

The California Tech

California Institute of Technology

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Number 29

Campus Favors Continuing H-Bomb Tests

'Tech' Poll Shows 70% Against Immediate Halt

Caltech faculty and students agree that the U.S. should not stop all nuclear weapons testing immediately, according to a poll just taken by the California Tech.

The poll, which included all Caltech faculty, graduates, and undergraduates, also showed that students and faculty disagree as to whether nuclear testing is essential to U.S. security. (see graph at right).

About 1500 questionnaires, each with nine questions on nuclear weapons testing, were sent out—550 to graduates, 350 to faculty, and 600 to undergraduates. Of these, 200 graduates, 150 faculty, and 315 undergraduates replied.

Future Danger "Serious"

Two questions were asked on whether "radioactive fallout and/or other radiation effects . . . is endangering the health of the world's present" (and future) generations. It was widely felt that danger to future generations is "serious" (see graph on page 2), that danger to present generations is "practically speaking, insignificant," and that both these questions need further study.

The figures on present generation danger are these:

	non-existent	insignificant	serious	no data
undergrad.	4%	4%	50%	
grad.	3%	3%	38%	
faculty	0%	0%	41%	
undergrad.		16%	30%	
grad.		18%	41%	
faculty		27%	32%	

Faculty Departments Differ

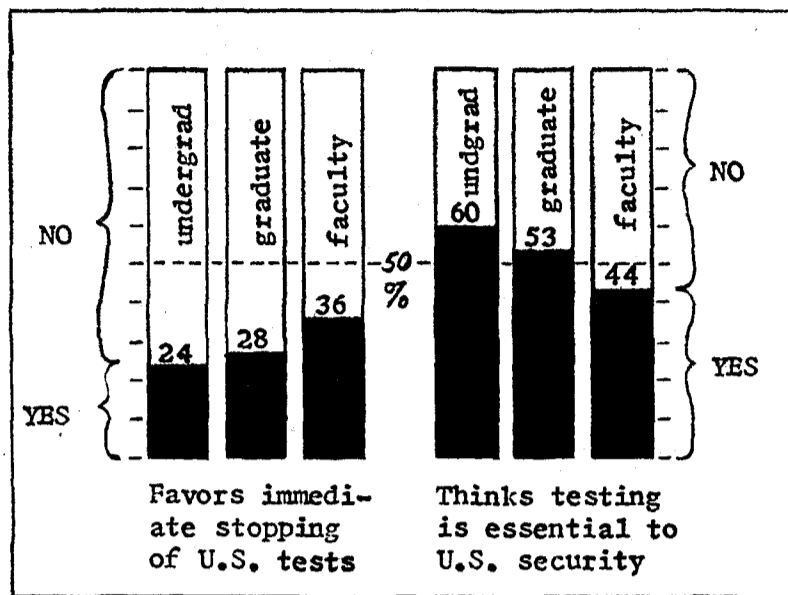
For further tabulation, the faculty was divided into departments, putting together chemistry and biology; math, physics, astronomy, and geology; humanities; and engineering. The chemistry group (41 replies) felt more than any others that fallout danger to present and future generations is serious:

	insignificant	serious	no data
present	34%	46%	20%
future	7%	73%	20%

The engineering group (42 replies) felt that, contrary to general faculty opinion, nuclear weapons testing is essential to U. S. security; 60% thought it essential, 40% felt it's not.

About 50% of the humanities group (18 replies) felt that

(Continued on page 2)



Comments On Bomb Poll Add Heat, Light to Results

By JIM ULEMAN
News Staff

A poll of all Caltech faculty and students has just been conducted for the California Tech, on the subject of nuclear testing. The comments on the questionnaires were not included in the statistical breakdown of campus feeling, and since these comments provide a valuable indication of sentiment, the poll results would be incomplete without some discussion of them.

Most Common Comment

The most common comment was that there was no provision for deciding U.S. policy on the basis of Russia's actions. Many opposed immediate discontinuation of U.S. tests, but felt that an agreement with Russia should be sought and tests should be discontinued by all nuclear powers as soon as possible.

Soph Runoffs Still Running

Hugh Kieffer and Cleve Moler emerged as final victors in the fourth runoff election for next year's sophomore Board of Control Representative. The elections were completed last Thursday.

Sophomore secretary candidates were still battling it out this week as the runoffs entered their third week. Gary Ihler, Jim Uleman and Christ Velline remained in the race before Tuesday's election.

Admittedly, if the word "immediately" is not emphasized in reporting replies to the first question—"I (do, do not) favor immediate discontinuation of all United States nuclear weapons testing."—the poll results could easily be used to misrepresent campus sentiment.

We did not ask about discontinuation of testing based on international agreement because we felt that U.S. policy would be so dependent on the specific provisions of such an agreement and a multitude of world conditions that replies would be meaningless or qualified beyond the point of classification. However, it is obvious that omitting the question has not solved the problem.

Several people felt that continued nuclear weapons testing decreases the probability of major war, and they objected to our not providing such a choice in question 8: "I think continued nuclear weapons testing at the present rate increases the probability of major war (not at all, slightly, or greatly)."

Pauling Mentioned

It is difficult, especially at Caltech, to mention banning nuclear testing without thinking of Dr. Pauling. In fact, our immediate reason for conducting this poll was to see how closely Dr. Pauling and others on campus agree. Here are some of the comments mentioning Pauling, or possibly referring to him, that we received on ques-

(Continued on page 6)

Trophy Winners Named at Banquet

Glenn Converse, Dick Van Kirk, Don Owings, John Walsh and Bob Tokheim were the recipients of the major athletic trophies presented at the annual ASCIT Awards Banquet last night in Tournament Park.

Rickets House received the Goldworthy Trophy for Scholarship again, and also copped the Interhouse and Discobolus Trophies. The Interhouse Committee did not vote on the winner of the Varsity Rating Trophy until yesterday afternoon, after the Tech had gone to press.

Frosh of the Year

Tau Beta Pi awarded the title of Freshman of the Year to Bill Bauer and Cleve Moler. This coveted award is presented to the most active and successful member of each freshman class.

The Vesper Basketball Trophy went to Glenn Converse, and the Carl Shy Trophy, awarded to the outstanding member of the freshman basketball team, was presented to Bill Ripka. Fred Newman and John Stene will be co-captains of next year's varsity team. Newman also received a plaque in recognition of his election to the All-Conference basketball team.

Dick Van Kirk gathered more laurels as he received Goldworthy Track Trophy. He was also elected captain of this year's team.

The Alumni Baseball Trophy was awarded to John Walsh, the league-leading hitter. Plaques for being members of the All-Conference Baseball teams were awarded to Walsh and Newman. Newman was also elected captain of next year's team.

Bob Tokheim won the Scott Tennis Trophy as a result of his efforts in the Scott Tennis Tournament held last week. Winner of the Novice Tennis Trophy was Neil Sheely.

The Campbell Swimming Trophy was awarded to Don Owings. Clark Rees was elected captain of this year's team.

