

Open House Drawing Paris, Peru Beckon

By JOANNE MILLER
Staff Writer

Visitors to Employees Open House will have an opportunity to win trips to Paris and the Alps or to Peru as well as a \$100 savings bond door prize.

Tickets for "The Trip," a lottery sponsored by the MIT Quarter Century Club to benefit the MIT Community Service Fund, will be available at Open House from 10am-1pm in Lobby 7. Chances are \$1 each or three for \$2.

First prize is a two-week trip for two to Paris and the Alps. Consolation prize is a one-week trip for two to Peru.

Mrs. Jerome B. Wiesner, wife of the MIT president, will draw the winning tickets, and the door prize, also provided by the Quarter Century Club, at the Open House reception, 2-3:30pm in the Sala de Puerto Rico, Puerto Rico.

Employees Open House, a biennial occasion for employees, their families and guests to poke around and find out what makes MIT tick, will be held this year from 10am to 5pm Saturday, May 7. The hours have been expanded this year in order to provide more opportunity to visit some 30 exhibits and activities that are planned.

"During their working life, employees are usually concerned with their own responsibilities in a specific area of the Institute," said Robert J. Radocchia, chairman of the board of the Quarter Century Club.

"Open House gives everyone a chance to look at the bigger picture, see parts of the Institute they don't ordinarily encounter and mingle with fellow employees and their families. MIT is a very human organiza-

(Continued on page 12)

World Change/World Order Lectures

Canon Carr,
Africa Leader,
Here Thursday

Canon Burgess Carr, a leading African churchman who has played a significant political role in African affairs, will speak at MIT Thursday, April 14, at 8pm in the Compton Lecture Hall (Room 26-100).

His lecture, open to the public, will be on the topic: "The Impact of Contemporary Political, Economic and Social Revolutions on African Spiritual and Moral Values."

Canon Carr, one of a group of world leaders who are speaking at MIT this year in a "World Change and World Security" lecture series, is general secretary of the All Africa Conference of Churches, which has 114 member churches in 31 countries in Africa.

The last two speakers in the lecture series, after Canon Carr, will be Robert S. McNamara, president of the World Bank, on April 28, who will talk on, "The World Population Problem: Progress and Prospects," and US Senator Frank Church, on May 2.

Canon Carr, 41, has played an important role in many of the political developments in Africa along with and as part of his work for the World Council of Churches and the All Africa Conference of Churches. He has helped settle disputes between African countries and in many ways has become one of the leading voices for reason and morality in Africa.

He is widely known throughout Africa for his rare combination of moral sensitivity and courage, and his ability to deal with practical political situations within the context of moral issues.

As an example of his influence, he played a major role several years ago in terminating a civil war in southern Sudan by persuading the late Haile Selassie, the Ethiopian leader, to mediate the differences between the two sides. He also was deeply involved in the

(Continued on page 12)



Canon Carr



Dr. Arbatov

Arbatov Says
Arms Proposal
Is 'One-Sided'

By CHARLES H. BALL
Staff Writer

A leading Russian spokesman on arms negotiations said at MIT Monday night (April 11) that Soviet officials rejected the most recent American proposal on arms reduction because it provided "one-sided advantages" for the United States.

On other subjects, he strongly defended the principle of detente and denounced the introduction of the human rights issue into international affairs.

The speaker, Georgi A. Arbatov, turned aside suggestions made by some American officials that the Russians had needed more time to evaluate the United States arms control proposal put forward in Moscow last month.

The proposal was rejected, Mr. Arbatov said, "not due to the fact that the Russians could not comprehend it fast enough and properly appreciate it, but precisely because the 'package' was understood too well—understood as violating the initial premise of equality and providing for US one-sided advantages."

Mr. Arbatov said he still hoped to see "in not too long a time" the conclusion of a Salt II agreement providing for more comprehensive agreements on arms limitations and reduction.

Mr. Arbatov said that a treaty must take into account "all the complexities of the strategic balance."

(Continued on page 12)

NAE Elects Six from MIT

Six members of the MIT faculty have been elected to membership in the National Academy of Engineering.

They are among 92 new members elected to the Academy this year nationwide. The six new members from the MIT faculty bring to 47 the total number of MIT professors who are members of the prestigious national engineering organization. Total Academy membership now stands at 769.

Election to the academy is considered among the highest professional distinctions that can be conferred on an engineer and honors those who have made important contributions to engineering theory and practice or who have demonstrated unusual accomplishments in the pioneering of new and developing fields of technology.

Announcement of the new members of the Washington-based Academy was made by NAE President Courtland D. Perkins.

Those elected from MIT and the citations given for each of them are:

Dr. Stephen H. Crandall, Ford Professor of Engineering in the Department of Mechanical Engineering, for "leadership in the theory, education, and practice of

engineering mechanics, especially in random vibration analysis."

Dr. Walter S. Owen, professor and head of the Department of Materials Science and Engineering, for "leadership in research on structure/property relationships in metals and in the extension of such concepts to the educational basis of materials science and engineering."

Dr. Ronald F. Probst, professor of mechanical engineering, for "contributions to the fields of hypersonics, rarefied gas flow, desalination, and water purification."

Dr. Norman C. Rasmussen, professor and head of the Department of Nuclear Engineering, for "contributions to applied radiation

(Continued on page 12)

Mathematician Plans Shakespearean Summer

By KATHARINE C. JONES
Staff Writer

For someone who plans to receive the SB degree in mathematics from MIT, Mitchell Rothstein of South Nyack, NY, has some unusual summer plans.

He'll be a Shakespearean actor. Shortly after MIT's commencement on June 6, he will go to Cedar City, Utah, where he will spend the summer as an actor at the Utah Shakespearean Festival. While an undergraduate he has developed a serious interest in both mathematics and the theatre to the extent that he is considering professional training in each field.

"I've allotted myself one year to find out what it's like to be a professional actor," he said. In September, 1978, he plans to enter graduate school, most likely in a program leading to the PhD degree in pure mathematics.

Mr. Rothstein applied to the Utah summer program after soliciting advice on theatre opportunities from Murray Biggs, director of the Shakespeare Ensemble and assistant professor in the MIT Department of Humanities.

"The programs in Utah and Ashland, Oregon, are the best seasonal Shakespeare festivals in the country," Professor Biggs said. "A perfect reconstruction of a Jacobean theatre was recently completed in Cedar City. An actor couldn't have a better opportunity to perform in something very close to original

(Continued on page 12)



PLOTTING REVENGE. MIT senior Mitchell Rothstein plots revenge against Othello as he rehearses role of Iago for upcoming Shakespeare Ensemble production of Othello. Mr. Rothstein will work this summer as an actor at the Utah Shakespearean Festival.

photo by Ephraim Vishniac



TAKING OFF FOR NOWHERE. Air Force Captain Cort Durocher (left) of Ft. Walton Beach, Fla., presently pursuing graduate studies at MIT, and Wolf Kohn of Boston, a graduate student and research member in the Department of Aeronautics and Astronautics, are shown in the department's airline

cockpit simulator used in aircraft control studies. The simulator is one of many research facilities that will be open to employees and their families during MIT Employees Open House from 10am to 5pm Saturday, May 7.

MIT Photo by Calvin Campbell

Shakespeare Ensemble Will Present 'Othello'



ENTREATING HER HUSBAND, Desdemona (MIT freshman Dorian Jankowski) kneels beside an unbelieving Othello (MIT senior Jesse Abraham) during rehearsal for Shakespeare Ensemble's production of *Othello* to be staged in the Sala de Puerto Rico at 8pm, April 20-24.

photo by Ephraim Vishniac

The MIT Shakespeare Ensemble will present *Othello*, its first production of a Shakespeare tragedy, at 8pm Wednesday through Sunday, April 20-24, in the MIT Student Center Sala de Puerto Rico.

Each performance will be preceded at 7:45pm with music of the Italian renaissance directed by Tim Aarset of the MIT Music Section.

Othello, perhaps Shakespeare's most human tragedy, is a story of sexual jealousy culminating in violence. The Moor, Othello, is a general employed by the Venetian republic to resist the Turkish invasion of the Mediterranean. He marries a Venetian, Desdemona, against her father's will, and she follows him to war. A strong-hearted, noble man,

Othello lets his mind be poisoned by jealousy until he destroys the woman he loves and then destroys himself.

Murray Biggs, assistant professor in the MIT Department of Humanities, will direct the play. The set is being designed by Constantine

The MIT Shakespeare Ensemble will perform scenes from its latest repertoire at 12 noon Thursday and Friday in Lobby 7. Scenes will be from some of Shakespeare's lesser known plays, *The Comedy of Errors*, *Henry VI, Part 2*, *Pericles*, and *The Winter's Tale*, as well as from Moliere's *Don Juan* and Woody Allen's *Death Knocks*.

Thomas, a graduate student in the Department of Architecture, and duels staged by Eric Sollee, MIT fencing master.

Leads will be played by Jesse Abraham (*Othello*), a senior in economics from Oak Park, Ill.; Mitchell Rothstein (*Iago*), a senior in mathematics from South Nyack, N.Y.; Dorian Jankowski (*Desdemona*), a freshman from Plattsburgh AFB, N.Y.; Jonathan Ivester (*Cassio*), a senior in chemistry from Anderson, Calif.; William Hodge (*Roderigo*), a senior in civil engineering from Needham, Mass.; and Jo Ann Kruger (*Emilia*), a senior in civil engineering from Pomona, Calif.

The play's action will be directed to afford maximum visibility from every side of the Elizabethan-style thrust stage. No seat will be more than 40 feet from the stage's edge.

Tickets for Wednesday and Thursday cost \$1.50; for Friday, \$3 and \$3.50; for Saturday, a champagne performance in celebration of Shakespeare's birthday, \$4 and \$4.50, and for Sunday, \$2. Student and group discounts are available on Friday and Saturday.

Tickets will be sold at the door. For reservations, call 253-4420.

The MIT Shakespeare Ensemble, formed in 1974, is a group of MIT students who work intensively on performance of Shakespeare's plays.

Detroit Keynoter

Professor Nathan H. Cook of the Department of Mechanical Engineering will be the keynoter at a May 10 manufacturing engineering-technology education forum of the Society of Manufacturing Engineers in Detroit. The theme of the forum is "Management—The Missing Link in Undergraduate and Graduate Engineering Education."

CABLE TV SCHEDULE X3-3625

April 13-April 27

Wednesday, April 13
Channel 8:
11am-12noon **POLITICS & TELEVISION #8** With Ed Diamond. (R)
12noon-1pm **RHETORIC & JOURNALISM #7** With Ed Diamond. (R)
5-6pm **NOTES ON THE 'VISION** By Mike Moser. (LIVE)

Channel 10:
10am-2pm **MIT PROFILES** With Nancy Lukitsh. (R)

Thursday, April 14
Channel 8:
12noon-1pm **BASEMENT VIDEO PRESENTS** (R)
5-7pm **SOME EXAMPLES: ALLO-ANTIGENS AND AUTO-ANTIGENS** by N. Aurion Mitcheson, F.R.S., Tumour Immunology Unit, Dept. of Zoology, University College, London, England. Lecture #2 in the Edward K. Dunham Lecture Series for the Promotion of the Medical Sciences. LIVE from Harvard University.
7:30-8:30pm **POLITICS & TELEVISION #7** With Ed Diamond. LIVE from 9-350.

Channel 10:
11am-1pm **MIT SYMPHONY** With Dalia Atlas. (R)

Friday, April 15
Channel 8:
9:30-10:30am **RHETORIC & JOURNALISM #8** With Ed Diamond. LIVE from 9-350.
4-5pm **BASEMENT VIDEO PRESENTS** (R)
5-7pm **APPLICATIONS IN IMMUNOPATHOLOGY** by N. Aurion Mitcheson, University College, London, England. Lecture #3 in the Edward K. Dunham Lecture Series for the Promotion of the Medical Sciences. LIVE from Harvard University.

Channel 10:
12noon-8pm **LOOKAROUND**

Monday, April 18
INSTITUTE CLOSED—NO PROGRAMMING SCHEDULED

Tuesday, April 19
Channel 8:
11am-12noon **POLITICS & TELEVISION #7** With Ed Diamond. (R)
12noon-1pm **BASEMENT VIDEO PRESENTS** (R)
1-2pm **RHETORIC & JOURNALISM #8** With Ed Diamond. (R)
3-4pm **BASEMENT VIDEO PRESENTS** (R)
Channel 10:
12noon-8pm **SPORTSWEET** (R)

Wednesday, April 20
Channel 8:
11am-12noon **POLITICS & TELEVISION #7** With Ed Diamond. (R)
12noon-1pm **RHETORIC & JOURNALISM #8** With Ed Diamond. (R)
5-6pm **NOTES ON THE 'VISION** By Mike Moser. LIVE
8-10pm **ROBERT MCNAMARA** President of the World Bank. LIVE from Kresge Auditorium. Sponsored by the "World Change and World Security Lecture Series."

