



President Jerome Wiesner answers student questions in the lobby of Building 7 Monday during a meeting attended by some 200 persons.
--Photo by A. E. Maloof

CEP Asks Faculty to Use Flexibility

(Following is a statement by the Committee on Educational Policy with regard to academic responsibilities and requirements for students during the current period of protest activity and political campaigning. The statement was arrived at Monday evening in response to requests for Faculty guidance in the handling of academic responsibilities during this period. The CEP decision was unanimous and all members signed the statement. Their names appear at the end of the statement.)

In the present time of national crisis and questioning, the CEP has been made aware that many members of the Institute community feel a pressing need to commit energy and time to political activities. University responsibilities and personal political commitments may sometimes conflict, and different individuals will balance their priorities in different ways. The Institute has an obligation to remain open and to have its classes and academic processes continue. The CEP recommends, however, that the faculty and administration provide to individual students and to individual faculty members as much flexibility in satisfying their Institute responsibilities within the current term as is consistent with the rights of other individuals.

More specifically it is the CEP's unanimous recommendation:

(1) that the individual teachers be flexible with regard to arrangements under which individual students may complete their academic work within the present term;

(2) that individual teachers make arrangements to ensure the continuity of their classes.

The CEP has established the following Special Committee, for the remainder of the term, to advise and assist individual students and faculty members in

these matters, and to help resolve difficulties arising from unusual circumstances: Roy Kaplow (CEP, CGSP), Chairman (MIT Extension 3322); Ernest Cravalho (CAP); Matthew Farber (CEP); George Flint (CEP); and Travis Merritt (CEP).

Stanley Backer II
Suzanne Berger XVII
Wilbur B. Davenport VI
Matthew Farber I
George Flint XV 4
Robert L. Halfman XVI
Daniel Holland XV
Roy Kaplow III
Daniel J. Kleitman XVIII
Douglas S. Luther XII 3
Travis R. Merritt XXI
Lisa Peattie XI
Norman C. Rasmussen XXII
Robert Silbey V
Steven R. Tannenbaum X
Michael L. Telson VI G
Rainer Weiss VIII
Walter A. Rosenblith
Constantine B. Simonides
Hartley Rogers, Jr. XVIII,
Chairman

Faculty Will Meet Friday

At a formal request of 12 members of the Faculty, officers of the Faculty have scheduled a special meeting of the Faculty for 3:15pm Friday in Room 10-250.

Faculty rules provide that a special meeting will be called on the petition of any 10 members.

The 12 signers of the petition have asked that the Faculty discuss issues related to current student strike activities. According to Professor Hartley Rogers, Jr., chairman of the Faculty, members of the Committee on Educational Policy will also be on hand for the special Faculty meeting to explain the committee's recommendations (see above) for Faculty flexibility during this period when some students are seeking to take time out to participate in protest-related activities or engage in political campaigning.

Meantime, the Student Center Committee announced it will sponsor a series of small discussion meetings for students, faculty and members of the administration to be held in the Sala de Puerto Rico at the Student Center between 1pm and 6pm Wednesday.

In still another development, an open meeting for all members of the MIT community was scheduled

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Hollomon Named First Director of Center for Policy Alternatives

A Center for Policy Alternatives has been established in the MIT School of Engineering to foster the application of technology to the solution of social problems and Dr. J. Herbert Hollomon, former president of the University of Oklahoma, has been appointed its first director.

Announcement of the new Center was made by Dr. Alfred H. Keil, Dean of the School of Engineering.

"The new Center will study and investigate substantive issues related to society, particularly those in which technology and engineering could play significant

roles, and will seek close cooperation from throughout the Institute in pursuing its research," Dr. Keil said.

"It will differ from most centers for policy analysis in that, based on its studies of actual problems, it will develop a number of alternatives for action and policy and identify possible means for their implementation. These alternatives will often be in the form of factual presentations of possible specific programs, regulations, or legislation."

Dr. Hollomon, an MIT alumnus, who was Assistant Secretary of Commerce for Science and Technology under President Kennedy and Acting Undersecretary of Commerce under President Johnson, was president of OU from 1968 to 1970 when he came to MIT as consultant to the MIT president and provost. Prior to entering government service, he was Director of Research and Head of the Central Engineering Laboratory for the General Electric Co.

Coincident with establishment of the new Center, Dr. Hollomon has been appointed Visiting Professor of Engineering and will transfer immediately from his consultant position to direct the new undertaking. He will serve as a member of the MIT Engineering Council and will participate in Council deliberations concerning tenure and promotion of faculty members in the School of Engineering.

The Center will be a focus to bring together experts in various disciplines from throughout MIT and from industry, government and other universities world-wide.

It will pool their talents in the common cause of finding alternatives to solve critical societal problems, particularly those in which technology plays a significant role.

Immediate studies will be started with regard to the formation and substances of national technology policy, the supply and

(Continued on page 4)

Skolnikoff Outlines Changes as CIS Enters 3rd Decade

(The Center for International Studies has been the target of recent protest activity. The following statement of information was prepared by Dr. Eugene B. Skolnikoff, director of the Center and head of the Department of Political Science.)

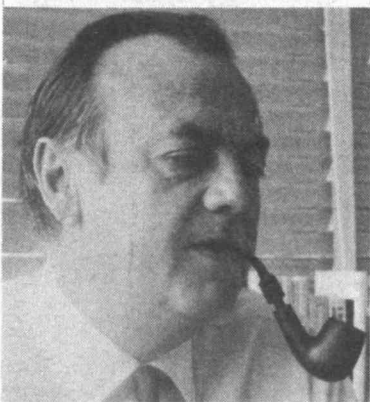
The Center for International Studies was established at MIT in 1951 to provide a focus for international affairs research at the Institute. Its primary commitment for the first two decades developed in the social sciences, where it provided the setting for research into some of the long-term problems of international relations. Political and economic development, international communications, military and foreign policy, arms control and studies of communism and revolution represented the major research areas. There has also been great interest in the application of new research methods and technological tools in international and social science research generally.

Until this year, the Center has

been part of the School of Humanities and Social Science, with most of those doing research under Center auspices holding faculty appointments in one of the regular academic departments. The MIT Political Science Department owes its early impetus to the nucleus of political scientists brought to the Center in the 50s, though the Department is now much larger and broader in focus.

This year marks a major change in Center direction. Concurrently with the appointment of Professor Skolnikoff as Director, succeeding Professor Everett Hagen who took over after Professor Millikan's death in 1969 (Professor Millikan was the first Director of the Center), the Center for International Studies is moving to emphasize more centrally international issues thrown up by or surrounding technology and science. Administratively, the Center has become an interdisciplinary center to facilitate closer cooperation and interaction between social sciences and the

(Continued on page 4)



Dr. Hollomon.

Registrar's Reminder

The deadline for cancelling registration in an undergraduate subject is Friday, May 5. After this drop date students will be required to petition the Committee on Academic Performance. In addition there will be a charge of \$5 for each subject added or dropped after May 5.

Use of Animals in Research, Teaching Outlined in Memo

The Animal Care Committee has issued the following memorandum concerning usage of experimental animals at the Institute.

This memorandum is intended (1) to clarify the roles of the Animal Care Committee and of the Institute Veterinarian and (2) to provide an overview of policies and procedures applicable to the use of animals in experimentation in both research and teaching functions at the Institute.

At the beginning of the current academic year, in view of the rapid growth in use of animals in experimentation at M.I.T. and recent changes in relevant federal legislation, the President asked this Committee to undertake a reexamination of these matters. The information contained herein is in part the product of this restudy. Since we anticipate that modifications may be required as you and we gain more experience in this area, the members of the Committee will welcome any comments or questions you may have.

Over the last several years, there has been a great increase in utilization of animals for experiment and teaching at MIT. Whereas in 1963, approximately 5,000 animals were purchased, this past year an estimated 25,000 were utilized. With these increasing numbers has come an increasing concern that animals receive proper care and humane treatment. The Institute's concern has been expressed through the appointment of an Animal Care Committee in 1963, and the appointment of an Institute Veterinarian in 1968.

In recent national legislation, there has been a redefinition of several constraints within which animal experimentation is to take place. The National Institutes of Health and other granting agencies have promulgated regulations for animal experiments which must be followed by all grant recipients. Accreditation of animal facilities has acquired central importance, and it is clear that the Institute as a whole, rather than individual departments or laboratories, is evaluated for accreditation. Accordingly, all who utilize animals in research and teaching share responsibility to assure continued institutional accreditation.

The Roles of the Animal Care Committee and the Institute Veterinarian

In this area, the Institute has two primary goals: the provision of

UBA Report Salutes MIT Community

The Annual Report of the Black Appeal this year includes a salute to MIT employees and administrators.

The salute, which will be published in May, says:

"For two years now you have been the only large organization to systematically support us. You did it with thoroughness and fairness and with consummate goodwill; and individual employees responded with enthusiasm and generosity.

"For the second year in a row, you have contributed more than all the other corporations together. On behalf of the black community of Boston, we salute and thank you."

proper care and humane treatment to animals used as experimental subjects and the protection of human health as it might be affected by animal experimentation. The President has charged this Committee with the responsibility to ensure that these goals are met. Thus, the Committee is responsible for setting and enforcing standards and guidelines for animal care within the Institute. It also acts as a judicial body in any dispute concerning the use and care of animals.

The Institute Veterinarian serves as the Executive Secretary of the Committee and he is charged by the Committee with the implementation of its policies. His duties include the overseeing of day-to-day care of all animals (mammalian, avian, reptilian) at the Institute. His assistance to experimenters may also include aid in identifying and acquiring animals appropriate to the needs of the experiment, as well as other veterinary services.

In all of its activities, the Committee seeks to serve a dual function: that of protecting animal and human health and that of providing a service for the experimenter.

In order for the Committee to function effectively, it must be sensitive to the needs of Departments, Laboratories, and experimenters. Toward this end, we seek close association and free communication between the Institute Veterinarian and experimenters and teachers. The Committee therefore sees as essential that each Department or Laboratory which uses animals appoint an individual or committee to act as liaison between the Committee and users of animals.

All animal purchases should be made through the office of the Institute Veterinarian. Experimenters may thus be assured that healthy animals are acquired from accredited dealers, as required by the new regulations. In addition, provision for receiving the animals properly and promptly can be made.

In order to fulfill its responsibilities, the Committee cannot ignore the particular nature of intended or ongoing animal experiments. Therefore, information about all animal experiments

should be submitted to the Committee through the Departmental or Laboratory representatives. Since the information the Committee needs is small in amount and specific in nature, a brief questionnaire will suffice to supply the necessary data concerning both current and projected experiments.

Instances of inappropriate use of animals or inadequate provisions for animal care are to be referred to the Committee so that remedial measures may be taken.

The Committee intends also to review periodically the needs of the Institute concerning physical facilities for the reception, quarantine and housing of such animals. We recognize that a central facility for such purposes may ultimately prove essential.

The Institute Veterinarian and/or members of the Committee have discussed these policies and procedures with members of the faculty and staff most directly concerned. We hope to broaden these discussions as seems appropriate as we seek to discharge the Institute's commitments in matters pertaining to animal care.

Boyce Burge
Robert D. Hall

David A. Kolb
Walle J. H. Nauta

Paul M. Newberne
Kenneth R. Wadleigh

Kenneth H. Goddard, ex officio
Melvin H. Rodman, Chairman

Barker Library Sets Seminar

The Barker Engineering Library is sponsoring a seminar on information sources in the field of bioengineering.

The seminar will be held on Thursday, April 27, at 3:15 pm. All interested persons are invited to attend.

The seminar will include a general discussion on how to locate material in the Barker Library, placing special emphasis on sophisticated techniques for using the card catalog. Abstracting and indexing services, new reference works, and sources of information outside the Institute will also be included in the discussion.

Uyeda Receives Medal from Science Academy

Dr. Seiya Uyeda, professor of geophysics at the University of Tokyo's Earthquake Research Institute, and a visiting professor this spring in MIT's Department of Earth and Planetary Science, this week received the Alexander Agassiz Medal of the National Academy of Sciences for his "outstanding contributions to the tectonic and thermal history of the earth."

The award, which Dr. Uyeda received in Washington on Monday night, is given approximately every three years for work in oceanography. It consists of a gold medal and a \$1000 honorarium.

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Dr. Uyeda started his research in geophysics through rock magnetism in 1952. During his

research, he discovered a rock which magnetizes itself in a direction just opposite to the applied magnetic field. He studied this for six years and it became the subject of his Ph.D. thesis.

Since then Dr. Uyeda has been studying thermal problems of the earth. With colleagues he has been involved in investigating the heat flow from the earth's interior in Japan and the Pacific Ocean. His work on how island arcs and the seas were formed through the development of the earth as a whole supports the current theories of global tectonics. It also indicates that the mountain building processes are currently going on in Japan and the surrounding seas and that the origin of these activities is the flow in the earth's mantle.

Born in Tokyo, Dr. Uyeda received a B.S. in 1952 and a Ph.D. in geophysics in 1958 from the University of Tokyo's Geophysical Institute.



Dennis Intravia, left, and Wesley Grandmont with their new bicycle lock.

Theft-Proof Bike Lock Invented by Students

Two MIT juniors have invented a revolutionary new bicycle lock that could cut the bicycle theft rate by 75 percent according to Captain James Olivieri of the Campus Patrol.

Dennis Intravia of Massapequa, New York and Wesley Grandmont of Taunton, became interested in the problem of bicycle theft several months ago in discussions of theft figures with Campus Patrol. In 1968 there were 68 bicycles stolen on campus; in 1969, 177; in 1970, 196 and in 1971, 246.

The two students developed a variety of locks which were tested with metal cutters and files in the Campus Patrol office and were finally rejected.

Eventually they came up with a lock made of a steel alloy similar to ships' armor. This lock resisted all attempts at cutting, filing or smashing made by the Campus Patrol.

The metal is made by the government and must be specially ordered. The students shape the metal themselves, then send it to a company which puts it through a hardening process. The resulting outside hardness, Intravia claims, is greater than that of most files, and the internal hardness is equal to that of most tools.

The lock, which is jointed and roughly pear shaped, weighs three pounds, the same as an ordinary bicycle chain. It was designed to fit any bicycle and fits under the seat when not in use.

The students have also

Soaring Club Memberships Are Available

The MIT Soaring Association would like to remind the Institute community that the best season for soaring has begun. Applications for membership are invited. Those who are planning to be in this area during the summer would find it particularly advantageous to join at this time. Annual dues are \$75.00 for students (undergraduate and graduate) and \$150.00 for other members of the community. For information, call Alex Nedzel on Ext. 405 Lincoln Lab.

TECH TALK

Volume 16, Number 42

April 26, 1972

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Tech Talk is published 50 times a year by the Institute Information Services, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, Mass. 02139, and distributed free to all members of the MIT community. Additional copies are available in the Information Center (Room 7-111) or in the News Office (Room 5-105). Large numbers of additional copies should be requested within two weeks of the issue date.

Mail subscriptions are \$7.50 per year. Checks should be made payable to Bursar, MIT, and mailed to the Editor, Room 5-111, MIT, Cambridge, Mass. 02139.

Please address all news and comment to the editorial office, Room 5-111, Ext. 3277.

Community Service Drive Hits Mid Point

The MIT Community Service Fund (CSF) is now in the midst of its fourth annual fund drive on campus. The Fund was established by vote of the faculty to support service projects in the neighboring area, particularly those in which members of the Institute community participate. It is believed that the MIT Fund is the only one of its kind.

CSF derives a majority of its support from individual contributions by members of the community. This year special effort was devoted to broadening the base of giving in an attempt to help the Fund become self-sustaining.

