

The Tech

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FRIDAY, DECEMBER 15, 1972

FIVE CENTS



A student haggles over the price of a candy cane in annual Candy Cane Day sale on Wednesday. Building 10 where the Class of 1974 held it's third

Photo by Roger Goldstein

IAP to become permanent

By Mike McNamee

The experimental 4-1-4 calendar plan which MIT is currently using will probably become the Institute's permanent calendar, according to Professor of Nuclear Engineering Kent F. Hansen, head of the faculty group studying IAP. The issue will be considered in the February faculty meeting.

The plan, which provides for the January Independent Activities Period, was set up by the faculty as a three year experiment in 1970. Results of the first two IAP's have been studied, and will be combined with the preliminary findings of this winter's IAP. All indications at present are that the faculty committee will recommend that the 4-1-4 plan be made permanent, and the faculty will do so.

"The only problem that we see at present," said Hansen, "will be if the results of this year's IAP studies are significantly different from those of the past two years. The issue must be decided in February, so that the academic calendar can be made up, as a result, we will have very little time to study the questionnaires we get back about IAP '73. If they show much change in attitudes from 1971 or 1972, then we'll recommend that the 4-1-4 be extended one year and studied again next year. Otherwise, we'll recommend that it be made permanent."

Feedback about IAP comes from questionnaires sent out to all students and faculty, asking them how they spent their time during IAP and how they felt about it. The IAP study group also held meetings and interviews with various groups and organizations to determine their response to IAP. "We met with the Deans for Student Affairs, the housemasters, the Athletic Department, the Medical Department, and several other groups to see what problems they had during IAP," Hansen said. "Almost all of them reported no special problems."

Figures from the past two IAP's show that roughly 65% of the faculty feel that IAP is good, around 23% are uncertain, and 12% feel it is not a good plan. "The opposition splits mainly into two groups," Hansen explained. "There are those who feel that we should try other

calendars - that we shouldn't consider ourselves stuck with 4-1-4 just because we've tried it out. There are also some that feel that we aren't getting our money's worth out of IAP." Hansen said that he felt that these critics could be answered: "We can't experiment with every calendar idea that comes along; at three years to an experiment, it would take quite a while. As for the other criticism - I can only say that students think that they got their money's worth, according to their replies to our questionnaires. I personally feel that a student has as much opportunity to learn during IAP as he does during the term - if not more."

Professor Robert Fano, who served on the first IAP evaluation committee, gave *The Tech* a differing view of IAP's usefulness: "It has been my experience that most students want a rest period after the first term - so why not give them one? The resources the Institute and the faculty puts into IAP just aren't

paying off in educational value. I'm not against giving students a rest, but I feel that it should be added on to the Christmas vacation rather than devoting all this energy to setting up an Independent Activities Period that no one seems to profit by." Fano felt that opportunities could be found for IAP-type activity during the term, and longer holidays and earlier dismissal in the spring could provide rest.

Another faculty member who favors a rest-type IAP is Professor James Mar. Mar produced statistics showing that the biggest activities in January are

(Please turn to page 2)

UA starts grievance service

UAP Curtis Reeves has announced plans for a service to act upon student complaints about the Institute and help bypass red tape in dealing with MIT.

According to Reeves, the

motivation for the service is twofold: first, the need is clearly present throughout the student community; secondly, it will be the first major effort of the recently revived General Assembly.

"We really want things to work this time," said Reeves in reference to the GA, "and we've had to realize that the only way to make things work is by showing people that we're doing things that are worth their time and effort."

Current plans call for one or two people to be in the UA office - center for operations - at all times between the hours of 9 and 5, and possibly at night as well, who will be able to give advice on the quickest way to get things done, who will answer questions, both general and specific about the Institute and getting around the Institute, and who will try to get through bureaucratic red tape when individual efforts fail.

"Right now," said Reeves, "our work is directed towards giving some meaning to our idea. We want to be able to say at the outset exactly what it is that we would like to do, and who the service can best help, so that we won't waste the time of people who we really can't do anything for."

Reeves stressed that the success of the operation depended on the work that was initially put into it, noting that implementation would be the hardest step of all. People will be needed, not only to man the office, but also to do research on

the case continues. Hewitt also observed that an unknown number of tires were missing from the shop, which was used as storage area for the tires.

The police took Brown to Peter Bent Brigham Hospital where he was treated for swollen ankles and hands and released.

The call from MIT was one in a series that the Boston Police received that morning stating that a person had been left tied in a building in Roxbury. The first time officers checked the area, they found everything secure and resumed regular patrolling. After another call, officers contacted the owners which led to the discovery of Brown. It has not been determined which of these phone calls were relayed through MIT.

The call from MIT was phoned in by the Campus Patrol. When contacted by *The Tech*, Captain James Olivieri made this report: "At 2:05 am Tuesday, we received a call from James Clark and Ann Johnson at WTBS. They reported that they had received an anonymous phone call from a listener informing them of a person tied in a building in Boston. It seems the disc jockey took the caller seriously, so he referred the information to us. At 2:10 am we referred the information to the Boston Police who sent a car to the aforementioned building. At 3:20 the Campus Patrol called back and found that the police had discovered the man. As of the time, we have no further information about the incident."

(Please turn to page 3)

CAP spots grade trend; I's, O's also discussed

(The Tech acquired a copy of the following memo to the members of the faculty from Professor of Electrical Engineering Arthur C. Smith, Chairman of the Committee on Academic Performance, on the subject of grading practices. -Editor)

Each term the Committee on Academic Performance reports to the Faculty on grading practices in the past term. The distribution of grades for the Second Term, 1971/72 (excluding grade of J) is:

Grade	Year 1	Grad
A	45%	49%
B	27%	23%
C	8%	3%
D	2%	<1%
F,O	2%	1%
I	7%	9%
N	91%	16%

The committee sees some problems in its end of term reviews of students' performance:

Missing grades - if grades are not submitted to the Registrar in time for inclusion on the Term Summary, the Com-

mittee is often prevented from making sound judgments.

Use of I, Incomplete - the Committee has observed wide variations in the circumstances in which I's are given. Faculty regulations state: "The grade of I indicates that a minor part of a specific requirement, such as a report or design or laboratory assignment, has not been completed and that a passing grade in the subject is to be expected when the work is completed." The appropriate grade to assign when a major portion of the subject is not completed is F. The appropriate grade for a student who is passing the subject and misses the final examination is O rather than I. Faculty regulations limit the authority of instructors to excuse students from final examinations to very special situations; the grade of I should not be used as a de facto excuse from the final examination.



The MIT Community Players enact "After the Fall." The autobiographical play by Arthur Miller was put on Thursday, Friday, and Saturday at the Kresge Little Theater. Pictured above is a scene between Quentin, played by Michael Routh, and Maggie, played by Heidi Huidekoper. The show will also be put on this weekend at 8 pm Thursday, Friday, and Saturday at the Kresge Little Theater. Tickets are available in building 10 from 12 to 2 daily.

8.01 faces major changes

By Ken Davis

There will be several changes in the format of the basic freshman physics course, 8.01, when it is offered during the spring term. According to Professor Harry M. Schey, who will be the lecturer, there will be a return to a more standard lecture-recitation approach, and the use of undergraduate students as teaching assistants.

Schey said that recitation sections will be taught by juniors, seniors, and possibly sophomores who are in the physics department. Once a week, all the TA's will meet in a seminar to discuss problems that arose in class. They will also be occasionally observed in their sections by Schey.

The use of undergraduates in 8.01 is the continuation of a three-term long program in which students have been used as TA's in 8.01, 8.02, 18.01 and 18.02. Schey hopes that the program will develop into a

teacher training lab for MIT students. Although undergraduates have been used extensively in self-paced courses, this is the first time that a course will be staffed entirely by undergraduates. The program in the physics department is made possible through the cooperation of Professors A. P. French and Robert Hulsinger.

feels that both the self-paced and the lecture-recitation mode should be available to students. The lecture-recitation format will also give the new TA's a chance to act as teachers, rather than tutors.

Any physics major interested in becoming involved in this program for academic credit should contact Schey.