Thursday, April 21
Channel 8:
12noon-1pm **BASEMENT VIDEO PRESENTS** (R)
1-2:30pm **A DEBATE ON THE TOPIC OF SINGLE-SEX VS CO-EDUCATION FOR PROSPECTIVE SCIENTISTS.** With Vera Kistlakowsky, Physics Dept. and Molly Potter, Psychology and City Planning. (R)
7:30-8:30pm **POLITICS & TELEVISION #8** With Ed Diamond. LIVE from 9-350.

Friday, April 22
Channel 8:
9:30am-10:30am **RHETORIC & JOURNALISM #9** With Ed Diamond. LIVE from 9-350.
4-5pm **BASEMENT VIDEO PRESENTS** (R)
Channel 10:
12noon-8pm **LOOKAROUND** (R)

Monday, April 25
Channel 8:
12:15-12:45 **MITV NEWS LIVE** from 9-355.
4:30-6:30 **LIPOPROTEIN RECEPTORS AND THE CONTROL OF CHOLESTEROL METABOLISM** by Dr. Joseph L. Goldstein, University of Texas. LIVE from Harvard University.
Channel 10:
1-6pm **MITV NEWS** (R)
Channel 12:
6-6:30pm **MITV NEWS** (R)
6:30-7pm **SPORTSWEET** (R)
7-8pm **LOOKAROUND** (R)
8-9pm **BASEMENT VIDEO PRESENTS** LIVE from 9-350.

Tuesday, April 26
Channel 8:
11-12noon **POLITICS & TELEVISION #8** With Ed Diamond. (R)
12noon-1pm **BASEMENT VIDEO PRESENTS** (R)
1-2pm **RHETORIC & JOURNALISM #9** With Ed Diamond. (R)
3-4pm **BASEMENT VIDEO PRESENTS** (R)
5-6pm **MIT PROFILES** With Nancy Lukitsh. LIVE from 9-355.
Channel 10:
12noon-8pm **SPORTSWEET** (R)

Wednesday, April 27
Channel 8:
11am-12noon **POLITICS & TELEVISION #8** With Ed Diamond. (R)
12noon-1pm **RHETORIC & JOURNALISM #9** With Ed Diamond. (R)
5-6pm **NOTES ON THE 'VISION** By Mike Moser. LIVE
Channel 10:
10am-2pm **MIT PROFILES** With Nancy Lukitsh. (R)

INSTITUTE NOTICES

Announcements

Foreign Students—A workshop regarding visa requirements, necessary if you are interested in seeking employment in US after graduation, will be held Tues, Apr 26, 3:30pm, Rm 9-150. Sponsored by Foreign Student Office & Assistant for International Visitors, Information Center.

Humanities Writing Prizes—Offered annually to undergraduates in 3 categories: works by freshmen; works of any length; works of substantial length. Rules available Rm 14N-409. Entries due by Apr 16.

GSC Meetings—Council meeting Wed, Apr 13, dinner 5pm (Walker), meeting 6pm, Walker Blu Rm. RSVP if attending dinner.

MIT Furniture Exchange—Open Tues & Thurs, 10am-2pm, 25 Windsor St, to buy or sell used furniture.

Associate Advisors—During April the FAC is recruiting upperclass students to be associate advisors for next year. If interested, stop by FAC office, Rm 7-103, and let us know. It's best if you already have an advisor lined up to work with, but some advisors ask us to find them associate advisors. Be sure to come in and fill out a card if you're interested.

Preprofessional Meetings—Robert Lee, assistant dean of minority student affairs at Washington University School of Medicine/Dentistry, will speak to minority premedical and pre dental students from schools in the greater Boston area Thurs, Apr 14, 4-6pm, Lecture Hall D, Harvard University Science Center.

Faculty Members—Faculty members interested in teaching an Undergraduate Seminar should contact the Undergraduate Seminar Office, Rm 7-105, x3-3621, as soon as possible.

Club Notes

MIT Archery Club—Shooting practice Sun, 10am, Rockwell Cge.

MIT Ballroom Dance Club—All invited to join in the fun. You too can tango. Info or lessons by phone: Fern Crandall, x5-8534 Dorm. Volunteers needed.

MIT Bridge Club—ACBL Open pairs duplicate bridge. Thurs, 7pm, Stu Ctr Rm 407.

MIT Bridge Club—ACBL Duplicate Bridge. Tues, 6pm, Stu Ctr Rm 473.

MIT/DL Bridge Club—ACBL Duplicate Bridge. Tues, 6pm, Stu Ctr Rm 473.

MIT Chess Club—Informal speed chess, analysis, etc., every Sat, 1pm, Stu Ctr Rm 407. Info: Brad, Burton Rm 141G.

MIT Comic Book Club—Wkly meetings, Wed, 7:30-9pm, Rm 7-102.

Gays at MIT—(formerly SHL) Coffee-house/meeting, first Sunday each month, 5pm, Gay Lng (Walker Rm 50-306). Everyone welcome. Info or just an ear listen: x3-5440, or join us for lunch.

Hobby Shop—Mon-Fri, 10am-6pm, Rm W31-031. Fees: \$10/term for students, \$15/term for community. Info: x3-4343.

MIT Madrigal Society—Group singing, primarily English madrigals. All voices (soprano, alto, tenor, bass) welcome, come add yours. Tues, 7:30-9:30pm, Rm 4-160. Brian Wibecan, Nw Hse 4-312, x5-7570 Dorm.

MIT Shotokan Karate Club—Rigorous training for intercollegiate competition & self-defense, given by 6th degree black belt. Thurs, 8pm; Fri, 6pm; Sun, 10am, du Pont T Club Lng. Info. x3-7220.

MIT Space Habitat Study Group—Interdisciplinary studies on space colonization. Thurs, 7pm, Rm 37-252.

Tae Kwon Do Club—Workouts on Tues, T-Club Lng (W31-125), & Thurs, W31-225, 6-7pm. Info: Jim Cole, x3-3283.

Tech Model Railroad Club—Meetings, Sat, 4pm; Operating Sessions, Fri nights; Rm 20E-214, x3-3269.

MIT Tiddlywinks Association—Meetings Thurs, 8pm, Stu Ctr Rm 473.

White Water Club—Pool sessions alternate Tues, 8-10pm, Alumni Pool. Next session April 26.

MIT Word Games Club—Meetings (Scrabble games) Mon, 7pm, Rm 1-134. Bring sets. Info: Jeff Jackson, 492-6983.

Religious Activities

The Chapel is open for private meditation 7am-11pm daily.

Hillel Services—Orthodox: Fri, sundown, Rm 50-005; Sat, 8:30am, Rm 10-105. Traditional/Egalitarian: Sat, 10am, 312 Memorial Dr (Religious Counselors Bldg). Reform: Fri, 7:30pm, Chapel.

You are invited to the weekly Interdenominational worship and holy communion, Wed, 5:05pm, Chapel. Get-acquainted supper following.

Prayer Time—Lunch hour Bible classes led by Miriam R. Eccles. Fri, 1-2pm, Rm 20E-207, prayer, music, guest speakers and refreshments. All are welcome.

Protestant Worship Service—Worship, prayer, praise & teaching. Sun, 10:45am, Chapel. Coffee, donuts & fellowship following.

MIT Seekers—Group of students will meet at 9:55am & 4:55pm each Sun in front of McCormick to attend services at Park St Congregational Church.

Tech Catholic Community—Mass Tues & Thurs, 5:05pm; Fri, 12:05pm; Sun, 9:15am, 12:15pm; all in Chapel.

United Christian Fellowship—Fellowship meeting Tues, 6:30pm, Rm 1-236, a time of praise, prayer, testimony and teaching. Everyone welcome. Contact: David Hoicka, 5-9649 Dorm.

MIT Vedanta Society—Meditation and discourses on the Gita by Swami Sarvagatananda, of the Ramakrishna Vedanta Society of Boston. Fri, 5:15pm, Chapel.

Placement

The following companies will be interviewing during the time period covered by the current Institute Calendar. Those interested may sign up in the Career Planning and Placement Office, Mon-Fri, 9am-3pm, Rm 10-140, x3-4733.

Thursday, April 14—Alpha Industries, Inc.; Consolidated Aluminum Corp; Dana Corp, Industrial Power Transmission Div. (formerly Formsparg Co.); ITT Surprenant Division (International Telephone and Telegraph Corp); Ferrofluidics Co; Naval Sea Systems Command and Naval Ship Engineering Center.

Wednesday, April 20—E.I. DuPont de Nemours & Co., Inc. (Mexican nationals only).

New UROP Listings

Department of Nutrition and Food Science
This project is intended to study the hydrolysis of protein. The changes in molecular weight distribution during hydrolysis will be determined by gel filtration chromatography. The objective of this study is to predict the molecular size distribution of the hydrolysate in order to develop industrial processes applicable for various proteins. For credit only. Contact Prof. ChoKyun Rha, x3-3492, Rm 56-137, or Dean Hsieh, x3-3493, Rm 56-138.

Children's Hospital Medical Center
This project would involve the writing of computer programs to compute the center of mass and moment of inertia of limb segments. The data for doing this is available through Children's Hospital. The resulting information would then be applied to the calculation of the moments and forces acting at the joints. This project will offer experience in computer programming and computer operations since direct contact with the computer (a PDP 11/10) will be involved. Pay is available.

Mass. General Hospital Anesthesia Department
A project is available with the Bioengineering Unit, Department of Anesthesia, Mass. Gen. Hosp., involving the development of various schemes for measurement of anesthetic agents and/or expired gasses during anesthesia. They have in mind certain techniques and devices which require testing and evaluation. The project would involve some

evaluation. The project would involve some circuit design and fabrication. An upper-class level student with some laboratory and practical circuit design experience is preferred. Another project involves interfacing a Burroughs plasma display to a microprocessor instrument. It would involve circuit fabrication, design and testing. An upperclass student preferred. Pay probably available, beginning summer.

Article Describes Press Warehousing

The joint MIT Press-Harvard University Press warehousing operation was the subject of an article in the March 28 issue of *Publisher's Weekly*.

The article, written by Bruce McCabe of the *Boston Globe*, called the operation "a pioneering step to reduce costs and increase efficiency" and said it "could persuade other university presses to make similar plans."

The warehouse operation, Uniserv, Inc., is in Littleton, Mass.

TECH TALK Volume 21, Number 32 April 13, 1977

Tech Talk is published 44 times a year by the News Office, Massachusetts Institute of Technology. Director: Robert M. Byers; Assistant Directors: Charles H. Ball, Robert C. Di Iorio, Katharine S.C. Jones, Joanne Miller, William T. Struble and Calvin D. Campbell, photojournalist; Reporters: Cathryn M. Chadwick (Institute Notices), and Susan E. Walker (Institute Calendar, Classified Ads). Address news and editorial content to MIT News Office, Room 5-111, MIT, Cambridge, MA 02139. Telephone (617) 253-2701.

Mail subscriptions are \$8 per year. Checks should be made payable to MIT and mailed to Business Manager, Room 5-111, MIT, Cambridge, MA 02139.

Echoes

April 9-April 15

50 Years Ago

The Technique Rush will open Junior Week festivities. The winner of the annual tussle for the paddles will receive a free copy of the year book autographed by President Samuel W. Stratton.

40 Years Ago

Technology debators will meet the Radcliffe team this week. The subject: "Resolved, that all humorous debates be abolished." The Radcliffe team refused to debate the original subject, a humorous treatment of our male and female bachelor population.

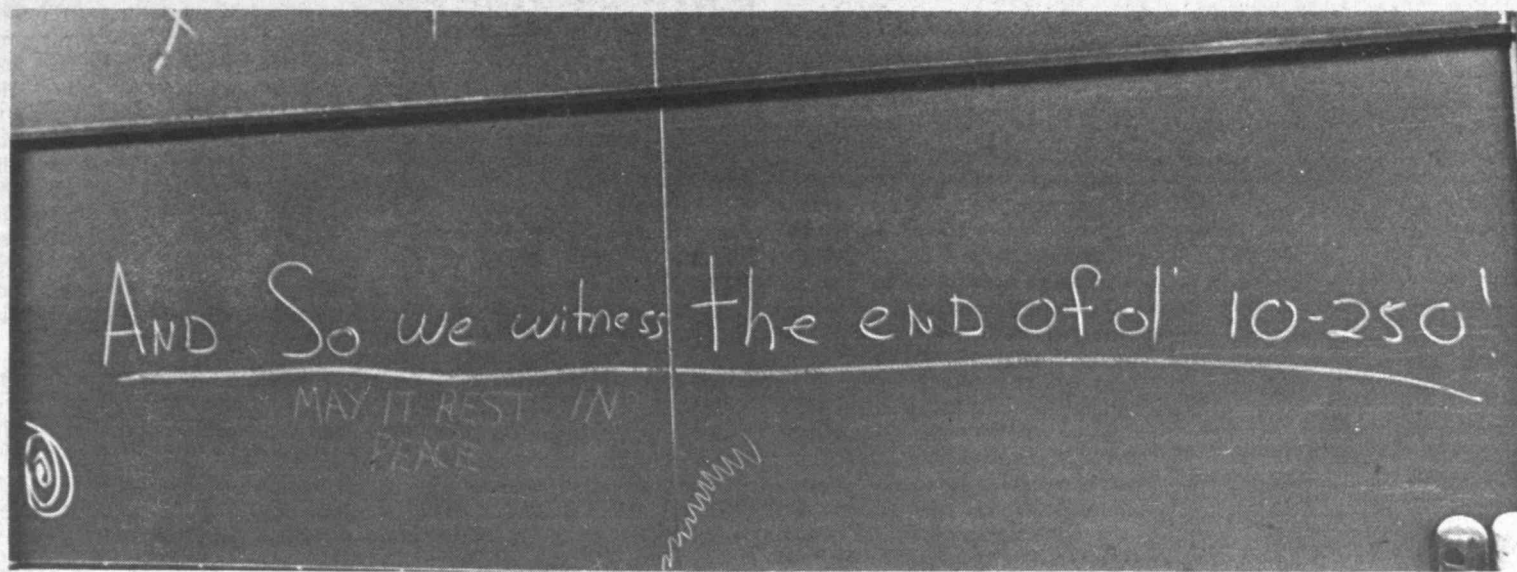
25 Years Ago

The complex problems of modern industry will be the focus of a \$1,000,000 grant to the new School of Industrial Management. The fund is the latest in a series of gifts to the Institute from the Sloan Foundation. This grant brings Mr. Sloan's gifts to MIT over the past thirty years to a total of more than \$8,300,000.