Each year since its inception, CSF has shown an increase in community giving. But out of

\$53,000 allocated last year, only \$36,000 was raised in personal contributions. By undertaking individual solicitation this year, the Fund hopes to encourage more people to give, even in small amounts.

The Fund is administered by a board of trustees composed of representatives of all segments of the Institute. Because the trustees must plan for 1972-73 allocations, they urge members of the community to make their gifts as soon as possible.

As the brochure points out, "If you care and can volunteer your time and talent towards alleviating the problems of the city, please do. If you care but are unable to offer your services, please contribute to the Community Service Fund."

Just-A-Start Features Work Study Program

Since 1968 the Institute's Community Service Fund (CSF) has helped support Just-A-Start, a creative, aggressive work-study program involving Cambridge residents, and other institutional, community and suburban leaders.

Just-A-Start employs neighborhood youths of college and high school age, under supervision, to perform work service projects, to participate in educational seminars, and to encourage the involvement of all neighborhood residents in long range impact programs to improve living conditions.

As a key component in the Wellington-Harrington neighborhood improvement program, Just-A-Start has three goals: to rehabilitate old homes and tenements for low to moderate income occupancy; to improve the quality of living and environmental conditions by upgrading services; and to involve and educate residents in constructive community participation.

Activities sponsored by

Education Warehouse Provides Tutoring and Placement Services

Education Warehouse is one of the main recipients of the money raised in the MIT Community Service Fund.

Started three years ago by a grant from HEW's Office of Education as a federal Talent Search program, the original purpose of Education Warehouse was to provide education counselling in the disadvantaged neighborhoods of Cambridge. There are 91 similar projects across the country.

Now the Warehouse is involved not only in counselling, but also in placing students in schools, tutoring, high school equivalency courses, and in attempting to change testing and admission procedures.

About half of the staff and budget at the Warehouse is devoted to counselling and to placement of students in some form of higher education such as college, graduate school or vocational training.

Annually, about 400 people of all ages are seen for counselling. Many are school dropouts or potential dropouts trying to find out what options they have. They are not required to fill out forms, and all services are free.

In addition the Warehouse staff works with the educational institutions in which counselees are

Just-A-Start include housing rehabilitation services, recreation programs, landscaping and beautification programs. In addition, educational seminars are offered, using MIT facilities. Last year eight seminar groups visited courts and prisons, wildlife sanctuaries and dumps, helped in day care and neighborhood service centers, talked with residents in many locations and looked into the quality and operations of playgrounds in the South End, Cambridge and Brighton.

Funding for Just-A-Start has been a combination of grants from the Department of Housing and Urban Development (HUD) and private foundations, businesses, universities and individuals. Because of a reordering of national priorities, obtaining large grants from HUD has become increasingly difficult. Therefore, in addition to residence, dining and educational services offered by the Institute, the Just-A-Start program needs continued monetary support from the Community Service Fund.



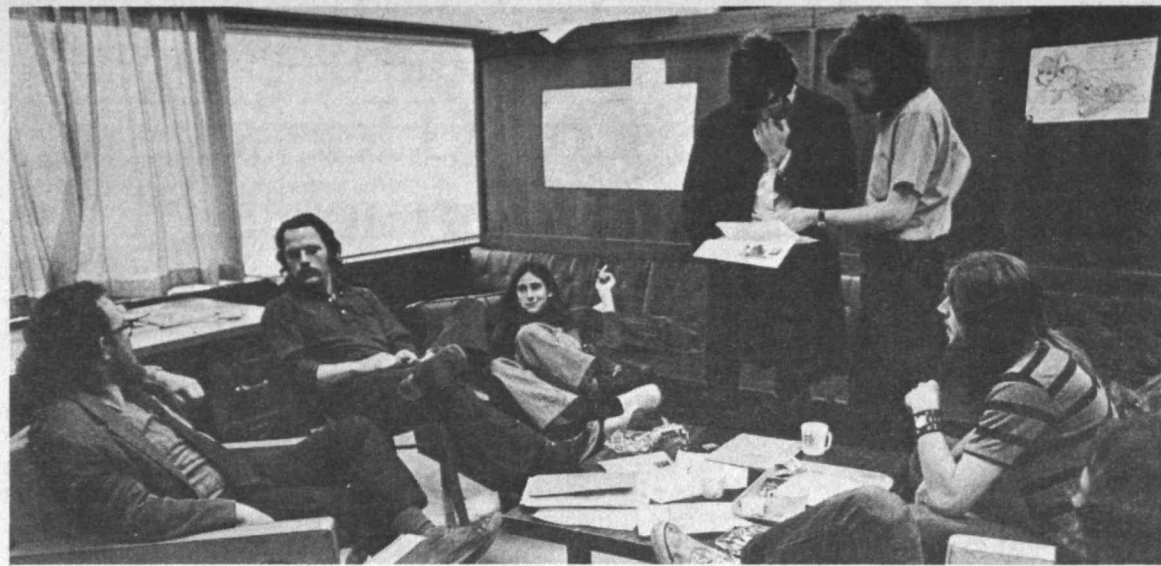
A tutee with her tutor at Education Warehouse.

placed. So far the retention rate for Warehouse students who have been placed in these institutions is 30 percent higher than for students in general.

Each year the Warehouse places about 250 people in colleges throughout the country. Presently there is one Warehouse student at MIT who is finishing his freshman year and doing well. Harvard University has five Warehouse students, and a number of others are at Boston area schools.

The second main focus at Education Warehouse is on instruction. In this phase the Warehouse has about 225 people annually.

The instruction programs include tutoring for all ages--students in high school or junior



Left to right: Tim Bird, Bruce White, Arlene Podell, Lubischer discuss on-going programs in the Urban Jerry Croan, Neil Cohen, Scott Edwards and Joe Action office.

MIT Urban Action Emerging with Vigorous, Expanding Program

After suffering a large drop in participation and severe organizational problems, MIT Urban Action has recovered in recent months to become a vigorous and growing program again.

Urban Action grew out of the Social Service Committee and serves as a clearing house for members of the Institute community who volunteer in a number of community-related activities. Though most of its volunteers are students, Urban Action seeks participation from anyone interested in its ongoing projects or in starting a new one.

"Our major problem was that volunteers were so wrapped up in their own projects that no one had time to look after the overall program," reports Scott Edwards, '73, present chairman of the Urban Action steering committee.

"Now, instead of having a formal or rigid organization structure, we have the steering committee, composed of a representative from each project. In the steering committee, everyone keeps abreast of each project and we can

all see how the projects relate to each other."

The restructuring of Urban Action began a year ago following serious consideration of disbanding the group altogether. An outside consultant studied the organization and recommended means by which it could be made to work effectively. Among his

suggestions was employment of a staff support person who could maintain the office and look after day-to-day affairs.

Arlene Podell, a graduate of Boston University, accepted the post of administrative assistant to Urban Action last spring. One of her immediate tasks was to bring

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Tutoring Plus Is Prime Beneficiary of CSF Aid



Children at Tutoring Plus get a camera lesson from one of the tutors. -Photos by Margo Foote

Tutoring Plus of Cambridge, Inc., a program of tutoring plus counselling for children in a nearby low-income neighborhood, is the prime beneficiary of the Community Service Fund (CSF).

Conceived almost nine years ago, Tutoring Plus was the first off-campus social service activity supported by the Institute. Since then the program has relied heavily on contributions from the MIT community--monetary support as well as volunteer help and administrative assistance.

Last June Tutoring Plus was incorporated as a non-profit organization and now administers its own budgets and fund raising programs. Despite incorporation, the Institute is still the major source of funding for Tutoring Plus, and that vital funding comes from the Community Service Fund.

The program was originally developed because neighborhood parents and several volunteer tutors felt an urgent need for educational assistance in the area.

The backbone of the Tutoring Plus program is the tutor-child relationship. At present, there are 119 matched pairs. For the child, this relationship is sometimes the only individual attention he receives, since most of the children are from large, one parent families of different minorities.

For the tutor the program offers a firsthand knowledge of inner city life and the problems confronting not only the children but also their parents. For both tutor and tutee, Tutoring Plus provides a learning experience which cannot be duplicated.

Tutoring Plus is a grassroots operation, run by neighborhood parents for their children and supported by surrounding communities. More and more people are hearing about Tutoring Plus and the number of children seeking this approach to education is growing. If the program is to survive and meet the increasing needs of the neighborhood, it must have continuing support.

Tech Baseball, Crew Heavies Lose to Harvard, Northeastern

The MIT baseball team, which is now 3-3-1 after its Florida practice session, hosted New England's finest, Harvard, last Friday at Briggs Field, and lost 5-3. Coach Fran O'Brien, of course, threw his best pitcher, righthanded flame thrower, Al Dopfel, against the Crimson.

Dopfel, sporting a .98 earned run average, was as effective as anyone could be, but fell behind 2-0 in the third due to two Tech errors. The 2-0 margin held up for just a half inning as MIT evened the score in the bottom of the third. Harvard's righthander Sandy Weissant, who had not been scored upon all season before the MIT game, yielded the go ahead run in the fifth.

With Dopfel coasting along, allowing only six hits while striking out nine Harvards, it looked as if MIT might pull off the biggest upset of the 1972 New England collegiate baseball season.

Once again, however, Dopfel faltered as a walk and an error put a Harvard runner in scoring position. A potential double play was broken up as Tech shortstop, Rich Roy, collided with a sliding Crimson baserunner, breaking up the play, permitting the tying run to cross the plate.

The Engineers had a golden opportunity to take all again in the bottom of the ninth when they had the bases full, but MIT left three stranded.

In the top of the tenth, Harvard pushed across two runs on two errors despite Dopfel's not allowing a hit.

The MIT nine broke out of their weekend slump on Monday, unleashing a 16-hit attack in a 12-2 victory over Boston University. Righthander Dave Yauch, '75 went seven innings, and southpaw Chuch Holcum, pitching with a broken left thumb, blanked the Terriers over the final two frames.

First baseman Herb Kummer, '75, lead MIT's most potent offense of the season with three hits and five runs batted in, scoring two runs himself. Al Dopfel, '72, also had three hits, and four others chipped in with two hits apiece.

The win was MIT's first in the Greater Boston League.

Photo Show in Gallery

"Joyous Following--Peaceful Movement," an exhibition of photographs by graduate students at the Institute, will be on display at the Creative Photography Gallery through May 19.

The photographs and the exhibition are the work of members of the 1971-72 graduate seminar in photography conducted by Minor White, director of photography at MIT. The students are: Jeff Cosloy, Joseph DeMaio, Marc PoKemper, Sam Unger, Caroline Vaughan and Donald Woodman.

The show is a group effort by members of the graduate class based on a theme derived from the 17th hexagram of the *I-Ching*, the ancient Chinese book of change. The group used the 17th hexagram as a focus for their energies and a direction in which to work.

The gallery is located in du Pont Gymnasium and is open to the public from noon until 6pm weekdays and from 1pm until 5pm on weekends.

Last Saturday on the Charles River, MIT's heavyweight finished in second place behind heavily favored Northeastern. MIT beat the Huskies once seven years ago and has won only two victories over any crew--Columbia twice--in the last four springs.

The Tech eight blasted into a half length lead at the 500 meter mark of the 2000 meter race. Northeastern, a veteran crew which opened its season the week before by routing Yale at New Haven, was not upset by Tech's fast break. However, NU Coach Ernie Arlett admitted "They just slipped away too darn fast. I was getting a bit worried."

Arlett's fears were increasing as MIT's lead over his Husky eight was built up to a length and a half at the half way mark. Arlett added, "I knew we had a strong finish, but I was surprised to see them hold on so long. I expected us to move up and go by earlier."

Tech's Coach, Pete Holland, driving a launch behind the race, was in a state of disbelief. "Do you

want me to drive Pete," asked freshman coach, Don Saer, as the launch weaved and swayed through a stretch of rough water, "so you can watch the race?"

Then, with 100 meters left, a sudden shift in speed, on command from coxswain Dave Burns, caught most of the crew unaware, except junior captain stroke, Jere Leffler. Leffler took a half stroke on the last of five counted strokes, but the rest of the crew didn't. As a result, Jere lost his sliding seat and was ineffective.

Tech's flying boat practically braked in the water, enabling the closing Northeastern boat to fly by MIT and win by a half length.

"Naturally" said Holland, "I'm disappointed. We rowed pretty well. It's the best we've rowed in the three years I've been here. I was surprised we moved out in the first 30 strokes as well as we did."

Next Saturday, MIT hosts perennial crew giant Harvard along with Princeton and Kansas State in the 34th Annual Compton Cup.

Experts, Novices to Compete in Bowling, Billiards Tourney

Beginning Tuesday, May 2, experts and novices alike will gather in the Student Center Games Area to compete in the Institute's first Community Bowling and Pocket Billiards Tournament.

The tournament is open to everyone in the community--students, faculty, staff, employees. To date some 60 persons have signed up, but more contestants are welcome. David Moser, '72, publicity manager for the tourney, says, "We would really like to see more of the non-student segment of the community enter the competition. So far most of the entrants are students, but we want this to be a real community tournament."

Players in the bowling tournament will be divided into four divisions according to their scoring averages--160 and over; 130 to 160; under 130; and a women's division. Non-league bowlers will be asked to play a six game qualifying round beginning on Tuesday, May 2. A fee of \$2.50 will be charged.

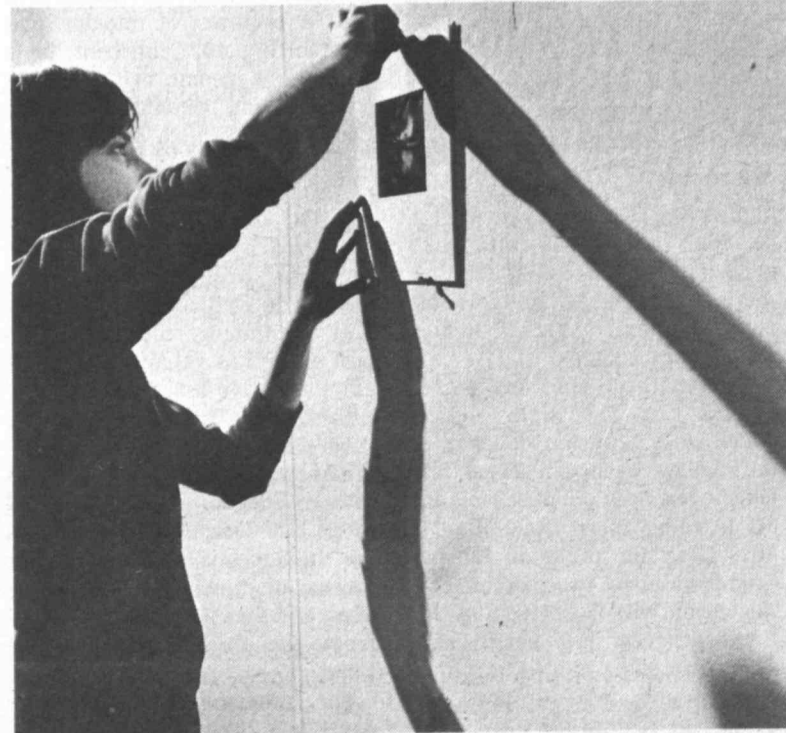
All who qualify will be eligible to play in the tournament itself. The entry fee is \$3 and will cover the entire tourney. In the first of three

rounds, each contestant will play six games. A second round of three games will be played by the top ten contestants in each division, and the final round will be played according to PBS rules. Trophies and gift certificates will go to the winners in each division.

