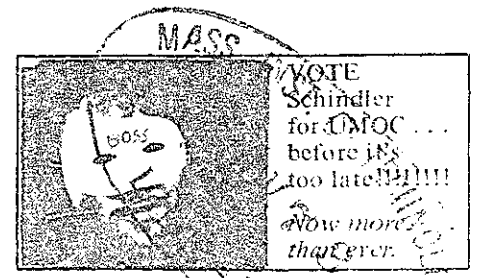


"Continuous News Service
Since 1881"

The Tech



VOLUME 93 NUMBER 46

MIT, CAMBRIDGE, MASSACHUSETTS

TUESDAY, NOVEMBER 13, 1973

FIVE CENTS

MIT Reaction

The Tech poll shows anti-Nixon sentiment Perkins appointed ass't to dean

By Mike McNamee

MIT students tend to favor impeachment of President Nixon — although they agree with his recently-announced energy policies, they feel that he has not been handling his job properly. These conclusions are based on a telephone poll taken by *The Tech* on Sunday, November 11. Several *The Tech* editors called telephone numbers selected at random from the student directory, and compiled the replies to the eight-question survey. The results are shown in the table below.

The pollsters discovered that although 76% of the students answered that they would support a movement by the House of Representatives to impeach Nixon, only 28% had lobbied in any way to promote or protest the impeachment moves currently being taken in the House. Students who had lobbied stated that they had signed petitions, wrote letters and sent telegrams to their congressmen.

Even those who supported impeachment, it was found tended to think it would not be

(Please turn to page 2)

By Ken Davis
The School of Engineering last week announced the appointment of Professor Frank Perkins as Special Assistant to the Dean of Engineering for Educational Programs.

Perkins, a professor in the civil engineering department, will be mainly responsible for initiating a new general engineering program that was one of the recommendations of a forthcoming study by the Center for Policy Alternatives.

The report, which was sponsored by the Sloan Foundation, is the product of a committee, whose twelve members included representatives from MIT, industry, and other universities. It covers engineering education in general, not specifically at MIT. The committee included Perkins and was chaired by J. Herbert Hollomon, Director of the CPA.

"We think that there's a market for a broader engineering degree than is available from any one department," said Associate Engineering Dean James D. Bruce. Perkins expects the program to appeal to three classes of students: 1) Those who feel educationally constrained by the requirements of any one department. In this respect, the program might be an analog of Course XXV.

2) Those who aren't certain what they want to do. The Program will be structured so that students at the end of their sophomore or junior year could switch into a department, or go to graduate school in a department.

3) Those who could benefit from a technical undergraduate education, but wish to enter other fields, such as medicine, law or management.

The program will be set up as a school-wide program, not as a separate course. There will be

new subjects developed for it, which will be combined with current courses to form the curriculum. The new courses will be taught by present staff.

Perkins feels that the new subjects set up will deal with areas that don't specifically fit into any department. They will include some that deal with issues and concepts, such as the energy crisis, resource development and environmental and economic implications of engineering. Other suggested subjects are systems analysis as applied to decision making in engineering, and computer methods of model building.

Perkins emphasized that the new program will have some depth. Students in the program will be required to have an area of concentration. "He [the student] must actually learn to do something," Perkins said.

Although this program will not specifically be designed to include new fields such as biomedical or environmental engineering, it is hoped that the course will be flexible enough to cover such subjects.

Both Bruce and Perkins said that there might be some problems in setting up school-wide courses. Bruce feels, however, that these problems will be mainly administrative, not conceptual. Bruce also feels that the subjects should be of some ap-

peal to students not in the program, but who want to get some background in engineering. Perkins stressed that plans for the program are not finalized. He is currently having discussions with MIT staff, as well as people at other schools with similar programs, and developing new ideas. Student involvement in the planning process will be sought at some later date. Perkins hopes to have the program operative by September of 1974.

One of the questions being debated is whether or not there are good reasons to have school-wide subjects. A possible alternative would be to use the joint label and put them in two departments. Perkins feels that it would be "psychologically beneficial" for the program to offer school subjects.

Perkins envisions that in the future, there may be Institute-wide offerings which will combine areas dealt with by several schools. He cited as examples subjects involving engineering and political science or economics.

Perkins noted that a general engineering program. Course IX-B existed at MIT in the 1950's and early 1960's. He intends to talk to people who were involved in the course to find out why it was dismantled, and hopefully avoid the pitfalls that caused it to fail.

	1	2	3	4	5	6
yes/approve	25%	64%	79%	76%	28%	28%
no/disapprove	75%	36%	21%	24%	72%	72%

	Question 7	Question 8
Excellent	12.5%	TV/Radio 47.4%
Good	43.8%	Newspaper 36.8%
Average	37.5%	Others 15.8%
Poor	6.2%	
Not at all	0%	

- 1) Do you generally agree or disagree with the way President Nixon has been handling his job?
- 2) Do you approve or disapprove of President Nixon's plans to ease the energy crisis?
- 3) Do you generally agree or disagree with the statement that recent events have seriously damaged President Nixon's ability to govern effectively?
- 4) The House Judiciary Committee is currently studying the question of impeachment. Would you support a move by the House to impeach President Nixon?
- 5) Have you in any way lobbied members of Congress to support or protest such an impeachment move?
- 6) Some commentators have viewed Nixon's energy speech, as well as the earlier military alert, as attempts by the President to "take the heat off" on the Watergate affair. Do you agree?
- 7) Would you consider your knowledge of current affairs to be: excellent; good; fair; poor; don't follow at all?
- 8) Do you get most of your news from: newspapers; TV/radio; newsmagazines; word-of-mouth?

Institute faces fuel oil shortage

By Mike McNamee

MIT's fuel oil supply for the coming winter has been cut by 30% due to nationwide shortages of oil, according to the Physical Plant Department.

White Fuel Company and Metropolitan Petroleum Company, MIT's two major suppliers of fuel oil, notified the Institute last week that they would be unable to supply MIT's full needs during November. There are "strong indications," according to Thomas E. Shepherd, Superintendent of Utilities in Physical Plant, that the situation will persist throughout the winter.

Vice President for Operations Philip A. Stoddard outlined steps that would be taken to conserve the Institute's energy supply: "The first thing will be acquainting people with various ways of saving heat — shutting drapes, keeping windows and corridor doors shut, and so on. We'll try to do this through articles in community papers and notices and memos."

Stoddard stated, "What we're facing is no more than what every homeowner and business in the country might be facing this winter." He added that the Institute's posture was simple: "We just have to cut back as much as possible."

Shepherd said that Physical Plant is trying to make at least a 15% cut in consumption, since "we are certain to be at least 15% undersupplied for the rest of the winter." Buildings that do not have large night-time use will have the ventilation systems shut off during off-hours, to cut the amount of air that is heated. This will reduce the temperatures in the buildings, but Shepherd said, "In a building that is substantially unoccupied, it will not be uncomfortably cold."