Twenty-five cents is the cost of having your favorite professor shine your shoes at the World Student Service Fund Charity Carnival this week. The organization hopes to earn money to help rehabilitate universities in Europe and Asia.

Prepared by Marcia Conroy, MIT Historical Collections, x3-4444.

The End of Ol' 10-250 - - Rest in Peace



—MIT Photo by Calvin Campbell

SOMEONE INSCRIBED the epitaph—"And So we witness the end of ol' 10-250! May it rest in peace"—on the blackboard of Huntington Hall (Room 10-250) where workmen have begun major renovations and remodeling. The \$1.3 million project also includes installation of an alumni reception/exhibition area on the first floor of the Maclaurin Bldg. (Bldg. 10) and is being paid for with contributions from thousands of alumni worldwide. The old 10-250 served generations of MIT students for more than half a century. Renovations include new seats, improved acoustics and lighting and a new projection system. The new Huntington Hall should be ready by fall.

12 Grad Students Named Health Sciences Fellows

Twelve MIT graduate students have been selected to receive PhD and MD-PhD Fellowships from the Health Sciences Fund during the coming academic year, according to Dr. Irwin W. Sizer, Dean Emeritus of the MIT Graduate School and president of the Health Sciences Fund.

The award of 10 new PhD fellowships and two new MD-PhD fellowships makes the Health Sciences Fund one of the major independent supporters of PhD candidates at MIT. The Fund will provide approximately \$150,000 for the support of these programs during the coming year.

Announcement of the PhD Fellowship awards was made by Dr. Kenneth R. Wadleigh, Dean of the MIT Graduate School. Candidates for the awards were nominated by their department heads, after being recommended by their Committee on Graduate School Policy member, and were selected from an outstanding group of students pursuing doctoral theses in the field of the life sciences and biomedical engineering.

Recipients of the MD-PhD fellowship awards were announced

by Dr. Sizer. These were made on recommendation of a faculty committee under the chairmanship of Dr. Irving M. London, Director of the Program in Health Sciences and Technology.

Both the PhD and MD-PhD fellowships are for 12 months commencing September, 1977, and cover full tuition, medical fees and a stipend of \$3,900.

The PhD Fellows and their research topics are:

Jerry K. Chung, Department of Physics, biomedical applications of a 'charge-coupled device,' which transfers, locates and orients living cells.

Daniel Donoghue, Department of Biology, model systems and vectors for recombinant DNA research using bacteriophage and E. Coli.

Nancy C. Eickman, Department of Chemistry, the electronic and geometric structure of the active site of transition metal-containing proteins.

David B. Laning, Department of Nuclear Engineering, methodologies for the improvement of computerized axial tomography.

Thomas J. Lynch, Department of Electrical Engineering, measurements of acoustic input impedance of the cochlea in cats.

Bjorn Merker, Department of Psychology, chemical lesions of nerve cells—a new technique for relating brain microscopic anatomy with behavior.

Michael O'Callaghan, Department of Mechanical Engineering, an apparatus for the control of the chemical and thermal environment of the isolated rat heart with reference to cryopreservation.

Douglas J. Pettibone, Department of Nutrition and Food Science, striatal non-dopaminergic neurons and feeding behavior.

Carlos A. Ramirez, Department of Chemical Engineering, transport of albumin and low density lipoprotein through the normal and de-endothelialized arterial wall of the rabbit.

Leslie Tung, Department of Electrical Engineering, a theoretical and experimental study of the electrophysiology of injury potentials arising in cardiac muscle.

The following MD-PhD students were selected:

Camille Bedrosian, Department

of Biology, aminoacyl transfer-RNA synthetase with reference to structure-function relationships.

Eliot R. Spindel, Department of Nutrition and Food Science, extrapituitary functions of thyrotropin releasing hormone.

The Health Sciences Fund Graduate Fellowship Program and

MD-PhD Fellowship Program is part of the Health Sciences Fund which also supports research projects in the life sciences and biomedical engineering of MIT faculty members. In addition, the Fund supports collaborative research between Harvard Medical School faculty, located either at the Medical School or in the Harvard teaching hospitals, and MIT faculty.

New York's WQXR Features Record

The MIT Symphony Orchestra recording of Piston's Suite from the Ballet "The Incredible Flutist" will be on "First Hearing," a program of radio station WQXR in New York on April 20, 1977.

The program, to be broadcast in New York City at 10:06pm, can be heard on 1560AM and 96.3FM stereo. The program is syndicated and will be played on other stations—though none in the Boston area—at later dates.

New recordings are played on "First Hearing" for panelists to evaluate without knowing the identity of conductor or performers. Martin Bookspan is host.

The record of the orchestra, directed by David Epstein, was

released on the Vox/Turnabout label in January and is the first of four records of the orchestra to appear in 1977. Copland's Dance Symphony is also on the record.

Records may be purchased at the Tech Coop which recently received a new shipment.

Edgerton Photographs In Paris Exhibitions

Two multi-exposure, stroboscopic photographs made by Dr. Harold E. Edgerton of MIT are on permanent display at the Georges Pompidou National Center of Art and Culture which was opened recently in Paris.

The photos show a back dive at the MIT pool and Gussie Moran, former professional tennis player, serving.

IAP Policy Committee Report: The First Seven Years

(Editor's note: The following is a summary of a report to the Faculty by the Independent Activities Period Policy Committee. The report will be presented formally at the Faculty meeting of April 20 by the policy committee chairman, Professor Michael S. Feld of the Department of Physics. The report, entitled "Trying One's Wings: Seven Years of IAP," covers the first seven years of IAP at MIT. Copies of the full 55-page report may be obtained from Joel Orlen, executive officer of Office of the Provost and a member of the IAP Committee. His office is in Room 3-234 and his extension is 3-1973.)

This is a synopsis of the progress report on the Independent Activities Period, which fulfills a requirement of the 1973 faculty vote that continued IAP as part of the regular academic calendar of the Institute. Over the past four years, the IAP Policy Committee has continued and further developed the system of collecting data on the MIT experience with IAP. Through yearly questionnaires to faculty members and students and through reports from activity leaders, we have collected extensive statistical information on the use of IAP, including their participation in Guide activities. Augmenting our statistical information are the oral and written responses we have gathered through interviews and discussions with members of the MIT community. Based on our data we have written a detailed profile of IAP which is summarized below.

We find that the 4-1-4 calendar continues to meet the objectives set forth by the faculty when it instituted IAP: (1) elimination of the January "lame-duck" period; (2) easing of the between-semester rush; (3) provision of fallow time for independent study and research; and (4) provi-

sion of opportunities for flexibility in learning and teaching. The first two objectives were achieved by virtue of the changes in the calendar which ended the first semester before Christmas vacation and added three and a half weeks to the break between terms. This report briefly reviews seven years of experience with the modified calendar, but most of our data focuses on the use of IAP by faculty members and students have made of their time during the past four inter-terms, including the extent to which they have taken advantage of the increased opportunities for concentrated or independent work and for flexibility in learning and teaching.

According to the data we have collected, most faculty members and students are on campus during IAP, engaged in academic work primarily in their regular areas of concentration, in independent projects, and in the more than 500 activities advertised in the IAP Guide. Over 85% of the faculty responding to our questionnaire say that during January they are on campus 75% or more of their working day. Approximately 65% of them report finding time during IAP to engage in new and different activities. On the average, the faculty members estimate that at least 70% of their working time is devoted to academic endeavors, mostly in their usual area of concentration and about 9% in new fields of interest.

Although faculty members are heavily involved in their regular research and teaching responsibilities, they also contribute in large numbers to the activities publicized in the Guides. Each year about 270 faculty members, or 30% of the total faculty, are listed in the Guide as activity organizers, seminar leaders, lecturers, and panel members. They come from all three ranks of the faculty in approximately equal proportions. Most are involved in activities which

require a commitment of time and effort—activities which are academically oriented and which meet frequently or in small groups. To see whether or not the same faculty members are carrying the burden of Guide activities year after year, we compared the names of faculty members listed in the Guides and found that in any one year from 40% to 50% of the faculty of the preceding year.

While faculty involvement in Guide activities has remained at a satisfactory level, over the last four years there has been a decline from 31% to 27% in the percentage of the total faculty participating in Guide activities and an accompanying decline in the number of Guide activities led by faculty. Although the committee feels the level of faculty involvement is still satisfactory, we are concerned and plan to continue to monitor future participation.

Based on yearly surveys of faculty members, we know that a large majority of them favor IAP. About 90% of the faculty respondents to our questionnaire find IAP personally beneficial, while close to 80% think IAP is a good idea for the Institute as a whole. In the first year of IAP full professors did not support IAP as strongly as did members of the other two faculty ranks; however, over the years their support has increased almost to the same level as that of the rest of the faculty.

Like faculty members, students report high campus attendance and involvement in academic work during IAP. Over 70% of the undergraduates completing our questionnaires say they are on campus 75% or more of their time, while 88% of the graduate students report the same attendance. When asked how they spend their time, undergraduates estimate an average of 37% of their time is devoted to academic pursuits, including work in their usual areas of concentration or in

IAP-generated academic activities. Graduate students report spending over 70% of their time in academic work—about 20% of it in independent study or non-credit work outside their regular research and teaching responsibilities. (We do not know how the same students would report the distribution of their time during the regular terms.) In their academic efforts, most students are not seeking credit and grades, but, as the faculty intended, are pursuing topics on their own initiative and at their own pace. Many of them are involved with Guide offerings, not only as participants but also in increasing numbers as activity organizers.

Since the first IAP, students have been strongly in favor of IAP. Well over 90% of the undergraduates responding to our surveys think IAP is a good idea, not only for themselves personally but also for the Institute as a whole. Graduate students are only a percentage point or two less enthusiastic than undergraduates.

The 500 or more activities publicized in the Guide provide a showcase for the wide range of interests and innovative imaginations of MIT students, faculty, and staff. Just as the number of activities remains high year after year, the variety and richness of the offerings continue to meet standards set in earlier years. Most activities are the results of the efforts of individuals working on their own initiative. The fact that 90% of these offerings, listed one or two months in advance of January without a preregistration system, actually take place and are well attended can be cited as evidence of the strength of IAP. To see the extent of the educational commitment being made by participants in Guide activities, we classified activities on the basis of their educational orientation. Each year about 70% of the activities were judged to be academically oriented, and from 40% to 60% of these were organized and led by

faculty members.

Based on our data about the way students and faculty allocate their time during January, including the extent of their participation in Guide activities, we conclude that 4-1-4 calendar with IAP fulfills and exceeds the purposes for which it was established. Instead of being tied to rigorous class schedules in January, faculty and students are concentrating on projects of their choice, sometimes trying their wings in new endeavors. From the contents of the Guides alone, without even considering all the unpublicized activities, we know that many faculty and students are taking advantage of the opportunities for academic flexibility and experimentation.

Therefore, we recommend that IAP be continued unchanged. The Policy Committee should continue to evaluate IAP and report to the faculty within four years.

This report was prepared during the spring semester, 1976-77, by the members of the IAP Policy Committee working with the IAP Administrative Committee. The members of the IAP Policy Committee are: Timothy C. Aarset, James J. Bishop, Michael S. Feld (Chairman), Woodie C. Flowers, Jean E. Jackson, Merton J. Kahne, Harvey F. Lodish, Joel Orlen, Cordelia M. Price, Peter J. Reynolds, Margaret S. Richardson, Charles H. Shooshan III, George Wolf, Theodore Wood, Jr., and Mark S. Wrighton. The members of the IAP Administrative Committee are: Richard J. Caloggero, Mary Enterline, Michael S. Feld, Victor M. Maslov, Louis Menand III, Joel Orlen (Chairman), Margaret S. Richardson, Jane Sauer, and William Westcott.