The "Continuous Pocket Billiards" tournament will run simultaneously with the bowling tourney and is also open to the entire community. Contestants will be charged 70 cents per hour to play in the billiards competition.

"Only ten persons have signed up for the billiards tourney so far," David reports. "Unless more people show an interest in playing, we may have to cancel the match. Entrants will be accepted until Monday, May 1."

In addition to publicizing the tournament, David is also interested in getting some response from the community about the possibility of starting summer bowling leagues at the Institute. Those interested in entering the upcoming tournament or discussing a summer league, should call Irving Curtis, Ext. 3913.



Caroline Vaughn, a special graduate student, helps prepare the "Joyous Following--Peaceful Movement," exhibition at the Creative Photography Gallery.

New Center Formed to Seek Solutions to Social Problems

(Continued from page 1)

demand for professional manpower nationally, opportunities in improving certain elements of the service sector such as education, the maintenance of consumer goods, the growing demand for energy supplies, and public communications improvements.

"During the last 20 years MIT's School of Engineering has become strong in those fields of applied science and engineering that relate to the extension of man's physical capabilities, particularly in those fields which undergirded the national programs for space, defense, nuclear energy and health," Dean Keil said. "The School of Engineering, like MIT and the nation as a whole, now faces the challenge of applying more of its resources to the crucial problems of our changing society."

"In order to do so, it must provide better mechanisms for connecting the School with these problems, for informing faculty and students of their character, importance and consequences, and for encouraging faculty and students to work on such problems. Students seek new directions, and some of them strive to relate their intelligence and learning more directly to the newly perceived problems of our times. It is likely that increasing financial support will be redirected in part toward those complex problems related to the newer needs of the changing society in which we live."

"The Center for Policy Alternatives will carry out rational study and analysis of issues, not only with the aim of suggesting alternatives, and to find new ways to beneficially connect technology and social and economic welfare but also to influence some of the interests and programs of its own faculty and students."

"The Center will encourage studies related to these issues in all parts of the Institute and provide a mechanism whereby students and faculty can become involved in the analyses that lead to alternatives for actions and problems and their evaluation. The Center will seek close ties and cooperation with the other Schools at MIT in order to interlock with such disciplines as political science, economics,

CIS Adopts Interdisciplinary Approach To World Projects

(Continued from Page 1)

physical sciences and engineering, and to provide a more accessible capability for scientists and engineers with international interests.

New projects and ideas are under active development with participation of faculty from many departments and from neighboring institutions. These include: comparative studies of advanced technological countries in areas such as technology policy, income distribution, and welfare policy; international impact and control of technology; arms control; population and migration; nutrition planning for developing countries; communication and development; international business and several others.

Support for these new projects will hopefully be derived from a variety of sources as in the recent past. At present, out of a research budget of approximately \$1x10⁶, roughly half comes from private foundations (particularly the Ford Foundation) and the rest from

management, systems studies, and architecture and urban planning.

"With the changing needs of our society for technology, this Center will serve to bring new views to MIT, particularly to the Engineering School, stimulating some of the faculty and students to participate in activities which have the greatest potential to social or economic utility."

"The Center will consist of associated faculty members and students and will have a small permanent core staff and part-time participants from throughout the Institute and from the outside world. It is not intended that all policy analysis at MIT be conducted in the Center. However, it is expected that many underlying studies of society and the techniques of developing policy analysis will find a home there. An advisory policy committee will be formed from within MIT to guide and help integrate the activities of the Center for the Institute as a whole. An external advisory committee will provide a national focus and contacts with others engaged in like pursuits."

The Center will initially be supported by a seed grant from MIT Sloan research funds. It is expected that the later support will come from funding of research proposals and from grants.

Dr. Hollomon, a native of Norfolk, Virginia, received his S.B. from MIT in 1940 and his Sc.D. in Metallurgy at MIT in 1946.

With Leonard D. Jaffe, Dr. Hollomon co-authored *Ferrous Metallurgical Design*, and he was the founder and first publisher of *ACTA Metallurgica*, an international journal of metallurgy. In addition to his scientific writings, Dr. Hollomon has written more than one hundred articles related to public policy, safety, consumer affairs and education.

Dr. Hollomon is a Fellow of the American Physical Society, of the American Institute of Mining, Metallurgical and Petroleum Engineers, and of the American Society for Metals. He is a member of the American Academy of Arts and Sciences, of the AAAS, a founding member of the National Academy of Engineering and a former member of its council, and he is a member of Sigma Xi.

several government agencies, of which the largest sponsor is the National Science Foundation; other government sponsors of current Center research are the National Institutes of Mental Health and the US Information Agency. Several members of the Center have received allocations from the Cambridge Project for methodological research. The Center in its early years had contracts with the CIA. These were terminated in 1966. All Center research is open and published via books, monographs, reports and articles; no classified research is conducted under Center auspices. Some of those engaged in Center-sponsored research are primarily or exclusively concerned with its contributions to social science theory and methodology; others at the Center, and elsewhere at MIT, are equally motivated by the hope that their scholarly research may help to illuminate policy choices. And, as scholars and as citizens, those engaged in research at the Center have a wide range of views on world issues.

Faculty Meeting Discusses Affirmative Action

Chancellor Paul E. Gray reported to the faculty on the Institute's Affirmative Action Plan and the recent survey of its workings by the Department of Health, Education and Welfare (HEW).

The federal survey criticized the Institute for its apparent lack of success with a formal program to improve employment opportunities for women and minorities. The HEW investigators said the plan—originally adopted in October 1969 and revised in May 1971—is “not workable” and that MIT can and should do more.

Dr. Gray pointed out, however, that there were several deficiencies in the HEW report. The report was based on data dating from November 1970, he said, and made no reference to changes since that time. In addition he noted that the report was selective in the data it used and that some data were in error.

Despite the deficiencies in the report, Dr. Gray emphasized that there is still a problem in the hiring and promotion of minorities and women. He said the Institute should put a high priority on equal employment opportunity, and presented charts showing the numbers of minorities and women.

It will not be necessary to change MIT's standards in order to achieve this, according to Dr. Gray. The Institute will have to go beyond traditional recruiting methods, he said, to find more female and minority candidates for academic positions.

Dr. Gray noted that there is presently a great shortage of black

candidates qualified for academic posts. This is largely because few black Americans were encouraged to go to graduate school until a few years ago. However, many more are now doing so and they will be available for faculty appointments within the next few years.

With respect to students, the Chancellor noted that there is no differentiation in standards for admission of male and female students. Until recently, admission of women was limited by the availability of on-campus housing for them.

The encouraging rise in the number of black student applicants in the past few years has fallen off somewhat.

Dr. Gray said the administration is in the process of compiling a comprehensive reply to specific questions raised by HEW and expected to submit it as soon as it is complete. A revised Affirmative Action Plan will be drawn up and submitted in May.

In conclusion Chancellor Gray said “We're now at the point where we have the opportunity and responsibility to look ahead and shape our commitments for the future. There is a continuing MIT commitment toward Affirmative Action, and it must be worked at by persons at all levels.”

In other action, the faculty voted unanimously to abolish the position of Assistant Secretary of the Faculty; to establish a 15-member Committee on the Library System and to delete the listing of its duties from the faculty rules.

A motion to change the grade of pass in a pass/fail course from

“N” to “P” was tabled until the motion can be rewritten.

In addition, reports were given by the Committee on Nominations

and by the Committee on Educational Policy concerning seminar research proposals and experimental programs.

ON-CAMPUS EMPLOYMENT OF BLACKS

CATEGORY	NOV. '70	JULY '71	JULY '72	JULY '73
Faculty	9 (2%)	8 (1%)	19 (2%)	32 (4%)
Academic Staff	18 (2%)	28 (3%)	49 (5%)	67 (7%)
Administrative Staff	11 (3%)	16 (4%)	22 (5%)	26 (8%)
DSR Staff	6 (3%)	10 (2%)	20 (3%)	30 (3%)
Exempt	14 (5%)	15 (5%)	16 (5%)	21 (7%)
Bi-weekly	79 (5%)	94 (8%)	158 (10%)	204 (12%)
Hourly	144 (11%)	151 (10%)	185 (11%)	182 (12%)

ON-CAMPUS EMPLOYMENT OF WOMEN

CATEGORY	NOV. '70	JULY '71	JULY '72	JULY '73
Faculty	17 (2%)	20 (2%)	32 (4%)	42 (5%)
Academic Staff	187 (18%)	186 (19%)	203 (20%)	219 (22%)
Administrative Staff	53 (14%)	72 (19%)	79 (20%)	82 (21%)
DSR Staff	124 (20%)	124 (20%)	132 (21%)	143 (23%)
Exempt	63 (23%)	83 (27%)	88 (29%)	97 (32%)
Bi-weekly	1420 (86%)	1385 (85%)	1389 (85%)	1367 (84%)
Hourly	183 (13%)	215 (14%)	203 (14%)	214 (14%)

BLACK AND WOMEN FACULTY (Includes Visiting Faculty)

BLACKS	NOV. '70	JULY '71	JULY '72	JULY '73
Professors	6	5	5	7
Associate Professors	2	1	6	7
Assistant Professors	1	2	8	18
Total	9	8	19	32

WOMEN	NOV. '70	JULY '71	JULY '72	JULY '73
Professors	4	5	5	6
Associate Professors	5	6	12	14
Assistant Professors	8	9	15	22
Total	17	20	32	42

ENROLLMENT

YEAR	FIRST YEAR	UNDERGRADUATE	GRADUATE	TOTAL
1968	7	25	16	41
1969	52	73	28	101
1970	58	120	52	172
1971	47	153	87	240
1972	35 - 37*			

YEAR	FIRST YEAR	UNDERGRADUATE	GRADUATE	TOTAL
1968	65	238	222	460
1969	74	263	280	543
1970	91	313	280	593
1971	125	390	288	678
1972	125*			

*Estimated enrollment.

Faculty Calls Meeting to Discuss Student Strike

(Continued from page 1)

for Kresge Auditorium for 12 noon Thursday where Professor Eugene B. Skolnikoff, director of the Center for International Studies and head of the Department of Political Science, will describe CIS research programs. Professor Wayne O'Neil of the Department of Humanities was to respond. There will be opportunity for questions from the audience. The Center has been the object of protest in the past and Professor Skolnikoff said he hopes to use the opportunity to make clear the nature and scope of the Center's present work and future plans.

MIT reaction to renewed bombings in North Viet Nam began last Wednesday. In an early development, President Jerome B. Wiesner joined with the presidents of eight Ivy League universities—Harvard, Yale, Dartmouth, Brown, Cornell, Princeton, Columbia and the University of Pennsylvania—in issuing a personal statement condemning the renewed bombing.

Thursday night, a protest “teach-in” at Rockwell Cage drew some 500 persons where speakers denounced the escalation and US policy in Viet Nam. They also heard a proposal to take over the Center for International Studies in the Grover M. Hermann Bldg. but the MIT administration took immediate steps to prevent such a takeover.

Also Thursday night, the newly-elected Graduate Student Council held its first meeting and passed a motion saying: “The Graduate Student Council is in favor of immediate action toward putting an end to the war in Viet Nam. We feel the most effective way to pursue this goal is the active political support of those candidates who would facilitate this end.”

Beginning last Friday, an undergraduate poll of students regarding their desire to participate in a national student strike to protest the new bombings drew votes from some 1,600 of M.I.T.'s 3,900 students. More than 900 voted for the strike and more than 600 against.

Friday morning some 150 persons set up a picket line in front of the 77 Massachusetts Avenue entrance to M.I.T. They later marched to the Gover M. Hermann Bldg. where they sought, but did not gain, entrance to the Center for International Studies. They then left M.I.T. to join in a city-wide rally on Boston Common Friday afternoon.

A student strike headquarters was in full operation in the Stratton Student Center over the weekend. Class attendance appeared normal, but many students were lending a hand to protest activities or political campaigning.

A prayer of vigil was organized Monday evening, including the ringing of chapel bells as a reminder of Viet Nam dead. Arrangements also got underway for the open meeting on CIS set for Thursday.

Also Monday morning, up to 100 pickets again appeared outside the 77 Massachusetts Avenue entrance. Later in the day, President Wiesner answered questions for a group of some 200 persons who gathered in the lobby of Bldg. 7. Also Monday afternoon, protesters placed small wooden crosses in the greensward in front of Kresge Auditorium as another reminder of Viet Nam dead and following a mass meeting there Monday evening, some 30 persons began a “live-in” in the Bldg. 7 lobby as a continuing reminder of protest.

In response to inquiries, a student was prepared by the MIT administration, explaining

security precautions being taken during the period of protest. There had been a bomb threat earlier in the day. The statement said:

“Security arrangements for the campus are aimed at protecting people, at protecting the educational facilities, and at permitting both protests to be expressed and the educational process to go on.

“The past few days have shown us that there are some persons in the Boston area who associate themselves with peaceful demonstrations of protest and use them as opportunities for violence.

The recent vandalism at Harvard's CFIA was carried out by a group of people who marched in front of a large peaceful demonstration.

“Here on our own campus, we have reason to be particularly concerned about the CIS in the Hermann Building where there was a bomb explosion last fall and against which explicit threats were made at the rally in the Cage on Thursday night. We are taking every precaution to make sure that harm to people and wanton destruction of campus facilities are deterred, and we are remaining in touch with the civil authorities.”

Urban Action Is Haven For Campus Volunteers

(Continued from page 3)

some order to the programs then in progress. By being in close communication with staff members at Tutoring Plus and Education Warehouse, for example, she was able to begin building a series of referral sources.

Since then, Urban Action has been working effectively. In addition to the nearly 200 volunteers who work with Tutoring Plus and Education Warehouse, there are about 75 in the Undergraduate Legal Services Project, 25 in the Fernald School Project and ten in the Cambridge Tenants Assistance Project.

Urban Action recently started a new project at the Cambridge Branch Library near the Harrington School where many children congregate after school. “Kids would come in with nothing to do,” Arlene said, “and with too much energy just to sit and read.”

Urban Action developed a program one afternoon a week.

The children have completed art projects, built weather stations and studied nature, among various other activities.

The library has asked Urban Action to expand the program to more afternoons, and other libraries in the system have requested similar programs. Right now, however, Urban Action lacks enough volunteers to staff a larger activity.

Another recent breakthrough in cooperation among social agencies came with the creation of Interchange, in which Urban Action participates. Interchange is a group of local educational agencies formed to consolidate opportunities, resources and information in the education field.

The MIT Community Service Fund is the major source of income for Urban Action. Last year Urban Action CSF contributed approximately \$12,000, and the fund has been asked for a similar amount this year.

—Photos by Margo Foote

THE INSTITUTE CALENDAR

April 26
through
May 5

Events of Special Interest

Advisory Committee on Shareholder Responsibility**
Open meeting, Thursday, April 27, 5pm, Rm 10-300.

Abortion Action Week*

Information booth: Monday-Friday, May 1-5, 10am-2pm, Bldg 10 Lobby. Film: "Abortion," Tuesday, May 2, 8pm, McCormick Country Kitchen. Speaker: Dr. David Chapin, "Abortion and Contraception," Thursday, May 4, 8pm, McCormick Green Living Rm.

L'Histoire du Soldat (The Soldier's Tale)**

Performance presented by Dept of Electrical Engineering Musical Coffee Hour Series. Tuesday, May 2, Rm 10-105. Coffee at 3:30pm, performance at 4pm.

Science and Responsibility*

Institute Prof. Salvador E. Luria, biology. Moderator: Prof. Joseph Weizenbaum, electrical engineering. Respondent: Prof. Robert W. Mann, mechanical engineering. Technology and Culture Seminar. Tuesday, May 2, 5:15pm, Rm 9-150. Buffet dinner (\$1), 6:30pm, Student Center Mezzanine Lounge. Responses and discussion, 7-9pm.