Long-term study of the Institute's heating system will be needed in planning for similar eventualities in the future according to Shepherd. "We have to look at each building individually, and analyze its heating needs," Shepherd said. "Right now, detail is the heart of the problem."

An IAP project is being considered, Shepherd added, to involve students in the analysis of the buildings' heating systems.

H. Eugene Brammer, head of Housing and Dining Service, told *The Tech* that his office is preparing information on energy conservation for dormitory residents, which will be distributed this week. "Dorms are different from offices, and

have to be treated differently," he said. "We can't screw around with dorm temperatures."

"We will take action as necessary to deal with the situations that arise," Brammer said. "But it definitely will not be a cold winter in the dorms."

News Analysis

The nuclear question: 'Are reactors unsafe?'

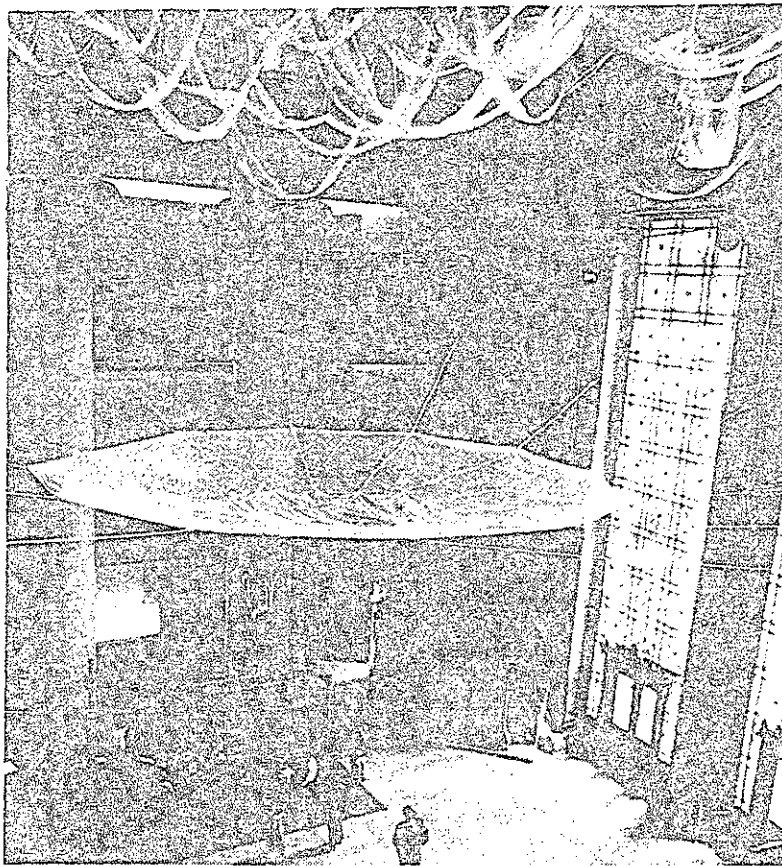
(Second of two parts)
By Storm Kauffman

Barring unforeseen regulatory action or delays, the US nuclear electric generating capacity will increase nearly tenfold in the next eight years. If President Nixon's call for accelerated reactor licensing becomes a fact, that figure could be much higher.

In 1972 the US had approximately 11,000 megawatts of nuclear electric capacity (or about 2% of the total installed capacity). At least 65,000 more megawatts of reactor power has been ordered and 45,000 planned by the utilities. Estimates for the year 2000 put the nuclear contribution at anything from 10% to 50% of the total electric demand.

If the country is going to be faced with that sort of escalation of nuclear power, the public should be adequately informed as to the dangers that may be involved. Both sides of the reactor safety issue — the utilities and vendors versus the environmentalists — have been attempting to do just that.

(Please turn to page 5)



Weather

The latest bit of artwork to adorn the Building 7 Lobby at 77 Mass Ave is this exhibition, entitled *Weather*. The display was designed by Professor of Architecture Otto Piene, and was set up last weekend. The exhibit will be on display in the lobby for several weeks.

NOTES

* The Activities Development Board is presently receiving applications for capital equipment funding for student and community activities until November 23. Applications may be secured from Dean Holden's office in Room 7-101.

* If you are planning to apply for an National Science Foundation Fellowship, the deadline date is November 26. You may pick up your preapplication forms at the Graduate School Office, 3-136.

* Norman Marx of Autodynamics Race Cars will be the speaker at an AUTOMOBILE CLUB meeting on Tuesday night in the Mezzanine Lounge of the Student Center. The meeting will start at 7:30. Autodynamics is the manufacturer of Formulax Fords and Vecs that have won 3 National Championships.

* Forum on the Legal Profession. Robert P. Bigelow will speak on "Practice in the Firm: the Specializing Generalist," Tuesday, November 13 at 3:30pm in the Mezzanine Lounge of the Student Center.

* On the 300th anniversary of the death of Moliere, the 17th-century French comic playwright, and prior to a French company's performance of L'Avare in Concord on December 2nd, the Department of Foreign Literatures is showing the French movie classic Portrait de Moliere, directed by Jean-Louis Barrault and B. Pansu. The film not only shows scenes from Moliere's plays, but also how the 17th-century French theatre was organized and operated. It will be shown on Tuesday, November 27th, in Rm 10-250, at 5:15pm. The film lasts 60 minutes, and admission is free.

* Tuesday 11/13, 14E-304, 8pm: Tillie Olsen, Women & Writer & Writing Part III; Denied Genius: Blood Kin of Great Writers; Dorothy Wordsworth, ALICE. James, Sophia Thoreau, Mary Moody Emerson.

* MIT UHF Repeater Association Tuesday November, 13 7:00pm. Second Floor West Lounge Student Center.

* The MIT Auto Club will have a meeting on Tuesday 13 November in the Mezzanine lounge of the Student Center at 7:30. * Professor Tamar Frankel will hold a group meeting on Monday, November 12 from 10 to 11am in 4-163. Dean Kirkpatrick from George Washington University Law will speak to interested students at a group meeting on Tuesday, November 13 at 12 noon in 4-149.

* MIT Hillel will sponsor a symposium entitled "Peace and War: An Encounter with Israel" and a performance by the Zamir Chorale of Boston on Sunday, November 18, 7:30pm at Kresge Auditorium. The participants in the symposium will be: Professor Alan Dershowitz of Harvard Law School, ("The Advocates"); Harvard social psychology professor Steve Cohen, editor of *Mideast Probe*; Professor of Religion Art Green of the University of Pennsylvania; and Harvard history Professor David Landes, Chairman of the Academic Committee for Peace in the Middle East. The Zamir Chorale, a professional college-age chorus just back from a summer in Israel, will present a program of Hebrew music. Admission to the event is free.

* Students - Would you like to spend the holiday with a family? MIT Families - Would you like to add to your family for the holiday? For information call Mrs. J.B. Fiedman 527-1022.