31 Are Promoted to Associate Professor Rank

The promotion of 31 assistant professors in 14 academic departments and the Sloan School of Management to the rank of associate professor have been announced. The appointments are effective July 1.

The new associate professors are:

Professor Mohsen M. Baligh, Department of Civil Engineering. A member of the faculty since 1973, Professor Baligh received the BSc degree from Cairo University in 1966 and the MSc and PhD degrees from California Institute of Technology in 1969 and 1972, respectively. Before coming to MIT Professor Baligh was a member of the Continuum Mechanics Division of Systems, Science and Software. His chief research interests are the behavior of deep foundations, slope stability and soil consolidation. Professor Baligh lives in Lexington, Mass.

Professor Moshe Ben-Akiva, Department of Civil Engineering. A member of the MIT faculty since 1973, Professor Ben-Akiva received the BSc degree in civil engineering from Technion-Israel Institute of Technology in 1968; the SM in 1971 and the PhD in 1973 in civil engineering, both from MIT. He was a Sloan research trainee at MIT from 1971-72 and a research assistant in civil engineering from 1972-73 before being named assistant professor in the Department's Transportation Systems Division in 1973. A native of Israel, Professor Ben-Akiva lives in Somerville, Mass.

Professor Ned J. Block, Department of Linguistics and Philosophy. Professor Block received the SB in physics and philosophy from MIT in 1964; studied in the D.Phil. Program at St. John's College, Oxford University, from 1964-66, and received the PhD in philosophy from Harvard University in 1971. He came to MIT in 1970 as a postdoctoral fellow, and was named assistant professor of philosophy in 1971. A member of the American Association of University Professors, American Philosophical Association, and the Society for Philosophy and Psychology, Professor Block edited a book, *The IQ Controversy*, in 1976 (with Gerald Dworkin, Pantheon). Professor Block, 34, lives in Cambridge, Mass.

Professor Kenneth Brecher, Department of Physics. A member of the MIT faculty since 1972, Professor Brecher received the SB in 1964 and the PhD in 1969, both in physics and both from MIT. From 1969 to 1972 he was a research physicist at the University of California, San Diego. He is a member of the MIT Center for Space Research and of the Center for Theoretical Physics. His major research interests concern high energy astrophysics and its connection with elementary particle physics, general relativity and cosmology. Professor Brecher, 33, lives in Belmont, Mass.

Professor Susan Carey, Department of Psychology. A member of the MIT faculty since 1972, Professor Carey received the BA summa cum laude from Radcliffe College in 1964 in experimental psychology. She studied African history at London University, England, under a Fulbright Fellowship in 1965, and received the PhD degree in experimental psychology from Harvard University in 1971. She taught at Harvard University from 1967-72 and was named adjunct assistant professor at Rockefeller University for one year in 1974. She is currently on leave from MIT at the Radcliffe Institute. Professor Carey, 34, lives in Cambridge, Mass.

Professor Whitney Chadwick, Department of Architecture. Professor Chadwick received the BA degree from Middlebury College in 1965; the MA in 1968 and PhD in 1975, both in art history from the Pennsylvania State University. She came to MIT in 1972 as visiting lecturer in the Department of Architecture and was named assistant professor of the history of

art in 1973. A member of the College Art Association of America, Professor Chadwick's primary field of interest is 20th century painting and sculpture. Professor Chadwick is working on a book, *The Golden Labyrinth: Myth and Surrealistic Painting in the 1930's*, supported by an American Council of Learned Societies Grant-in-Aid. A native of Niagra Falls, N.Y., Professor Chadwick, 33, lives in Cambridge, Mass.

Professor Lloyd A. Clomburg, Jr., Department of Chemical Engineering. Assistant professor of chemical engineering at MIT since 1971, Professor Clomburg received the BS degree in 1966 from Texas Tech University in Lubbock and the ScD from MIT in 1971. Professor Clomburg's research interests include heat and mass transfer and mathematical and experimental modeling of engineering components and systems. He was director of the School of Chemical Engineering Practice from 1971-73. Born in Detroit, Mich., Professor Clomburg, 33, lives in Somerville, Mass.

Professor Robert E. Cohen, Department of Chemical Engineering. A member of the faculty since 1973, Professor Cohen received the BS degree with distinction from Cornell University in 1968, and the MS (1970) and PhD (1972) in chemical engineering from the California Institute of Technology. Before coming to MIT he spent a year as ICI Postdoctoral Fellow at Oxford University, England. His research concerns the physics and chemistry of polymers, and he is a member of MIT's Interdepartmental Committee for Polymeric Materials. He was awarded the DuPont Young Faculty Award by the Department of Chemical Engineering in 1974, and was appointed Esther and Harold E. Edgerton Assistant Professor in 1975. Professor Cohen, 30, lives in Newton, Mass.

Professor John D. Fernstrom, Department of Nutrition and Food Science. Professor Fernstrom received the SB degree in life sciences in 1969 and the PhD in nutritional biochemistry and metabolism in 1972, both from MIT. After a year as a postdoctoral fellow at the Roche Institute of Molecular Biology in Nutley, N.J., Professor Fernstrom was named assistant professor of physiology at MIT in 1973. He is a member of the editorial board of *Endocrinology* and a member of the American Physiological Society, Endocrine Society, Society for Neuroscience, International Society for Neurochemistry and American Institute of Nutrition. A native of Houston, Tex., Professor Fernstrom, 29, lives in Boston, Mass.

Professor Ira P. Goldstein, Department of Electrical Engineering and Computer Science. Professor Goldstein is primarily interested in computers in education and has been affiliated with MIT's Division for Study and Research in Education since 1973, when he was appointed assistant professor of engineering and education in the Department of Electrical Engineering and Computer Science. He received the BA degree in mathematics and philosophy, cum laude, from Harvard University in 1969, and the PhD in mathematics from MIT in 1973. He has worked with the MIT Artificial Intelligence Laboratory since 1969. In the summer of 1974 he was visiting lecturer at Edinburgh University. Professor Goldstein is on the editorial board of *Cognitive Science*. He is 28 and lives in Winchester, Mass.

Professor Alan J. Grodzinsky, Department of Electrical Engineering and Computer Science. A member of the faculty since 1974, Professor Grodzinsky received the SB and SM degrees in 1971 and the PhD in 1974, all from MIT. He received the Goodwin Medal for effective teaching as a graduate student and instructor from 1972-74. His research has been mainly on transduction properties of the biological tissue, collagen, and other membrane structures, with application to implantable medical assist devices, and the electrical properties of connective tissues.

He was appointed Esther and Harold E. Edgerton Assistant Professor of Electrical and Bioengineering in 1975. Professor Grodzinsky, 30, lives in Watertown, Mass.

Professor Paul D. Gottlieb, Department of Biology. A member of the faculty since 1973, Professor Gottlieb received the BA degree in biochemical sciences from Princeton University in 1965 and the PhD in life sciences from The Rockefeller University in 1971. Prior to his appointment as assistant professor of immunology at MIT in 1973, he was a postdoctoral fellow at Stanford University School of Medicine. Professor Gottlieb's major research interest is immunology and leukemogenesis. He is a member of the American Association of Immunologists. A native of New Brunswick, N.J., Professor Gottlieb, 33, lives in West Newton, Mass.

Professor Michael Hammer, Department of Electrical Engineering and Computer Science. A member of the faculty since 1973, Professor Hammer received the SB degree in mathematics in 1968, SM in electrical engineering in 1970 and PhD in computer science in 1973, all from MIT. In 1973 he was appointed assistant professor of computer science and engineering in the Department and the MIT Laboratory for Computer Science. His fields of specialization include data base management systems, programming languages and compilers and management information systems. He is a member of the Association for Computing Machinery and a founding member of the IEEE Computer Society Technical Committee on Database Engineering. Professor Hammer lives in Newton, Mass.

Professor Dolores Hayden, Department of Architecture. Professor Hayden was named assistant professor of history and architecture at MIT in 1973. She received the BA degree magna cum laude from Mt. Holyoke College in English and fine arts in 1966; the Diploma in English Studies from Girton College, Cambridge University, England, in 1967 and the M.Arch. degree from Harvard Graduate School of Design in 1972. The author of *Seven American Utopias: The Architecture of Communitarian Socialism, 1790-1975* (MIT Press, 1976), Professor Hayden's fields of interest include American environmental history, the history of building trades and feminism and design. She is a founding member of Women in Architecture, Landscape Architecture and Planning (WALAP). On leave from MIT as a Radcliffe Institute Fellow, Professor Hayden, 32, lives in Cambridge, Mass.

Professor Nancy H. Hopkins, Department of Biology. Professor Hopkins was appointed assistant professor in the Department of Biology and the Center for Cancer Research in 1973. She received the BS degree cum laude in biology from Radcliffe College in 1964, and the PhD in molecular biology and biochemistry from Harvard University in 1971. From 1971-73 she was a postdoctoral fellow at Harvard and Cold Spring Harbor Laboratory. Professor Hopkins, 33, a native of New York City, lives in Cambridge, Mass.

Professor Jean E. Jackson, Department of Humanities. Appointed assistant professor of anthropology in 1972, Professor Jackson received the BA degree in sociology and anthropology with honors from Wellesley College in 1965; the MA in 1967 and the PhD in anthropology in 1972, both from Stanford University. Professor Jackson's primary interests are in cultural anthropology and linguistics. She is a member of the Latin American Studies Association, Sociedad Antropológica de Colombia, and a Fellow of the American Anthropological Association. Professor Jackson, 33, lives in Somerville, Mass.

Professor Marc A. Kastner, Department of Physics. A member of the faculty since 1973, Professor Kastner received the BS degree in chemistry with special honors in 1967; the MS in physics in 1969, and

the PhD in physics in 1972, all from the University of Chicago. He was a Hertz Foundation Fellow from 1967-72 and a Harvard Research Fellow from 1972-73. A native of Toronto, Canada, Professor Kastner, 31, lives in Newton, Mass.

Professor James L. Kirtley, Jr., Department of Electrical Engineering and Computer Science. Appointed assistant professor of electrical engineering in 1971, Professor Kirtley was a member of the Department's cooperative program as an undergraduate. He received the SB and SM degrees in 1968; the EE degree in 1969; and the PhD in 1971, all from MIT. He has participated extensively in MIT's program on superconducting electric machines. He is a member of IEEE and Sigma Xi, and is a Registered Professional Engineer in Massachusetts. Professor Kirtley, 31, lives in Brookline, Mass.

Professor Gary L. Lilien, Alfred P. Sloan School of Management. A member of the faculty since 1973, Professor Lilien is a marketing specialist. Educated at Columbia University, Professor Lilien received the BS degree in 1967; the MS in 1968; and the DES in mathematical methods in engineering and operations research in 1973. From 1968 to 1973 he was employed by Mobil Oil Corporation. He is associate editor of *Management Science* and belongs to a number of professional societies. A native of New York City, Professor Lilien, 30, lives in Newton Centre, Mass.

Professor Ernest J. Moniz, Department of Physics. A member of the faculty since 1973, Professor Moniz received the BS degree from Boston College in 1966 and the PhD from Stanford University in 1971. His primary research interests involve pion-nucleus interactions and high energy electromagnetic interactions with nuclei. Professor Moniz is a consultant at Los Alamos Scientific Laboratory and serves on an American Physical Society study group concerned with nuclear fuel cycles and radioactive waste management. Professor Moniz lives in Arlington, Mass.

Professor Charles M. Oman, Department of Aeronautics and Astronautics. A member of the MIT faculty since 1972, Professor Oman received the BSE degree from Princeton University in 1966 and the PhD in instrumentation and control from MIT in 1972. He is currently involved in research on sensory transduction in vestibular organs, development of microprocessor based instrumentation for analysis of eye movements, and preparation of an experiment on vestibular function and motion sickness for the first Space Shuttle/Spacelab mission. Professor Oman lives in Winchester, Mass.

Ronald L. Rivest, Department of Electrical Engineering and Computer Science. Assistant professor of computer science and engineering since 1974, Professor Rivest's interests include applied computational complexity and development of optimal algorithms. He received the BA cum laude in mathematics from Yale University in 1969 and the PhD in computer science from Stanford University in 1973. Professor Rivest is a member of the Association for Computing Machinery, SIAM, Mathematical Association of America and the American Association for the Advancement of Science. Born in Schenectady, N.Y., he is 29 and lives in Belmont, Mass.

Professor Nils R. Sandell, Jr., Department of Electrical Engineering and Computer Science. A member of the faculty since 1974, Professor Sandell received the BEE degree in electrical engineering from the University of Minnesota in 1970, the MS in 1971 and PhD in 1974, both in electrical engineering from MIT. Professor Sandell is interested in control theory, stochastic processes, computer systems, modern control and estimation theory. He is on several committees of the Institute of Electrical and Electronic Engineers. Professor Sandell is co-author of a book, *Computer Subroutines for Modern Control Theory*, published

by MIT's CAES in 1974. He lives in Arlington, Mass.