In the past, student response to undergraduate TA's has been very good. After the first term of the program, responses to letters sent to 18.01 students were "quite laudatory," according to Schey. In succeeding terms, evaluations by freshmen have remained generally favorable. Apparently, someone close in age and status to students is desirable. The use of students also increases the effective manpower of the department.

Schey also explained the reason for not using the self-paced format next term. "We should be in the business," he said, "of providing as many teaching and learning modes as possible." He

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Alumni offers students help

The Alumni Association (AA) has recently introduced three programs which will eventually involve some 1000 alumni in work with students.

The AA has long encouraged its members to take a more active role in Institute affairs. They are now getting a chance to do so in three different programs:

1) "A Day in the Life" is listed in the IAP guide as number 342; it offers any student the chance to see what his future career might be like by spending a day in it with an MIT alumnus.

2) Alumni clubs in many cities are offering students a chance to meet alumni in their home city at Christmas parties (for a list or further details, call AA Club Services at 3-3878). The alumni are anxious to meet students and to have them talk to potential applicants.

3) A formal system of contacts for finding summer jobs has been set up through MIT Club presidents in various cities. Here is a partial list:

Atlanta - William P. Chandler '52 - 404-633-2951; Baltimore - Charles

Gholz '65 - 202-293-7060; Bethel - Walton W. Hofmann '34 - 215-694-2424; Boston - Gen. Rush B. Lincoln, Jr. CE'35 - 782-2800; Buffalo - Herman E. Gabel '44 - 716-896-6500; Chicago - John W. Barriger '49 - 312-427-4900; Cincinnati - W. Parlin Lillard '44 - 513-421-2666; Cleveland - Sheldon G. Thorpe '52 - 216-792-6521; Columbus - Peter M. Bernays '39 - 614-422-7600; Dallas - Stanley Martin, Jr. '50 - 817-280-2131; Dayton - Steven Heller '43 - 513-253-7111; Denver - Robert S. Nedell '40 - 303-388-4181; Detroit - John Erickson '55 - 313-956-3175; Fairfield - F. Eugene Davis IV '55 - 203-333-3165; Framingham - Harry Movitz '65 - 877-0125; Hartford - Robert M. Dawson III '55 - 203-525-4192; Honolulu - Douglas R. McLane '65 - 808-536-3411; Houston - D. Dana Price '32 - 713-522-2768; Indianapolis - Frank E. Burley '30 - 317-356-8811; Kansas City - Edmund W. Peakes '44 - 816-842-9745; Long Island - Robert O. Dulin, Jr. NC'67 - 212-788-5000 x500; Los Angeles - Charles Edwards '40 - 213-681-0296 or 795-0421; Miami - Russell L. Law, Jr. ED'48 - 305-854-5444; Milwaukee - John J. Koch '53 - 414-271-0345; New Jersey - Thomas Moranian '49 - 212-247-1766; New

edford - William H.S. Preece '38 - 617-994-7045; New Haven - Hillel Auerbach '58 - 203-777-6481; New Orleans - Stuart Thayer '48 - 504-524-6692; Newport News - John M. Pirkle '63 - 703-722-1485; New York City - Donald R. Miller '50 - 212-682-5400; Orlando - George W. "Bill" McClary '51 - 305-855-6100; Philadelphia - James S. Rumsey '40 - 302-658-7587; Pittsburgh - James W. Spalding '48 - 412-433-7563; Portland, Me. - Robert A. Lindquist '51 - 207-774-2611; Portland, Ore. - Edward W. Kimbark '33 - 503-234-3361; Richmond - Richard Cole ML'52 - 703-282-2311; Rochester - Donald W. Ramsey '50 - 716-254-5050 x593; St. Louis - Robert L. Slifer CH'50 - 314-694-8154; San Francisco - Philip A.D. Richardson '57 - 415-495-6180; Sarasota - Clyde K. Hall '20 - 305-966-2946; Scranton - Louis V. Russoniello '40 - 717-346-1556; Seattle - William M. Eldridge '60 - 206-237-2343; Tampa - Harold Radcliffe '41 - 813-345-9168; Toledo - Thomas R. Clevenger, Jr. ML'61 - 419-242-6543; Toronto - Michael M. Koerner '49 - 416-363-0841; Tulsa - Karl H. Bergey, Jr. '51 - 405-325-7241; Washington D.C. - John N. Maguire GM'60 - 703-620-9498.

Committee recommends permanent IAP plan

(Continued from page 1)

resting, traveling, and athletics. "Figures show that 983 people spent 23% of their time in recreation, 905 people spent 23% of their time resting, and 575 people used 20% of their time on MIT extracurricular activities and athletics. If I was a parent sending a student to MIT and paying tuition to support the IAP period, I would be somewhat upset by these figures." The next largest category in the statistics is academic work not for credit (the type activities IAP was to be set up for), with 550 people spending 18% of their time on these activities.

One alternative calendar plan proposed by Fano is the quarter plan, which has three terms in the academic year. "The quarter plan has acquired a bad name because people just shorten the

present courses and try to carry the same load as they carry in a normal semester. If the quarter plan was set up so that a student would only take three intensive courses during a quarter, it could be a feasible plan." Fano added that increases in administrative costs of having three academic periods might be too high to allow a quarter plan, but that he felt the increased flexibility for students would be a desirable goal.

NOTES

* First term grade reports will be mailed to the home address, except for foreign addresses, on Wednesday evening, January 10, 1973; grade reports may be sent to the students at a different address if reported directly to the registrar's office no later than January 3; grade reports will be sent to the parents of first year students.

* Pot Luck Coffeehouse - Live entertainment every Friday and Saturday night, 8:30 pm to 12 m. Mezzanine Lounge of Student Center. Free coffee, cider and doughnuts. Performing this week: Friday: The Hobo Acoustic Band; Saturday: Susan Hanson, Cal Drake, and Martin Brooks. No Admission Fee. Last Pot Luck Coffeehouse until January 12, 1973.

* Application material for consideration for financial aid for the academic year 1973-74 can be picked up in the Student Financial Aid Office, Room 5-119.

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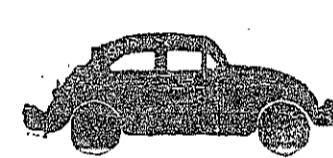
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To Professor Richard Douglas: Another pair of scissors, but with dull edges, the kind that can't cut people.

To Vice-President Ken Wadleigh: A decision on Simplex, or an answer to the question "Why fill out a parcel we aren't using?"

To Chi Phi: Co-eds
To Conner Four: Co-eds
To Ken Browning, Dick Sorenson, Walter Milne, and James Culliton: Bigger and better pads to write names in at demonstrations.

To New England Telephone: A phone that works, and phone

hackers that don't.
To Jerry Wiesner: Four More Years

To Vice-President Phil Stoddard: His own copying machine
To Rob Hunter: More and more scores

To Norman Sandler: Grease remover

To Neil Vitale: Knowledge of what to kiss and when to kiss it.

To Peter Pekarsky, *The Tech* Washington Bureau Chief: a knowledge of entymology.

To David Searis: A self-study proctology course

To Curtis Reeves: In recognition of his dedication to the Undergraduate Association, six free lessons in necrophilia.

To Constantine B. Simonides: A portfolio

To Hartley Rogers: A captive audience

To Arthur Mattuck: A blackboard that goes up and down

To Paul Eugene Schindler: A real newspaper

To the Board of Volume 93 of *The Tech*: A pseudo editor-in-chief

To Larry Goldstein and Frank Peseckes: Any newspaper at all

To Lee Giguere: A new dictionary and a pooper-scooper

To Steve Loutrell: A template of a "9" and a "g"

To John J. Donovan: A spelling book

To Henry Kissinger: His own president and a centerfold in the last issue of *Life*.

To the Coop: A mortgage on the *Harvard Crimson*.

WTBS notifies police, robbery discovered

(Continued from page 1)

At WTBS, *The Tech* found out that Johnson had initially taken the call and then referred it to Clark who was the on-the-air disc jockey. After talking to the listener and not being able to get any more information, Clark called the Campus Patrol because "the police will listen to someone like the CP before they listen to someone like me."