* MIT Committee on the Middle East sponsoring: FORUM - Crisis on the Middle East; Thurs. November 15 at 7:30pm in the Sala de Puerto Rico. Speakers - Professors Norm Chomsky of the Linguistics Dept, David Gil of Brandeis, Gerard Chalhond - journalist, author of books on Palestine, Vietnam, etc. and other speakers.

Tech poll shows support for impeachment

(Continued from page 1)
carried through by Congress. One Burton House resident said "I suspect he's not going to be impeached ... Everybody's refused to put their foot down."

The replies to the first question, dealing with Nixon's performance in office, reflected the nation-wide feeling of dissatisfaction with the President that has been reported in many other polls.

Nixon's ability to govern had been damaged by recent events, according to 79% of the respondents. One student said, however, that he disagreed with this, because "President Nixon never had the ability to govern effectively." He added that Nixon should be "thrown out of office before he does more damage."

The energy crisis is the only area covered by *The Tech's* questions where MIT students seem to agree with the President's policies: 64% approved of his plans to ease the crisis. Some students expressed a feeling,

however, that the actions taken by the President are "too little too late." One student commented, "It was a very foreseeable problem. I think they knew there was going to be an energy crisis, but they were afraid to do anything about it."

As reflected in replies to the

UMOC results

Phil Mandel lead the field at the end of the first day of collections for the APO Ugliest Man or Campus Competition, with \$42.19.

The competition, held annually, raises funds to be used for charity. This year the recipient is CARE.

Solid last among regular candidates was *The Tech* candidate Paul E. Schindler, Jr., with \$18.54. Count UMOC was a close second, with \$41.81; Nick Danger collected \$32.98 the first day.

Highest write-in total was tallied for Richard M. Nixon, who got \$6.24.

last two questions, most students depend on TV and radio, and to a lesser extent newspapers, for their information. Most of the respondents considered their knowledge of current affairs "good" or "average."

One student who rated his knowledge as "poor" added, "I

don't think you can judge by what is said in newspapers or on TV . . . They're too biased."

Only a few respondents failed to reply to questions due to lack of knowledge of the issues. Several students did, however, point out that "these questions are hard to answer yes or no."

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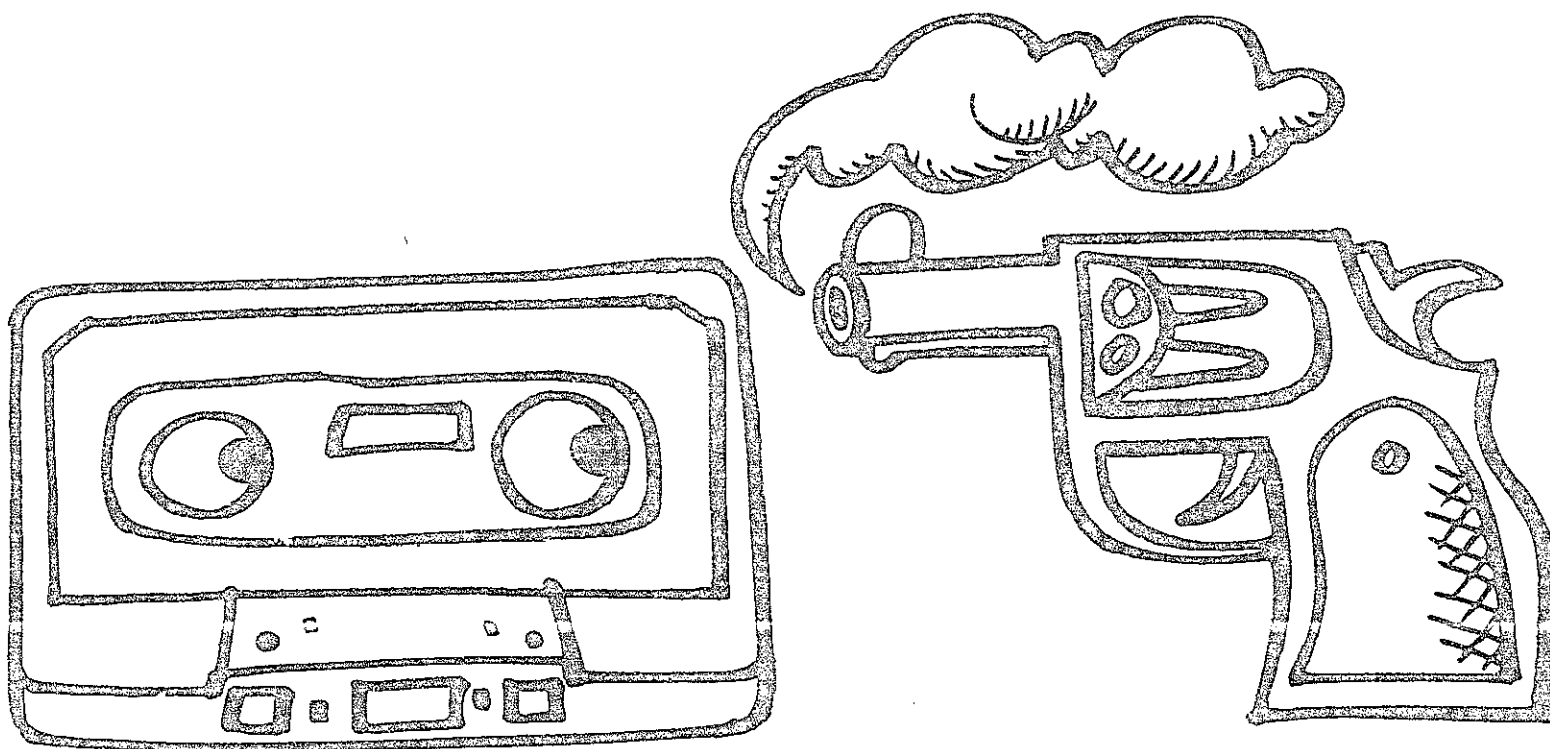
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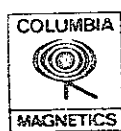
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Nixon energy plan: "too little, too late"

By Norman D. Sandler

As the cold air of winter began descending upon the nation, President Nixon last week assured the American people he would see to it that they would stay warm, even if it does take a few extra blankets and a reluctant acceptance of cold showers over warm ones.

Actually, the plan for easing the energy crisis outlined by Nixon in his nationwide address last week would have been effective - if he had ordered the initiatives taken one year ago, when everyone was talking about an "impending energy crisis," but nobody was doing anything to prevent it.

A major thrust of Nixon's energy statement was in the area of nuclear power. The President said he was committing this country to further development, improvements and upgrading of nuclear power plants, which many experts believe could make up for any future energy shortages.

Admittedly, the President last year announced he was giving the highest civilian priority to research and development of the Liquid Metal Fast Breeder Reactor (LMFBR) which when in operation could provide electricity for "the masses." However, that step was but a long range initiative. The LMFBR is still in the earliest research stages, and researchers report having trouble with several pre-prototype designs.