Dames Craft Sale*

Paintings, prints, pottery and other homemade crafts. Friday, May 5, 8am-4pm, Bldg 10 Lobby.

Seminars and Lectures

Wednesday, April 26

Optical Guided Waves*

Prof. E. M. Conwell, Abby Rockefeller Mauze Professor in Electrical Engineering. Mauze Lecture. 12n-1pm, Rm 3-133.

Externalities and Other Market Imperfections in Urban Transportation Systems*

Prof. Jerome Rothenberg, economics. Civil Engineering Transportation Division Seminar. 3-4:30pm, Rm 1-146. Refreshments following.

An Experimental Investigation of Acoustic Waves in Turbulent Fluid Transmission Lines*

Donald Margolis, mechanical engineering, doctoral thesis presentation. 3pm, Rm 3-446.

Ontogenesis of the Endoplasmic Reticulum

Dr. Philip Siekevitz, Rockefeller University. Oral Science Seminar. 3-5pm, Rm E18-301.

Environmental Radiation and Impact on Nuclear Program*

Ragnwald Muller, consultant, Technologic Hazards, General Electric Company. Nuclear Engineering Seminar. 3:30pm, Rm NW12-222. Coffee, 3pm.

Comparative Perception and Reception of a Single Technology—The Railroads in Britain, France, Germany and Belgium*

Prof. David B. Ralston, humanities. History of Technology Seminar. 4pm, Rm 14E-304.

The Convection Due To A Moving Periodic Heat Source: A Model for Venus's 4-Day Atmospheric Circulation*

Dr. E. J. Hinch, University of Cambridge, England. Applied Mathematics Seminar. 4pm, Rm 5-134.

System Identification: Applications to Electric Power Systems*

Prof. F. C. Schweppe, electrical engineering. Decision and Control Sciences Group Seminar. 4pm, Rm 37-212.

Prehnite-Pumpellyite Metamorphic Rocks, Northern Appalachians

Dr. E-An Zen, US Geological Survey. Earth and Planetary Sciences Colloquium. 4pm, Rm 54-100.

Thursday, April 27

Mining Exploration Whither?*

Dr. Arthur Brant, director, Geophysical Dept, Newmont Exploration Ltd. Earth and Planetary Science Luncheon Seminar. 12n-1pm, Rm 54-915.

Information Sources in the Field of Bioengineering*

Barker Engineering Library Seminar. 3:15pm, Rm 10-550.

A Hard Look at Airport Costs*

Stuart Lipton, president, Air Transportation Association. Aeronautics and Astronautics Flight Transportation Division Seminar. 4pm, Rm 35-225. Coffee, 3:30pm, Rm 33-411A.

Trace Element Data Bearing on the Origin of Salic Rocks from the African Rift

Dr. Ian L. Gibson, Bedford College. Earth and Planetary Sciences Colloquium. 4pm, Rm 54-915.

Absorbing Operation Research in Industry*

Jim Heeremans, consultant, Arthur Anderson Company. Operations Research Center Seminar. 4pm, Rm 24-307. Refreshments following in Rm 24-219.

Recent Studies in Vocal-Tract Theory*

Prof. Gunnar Fant, head, Dept of Speech Communication, Royal Institute of Technology, Stockholm. Speech Communication Seminar. 4pm, Rm 20E-222.

Optimization Analysis of the Nutritional Value and Resource Requirements of Agricultural Production Patterns*

Philip Abbott, graduate student, mechanical engineering. Thermodynamics Seminar. 4pm, Rm 3-343.

Application of Affinity Chromatography in Isolation of the Insulin Receptor*

Dr. Howard Katzen, Merck Institute for Therapeutical Research. Nutrition and Food Science Seminar. 4:15pm, Rm 54-100. Coffee, 4pm. Followed by sherry hour, Rm 16-322.

Collision Phenomena with Highly Stripped Ions

Prof. Hans D. Betz, physics. Physics Colloquium. 4:30pm, Rm 26-100. Tea, 4pm.

Friday, April 28

Amazon Workshop*

Augusto L. Dias Carneiro, senior in management science. Discussion of progress of a systems analysis approach to the creation of urban centers in the Amazon. 1-3pm, Rm E52-461.

Chemical Engineering Graduate Seminars*

T. Burke, "An Improved Polyvinyl Alcohol for Biomaterials," 2pm; G. Wildman, "Carbon Gasification," 3pm. Rm 10-275.

The Misbehavior of Electrons in Ferromagnetic Metals*

Prof. Brian Schwartz, physics. Center for Materials Science and Engineering Colloquium. 4pm, Rm 9-150. Coffee, 3:30pm.

Metaphor Case for Likeness*

Prof. Paul Ricoeur, visiting professor at University of Chicago, Dept of Philosophy. Philosophy Seminar. 4pm, Rm 14E-304.

Plasma Confinement Experiments in Doublet and Multipoles at GGA*

Dr. T. H. Jensen, Gulf General Atomic Company. RLE Plasma Dynamics Seminar. 4pm, Rm 26-214.

Monday, May 1

Nuclear Engineering Doctoral Seminars*

P. Doan, "Studies on the Consequences of a Hypothetical PWR Pressure Vessel Rupture;" A. Hanson, "Interchannel Coolant Mixing in Wire-Wrapped Rod Bundles;" M. Gregory, "Heterogeneous Reactivity Effects in Fast Breeder Reactors." 3-5pm, Rm NW12-222.

The Neglected Art on the Back of the Envelope*

Prof. R. C. Larson, electrical engineering and urban studies and planning. Decision and Control Sciences Group Seminar. 4pm, Rm 37-212.

Vision*

Prof. George Wald, Dept of Biology, Harvard University. Phi Lambda Upsilon Ashdown Memorial Lecture. 4pm, Rm 54-100. Followed by sherry hour.

Effects of Grain Size Variation on the Theory and Practice of Sediment Tracing*

Dr. William R. James, head, Special Studies Section, Engineering Development Division, CERC. Civil Engineering Water Resources and Hydrodynamics Seminar. 4-5pm, Rm 48-316. Coffee, 3:30pm, Rm 48-410.

How Can We Aid the Black African Liberation Struggle in Southern Africa*

Rev. Gladstone Mxolisi Ntlatati. Political Science Dept Seminar Series on "Black African Liberation Movements in Southern Africa." 7pm, Student Center Mezzanine Lounge.

Tuesday, May 2

Alternative Strategies for Urban Problems*

Survey of present research in urban technology presented by Dept of Mechanical Engineering. 12n-3pm, Rm 10-105.

The Role of A Contractor's Project Manager*

Robert S. Kerr, senior vice president, Guy F. Atkinson Co. with panelists William B. Foxhall, senior editor, "Architectural Record;" Norman B. Leventhal, president, Beacon Construction Co.; Chester V. Vappi, president, Vappi & Co., Inc.; Steve Leslie, graduate student, civil engineering; and moderator Dr. Fred Moavenzadeh civil engineering. Henderson Memorial Series on Project Management. 3-5pm, Rm 9-150. Coffee, 2-3pm.

Propulsion to Orbit by Ground Based Lasers*

Arthur R. Kantrowitz, Visiting Institute Professor in Dept of Mechanical Engineering. Aeronautics and Astronautics Seminar. 4pm, Rm 35-225. Coffee, 3:30pm, Rm 33-206.

Current State of the Art—Controllable Pitch Propellers*

Donald Ridley, vice president, Bird-Johnson Company. Ocean Engineering Seminar. 4pm, Rm 3-270. Coffee, 3:30pm, Rm 5-314.

Wednesday, May 3

Optical Guided Waves*

Prof. E. M. Conwell, Abby Rockefeller Mauze Visiting Professor in Electrical Engineering. Mauze Lecture. 12n-1pm, Rm 3-133.

Title to Be Announced*

Prof. Paul Roberts, Harvard University. Civil Engineering Transportation Division Seminar. 3-4:30pm, Rm 1-146. Refreshments following.

Role of Hormones and Nutrition in Muscle Growth*

Dr. Donald B. Cheek, Johns Hopkins Hospital. Oral Science Seminar. 3-5pm, Rm E18-301.

High Resolution Radar Topography of Mars*

Prof. Gordon H. Pettengil, earth and planetary sciences. Lincoln Lab Lecture. 3:30pm, Lincoln Lab.

What a Nuclear Engineer Should Know about LMFBR Materials
P. G. Shewmon, director, Materials Science Division, Argonne National Laboratory. Nuclear Engineering Seminar. 3:30pm, NW12-222. Coffee, 3pm.

Reliability Optimization of Isostatic Structures

Prof. Emilio Rosenblueth, Institute de Ingenieria, Universidad Nacional Autonoma de Mexico. Civil Engineering Seminar Series on Structural Theory. 4-5pm, Rm 1-353. Coffee, 3:30pm.

Thursday, May 4

The Case of the Premature Sub-Electron

Prof. Gerald Holton, Harvard University. Physics Colloquium. 4:30pm, Rm 26-100. Tea, 4pm.

Friday, May 5

Producing School Science Materials through Community Industry

Dr. Douglas M. Lapp, director, Instructional Materials Processing Center, Fairfax County Public Schools, Virginia. ERC Colloquium. 12n, Rm 6-120.

Chemical Engineering Doctoral Seminars*

J. Donahue, "Selectivity of Chemical Reaction Accompanied by Mass Transfer and the Influence of Marangoni Convection," 2pm; Trindade, "Studies on Magnetic Cleaning of Coals," 3pm. 10-105.

Mathematical Modeling of Estuaries—The State of the Art*

Dr. G. T. Orlob, president, Water Resources Engineers. Engineering Water Resources and Hydrodynamics Seminar. 4-5pm, Rm 48-316. Coffee, 3:30pm, Rm 48-410.

Problems in Materials Processing

Prof. Nam P. Suh, mechanical engineering. Mechanical Engineering Seminar. 3pm, Rm 3-270. Coffee, 4pm, Rm 1-114.

Laser-Plasma Interactions and Their Possible Fusion Applications

Prof. E. V. George, physics. RLE Plasma Dynamics Seminar. 4pm, Rm 26-214.

Women's Forum

Bi-Weekly and Administrative Staff

Presentation of suggested final proposal. Thursday, April 27, 12n-2pm, Rm 10-280.

Faculty and Research Staff

Friday, April 28, 1-2pm, Rm 10-310.

Forum

General discussion, Monday, May 1, 12n-1pm, Rm 10-105.

Student Meetings

Student Information Processing Board Meeting

Every Monday, 7:30pm, Rm 39-200.

Thursday Staff Meeting**

Every Thursday, 8pm, 2nd floor, Walker.

Technique Staff Meeting

Every Saturday, 11am, Student Center Rm 457.

ERGO Staff Meeting

Every Sunday, 6pm, Student Center Rm 443.

MIT Club Notes

ZPG

Election meeting and vote on constitutional amendments. Wednesday, April 26, 5:15pm, Student Center Rm 002.

Plant Club*

Meeting. Wednesday, April 26, 7pm, Rm 24-608.

Scuba Club*

Election meeting. Wednesday, April 26, 8pm, Rm 20E-017.

Chinese Students' Club***

Discussion of Tiao Yu Tai. Thursday, April 27, 7pm, Student Center Mezzanine Lounge.

Lecture Series Committee*

General meeting. Monday, May 1, 7-10pm, Student Center Rm 407.

Rocket Society**

Meeting. Tuesday, May 2, 7:30pm, Walker Memorial Rm 320.

White Water Club**

Pool session. Tuesday, May 2, 8-10pm, Alumni Pool.

Alpha Phi Omega**

Meeting. Wednesday, May 3, 7:30pm, Student Center Rm 407.

Scuba Club

Pool session. Wednesday, May 3, 8pm, Alumni Pool.

Classical Guitar Society**

Concert guitarist Hugh Geoghegan is available for private instruction for intermediate and advanced students. Call Vo Ta H. 661-0297.

Baker House SPAZ Jogging Club**

Daily, 10:45pm, Baker 2nd Floor West.

Unicycle Club*

Every Sunday, 3pm, in front of Student Center. Beginners welcome. Call Andy Rubel, X3161.

Hobby Shop**

Open weekdays, 10am-4:30pm, duPont Gym basement. For more information, contact student, \$6/term or \$10/year; community, \$15/year. Call X4343.

DL Duplicate Bridge Club**
Argery Sunday, 2:30pm, Walker Blue Rm. Every Tuesday, 6pm, m, obdell.

Winks Association*
Every Monday, 8-11:15pm, Student Center Rm 491.

Sailing Association**
First and third Mondays every month. 7:30pm, Student Center Rm 73.

Do Club**
Every Monday, Wednesday, Friday, 5pm; every Saturday, 1pm. uPont Gym Exercise Rm. Beginners welcome.

Quilting Club*
Every Monday, Thursday, 5pm, Student Center Rm 473.

Nautical Association**
Basic Sailing Shore School, repeated every Monday and Thursday throughout the spring, 5:15pm, Sailing Pavilion, non-members welcome.

Fencing Club**
Every Tuesday, 6-9pm, duPont Fencing Rm.

Lee Club**
Every Tuesday, Wednesday, Thursday, 5-6:30pm, Kresge. New members, especially tenors, welcome. Call Cyril Draffin, 247-8691.

Classical Guitar Society**
Classical guitar classes, group or private. Every Tuesday and Thursday, 5-8pm, Rms 1-132, 1-134, 1-136. Anyone interested in lessons, call Vo Ta Han, 661-0297.

Rugby Club
Practice. Every Tuesday and Thursday, 5pm, Briggs Field.

Urban Vehicle Design Competition
Volunteer meetings. Every Wednesday, 3pm, Rm E40-250.

Table Tennis Club***
Practice session, every Wednesday, 7:30-10:30pm, T-Club Lounge, iPont.

Science Fiction Society*
Every Friday, 5pm, Rm 1-236.

Student Homophile League*
Meeting and mixer meets Fridays, 7:30pm, Mission Church, 33 Swdoin St, Boston. For gay help (anonymous) at MIT, call the student gay tutor, 492-7871 anytime.

CBL Duplicate Bridge**
Bridge Club. Every Saturday, 1:30pm, Student Center Rm 473. Members, free; non-members, 75 cents.

Chess Club**
Every Saturday and Sunday, 1:30-5:30pm, Student Center Rm 491.

Social Events

Society of Sigma Xi**
Formal coffee hour. 4-5pm, Student Center Rm 407. Thursday, April 27, **Prof. J. Austin**, host. Thursday, May 4, **Prof. S. Miller**, host.

Muddy Charles Pub**
Be with your friends at the Muddy Charles Pub, 110 Walker, daily 11:30am-7:30pm. Call X2158.

Friday Afternoon Club**
Music, conversation and all the cold draft Budweiser you can drink. Featuring folk singer Rich Holloway. Every Friday, 5:30pm, Ashdown basement Games Rm. Admission: men \$1, women 50 cents. Must be over 21.

Movies

The Cabinet of Dr. Caligari
Humanities Film Series. Wednesday, April 26, 6pm, Rm 10-250.

Day of Wrath by C. L. Dreyer
Philosophy Dept film. Wednesday, April 26, 7:30pm, Rm 2-390.

Waves in Fluids and Generation and Propagation of Sound
Fluid Mechanics Films. Thursday, April 27, and Monday, May 1, 5pm, Rm 3-270.

Spanish Earth
Humanities Film Series. Friday, April 28, 10am, Rm 14N-0615.

