

The Caltech Math Club will hold a meeting Thursday (Dec. 1) at 7:30 p.m. in the Math Lounge, Sloan. Everyone (especially frosh) is invited to attend.

RIBALD HUMOUR—FINE CUISINE

Next Thursday night, December
(Continued on page 3)

Students' Day Draws Mob

Newton Denies "Recruiting" Charges

by Bone

"This is definitely not a recruiting stunt," said Charles Newton, assistant to President DuBridge and chairman of the Faculty Committee for Students' Day.

Newton stated further that the sole reason for holding Students' Day is that "Caltech has an obligation to show the public what it is doing." He commented, however, that about 10-20 applicants each year state that they first became interested in Caltech by attending Students' Day.

Allegro

Students' Day began, according to Newton, as an "open house" held annually back in the days when Caltech was still Throop Institute. Abandoned during the war, it was revived in its present form through the efforts of three students in 1950.

Andante

Don Sheppard, the most enthusiastic of the three and the driving force behind Students' Day, became so involved with arrangements for the day that he was flunking all of his courses. According to Newton, Dean Eaton called him (Newton) to complain. Newton asked "if Sheppard couldn't get some help from the student tutoring committee," whereupon Eaton informed him that Sheppard was the chairman of that group, too. For what it's worth, he pulled out and went on to graduate and have a scholarship named for him.

Scherzo

Since Sheppard's time, the

Schmidt Talks on Quasars In Beckman Aud.

"These quasars should provide us with an opportunity to study the universe, its formation and its future," proclaimed Dr. Maarten Schmidt at this week's Monday night lecture. Schmidt, professor of astronomy at Caltech and a staff member of the Mount Wilson and Palomar Observatories, is presently studying this exploding part of astronomy.

Discovered in 1963, quasars are today one of astronomy's greatest puzzlers. They are small distant bodies that radiate immense amounts of radio and light waves, and they are considered the brightest objects in existence.

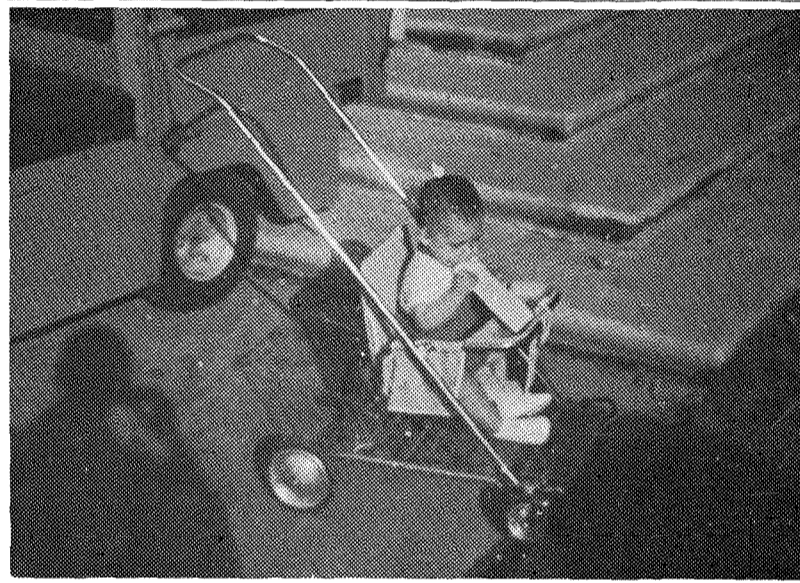
Quasars stoke it on

Schmidt explained that ever since the 30's we have known that observed red shift, or Doppler effect in light, is related to both the distance to the object and its velocity relative to the earth (Hubble's Law). Recently, strong radio sources have been found where no galaxies exist; instead, only small objects have been found. The brightest of these quasars is 3C 273, which has a red shift of 15.8%. This is not in itself
(Continued on page 4)

form of Students' Day has changed little. This year about 1178 students and 237 teachers will see 60 exhibits and listen to three speeches (in Beckman Auditorium, which has a seating capacity of 1179). Newton said that he expects some of the throng to siphon off after lunch. (Wanna see my room, girlie?)

"This is the biggest show,"

(Continued on page 3)



Caught in a candid pose on the hallowed steps to Throop Hall, a student visitor to last year's Student Day enjoys the Pause that Refreshes. Hordes of his fellows will return once again this year to gawk at this marvel(?)ous Institute.

Prufrock Chosen For Coffeehouse

Vice President for Business Affairs, Robert B. Gilmore, announced Tuesday that recent meetings of two Institute planning bodies have resulted in the affirming of a Caltech Coffeehouse. The Trustee Committee on Buildings and Grounds and the Faculty Committee on Campus Planning made the crucial decisions on November 23 when President DuBridge presented the proposal to them. Both groups happily endorsed the idea and expressed approval at the responsible manner in which Caltech students have conducted the drive for a coffeehouse.

Eat a peach

Prufrock House will provide a location for the gathering spot, which will remain open as long as interest and participation warrant and as long as the area is not required for a new building. The Coffeehouse will not be replaced by a parking lot; however, sometime in the future a new building will arise there. Institute personnel, notably Gilmore and Director of Procurement Kermit Jacobson, hope that the Coffeehouse will then be relocated.

Active work on the building will begin when Pasadena grants a zoning variance. Structural modifications to meet health and safety requirements will follow. After decoration by a student committee aided by a qualified liason, operation can begin. The Institute expects to see the Coffeehouse open in 60 to 90

Over 1200 Visitors Planned

by Hecht

Over 1100 high school students from over 200 schools in the vicinity will invade the Caltech campus this Saturday for the seventeenth annual Students' Day. They come from as far away as Yuma, Arizona and will be accompanied by almost 250 teachers. The annual event brings more Institute guests to campus than any other event in the year.

Students' Day is an out-

growth of pre-World War II open houses held by the Institute to show prospective students what they might end up attending. The war forced its suspension and when re-initiated afterwards, it attracted such large hordes of curiosity-seekers that it was impractical. This led to the practice of inviting high schools to send only their outstanding male senior in science, along with one or two of his teachers.

The purpose of Students' Day has changed over the years. The high school girls that come are (unfortunately) not prospective students. Rather the main purpose is to acquaint the students with the methods of the scientist and engineer.

Fixtures at an exhibition

After registration in the Student Houses at the ungodly early hour of 8:30 a.m., the visitors will divide into groups to tour the various exhibits from 9 until noon. Each of the groups will see six different exhibits.