Estimates vary as to when this country can expect operational breeder reactors. However, the earliest predictions are not until the late 1980's, with a more realistic date approaching the early to mid 1990's. Yet, Nixon boosted the Atomic Energy Commission's Fiscal Year 1974 (FY '74) budget some \$63 million, of which \$51 million is being added to the LMFBR R&D effort. This along with a 35% (\$32.8 million) increase in R&D for the AEC's thermonuclear fusion program, constitutes a large investment in long range possibilities, but there still exist no solutions for the short term.

Nixon said he would trim licensing and construction times for nuclear (fission) power plants from 10 to six years, yet the FY '74 budget included only an 11% increase in funds for work in insuring the safety of current generation nuclear facilities.

What the latest Nixon posture statement on energy amounts to is just "too little too late," as one member of the scientific community observed. We now find ourselves in a position where gas rationing appears to be imminent, schools and industry are preparing for a cold winter and over \$100 million has been appropriated in R&D funds for research on facilities which may not be on-line until the year 2000.

However, the situation is by no means hopeless. In order to curb energy consumption and conserve fuel, there will have to be major shifts in social policy, initiated by the government. Not only will speed limits be reduced, but changes will have to be made in transportation policy which discourage

large, "gas-gulping" cars, and favors smaller vehicles which can meet current pollution standards, while promising lower fuel consumption.

White House energy czar John A. Love predicted Monday that rationing of gasoline would take place by January, and said the "energy crisis" would last for at least three to five years. Love's predictions are rather conservative, since many new energy resources (such as new nuclear power plants) will not be in operation until at least 1980. In addition, Interior Secretary Rogers C.B. Morton said Sunday rationing would begin "within the next two or three months," and Morton's estimate was backed up by a similar claim by Love's deputy director, Charles Dibona.

Shifts in lifestyles such as this cannot be achieved by government fiat alone; nor can they be left wholly up to the discretion of the public. Rather, there must be some interface between the public and private sectors to insure steps are being taken to decrease energy consumption.

One of the most obvious places from

which fuel cuts will come is transportation, and particularly the auto industry. Supported by monies from the Department of Transportation, the Environmental Protection Agency's Alternate Power Systems Program, the National Science Foundation and a number of other federal funding sources, the major auto makers are all experimenting with new engines, which will comply with future federal pollution and fuel consumption standards.

The problem again is one of time. Prototypes of vehicles incorporating the new engines may be ready by the 1975 deadline, but full-scale production could not begin much sooner than 1980. It is apparent that in the meantime we will have to work to decrease our dependence upon the automobile, which in the past half century has played an instrumental role in shaping the fabric of our social structure.

In order to ease the strain on energy resources the public will have to make a number of sacrifices which ordinarily would seem unreasonable. Two car fam-

ilies will begin relying upon one car, members of the MIT community who commute to work in the morning will begin looking for car pools or taking advantage of what will probably become an overworked rapid transit system (MTA) and those who insist on the luxuries of large automobiles will have to pay the price, in the forms of high gasoline prices (perhaps three times as great as those currently charged) and taxes on parking within the city, levied to discourage commuting by car.

These short-term "stop gap" measures will certainly inconvenience people in the near future. Exactly how long they will remain in effect cannot yet be determined. However, any comprehensive effort to solve the energy crisis will have to include voluntary and mandatory restrictions on personal and commercial uses of fuel resources, as well as an expanded and accelerated federal R&D program to develop and promote new sources and more efficient uses of energy, so that the stop gap measures designed for the short term do not extend into the long term.

(Norman Sandler is Executive Editor of The Tech.)

Letters to The Tech

To the Editor:

While the President's conservation measures deserve overall support, they reflect a mixed-up set of priorities, penalizing relative necessities at the expense of relative luxuries. My major objection to his proposals is the reduced speed limit, which fails to affect the half of the driving done in urban areas, while having disastrous effects on long-distance travel times, especially interstate freight and bus schedules. Further, lowering the speed limit by more than a quarter (70 to 50) lowers the road capacity by the same amount. The real problem is not the speed driven, but the poor mileage caused by the American love affair with large automobiles. I propose the following further steps as alternatives to the speed reduction, and as reflecting a more proper priority:

- 1) A ban on production and sale (after Jan 1) of cars yielding less than 10 miles per gallon, to be extended to 15 miles per gallon after September 1, 1974. Catalytic conversion replacing inefficient carboration makes this possible within current pollution control levels.
- 2) An immediate ban on production and sale of snowmobiles, private planes, and pleasure boats.
- 3) Immediate ban on sale of fuel for the above, with the exception of vital private aviation (e.g. crop dusting, but not "executive" aircraft).
- 4) Ban on sale of electric lights stronger than 75 watts for home use.
- 5) Construction of urban facilities for bicycle parking, with relaxation of fire department ban on bicycles in elevators.
- 6) Proper synchronization of traffic lights in large cities to reduce idle time; changeover from stop lights to flashing signals in off-peak hours.
- 7) Government-sponsored computer carpooling, with subsidies in the form of reduced excise taxes for participants. Gasoline tax increases to offset lost revenue.
- 8) Federally funded crash program for alternate sources of energy production, e.g. geothermal, tidal power, offshore wind turbines, ocean thermal gradients.

If these proposals are adopted, the vast majority of the population will be totally unaffected. It is interesting that the

President suggests reduction of airline flights, while failing to mention the private aircraft used by the businessmen who contributed so heavily to his campaign.

David A. Konkel

To the Editor:

I'm writing for the Wesleyan Constitutional Action Committee, a group at Wesleyan University working for the impeachment of President Nixon. We plan to do some lobbying in Washington and would like to get together with other impeachment groups at other schools to coordinate lobbying efforts. Coordination is essential if we are to effectively use our political power as students.

We're hoping that you, individually or through your paper, can help us in contacting impeachment groups at MIT and in the lobbying effort itself. The best thing we can do to help impeachment is to keep Congress conscious of the fact that substantial popular sentiment exists for impeachment - a constant barrage of coordinated lobbyists can accomplish this objective. Yale has sent a bus down to Washington this week and their initiative must be followed.

Wesleyan Constitutional Action Committee
c/o Ralph Wilson
Box 818
Wesleyan Station
Middletown, Conn. 06457

Thanks!

Janet R. Melkemes

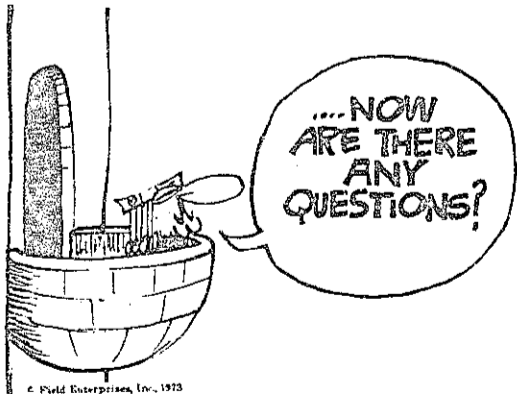
To the Editor:

I must take issue with my friend Ernest Evans (*The Tech* Tuesday, Nov. 6, 1973 page 5 column 2). To say that the CIA was *not* reflects the warped liberal smog permeating the pre-Watergate air.