Professor Robert J. Slattery, Department of Architecture. Professor Slattery received the BS degree from Notre Dame University in 1964 and the M. Arch from MIT in 1970. He was named instructor at MIT in 1971, and assistant professor in 1974. Professor Slattery is a principal and director of Arrowstreet, Inc., where he has been involved in a number of projects, including the modernization of the Park Street MBTA station. A native of Hartford, Connecticut, Professor Slattery lives in Cambridge, Mass.

Professor Sean C. Solomon, Department of Earth and Planetary Sciences. A member of the faculty since 1972, Professor Solomon received the BS degree in geophysics with honors from the California Institute of Technology in 1966 and the PhD in geophysics from MIT in 1971. He has held NSF graduate and postdoctoral fellowships, and was also a Fannie and John Hertz Foundation Fellow. Professor Solomon's research concerns the structure, dynamics and history of the crust and upper mantle of the earth and the terrestrial planets. A native of Los Angeles, Calif., Professor Solomon is 31 and lives in Arlington, Mass.

Professor Gerald J. Sussman, Department of Electrical Engineering and Computer Science. Professor Sussman has been involved with MIT's Artificial Intelligence Laboratory since he came to MIT as an undergraduate. He received the BS degree in mathematics in 1968 and the PhD in mathematics in 1973. He was appointed assistant professor of electrical engineering in 1973. His research concerns the fundamental mechanisms involved in the reasoning in the design, analysis, debugging and explanation of complex systems. Professor Sussman, 30, was born in Brooklyn, N.Y. and lives in Arlington, Mass.

Professor Nawal K. Taneja, Department of Aeronautics and Astronautics. Professor Taneja, a native of India and a naturalized citizen, has been a member of the faculty since 1973. He received the BSc degree in aeronautical engineering with first class honors from the University of London in 1966; the MS in flight transportation from MIT in 1967; the MS from the Sloan School in 1969, and the PhD in air transportation from the University of London in 1971. He received a three year grant from NASA in 1974 to develop a more effective policy-oriented long-range planning system for aviation technology. He is the author of a book, *The US Commercial Airline Industry: Managerial Practices and Regulatory Policies* (1976). Professor Taneja, 33, lives in Lexington, Mass.

Professor William G. Thilly, Department of Nutrition and Food Science. Professor Thilly received the SB degree in 1967 and the ScD in 1971, both from MIT. In 1972 he was appointed assistant professor of genetic toxicology. Dr. Thilly is studying chemically induced mutation in human cells and is active in devising assays of genetic hazard associated with environmental chemicals. In 1974 he received the Baker Award for undergraduate teaching. Professor Thilly, 31, grew up in central Pennsylvania. Since 1974 the Thilly's have been faculty residents at MacGregor House.

Professor Bonnie M. Tyler, Department of Biology. Prior to appointment as assistant professor in 1973, Professor Tyler was an instructor and research associate at MIT. She received the BA degree in mathematics from Wheaton College in 1962 and the PhD in biology from MIT in 1968. From 1968-70 Professor Tyler was a Postdoctoral Fellow at the University of California at Davis. Professor Tyler's research concerns microbial physiology and biochemistry. She is on the editorial board of the *Journal of Bacteriology*. A native of New York City, Professor Tyler, 36, lives in Winchester, Mass.

Professor William C. Wheaton, Department of Economics. Professor Wheaton received the BA degree in economics and sociology

(Continued on page 5)

MIT Experiment Picked For U. S. Spacecraft Flight

by ROBERT C. DIORIO
Staff Writer

An MIT biomedical engineer's proposed experimental program to investigate the in-flight and after-flight effects of space motion sickness and weightlessness has been selected by the National Aeronautics and Space Administration to be aboard the first Spacelab flight in 1980.

Dr. Laurence R. Young, director of the Man-Vehicle Laboratory in the MIT Department of Aeronautics and Astronautics, heads the team of American and Canadian scientists and engineers who have been studying for several years the mechanism and limitations of the system in the inner ear by which humans orient themselves in space.

Professor Young, 41, is one of only 17 principal investigators selected by NASA from the more than 2,000 candidates who responded to invitations to participate in the Spacelab mission, a mission planned jointly by NASA and the European Space Agency.

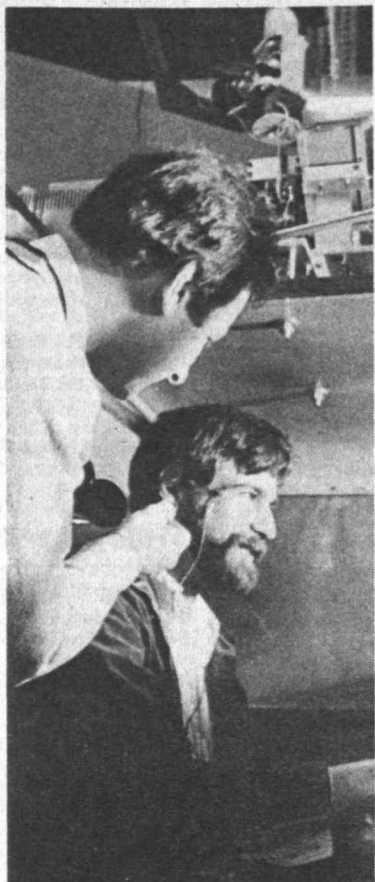
Scheduled to be launched into Earth orbit aboard NASA's Space Shuttle in the second half of 1980, the European-built Spacelab is designed to allow workers to live and to perform experiments in space economically and frequently. The initial flight's primary objective is to verify the performance of the Spacelab systems and subsystems and to measure the environment surrounding the Shuttle.

The experimental program Professor Young directs involves seven closely related experiments that seek to answer two basic questions: How does the human sensory motor system reorganize itself when one of the channels through which it receives information is inoperative because of zero gravity, and what changes occur in the balance-governing system as the body becomes accustomed to space travel.

Co-investigators are Dr. Charles M. Oman, associate professor of aeronautics and astronautics at MIT; Capt. (Dr.) Richard E. Malcolm of the Defense and Civil Institute of Environmental Medicine, Ontario, Canada; Dr. Geoffrey Melvill Jones, director, Aviation Medical Research Unit, McGill University, Montreal, Quebec, Canada; Dr. Kenneth E. Money, Defense and Civil Institute of Environmental Medicine, and Dr. Douglas Watt, aviation medical research unit, McGill University.

Research results to date, Professor Young said, indicate that such adaption takes place over the course of several days and may carry over to post-flight terrestrial conditions.

"This problem of basic importance can only be studied in orbiting vehicles," he said. "Parabolic flights are



PROFESSOR YOUNG (left) with graduate student Greg Zacharias. too brief and ground studies are contaminated by a one-G bias."

Space motion sickness, which occurred on several American and Russian missions, has affected the productivity and well-being of astronauts. Although the Skylab results indicated that humans can adapt to zero-G environment within a week, the problem remains a serious one for the short-term space traveler.

It is especially critical to the future of the Space Shuttle/Spacelab experiments because many of those selected for orbital flights will be engineers and scientists who have not undergone extensive training as astronauts. The MIT research program will concentrate on experiments designed to detect changes in the function of the inner ear at several levels: combined ear-eye reflexes, the connection between inner ear and spinal pathways, brain functions that involve perception of motion of spatial orientation, the interaction of the eye and inner-ear and susceptibility to motion sickness.

The research program was developed as a bi-national effort by investigators from the United States and Canada. Each individual experiment has a lead investigator either at MIT or at the Defence and Civil Institute of Environmental Medicine in Canada.

Two of the seven experiments will make use of a rail-mounted space sled that will be assembled within Spacelab for the experiments. Small electric motors will propel the sled along the 4½-meter long rails, giving the subject a small amount of acceleration in a zero-gravity environment. The experiments will measure perceived velocity during linear acceleration and measure eye movements associated with accelerations. The Space Sled experiments will be done jointly with the European research team headed by Dr. Rudolph von Baumgarten of Germany.

Experiment 3 will investigate the perception of self motion and the eye movements induced by a rotating visual field.

Experiment 4 will investigate the astronauts' awareness of body position in the absence of visual information.

Rowers Meet

The MIT heavyweight crew will open its regular season against Columbia University on Saturday, April 16, on the Charles River.

The MIT Alumni Center of New York in conjunction with the Columbia Alumni Rowing Committee is donating the MIT-Columbia University Alumni Cup to be presented to the winner of this annual rowing regatta.

The varsity race is scheduled for 11:30am and the first annual presentation of the cup will take

Political Science Open House

Discussion of internships in state and local government agencies, and of a new major focus on public policy studies will be two of the topics featured at the Political Science Department's Open House tomorrow (Thursday, April 14), from 3:30 to 5:30 in the Mezzanine Lounge of the Student Center.

Department faculty will answer questions of students interested in political science as a major, a concentration, or for its special fields of interest.

The new public policy program, which will start next year, will provide an opportunity for students to emphasize policy initiation, development and program implementation. It will build on departmental strengths in the areas of American politics, health policy, media and communications, arms control, international relations, and other fields, and develop links with other departments with strengths in policy areas. Internships in appropriate fields will be part of the new undergraduate emphasis.

During the afternoon there will be a showing of television campaign materials from the television political materials collection of the department. Refreshments will be served.

BPW White Elephant Sale Is Next Friday

The MIT Branch of the Cambridge Business and Professional Women's Club will hold its annual White Elephant Sale Friday, April 15, 9am-2pm in Rm. 7-102.

The sale supports the Cambridge BPW Olive Litbitz Memorial Scholarship, named in memory of a former staff member in the MIT Comptroller's Accounting Office. The scholarship goes annually to a woman graduate of a Cambridge high school.

White Elephant contributions may be given to Alice Seelinger, Rm. 7-133.

"Skylab crews reported that with the eyes closed of the light out they eventually lost the sense of where the objects were relative to their bodies," Professor Young said.

"The experiment is designed to determine whether this phenomenon can be demonstrated objectively and accurately described, and to test several different hypothesis concerning its mechanism."

In this experiment, space travelers will observe several different targets and will be asked to recall where those targets are while blindfolded, point to them and describe where they think they are in relation to the objects.

The fifth experiment will test the effects of inner-ear changes on leg muscle activity. Experiment 6 will measure motion sickness by oscillating the subjects from side to side and by monitoring their head movements through the use of a helmet fitted with small accelerometers. Motion sickness symptoms will be graded by a trained scientist who will be aboard Spacelab. A color television camera will be used to measure changes in skin pallor.

The final experiment will evaluate the residual effects of seven days of weightlessness on vestibulo-spinal and vestibulo-ocular pathways.

The MIT Man-Vehicle Laboratory has concentrated for several years on research on the vestibular, manual and visual systems, displays and life-support systems. Professor Young has been director of the laboratory since 1968.

Rowers Meet Columbia; New York Alumni Offer Cup

place at MIT's Pierce Boathouse following the conclusion of the race.

Representatives from the Alumni Center of New York and Columbia Alumni will attend the festivities and make the presentation. Hotdogs and soft drinks will be available for alumni and friends attending the events.

The rivalry between MIT and Columbia in heavyweight rowing started in 1961, with Tech winning thirteen of the past sixteen regat-

Borodin Quartet Coming



BORODIN QUARTET. Dimitri Shebalin, viola; Valentin Berlinsky, cello; Andrei Abramenkov, second violin, and Mischa Kopelman, first violin, will give the Abramowitz Memorial Concert at 8pm on Wednesday, May 4, in Kresge Auditorium.

The Borodin Quartet from Moscow—one of the world's great string ensembles—will give the Abramowitz Memorial Concert at 8pm Wednesday, May 4, in MIT's Kresge Auditorium.

They will play Quartet No. 2 in F Major, Op. 22, by Tchaikovsky; Quartet in D Major, Op. 64, No. 5, *The Lark*, by Haydn, and Quartet No. 8 in C Minor, Op. 110, by Shostakovich.

Although the concert is free, tickets will be required. Requests for tickets must be received by Wednesday, April 27. For tickets, call Ext. 3-3210 or Ext. 3-2906; stop by the Music Office, Rm. 14N-434 or the Kresge

He received the AB degree from Amherst College in 1957, a certificate in applied mathematics from the Sorbonne, Paris, as a French Government Fellow in 1958; the SB and SM degrees in electrical engineering, and the ScD in instrumentation from MIT, from 1957-62.

Professor Young worked on the development of flight control systems with Sperry Gyroscope Co. in 1957 and from 1958 to 1964 was a member of the MIT research staff, working on inertial guidance systems at the Instrumentation Laboratory and on problems of bioengineering at the Electronic Systems Laboratory. During 1961 he did eye movement research at the University of Puerto Rico's School of Medicine.

Professor Young is a lecturer at Harvard Medical School in the Harvard-MIT Program in Health Sciences and Technology and chairman of the Committee on Biomedical Engineering.