Exhibits will range from JPL's one-sixth scale model of Surveyor 1 in the center of campus to the frosh and sophomore physics labs. The aeronautics department will show a "Fire Whirl," and chemistry will exhibit "Spinning Protons." Other exhibits include "Information Transfer by the Single Neuron," "Engineering of Heart-Lung Machines," "Holography and Lasers," "Visco-Elastic Fluids," and "Green Gaussian Noise."

The teachers will eat in the Athenaeum, and listen to Dr. Robert F. Bacher, Provost, speak on "New Challenges for Scientists and Engineers." Students will be treated to lunch in the Student Houses. After discovering the truth about Institute food, the budding savants will listen to the Glee Club sing in Beckman.

College? Hell, an institution!

The general session for all guests will begin at 1:30 in Beckman. President DuBridge will open the session, speaking on

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"Honorable Estate" Premiering Tonight

Controversial producer John Houseman, noted playwright Samuel Beckett, and actress Nina Foch combine their talents in a unique stage production tonight at Beckman Auditorium.

Entitled "The Honourable Estate," the dramatic anthology takes an intimate look at matrimony through the eyes of twelve noted females. Spanning three centuries of dramatic literature, the heroines are Shakespeare's wild wench, Kate; the beautiful and witty Mrs. Millamant from Congreve's "Way of the World"; Strindberg's emancipated ladies from "The Stronger"; Nora the strong-willed wife from Ibsen's "The Doll's House"; Mrs. George from Shaw's "Getting Married" and the formidable Queen Victoria.

Foch teaches at USC

Miss Foch, a veteran of stage, screen and television, appears with well known character actor Theodore Marcuse in the second half of the program, the West Coast premiere of Samuel Beckett's new play "Happy Days."

In a delightful different way, "The Honourable Estate" uses widely divergent, but typically feminine views to shed some light on one of civilized society's craziest experiments — basing marriage, which is permanent, on love, which is a passing fancy.

Tickets for this limited engagement, running tonight through Sunday, are available at the Caltech ticket office, from 9 a.m. to 5 p.m.

Editorial

To Our Visitors

To those faculty, students, and other distinguished members of the multitude of high schools represented this Saturday, the **California Tech** and its loyal staff bid you a hearty welcome to Caltech. Whether you are devoutly interested in science, moderately enthused over it, or even just plain skeptical about the entire boondoggle, this campus has something to offer.

The exhibits which you see are typical examples of the research and technical hardware to be found here. Although it is impossible to demonstrate properly the thousands of hours of work varying from purest grind to the most exalted thought ever conceived in the mind of mortal man, these exhibits are a reasonable representation of the lifeblood of this Institute. However, there is more to be found on this campus than the throbbing beep of the synchrotron horn or the conception and gestation of the PhD thesis.

Take a look at the Student Houses after lunch. Corner a few still-sleepy Teckers and talk to them about Caltech; you will be rewarded with the undergraduate's typically wary, but enlightened view of science and scientific education. Even though most of his waking study hours are spent on science, no one, not even the super-lucubrating Tecker, spends all of his time studying. It is indeed one of the unique aspects of Caltech that the undergraduate population is practically forced to become diversified, paradoxically, for its own lack of diversification. For example, we have varsity football players who never saw the gridiron in high school, Glee Club members who never sang before, and newspaper and yearbook editors similarly without previous experience in secondary school. These and other activities make life here tolerable by breaking up the leaden tedium of required scientific academia.

Caltech is still very far from the vast polylogical university; but it is also a fact that the other fields of the humanities and social sciences have been steadily gaining prestige. It is edifying to notice that the extracurricular activities are supported by students and faculty of noted esteem.

For example, the Scripps Conference has been blessed at one time, by the participation of one Richard P. Feynman; Murray Gell-Mann graced the Political Military Exercises with his belligerent African policies. Thus, while the Renaissance man may be an ideal of the past, the greatest of modern scientists have often been men of wide fields of interest. The importance of outside activities at Caltech and other colleges and universities cannot be underestimated in their contribution to the **whole man**.

And if you happen to be seriously considering Caltech for the next four years, be sure to get the lowdown about life here from the students . . . for no one, after all, starts out with his PhD.

—John Middleditch
Michael Meo

The Choice Is Yours

Because the horizons of science have expanded so greatly since the Renaissance, it is no longer possible to do as Leibnitz did, to "know all there is to know." Specialization is necessary for a man to achieve anything in the highly developed scientific world of today. On the other hand, specialization restricts the development of a well-rounded, broadly-educated man.

So much for platitudes. The question at hand is whether a man **must** produce something significant with his life (you know, find a new particle or build some bridges or find a new antibiotic), or whether he can become a professional student. It's a wider question than just studying, really, and we can find its ramifications in modern theology, philosophy, and psychology.

Stated simply: Must we Caltech students buckle down and pick a field in which we spend our life working, or can we study and survey for the rest of our natural existence?

To most Westerners "success in life" can be measured to some degree materialistically. If a Caltech graduate student dies unknown and penniless after sixty years of living on welfare, most people would rate him as a failure. You've got to get out there in that old capitalistic society, earn money, send your kids to college, live in a house of ticky-tacky. In an intellectual sense though, Western man has to attain "fulfillment" to be a success. He has to do something worthwhile, has to have something to which he can point as justifying his existence when he finally exits with the Grim Reaper.

Is this necessary? In the Middle Ages, people thought differently. Material success meant little or nothing, for this life was only a preparation for Heaven or Hell. The religious life was everything, and a man's life was devoted to getting to heaven. Fulfillment meant obeying the laws of the Church.

With the Easterners, also, such a perspective is not necessarily correct. To many Hindus, the first twenty years of a man's life he should study, the second twenty he should raise a family, and the third twenty wander as a mendicant holy man

from village to village. His life's work, of not very great significance, is but one step in eternity. His highest goal is desirelessness, but it can only be reached through several lifetimes. There is no meaning to materialism and heaven is nothingness.

The modern Western man, the medieval man, and the Eastern man all have a goal for which they strive. They all condemn the "professional student" that stands off and observes but does not dedicate his life to anything. They all live their lives for the sake of something external to life (respectively success, God, and Nirvana).

The alternative, Spanish philosopher Joe Ortega Y Gasset's "Modern Theme," is to live life purely for the sake of life. Applied to the Caltech situation, it is to study for the pure enjoyment learning brings, not in order to do something for the Great God Science (In Principiam erat Feynman . . .).