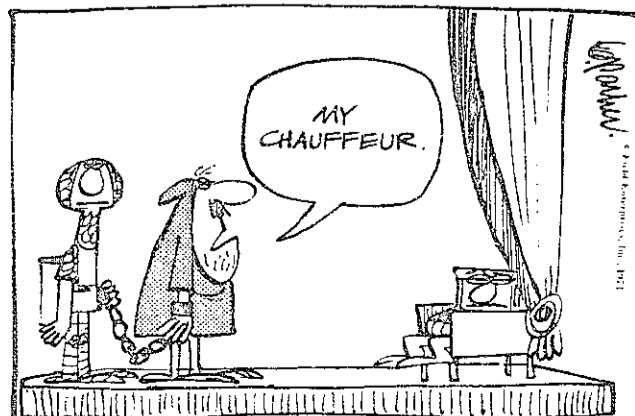
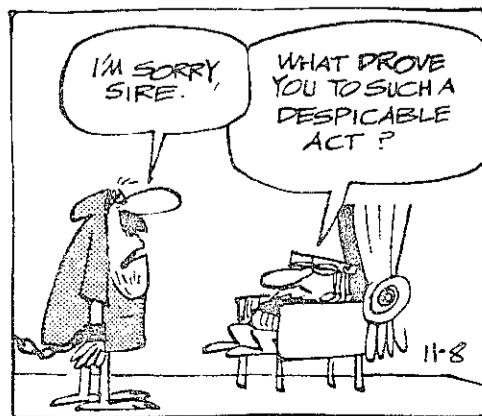
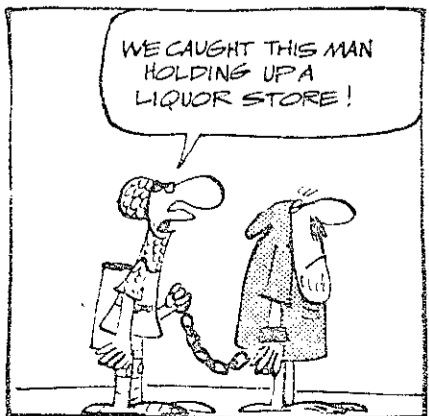
The CIA has its fingers in so many international pies that one is surprised that it is only an intelligence operation. Everytime it sticks its thumb into a pie, like Little Jack Horner, it puts out a coup, execution, or fun and profit.

Sure the CIA makes mistakes, like Watergate, as Ernest Evans points out. The only unusual mistake in Watergate was getting caught, not its minor involvement in a petty domestic squabble.

Walter W. Hill



THE WIZARD OF ID



The Wizard of Id appears daily in the Boston Globe

by Brant parker and Johnny hart

Continuous News Service

The Tech

Since 1881

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More nuclear safety research is a necessity

(Continued from page 1)

The issues that environmentalists have raised recently about the safety of clear reactors lie mostly in three areas: daily radioactive emissions, provisions for cooling the core in an emergency, and storage of nuclear wastes.

About four years ago, the debate began. It dealt with emissions of radioactive gases and particulates from reactors and radiation levels at the plantimeter. The AEC stepped in quickly and imposed strict limits on the power plant emissions, cutting permissible rates to less than half their normal levels.

For the present, most experts are satisfied with these restrictions. Common observations are that a person would get more radiation on a plane flight to a reactor for a year and a fossil plant releases more activity to the atmosphere (in the form of Carbon-14) than a coal plant.

But as soon as this controversy died down, a new and more serious one moved in to take its place.

The question of the extent is whether reactor systems are capable of coping against a disastrous event should a reactor lose its cooling water. This situation is the "maximum credible accident" for a reactor and is called "loss of coolant accident, (LOCA)." Reactor vendors claim that they have sufficiently provided for a LOCA by installing Emergency Core Cooling Systems (ECCS) which are designed to inject coolant into the core in the event of a failure of the primary system.

The scenario for a "maximum credible accident" LOCA is that there is no ECCS

protection is that of the worst possible reactor accident. The activating circumstance is earthquake, sabotage, or fatigue failure which results in a shearing rupture of the main (primary coolant) inlet pipe (safety analysts always attempt to consider the worst possible credible cases.) The primary coolant then sprays forcefully (system pressure 1000-2000 psi, temperature in excess of 600°F) out of the open ended break.

In the absence of the water, which serves as a neutron moderator to permit continuation of a chain reaction, the fission process would cease. However, an extensive source of heat remains in the form of the intensely radioactive fission products in the fuel. As these decay, they release more heat (which decreases as only the fifth power of time). The net result is that there is still a substantial source of heat, and that this heat must be removed for a long period after the shutdown of the reactor.

Under normal operating conditions the fuel cladding sheathing temperature is approximately 660°F, while the centerline fuel temperature is 4000° (melting point about 5000°F). Upon loss of coolant the fuel begins to heat rapidly and would begin to melt, probably within a minute. If the ECCS was not effective within this time, the entire reactor core (fuel, cladding, structural material) would begin to melt and slump downward.

Cooling water injected at this stage could amplify the disaster — the water would flash into steam, and metal-water and metal-steam reactions would add more heat to the process (besides further attacking the integrity of the cladding).

As the cladding is the pri-

mary defense against release of fission products and 20% of the fission products are gaseous (krypton and xenon), the meltdown would release considerable radioactivity from the core. If the secondary defense, the containment vessel, did not burst, the molten core would still continue to melt its way downwards. The possibility of this process continuing indefinitely has been flippantly named the "China Syndrome" but calculations indicate that the mass would probably come to rest some tens of feet below ground.

However, by this time all containment barriers have been broken and the massive radioactive inventory (about ten billion curies) of the reactor is free to spread.

The probability and the remedy

Considerable research has been conducted into construction of pressure systems of high integrity, and the standards have been drawn up as the industry-wide code known as Section III, Nuclear Vessels of the ASME Boiler and Pressure Vessel Code, and a similar code for pressure piping. According to Professor of Nuclear Engineering Norman Rasmussen, these codes — which cover suitability of materials, design criteria, fabrication methods, testing procedures, inspection and quality assurance and control — are "recognized as the most stringent codes for pressure systems in use today."

Rasmussen is currently working with a group under AEC contract on a project to evaluate probabilities of reactor accidents. No results are ready yet, but some preliminary estimates from previous work were published in *Science* last year.

The systems do occasionally develop small, slowly propagating cracks from fatigue, and "reactors must be instrumented to detect these leaks quickly so they can be repaired long before a LOCA can develop," says Rasmussen. As there has been no instance of a sudden sizeable break, there is no information on which to base a normal probability estimate. However, pressure systems specialists believe that such failure have probabilities on the order of one in ten-thousand per reactor year. A group of 100 reactors might thus have a chance of .1/decade of having a LOCA. As this is

unacceptably high, ECCS have been added to provide protection in case of a LOCA.