When asked why the station (WTBS), out of all the other stations in Boston, would receive such a phone call at that time of the morning, Clark said, "The name of the program is *The Ghetto*. Our shows are broadcast from midnight to 3 am. The programs are primarily soul and a lot of people in Boston, black people, that is, listen to us because there are no other soul

stations broadcasting in Boston after midnight. A lot of brothers and sisters in the Boston area relate to *The Ghetto* and we try to relate to them. That's probably why the guy called us instead of one of the other stations in this area."

Speaking as the program director of WTBS, a position he has held for the past three months, Clark, who is also known as JayCee, said, "I'm glad that WTBS could play such an important role in this incident. We are trying to create a program schedule that can relate to all communities within the range of this station."

Later contact with the Boston Police informed *The Tech* that the investigation into this case is being continued and that no other information is available at present.

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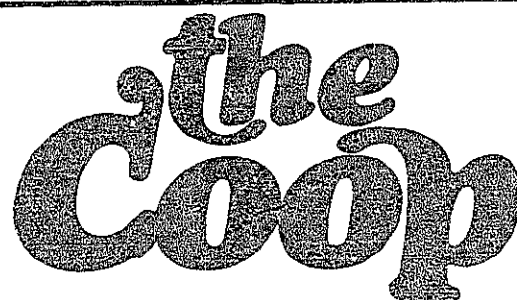
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Technology: can Congress take control?

Copyright 1972 by Peter Peckarsky
WASHINGTON, December 12, 1972. The Congress has long been in need of an independent body to analyze technical issues having an impact on legislative matters. This need was acutely felt during Congressional consideration of the Safeguard Anti-Ballistic Missile system in 1969 and the Supersonic Transport in 1971. Technical, strategic, economic, and political analyses were a dime a dozen on both occasions — most were provided by parties to the debate.

In the final hours of the 92nd Congress, the Congress passed, and the President signed, Public Law 92-484 which provides for the establishment of an Office of Technology Assessment (OTA) as an arm of Congress.

(Technology assessment is the thorough and balanced analysis of all significant primary, secondary, indirect and delayed consequences or impacts, present and foreseen, of a technological innovation on society, the environment, or the economy.)

This action represents the fruition of many year's effort by the Congressional Technology Assessment (TA) movement.

Policy-making components of the OTA will be the Technology Assessment Board (TAB) and the Technology Assessment Advisory Council (TAAC).

The TAB will be comprised of three majority and three minority members from each House of Congress. The OTA Director, who will be selected by the TAB, will be an ex-officio Board member. TAB will be the governing body of the OTA and will make all major policy decisions.

In organizing the fledgling agency, the most crucial decision facing the TAB members will be that of choosing the first OTA Director.

The leading candidate for the position of OTA Director is former Democratic Representative Emilio Q. Daddario of Connecticut. Daddario, known as Mr. Technology Assessment for his work with the Subcommittee on Science, Research

and Development of the House Committee on Science and Astronautics, provided the initial impetus for the Technology Assessment Act of 1972. On March 7, 1967, he introduced legislation calling for the creation of a Technology Assessment Board. The legislation was offered more as an instrument with which to educate Congress about TA than as a serious legislative proposal. Since leaving the House in 1970 to wage an unsuccessful campaign for the governorship of Connecticut, Daddario has been a Vice-President of Gulf and Western Precision Engineering Company. He is the only candidate who would be able to stand up to the TAB members and not cave in to their inevitable demands to turn the staff positions into patronage appointments. If the OTA staff positions become sinecures for political appointees, the idea behind the TA movement will be vitiated to the detriment of the Congress and the people in their attempt to keep a rein on the Executive Branch of the government.

TAB members during the 93rd Congress will be Democratic Senators Hollings, Humphrey, and Kennedy, Republican Senators Dominick and Schweiker, Democratic Representatives Davis and McCormack, Republican Representatives Gubser, Harvey, and Mosher as well as replacements for Senator Allott and Representative Cabell who were defeated in their re-election bids. It is expected that the chairman of the TAB during the 93rd Congress will be Senator Edward M. Kennedy (D-Mass.). (The chairmanship will rotate between the two Houses with the chairman being drawn from the House TAB members during even-numbered Congresses.)

(It is especially fitting that Rep. Mike McCormack be a TAB member since he is known as the only scientist in Congress. McCormack received an M.A. in Chemistry from Washington State University and was a research chemist at the Atomic Energy Commission's Hanford, Washington facility for twenty years.)

The TAB will approve the Director's choice of a Deputy Director, formulate

selection criteria for determining which projects will be accepted by the OTA, and name the ten public members of the TAAC. In addition to the ten appointees, the Comptroller General and the Director of the Library of Congress' Congressional Research Service will have seats on the TAAC. This body will have a purely advisory role and will perform only those functions requested of it by the TAB.

Finally, the TAB will, in all probability, be instrumental in the decision as to whether the OTA will contract for the performance of TA work or perform assessments with an in-house capability.

It is entirely possible that the operational component of the OTA, led by the Director and Deputy Director, will not perform technical analyses itself but will merely farm out contracts to private research groups who will provide the technical capability. There are several faults with this procedure.

First, the outside parties will be dependent upon other sponsors for their continued corporate existence and will thus be unable to provide truly independent analyses.

Second, there will be a reluctance on the part of some of the more competent research concerns to perform contract work for the Congress when their main support comes from the Executive Branch, in particular the Defense Department.

The amount of money authorized for appropriation to the OTA between now and the end of fiscal year 1974 (June 30, 1974) is \$5 million. The money would probably pay for significantly more analytical capability if it were utilized to recruit highly qualified staff members than if it were used to purchase the same analytical capability from private firms since the outside groups would have to receive some profit on the contracts even if they were so-called "non-profit" think tanks.

Moreover, if the funds given to the OTA are invested in the development of a first-rate independent in-house analytical

capability the ultimate consequence of this investment would be the formation over the long term of Congressional analytical capital.

The options available to the OTA appear to be:

1) develop a technically competent staff which will perform those tasks accepted by the TAB in-house;

2) evolve into a contracting agency with a technical competence sufficient to understand contractor technical assessments but not to perform them in-house, or;

3) develop a hybrid system.

The third approach has some merit in that it would allow the OTA to provide immediate technical assistance to the Congress and at the same time develop a competent technical staff which could eventually assume the entire analytical function.

It would indeed be a shame and a waste of the taxpayer's money if the OTA were to become yet another office dispensing technical staff capable of providing answers to those technological questions impinging more frequently of late on legislative affairs.

With this issue, *The Tech* ends publication for the term. During January, *The Tech* will appear once a week, on Tuesdays, beginning January 9. On February 6, *The Tech* will resume semi-weekly publication.

Continuous News Service

The Tech

Since 1881

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December 15, 1972

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Letters to The Tech

To the Editor:

In your article on the Literature Section cutbacks, we were both seriously misquoted. Patricia Cummings was reported as saying that Professor Douglas "wanted to terminate all nine of the first year contracts in Literature." This is a condensation of a somewhat more complicated situation, for she reported that in the Literature Section senior faculty meeting it was felt (by the senior faculty) that all nine of the people on one-year contracts *might* be endangered by the cut, and that, therefore, they should narrow the list down as far as possible. We don't think that anyone was in a position to know exactly what Professor Douglas wanted; we believe that he, like the rest of us, would prefer a flourishing and secure department. We continue to hope very strongly that this situation will be brought about through the retention of people whose jobs are now in jeopardy.

To Wayne O'Neil was attributed the feeling that the Literature Section was endangered by the newly appointed dean, Harold Hanham, because Hanham "is known to favor the social sciences over the humanities." Actually we do not know what Dean Hanham has in mind for the department (of which he will also be acting chairman) or the school. We hope for the best.

Patricia Cummings
Assistant Professor of Literature

Wayne O'Neil, Head
Literature Section

faculty meetings that usually have a larger attendance are those following events of campus violence, student strikes, etc. Questions concerning programs and degrees are usually decided upon by the select few — an interest group of 10 — 20 of the 800+ faculty members who do not usually attend can represent the majority opinion at such a meeting.