Name Bacher To A-Panel

Dr. Robert F. Bacher, chairman of Caltech's Division of Physics, Mathematics, and Astronomy, was named May 24 as one of three U.S. experts who would meet with Soviet scientists in a proposed conference in Geneva to discuss the policing of a nuclear test suspension.

President Eisenhower, in a letter to Nikita Khrushchev, has asked the Russian leader that if the conference is agreeable to him, to choose men of special competence, and that these choices be made on a scientific and not political basis, so that the conclusions reached by the talks shall be only of a technical nature.

The three men named by the U.S. are Bacher, Dr. James Brown Fisk of the Bell Telephone Labs, and Dr. Ernest O. Lawrence of the Radiation Lab of the University of California.

Dr. Bacher was the wartime head of the Experimental Physics Division at Los Alamos Laboratories and a member of the Atomic Energy Commission.

BOD Debates New Frosh Visitation

Summer visitation of entering freshman came into the limelight this week when the ASCIT Board of Directors began to consider its responsibility in the problem.

Motions recommending that the student house not organize any summer visitation programs and that the Deans make the list of new freshmen available to everyone, were passed by the Board at their meeting Monday. A motion calling for complete acceptance by ASCIT of responsibility for carrying on a summer program was defeated, however.

ASCIT President Mike Godfrey pointed out after the meeting that the problem will be considered further next week and that new action will probably be taken.

Godfrey commented further, "The decisions that the Board reached were made under the influence of statements of selfish half-truths. Everyone took an immediate negative attitude even before the Board made any comments."

Violation of Spirit

"At least one house has violated the spirit of rotation rules in the past, but no one was willing to present the details," Godfrey said.

Dennis Kuli, president of the Interhouse Committee, pointed out that rotation rules do not forbid summer visitation, but simply rule out any discussion of particular houses. "Any curtailment of summer visitation would only hurt the frosh," he added.

Jim Wilkinson, ASCIT Vice-president, said that he felt that the spirit behind the Board resolution was merely to call for compliance with the IHC rotation rules.

Valbert Wins Chem Award

Jon Valbert has been chosen to receive the eighth annual Medal Award given by the American Institute of Chemists. The recipient, who must be a senior, is chosen on the basis of leadership, character, and scholastic achievement.

Jon, along with award winners from other schools, received the medal at an awards banquet yesterday.

Student Center, Biology Lab Funds Given

A gift of \$335,000 from Mr. P. G. Winnett of Los Angeles will enable Caltech to provide, for the first time in history, a center for extracurricular student activities.

Mr. Winnett, Chairman of the Board of Bullock's Inc., has been a member of Caltech's Board of Trustees since 1939.

His gift, announced last week by President L. A. DuBridge, will finance a two-story building that will contain offices for student publications, meeting rooms for the student governing body, headquarters for the student YMCA and Throop Club. The building will also contain a new bookstore, a student shop, a game room and a lounge.

To be located on the north side of the campus, the building will be known as "The Winnett Center." Detailed plans are now being worked out by the faculty-student committee, in consultation with architects. Construction, however, cannot begin for some two years after the new student houses and cafeteria have been completed and space cleared for the new Center.

It is one of 16 new buildings which, in addition to increased faculty salaries, are the goal of Caltech's recently announced campaign for \$16,100,000. Contributions and pledges to date total \$3,555,000.

Biology Addition Set

A major addition to facilities

for biological research at the Institute has been assured by a gift of \$350,000 from Dr. Gordon A. Alles of Pasadena.

Dr. Alles' gift will finance in large part a five-story building that is needed for rapidly expanding research and teaching in virology, biochemistry, biophysics, immunology and psychobiology. The new building, forming a link between the present Kerckhoff and Church laboratories, will be known as "The Gordon A. Alles Laboratory for Molecular Biology."

The total cost of the building is estimated at \$900,000 of which \$391,500 has been pledged by the U.S. Public Health Service.

California Tech

EDITORIAL PAGE

Nuclear testing and disarmament looms as a major issue in the world today; here in the United States, sentiment is sharply divided over whether we should continue to participate in a race for nuclear superiority. But one thing is sure—each time the discussion rages, Caltech manages to pop up, near the center of the controversy.

Caltech faculty members have been called on repeatedly by the government to supply needed facts, expert opinion, and testimony on the capabilities of nuclear weapons, their biological effects, and the feasibility of test detection.

Beyond this service, some faculty members have assumed the initiative to impress the American public directly with their vigorously-held opinions of the nuclear weapons issue. Their efforts to educate the public to their points of view have done much to give the Institute a prominent position in the controversy.

The California Tech recognizes a responsibility to give coverage to Caltech's role in the problem. In this issue appear interviews on the subject with four prominent professors: Linus Pauling, Harrison Brown, Matt Sands, and James Davies. These men were not chosen to represent a cross-section of campus sentiment; Pauling and Brown were consulted because of their importance as leading advocates of nuclear test cessation; Sands was consulted because of his articulateness and great willingness to express himself on the subject; Davies was interviewed to provide a political scientist's analysis of the nuclear test problem, and to evaluate the efforts of men like Pauling and Brown.

As an added attraction the Tech offers some results of the campus survey taken on faculty, grad, and undergrad sentiment on the nuclear test question. The poll was run to determine just to what extent men like Pauling and Brown are spokesmen for general campus opinion.

Secretary's Report

SUMMER CONTACTING PROGRAM

A poor, poor show. The discussion on this issue revealed little more than the nature of selfish interests on the campus. ASCIT was accused of overextending its authority in considering the possibility of operating the summer contacting program. Little more than this was accomplished. The issue, however, is not closed and will be reconsidered next week.

VARSITY AND FROSH ATHLETIC AWARDS

Varsity Tennis: Frank Cormia, Robert Tokheim, Reed Warriner, Dave Butterfield, Carl Morris, Clint Frazier, Phil Reynolds, Charles Antoniak, manager.

Frosh Tennis: Joel Yellin, Steve Hechler, John Lohman, Harold Marr, Dave Zimmerman, Robert Quigley, Lawrence Brown, Harold Stark.

Varsity Swimming: Clarke Rees, Don Owings, Keith Brown, Bob Blandford, Pete Rony, Robert Smoak, Dave Tucker, Robert Pailthorp, Miles McLennan, Phil Thacher, Vince Taylor, Mike Milder, Richard Fiddler, manager; John Asmus, Senior Service Award.

Frosh Swimming: Gary Tibbets, Pete Mayer, John Erskine, Tom Tisch, Roger Bland, Bob Heath, Milton Lindner, Ron Gatterdam, manager.

Varsity Baseball: Bob Emmerling, Bill Kern, Fred Newman, John Walsh, Dennis Kuli, Herm Hartung, Dave Blakemore, Dave Teal, Mel Holland, Anthony Howell, John Price, Marty Kaplan, Nelson Byrne, manager.