During 1972-73 Professor Young was visiting professor at the Federal Institute of Technology and the Zurich canton hospital in Zurich, and a visiting professor at the Conservatoire National des Arts et Metiers, Paris. He is active on several professional and government committees and is a member of the Barany Society for vestibular research. Professor Young is also a member of the editorial board of *Neuroscience*. He was a member of the administrative committee of the Man and Cybernetics Society of the IEEE and a charter member of the Biomedical Engineering Society.

Music Office, Rm. 16W-002; or mail a self-addressed envelope to Music Office, MIT Rm. 14N-434, 77 Massachusetts Ave., Cambridge, Mass. 02139.

The Abramowitz Concert series was established in 1961 to bring distinguished artists and lecturers to MIT. It was made possible by a gift from William L. Abramowitz, Class of 1935, and is sponsored by the MIT Department of Humanities.

Members of the Borodin Quartet are Mischa Kopelman, first violin; Andrei Abramenkov, second violin; Dimitri Shebalin, viola, and Valentin Berlinsky, cello.

Founded in 1945 when its members were conservatory students, the quartet was originally called the Moscow Philharmonic Quartet. In 1955 the Russian government honored the group by giving it the name of Alexander Borodin, the father of Russian quartet music.

The quartet made its first concert tour abroad in 1955 and its second concert tour of North America in 1964. Irving Kolodin wrote of them in *The Saturday Review* (Jan. 25, 1969), "The Soviet Union has sent us no organization more creditable to its musical establishment than the Borodin Quartet."

Its repertoire ranges from classic and romantic to contemporary works by such composers as Vassarin Shebalin (father of violist Dimitri Shebalin) and Kurt Schnitke, both of whom have composed works specifically for the quartet.

Lipsky Co - author of Book on Riots

Michael Lipsky, associate professor of political science at MIT, is co-author with David J. Olson of Indiana University of a new book, *Commission Politics: The Processing of Racial Crisis in America*, just published by Transaction Books, New Brunswick, N.J. The book examines the political and organization behavior of riot commissions to which the public looked for answers to questions concerning the race riots of the mid-1960s and the development of public policy related to the riots.

Associate Professors

(Continued from page 4)

cum laude from Princeton University in 1968 and the PhD in planning from the University of Pennsylvania in 1972. He was a lecturer at the University of Pennsylvania until his appointment as assistant professor of economics and urban studies at MIT in 1972. Professor Wheaton's current research interests include local government and service quality, housing markets, urban growth, immobile capital and centralized and decentralized alternatives for economic institutions. Professor Wheaton, 32, was born in Washington, D.C., and lives in Salem, Mass.

Professor Thomas R. Willemain, Department of Urban Studies and Planning. A member of the faculty since 1972, Professor Willemain received the BSE summa cum laude in electrical engineering from Princeton University in 1969, the SM in 1970 and PhD in 1972, both in electrical engineering from MIT. He consults widely in his field of expertise, quantitative methods in health planning. Professor Willemain is a member of the NAS/NRC Committee on Emergency Medical Services. Professor Willemain, 29, lives in Belmont, Mass.

THE INSTITUTE CALENDAR X3-3270

April 13 through April 27

Events of Special Interest

TWO Spring Crafts & Bake Sale* — Thur Apr 14 8:45am-5pm, Bldg 10 Lobby.

Political Science Open House — Internships in state & local government agencies and a new major focus on public policy studies will be featured topics. Thurs, Apr 14, 3:30-5:30pm, Stu Ctr Mezzanine Lng. Faculty will be present. Television campaign materials from department collection will be shown. Refreshments.

Young People's Lecture: Earthquakes* — William F. Brance, Cecil and Ida Green Professor of Geology in the Department of Earth and Planetary Sciences. Technology Children's Center, Inc. benefit for MIT's Nursery School and Day Care Center. Sun, Apr 24, 3pm, Rm 9-150. Tickets: \$1, Child Care Office x3-1592.

Sixth Annual MIT Black Students' Conference on Science and Technology* — Fri, Apr 22, 10am-6pm; Sat, Apr 23, 9am-1am, Stu Ctr. Workshops, symposia, banquet and speakers on economic development in a technological society. Info: x3-5313, or 494-8120, evgs.

Seminars and Lectures

Wednesday, April 13

Rare Disorder of Cysteine Metabolism* — Dr. Vivian Shih, neurology, Harvard Medical School; Assistant Neurologist, Mass. General Hospital. Clinical Research Center Seminar. 9am, Rm E18-408.

Ionic Conduction in Polymers* — D.A. Seanor, Xerox Corp. Guest Lecture in Electrical Properties of Polymers (3.68). 10am, Rm 8-119.

Facts and Folklore in Optimization* — D.M. Himmelblau, chemical engineering, University of Texas. Chemical Engineering Seminar. 11am, Rm 66-110.

Observations of Interaction Between the Internal Wave Field and Low-Frequency Flows in the North Atlantic* — Barry R. Ruddick, oceanography, MIT/WHOI. Oceanography Sack Lunch Seminar. 12n, Rm 54-915. Coffee.

Technology and Political Opportunity: Evolution of the Boston Energy Office* — M. Tyson, G. Energy Assessment Group Seminar. 12n, Rm 12-142.

Migration and Labor Underemployment in LDC's* — Dipak Mazumdar, World Bank. CIS Migration and Development Seminar. 12:30pm, Rm E53-482.

Southern Africa: Do the Whites Have the Right for Self-Determination?* — Dov Ronon, Harvard Center for International Affairs, on leave from Hebrew University. MIT Harvard Joint African Luncheon Series. 12:30-2pm, HCFIA, 6 Divinity Ave, Rm 1.

Strobes and Sonar* — H.E. Edgerton, Institute Professor & professor of electrical measurement, emeritus. EECS Optics Seminar. 1pm, Rm 4-402.

Diffusion of Neon as a Tracer Impurity in Versator* — George Lasche, G, nuclear engineering. Nuclear Engineering Seminar. 2pm, Rm 38-166.

Design Considerations for Improved Hearing Aids* — Louis Braid, electrical engineering. Biomedical Engineering Center for Clinical Instrumentation. 4pm, Rm 36-428. Refreshments 3:45pm.

OPEC — Will it Last?* — Morris Adelman, economics, Sidney Alexander, Sloan School of Management and William Griffith, Ford International Professor of Political Science. Undergraduate Economics Association Interdisciplinary Social Science Forum. 4pm, Rm E52-161.

Differential Geometric Foundations of the Inverse Scattering Technique, Part I* — R. Herman, mathematics, Rutgers University. EECS Seminar on Mathematical Methods for Nonlinear Problems Arising in Engineering and Physics. 4pm, Rm 35-338.

Nuts to Nernst OR Major Element Distribution between Plagioclase and Liquid* — John Longhi, earth & Planetary Sciences. Earth & Planetary Sciences Colloquium. 4pm, Rm 54-915. Tea 3:30pm, Rm 54-923.

Simulating the Operation of an Electric Power System* — J. Guerra, G. Nuclear Engineering Seminar. 4pm, Rm NW12-222.

Quantum Gravity* — Stanly Deser, Brandeis University. Undergraduate Physics Colloquium. 4:15pm, Rm 4-339. Social hour following.

VLBI with the 100-m antenna and Nuclei of Galaxies and Quasars* — Eugen Preuss, Max-Planck-Institut für Radio-astronomie, Bonn & N.R.A.O. Astrophysics Seminar. 4:15pm, Rm 37-252. Coffee 3:45pm.

Jewish Partisans During the Holocaust: An Inside Look* — Jack Nusan Porter, sociologist, editor, co-author of *Jewish Radicalism*. MIT Hillel Lecture. 8pm, Stu Ctr West Lng.

Thursday, April 14

The Free Electron Laser* — M. O. Scully, University of Arizona. Research Laboratory of Electronics & Spectroscopy Laboratory Seminar. 11am-12n, Rm 66-110. Coffee 10:30am.

Convective Cells in Inhomogeneous Plasma* — Prediman Kaw, Princeton Plasma Physics Lab. RLE Plasma Theory Seminar. 2-3pm, Rm 36-261.

Undergraduate Research in Medicine: Projects in Boston Hospitals* — Six MIT undergraduates will speak about their UROP research experiences at local hospitals. Sigma Xi and UROP Symposium. 2pm, Rm 9-150. Programs available at UROP office.

Process Control Applications in the Pulp and Paper Industry* — Mac Rivkin, WESTVACO Co., Charleston, SC. Laboratory for Manufacturing and Productivity Seminar. 3pm, Rm 37-187.

Trace Metal Analysis by Anodic Stripping Voltammetry: Effect of Sorption by Organic Compounds in Sea Water* — Rebecca Siebert, G. Analytical Chemistry Seminar. 4pm, Rm 8-105.

Thermal Boundaries Resistance of Solid Helium, Hydrogen, Deuterium, and Neon* — Claude Lewis Reynolds Jr, Physics and Materials Research Laboratory, University of Illinois. National Magnet Laboratory Seminar. 4:15pm, Rm W14-2209. Refreshments 4pm.

Evolution of Stars and Galaxies: New Insights* — Paul C. Joss, physics. Physics Colloquium. 4:15pm, Rm 26-100. Refreshments 3:45pm.

Chemically Modified Electrodes* — Royce W. Murray, University of North Carolina. Harvard-MIT Inorganic Colloquium. 5pm, Rm 4-270. Refreshments 4:30pm, Rm 6-321.

Friday, April 15

Nuclear Electric and Magnetic Structure Studies by Atomic Spectroscopy* — H.H. Stroke, physics, NYU. RLE & Spectroscopy Laboratory. Seminar on Modern Optics and Spectroscopy. 11:00am, Rm 9-150. Coffee 10:30.

The Pipe Airport Terminal — A New Concept in Design* — Hans Fischer, Manager Airport Planning, Alitalia. Center for Transportation Studies Luncheon/Seminar. Luncheon, 12n, \$1; lecture, 12:45pm, free; Stu Ctr Mezzanine Lng.

Magnetically-Induced Desulfurization of Liquid Coal* — I.Y. Akoto, G. Chemical Engineering Seminar. 2pm, Rm 66-110.

Preparation of Nb-Sn Superconductors by Powder Metallurgy Techniques (Infiltration)* — K. Hemachalam, Magnetic Corp of America. Superconducting Materials Development Seminar. 2:30pm, Rm NW14-2209. Refreshments 2:15pm.

Inclusions, Steelmaking & Machinability* — S. Ramalingam, mechanical engineering, State University of New York, Buffalo. Mechanical Engineering Seminar. 3pm, Rm 3-370 Coffee 4pm, Rm 1-114.

A Study of Supported Group VIII Metal Catalysts* — B.P. Sung, G. Chemical Engineering Seminar. 3pm, Rm 66-110.

Net Directions in Tokamak Fusion Technology and Reactor Research* — Robert Conn, University of Wisconsin. MIT Fusion Center — Plasma Dynamics Seminar. 3:30pm, Rm 36-261. Refreshments 3pm.

Water in Synthetic Fuel Production* — Ronald F. Probst, mechanical engineering. Mechanical Engineering Seminar. 3pm, Rm 3-133. Coffee 4pm, Rm 1-114.

Some Puzzles about Comparatives and Superlatives* — Peter Geach, University of Leeds. Philosophy and Linguistics Colloquium. 4pm, Rm 37-212.

Tuesday, April 19

Injection Locking & Mode Selection in TEA-CO₂ Oscillators* — Dr. J.L. Lachambre, Defense Research Establishment Calcartier, Courcellette, Quebec, Canada. National Magnet Laboratory Seminar. 4pm, Rm W14-2209. Refreshments 3:45pm.

How to Get Blood Out of a Stone: Electromagnetic Energy Extraction from Kerr Black Holes* — Roger Blandford, California Institute of Technology. Astrophysics Colloquium. 4:15pm, Rm 37-252. Coffee 3:45.

Recent Studies in the Biology of Murine Leukemia Viruses* — Dr. Wallace Rowe, National Institutes of Health, Bethesda, MD. Biology Colloquium. 4:30pm, Rm 6-120. Coffee 4pm, 5th floor vestibule, Bldg 56.

The Biological Basis of Grammatical Relations* — Thomas Bever, psychology, Columbia University. Linguistics and Philosophy Lecture. 7-9pm, Rm 26-414.

Wednesday, April 20

Nutrition and Cancer* — Dr. Paul Newberne, nutrition and food science. Clinical Research Center Seminar. 9am, Rm E18-408.

Materials Aspect of Charge Transport in One Dimensional System* — J. Perlstein, Eastman Kodak Co. Guest Lecture in Electrical Properties of Polymers (3.68). 10am, Rm 8-119.

Finite Element Method in Polymer Processing* — R.I. Tanner, mechanical engineering, University of Sidney. Chemical Engineering Seminar. 11am, Rm 66-110.

Exploding Universe* — Irwin Shapiro, earth and planetary sciences. MIT Women's League Seminar. 11:30am, Rm 10-340. Sherry and luncheon 1pm (\$2.25). Reservations, x3-3656, Mary Pinson.

Remote Sensing of Sea Ice* — Everett Carter, G. Oceanography Sack Lunch Seminar. 12n, Rm 54-915. Coffee available.