On the agenda for the next faculty meeting is the Environmental Engineer Degree, I, as well as many other students at MIT, feel that this is an important issue that should be considered by the open-minded faculty instead of the specific interest groups which might be too concerned about departmental enrollment and economics. We do not wish to start a violent demonstration to encourage faculty members to attend. Instead we propose a grass roots effort — students should urge the faculty to attend and faculty should convince their colleagues to come to consider this issue.

Many members of the MIT faculty are engaged in research and other activities to aid in environmental maintenance. A further, perhaps more important, action they can take is to teach the next generation the wide interdisciplinary knowledge needed to cope with environmental problems. This is the purpose of the Environmental Engineer Degree. At least let it be objectively considered.

Fred Gross, chairman
MIT Ecology Action

To the Editor:

We, the students of one of Janet Horowitz' 21.03-21.22 classes, wish to protest her recent firing. She has done an outstanding job of teaching us this term, having successfully gotten a group of non-humanities majors involved in English literature.

It is always a tragedy for the students when such a teacher is fired. It is even more of a tragedy when the teacher is

from the Humanities Department, where small class sizes are necessary, and where teachers who can "save" science and engineering students are a much coveted rarity.

The present situation — the five firings — would not have arisen had such considerations been important to the administration. At this point, however, we can only ask that Janet Horowitz be rehired. (The preceding letter was accompanied by twelve signatures. — Editor)

To the Editor:

Your interest in my installation as Lutheran Chaplain at MIT is warmly appreciated. I would like to note, however, that the Reverend Don Lee, reported as deceased in your article, is still very much alive.

Constance Fern Parvey
Lutheran Chaplain

To The Editor:

Winter is now upon us, and the weather will be getting increasingly cold. For many years, the MIT community has complacently accepted this coldness, but the time for such complacency is now over! Whenever it gets too cold in the future, petitions demanding redress should be sent to the MIT Department of Meteorology. If these petitions are ignored, then more insistent means of communication could be used. For example, an Annual Temperature Riot could be held. Rioters could chant "Twenty-nine degrees is too damn cold!" or on slightly warmer days "Thirty-one degrees is too damn cold!" Some may say that The System is so rotten that petitions, Annual Temperature Riots, or even more extreme methods will prove to be totally ineffective in getting more pleasant weather. Still, it is important that we at least try, since if nobody even tries, then nothing will ever get done.

Greg Saltzman

Commentary:

Military research: our slice of the pie

By William Watson

(William Watson is an Associate Professor of History at MIT.—Editor)

The Department of Defense (DoD) recently issued its annual list of the top 100 military contractors for Fiscal Year 1972. To nobody's surprise MIT had more business with the military than any other university in the country. Its nearest university rival, the Johns Hopkins, had only slightly more than half the MIT total. No other university even made it into the top 100.

(These rankings are made annually by the Department of Defense and may be obtained from ASD/PA, Pentagon, Washington DC 20301 by asking for the publication: "100 companies and their subsidiaries listed according to net value of military prime contract awards." The

with the research departments and laboratories of the major weapons manufacturers. Except for the Johns Hopkins, there isn't another university on the list until you get down to 45th-ranked University of California, and they only make that rank by adding together all the campuses in the university system. Their volume of military research is trivial by comparison with MIT's. Berkeley, for instance, received \$5 million in military research contracts in 1972, compared with MIT's more than \$125 million. For New England you have to go down the list to 162nd-ranked Harvard to find another university engaged in military research.

MIT's real competitors are the high-technology weapons makers whose position in the military market depend in part

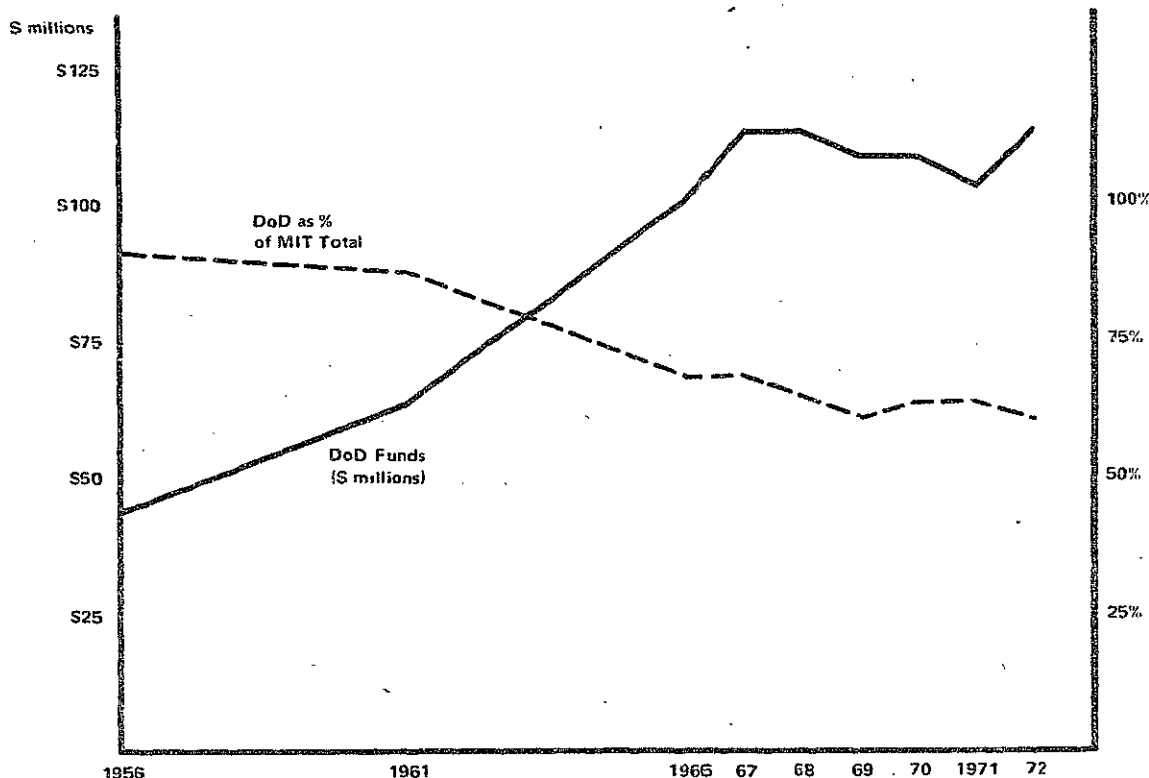


TABLE 1
SOURCES OF RESEARCH MONEY AT MIT
FOR FISCAL YEAR 1972*

Source	Total MIT		On Campus		Lincoln Lab		Draper Lab	
	\$	%	\$	%	\$	%	\$	%
DOD**	\$113.4	(60)	\$15.4	(22)	\$66.2	(95)	\$31.8	(66)
NASA	26.3	(14)	11.4	(16)	0.1	—	14.8	(30)
AEC	7.7	(4)	7.6	(11)	—	—	0.1	—
DOD-NASA-AEC	147.4	(78)	34.4	(49)	66.2	(95)	46.7	(96)
NSF	11.5	(6)	11.3	(16)	—	—	0.2	—
NIH	10.7	(6)	10.6	(15)	—	—	—	—
Other Federal	8.3	(4)	4.2	(6)	3.4	(5)	0.7	(1)
NSF-NIH-Etc.	30.5	(16)	26.1	(37)	3.5	(5)	0.9	(2)
Total Federal	177.9	(94)	60.5	(86)	69.6	(100)	47.6	(98)
Foundations	7.7	(4)	7.7	(11)	—	—	—	—
Industries	2.4	(1)	1.6	(2)	—	—	0.8	(2)
Other Govts.	0.9	(0)	0.9	(1)	—	—	—	—
Other Sources	11.0	(6)	10.2	(14)	—	—	0.8	(2)
TOTALS	188.7	(100)	70.7	(100)	69.6	(100)	48.5	(100)

*Source: MIT, Report of Sponsored Research, Fiscal Year 1972 (November, 1972) 268pp. The report is not widely distributed at MIT, but copies can be obtained from the office of Mr. James Cronin in the Accounting Office, Room E19-570. The report is also the source for the other tables in this article dealing with figures for 1972. For earlier years information has been obtained from either the reports of those years or from the Provost's Office.