Opponents of the reactor programs, such as Professor of Physics Henry Kendall of the Union of Concerned Scientists, claim that these probability calculations are in error. Further, they contend that the ECCS, if called upon, will fail to do its job.

In a previous interview with *The Tech*, Kendall pointed to one of the few tests of an ECCS. The tests, part of the Loss-of-Fluid program, were performed on a small semi-scale mockup of a pressurized water reactor ECCS, designed to flood the core from the bottom.

Only a fraction of the ECCS water reached the core, most of the coolant was observed to escape through the initial break in the primary system. Thus, the indication was that the ECCS would fail at the same time and in the same way as the primary system. Kendall states that these results raise a basic "uncertainty about the reliability of the emergency core cooling system." He further points out that equivalent tests for boiling water reactors have not been performed.

In his article, Rasmussen analyzes a four-component BWR ECCS (high pressure injection, core spray, and low pressure injection). The two most important parameters are the break size and its location. Requirements are that cladding of the hottest pin not exceed 2300°F, the core geometry remain amenable to cooling, and that the cooling be maintained long enough to remove decay heat.

Rasmussen notes that "the calculational model must include certain assumptions and approximations," but notes that the most conservative assumptions are used. Also, the model must be checked carefully against instrumented experiments. While a large-scale test is planned, to date all have been on tenth-scale models. However, the calculational models have predicted test results well.

Using worst situation assumptions (largest break and need for startup of on-site auxiliary power and others), the models show that safety requirements are met. Allowance for swelling due to temperature

transients should still permit sufficient coolant flow.

Rasmussen agrees that "we do not know many of the parameters as accurately as would be desirable and surely continued research is necessary," but concludes that the possibility of a LOCA is less than once in every 10,000 years of reactor operation with ECCS failure at least a hundredth of that. Kendall contends that the assumptions on which the models are based are invalid, and that LOCAs are more likely and ECCS failure more certain.

Both agree that more tests are necessary but disagree on whether the nuclear program should be permitted to continue in the meantime. The decision may ultimately lie with the public who will have to decide whether the benefits of available power are worth the risks (whatever the models show them to be) of nuclear reactors.

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Police Blotter

Police Blotter is a compilation prepared by Campus Patrol to report crimes occurring in the MIT community.

11/4/73 - 4:30am
Recovery of a Stolen Motor Vehicle on Amherst Street (West). Stolen from District No. 1, Boston on October 29, 1973. Turned over to Cambridge Police Department.

11/5/73 m
Larceny of a Brown Leather Navy Type Flight Jacket from the coat rack, second floor of Student Center. Owner was giving blood at time of theft.

11/5/73 - 4:05pm
Larceny of a womans handbag from an open room, second floor, Nichols. Handbag found in trash bag on second floor, wallet found in trash bag on first floor, intact except for money.

11/6/73 - 3:30am
Found in vicinity of Twenty Chimney's, one pair of mens brown leather shoes and note-

books. Believed to be property of John E. Lay. John may retrieve by claiming same at Campus Patrol Headquarters.

11/6/73 - 5:59am
Report of a disturbance at Student Center. Patrol investigated and report enroute to Boston State Hospital to return subject.

11/7/73 - 1:25am
Recovery of a Stolen Motor Vehicle on Memorial Drive. Stolen in District No. 14, Boston on October 7, 1973. MDC Police notified.

11/6/73 - 11:00am
Larceny of four (4) hub caps from a VW parked in the Building 48 parking lot.

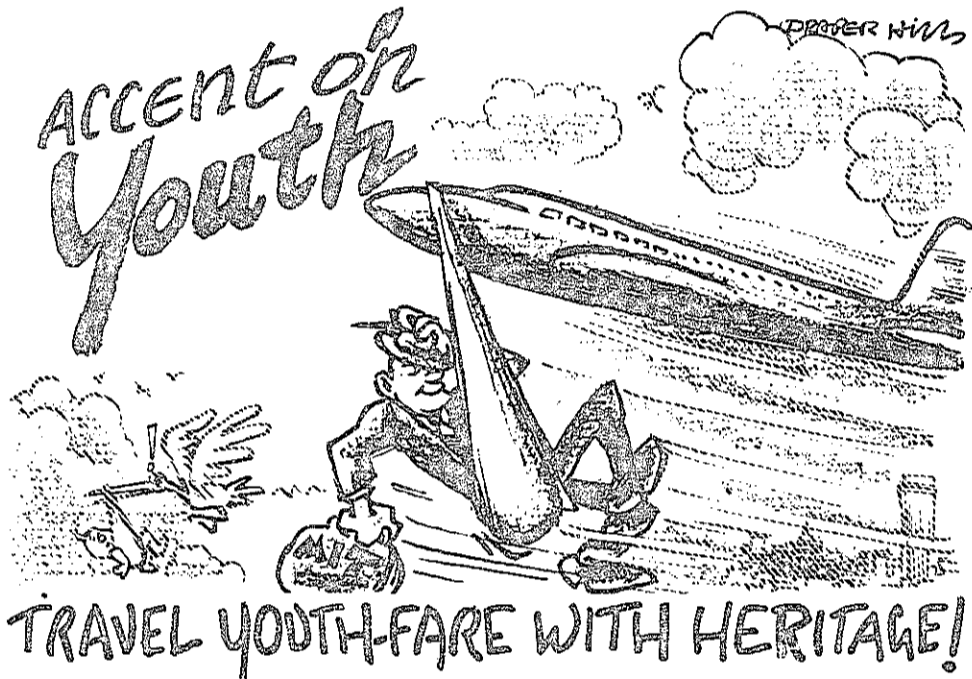
11/7/73 - 8:00pm
Larceny of a wallet from a coat pocket while firing at the MIT Rifle Range. Coat was hung in

the lobby and contained \$8.00 cash, three (3) bank Harvard Trust Company checks and the usual ID cards, etc. Harvard Trust will be notified.

11/7/73 - 9:00pm
Report of two (2) larcenies of wallets from unlocked lockers at the duPont Locker Room.

11/7/73 - 11:00pm
Unsuccessful attempt to steal motor vehicle at the Westgate II Parking Lot. Anti-theft device activated, failing attempt.

11/7/73 - 12:05pm
Larceny of a wallet from under the desk, typewriter well, on the first floor of Building 3. Complainant reports that she had left the office for no longer than two minutes and upon her return observed a suspect, who when questioned left area. Patrols given description.