Frosh Baseball: Albert Merrill, Karl Pool, Skip Stenbit, Leroy Sievers, Christ Velline, Sam Suitt, Bill Ripka, John Stromberg, John Haworth, James Sasser, John Emmett.

Varsity Golf: Jerry Siegel, Ed Shuster, Wayne Kreger, John Bard, Joe Cointment, Jim Sorensen, Jon Tibbitts.

Varsity Track: addition: Dick Herlein.

STUDENT EDUCATIONAL POLICIES COMMITTEE

The members of this committee for the coming year will be announced at next week's meeting.

Tom Jovin
ASCIT Secretary

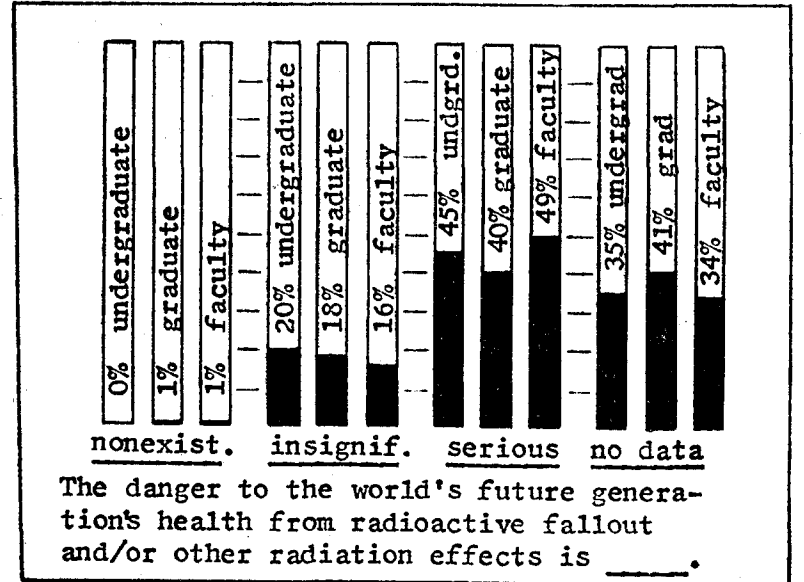
Tech Worried By Fallout, Poll Shows

(Continued from page 1)

"there is insufficient data for the formation of an opinion" on the two questions on fallout danger. 78% of the same group thought nuclear weapons testing is not essential to U.S. security.

This poll was undertaken by Jim Uleman, Tech staff member. He designed and wrote the questionnaire, addressed them and sent them out, and tabulated and graphed the results. Work was begun about April 1.

Because of time limitations, only four of the nine questions have been tabulated. Uleman hopes to complete tabulation this summer.



LETTERS

Dear Sir:

I wonder whether you can help me by publishing this letter in your paper. I am an engineering student (ME) at the University of Bristol and have ideas about taking a graduate course at an American university and probably staying in America.

I would like to enter into correspondence with a second- or third-year undergraduate with a view to finding out what your universities and country are like and for the other party, if he wants to, to find out what the educational system and the country is like here.

Yours faithfully,

Alex R. Henny
19, Hampden Rd.,
Knowle
Bristol 4, England

California Tech

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President's Column

We had a very interesting Board meeting last Monday night. It was a perfect example of a group of individuals who were unwilling to present the facts of an issue and discuss that issue in a rational manner. (See story, page 1.)

The issue was that of whether ASCIT should assume responsibility for the summer visitation program and whether some control should be attempted concerning individual Student House activity in this area.

Selfish House interests were well represented. This narrow unprincipled attitude was allowed to pervade the entire meeting. Any attempt to divide the issue into two parts, first the question of whether ASCIT with the consent of the YMCA should run the program and then the question of House oriented visitation activities was thwarted by reversion to statements directed to cover narrow House interests rather than present facts on which the Board could base a decision.

The vociferousness with which almost every spectator (we had

by far the largest audience that has attended a Board meeting this year) stated that there really was no problem was amazing. Next time we want a large audience we will have to remember to announce that we have no problems to discuss.

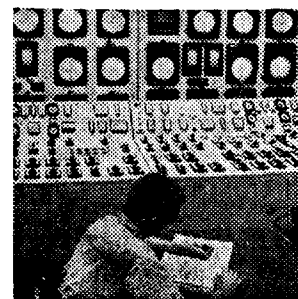
It is now clear that we cannot expect a constructive attitude from the IHC on matters concerning freshman rotation. The tone of the meeting was set by the spectators. It was they who alienated the Board by taking a negative and closed attitude toward all discussion.

Needless to say it was very discouraging to realize that members of the student body, through ignorance or design, would present this kind of attitude.

The Board will have a problem to discuss this Monday evening. The issue of ASCIT responsibility for the summer visitation program will be reconsidered. Anyone who has any constructive information to add to this discussion is cordially invited to attend the meeting.

Michael Godfrey
ASCIT President

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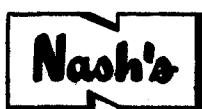
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Review

'Remains To Be Seen' Proves Success

By Ford Holtzman

Last weekend Caltech and its neighbors were treated to one of the most successful Caltech Drama Club presentations in anybody's memory. Lindsay and Crouse's comedy, "Remains to be Seen," lived up to all expectations and proved to be well suited to the Caltech temperament. In addition, the acting and staging surpassed most people's expectations and proved to be of a

high quality rarely found in amateur productions.

Goofs Cut to Minimum

There were, of course, the inevitable miffs and flubs which plague every production west of Broadway and east of Hollywood. The actors did occasionally muffle their lines, the lights did sometimes go on or off a few seconds before the actor had flicked the light switch, the tim-

ing of entrances was slightly off in a few spots, and so on and so forth for a million and one other technical details which prove to be the bane untold numbers of amateur productions. But I think it safe to say that such goofs were cut to a minimum and then some.

Credit to Stars

One of the strongest criticisms of last year's play was that the actors did not "get out of themselves" and into their parts. That criticism simply did not hold in "Remains to be Seen." There was not a weak part in the whole play. Especial credit goes to the principals—Robin Street as Jody, Ken Dinwiddie as Waldo, and John Conover as Goodman.

Excellent Balance

The outstanding feature of this year's Drama Club presentation was the balance—the integration of the various aspects of the production. No matter how well everybody performs his part, if a play degenerates into warfare for the audience's attention all the subtleties in the dialogue and the acting will be lost. This did not happen. Every facet of the production was in proper balance, and every nuance, every personality quirk of the characters was brought out and given proper emphasis to add immeasurably to the tone of the play—to make the difference between a flat, lifeless ordeal and a convincing effective performance. Much of the credit for this, and indeed for the success of the entire performance goes to the director, George Stephens.

All in all, I think you will have to look far and wide for a finer amateur production.

DOUBLED AND REDOUBLED

By Dave Singmaster

North-South vulnerable; West dealer. Bidding: (Probable)

W	N	E	S
—	1C	—	4NT
—	5D	—	5NT
—	6H	—	7H
Dbl.	—	—	Redbl.