**DoD funding includes small amounts of sub-contracted work from one or the other of the military laboratories done either on campus or at the other Laboratory.

list was also published in the most recent issue (December 4) of American Report, p. 15.)

What was surprising, in view of recent assurances that MIT was cutting down on military research, was the substantial increase in MIT's military contracts last year. In Fiscal 1971 MIT had been awarded \$97.7 million in military contracts; in Fiscal 1972 the amount jumped almost \$30 million to \$127.3 million, and MIT's ranking in the top 100 accordingly rose from 47th to 44th.

Some idea of what this ranking means can be obtained by a look at the company MIT is keeping among military contractors in New England. There were nine of them in the top 100 last year, with MIT ranked sixth in the region after United Aircraft (makers of Pratt & Whitney aircraft engines), Raytheon (missiles and electronics), Textron (Bell Helicopters), AVCO and Sanders Associates (Electronics). Behind MIT in New England were ITEK (Electronics) and Kaman (helicopters).

Perhaps it is not entirely appropriate to compare MIT with weapons manufacturers, even though MIT's dollar volume of military business makes such comparison unavoidable. A more reasonable comparison, since MIT is a research institution, would be with other institutions doing military research. In a DOD list of the top 500 military research contractors for Fiscal 1972 MIT is ranked 12th in the country and first among non-profit research institutions.

(Also available from the same Public Affairs Office of the Pentagon is: "500 contractors listed according to net value of military prime contract awards for research, development, test and evaluation work." A summary of military research in New England for Fiscal 1972 can be obtained from NEAR, 48 Inman Street, Cambridge, MA 02139 (864-3150).)

Going down this list — McDonnell Douglas (third), Lockheed (fourth), AT&T's subsidiary Western Electric (fifth), and so forth — one realizes that MIT is not competing with other university for the military research dollar, but

on their ability to maintain the sophisticated scientific and technological base required by modern weapons systems. Since MIT's military research is also aimed at maintaining this same base — though seldom as explicitly related to a single weapons system as most corporation research — it is not surprising that there is a good deal of convergence between MIT's research interests and those of the huge aerospace and electronics corporations, a convergence that is promoted and financed by the Pentagon.

The impact of this channeling of research talent by the military can best be seen in Table 1, on the Sources of Research Money at MIT for Fiscal 1972.

The table shows the continued preponderance of military sponsored research at MIT — 60% of the Institute total. Despite the fact that most DOD research is done at the two military laboratories, the DOD is still the single most important sponsor of research on campus and surpasses its nearest competitors, NASA and NSF, by some \$64-million. The table also provides a measure of the difficulty MIT is going to have in replacing DOD funds with other types of research money, because the \$15 million now provided by the DOD for on-campus projects is equal to the combined total of all foundation support, all support from industries, all support from local and state governments, and all other federal funding not provided by NASA, AEC, NSF, and NIH.

This difficulty should be taken into account when one reads, as one could in last Tuesday's *The Tech*, that "there is a pronounced trend away from Department of Defense funded work and toward activities paid for by the National Science Foundation and the Department of Health, Education and Welfare." (*The Tech*, December 12, 1972, p. 5). Table 2 offers a survey of these trends.

One can readily see in the DOD figures a consistent decline in the percentage share of total research funds provided by the DOD, from 91% in 1956 to a low of 60% this year. The percentage may be even lower next year as the NSF picks up the tab for the million or so dollars now

provided for the Materials Science Center by the DOD.

This particular trend, however, must be put in a larger perspective. The first is that the dollar amount of DOD funding has not declined at all, but rather just the opposite — it has tripled over the corresponding period (see graph). Thus you get the apparently contradictory statements that DOD funding at MIT is as high as it has ever been and that the DOD percentage of the total research has never been lower. Both statements are true, and are made so by the third fact, often overlooked by those hunting for trends, that MIT's total research budget has more than quadrupled in the same 16 years.

The second perspective concerns the DOD funding of on-campus research. The Provost last spring, and other administration spokesmen more recently, have made a great deal out of the "substitution principle" by which MIT has been able to reduce DOD funding by substantial amounts and to replace it with other funding, primarily from the NSF. This substitution, coupled with the growth in funding from other governmental agencies above all HEW-NIH, by next year will mean a reduction in dependence on DOD funding to one-quarter of what it was in 1956, at least so it seems in percentage

terms (68% DOD in 1956 down to a projected 17% in 1973).

The decline in DOD funding, however, is much less real than it seems. The first point to remember is that the present decline is measured from an all-time high for on-campus DOD funding of \$17.5 million in 1971. The second point is that it wasn't until 1962-3 that DOD funding on campus went higher than the \$10 million level, so that a reduction to the \$13 million level is hardly a major achievement historically, however difficult it may have been to get there.

Furthermore, the substitution principle that transfers more than \$3 million in DOD money from the Magnet Lab and the Materials Science Center to the NSF leaves virtually unmolested the DOD underwriting for all the rest of the projects sponsored by the military on campus. A department-by-department, laboratory-by-laboratory comparison of this year's funding with that of Fiscal 1971 reveals that DOD funding levels have remained essentially the same. DOD funding for the School of Engineering was \$4.4 million in Fiscal 1971; in 1972 it rose slightly to \$4.7 million. The departments in the School of Science were funded by the DOD in 1971 for \$2 million; in 1972 the total dropped slightly, to \$1.9 million.

(Please turn to page 6)

TABLE 2
TRENDS IN RESEARCH FUNDING AT MIT, 1956-1972
(Millions of Dollars)

Source	1956	1961	1966	1968	1970	1971	1972
DOD:							
On Campus	\$8.3	\$9.2	\$16.9	\$17.4	\$16.1	\$17.5	\$15.4
Lincoln Laboratory	—	—	—	65.3	63.1	57.4	66.2
Draper Laboratory	36.1	54.7	84.7	30.7	28.7	28.8	31.8
Total DOD	44.4	63.9	101.6	113.4	107.9	103.7	113.4
% of MIT Total	(91)	(83)	(68)	(65)	(63)	(63)	(60)
NASA:							
On Campus	0.1	0.4	5.3	6.2	6.5	7.7	11.4
Lincoln	—	—	—	0.1	0.1	0.3	0.1
Draper	—	1.6	18.1	22.3	20.4	14.1	14.8
Total NASA	0.1	2.1	23.5	28.6	27.0	22.1	26.3
% of MIT Total	—	(3)	(16)	(16)	(16)	(13)	(14)
AEC:							
On Campus	0.9	4.6	7.4	9.8	8.7	8.1	7.6
Draper	—	—	—	0.4	0.4	0.3	0.1
Total AEC	0.9	4.6	7.4	10.2	9.1	8.4	7.7
% of MIT Total	(2)	(6)	(5)	(6)	(5)	(5)	(4)
Total DOD-NASA-AEC	45.4	70.6	132.5	152.2	144.0	134.2	147.4
% of MIT Total	(93)	(91)	(89)	(87)	(84)	(82)	(78)
NSF	0.2	2.0	4.5	7.1	6.5	7.2	11.5
NIH	0.2	1.3	5.2	7.5	8.2	8.9	10.7
Other Federal Agencies	1.1	1.2	2.3	2.3	5.0	4.5	8.3
Total NSF-NIH-Etc.	1.5	4.5	12.0	16.9	19.7	20.6	30.5
% of MIT Total	(3)	(6)	(8)	(10)	(11)	(12)	(16)
Total Federal Govt.	46.9	75.1	144.5	169.1	163.7	154.8	177.9
% of MIT Total	(96)	(97)	(97)	(97)	(95)	(94)	(94)
Foundations & Non-Profit	0.7	0.7	0.9	3.2	6.2	6.6	7.7
Industries & Others	2.0	2.1	2.7	2.4	2.1	2.0	2.4
Other Governments	—	0.1	0.3	0.5	0.4	0.8	0.9
Total Other Sources	2.7	2.9	3.9	6.1	8.7	9.4	11.0
% of MIT Total	(5)	(3)	(3)	(3)	(5)	(6)	(6)
TOTAL MIT	48.7	77.3	148.5	175.0	172.4	164.3	188.7

Research at MIT: who foots the bill?