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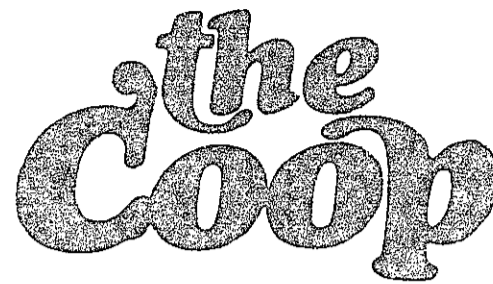
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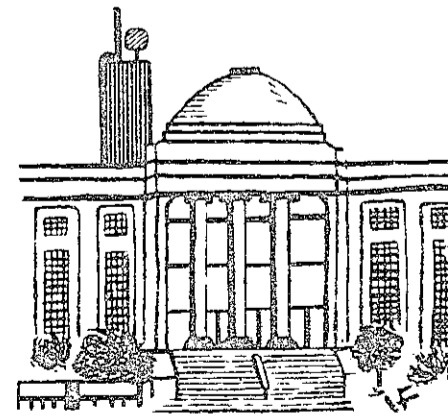
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Did you edit your high school newspaper?

The MIT Admissions Office estimated this fall that, out of 898 admitted freshmen, 176 of them edited or worked for their high school newspaper. With that many experienced student journalists, why does *The Tech* have to run recruiting ads? Many MIT students feel that education comes in the classroom, and that this formal education is all they need to acquire at the Institute. Other students need time for employment, or for other activities. While we would be the last to deny the importance of those factors, we'd like to point out that:

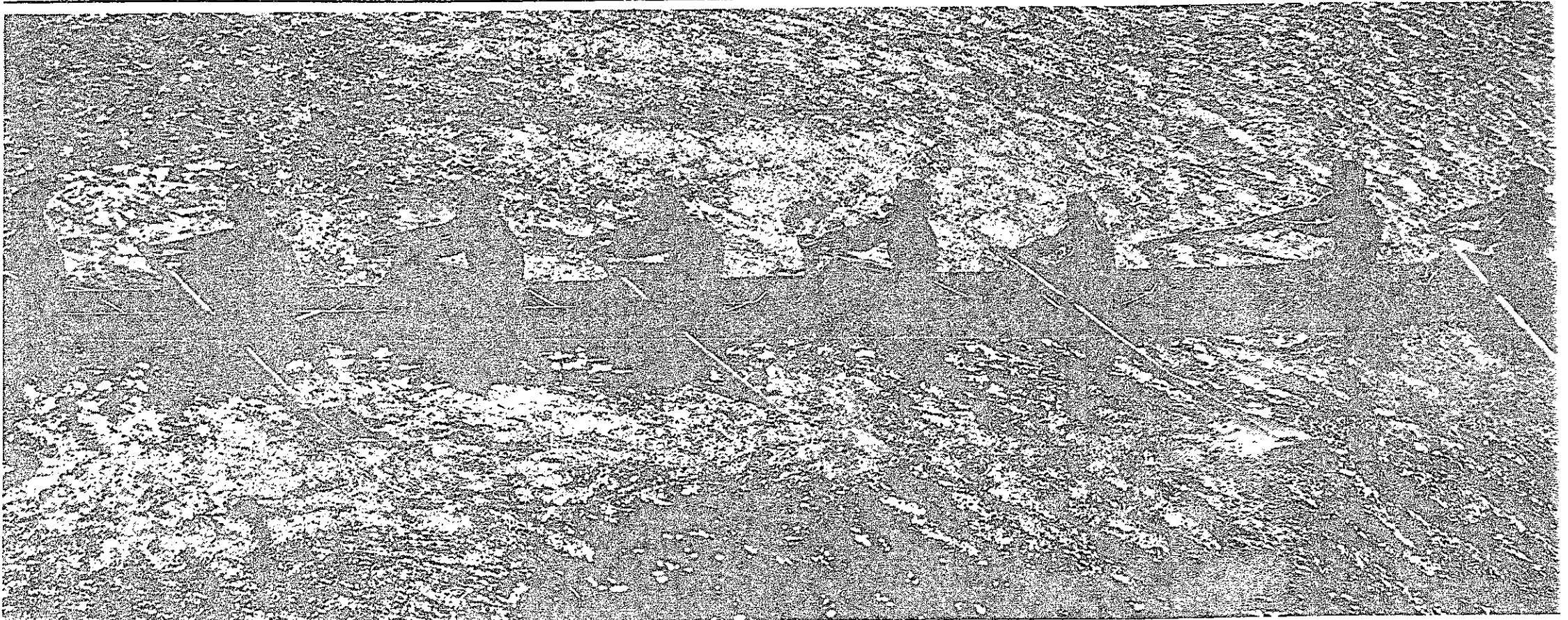
- 1) Non-formal education is also important. Working for *The Tech* can give you skills in writing, editing, interviewing, and other areas that will be helpful whenever you have to communicate ideas. After all, why do you think graduate schools look for newspaper experience on applications?
- 2) Many of *The Tech's* staffers are here because they need a job, not in spite of the fact. Advertising staff, business staff, and production staff - the "off-front-page" people who are so important - earn money for their work.
- 3) Members of *The Tech* staff include crew jocks, UA, IFC, SCC and Dormcon officers, and members of student-faculty committees. Working for *The Tech* can hardly be considered limiting.

Now that you can see no reasons *not* to join *The Tech*, maybe you should consider it. Join *The Tech*.



The Tech

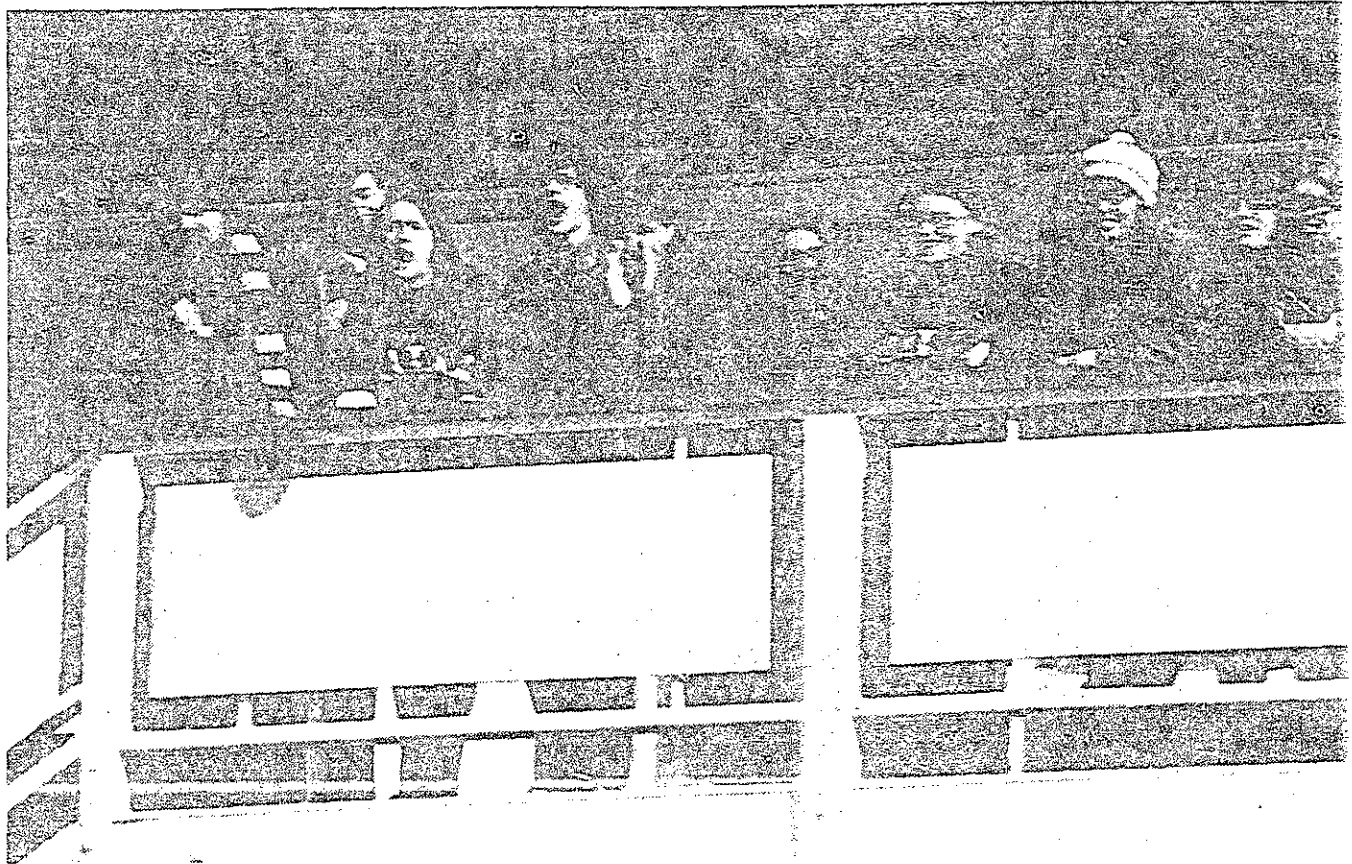
More than just a newspaper.