North

S—K1098
H—
D—KQJ10
C—AQJ97

East

S—765432
H—642
D—A9654
C—

South

S—AQJ
H—AKQJ1098
D—
C—K108

West

S—
H—753
D—8732
C—65432

The hand shown above is one of the great bridge hands of all time. It, with its variants, is shown as "The Mississippi Heart Hand" or a similar name. This hand was a favorite of the Mississippi River steamboat gamblers in the late 1800's when bridge was still young. In those days it was permissible for both sides to continue redoubling as long as they wished, with penalties also doubling, much as in poker with no limit on the number of raises.

The gamblers who frequented the steamboats would casually suggest a little game of bridge to while away the time. After a

brief and uneventful period in which the sharks made some bad but deliberate misplays, someone invariably would suggest playing for money, say a dime a point or so. The game would progress and the dupes would get a little behind and then come back into the lead when this hand would appear. The "Fish" would get to seven hearts by some bidding sequence or other and West would lead the six of clubs or East would lead the seven of spades. In either case, East-West manage to cross-ruff six tricks before their opponents win a trick.

Down six vulnerable doubled is 1700 points, redoubled is 3400 points, and that redoubled several more times makes quite a tidy sum that the fish get milked out of in one hand.

I once managed to get into a similar position at four spades. I was South, Frank Albini (God bless his soul) was East and John Price and Hugo Fischer were the other two players. Fortunately, we weren't playing for money but it was getting on toward the end of many hours of play. Suddenly, I had a two spade opened and we got to game. Frank led and, lo and behold, I was down three before I knew it. The game ended there and we all went home. I never found out, until long afterwards. Sigh!

Pit and Paddock

Trintignant Wins Big Event

Maurice Trintignant, driving a Cooper, was the surprise winner of the Grand Prix of Monaco. Second was Luigi Musso and third Peter Collins, both on Ferraris. Trintignant completed the 100 laps, equal to 195 miles, in 2 hours, 52 minutes, and 27.9 seconds for an average speed of 68.04 mph, a new record for the course by over two miles per hour.

Musso, by finishing second, picked up enough points to put him in the lead for the drivers' world championship. He now has twelve points; second, with eight points each, are Moss and Trintignant. The race was a very difficult one this year; only six of the sixteen starters finished.

Targa Florio

Last May 11 the third race in the world's championship for sports cars was held over the arduous Targa Florio course. Winners were Luigi Musso and Olivier Gendebien in a three

litre Testa Rossa Ferrari. Second was a Porsche 1500 driven by Jean Behra and Giorgio Scarlatti, third were Wolfgang von Trips and Mike Hawthorn on a three litre Rossa Ferrari, and Phil Hill and Peter Collins, also on a Ferrari, finished fourth. Musso and Gendebien were over two miles per hour slower than the record set by Peter Collins and Stirling Moss on the Mercedes-Benz 300 SLR in 1955.

Ferrari is now firmly entrenched in first place for the world's championship for sports cars. They have won the first three out of the eight events to be run this year, scored a total of 24 points against Porsche's 14 and Lotus' three.

Jazz Beat



by Lloyd Kamins

Walkin' — Miles Davis Prestige 7076

Miles Davis Sextet, featuring: Miles Davis, trumpet; Jay Jay Johnson, trombone; Lucky Thompson, tenor; Horace Silver, piano; Percy Heath, bass; Kenny Clarke, drums.

Miles Davis Quintet, featuring: Miles Davis, trumpet; Dave Schildkraut, alto; Horace Silver, piano; Percy Heath, bass; Kenny Clarke, drums.

Here is another survey of Miles Davis, portraying him in moods ranging from down and gutty to haunting and lyrical.

Walkin', the title track, justifies purchase all by its own sweet self. The simple theme is highly appealing and engaging. It's one of those tunes that you can't get out of your head—and don't really want to. It's pure funk on a platter, all the way to the last major seventh. The entire band exhibits a oneness that is rarely attained. Nobody's fighting, nobody's protesting, everybody's just blowing blues—funky, way down, meaty blues.

Lucky Thompson plays some real fine things on this set. His rich, vibrant tone goes so well with the mood of Walkin'. He takes long solos but never gets repetitive, and consistently swings. Thompson uses his backing well, paying particular attention to the sounds of Horace

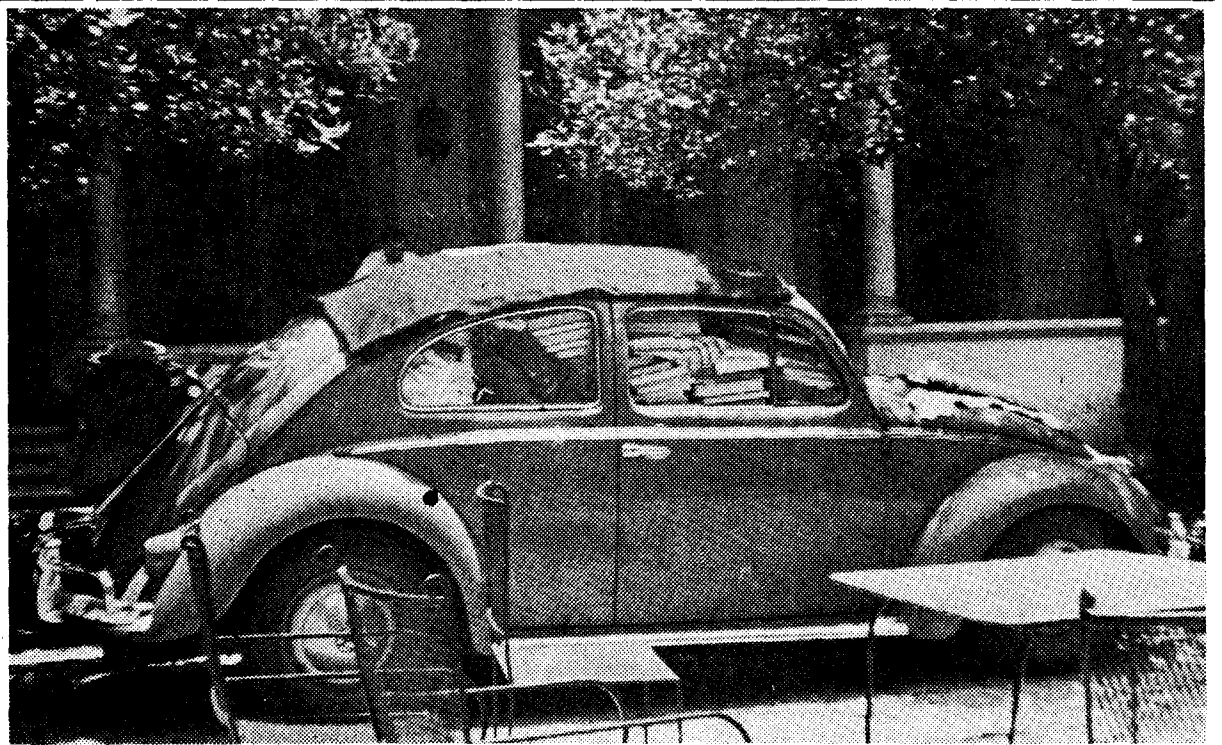
Silver, who is a rhythm section in himself. Thompson gets boosted along by riffs from the brass, in various choruses. In Walkin', Davis plays the compelling theme behind the wailing tenor with gratifying effect.