(Continued from page 5)

Only the Center for International Studies showed a significant percentage drop in DOD funding, from 24% to 14%, though in terms of total dollar volume the \$90,000 involved is relatively insignificant.

The interdepartmental laboratories (with the exception, of course, of the Magnet Lab) show the same stability — a small rise here, a modest drop there. Take the Magnet Lab out of the comparison and total DOD funding for all the labs would be almost the same for both 1971 and 1972 — \$7.8 million.

Finally, I think that the implications of NSF funding for projects that were once considered worthy of substantial support by the military need to be examined in more critical detail than I can undertake in this article. The military, after all, is not a charitable organization no matter how much the scientific and technological community once regarded it as a bottomless source of funds. Their sponsorship of laser research at the Magnet Lab, to take one major example, was undertaken with a long-range look into the future of weapons systems. We also know that there is periodic coordination among the governmental agencies

TABLE 4

DEPENDENCY OF MIT LABORATORIES & DEPARTMENTS ON DOD FUNDING, FISCAL 1972 (20% Or More)

Laboratories or Departments	DOD \$ As % Of Dept/Lab Total
1. Project Cambridge	100
2. Materials Science Center	100
3. Project MAC	99
4. Artificial Intelligence Agency	97
5. Lincoln Laboratory	95
6. Draper Laboratory	66
7. Electrical Engineering Department	54
8. Physics Department	53
9. Metallurgy Department	46
10. Aeronautical & Astronautical Engineering Dept.	45
11. Ocean Engineering Department	27
12. Research Laboratory of Electronics (RLE)	26
13. Earth & Planetary Sciences Department	23
14. Meteorology Department	23

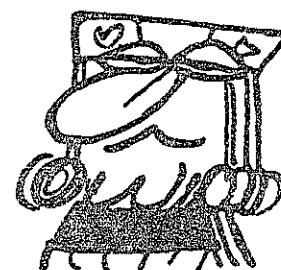
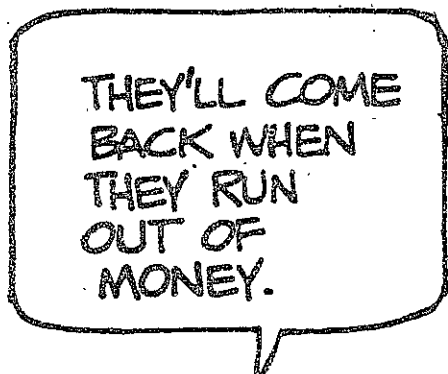
TABLE 3

TOP DOD-FUNDED LABORATORIES & DEPARTMENTS AT MIT, FISCAL 1972 (Thousands of Dollars)

	DOD Funds	% of Lab/Dept Total	% of DOD Total
A. Laboratories & Projects			
1. Lincoln Laboratory	\$66,186	95%	58%
2. Draper Laboratory	31,830	66	28
3. Project MAC	3,361	99	3
4. Research Laboratory of Electronics (RLE)	1,282	26	1
5. Project Cambridge	1,073	100	1
6. Artificial Intelligence Agency	1,031	97	1
7. Materials Science Center	969	100	1
8. National Magnet Laboratory	370	11	—
TOTALS	106,102		94
B. Departments			
1. Electrical Engineering	1,333	54	
2. Aeronautical & Astronautical Engineering	1,198	45	
3. Metallurgy	1,080	46	
4. Physics	674	53	
5. Earth & Planetary Sciences	529	23	
6. Mechanical Engineering	438	17	
7. Meteorology	342	23	
8. Ocean Engineering	284	27	
TOTALS	5,878		5
TOTALS FOR LABS & DEPARTMENTS	111,980		

most interested in the development of science and technology — DOD, NASA, AEC, and NSF — to make sure that research projects are allocated to the most appropriate agency. This consultation across agencies allows the funding of a basic science research project to be picked up by one of the military branches or by ARPA (Advanced Research Projects Agency) whenever further development of the project looks as though it may have direct relevance to one or more military missions.

The fact that so much of MIT's research still meets the test of military relevance after the Mansfield Amendment imposed the criteria of relevance on all DOD funded projects is a sobering reminder that whatever the changes of recent years, MIT is still primarily a military research institution, and is likely to remain so for some time to come.



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ODAY



God Rest You Merry Gentlemen

O Little Town of Bethlehem

Silent Night (Solo)

While Shepherds watched their flocks
Beck the Halls

Hark The Herald Angels Sing

We Three Kings Of Orient Are

The First Noel

O Come All Ye Faithful (Adeste Fideles)

Tr. F. OAKELEY, 1841

J. F. WADE'S
Cantus Diversi, 1751

1. O come, all ye faith-ful, Joy-ful and tri-umph-ant, O
2. Sing, choirs of ang-els, Sing in ex-ul-ta-tion,
3. Yea, Lord, we greet Thee, Born this hap-py morn-ing;

come ye, O come ye to Beth-le-hem; Come and be-
Sing, all ye cit-i-zens of heav'n a-bove: Glo-ry to
Je-sus, to Thee, be-glo-ry giv'n; Word of the

After each verse
hold Him, Born the King of An-gels;
God In the high-est; O come, let us a-dore Him, O
Fa-ther, Now in flesh ap-pear-ing;

come, let us a-dore Him, O come, let us a-dore Him, Christ the Lord.

Wassail Song

Away in a Manger

It Came Upon the Midnight Clear

E. H. SEARS, 1846

R. S. WILLIS, 1850

1. It came up-on the mid-night clear, That glo-ri-ous song of old,
2. Still through the clo-ven skies they come, With peace-ful wings un-furled;
3. For lo! the days are hast'n-ing on, By prophets seen of old,

From an-gels bend-ing near the earth, To touch their harps of gold;
And still their heav'nly mu-sic floats O'er all the wea-ry world;
When with the ev-er-cir-cle-ing years, Shall come the time fore-told,

Peace on the earth, good will to men, From heaven's all gra-cious King;
A-bove its sad and low-ly plains They bend on hov'-ring wing,
When the new heav'n and earth shall own The Prince of Peace their King,

The world in sol-emn still-ness lay To hear the an-gels sing.
And ev-er o'er its Bab-el sounds The blessed an-gels sing.
And the whole world send back the song Which now the an-gels sing.