Certainly Caltech students are among the few who can contemplate spending life in such an abstract manner, mainly because very few scientists starve. If we do not decide to work hard in order to send our kids to Harvard, Yale, or M.I.T., then we are still assured that we will not wind up as garbage collectors. We could all stay alive teaching science in some remote junior high school, so finances are no great problems.

This is a contemporary manner of thinking, though, which inspires Bertrand Russell to write **In Praise of Idleness**. The new man has looked at the traditional values and not uncovered any vibrant sense of mission. By way of aside, some visiting Russian students were met at the gate to the Peking airport recently by a group of Chinese students. The two unarmed crowds glared at each other, neither wishing to precipitate violence. Then the Russians struck up the "Internationale," formerly the Russian national anthem and the international Communist theme song even today. The Chinese replied with the stirring chords of "The East Is Red," an adulation of the great Chinese patriot Mao Tse-Tung. The scene, described by a Russian student who participated, resembled the 1812 Overture, with the two songs vying for dominance in a tense confrontation. The point is this: how many Western intellectuals feel this stirring nationalism anymore? This is the Spaniards meeting the Swedes in the Thirty Years' War, with the Catholics chanting "Ave Maria" and the Protestants bellowing "A Mighty Fortress Is Our God." Westerners don't sing when they go into battle any more. Stephen Decatur's "My Country Right or Wrong" brings a smile or even a laugh to today's Americans.

We see the modern thinking in our political institutions, too. When the Third Estate and its sympathizers took the Tennis Court Oath, when they passed the Declaration on the Rights of Man, they felt they were acting for all of mankind. They were engaged, they thought, in world-shaking, history-making events. Contrast this with the Mau Mau in Kenya, or if your stomach is upset easily, with the Negro Revolt in the United States. The universalist, Utopian outlook has been lost, gone forever. The cry is for self-interest, for Black Power. Freedom for All Men has lost its power to intoxicate people's minds; now they ask for Freedom for Me. The Chinese Communists are probably the only people in the world today who think they possess the Grand General Solution to All the World's Problems. And they are prepared to use force to apply it.

So if we look at the old methods of finding meaning in life and we realize that they no longer apply to us, we can proceed to attempt to build our own system of vital values. The foundation stone then is:

Study for the joy of learning.

It varies from the goal of achieving anything; we need not produce any new scientific laws or publish learned historical tomes. In point of fact, we have no goal, no end to which we aim. As soon as the subject becomes uninteresting, we change the topic to another.

Mario Savio and the Berkeley protesters, the Amsterdam "provos" who demonstrate every night against **something**, do not seem quite so distant from the olive trees of Caltech. The others are demonstrating more for the joy of demonstrating than in the hope of accomplishing anything (oh, so now we can write dirty words on our posters? oh wow.), and Caltech students have the opportunity to study solely for the joy of learning.

In evaluating innovations, perhaps the pragmatist approach is the most valid one. To judge the worth of this idea we cannot reject it by argument nor accept it on faith (which faith we lost long ago) but we ought to try it. We have precursors, of course: Goethe, near the end of his life, said, "The more I think of it the more evident it appears to me that life exists simply for the purpose of being lived." The celebrated Don Juan also based his legendary approach to life on enlightened hedonism.

Tecker — you stand on an eminence overlooking the entire world of human thought and endeavor. On your left historians and economists are sifting data; out in front engineers are launching satellites and making possible televisiphone; on the right astrophysicists are working on the equations describing the evolution of stars. Before you pick a field to plunge in, before you bemoan your martyrdom to science — look to your values. Do not what others think is right, but only that which you yourself want.

—Michael Meo
John Middleditch

Adventurer To Narrate Films On Exploration

The contrast of the four South American countries, Venezuela Surinam, Brazil, and Peru will be brought to the full color screen by the eminent explorer John M. Goddard, this Wednesday, in Beckman Auditorium at 11 a.m. Goddard will narrate the films of his own making which cover the wild-life, natural geographical wonders, opulent cities, and primitive cultures of the four countries.

Partner whirls in pool

Goddard, after carrying out two expeditions with his father before he was 22 and winning distinctions as a combat flier in World War II, first gained international recognition with his expedition down the 4,000 mile Nile River. He also conducted the first exploration of the entire 2700 miles of the Congo river. Goddard started at the source with his British partner Jack Jowell, but the Briton later drowned in a giant whirlpool when their boat capsized.

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Relativity Assailed As "Inconsistent" By Forces of Darkness; Saved By Lowly Freshman Reviewer

(Eds. note: This is a review of a recently-published paperback book, **Relativity Is Dead**, by Otto Luther. The Caltech bookstore will order this monumental work for you if you want to read it.)

by George Bernard Schwartz

The arguments used by Mr. Otto Luther to refute Einsteinian Relativity are consistent and logical. Unfortunately for those taking Ph 236, the physical laws called upon to provide support for his arguments are not the laws of nature in this universe. All Luther proves is that Relativity is not consistent with the laws of nature that govern the author's conception of reality.

Feynman in error, too

Many students of physics will be heartened to know that kinetic energy is a function of the volume per unit mass, and that potential energy is a function of the density of the material. Another astounding fact revealed by Luther is that an object leaving the Earth at a velocity of seven miles per second is beyond the influence of Earth's gravity. Such errors of fact and definition can be readily found on almost every page of **Relativity Is Dead**. Though he accuses Einstein of having had semantic problems, it seems Luther is sorely in need of a good scientific encyclopedia.

Do not be discouraged, for the theories proposed by Luther are very interesting indeed. Be-

ginning with an alternate explanation of the null result of the Michelson-Morley experiment, the book goes on to revive the idea of the luminiferous ether—the almost (if not totally) undetectable substance that is the transmission medium of light.

Luther objects to the particle theory of light, although it is the basis of Snell's Law of Refraction which he calls upon as an alternate explanation of the bending of light in the vicinity of the sun, and he cannot see how a wave can exist without a carrying medium. What he doesn't see is that both the wave theory and the particle theory are but equivalent mathematical descriptions of external reality. Gravitation is neither "action-at-a-distance" nor a condition of space-time to Luther. Rather, it is a force caused by the shadowing of space-pervading radiation by matter.

More logic

This theory of the particle nature of gravitation has often been proposed, but never seriously considered. From this concept and his confusion of mass and density, Luther comes to the conclusion that particle interactions are gravitational in nature. The decrease of gravity found at the equator is not due to the increased distance from the center of the Earth, but to the decreased density of the Earth in that region.