Fortune and Men's Eyes**
S.C. Friday, April 28, 7pm and 9:30pm, Rm 26-100. Tickets 50 cents. Must show ID.

The Raven**
Student Center Committee. Friday (Saturday morning), April 28, 12:30am, Sala de Puerto Rico. Free.

7. Dancers and Other Strangers**
S.C. Saturday, April 29, 7pm and 10pm, Rm 26-100. Tickets 50 cents. Must show ID.

Thi*
Ingram. Sunday, April 30, 3:30pm, Rm 26-100. Tickets \$1.50. Call 247-10080.

On Uncle*
S.C. Sunday, April 30, 8pm, Rm 10-250. Tickets 50 cents.

Broshima Mon Amour
Humanities Film Series. Tuesday, May 2, 6pm, Rm 10-250. Free.

Name
Humanities Film Series. Tuesday, May 2, 8pm, Rm 10-250. Free.

The Wild Child
Humanities Film Series. Wednesday, May 3, 6pm and 8:30pm, Rm 10-250. Free.

Make Out and The Women's Film
Humanities Film Series. Friday, May 5, 2pm, Rm 14N-0615. Free.

Lord of the Flies
Humanities Film Series. Thursday, May 5, 6pm and 8:30pm, Rm 10-250. Free.

Johnny Got His Gun**
LSC. Friday, May 5, 7pm and 10pm, Rm 26-100. Tickets 50 cents. Must show ID.

Cat Ballou**
Student Center Committee. Friday, May 5 (Saturday morning), 12:30am, Sala de Puerto Rico. Free.

Music

Noonhour Concert*
Program of guitar music with **Hopkinson Smith**. Thursday, April 27, 12n, Chapel.

A Spring Festival of Music*
Concerts by the **Fine Arts String Quartet**, Tuesday and Wednesday, May 2-3. Bach's St John Passion performed by the **Choral Society** and **Glee Club** with **Klaus Liepmann** conducting, Saturday, May 6. All start 7:30pm in Kresge. Free.

Theater and Shows

Company*
Musical comedy performed by Musical Theatre Guild. April 26, 28 and 29, 8:30pm, Kresge. Tickets \$3 and \$3.50, available at X6294 or in Bldg 10 lobby.

Dance

Spring Folk Dance Festival*
Folk Dance Club. Friday-Sunday, April 28-30, Sala de Puerto Rico: Workshops: Saturday with Martin Koenig (Balkan) and Sunday with Fred Berk (Israeli) at 10am-12n and 1:30-4:30pm. Social events: Party on Friday, concert-party on Saturday, and regular dancing on Sunday, all at 7:30-11pm. Admission: 50 cents per event; \$1 for concert-party.

Folk Dance Club*
International folk dancing. Every Sunday, 7:30-11pm, Sala de Puerto Rico (exceptions to be posted).

Modern Dance Technique Class**
Elementary/Intermediate. Every Monday, Wednesday, Friday, 5:15pm. Every Sunday, 1pm. McCormick Gym.

Folk Dance Club*
Balkan folk dancing. Every Tuesday, 7:30-11pm, Student Center Rm 407.

Tech Squares*
Every Tuesday, 8-11pm, Rm 10-105. Call dorm X0888 or 492-5453.

Folk Dance Club*
Israeli folk dancing. Every Thursday, 7:30-10pm, duPont Gym T-Club Lounge.

Friday Afternoon Dance Break*
International folk dancing on the Kresge Oval, every Friday (weather permitting), 12:30-1:30pm.

Exhibitions

Klaus Liepmann Retrospective*
Exhibition of posters and programs illustrating the history of music at MIT, honoring Klaus Liepmann, director of music. Hayden Corridor Gallery, April 28 through May 22.

Autographed Music Scores
Exhibition of autographed musical scores in honor of Klaus Liepmann and the Choral Society. Music Library (Rm 14E-109) through the summer.

Graduate Show*
Photographs taken by students enrolled in Minor White's graduate photography course. Creative Photography Gallery through May. Open daily 12n-7pm.

To Look on Nature*
Exhibition of 19th Century landscape painting of France, England, America, Germany, Holland, Italy and Spain. Hayden Gallery, April 7 through May 8.

Photography Exhibit*
Photographs by MIT students **Peter Sramek** and **Baldwin Lee**. Hayden Corridor Gallery through April.

Jerusalem of Gold*
Photographic exhibit by Israeli artist **Yossef Ben-Purat**, through April 28, 10am-3pm, Student Center "Center Lounge."

Hart Nautical Museum*
Exhibits include "Naval Undersea Research and Development Center," "The Art of Rigging," and "French Undersea Research" (through April). Bldg 5, first floor.

Athletics

Varsity Baseball*
Brandeis. Wednesday, April 26, 3pm, Briggs Field.

Freshman and Varsity Tennis*
Dartmouth. Wednesday, April 26, 3pm, duPont Tennis Courts.

JV/F Baseball*
Bryant and Stratton. Friday, April 28, 3pm, Briggs Field.

Heavyweight Crew*
Compton Cup with Harvard, Princeton, Kansas State. Saturday, April 29, 10:30am, Charles River Basin.

Varsity Baseball*
Coast Guard. Doubleheader, Saturday, April 29, 1pm, Briggs Field.

Varsity Lacrosse*
Trinity. Saturday, April 29, 2pm, Briggs Field.

JV Tennis*
Leicester Junior College. Saturday, April 29, 2pm, duPont Tennis Courts.

Golf*
UMass, WPI, Boston University. Monday, May 1, 2:30pm, Crystal Springs Country Club, Haverhill.

Varsity Tennis*
Brandeis. Monday, May 1, 3pm, duPont Tennis Courts.

JV/F Lacrosse*
Milton Academy. Wednesday, May 3, 3pm, Briggs Field.

JV/F Baseball*
Northeastern. Wednesday, May 3, 4pm, Briggs Field.

Lightweight Crew*
Tabor Academy. Wednesday, May 3, 4pm and 4:30pm, Charles River Basin.

Religious Services and Activities

The Chapel is open for private meditation from 7am to 11pm every day.

Roman Catholic Mass*
Every Sunday, 9:15am, 12:15pm, 5:15pm, Chapel.

Christian Worship Service*
Every Sunday, 11am, Chapel.

Christian Discussion Group*
Bible study and discussion of Christianity today. Every Sunday, 9:30-11am, McCormick Seminar Rm A. Call Ron Gamble, X6712 or 547-4279.

Hillel Religious Services*
Monday-Friday, 8am, Rm 7-102; Fridays, 7:30pm, Chapel; Saturdays, 9:30am, Chapel.

Ananda Marga Yoga Society*
Group meditations. Every Tuesday, 5pm, Rm 14E-303. For information, call X3664.

Christian Science Organization*
Meeting includes testimony of healings. Every Tuesday, 7:15pm, Rm 8-314.

Latter Day Saints Student Association**
Religious seminars. Every Tuesday, 8am, Student Center Rm 473.

Christian Bible Discussion Groups*
Every Wednesday, 12:30pm, Rm 4-343; every Thursday, 12:30pm, Rm 20B-222. Call Prof. Schimmel, X6739, or Ralph Burgess, X2415.

Christians for Dinner*
United Christian Fellowship. Every Thursday, 6-7pm, Walker Dining Hall (under sign of the fish).

Praying, Singing, Sharing Meeting*
United Christian Fellowship. Every Thursday, 7-8pm, East Campus Lounge.

Islamic Society Prayers*
Every Friday, 1pm, Kresge Rehearsal Rm B.

Vedanta Services*
Every Friday, 5:15pm, Chapel; discussion hour, 6pm, Ashdown Dining Hall.

College Life Campus Crusade for Christ*
Brothers and sisters for fellowship and a time of teaching from the Open Book. Every Friday, 7-9pm, Rm 1-132.

Islamic Society Discussion*
Isha prayers followed by discussion of various aspects of the Islamic way of life. Every Friday, 7:30pm, Student Center Rm 473. Coffee and doughnuts served.

Free Draft Counselling*
Hillel, 312 Memorial Drive, X2982. Call or visit 10am-5pm.

Announcements

Concert Band Rehearsal Change
Rehearsal will be held Wednesday, April 26, from 7-9pm in the Student Center instead of 8-10pm.

Wellesley-MIT Exchange
Applications for the Fall 1972 cross-registration program are due Friday, May 5. Applications and information are available in Rm 7-101, X1668.

Chemical Engineering Freshman Orientation Meeting†
Monday, May 1, 7:30pm, Rm 12-124. Students and faculty urged to attend. Refreshments following meeting.

Numbers
18.051 Professor Rota's long-awaited booklet of alphabetical number tables is now available for 50 cents at the Tech Coop book dept and sporadically in the lobby of Bldg 10.

1974 Class Rings
Rings will be on sale through Wednesday, April 26, in the Lobby of Bldg 10 from 9am to 5pm.

*Open to the Public
**Open to the MIT Community Only
***Open to Members Only
†Freshmen encouraged to attend

Send notices for May 3 through May 12 to the Calendar Editor, Room 5-111, Ext. 3279, by noon Friday, April 28.

Apollo 16 Mission Put Draper Laboratory in Limelight

With Apollo 16 astronauts John Young, Charles Duke and Tom Mattingly enroute back to earth Tuesday, engineers at MIT's Charles S. Draper Laboratory were looking back on a moon mission that twice put them in the national limelight.

Using simulation facilities and test equipment at Bldg. DL7, 75 Cambridge Pkwy., the MIT men helped Houston ground controllers and the astronauts cope with "glitches" that could have terminated the mission.

The Laboratory's Apollo Group designed and developed the on-board guidance systems used in Apollo command and lunar modules--the systems the astronauts use via the now-familiar display and keyboard in their spacecraft. In addition, the Laboratory developed and verified by computer simulation all of the mission programs used in the on-board computers of the guidance systems. During flights, the Laboratory sends teams to Cape Kennedy and Houston and maintains around-the-clock teams in Cambridge to help out, via closed circuit communications, with any in-flight problems.

The first in Apollo 16 problems requiring Draper Lab support came early Tuesday when an electromagnetic interference "glitch" lead to momentary loss of the gyroscopically-fixed inertial reference in the command module guidance system.

When the spacecraft was some 140,000 miles from earth an electromagnetic interference problem occurred in the electronic subunit which links the inertial platform to the guidance computer. This interference or "glitch" caused a bit to be inadvertently set which caused the computer to think that the three-axis Inertial Reference Unit (IMU) was in an orientation known as gimbal lock. The computer is programmed so that when this phenomenon actually occurs the IMU is removed from an inertial mode and put in a coarse align

mode which is no longer useful for active guidance. In this particular case, the signal was falsely sent, but since the computer thought gimbal lock had occurred the system was put in the coarse align mode and Mattingly was forced to realign the platform by taking star sightings.

The problem occurred during coasting conditions which were not time critical. The major concern, however, was for what might happen during thrusting flight. Occurrence of a problem of this type then would cause loss of inertial reference and force the astronauts to use backup steering modes.

A similar problem occurred on Apollo 12 which was struck by lightning during launch. In the Apollo 12 launch the Saturn booster guidance system (used as the primary system when the Saturn is still attached to the command module) rather than the command module guidance system was controlling the vehicle, and therefore no guidance transient resulted. However, as a result of this Apollo 12 problem MIT's Draper Lab made a change in the spacecraft computer program to prevent a similar occurrence while the command module was attached to the Saturn on future flights. In the Apollo 16 case, Draper Lab personnel determined that this same fix could be used most of the time even though the Saturn was not attached. The procedures for doing this were tested at Draper Lab and the recommendations relayed to the Mission Control Center in Houston.

During preparation for the lunar landing, the command module circularization maneuver behind the moon was delayed six hours, however, by a second "glitch" that also involved MIT help. The service propulsion engine nozzle is pivoted so it can be swiveled up and down (pitch) and side-to-side (yaw) to direct thrust. Pitch and yaw directions are controlled by separate electrical circuits and

each circuit has a backup in case of a failure in the primary.

On the orbit when Mattingly was supposed to fire his command module engine behind the moon to circularize his orbit and pull away from the now-detached lunar module carrying Young and Duke, trouble appeared in the backup circuit for yaw engine control. Since mission rules require this system to be in working order before starting the lunar landing maneuvers, Mattingly aborted the burn and, upon emerging from behind the moon, radioed earth for assistance.

The trouble was an indication that the engine nozzle was oscillating in yaw when under control of the backup yaw circuit. The presumption was an open current in the rate feedback loop.

Simulation and testing at Downey, Calif., where the spacecraft is made, showed that a steady burn could be obtained from the engine even with the nozzle oscillating. At MIT, simulation confirmed this finding and determined that dynamic control of the spacecraft could be maintained by the guidance and control system. This gave ground controllers in Houston the confidence they needed to go ahead with the landing, which was made six hours late.

The MIT team in Houston included the Apollo Group director, David G. Hoag of Medfield, Cambridge-based engineers Philip G. Felleman of Sudbury, Russell A. Larson of Boxford, Steven L. Copps of Andover, Romilly Gilbert of the Draper Lab's office at Cape Kennedy, and the Lab group permanently assigned to Houston--George L. Silver, Edwin Olsson, Thomas Lawton, George Reasor, Kenneth Goodwin and Anthony Cook.

Operations at MIT involved more than 50 different engineers and software specialists and were coordinated by Norman E. Sears of Sudbury.

Communicators assigned to

shifts to monitor communications with Houston were Robert E. Werner of Acton, Harry McQuat of Wakefield, Kenneth Kido of Reading, Edward J. Grace of Harvard, Warren Prince, Jr., of Malden, and William H. Woolsey of Wollaston.

Among the half-a-hundred to help out solving real command module problems during the flight were Jerry Gilmore of Newton, Bruce McCoy of Cambridge, George Edmonds of Cambridge, Vince Megna of Arlington, Roy

Cushing of Topsfield, Martin Landey of Watertown, Carl Ogren of Stoneham, Margaret H. Hamilton of Cambridge, Phyllis Rye of Waban, Gerald Levine of Norwood, Joseph Turnbull of Milton, Ivan Johnson of Brighton, Thomas Fitzgibbon of Waban, Robert Lones of North Reading, Don Fraser of Lincoln, Robert Schlundt of Boston, Al Engel of Chelmsford, Keith Glick of Needham, Robert Kiburz of Arlington, Lance Dane of Cambridge and Madeline Johnson of Arlington.

Duke and Seven Other Astronauts Are MIT Alumni

One of the five astronauts serving in shifts as capsule communicators with the Apollo 16 spacecraft from Houston is Anthony E. England of Fargo, N.D., one of eight astronauts who are MIT alumni.