Christmas Convocation

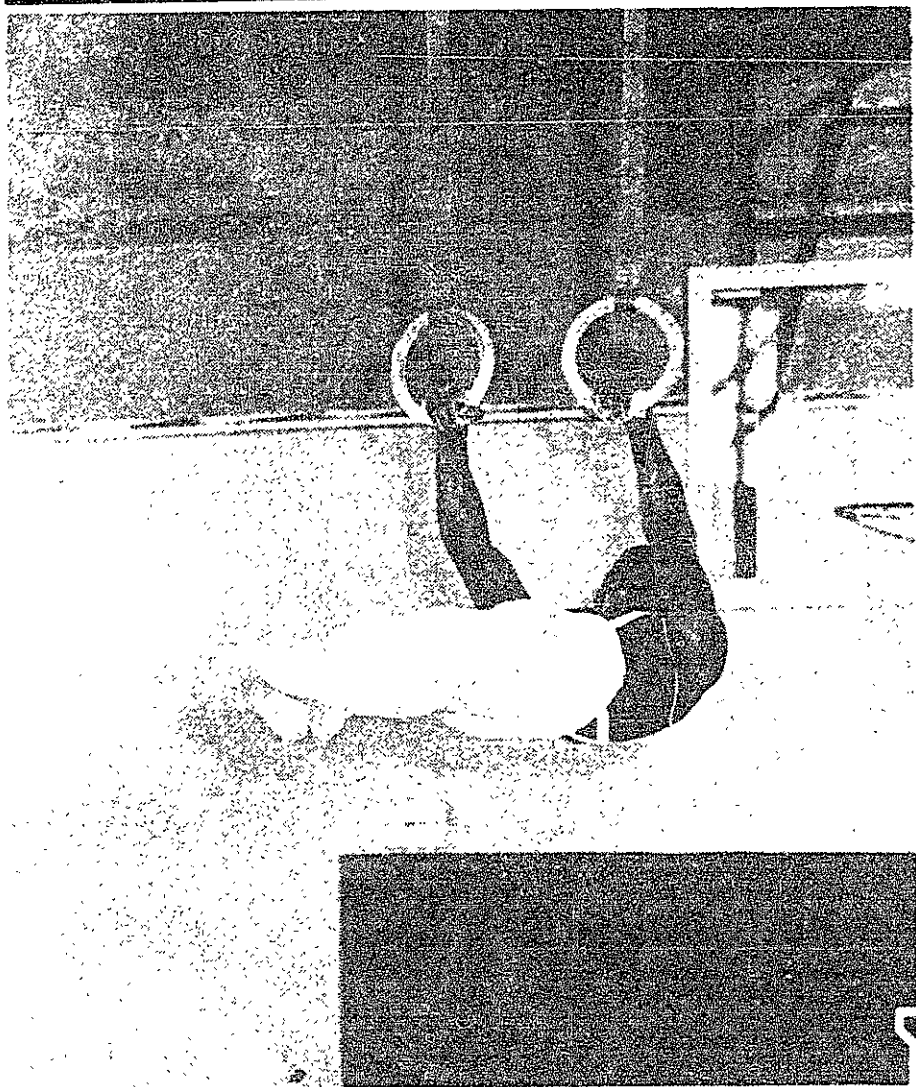
NOON

building 7 lobby

Good Christian men Rejoice

Joy to the World

SPORTS



Fencers minus aces: still dump opposition

By Bob Liu

The MIT fencing team charged onward victoriously against Brooklyn College and the Polytechnic Institute of Brooklyn. The team was without quite a few experienced members due to graduate record exams, but managed to put together a highly spirited showing for the two matches held Friday and Saturday afternoon. Coach Eric Sollee going ahead with three first-year fencers felt confident that the men of MIT could do well in the matches through good style and technique overcoming what they lack in experience.

The Friday night match against Brooklyn College was the most dramatic one of the season, MIT winning 14-13. MIT took a strong lead at the end of the first round 7-2, despite a very short warm-up period due to a late arrival in New York. The sabre team scored 6-3 with Michael Wong '73 (1-2), Dong Park '75 (2-1), and Capt. John Tsang '73 (2-0) leading the charge. The foil team with two newcomers went 3-6, Matt Fowler '74 and Bob Liu '75 (each 1-1), and Marty Fraeman '73 (1-2). The amazing epee team of Jim Cook '75, Dave Dreyfuss '75, and Chris Eckel '74 (current holder of the team "Dyke's Lumber Award") won 6-3. The meet, which lasted over 4½ hours, was decided on the final bout of Chris Eckel versus Israel of B.C. with the score tied 13-13. Fighting with wit, cunning, and nerves of fibrous graphite, Chris battled his opponent to a score of 4-4 with only one point to decide the final and total outcome. On a

Reminders

Skating classes for Faculty/Staff/Student children will begin this Saturday, December 16. Beginners classes are from 10-11 am, Advanced Beginners are from 11-12 N. For more information and registration, call the Athletic Office in duPont, W32-109, x3-4498.

IM Bowling: IM Bowling rosters are due in the intramural office today, December 15. Bowling fees must be paid by next Friday, the 22nd. For more information, contact Rosemary in the IM office, W32-121, x3-7947.

floor touch follow by a hit to the toe, a questionable judgment by the official initially gave the victory to Israel of B.C. The judge retracted his decision upon clarification by an outside source not participating and nullified the last touch. Chris came back with a dramatic flourish of blade work to register a clean hit and winning for MIT.

Poly unsaturated by MIT 16-11

The Tech fencers secured the second days victory with strong showing from its foil and epee team. The sabre men held on 4-5: Bob Brooks '74 and Park each (1-2) and Wong going (2-1). The foil team after analyzing its mistakes from the previous day won 6-3; Dave Chen '75, Liu, and Fowler each with scores of (2-1). The epee team became a potpourri when jack-of-all-trades Tsang and Greg Rothman '75, a foilist, combined with the partners of Cook and Eckel to win 6-3 over the Poly Foilers.

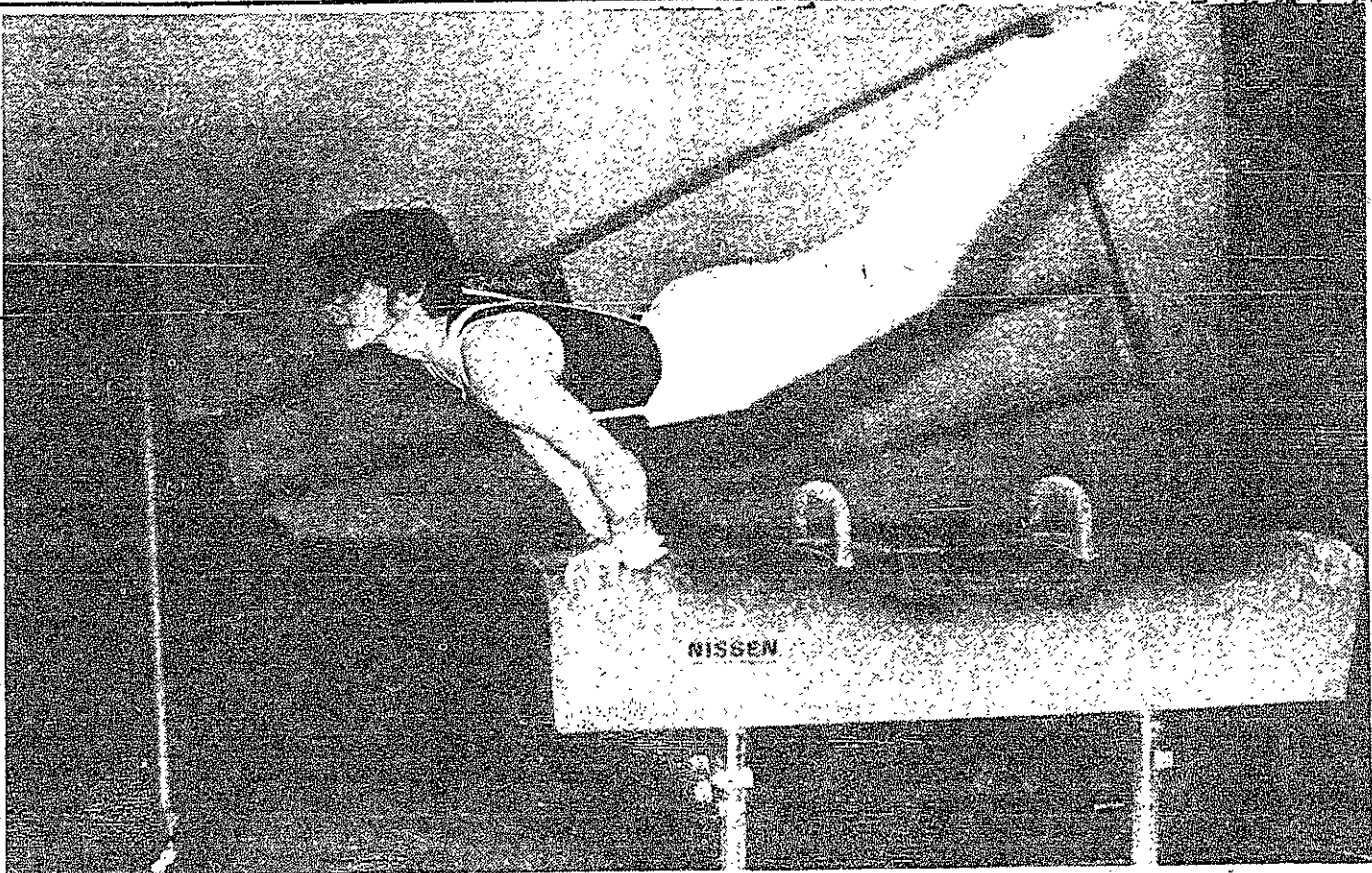
The Brooklyn Poly team was rated as a very tough team, but succumbed to the calculating minds of the dashing Tech Trouncers. The next varsity match will be on January 20 against Southeastern Mass at home.