Master of Mood

Davis, of course, is superb. No matter what the tempo or the mood is, he still remains the master. Perhaps his best work is on the second side, in the quintet. Miles sticks his mute in his horn and steals the scene. After the record is over, it is difficult to recall whether or not there was a band playing behind the great artist. Miles is just too captivating.

Solar is a wonderful little tune. It somewhat unexpectedly turns out to be a blues riff. Davis probes around a bit, in the soulful melody line, and finds many phrases of delicate beauty. It is in You Don't Know What Love Is that Miles exhibits his genius, however. The haunting melody was made for Miles and his muted horn. The mesmeric lines of Davis cast a spell over the listener, holding him enraptured in the sheer beauty of the song.

This album is one of Miles' best. I trust that the significance of the statement will not be lost.



SENIOR DITCH DAY came and went last week but it lasted long enough for some underclass friends of senior Bill Clement to perch his car in the middle of Fleming courtyard, somehow. The vehicle also served as a handy receptacle for the contents of several other seniors' rooms, Clement discovered.

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The Nuclear Test Controversy: A Survey Of Expert Opinion

"No More War!"

Pauling Airs World Views In New Book

By Bill Bauer

No More War! is the title of Dr. Linus Pauling's most recent book to be published early in August, defending his opinion on the greatest problem of the modern age. "No More War" is also an expression of his great desire to improve the present world situation.

Essential to Pauling's point of view are two proposals, ideas which have provoked stormy centers of controversy: first, that the United States should take the lead in pressing for an end to world armament; and second, that our present research into munitions development should be channeled toward research for peace.

The present controversy has, of course, been brought about by what would be Pauling's first step towards the realization of these objectives: an end to the testing of hydrogen bombs.

Pauling considers the end of H-bomb testing vital to any plan of lessening world tensions. He commented:

GREAT DANGER: "We are in great danger — danger of destruction of the world by the accidental outbreak of a nuclear war. Some technological or psychological accident may bring this about at any time; as the stockpiles of nuclear weapons spread to other countries, the danger becomes greater and greater. We have a sort of international anarchy now; there might be a sort of international banditry. It is essential that this process be brought under control. Control of stockpiling would require many thousands of inspectors, whereas the control of testing is simple."

Biological Damage

As a special way in which the testing of the bombs has tightened the atmosphere of international tension, Pauling has emphasized the danger of permanent biological damage to the human race. "My present information leads me to conclude that one year of testing, at a 30 megaton

rate, would lead to 225,000 seriously defective children, plus 425,000 embryonic and neonatal births; it would also be the cause of many millions more of minor defects over a period of many generations."

PAULING UNDER FIRE: The figures quoted by Pauling to support his stand have come under fire from many quarters as "untrue" and "greatly exaggerated."

Pauling replies to his critics: "In general the Atomic Energy Commission has not said that my statistics are incorrect. The A.E.C. estimate is that one year of testing leads to from 2,500 to 13,000 defective children; this is a serious underestimate. Not only has the effect of ordinary fallout been belittled, but the fact that carbon 14 will continue to exert its effect over many thousands of years has been completely neglected.

"The ordinary people have been misled by Mr. Strauss, and even by President Eisenhower."

'Clean Bomb' Fraud

Pauling noted that much ado has been made recently over the prospect of "Clean" bombs—bombs which supposedly minimize the danger of radiation fallout. He first pointed out that the use of the word "clean" in this context was certainly a misnomer. He then went on to add:

GUILTY OF MALFEASANCE: "The leaders of this nation, charged with its defense, would be guilty of malfeasance if they didn't stockpile 'dirty' bombs." To back this up, he called attention to the costs of production of the bombs: for an extra \$15,000 a five mgaton bomb, costing perhaps hundreds of thousands of dollars, could be made three or four times as effective, merely by placing around it an extra half ton of ordinary uranium (the uranium, of course, is a major contributor to fallout).

"No authority has ever suggested that

we want to make clean bombs for use over Russia. Clean bombs will be used to shoot down Russian attackers near the United States. I am sure that the United States is stockpiling dirty bombs for an attack on Russia, and that Russia is stockpiling dirty bombs for an attack on the United States."

SERIOUSLY MISLEADING: Pauling again placed a great part of blame for confusing the issue of clean versus dirty bombs squarely on the shoulders of the Atomic Energy Commission. "Some of the statements made by the A.E.C. people are really seriously misleading. It seems to me that the men themselves can hardly have been unaware that their statements were misleading."

Personal Attacks

Also provoked by Pauling's efforts to end the bomb tests have been several attacks directed against him personally, or against those who share his opinion. The object has been, of course, to discredit his authority. The charge most often repeated has been the cry of "Communist!" This has been especially used in an attempt to invalidate the weight of the petition signed by over 9000 scientists, from all parts of the world, and sponsored by Dr. Pauling. To this charge Pauling has replied:

"Of course I don't know all those who signed the petition—many are from foreign countries. Many of them may be Communists—probably are; I just don't know. Perhaps Professor Simyonoff, the Russian Nobel Laureate, is a communist—I don't know how they discuss these matters in Russia. In America, 104 belong to the American Academy of Sciences, and I feel confident that there isn't a single Communist among them. There are 37 Nobel Laureates, and I'm sure that none of the American laureates, who constituted about one-third of them, is a Communist."

Damage Suit

In addition to the publicity which he has brought to his viewpoint in recent months, Pauling, along with other outspoken leaders, has instituted definite action in the form of a damage suit filed in courts in both the United States and in the Soviet Union. In justification of this action, which refers specifically to the fallout danger, Pauling stated:

A PROPER WAY: "Resort to the courts is a proper way of trying to solve the problem. Here you have a case of damage to the people by the actions of the A.E.C. Even though you may not be able to say, 'I have leukemia caused by bomb tests,' you can still resort to the courts, if you can show that there is a chance that you will be damaged. You can get an injunction against your neighbor if he has an open well in his ground, into which your child might fall. You don't have to wait until your child falls into it."

The other side of Dr. Pauling's case consists of his positive proposals to remedy the precarious international situation. His most important constructive step is the establishment of a commission specifically designated to work out the problems of a lasting peace. Here is the proposal as Pauling explains it:

Pauling's Proposal

"There should be carried out research for peace in the same way that research for war is carried out now. There are thousands of scientists who are advising the government on how best to carry on war or to carry out defense. But there is no great group of people working on the solution of the problem of keeping the world from being destroyed by war.

"It's time that we had a United Nations agency—something like a great institute for advanced study, with thousands of specialists — 10,000 scientists — working away year after year on research for the solution of world problems.