The Benefits of an Accelerated Energy Conservation Policy* — E.P. Gyftopoulos, Ford Professor of Engineering. Energy Assessment Group Seminar. 12n, Rm 12-142.

Consequence Model — Application to Radiological Emergency Response Planning* — D. Aldrich, G. Nuclear Engineering Seminar. 4pm, Rm NW12-222.

Multi-Commodity Flows, Loops and Shortest Route Flows* — Robert G. Gallager, electrical engineering, Assoc Dir, Electronic Syst Lab. Electronic Systems Laboratory Control and Communications Seminar. 4-5pm, Rm 39-500.

Differential Geometric Foundations of the Inverse Scattering Technique, Part II* — R. Herman, mathematics, Rutgers University. EECS Seminar on Mathematical Methods for Nonlinear Problems Arising in Engineering and Physics. 4pm, Rm 35-338.

Electromechanics and Electromechano-Chemistry of Collagenous Tissue* — Alan Grodzinsky, Esther and Harold E. Edgerton Assistant Professor of Electrical and Bioengineering. Biomedical Engineering Center for Clinical Instrumentation Seminar. 4pm, Rm 36-428. Refreshments 3:45pm.

Weather on Neptune* — Carl Pilcher, Institute for Astronomy, University of Hawaii at Manoa. Earth and Planetary Sciences Colloquium. 4pm, Rm 54-611. Tea 3:30pm, Rm 54-923.

Frontiers in Modern Spectroscopy* — Shaoul Ezekiel, aeronautics and astronautics. Undergraduate Physics Colloquium. 4:15pm, Rm 4-339. Refreshments following.

Alternatives in the Silver Image* — Ray Metzker, photographer. Creative Photo Lab Lecture and slides. 4:30pm, Rm W31-310.

Thursday, April 21

Kinetics Equation Approach to Non-Equilibrium Superconductors* — Dr. Jhy-Jiun Chang, California Institute of Technology. National Magnet Laboratory Seminar. 11am, Rm W14-2209. Refreshments 10:45am.

New Methods of Laser Spectroscopy* — T.W. Hansch, Stanford University. RLE & Spectroscopy Laboratory Seminar. 11am-12n, Rm 66-110. Coffee 10:30.

Anomalous Transport Processes in Tokamaks* — James Callen, Oak Ridge National Lab. RLE Plasma Theory Seminar. 2-3pm, Rm 36-261.

Rolling Contact Fatigue — Selection of Materials and Mechanisms of Failure* — Douglas Scott, National Engineering Laboratory, Glasgow, Scotland. Laboratory for Manufacturing and Productivity Seminar. 3pm, Rm 37-187.

Cellular and Molecular Events in Chemical Carcinogenesis* — Dr. I. Bernard Weinstein, Institute of Cancer Research, Columbia University. Department of Nutrition and Food Science Lecture in Toxicology. 4pm, Rm 16-134.

History of Industrial Society Workshop* — Prof Stephen Marglin, economics, Harvard University, will speak on the organization of work and the division of labor. 4pm, Rm 14N-317.

Development and Evaluation of a Rapidly Scanning Ultraviolet Detector for High Pressure Liquid Chromatography* — Linda J. Anthony, G. Seminar in Analytical Chemistry. 4pm, Rm 8-105.

The Evolution of Natural Communities: Darwinism and Ecology** — Jared M. Diamond, physiology, UCLA School of Medicine. Darwinism and Culture Seminar Sponsored by Technology and Culture Seminar and Cambridge Humanities Seminar. 4-5:30pm, Rm 9-150.

Three Ways to Read a Detective Story — or a Brahms Intermezzo* — Edward T. Cone, music, Princeton University. Faculty Seminar on Music, Linguistics and Aesthetics of the School of Humanities and Social Science. 4pm, Rm 14E-109.

Elementary Discussion of Renormalization* — Leo P. Kadanoff, Brown University. Physics Colloquium. 4:15pm, Rm 26-100. Refreshments 3:45pm.

Friday, April 22

Molecular Motion and Charge Transport in Polymeric Photoconductors* — D.J. Williams, Xerox Corp. Guest Lecture in Electrical Properties of Polymers (3.68). 10am, Rm 8-119.

Thermorheological Properties of Carbon Black Filled Elastomers* — J.M. Caruthers, G. Chemical Engineering Seminar. 2pm, Rm 66-110.

Soot Formation in Premixed Flames* — J.D. Bittner, G. Chemical Engineering Seminar. 3pm, Rm 66-110.

Grain Sector within the Agribusiness System** — Robert Ludwig, Food and Agribusiness Section of Arthur D. Little. Nutrition and Food Science Seminar on the Agribusiness System. 3:30pm, Rm 16-134.

Structure of Inclined Seismic Zones at Island Arcs* — Muawia Barazangi, geological sciences, Cornell University. Earth and Planetary Sciences Colloquium. 4pm, Rm 54-915. Tea 3:30pm, Rm 54-923.

Decay of Persistent Currents in Thin Films of Superfluid He** — Robert B. Hallock, University of Massachusetts at Amherst. Center for Materials Science and Engineering Colloquium. 4pm, Rm 9-150. Refreshments 3:30pm.

Monday, April 25

Human Verses Animal Nutrition: Post Drought Sahel Development* — Dr. Joel Teitelbaum, public health, University of North Carolina. International Nutrition Policy & Planning Program Seminar. 3pm, Rm 26-414.

All That You Ever Wanted to Know About e² And Its Approximants* — Richard Varga, mathematics, Kent State University, Kent, Ohio. Applied Mathematics Colloquium. 4pm, Rm 2-338. Tea 3:30pm, Rm 2-349.

Groundwater-Surface Water Conjunctive Use in a River Basin* — Robert Schrieber, Resource Analysis, Inc, Cambridge. Water Resources and Environmental Engineering Seminar. 4-5pm, Rm 48-316. Coffee 3:45pm, Rm 48-410.

Polymers* — Edward Merrill, Carbon P. Dubbs Professor of Chemical Engineering. Undergraduate Chemistry Seminar. 4pm, Rm 4-231. Refreshments preceding, Rm 6-321.

Resistance to Persecution* — Ismar Schorsch, Prof of Jewish History and Dean of Grad School of the Jewish Theological Seminary. Hillel Annual Charles Sparrow Memorial Lecture. 8pm, Stu Ctr, West Lng.

Tuesday, April 26

Sand, Sun and Wind, or Teaching Design in the Desert* — Avram Bar-Cohen, mechanical engineering, Ben Gurion University of the Negev, Israel. Mechanical Engineering Seminar, Systems and Design Division. 1-2pm, Rm 3-465. Smoke free. Coffee and tea.

A Two-Surface Theory of Shell Structures* — C.R. Calladine, Cambridge University, Cambridge, England. Applied Mechanics Seminar. 3pm, Rm 3-133.

Double Radio Sources and Their Meaning: Radio Galaxies, Quasars, . . .* — Philip Morrison, Institute Professor, physics. Astrophysics Colloquium. 4:15pm, Rm 37-252. Coffee 3:45.

Pool Swell Modeling* — Bill Anderson, Lincoln Lab. Fluid Mechanics Laboratory Seminar. 4pm, Rm 3-134. Coffee 3:50pm.

Wednesday, April 27

Fine-structure in the Southern Ocean* — Dan Georgi, Lamont-Doherty Geological Observatory. Oceanography Sack Lunch Seminar. 12n, Rm 54-915. Coffee available.

Limited Motor Communication* — William J. Crochetiere, engineering. Tufts University. Biomedical Engineering Center for Clinical Instrumentation. 4pm, Rm 36-428. Refreshments 3:45pm.

Leadership and Management Education in the United States Air Force* — Col. Henry M. Kelly, Director of Concepts and Curriculum in the Leadership and Management Development Center, Maxwell Air Force Base, Alabama. Aerospace Studies Seminar. 4pm, Rm 16-134.

On Unipolar Dynamos, the Electrical Industry and Relativity Theory* — Arthur I. Miller, physics, University of Lowell. Technology Studies Seminar. 4pm, Rm 20D-205. Coffee 3:30pm.

Community Meetings

International Cooking* — TWO. Beth Gaboury of Mass. will cook at Wed April 13 meeting, 8pm, Rm 10-340. Members 50¢, non-members \$1. Call Jenny Gordon, 547-6471.

Poetry Reading* — Sponsored by Dept. of Humanities. Susan Weiner poet (published in *Grist, Aspect, Response*). Some poems presented with masks and mime. Wed, Apr 13, 8pm, Rm 14E-304.

MIT Branch of Cambridge Business and Professional Women's Club* — White Elephant Sale. Fri. Apr 15, 9am-2pm, Rm 7-102. Money raised for scholarship for Cambridge High School woman graduate.

University Scouting Advisors General Meeting* — Tues, Apr 19, 7:30pm, Stu Ctr Mezzanine Lge. Discussion of opportunities to help the Scouting movements in Cambridge.

MIT Medical Advisory Board Meeting* — Mon Apr 25, 12n-1:30pm, MIT Infirmary, third floor conference rm. Proposed student health insurance

gram for next year will be discussed.

"Tech" Lodge** — Wed, Apr 20, 5:45pm, Masonic Temple, 1950 Mass Cambridge. Regular communication of Richard C. Maclaurin Lodge & AM. Buffet dinner 6:45pm. \$5. Reservations x8-3467 Draper. Master's Welcome.

an Action Annual Big Brother Drive* — Wed, Apr 20 thru Fri, Apr 21, 10am-4pm, Lobby 10. Sponsored by MIT Urban Action. Stop by and sign up about becoming a Big Brother with representatives from the Big Brother League and MIT students who are Big Brothers. Info: x3-2894.

udent Committee on Educational Policy (SCEP) Meeting* — Thurs, Apr 21, 7:30pm, Rm W20-413. Meeting to discuss spring course evaluation and other relevant topics.

Women's Forum* — Mon, Apr 25, 12n, Rm 10-340. Lois Harris & John Eggleton of Boston Gray Panthers will lead a panel discussion on the issues of aging and the basic issues of society.

Women's Group** — Group leaders: Charlotte Schwartz, sociologist & Myra Giguere, social worker, both from Medical Dept; Carol Hulsizer, faculty member in residence, Ashdown Hse. Wed, 3-5 pm, Stu Ctr West Lng. Meeting Stu Ctr Rm 473. Cheryl, x3-4911. **Apr 13:** Emily Marx, will speak on "The Transcendental Meditation Program — Unfolding Human Potential". 3-5pm, West Lng.

Technology Wives Exercise Class** — Marilyn deKleer, instructor. Sponsored by TWO. An hour of serious exercising. Newcomers welcome. Wed, 8pm, Exercise Room, Dupont Gym. Admission, 50¢.

WPS* — Tech Organization of Professional Secretaries. Meetings Thurs, 7:30pm, Walker Blue Rm.

Back Problem Exercise Class* — Thurs, 1-2:30pm, Maggie Lettvin, Mass Ave., Bring 3 pillows and on OK from your doctor. \$15/ea class. Info: x3-4138, Mon, 9am-5pm.

Social Events

ormal Ballroom Dance* — MIT-Wellesley Ballroom Dance Club. Fri, Apr 15, 8:30pm-12m, Baker Dining Hall. An evening of teaching and dancing. Admission, 50¢. Refreshments. Info: Jung Choi, x5-7192 Dorm.

riot's Day Weekend Retreat (Shabbaton)* — MIT Hillel Retreat at University of RI, Apr 15 thru 17. The weekend will include Reform, Conservative and Orthodox services, and speakers Carl Feldman, Rabbi Shevitz, Rabbi Ben Marcus, and Alice Edelman. Charge: \$15, includes housing and program. Register at MIT Hillel, 312 Memorial Dr.

el Independence Day Booth* — Fri, Apr 22, 9am-3pm, Lobby 10.

Wellesley-MIT Ballroom Dancing Club Semiformal Dance* — Wed, Apr 20, 8:30pm, Wellesley College. Live band, semiformal dress, instruction available upon request, don't need partner. Free. Info: Daphne Wilcox or Sandra Youa 237-4051.

er-Collegiate Israel Independence Day Celebration — Gala celebration, party, dance, and entertainment. Sponsored by MIT Hillel, Boston Hillel, and Israel Student Organization. Sat, Apr 23, 8:30pm, Walker Memorial DR. Admission, \$2, Student ID required.