Relativity seems riddled with paradoxes and logical absurdities to the layman, and much of **Relativity Is Dead** is devoted to exposing the alleged contradictions in Einstein's theory. For example, it is obvious to Luther that aging proceeds more rapidly at higher velocities,

since velocity is related to the rate of energy expenditure. However, he neglects to note that it is the vehicle, and not the organism, that is providing the necessary energy.

Luther is an intelligent man: literate, well read in his "field," but he has no comprehension of science. At least I would prefer to think of him rather as an uncomprehending but intelligent man than as an unscrupulous charlatan.

Sheppard's Folly

(Continued from page 1)

said Newton, "that we put on for anybody, including trustees, associates, and alumni." He repeated that Students' Day is not a recruiting stunt, and that in fact only about one-fifth of the attending high school students ever have any chance of acceptance at Caltech.

Allegro con crescendo bien diminuendo

This year there will be an innovation in the form of a discussion of relations between Caltech and high schools, involving the visiting teachers and some members of the Institute faculty. One of the purposes of this discussion will be to make suggestions about future Students' Days.

Students' Day attendance has risen from approximately 750 students and teachers to about 1200 last year; the high school population, on the other hand, has approximately doubled in the same time, according to Newton. The question now is: should Students' Day continue to be run as it is now, with limited attendance, or should attendance be increased, thereby necessitating a decrease in the number of exhibits each student can see?

More Mr. Wizard

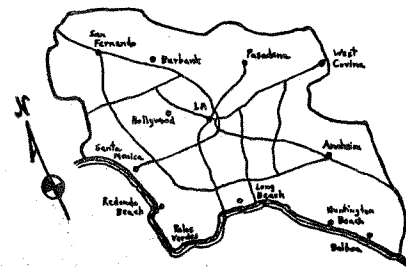
(Continued from page 1)

"What kind of a College is This?" An example of scientific work will be presented by Dr. Leonard Jaffe of JPL, discussing "Scientific aspects of the Surveyor Moon Landing." The session will be closed by Dr. Robert Huttenback, professor of history and Master of Student Houses, considering "In Quest of a Liberal Education."

Intelligence Report

by

Fehder and Jacobs



Frankly, "Intelligence Report" has just about reached the end of its rope. The shortage of suitable female companions for Caltech students has long been recognized as the major problem affecting student social life. During the last few weeks, however, another problem has become increasingly apparent to PLF and KCJ—that is, the shortage of really interesting night spots in the LA area catering to the 18-20 yrs. age group.

ABC, Fuzz bite hard

A number of factors play a role in causing this shortage, but the zealotism of the California Alcoholic Beverage Commission and the local police forces (with respect to enforcement of the state liquor laws) is undoubtedly the major contributing factor. Most establishments which might serve this age group prefer to avoid being overrun by the police or ABC inspectors fer to avoid being overrun by the regulations and therefore set a 21 age limit for males. (For some reason, young ladies are thought to be less likely to use forged ID's.)

In general, we have found that those establishments which do

not have a 21 age limit (for fellows) have no age limit at all—and are consequently swamped by the "Teenie Bopper" set. The recent "push" for tighter enforcement of the curfew laws (in the Strip area, at least) may alleviate this difficulty somewhat. On the other hand, the actions of the Board of Supervisors—failure to renew the "cabaret" permits of a number of the discotheques in the area—may only serve to compound the problem in general.

We would appreciate receiving any suggestions anyone might care to make. Please send them (via campus mail) to Fehder, c/o the Chemistry Dept.

More Notices

(Continued from page 1)

8, 1966, in the Lloyd House dining room will be the happening! The Annual ASCIT Fall Sports Banquet with a fee of \$1 and a menu of lobster, will take place.

BUY A JACKET

The Caltech Glee Club, having purchased new black blazers and white dinner jackets, is selling the old jackets for \$5.00 each. See Les King in 28 Fleming.

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TECH Sports

CHM Defeats Caltech in Loser's Bowl; May Replace SC in New Years Game

The football squad overcame its last obstacle against Claremont Harvey Mudd and finished the season with a perfect record for the second year in a row. The team's record two years ago was marred by a victory over LA Pacific, which promptly allowed its football team to merge with Azusa's. The team's record this year was 0-8.

The fit hits . . .

Even though the score was lopsided, 42-0, Caltech looked good for 28 minutes of the first half. The teams traded downs for a while until midway in the second period when the visitors began a march from deep in their own territory. Shortly, after crossing midfield, John Frazzini, junior fullback, was taken out with what was diagnosed later as a cracked ankle. He was hurt after the play was over.

As he left the game so did the drive, and Caltech gave up the ball on downs. This was as closing to scoring as the team came.

With only a few minutes to go in the half and Claremont with the ball on its own twenty it looked as if the half would end scoreless. However, a desperation pass that wobbled over the head of the defender went for a touchdown and Claremont was ahead. Then with 20 seconds to go in the half Burton punted on a fourth-down situation from mid-field and CHM ran that back all the way for its second touchdown.

. . . the spinning shan

The second half was only slightly sadder as the defense

Prufrock Proposal

(Continued from page 1)

house and not lease it to the students; second, existing administrative organs will enhance purchasing and payroll procedures.

Preliminary plans are based upon a minimum menu to cut down on necessary building modifications and upon prices designed to facilitate self-sustaining but nonprofit-making operation.

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was weak but the offense was nonexistent. Ray Kawal, another junior, played an excellent game at halfback. From the middle of the second quarter to the end of the game, he and quarterback Tom Burton were the only ones to touch the ball either on hand-offs or passes. Even though it was certain Kawal would have the ball every time he still managed to pick up yardage.

Courting Disaster

Frosh Team Gone; Now J. V.

The varsity basketball team is out to try something new this year in an effort to stay close to a league that is rapidly moving away from it. This year there will be a junior varsity and var-

Doug Holford, class of '66, has been awarded a \$1,000 grant to aid him in study at the Harvard Law School. Doug graduated seventh out of a class of 135. The scholarship was given by the National College Athletic Association (NCAA) for Doug's performance in basketball. He was captain of the Caltech team in his junior year.

Doug is the second member of last year's graduating class to get an NCAA grant. Peter Wyatt, now at Yale, also received \$1,000. He ran the 440 intermediate hurdles.

sity team, thus enabling frosh to play on the varsity squad.

So far it appears that three frosh will be playing varsity, Tom Bickell, Bruce Odegaard, and Norm Threewitt and conversely, two upperclassmen will be playing jv, John Dancz and Sali Ma. Rounding out the rest of the varsity squad, so far, are Terry Bruns, George Fox, Eddie Hsi, Jim Pearson and Jim Stanley. Les Fishbone is expected out for practice soon and on a clear day you can see John Frazzini shooting baskets with a cast up to his knee.