MUTUAL TRUST: Since any hope of disarmament must rely upon the assumption of cooperation and mutual trust with the Soviet Union; and since this cooperation has been extremely difficult to bring about in the past, and this trust so often broken, Dr. Pauling has been under fire for being unrealistic—or, again, for being a Communist sympathizer. He has expressed his ideas on mutual agreements:

"We have to trust the Communists—at least, we have to make agreements with the Communists.

"I think that it will be a long time before a really extensive atmosphere of trust and confidence is built up between nations. But we are forced into getting along in the world today. An end to the testing of hydrogen bombs is the first, vitally necessary step in this direction."

Harrison Brown

'Control The Tests Now Before It Is Too Late'

By Martin Carnoy

Dr. Harrison Brown, professor of geochemistry, is one of the chief proponents of control and reduction of armaments. His reasons for supporting this view are quite basic; that is, the course that we are following now is more dangerous than that of making an agreement with the Soviet Union to control testing.

"The most immediate danger, of course, lies in the possibility of an all-out nuclear war with the Soviet Union. But as the years pass, other dangers will quickly emerge which will present problems even more serious than those which now confront us.

"These new dangers will result first from the spread of nuclear military capabilities to other presently industrialized nations. Second, they will result from the spread of industrialization, and with it the power of waging modern nuclear war, to the large areas of Asia, Africa, and South America."

NEGLIGIBLE RISK: Brown stated that this is the main reason for stopping the tests now, and that this would serve the best interests of both the Soviet Union and the United States. The arguments for testing, he says, are far overshadowed by those against.

"I believe that the risks inherent in a

policy which would hinder nuclear-military developments on a worldwide basis would be negligible when compared with the risks inherent in a situation in which controls are non-existent."

These are Brown's arguments for stoppage of nuclear testing. However, he has more than just reasons. He has devised an actual plan which could be put to work effectively in a reasonable amount of time. Following is the plan he has proposed:

Brown's Proposal

"First, we could agree upon a suspension of tests for a fixed period long enough for an international panel of scientists, representing the various areas of knowledge involved, to work out the specifications for a worldwide network of detection stations. This period might be somewhere between 1 and 3 years.

"Such a network could take any one of a number of forms. As an example, we might consider an assemblage of stations spaced over the land areas of the earth at 1,000-mile intervals, each of which would be equipped with the most sensitive of seismic, barographic, radiation detection, and other instrumentation.

"The stations would be manned by an international staff and would be in daily

communication with a central detection headquarters. The stations could, if desired, be placed at closer intervals than 1,000 miles, thus achieving even greater sensitivity.

STATION SENSITIVITY LIMITS TEST SIZE: "Second, knowing the characteristics of this network, we might then agree to ban all tests which could be detected and identified by the established system. This would mean that one could not let much radioactivity into the atmosphere or generate any appreciable air pressure waves. With respect to underground explosions, I am convinced that a system such as that which I have described could be designed which could detect, locate, and positively identify explosions above a certain minimum energy, which would lie somewhere in the kiloton range. The precise sensitivity would depend upon the nature of the rock in the vicinity of the explosion.

"However, the exact sensitivity is not the important factor. The most important aspect of the system would be that the really large explosions would be completely eliminated from the world scene.

"I would like to stress that at this stage I would not advocate the banning of all nuclear weapons tests for the simple reason that a much more elaborate system

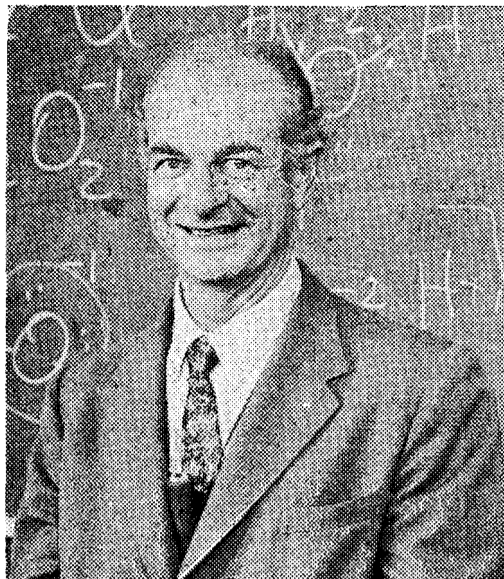
would be required to monitor the very small explosions. Nor would I be inclined to specify the maximum energies of tests.

"We should, I believe, keep this first step toward arms control as simple and uncomplicated as possible and simply agree not to conduct any tests which can be detected and identified by the established system. In other words, I would create a symmetrical situation so that the scientists of our own country would be as free as those of others to attempt to devise ways and means of testing within the framework of the restrictions."

A First Step

These controls by such an agreement are so important that Brown would not want the U.S. to connect this proposal with any other that would decrease the chances of attaining his primary goal. The agreement would not be the answer to all our problems.

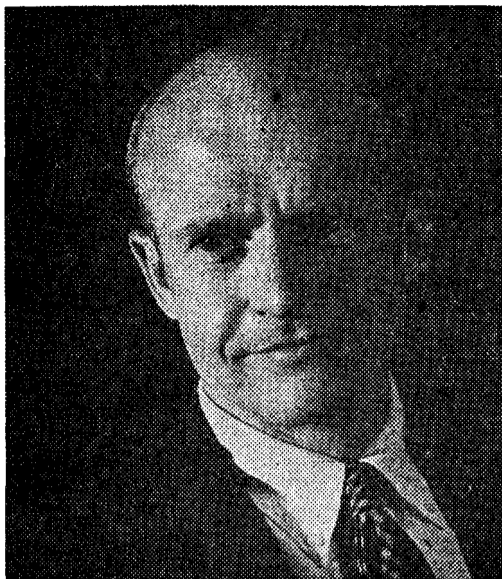
"Such an agreement would, however, keep matters from getting considerably worse than they now are. It would buy us time. Given these first steps it is conceivable that the way will be paved for much more sweeping agreements which might help us lessen still further the enormous dangers which confront us, before it is too late."



Linus Pauling



Harrison Brown



James Davies



News Bureau, E & S
Matt Sands

The Experts: High Qualifications For Public Concern

Linus Pauling

Dr. Linus Pauling is the outstanding critic of the hydrogen bomb testing program. Within the last few years the Chairman of Caltech's Department of Chemistry and Chemical Engineering has become the center of a storm of controversy.

Pauling was awarded the Nobel Prize in Chemistry for 1954 for his research into the nature of the chemical bond and its application to the elucidation of the structure of complex substances. His contribution to chemistry have been recognized also by several other awards including the American Chemical Society Award in Pure Chemistry and the Davy Medal of the Royal Society.

In 1948 he was given the Presidential Medal for Merit "for exceptionally meritorious conduct in the performance of outstanding services to the United States from October, 1940, to June, 1946."