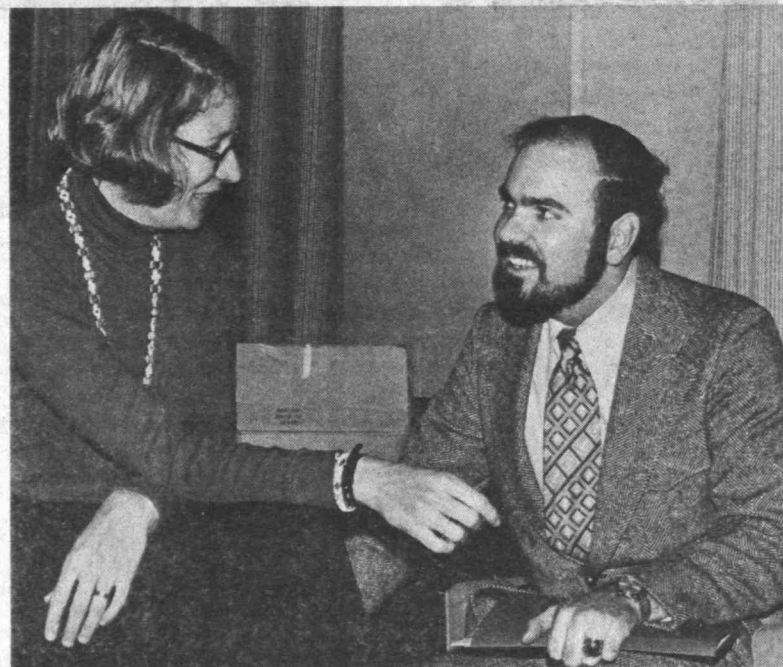
In addition, Charles M. Duke, Jr., the lunar module pilot on Apollo 16 who kept up a steady chatter from the lunar surface with a drawl that traces to his native So. Carolina, received his master of science degree from MIT in 1964 for graduate study performed in part at Draper Laboratory and having to do with human performance during Apollo mid-course navigation sightings. He is the fourth MIT alumnus to go to the moon, the others being Edwin E. Aldrin (Sc.D. '63) on Apollo 11, Edgar D. Mitchell (Sc.D. '64) on

Apollo 14, and David R. Scott (S.M., Eng. '62) on Apollo 15.

Dr. England received his S.B. and his S.M. in earth and planetary sciences from MIT in 1965 and was working on his doctor's degree in the same department in 1967 when he was picked to be a scientist-astronaut. He since received his doctor's degree.

Dr. England, Dr. William B. Lenoir (S.B. '62, S.M. '63, and Ph.D. '65), an assistant professor of electrical engineering and a staff member at the Research Laboratory of Electronics, and Dr. Philip K. Chapman (S.M. '64, Sc.D. '67) of the Measurement Systems Laboratory were three of the 11 scientist astronauts picked that year--which was the last time astronauts were selected.

Warehouse Opens Educational Doors



Nancy Gray of Education Warehouse discusses the program with Joseph S. Collins, coordinator of the Community Service Fund.

—Photo by Margo Foote

(Continued from page 3)

support and an excitement about accomplishment. It is standard for students who have passed their high school equivalency tests to come back to the Warehouse to help prepare students, both academically and emotionally, for the tests.

Some students who have passed the equivalency test are now being trained at the Warehouse to work as teaching assistants. As of September when the Equivalency program officially began, 26 of the Warehouse students had passed the testing; no student has ever failed. No figures have been compiled since September for the number of new passes.

In a separate effort, the Education Warehouse has worked to have SAT fees and college application fees waived for underprivileged students. There are

seven former Talent Search directors now on the SAT Board who are working to have the tests revised in order to make them more relevant to minority students.

About half of the budget for Education Warehouse, \$60,000, comes from the government for the Talent Search Program. This year the Warehouse has asked MIT for \$12,000; MIT gave \$10,000 in 1970 and \$8,000 in 1971. A group called "Friends of the Warehouse" raises about \$5,000 annually, and all other funds come in small donations.

The budget supports a staff of 18 paid employees. In addition, there are between 150 and 250 volunteers working at the Warehouse each year. According to Miss Gray, more than half of the volunteers are certified teachers and the others are students, including some from MIT, or young professionals.

Radiation Resistant Bacteria Warning Issued by Scientists

--MIT researchers reported Monday here that the use of radiation to preserve foods and medical supplies may be rendered ineffectual by the emergence of mutant forms of bacteria with many times the normal bacterial resistance to radiation.

This extreme resistance could be produced by the exposure of bacteria to low levels of gamma or x-radiation, possibly, the researchers feel, in the cooling systems of nuclear reactors or in the process of irradiating foods to extend food shelf-life.

The paper was presented by Stella Ibe, a graduate student from Nigeria studying in the Department of Nutrition and Food Science. Miss Ibe spoke before the American Society of Microbiology at its 72nd annual meeting, in Philadelphia. Coauthors of the paper are Dr. Roland Davies and Dr. Anthony Sinskey, also of Nutrition and Food Science, who are supervising Miss Ibe's doctoral research.

The researchers said they have produced strains of bacteria with 20 times the normal resistance to ionizing radiation and the resistance is a genetic characteristic that can be passed from one generation to the next. Fur-

thermore, by growing the extremely resistant bacteria in the same culture with normal bacteria, Miss Ibe said she has observed that the genetic material controlling resistance is passed from resistant bacteria to normal ones.

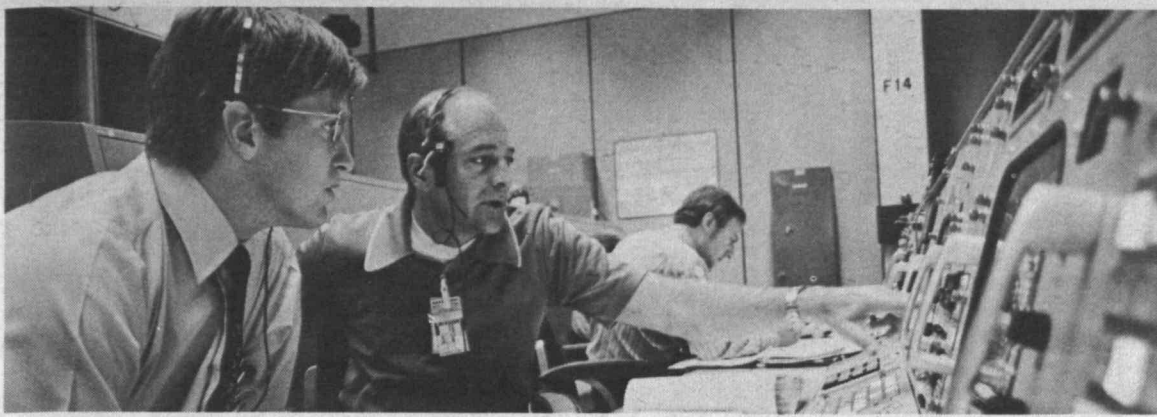
The bacterium used in the research is Salmonella, which commonly causes food poisoning.

The extremely resistant bacteria were produced by first subjecting Salmonella to a low level of radiation. The survivors were allowed to reproduce and then subjected to further, higher radiation doses. Eighty-four of these cycles, each about two days, resulted in the highly resistant strains, the researchers said. The research is being funded by the US Food and Drug Administration (FDA).

Intense ionizing radiation has been used experimentally to sterilize food, killing all the bacteria present primarily by destroying their genetic material, or DNA. But food sterilized that way has never reached the market because the method of sterilization has not yet been approved by the FDA.

An alternative being considered by food processors would be to use less intense radiation to reduce the numbers of bacteria in the food, resulting in longer shelf-life. But the levels of radiation proposed, the researchers said, are about the same as they used to produce their extremely resistant strains. That would add, they warned, to the ever-growing numbers of radiation sources with the potential for producing radioresistant forms of pathogenic bacteria--bacteria that would render useless the low levels of radiation allowable for food preservation.

In the laboratory, Miss Ibe is trying to determine exactly what factors are responsible for the hyperresistance. By observing a form of bacterial mating in which genetic material is transferred from one bacterium to another, she knows that several genes are responsible. One possibility is that the bacterial machinery for repairing DNA is extremely active in the resistant lines. Another possible factor could be that the DNA attaches itself to the cell membrane of the resistant bacteria, making the DNA more rigid and less susceptible to breakage by the radiation.



MIT'S TONY ENGLAND (left) was one of five astronauts who served as capsule communicators in 1965, was completing his doctor's work in 1967 when selected as a scientist-astronaut. Another communicator, astronaut Ron Evans, is at right. He received S.B. and S.M.



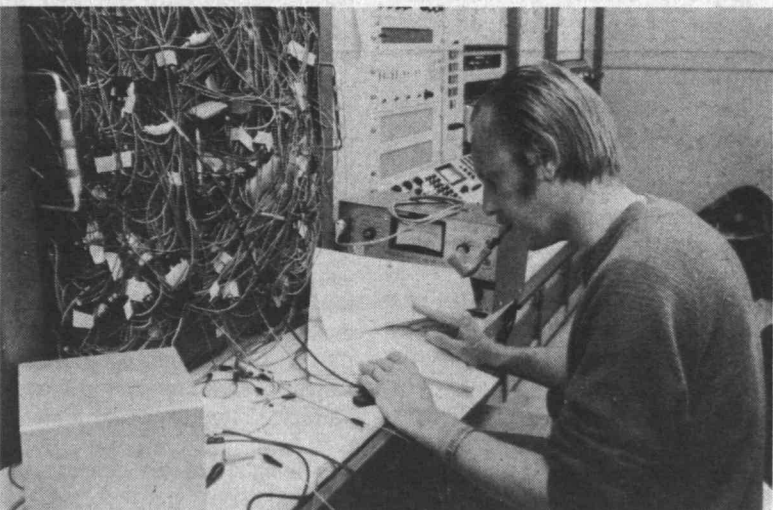
MIT DRAPER LAB engineers worked at stations in the backrooms at Mission Control, Houston, during Apollo 16 helping solve guidance problems. George Reasor (left) and Tom Lawton (right) are among six MIT engineers permanently assigned to Draper office at NASA Houston. They are shown monitoring hot lines in the Mission Evaluation Room, Houston.



RUSSELL L. LARSON, Boxford, was part of Draper team at Mission Control, Houston, for Apollo 16.



MIT SECRETARY, TEXAS branch, is Mrs. Mary Bittenbinder who has served engineers at MIT Draper Lab Office at NASA Houston for five years. At left is David G Hoag of Medfield, director of Lab's Apollo Group, Cambridge, who was in Houston to help with Apollo 16 mission.



BACK IN CAMBRIDGE, Draper Lab engineers worked around-the-clock shifts helping solve glitches in Apollo 16 mission. Carl Ogren of Stoneham is shown working on simulation of spacecraft engine control problems prior to lunar landing.



CENTER OF ACTION. Steven L. Copps (left) of Andover and Philip G. Felleman (right) of Sudbury, engineers from MIT Draper Lab, Cambridge, exchange notes at shift change in Spacecraft Analysis (SPAN) room adjacent to Mission Control Center, Houston, during Apollo 16. Draper engineering teams are on hand at all times in Houston and Cambridge to help ground controllers and astronauts during Apollo missions. Felleman headed Apollo 16 support operations.



MISSION GLITCHES command the attention of three MIT engineers manning the MIT station in NASA's Mission Evaluation Room, Houston, during Apollo 16. Romilly Gilbert (left) of MIT Draper office, Cape Kennedy, Fla., studies flight time line. Tony Cook (center) and Edwin Olsson (right) are among Draper Lab permanent personnel at Houston. MER stations backup nearby Mission Control Center.



GEORGE L. SILVER, head of MIT Draper office, NASA Houston.



HARDWARE TEST of spacecraft engine control problems were performed at Draper Lab, Cambridge, during Apollo 16, using duplicate guidance system in Systems Test Lab. Among those who worked on problem in Cambridge were Gerry Gilmore of Newton (foreground) and George Edmonds of Cambridge, shown with a system on test stand.

Spring Festival of Music to Honor Liepmann

The Institute will present a Spring Festival of Music in honor of Klaus Liepmann, music director, who will retire from the faculty this June.

The festival, which is composed of three concerts, will take place the first week of May. All of the concerts will be held in Kresge starting at 7:30pm and will be free to the public.

The Fine Arts String Quartet will open the festival on Tuesday, May 2, with a program of works by Bartok, Brahms and Haydn. On Wednesday, May 3, the same ensemble will present a concert of works by Beethoven, including Quartet in F, Op. 18, #1, Quartet in E minor, Op. 59, #2, and Quartet in C sharp minor, Op. 131.

On Saturday, May 6, Klaus Liepmann will conduct the St. John Passion by Johann Sebastian Bach with the Choral Society, the Glee Club and the Cambridge Festival Orchestra. David Brink will be the concertmaster. Francis Hester, bass, will play the role of Jesus and Karl Sorenson, tenor, will play the Evangelist. Other guest soloists will be: Jane Bryden, soprano; Pamela Gore, Alto; Frank Hoffmeister, tenor; and David Evitts, bass.

The Choral Society has had an illustrious quarter century of activity under the leadership of its founder and conductor, Klaus Liepmann. It could be said that the birthplace of the Choral Society was the Boston YWCA. In 1947-48 Professor Liepmann directed a chorus of women's voices and

combined them with the MIT Glee Club and Symphony Orchestra for two concerts.

The following year the group left the "Y" but continued as a mixed chorus and met weekly at the Liepmann's home in Cambridge. A year later the Choral Society became a definite part of the MIT musical picture and combined with the Glee Club for an annual December concert.

From those beginnings the present concert schedule and organization, developed, and the Choral Society has grown into a well-known group averaging 80-100 members each year. It contains a cross section of the entire Institute community with a membership now including students, alumni, members of the faculty and staff,



Professor Liepmann.

technicians, secretaries and student wives.

All concerts of the festival are free, however, tickets are required and may be obtained by sending a self-addressed envelope to the Music Office, Room 14N-233B, or going to the office in person. Please indicate which concert or concerts you wish to attend. Tickets for the St. John Passion will also be available in the Maclaurin Lobby.

Abortion Week Planned for May 1-5

Abortion Action Week will be observed at MIT from May 1-5.

The Committee for the Right to Choose has planned several events during the combined drive for more effective contraception, repeal of all abortion laws, and an end to forced sterilization.

An information booth in the lobby of Building 10, open daily from 10am to 2pm, will offer information on contraception, pregnancy testing and counseling, legal abortions, venereal disease, MIT medical insurance coverage in these areas, and the campaign to repeal the abortion laws in Massachusetts.

The evening events are scheduled: On Tuesday, May 2, the film "Abortion" will be shown at 8pm in the McCormick country kitchen. On Thursday, May 4, Dr. David Chapin of the Massachusetts General Hospital and Harvard Medical School will speak on "Contraception and Abortion."

The committee is an MIT undergraduate activity. Some members are undergraduates, some are MIT employees, and others are registered nurses.

Persons interested in joining the group may call Sheri Kohl, ext. 7812, Elizabeth Feld, Dorm ext. 9306, or Mona Berch ext. 4485.



Members of the Musical Theatre Guild join together "Company." Performances, held in Kresge at 8:15pm, for a production number from "Company," the award will continue nightly through Saturday, April 29. winning musical comedy which played on Broadway Tickets are available in the Maclaurin Lobby or by calling Ext. 6294. The Musical Theatre Guild is the first amateur group in the country to perform

-Photo by Sheldon Lowenthal, '74

CAVS Organizes Kinesthetic Exhibit

Tactile, acoustic, olfactory and thermal displays compose "Dialogue for the Senses," a kinesthetic exhibit for the blind designed at the Center for Advanced Visual Studies, under the direction of Institute Professor Gyorgy Kepes, director of the Center.

"Dialogue for the Senses" will be

Craft Sale to be Friday

The Technology Dames, an organization of student wives, will hold its spring crafts sale on Friday, May 5, in the lobby of Building 10.

Featured at the 8am to 4pm sale will be handmade needlework, including clothing, placemats, napkins, smocks, knitted and crocheted items, toys, and wall hangings.

The art work on sale will include original paintings, collages, batik, decoupage, sketches, note cards, paper mache, pottery, mobiles and jewelry.

Gift items such as paper flowers, flower pots and potted plants will also be on sale.

In addition to the arts and crafts, the Dames will sell bread, cakes, cookies, candy, cupcakes and sandwiches.

Of the proceeds from the event, 90 percent will go the makers of the crafts and 10 percent will go to the Dames.