Crams it down . . .

The league this year looks just as strong if not stronger than in the past. Last year CHM took the league championship but varsity coach Ed Priesler looks to Whittier this year on the strength of last year's frosh team. Whittier has a 6'2" forward by the name of Fenderson who supposedly can cram his arm through the basket up to the biceps!

For Caltech, Terry Bruns will be holding down the center spot. According to Priesler, Bruns is the best he's seen at Caltech in 10 years. Jim Pearson, captain for the second year in a row, is hurting with a bad finger right now but is expected to

play the whole season.

Ratchet and pawlball

Coaching the junior varsity will be Hudson Scott from PCC, a 15-year basketball veteran. Under the new system a player may be moved from the jv team to the varsity but a varsity player may not be moved down. Therefore, once a player is moved up he stays there.

There are certain advantages to the new method in that upperclassmen who may not be up to varsity caliber will still be able to play a great deal. Also once the varsity team will have more material to draw from. The disadvantage is that the frosh will lose some of the valuable first year experience sitting on the varsity bench.

Last year the basketball team jumped off to a four game winning streak before second term brought them back to reality. This year they have hopes of doing the same. The first game is tonight on the home court against Life College. Tomorrow night both jv and varsity play at Southern California College and Saturday's game against Pacific Christian has been cancelled. Tuesday, Life comes back and Wednesday Biola will be here. All varsity games start at 8:30 and all frosh games start at 6:30.

Confirmation of Big Bang

(Continued from page 1)

exceptional, except that galaxies with the same red shift, and hence at the same distance from us, are only one-fortieth as bright as 3C 273. In general, quasars seem to be from ten to 1,000 times as bright as galaxies.

Because quasars are so much brighter than whole systems of stars, very distant (and fast-moving) ones may be detected and studied. Over 70 quasars with red shifts ranging all the way up to 200% have been found. In the laboratory, such a large red shift indicates relative velocities of 80% the speed of light.

Throb! Throb! Throb!

In the three years since their discovery, it has become recognized that quasars change by factors as large as 20 or 30 in luminosity over periods of time as short as six months. If a quasar were to instantaneously increase its emission of light, we, as observers at a distance, would see this as a gradual change because the increased light from the close edge would reach us before the increased light from the far edge. Thus, because light intensity fluctuations with periods of less than one are observed, we can infer that quasars are about one light year across. (Galaxies are about 100,000 light years across).

This view is supported by the

fact that quasars do not subtend a measurable angle (1" of arc), even on the 200-inch telescope, while galaxies with similar red shifts subtend 10" to 30" of arc.

The Reds are coming!

Certain problems are encountered with red shifts of 200%. Consider a normal spectral line at 4,000 A; in our frame it will be shifted to 12,000 A, way out of the visible range. Light from quasar 3C 9 has been travelling to us for 8 billion years. The estimated age of the universe is ten billion years. With such remotenesses of time and space, "there is some objection to talking about the concept of distances," said Schmidt.

Puff, puff, . . . bang!

In relation to the seemingly radically expanding universe, Schmidt offered the following analogy. Consider a bunch of flies on a balloon, but think that they are on a plane surface. If someone blows up the balloon, each thinks that the others are moving away. Perhaps we are in an analogous situation in four space, but we don't know it because "I don't think that we are allowed to imagine this type of space," speculated Schmidt.

The lecture was excellently presented, and well appreciated by the packed auditorium. After the lecture, Schmidt answered questions for an hour.

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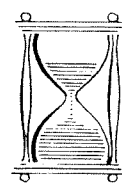
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Cross Country, Soccer Finally End Seasons

Cross Leads Team Through Finals

The cross country team finished the season in a rash of large meets last week. On November 19, in the NAIA district meet, Pete Cross finished 21st and Mike Meo was 30 places behind him in the four-mile run. Celaza of Oxy finished first with a time of 20:32; Cross's time was 22:44.

On November 22nd at Mount Sac, Celaza also took the conference finals, 20:42. Cross was 10th with a time of 21:32 and Lane Mason was right behind him at 21:33.

Clear cold weather helped produce the good times although the only team that Caltech beat was CHM, also the only team that Caltech beat during the regular season.

Chow time!

Mason put on a surprisingly strong performance as Cross didn't overtake him until the last hill, resulting in a wild finish across the last 200 yards of flat land. Both of the two men's times were bests for the year.

Like a broken record

The final run of the year was the cross-country intra-squad handicap mile run. In this race times are "given" to team members. For instance, Mason had a 5-second handicap while Dave Kolb and Tex Schneringer each had handicaps of sometime around half-a-minute. Pete Cross ran scratch and also won the race in 4:24.6. Mason was second, although he sportingly forsook his 5-second handicap to race the first three laps even with Cross.

While the Caltech varsity soccer team was finishing its season on a misreable note, the open team was beating UCLA for the first time within memory. In three previous meetings this year UCLA had won 6-0, and 4-2, and one game had ended in a 3-3 tie, but the last game, which determines the possession of the Miller Trophy, was all Caltech.

The ref beats his wife

The open team played the UCLA varsity, which is composed mainly of grad students, on Saturday, Nov. 19. The game was a see-saw battle for about three quarters, but Caltech had more energy left at the end and managed to win 5-4. It would have been 6-4, except for a much-disputed call by the referee. Yilmaz Sahinkaya took a penalty-kick which was blocked by the goalie, but Edgar Anderson kicked it back in. The referee called some kind of an offside penalty, although there can be no offside when a defender last touches the ball. The goal was

Soccer Squad Succumbs 1-0 To UCLA in Final Contest

nullified, making the game much closer. Sahinkaya scored two other goals, Payton Fuller scored two, and John Trischuck scored the other.

Hunk missed a shot

The game between the Caltech varsity and the UCLA jv's was held on Friday, Nov. 18 at Tournament Park. Like the first game of the season, which was won by UCLA 2-1, this was a very close contest. The game started with Caltech being on the attack most of the time, taking a flurry of shots at the goal. Several long-distance shots were stopped by the goalie, and Peter Balint missed an easy shot from in close. The Bruins couldn't mount much of an attack, so the half was scoreless. The second half saw the Beavers playing very poorly and almost quit taking shots at all. Meanwhile, UCLA's attack perked up, and they scored on a corner-kick which found all the defenders, including the goalie, out of position.