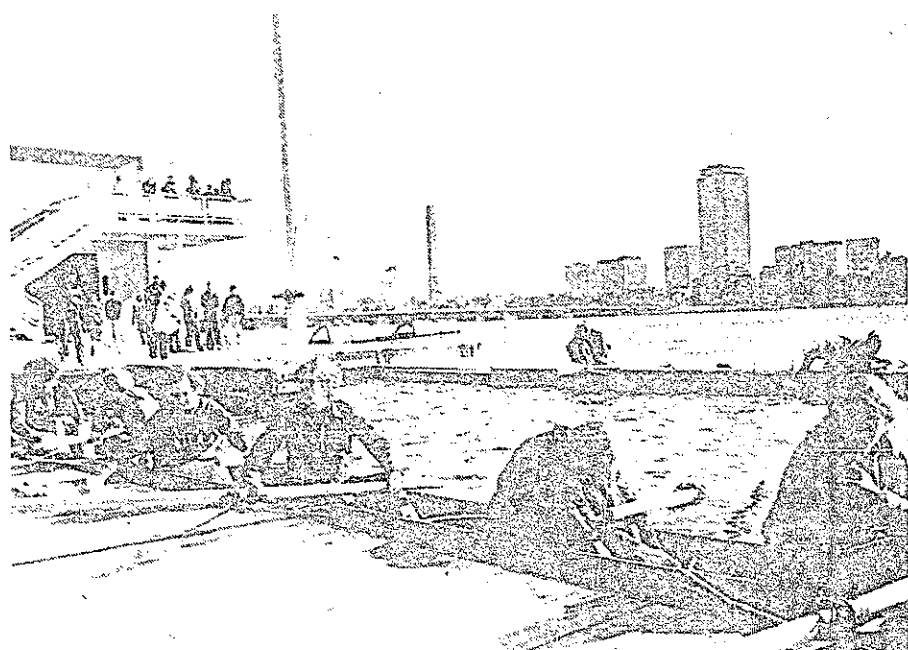
The Tech's junior eight, winner of The Golden Turkey Quill Challenge, rowing during Class Day.

Class Day results:

- Junior Eights**
- Trial 1: 1) MacGregor (4:20), 2) PDT (4:26), 3) East Campus
4) ZBT, 5) Conner
- Trial 2: 1) BTP (3:58), 2) No. Six (4:06), 3) Baker, 4) Chi Phi, 5) Fiji
- Trial 3: 1) PBE (4:06), 2) Sigma Chi (4:10), 3) PKS, 4) DU
- Trial 4: 1) SPE (4:10), 2) Burton Bombers (4:17), 3) SAE, 4) PKS
- Trial 5: 1) Theta Chi (4:36), 2) PDT (4:57), 3) The Tech, 4) Technique
- Senior Eights**
- Trial 1: 1) Delta Upsilon (3:39), 2) SAE (3:47), 3) PDT
- Trial 2: 1) East Campus (3:51.4), 2) MacGregor (3:52.4),
3) PKS (3:53.1), 4) McCormick
- Mixed fours**
- Trial 1: 1) Leffler (4:46), 2) Gregg (4:58), 3) The Tech, 4) Vidmar
- Trial 2: 1) Christensen (4:32), 2) Pride (4:52), 3) Filosa
- Trial 3: 1) Miller (4:15), 2) Biodegradable (4:25), 3) Beamen, 4) Miller
- Senior fours**
- Trial 1: 1) SAE (3:47), 2) Fiji (3:45), 3) BTP, 4) Connor 5
- Trial 2: 1) Coaches, 2) DKE, 3) LCA, 4) PDT, 5) PLP
- Finals**
- Junior 8's: 1) Theta Chi, 2) BTP, 3) PBE, 4) MacGregor,
5) Burton Bombers, 6) SPE
- Senior 4's: 1) SAE, 2) Coaches, 3) LCA, 4) Fijis
- Senior 8's: 1) SAE, 2) DU, 3) East Campus, 4) MacGregor
- Mixed 4's: 1) Leffler, 2) Christensen, 3) Gregg, 4) Biodegradable, 5) Miller



The PDT junior eight placed second in their heat, losing to the eventual winner, Theta Chi.



The crew from Technique preparing for their heat.



Class Day 1973

The MIT Boat Club's annual Class Day Regatta was held last Saturday despite the cold and windy weather, which is typical of the Charles River during November.

Events began in the morning with a race between the first freshmen lightweight and the first frosh heavy boat at 9am which was followed at 9:15 by the second lights vs. the second heavies. The stronger heavyweights swept both races.

Following the freshmen races were the preliminary heats for the Junior eights, Senior eights, Mixed fours, and Senior fours events.

SAE picked up two first places as they won both the Senior four and Senior eights races.

The Junior eights event was won by Theta Chi, as they defeated the BTP boat for the title. The boat stroked by Jere Leffler '73 won the Mixed fours title.

In a contest new this year to Class Day, a motley crew from The Tech beat Technique's Junior eight squad hands down and were the winners of the first annual Golden Turkey Quill Challenge Award.

Photos on this page by
Dave Breuer
Robert Olshaker
and Tom Klimowicz