Recent Activities

His recent activities in the field of nuclear testing include numerous public speeches and a telecast debate with Dr. Edward Teller, of the University of California at Berkeley, on the subject, "Should H-bomb tests be banned?"

On January 18, 1958, Dr. Pauling presented a petition to the United Nations, carrying the signatures of over 9000 scientists from over 47 countries, protesting the continuation of tests of the hydrogen bomb.

Filed Suit

On April 17 of this year Pauling announced that he, along with a group of other distinguished scientists and world leaders, had filed suit against the governments of the United States and Russia in a protest attempt to end the tests. The suits are still pending. Recently Pauling announced his intention to begin similar proceedings in both Great Britain and France.

The most recent of Dr. Pauling's public appearances on behalf of his opinions took place on May 11, 1958, on the national television program, "Meet the Press."

Harrison Brown

Dr. Harrison Brown received his B.S. degree at the University of California in 1938, and three years later the Ph.D. at Johns Hopkins University. During the war he made key contributions to the atomic bomb, first on the Plutonium Project at Chicago and later as assistant director of chemistry at the Clinton Labora-

tories, Oak Ridge, Tennessee.

After five years at the University of Chicago Institute for Nuclear Studies, he came to Caltech in 1951 to establish its geochemistry laboratories in the Division of the Geological Sciences.

Authorship and Awards

Brown has received awards from the American Association for the Advancement of Science and the American Chemical Society for his work in the investigation of the age of rocks, the abundance of elements in the universe, and the composition of the earth and of meteorites.

Brown is the author of "Must Destruction Be Our Destiny?", 1946; "The Challenge of Man's Future," 1954; and "The Next Hundred Years," 1957; which he co-authored with Dr. James Bonner and Dr. John Weir.

Brown was recently called to testify before a senate subcommittee on Foreign Relations as an expert on armament controls.

James Davies

Dr. James C. Davies holds a Ph.D. in political science from the University of California (Berkeley) 1952. In addition, before receiving his duties at Tech, he en-

gaged in study, teaching, and research at Oberlin (B.A.), University of Chicago (law school), University of Texas, Harvard and Michigan.

He specializes in the field of public opinion, having devoted detailed studies to the national election campaigns. Davies, a Democrat, is a member of the Society for Psychological Study of Social Issues, a division of the American Psychological Association and has written "Some Relations between Events and Attitudes," published in the "American Political Science Review."

His present post is Assistant Professor of History.

Matt Sands

Dr. Mathew L. Sands took his Ph.D. in physics at MIT in 1948 and joined the Institute two years later; he became an Associate Professor of Physics in 1953. Since then Matt Sands has become known as one of the more public-spirited and articulate faculty members.

He has been interviewed by Paul Coates on television and has spoken before the United Nations Association, as well as appearing numerous times before YM-CA and church groups, and campus lunch clubs.

James Davies

'Internal Decay Is Bigger Threat Than War'

By John Todoroff & Carl Gottschall

Dr. James Davies, speaking from a political science point of view, relegates the cessation of A-bomb and H-bomb testing to lesser importance than the question of the quality of our civilization and the consistent losses he foresees in competition with the Soviet system. He is far more worried by this subtle internal deterioration "without a shot being fired," than by the possibility of nuclear war.

In supporting these views to California Tech reporters, Davies offered the analogy of the bank president who is so concerned about the possibility of his bank burning down that he fails to note the steady withdrawal of deposits. That is, he accuses the U.S. of losing its sense of direction in a purely materialistic outlook, while Russia's unmistakable policy of active friendship toward the overthrow of "old, corrupt class systems, even at the price of a country's freedom," is attracting many small independents.

FAILURE TO UNDERSTAND: Davies is afraid that the U.S. citizen fails to understand that essentially his community has expanded from a few square blocks to the whole world. He wishes that politicians would divert attention from arguments to make, test, or drop bombs, to a consideration of "what's good in our civilization and how to spread this to the people who don't have it. We must sell them on our individual democratic freedoms."

For one thing, Davies firmly predicts that neither Khrushchev nor Eisenhower is "crazy" enough to commit the "suicide, not just homicide" of initiating an atomic war. He recalls that Adolph Hitler, "the closest to clinically insane of any person who has held public office in modern times," decided not to begin a poison gas warfare that would have destroyed Germany as well as London.

Further, Davies thinks that the relentless cries of men like Pauling and Brown are having their effect on the public opinion. In this vein, he forecasts a decision shortly, possible only a tacit agreement, concerning regulation of fissionable material. In stating confidence in the effectiveness of such a settlement, he reviews that the Hitler gas agreements weren't written down either, but were

Matt Sands

'Suicide, Perhaps - But With Our Eyes Open'

By Pete Bickle

Some time ago Dr. Mathew L. Sands came to the belief that total destruction of the human race through nuclear war is a real possibility, and that the world has entered a critical stage in its history. Ever since that time he has directed all his activity toward making the public aware of this fact. "If we wish to commit suicide," he puts it, "let us at least do so with our eyes open."

Sands feels that the concept of limited war is out of date. As was demonstrated by World War I, a limited conflict between minor powers can involve major partners by means of the alliance system. Despite any ban or understanding on the use of nuclear weapons, a general on the spot or at home might always feel that all could be won by using them. Then the game would be on. In fact, Dr. Sands pointed out, "The theory of modern war is being greatly influenced by the theory of games, in which irrational acts are essential to winning."

EVENTUAL DANGER: Even if limited war should be deemed practicable for the present, to Matt Sands, Dr. Harrison

enforced.

"Maybe people fail to give human beings credit for as much rationality as I do."

As a sidelight, however, Davies observed that the Brown-Schweitzer-Pauling contingent are not and will not arouse government leaders themselves as much as will the people that the scientists incite. "It is the private citizen, acting as

a conscience for society, who puts the pressure on the government."

He offers as reason, somewhat surprisingly, that our government is more sensitive to what will throw them out of office than it is directly to testimony to the Atomic Energy Commission. Even "the Commander-in-Chief is more responsive to the people that Harrison Brown excites than to Brown himself."

Brown's predictions of disaster seem quite probable: the eventual possession of nuclear weapons by more than two camps, any one of which may launch a sneak attack on the other without notice. With the advent of this concept, the entire idea of mass retaliation and the major use of atomic weapons is impractical.

Thus, to Dr. Sands, discontinuation of weapons testing above a certain size would be a logical first step out of the dreary mess we find ourselves in. The possibility of the spread of A-weapons to more than two major contenders would then be minimized; and he adds, an important first step towards the improvement of our tense martial climate would be made. Then the arms race, Sands claims, which seems to point inevitably to major conflict, would slow down. With this measure safely taken, others such as the discontinuation of ICBM testing could be made.

EVERY LIFE PRECIOUS: Finally, Dr. Sands considers the moral implications of H-bomb testing. "Admittedly the thousands of lives that will be lost due to the minute increase in total radiation seem

negligible to the number of humans of this earth. Nevertheless, each one of the men is being deprived of his life against his will and without his consent. Every human life that can be spared without harming others is precious."