The season, while promising to be successful, has turned out to be a flop. The team failed to win a game, although they came close many times. The defense, with such stalwarts as Peter Balint, Richard Burton, Walter

Innes, Mike MacLeod, and goalie Les Fishbone, performed admirably most of the time, but they were let down by the inability of the offense to score. There were several fine players on the forward line, such as Armando Moreira, Ken Young, and Nelson Briceno; but they couldn't play together well enough to be a great threat. The offense worked fine up to the opposition's penalty zone, but from there they couldn't move the ball. Only four goals were scored in nine games.

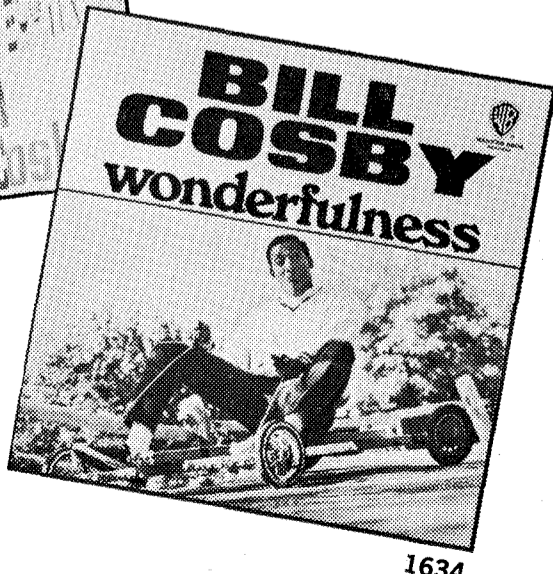
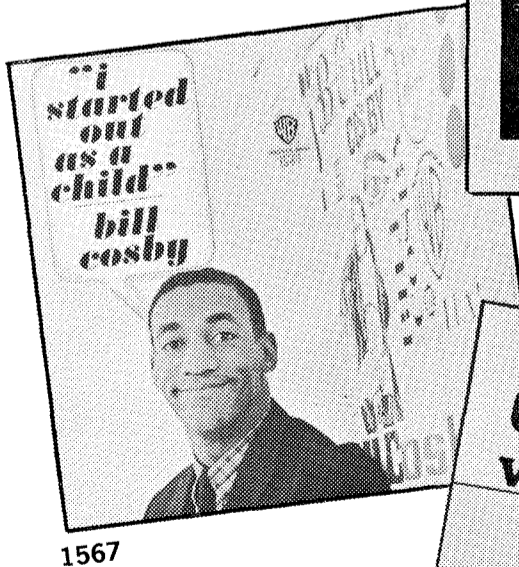
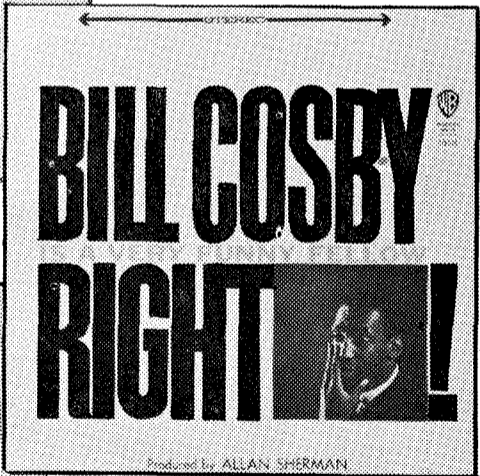
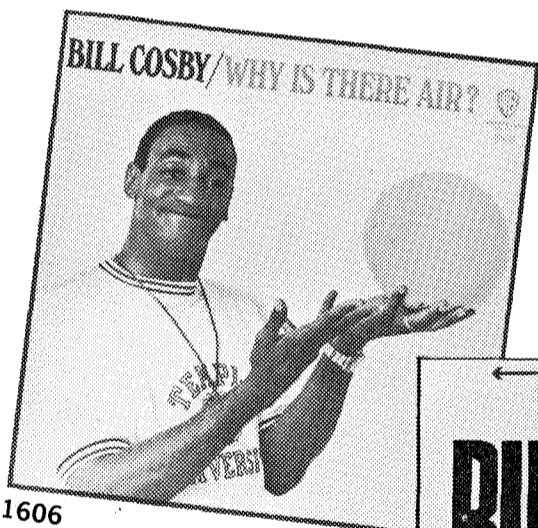
There is some hope for next year, as all of the offense will return. Unfortunately, the team will lose most of its defense, but perhaps the improvement of present players plus incoming freshmen will take up the gap.

The whole team played one of the finer games of its season. The personnel have been fine at every position; the only trouble has been at goalie. Two people played there in the last game, and several more have tried their hand at it during the season. Payton Fuller was the outstanding player for the year, scoring most of the team's goals. Sahinkaya came out late in the season, but also contributed a lot to the offensive effort.

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by L. F. Shaffe

Woe be unto the innocent lambs of Blockhouse, for sin and vice have come to reign. That noble hero, Supertwitch, tried to fight off LDP, the bringer of evils, but he lost his mighty battle. Now each, alone must fight off sin and corruption. Even now, one poor frosh, far from the cold of his native land, has yielded to this great evil. And when day breaks, and the Sun rises, another evil has been done. We only wonder, whose evil?

It can truly be said that there are harbingers of spring. Like these are the signs of a new term. Before even the truest troll has opened a book for that dreaded time, he whose name is one-third of the magic number has begun his work for next term. His Feynman collects dust, while he toils deep into

the night making the mysterious markings that will tell all where they shall go.

Alas, alack and woe, for the frosh have had too much. It remains to be seen how many frosh will be allowed out of their padded cells for second term. Even he who empties the mailbox each day may not hear the Valkyries through hard walls. True, he has found rest, relaxation and contentment, which of all things frosh lack greatest, but as you see his rest, relaxation and contentment chug around on his dresser, you begin to wonder.

Inspiration is rare in Purge House, and it generally comes in glass containers. It was a celebration of those who can procure inspiration that produced the greatest inspiration. As the staff of life flowed freely, they saw the final solution to the idol problem. The dismal scenery surrounding it, the wreckage of great things was replaced in their minds by a noble crossroads of the world, lighted up by the golden idol and surveyed by its great red eye. Like all true men of vision they had to fulfill theirs. Bold and brave they bore it to its new home.