ME Topic to Be Urban Technology

The Mechanical Engineering Department will present a survey of current research in urban technology on Tuesday, May 2, from noon to 3pm in the Vannevar Bush Room.

"The reasoning behind the survey is that, because of their complexity, most problems found in the urban environment do not lend themselves to straightforward solutions. What is needed is a coordinated strategy of diverse approaches, dealing with both the overall situation and the finite elements that compose it," said Larry Sweet, coordinator of the Engineering Projects Lab and instructor in mechanical engineering.

Examples from research in solid waste disposal, electric power generation, air and noise pollution, and social system modelling will be discussed.

the first exhibition installed in the new Tactile Gallery at the Wadsworth Athenaeum in Hartford, Connecticut. The Tactile Gallery is

a permanent facility for non-visual perception that will hold changing exhibitions, including commissioned works designed by artists throughout the country. "Dialogue for the Senses" will open to the public on May 10 and will remain at the Athenaeum through November.

The Wadsworth Athenaeum started planning a facility for blind persons in 1967, with a proposal by Mrs. D. Sargeant Pepper, chairman of the Ladies Visiting Committee for the Connecticut Institute for the Blind in Hartford. In 1969, 43 Lions Clubs from Hartford and Litchfield counties in Connecticut endorsed the project and guaranteed installation and operating expenses for three years. The next two years were spent fund raising. Finally in 1971 the project was ready to be put into operation. Mary Lyn Ray was appointed curator of the Tactile Gallery and last fall asked the Center for Advanced Visual Studies to design and build the first gallery installation. After Professor Kepes accepted the project for the Center, he asked the Perkins School for the Blind and the Connecticut Institute for the Blind for suggestions.

Two Named to duPont Positions

Two assistant professors in the Department of Mechanical Engineering, James H. Williams, Jr. and Arthur P.L. Turner, have been awarded a joint 1972 duPont Young Faculty Grant.

The purpose of duPont Young Faculty Grants is to provide strong support for young faculty members in getting started in their teaching and research careers. It is intended that the grants will be used to encourage recipients to select research fields of high originality. Professors Williams and Turner will base their research on the applications of composite materials from the point of view of designing and building structures.

In addition to the duPont grant, Professor Williams has received a 1972 Research Initiation Grant from the National Science Foundation. He proposes to study the fracture, fatigue and wear characteristics of high modulus graphite fiber composites.

"Many art galleries have special displays that unsighted persons are allowed to touch, such as conventional sculpture, which presents the visitor with rich tactile experiences," Professor Kepes explained. "We don't intend to repeat those efforts. What we hope to create is a total environment that offers to the non-visual person an artistic experience involving many senses."

"Dialogue for the Senses," which Professor Kepes describes as a "playhouse for the senses," comprises many individual pieces requiring participation by the visitor. A sound producing floor will emit a variety of acoustical effects when stepped on. A walkway will wind between serpentine walls covered with fur, hair and feathers, to name only a few of the materials to be used as surface coverings. Drops of water will fall from a water organ. A forest of different textured columns and rubber sculptures and collages will be located throughout the gallery.

Upon entering the gallery, the visitor will receive a braille map of the display area. Professor Kepes explained that revisions will be made continuously and new displays, based on the reactions of gallery visitors, may be added.

"Dialogue for the Senses" is a collaborative project at the Center. Professor Kepes made the initial plans and Michio Ihara carried them out in cooperation with composer Paul Earls, who has planned the acoustical details of the gallery, Mauricio Bueno and Lowry Burgess. Friedrich St. Florian helped coordinate the preliminary details, and MIT students helped construct the exhibit.

Information Available

The following items of interest are available in the Information Center, Room 7-111:

--Programs and registration forms for the Alumni Association Seminar Series on "The Future Character of the Urban Fringe" which will be held on April 29 and 30.

--Examination schedules for second term.

--The Observer.

--Summer Session catalogues.

Ronald Kalil Wins Grant

Dr. Ronald Kalil, research associate in the Department of Psychology, has received a research grant from the Massachusetts Society for the Prevention of Blindness, Incorporated.

Trained in neurophysiology and neuroanatomy, Dr. Kalil will use the grant to investigate the growth and formation of modified neural connections in the central visual pathway of kittens. The grant was approved by the National Society's Basic and Clinical Research Committee.

The National Society, founded in 1908, is the oldest voluntary agency engaged in the prevention of blindness through a comprehensive program of community services, public and professional education and research.

Apply to Tech Nursery Now

The Technology Nursery School is now taking applications for both Eastgate and Westgate schools for the fall semester.

The school, open to children of all members of the Institute, is run as a cooperative venture with parents participating in classroom activities. This year 80 children, aged three to five, were enrolled.

Hours are flexible at both nursery schools but generally run from 9am to 5pm at Eastgate and 9am to noon at Westgate.

Information on fees for the school is available in a handbook on the nursery schools which can be obtained by writing Technology Nursery School, 60 Wadsworth St., Cambridge 02139.

Interested parents should contact Director Bernice Hillman, X5989.

CLASSIFIED ADS

For Sale, Etc.

Dresses, 2 fl length gowns, sz 16, hot pink, lt pink, green organdy coat set, 10, \$15 each; pr sz 6 1/2 white lthr shoes, med heel, \$4. Palmieri, X4095.

Baby furn, 3-way carr w/new matt, was \$80 now \$15, mesh playpen w/new mat, was \$30 now \$15, infant seat, was \$7 now \$4, walker wgn, was \$10 now \$5, tbl highchair, was \$25 now \$10. Jerry, X2920.

Hoover baker broiler toaster oven, gd cond, \$7. Siv Berg, X5657.

Sm bedside tbl, solid oak chest drws, attrac LR tbl lamps, sm BR lamps. Cathy, X2168.

New stereo equip, BSC MacDonald 310, \$40, Sansui 210, \$81, Rectilinear 11's XI, \$60 each, Wl sack 4760 Cassette, \$230, entire syst m for \$400. Ross, X7920.

GE delux hatbox hairdrye, \$5. Peggy, 332-6568 evgs.

Baby carriage, \$15, Danikh carry all basinette, \$10, infant sea, \$3, exc cond. Irene Skibinski, X3138.

Mamiya/Sekor rangefinder w/needle exposure control, 50mm f/1.5, \$100, Yashica Electro halfframe auto exp, 32mm, f/1.7, \$50. X6464.

Cameras, 55mm, f/3.5 Auto Micro Nikkor, \$100, 135mm Auto Tamron, \$40, Yashica D 2 1/4 TLR w/case, \$45. Jeff or Charlie, dorm X0496.

Mason & Hamlin upr piano, recon, \$300. Katherine Ahearn, X6966.

VW tire, new, \$12, with '65 VW rim, \$15. Paul Mascall, X5461.

Hosp bed, \$75. X7192 Linc.

Viola, exc cond, gd tone, 15", \$200. Sandra, X4160, lv msg.

New AR amp model A, \$90. Beverly, X6014.

GE hairdryer, \$2.50, 3-dr desk, \$5, sm Japanese binoculars, \$7.50, new Remington elec knife, \$7.50. Milton Lavin, X6680.

Eddie Bauer ultralight down sleep bags, almost new, xtra long, \$85 each; exc frame pack, \$36; Parkway wet suit, lg, \$40. Gary, X6710.

Revere 8mm movie proj w/movie camera, lk new, \$60; ofc metal desk, 6 dr, exc cond, \$85; recliner chr, blk, \$25; port Royal typewrtr, exc cond, \$55. Mary, X3423.

Pr wdn skis w/bindings, 185cm, \$30; pr Head 240 skis, 180cm, \$55; pr Castinger boots, W 7 1/2, \$25. Linda Boyar, X7024.

Flr furnace, wall furnace, thermostats, reas & warm. X5359 Linc.

Basebrd htr, 8', elec, nvr used, \$15. Michael, X7328 Linc.

Air cond, \$30. X7142.

RCA Whirlpool washer, gd cond, yr old, used 9 months, 16 wash load cap, 2 spd, 3 cycles, mtd on wheels, w/washer guarantee, \$175. Walter, X4753.

Raleigh 10-spd, simplex derail, best offer over \$75. Al Ritter, X3161, lv msg.

Goose down, 2 lb, \$10/lb. Dave, 354-3349.

Elec range, 30", 4 burn, white gd cond, \$40 or best. Frances, X5183.

Cof tbl, 4', wood-grained formica top, \$9. Walt, X3105.

Camera equip, 8mm, power zoom camera, projector, screen, all exc cond. Michael Marx, X7622 Linc.

Shag rug, 12'x15', yr old, new \$128, asking \$64. Bonnie, X1681.

Beautyrest dbl matt, yr old, box spr & frame, \$130 or best. Debby, X5434.

Ads are limited to one per person per issue and may not be repeated in successive issues. All ads must be accompanied by full name and extension. Only Institute extensions may be listed. Members of the community who have no extensions may submit ads by coming in person to the Tech Talk office, Room 5-111, and presenting Institute identification. Ads may be telephoned to Ext. 3270 or mailed to Room 5-105. The deadline is noon Friday.

Semi antique Sarouk oriental rug, 6'10"x4'4", floral design w/center medallion, beaut colors and cond, \$300. X5112, lv msg.

Stella Harmony acoustic guitar, \$15. John, X161 Linc.

Hand embroidered oriental waistcoat, new, \$40. Jawaid, dorm X9636.

Free: 1968 Physical Review, Sec S, vol 165-176; cheap Maytag elec wringer washer. Stu Galley, X1418.

BR set, 4 pc, blond, \$250. Cathy, X5867 Linc.

Punching bag, 70lb, gd cond, \$35. Scotty, X7391.

Baby seat for bicycle, \$7. X3724.

Deer head, 6 pointed antlers, \$50 or best offer. Ivan, X368 Draper 7.

Minolta SRT 101, 58mm f/1.4, less than 1 yr old, \$200; Vivitar 200 f/3.5 telephoto for Minolta, \$75. Dick, X4170.

Sears pwr mower, reel, 21" cutter, 3 yrs old, \$65. Fred Allen, X3501.

Br new super 8 Bell & Howell proj, fl yr guar, was \$85, asking \$70. Alex, X4170.

Auto dishwasher, 6 mos old, gd as new, \$125. X4446.

Furn: mod sofa & chrs, wal desk, sofabed, fl, ceiling, tbl lamps; bkcases, bridge tbl & 2 chrs, Olivetti port typwr, carpeting, curtains, etc, low prices. X3663.

Child's playhse, 5x6x6' high, \$40; new Wilson 12-str guitar w/case, \$70; mini-bike, gd cond, \$90. Nichols, X314 Linc.

Gowns, sizes 5-9, worn once, were \$50-60, now \$25. Susan, X5784 Linc.

Bronze w/bl trim screens, custom made, var sizes, gd cond. Carlo, X5411.

Pr 7.75x14 snows, gd cond, \$20. Judy, X6455.

Br new Junior Winner tennis racket, unused, \$5; hair dryer, \$5. Lillian, Dorm X9024 evgs.

Black kangaroo fur coat, sz 12-18, \$150; ice skates, grls 11, ladies 10, mans 9, \$7 each; man's 3-spd bicycle, \$40; air mattress, \$10; dressing table, \$30; shopping cart, \$6; slide proj, \$20; tape recorder, \$17; humidifier, \$10; snow tires, \$28/pr; 21" RCA TV, \$25; children's toys. Bernard, X3708.

CFM Holley 780 carb, vacuum secondaries, needs rebuilding, \$30. Henry Clausen, X7371.

Bicycle, 3-spd, men's, like new, \$45 or best, sgl bed, \$20, two chests of drawers, cheap. Loren, 876-6904 evgs.

Royal man typewrtr, exc cond, \$50. George, X7213.

Leica IIIG, 50mm, f2 Summilor, \$85 firm. Bill, X6718, lv msg.

White fencing jacket & gloves. X1786.

Samsonite folding table & 4 chr set, \$20; Wanted: kitchen step stool. Francis or Susan, X6253.

Back issues, Sci Amer, Amer J Physics; elec broiler, flr lamp; Wntd: woman's 3-spd bike, reas price, any cond. Ed, X6815.

Pr VW rims for pre '67 sedan or bus, \$4. Fred, X2484.

Mod d'ette set, mo old, looks br new, was \$100, now \$50. Rosemarie, X661 Linc.

New ww on new Toyota Corolla wh, 6.00x12, balanced; '68 Fiat 124 spt coupe, 23K. Andy, X7010.

Vehicles

'60 VW w/newly rebuilt engine, runs well, \$225, must sell immed, also '61 VW body, make offer. Call 661-8136 evgs.

'63 VW bug, exc body & mech cond, \$375. Tam, X6646 or Kwan, X4620.

'62 VW sunrf, \$100, nds muffler. Eric Li, X6872.

'64 Karman Ghia convert, 3K on rebuilt eng, \$400. Stephen, X5671 after 5pm.

'64 Falcon, nds work but has gd reputation, best offer. Herb Newborn, X6887 lv msg, X3161 or dorm X8335.

'65 Dodge Dart GT, 54K, auto, pwr str, R, bucket seats, mtd snows, \$600 or best offer. Bill, X6813.

'65 Corvair Corsa, 53K, gd cond, nds muff, \$125. X6722.

'65 VW, 85K, passed April inspec, \$395. X4200.

'66 Corvette, 2 roofs, 4 spd, positrac, 300 hp, \$1900. X467 Linc.

'66 Rambler Classic 770, stn wgn, exc mech cond, gd tires, \$600, living country. Dr. Hawkins, X1670.

'66 BMW 1800TI, rebuilt eng, radials, R, \$1200 or best. Call 731-6675.

'67 Saab 96 Sport, 43K, exc cond, new tires, 5K on eng since rebuild, asking \$490. Bill Worthington, X7548 Linc.

'67 VW Fastback, 63K, eng in exc cond, body has few dents, asking \$795. Hynda Klunman, X6788.

'67 Sunbeam Alpine w/hdtop, wl sell separately, best offer. Ed, X3993.

'68 Mer Montego, V8, pwr str, 4 dr, auto, 2 snows, used 1 seas, 61K, gd cond, lt blue, \$1000 or best offer. X6037.

'68 VW bug, low mi, \$995 or best. Arun, X7425.

'68 Coachman pickup camper, comp, self-contained, gd cond, reas. Leo, X349 Linc.

'69 Buick Skylark, exc cond, warranty, low mi, \$1800. Susan, X3231.

'69 MGB conv, 4 spd, synchromesh trans, wire wheels, new tires & bat, 26K, tonneau exc cond. Ziggy, X3782.

'69 Cougar, 4-spd trans, AM-FM R, exc cond, active warranty, gd price. Doris, X7174.

'70 Triumph Spitfire conv, maroon, 29K, exc cond, \$1350 negotiable. John, 262-6929.

'70 Chevy Nova, pwr str, inc 2 studded sno tires, exc cond, still in warranty, \$1895. Claudia Hagman, X3330.

'71 Triumph Spitfire, hard and soft top, radials, exc cond, \$2700. Jim, X7287.

'71 Chevy Nova, auto, p st & br, air cond. Charlie, X7148.

'71 VW convert, 11K, AM-FM R, warranty, perf cond. Elsie, X7986.

Ford Econoline, reblt eng, new gen, clutch, hvy-duty bat, Monroe Load-leveler shocks, west coast mirrors, body and drive train in exc cond. Tony, X4418.

'71 Honda CB450, 2200 mi, crash bars, book rack, repair man, 2 helmets, \$925 or best. Dick, X3994.

Lippincott No. 10991 Lightning sailboat, exc cond, trailer, sails, race equip, self rescuing, Harken blocks, many xtra, \$2500 or best. Dick, X6432.