This is the very point on which the proponents of further testing base their case. To them, continued testing is essential to the security of the United States. The discontinuation of tests, Sands' opponents reason, is not practicable since observation outside of a country's borders is impossible; and, in any case, the enemy's manpower resources without the aid of bombs would win the day.

SWIFT RETORT: To this argument Sands brings swift retorts. According to the presidential advisory commission, observation of weapons above a certain size is perfectly practicable. Manpower would not be a factor in any case, since previous stockpiles and research would continue. Moreover, with the spread of nuclear bombs to other countries, the device's value as a retaliatory weapon would be lost.

The Fair Sec's

By Howard Weisberg

While walking for some strange reason through the dark corridors of Gates Laboratory of Chemistry we saw several grad students leaning on the doorway of the Chemistry Office with their tongues hanging out and a glazed look in their eyes.

Wondering whether this peculiar behavior was their normal habit or whether it was prompted by some special circumstance, we looked inside the office and saw there a smiling, dark-skinned girl.

Fifteen minutes and two cups of coffee later we learned that her name is Della Lucero and that she has been working here since last year.

Cooks 'n Sews

We also determined that she was born in Greeley, Colorado, and that she is a graduate of Colorado State College, Class of '56, where she majored in home economics.

She is only working at Caltech, she said, because there are no openings now in the line of work that really interests her, that of a Home Demonstration Agent.



She tried to explain what that is to us but all we could understand is that it has something to do with 4H clubs and that you have to go to college to be one. Ask her if you want to know more.

She's a brunette, by the way, 5-3, with big brown eyes.

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 Breakfast, Lunch, Dinner
 SERVED DAILY
 Corner California & Lake

Poll Evokes Confusion, Strong Opinions

(Continued from page 1) tionnaires. These comments, while representing the thirteen such comments received, do not necessarily represent those who did not comment.

Faculty: "It should be pointed out that communists, fellow travellers and those slackers who never concerned themselves in their lives with any of the great projects for the protection of human life and freedom have been in the forefront, demanding that the free nations drop their guards. . ."

Graduates: "Reluctantly, I am forced to endorse the present testing policy of the U.S. until the dangers resulting from this policy are clearly defined by an equally competent authority."

"If the sentiment favors Dr. Pauling's position as I feel it will, I think you should exert all the influence your paper can in distributing Caltech's opinion to all newspapers . . . possible so that we may show our wholehearted support of Pauling's (et al) cause."

"All this fuss about a few thousand leukemia cases (maybe) when thousands are dying

of starvation (daily) and the situation encourages a nuclear war is . . . incredibly unrealistic, so much so that one is tempted to believe (at least in part) the statement of Lewis Strauss that some of the excitement is fostered by Communists."

"It is possible to oppose testing without agreeing with Linus Pauling."

Undergraduates: "I doubt that anyone knows the health hazard any better than those who are conducting the tests."

"I feel that he (Dr. Pauling) is a competent physical-biochemist who knows what he is talking about, regardless of the sometimes impractical methods he uses."

"I admire Pauling's humanitarian interests, but I consider it pie-in-the-sky intellectualism." "Pauling has made his point, now it is time for him to shut up and stop giving Tech a black-eye."

The last question — "Keeping in mind the possible advantages (increasing scientific knowledge, increasing national security) and the possible disadvantages (endangering the

health of present and future generations, increasing the probability of major war) of continued nuclear weapons testing, I (do, do not) think the advantages of continuation of such tests outweigh the disadvantages, (greatly, slightly)." — drew many comments, among them, "Huh?" It is an ambiguous question, offering a confusing array of choices (and we got a confusing array of answers, like "I do not think the advantages . . . outweigh the disadvantages slightly.") It also did not provide the choice that disadvantages outweigh advantages.

Another objection is typified by "A layman like myself has few facts to reason from," and "Any action should be taken for sound reasons, not mob opinion." The purpose of this poll was to determine "mob opinion," not to determine policy.

We want to thank everyone who returned his questionnaire and urge those who have not yet returned them to do so as soon as possible, since we intend to tabulate the complete poll this summer.

Campus Brewins

Beak was sojourning in front of Blackblurb when who should appear but Yon Barps, human TV antenna. "Why," asked Beak, "are you dressed in your formally with date?"

"Man," Barps said, "are you too out of it, like. Don't you dig nice lookers man?"

"Yeah," gasped Beak, "but like where do you wear the sleeping bag?"

Toth Tricked

Poor Teeth lay prostrate on the floor, pinned by massive bodies above. Infinitely worst of his pain were the two strange eyes staring down at him.

"Doll," he whispered to his date, "who's on top?"

"Beats me," said she, turning around, "I never met him until just now, but he's awfully . . . nice."

Peter Panned

Van Crotch and Restroom claim they don't understand modern dance.

"We were watching Peter Pan," sorrowfully mumbled Restroom. "Peter was played by a dancer and a speaker."

"When they gave first prize to 'The Dancing Peter' they threw us out. We must've reacted wrong, or sump'n."

Sticklers!

WHAT'S THE FOREMAN IN A CATCHUP FACTORY?

 SHARON YACHON, U. OF DETROIT Sauce Boss

WHAT IS PEANUT BUTTER?

 ROBERT ALTIERI, U. OF PITTSBURGH Spreadable Edible

WHAT'S A BANK'S ARMORED CAR?

 JENNIFER BELT, RADCLIFFE Buck Truck

WHAT IS AN INEPT SKIER?

 HELEN ZAYNOR, U. OF AKRON Slope Dope

LAST CALL FOR STICKLERS! If you haven't Stickled by now, you may never get the chance again! Sticklers are simple riddles with two-word rhyming answers. Both words must have the same number of syllables. (Don't do drawings.) Send stacks of 'em with your name, address, college and class to Happy-Joe-Lucky, Box 67A, Mt. Vernon, N. Y.

WHAT'S A SENIOR WHO DOESN'T GET LUCKIES FOR A GRADUATION PRESENT?
 (SEE PARAGRAPH BELOW)

GRADUATION PRESENTS? You may get a (Groan!) 6-cylinder European sports car or a (Yawn!) 6-month European vacation. These silly baubles just prove that parents don't understand the college generation. What every senior really wants (C'mon now, admit it!) is a generous supply of Luckies! Luckies, as everyone knows, are the best-tasting cigarettes on earth. They're packed with rich, good-tasting tobacco, toasted to taste even better. So the senior who doesn't receive 'em is bound to be a *Sad Grad!* Why let parents spoil commencement—it only happens (Sob!) once. Tell 'em to gift-wrap those Luckies right now!

WHAT'S A GROUP OF 190-LB. GIRLS?

 CAROL BRADSHAW, COLORADO STATE Heavy Bevy

WHAT IS AN OSTRACIZED BEE?

 BARBARA FELLOW, DE PAUW Lone Drone

WHAT ARE A ROBOT'S RELATIVES?

 DON GUTHRIE, U. OF WICHITA Tin Kin

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