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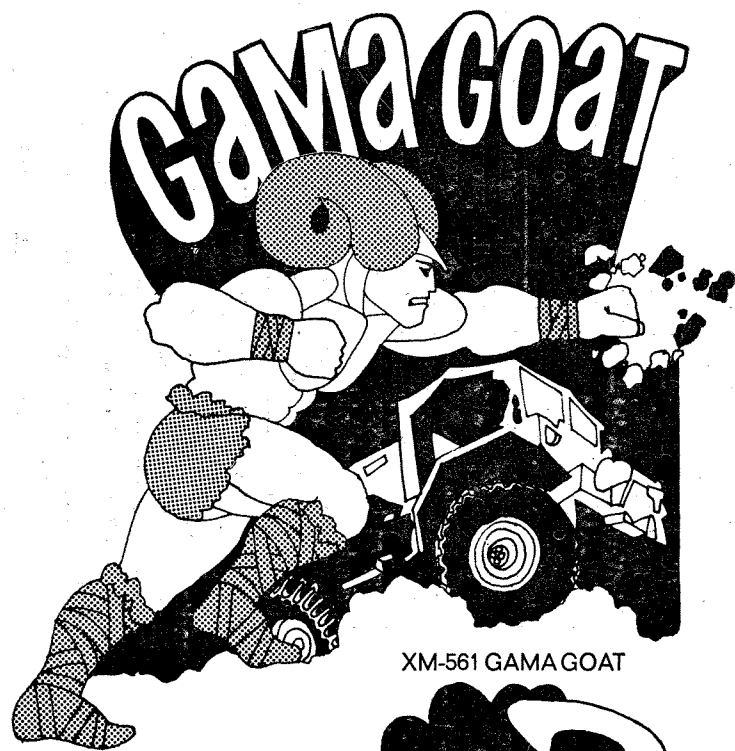
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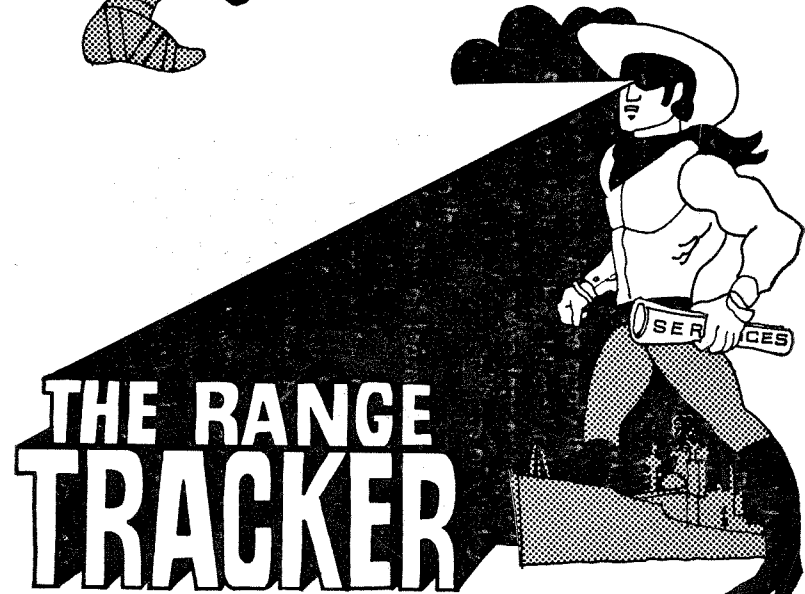
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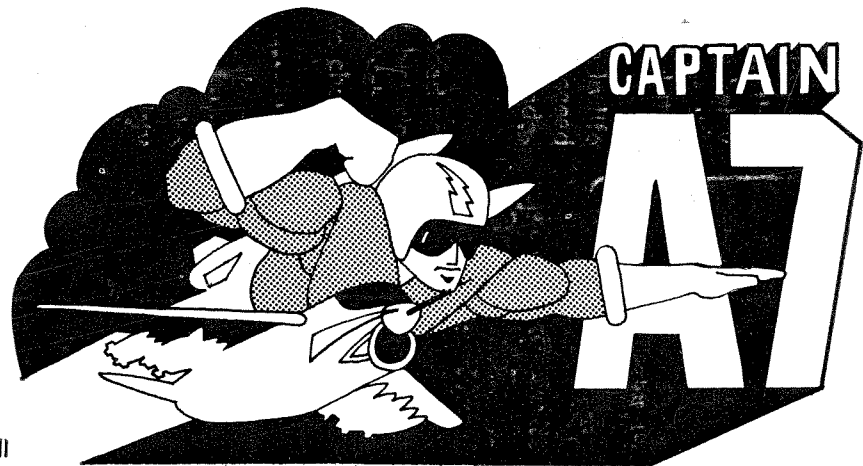


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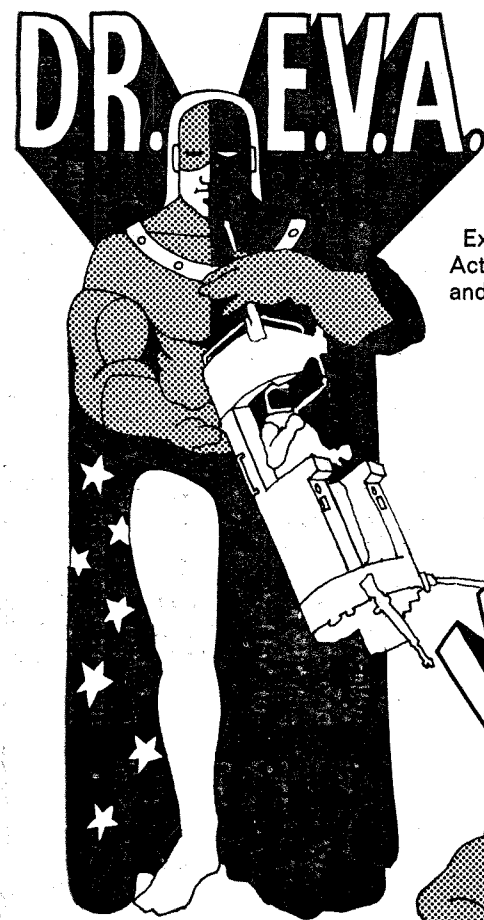