Pennant Class Sloop, 18 1/2', finn keel, wdn, cutty cabin, water tight seat lockers, well equip, dacron sails, 10hp ob, comp refinished. Bob, X4007.

Housing

Back Bay, Hemenway st, 5 BR apt, summer sublet June 1 w/opt. Call 261-8758 evgs.

Back Bay, Comm Ave, 1 BR, sublet 6/1, w/opt, \$185/month. Jim Schaefer, 267-2031.

Bcn HI, 3 BR apt, sum sublet w/opt, fireplace, \$265/month inc heat. Wendy, X3241 or Barb, X5757.

Beacon St, 1 BR apt, LR, furn, sublet 6/1 w/opt, nr MIT & Kenmore Sq, \$170. Call 536-3242 evgs.

Brighton, sublet 1 BR apt off Comm Ave, pets allowed, avail 6/1, \$165 incl water, gas, ht. Call 254-2012 evgs.

Brighton, mod 2 BR apt, on T, sum sublet w/opt, avail now, \$225/mo. Linda, X5357.

Brk, sum sublet, nr T, 8 rms, 4 BR, furn, \$250/month. Call 731-4052.

Brk, htd lux apt, 3 BR, DR, den, frpl, dish & disp, porch, Driscoll school area, avail 6/15 or 7/1. Arlene, X6010.

Camb Cent Sq, sum sublet, furn, 2 BR, best offer. Bill Porteous, X4560.

Camb, 2 BR apt sublet, nr Cent Sq, avail 6/1, air cond, patio, gd cond. X4988.

Camb, quiet, spac 2 BR apt, Mass Ave bet Harv & Cent Sq, avail 6/1, \$225/mo. Call 864-0779.

Camb, sum sublet w/opt, 5 min MIT or Harv, 2 BR, LR, 1 1/2 B, air cond, balcony, dw, wash mach, undergrnd pkg, avail June 1, \$350/month. C.L. Liu, X6024.

Camb, apt to sublet w/opt, May 20-Aug 31, 5 rm, nr Cent Sq, \$100/month. John, X4719.

Camb, nr Central Sq, 4 BR apt, K, B, June 1, \$175/month + util. Call 354-3349.

Camb, cheap 4 BR or 3 BR and LR apt, for sum w/opt, Cent Sq area, \$175/month. Call Mike, Sandy or Dave, 354-3349.

Camb, Harvard st nr Cent Sq, 1/2 of 2 BR, 2 B, in new apt, priv bath and ent, air cond, June 1-Aug 31, \$150. Marjorie, X1826.

Camb, 100 Memorial Dr, lg furn 4 rm apt, to lease to faculty for 9 to 15 months, June 72 to Aug 73, \$245/month, garage, \$25/month. Prof. Hagen, X3121.

Camb, Harv Sq area, summer house rental, end July to Labor Day, all conven. X7281.

Camb, nr MIT campus, 2 BR, furn, air cond, sublet mid-May thru July. Call 876-6763.

Chestnut Hill, 2 BR apt, mod bldg, sublet w/opt, ww, htd, pool avail, \$235/month. X1917.

Medford Sq, sublet w/opt, 2 BR, lg LR, mod K & B, d&d, ww, a/c, off st pkg, top flr, avail 6/1, \$250/mo. Call 396-4646.

North Camb, lg studio sublet w/opt, furn, avail 6/1, \$150/mo. Michael Tenenbaum, X5338.

Northgate, 2 BR furn apt, mod, skylight, 5th flr w/elev, 12 min walk to MIT, Harv, sublet for summer or part, \$250/month + elec. Shirley, X7236.

Reading, 7 rm hse to rent, June-Aug, \$300/month inc util. X231 Bedford.

Winch, 3 BR house, furn, avail 8/31 for 1 yr, married cpl only. X582 Draper 7.

Conway, NH, lodge, mtn view, sun-deck, lg LR, frpl, 4 BR, playrm, 2 B, sum rental by wk, mo or season. X4291 or 4916.

Lovell, Me, sum home on Kezar Lake, mtn view, sleeps 10 w/crib, lg dock, canoe, 18hp boat, \$170/wk. Rachel, X2285.

Rangely, Me, lux contemp, 3 BR hse, on lake, mtn view, priv, hike, swim, fish, canoe, in unspoiled wilderness, wkly rental. Jeannie, X3584.

Animals

Free kittens, beautiful, long hair, 1 gray tiger w/white paws, 2 bl & white. Dr. Tannenbaum, X3729.

Siamese kittens, raised w/their parents and our children, \$25. Charles Rader, X7237 Linc.

Lost and Found

Lost: non-pierced earring, brass & copper hoops. Fran, X5088.

Wanted

Apt from Aug to Dec for grad student & wife, will graduate in Dec. Andy, X4336.

Rmmate 21+ for sum &/or next year, spac 4 BR apt nr Inman Sq, 3 rm avail, \$70. Call 491-6195.

Fem rmmate, Camb nr Cent Sq, 2nd flr, own rm, \$58. Fran, X2053.

Rmmate for 4 BR apt nr Cent Sq, own rm, avail 6/1, ww carpet, 5 min to MIT, \$72.50 incl heat & water. Judy Kornfeld, X5763 or X2920.

Daily ride, Billerica to MIT, 8am, return after 3pm. Jim Smith, X7261 Linc.

Man's 3-spd bicycle, pancake griddle & record player, cheap. Call 491-7907.

Used overseas trunk. George Poupoesci, dorm X9004.

Troy-bilt roto tiller. Henry Stommel or Dennis Moore, X7828.

Computer job for undergrad research proj to begin in fall involving Monster program for evaluating nutritional adequacy of diets, much responsibility and credit. Call E. Bennett, dorm X0185.

Fem rmmate to share 3 BR apt, own rm, Arl/Camb line, \$67/month, avail 6/1. Janet, X5768 Linc.

Camping equip. Zvi Body, X1476.

Framework molecular model sets, \$2/each. Ross, X4710.

Old fash lg sturdy baby stroller. Clark, X4202.

Tires, 7.50-14. Dick, X7169 Linc.

Bicycle, 1 or 3 speed, full sized, \$35. Lida, 523-1770 evgs.

Covered util trlr, \$50-\$100, 2 rims to fit '66 Olds Cutlass. Barry, X2283.

Service manual for '67 Dodge. X6814.

Rmmate, summer, own rm, in 3 BR apt, 10 min walk from Bldg 10, LR, den, K, \$75/mo. Alan, X6944.

Miscellaneous

WI do thesis/term paper typing on Selectric. Margie, X5625.

Exp Indian drummer wl teach Tabla. Dahanukar, X2961.

Babysitting by depend mother in my home, infants, babies pref, Arl area. Dave, X7677.

Invest \$5/share in handicapping system for dog track. I nd more computer time & betting capital, prelim results gd but still some risk. H.S. Lahman, 5-025, X6631.

Married couple avail for child and/or home care. Will negotiate. Steven Book, 232-1712.

MIT senior will housesit, clean hse, keep up grounds over summer for free rent. Tony Zawadzki, dorm X8161.

WI do general typing. Ron, X7273.

Positions Available

The Office of Personnel Relations is seeking individuals from within the Institute to fill the following openings:

Secretary IV. Fund raising office has ideal job for person who likes to be busy and who can take responsibility. Good typing and shorthand required. Must be well organized in order to handle heavy work load.

Secretary IV. Large, very productive research group in cell biology needs skilled, well organized secretary. Responsibilities include general laboratory operation, grant renewals, manuscript production, and organization of teaching material. Challenging position for experienced person.

Ext. 4251

Technician A (E-M). Maintenance of electronic equipment associated with controlled low background facility, breath radon and thoron equipment. Troubleshoots nuclear pulse instrumentation. Some fabrication and wiring.

Good to excellent knowledge of transistor pulse circuitry. Good knowledge in use of oscilloscopes and other test instruments. Some knowledge in use of shop machinery. Ability to work with minimum supervision.

Ext. 4268

Systems Programmer. The Laboratory for Nuclear Science is seeking a Systems Programmer for its computer facility. The position will involve responsibility for developing, maintaining, updating and modifying the operating system and language compilers for the IBM 360/65 which the laboratory provides as a general purpose computer for its research staff. In addition, Systems Programmers in the group write routines for special use in the L.N.S. system and consult with users on systems bugs and special problems.

Applicants should have a degree in Computer Science, Math or Physics and experience with operation systems on large scale computers, preferably with OS, the operating system used on the IBM 360 computers. Experience in programming in 360 assembly language is a mandatory requirement.

Richard E. Higham
Ext. 4278

Development Foundation Organized by Institute Charles River Cleanup Aid Is Needed

A new experimental corporation designed to foster more rapid application of technological innovation to problems of widespread public concern has been formed by the Institute.

The new corporation, which will be called MIT Development Foundation, Inc., was announced by President Jerome B. Wiesner. The corporation was granted its charter by the State of Massachusetts on April 3.

"There is a growing need for new mechanisms whereby science and technology may be more effectively employed to solve problems of public interest," Dr. Wiesner said.

"Too often good ideas languish for want of proper impetus. We hope this new organization will assist in the generation of new enterprises and serve as a communications link between government, industry and sources of venture capital that may be interested in the development and application of technology at MIT."

The corporation will not engage directly in business operations, Dr. Wiesner added, "but it may make modest investments in new ventures with which it is involved and acquire donations in the form of

gifts and stock from alumni and others in the new enterprise community."

MIT Development Foundation, Inc. is organized as a Massachusetts charitable corporation, in accord with Chapter 180 of the Massachusetts General Laws, formed for the benefit of and controlled by the Institute. It is anticipated that a favorable ruling will be obtained from the US Internal Revenue Service, permitting the foundation to operate as a tax-exempt organization under the Internal Revenue Code.

Pending election of a full board of directors for the new organization, the Executive Committee of the MIT Corporation has appointed three initial directors. They are Carl M. Mueller, senior partner, Loeb, Rhoades & Co. of New York and a member of the MIT Corporation; Albert G. Hill, vice president for research and professor of physics; and Richard S. Morse, senior lecturer in the Sloan School of Management. Mr. Morse has been elected president of the new corporation.

Mr. Morse, an MIT alumnus, organized and was president of the National Research Corporation of

Boston. He gave up that position in 1950 to serve as director of research and assistant secretary of the Army for research and development under Presidents Eisenhower and Kennedy. He now teaches a course in new enterprises at the Sloan School.

"MIT has consistently encouraged the public use of science and technology, and its alumni, faculty and major laboratories are concerned with the problems of transferring technology and management skills to the public and industrial sectors of our society," Mr. Morse said. "The new corporation is frankly experimental. We hope that, at its best, it may provide a device for speeding the application of socially relevant technology, help create more jobs for more people, and encourage and support basic and applied research at MIT."

The Institute has provided initial financing for the new corporation in the amount of \$50,000. Additional operating funds will be obtained from a number of sponsors interested in the generation of new enterprises and concerned with the need for new mechanisms for technology transfer and job creation. For the time being, the

offices of MIT Development Foundation, Inc. will be at the Sloan School.

Obituaries Sylvia Bateman

Sylvia Bateman, 69, of New Market, N.H., a former technical assistant in geology, died on April 20 after a long illness.

Miss Bateman joined the Institute staff in September, 1960, and retired in 1967.

She is survived by her sister, Lois K. Jones, and several nieces and nephews.

Thomas Turnbull

Thomas Turnbull, 63, of Cambridge, a former building maintenance night custodian, died April 16.

Mr. Turnbull joined the Physical Plant in 1971.

He is survived by his son William G. Turnbull of Cambridge; sisters Marie Lynch and Ellen White and brother Eugene Turnbull, all of Maine; granddaughters Kim Rita Rogers and Dawn Louise Turnbull; and great-grandson Sean Douglas Turnbull.

Members of the MIT community are being asked to help with the annual Charles River Basin Clean-up which will be held on Saturday, May 6.

The Community Boating Club has assumed primary responsibility for both sides of the river from the Science Museum to the Massachusetts Avenue Bridge. In addition, they will assist in the clean-up efforts up-river and in coordinating the various organizations handling that part of the river.

Since many MIT people use the river, Community Boating is hoping that they will participate in the clean-up. People interested in helping should call Vlad I. Kobal, president of Community Boating, at 523-9763.

Daylight Savings Returns

Daylight Savings Time begins at 2 am Sunday, April 30. Before retiring Saturday night, turn all clocks ahead one hour.



Mr. Eastman.

Most Wanted Men

The MIT Memorabilia Committee is continuing its search for any paintings, photographs and busts from early days at the Institute.

Featured on the "Wanted" list this week are portraits of George Eastman and Charles Louis Flint and a bust of Erastus Brigham Bigelow.

Mr. Eastman served on the corporation from 1920 to 1932. The committee is searching for a portrait of him by Louis Betts. Also missing is a portrait by Seymour Stone given to the Institute in 1943 and located in the Forest J. Moore Room (6-325) until recently. The portrait of Mr. Eastman done by Philip de Lazlo has been found by the committee.

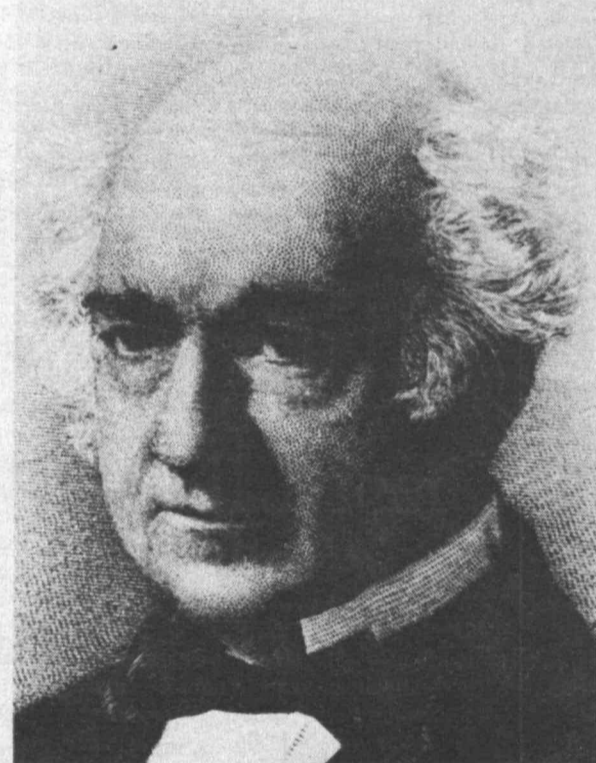
Mr. Flint was one of the original incorporators of the Institute and served on the corporation from 1862 to 1889. The Memorabilia Committee is looking for an oil portrait of Mr. Flint which was at MIT at one time.

Mr. Bigelow, also an original incorporator, was a member of the MIT corporation from 1862 to 1877. The committee is searching for a bust of Bigelow which was last seen in the Engineering Library 25 or 30 years ago.

Members of the MIT community are being asked to look through their offices and storerooms and report anything that resembles a work of art to the Memorabilia Committee at X4440 or X4444.

Also being searched for are busts of Loammi F. Baldwin of the Class of '74 (1874) and Algion K. P. Welch, an early benefactor at the Institute. Mr. Welch's bust was known to have been in Engineering Library 25-30 years ago.

Found recently was a portrait of Alexander S. Wheeler by an unknown artist. Mr. Wheeler was a member of the Corporation from 1882 to 1907. His portrait was found hanging in the law firm which he founded. The portrait is now being cleaned and repaired and will hang in a retrospective show this spring in Hayden.



Mr. Bigelow.



Mr. Flint.