Hockey team splits a pair

By Dan Gantt

Tech's pre-Christmas varsity hockey season drew to a close last week with two very different contests. MIT won its home opener on Thursday night, defeating a club team from Tufts 5-2. However, a complete reversal of form awaited the Engineers at Wesleyan on Saturday as they were annihilated 13-2.

While hardly an artistic success, the victory over Tufts was certainly pleasing to the home team fans. Playing a man short, MIT's George Kenny '74 opened the scoring at 8:42 of the first period as he came up with the puck and rammed home an unassisted goal. Having maintained their lead thanks to a muffed breakaway by Tufts, Tom Lydon '73 scored Tech's first power play goal of the season on a good pass from Tony Luzzi '74.



Gymnasts edge Lowell Tech

The MIT gymnastics team had a tough, close, bizarre meet against Lowell Tech on Saturday. A combination of some poor jobs by MIT and surprisingly good performances by LTI kept MIT discouraged and behind for almost the whole meet. Behind by .85 going into the last event, MIT saw its top three high bar men have breaks in their routines, only to see a worse job by LTI and have the MIT gymnasts pull out the meet 115.4 to 113.6. The team really needs a vacation after the painful experience at Lowell.

Surprisingly to anyone at the meet, MIT actually beat Lowell in four of the six events. Unfortunately, though, they started off losing on floor exercise by a big three and a half points. They had to nibble away at this deficit throughout the rest of the meet. On pommel horse MIT got back half a point mainly due to a score of 7.0 by captain Paul Bayer '73, the first place (with special thanks to the judges, who overscored him by at least half a point). The next event was rings, and it was the effort by the ring team which contributed most to MIT's victory. All four gymnasts, Dave Millman G, Jarvis Middleton '74, Larry Bell '74, and Jon Johnson '75, did exceptional jobs to beat LTI by 2.55. Millman's 7.95 took first place.

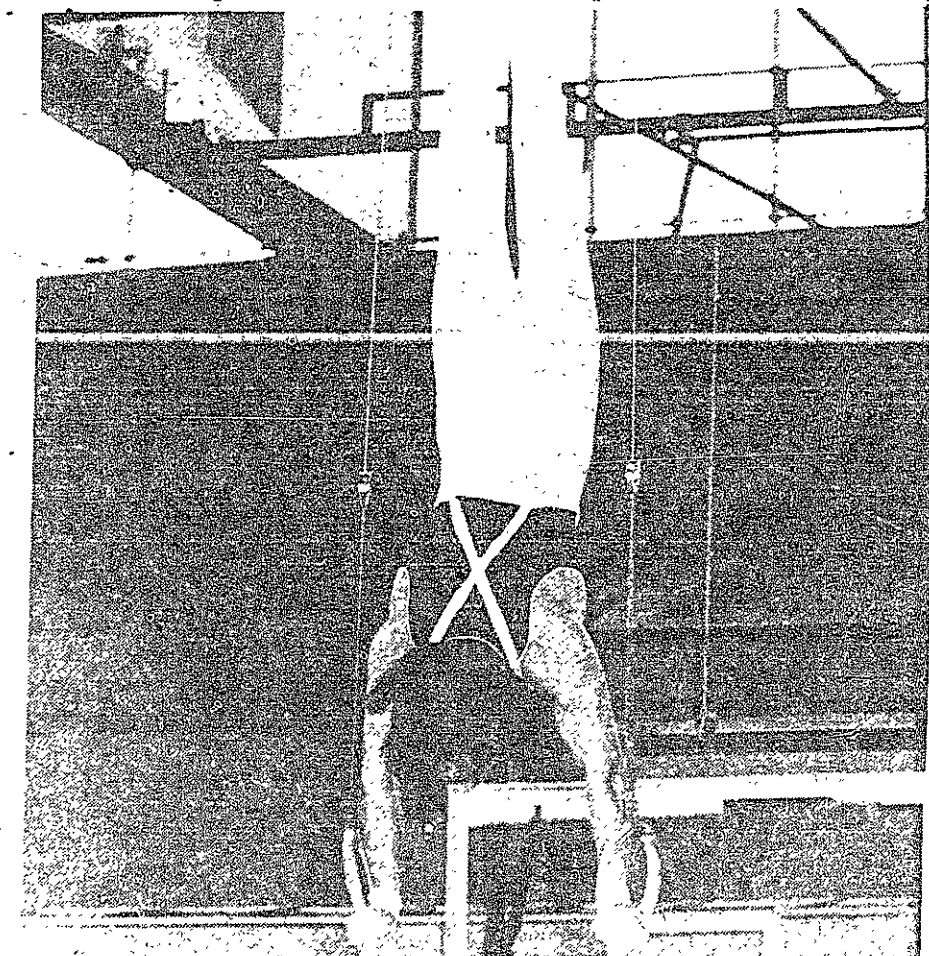
The second half of the meet started with MIT down by .45 and with competition on vaulting, MIT's weakest event. Luckily, Johnson's good lead off vault forced the judges to give the Tech vaulters reasonably high scores and minimized the loss on the event. The second place score of 8.05, awarded to John Auston, was MIT's first

score in the eights this year. Now down by 1.4, the parallel bar team gained back another half point. Andy Rubel '74 got an underscored 7.25, which tied him with Bell for second. This brought it down to high bar. Bell's fine 6.35 earned him first place, while the other scores should perhaps stay unmentioned.

This meet brought to a close the short first half of the gymnastics season. While their record of 2-1 was expected before the

season started, it has still been a disappointing opening. Every team that MIT will face in the second half has to be rated higher than Lowell Tech. The gymnasts will have to have a boost in morale over the vacation and productive practices in January to be ready for the meets to come.

Last Friday in MIT's first JV gymnastics meet ever, Boston State won 100.45 to 84.9 despite grad student Paul Eckbo's six first places.



MIT's record in gymnastics so far this year is 2-1. The pictures shown above are from their meet last weekend at Lowell Tech. The picture at the upper left shows Dave Millman G on the rings; the upper right is Paul Bayer '73 on the horse, and directly above is Jarvis Middleton '74.

Photos by Brye Davis

ny (assisted by Fisher and Warner). The win evened MIT's record at 1-1.

Wesleyan soon wrecked that record, though. Just what does one say about a 13-2 loss? Tech was out-played in all areas of the game, being out shot 48-24. Neither Tech goalie was able to stem the tide, both failing on one of every four shots.

Things did not look so bleak at the outset as Warner's unassisted goal at 7:10 of the first period attained a 1-1 tie. From then on it was all Wesleyan as they ran off seven straight goals to take a commanding 8-1 lead before Tech's final score of 3:50 of the third period by Fisher from Luzzi and Kenny. Five more Wesleyan goals added insult to injury, sending MIT home to regroup before they next take to the ice January 13 at home against Bridgewater State.

to move MIT up by two with a minute left in the period.

Tufts narrowed the gap to 2-1 early in the second period. Shortly thereafter, a small donnybrook erupted resulting in some 16 minutes of penalties. After the smoke cleared and with both teams back at full strength, Tech again moved back on top by two on Lydon's second goal, assisted by Rob Hunter '73 and Kenny. The last ten minutes of the period were totally dominated by MIT as they carried the play to Tufts and appeared to have the game under control.

However, a Tufts player left unchecked in front of the goal connected to put Tufts within a goal at 3:08 of the third period. Tech iced the game in the final four minutes on power plays by Ian Fisher '74 (with an assist from Steve Warner '73) and Ken-

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