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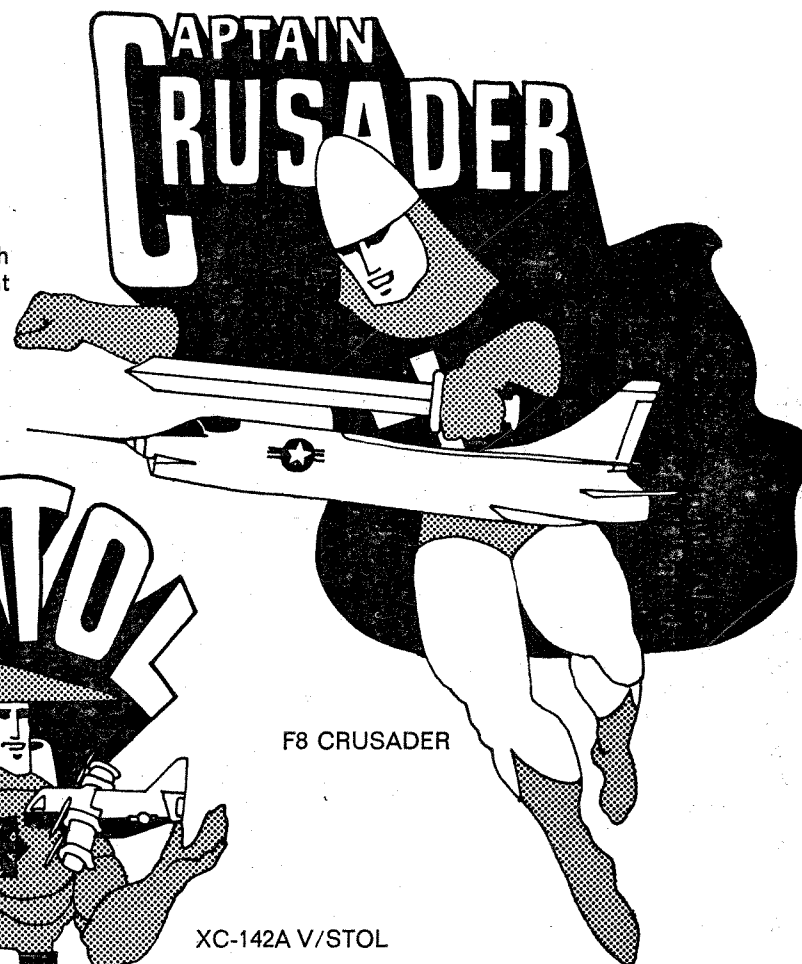
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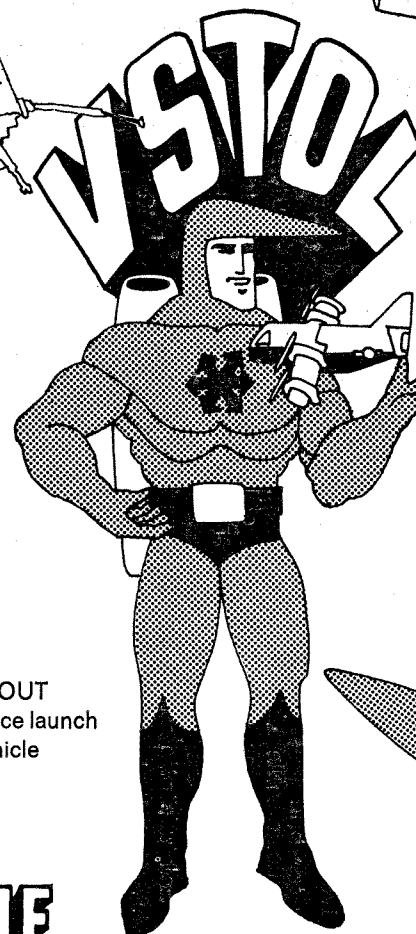
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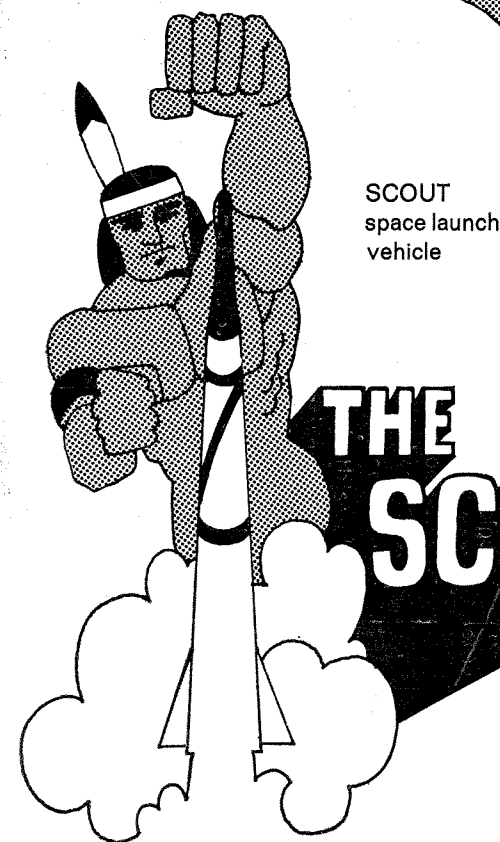
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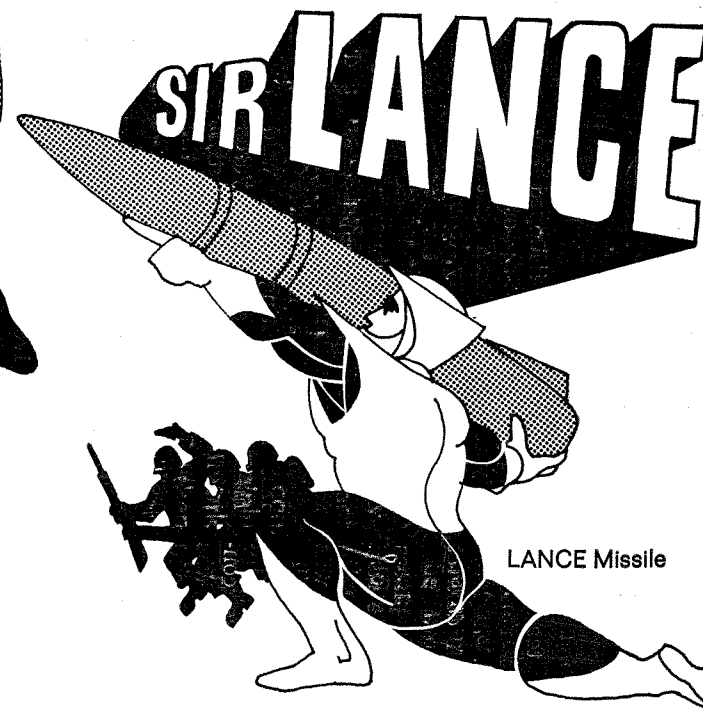


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