Movies

emkin** — Humanities Department. Wed Apr 13, 7pm, Rm 66-110.

merican Realists, Part 2: 20th Century; Calder's Circus; Twentieth Century Art: A Break with Tradition; The Americans: Three East Coast Artists at Work** — Films About Artists. MIT Student Art Association. Thurs, Apr 14, 5:15pm, Stu Ctr. Wine & cheese. Free. Info x3-7019.

night Cowboy** — LSC. Fri, Apr 15, 7 & 9:30pm, Rm 26-100. Admission, 75¢, MIT or Wellesley ID required.

manuelle** — SCC MidNite Movie. Fri Apr 15, 12m, Lobdell. Free.

epico** — LSC. Sat, Apr 16, 7 & 10pm, Rm 26-100. Admission 75¢, MIT or Wellesley ID required.

apaz** — LSC. Sun, Apr 17, 6:30 & 9:30 pm, Rm 26-100. Admission 75¢, MIT or Wellesley ID required.

ocaust Remembrance Program* — Two Films: **The Hangman** and **Two of Us**, and Holocaust Picture Exhibit. Sponsored by MIT Hillel. Thurs, Apr 18, 8pm, Basement, MIT Religious Counselors Bldg, 312 Memorial Dr.

st Year at Marienbad (Resnais)* — MIT Film Section. Wed, Apr 20, 7:30pm, Rm E21-010. Free.

ebeth (Polanski)** — LSC. Fri, Apr 22, 7 & 10pm, Rm 26-100. Admission, 75¢, MIT or Wellesley ID required.

The Bridge Over the River Kwai** — SCC MidNite Movie. Fri, Apr 22, 12m, Lobdell. Free.

Bananas** — LSC. Sat, Apr 23, 7 & 9:30pm, Rm 26-100. Admission, 75¢, MIT or Wellesley ID required.

Harold and Maude** — LSC. Sun, Apr 24, 6:30 & 9pm, Rm 26-100. Admission, 75¢, MIT or Wellesley ID required.

The Passengers (Tresgot); The Land Burns (Gleyze)* — Mastering the City: Work and Survival in the Third World, films and discussion. Tues, Apr 26, 5pm, Rm 3-133.

Touch of Evil (Welles); My Life to Live (Godard)* — MIT Film Section. Tues, Apr 26, 7:30pm, Rm E21-010. Free.

Lobby 7 Events

MIT Shakespeare Ensemble* — Scenes from *Comedy of Errors*, *Henry VI, Part 2*, *Pericles*, *The Winter's Tale*, *Don Juan* (Moliere), *Death Knocks* (Woody Allen). Thurs, Apr 14, — Fri, Apr 15, 12n, Lobby 7. Free.

Impulse Dance Company* — Wed, Apr 20, 12n, Lobby 7. The company will perform works of modern dance.

Music

Preparation of a Piano for Contemporary Music Performance* — **Richard Bunger**, pianist. MIT Music Section Lecture/Demonstration. Thurs Apr 21, 1:30pm, Kresge. Free.

Thursday Noon Hour Concert Series* — Concerts in Chapel, 12n-1pm, free. **April 14:** Sandra Stewart, soprano; James Johnson, harpsichord. **April 21:** Baroque Concert.

American Piano Music from 1904-1977* — Richard Bunger, pianist. Music Section Concert. Works by Ives, Cage, Lamb, Budd and others. Fri, Apr 22, 8pm, Kresge. Free.

Zamir Choral Concert* — MIT Hillel Choral Concert. Sunday, April 24, 7:30pm, Basement, MIT Religious Counselors Bldg, 312 Memorial Dr. Tickets: Students \$2.50; public \$3.50 and up. Info, Andy 494-8523.

MIT Chamber Players Concert* — Program of Stravinsky, Wagner, & Schubert. Mon, Apr 25, 8pm, Kresge. Free.

Renaissance Vocal Music* — Sponsored by Chamber Music Society. Auditions & rehearsal Sun, 7:30pm, Rm 4-160. Yves, x3-5810.

Chamber Music Society Concert* — Wed, 5:15pm, Music Library. Info: x3-3210. Free.

Theatre

Godspell* — MIT Musical Theatre Guild. Apr 14-16, 8pm, Kresge. Tickets: \$3.50, \$2 children under 12, \$2.50 w/MIT ID; sold in Lobby 10, Apr 13-15, 9am-5pm. Reservations, x3-6294.

Othello* — MIT Shakespeare Ensemble production of Shakespeare's tragedy. Wed, Apr 20-Sun; Apr 24, 8pm, Sala. Tickets available in Bldg 10 Lobby weekdays, 10am-5pm, or at door. Reservations: x3-4420. Prices: All seats Wed & Thurs, \$1.50; all seats Sun, \$2; Fri, \$3.50 & \$3; Sat (champagne celebration of Shakespeare's birthday) \$4.50 & \$4. Student & group discounts available.

France Through Slides* — Cercle Francophile (French Club) Slide Show. Wed, Apr 20, 7:30pm, Stu Ctr Rm 407.

Dance

MIT Ballroom Dance Club Workshop* — Sat, Apr 24, 2pm, Sala. Come and learn the dances not taught earlier, or more advanced steps to those already learned. Review will be done. Info: Sharon Pastoriza, x5-8667 Dorm.

MIT Folk Dance Club — International: Sun, 7:30-11pm, Sala. **Balkan:** Tues, 7:30-11pm, Stu Ctr Rm 491. **Informal:** Fri, 12n-2pm, Kresge Oval (Bldg 7 Lobby in bad weather). **Israeli:** Thurs, 7:30-11pm, Sala.

Renaissance Dance* — Sponsored by MIT SCA. Beginners Welcome. Wed, 8pm, Burton dining hall. Info: Beth Parkhurst, 964-1840.

MIT Dance Workshop — Sponsoring a number of different projects for second term. Please check Workshop bulletin board, duPont Armory, Bldg W31.

Exhibitions

Department of Psychology Art Show* — Exhibition of works by department faculty, staff and their family members, representing many media — paintings, watercolors, prints, photographs, some crafts. Exhibit thru Fri, Apr 8, Rm E10-013. Hours: whenever classroom not in use.

Photographs of India in Black & White* — Photography by Ram Rahman, student, architecture. Mon, Apr 11 thru Mon, Apr 25, The Rotch Visual Collections, Rm 7-304.

Nancy Begin: Watercolors & Oils* — Faculty Club exhibit thru Sat, Apr 30. Hours: Mon-Fri, 9am-11pm. Free.

Photography by Dan Ranalli & Lauren Shaw* — Creative Photography Gallery exhibit. Wed, Apr 6 thru Sat, Apr 30. Hours: Mon-Sat 10am-6pm; Sun, 12n-8pm. Free.

Selections from the MIT Collection* — Includes paintings, sculpture, prints, drawings, & works in site. Hayden Gallery, Fri, Apr 15-Sat, Apr 30. Hours: Mon-Sat, 10am-4pm. Free.

The Dyer's Art: Indigo Cloth from West Africa* — Fri, Apr 15 thru Sat, Apr 30, Hayden Corridor Gallery.

Spring Rounds* — Exhibit of musical scores. Music Library, thru May. Free.

MIT Historical Collections* — Permanent exhibition Mon-Fri, 9am-5pm, Bldg N52, 2nd floor. **Bicentennial Exhibits:** Katharine Dexter McCormick, '04; Vannevar Bush, '16; Karl Taylor Compton; Norbert Wiener, and 1876 Exhibit, Bldg 4' corridor. **The New Technology Exhibit** 2nd floor balcony of Lobby 7. **Energy Exhibit** Bldg E40, 1st floor. **Radiation Laboratory Exhibit** main corridor, Bldg 8.

Strobe Alley* — High speed photographs by Harold E. Edgerton, Institute Professor and Professor of Electrical Measurement, Emeritus. Bldg 4, 4th fl.

Hart Nautical Museum* — Permanent exhibit of rigged merchant and naval ship models, half models of yachts and engine models. Open daily in Bldg 5, 1st floor.

Graphics by MIT Design Services* — On Exhibit in Bldg 7 corridor.

Canones* — Music Library, Rm 14E-109. Examples of the use of canons from 7 centuries of music.

Athletics

Home Schedule* — Thursday, April 14 — V Golf. WPI & Babson, 12:30pm, Brae Burn Country Club. **JVM Tennis.** Belmont Hill, 3pm, duPont Tennis Court. **W Tennis.** Endicott Jr. College, 3:30pm, duPont Tennis Court. **V Baseball.** Boston University, Briggs Field. **Friday, April 15 — Lacrosse.** Holy Cross, 3pm, Briggs Field. **Saturday, April 16 — HVWT Crew.** Columbia, 11:30am, Charles River Basin. **JV Lacrosse.** Winchedon School, 2pm, Briggs Field. **VM Tennis.** Williams, 2pm, duPont Tennis Court. **JVM Tennis.** Williams, 2pm, duPont Tennis Court. **Track.** Bowdoin, 12:30pm, Briggs Field. **Sunday, April 17 — HVWT Crew.** Coast Guard, 9am, Charles River Basin. **LTWT Crew.** Coast Guard, 9am, Charles River Basin. **W Sailing.** Newisa Lark Invitational, 9:30am, Charles River Lower Basin. **Monday, April 18 — Baseball.** Brandeis, 3pm, Briggs Field. **VM Sailing.** Greater Boston Dinghy Championship, Oberg Trophy, 9:30am, Charles River Lower Basin. **VM Tennis.** Brown, 2pm, duPont Tennis Court; **JVM Tennis.** Brown, 3pm, duPont Tennis Court. **Tuesday, April 19 — Golf.** Harvard & Bates, 12:30pm, Brae Burn Country Club, Newton. **W Softball.** UNH, 3:30pm, JV Baseball Diamond. **Wednesday, April 20 — V Baseball.** Boston State, 3pm, Briggs Field. **JV Lacrosse.** Phillips Exeter, 3pm, Briggs Field. **Thursday, April 21 — V Lacrosse.** Merrimack, 3pm, Briggs Field. **W Softball.** Radcliffe, 4pm, JV Baseball Diamond. **Friday, April 22 — V Golf.** Bowdoin & Lowell, 12:30pm, Brae Burn Country Club. **VM Tennis.** Vermont, 3pm, duPont Tennis Court. **Saturday April 23 — VM Tennis.** Trinity, 2pm, duPont Tennis Court. **JVM Tennis.** Trinity, 2pm, duPont Tennis Court. **Track.** WPI, 12:30pm, Briggs Field. **Sunday, April 24 — JVM Sailing.** Freshman Invitational, 9:30am, Charles River Lower Basin. **Tuesday, April 26 — V Baseball.** Suffolk, 3pm, Briggs Field. **Wednesday, April 27 — V Lacrosse.** Colby 3pm, Briggs Field.

Maggie's Self-Designed Fitness Class — Classes 12n-1pm, du Pont fencing & wrestling rms; 5-6pm, du Pont T Club Lng. PE credit course, but all are welcome.

Freshmen are encouraged to attend departmental lectures and seminars. Even when these are highly technical they provide students one means to learn more about professional work in a department and field.

*Open to the public
**Open to the MIT community only
***Open to members only
Send notices for Apr 27 through May 8 to the Calendar Editor, Room 5-111, Ext. 3-3270, before noon Friday, Apr 22.

Medical Projects Featured At UROP Seminar Thursday

Several MIT students engaged in medically-related research at Boston-area hospitals under auspices of the MIT Undergraduate Research Opportunities Program will describe their work at a public symposium Thursday afternoon (April 14) sponsored by UROP and Sigma Xi.

While the symposium—starting at 2pm in Room 9-150—will be open to all members of the MIT community, special invitations to attend have been extended to MIT faculty and staff already affiliated with UROP projects or considering affiliation. Special invitations also have been extended to staff members at participating off-campus hospitals and research institutions.

"We think this will be a splendid opportunity for people interested in UROP to hear first hand illustrative projects now underway," Professor Margaret MacVicar said. Professor MacVicar is UROP director.

More than 2,000 MIT undergraduates are participating in research projects along with senior research scientists at MIT and at

scores of off-campus research institutions and centers. The program, aimed at engaging the interest of undergraduates in specific and real research work and thus enriching their undergraduate educational experiences, began at MIT some seven years ago.

Moderator at Thursday's seminar will be Douglas G. Evans, a junior in biology from Coram, N.Y., who is himself working on a UROP project with physicians and staff at the Eunice Kennedy Shriver Center for Mental Retardation in Waltham.

Thursday speakers, their topics and their participating institutions include:

Steven A. Norris, a junior in electrical engineering and computer sciences from Princeton, N.J., "Implementation of a Model to Simulate Muscle Signals," Children's Hospital Medical Center, Boston.

Pearl S. Huang, a junior in biology from Houghton, Minn., "Augmentation of Pulmonary Surfactant Release by Lung Expansion at Birth," Boston Hospital for

Correction

A table accompanying the Report of the Committee on Undergraduate Admissions and Financial Aid appearing in last week's issue of *Tech Talk* inadvertently listed MIT's entrance requirements in high school algebra and plane geometry incorrectly. MIT requires two years of algebra and one year of plane geometry (instead of the reverse, as shown in the table).

Women.

Walter A. Koltun, a senior in biology from Toronto, Canada, "Control of Local Cerebral Blood Flow by Catecholamines," Beth Israel Hospital, Boston.

Steven L. Wertheim, a junior in electrical engineering and computer science from University Heights, O., "Cortical Projections to the Spinal Cord of the Rhesus Monkey: An HRP Investigation," Children's Hospital Medical Center, Boston.

Victor V. Villareal, a junior in chemical engineering from El Paso, Tex., and William D. Rhine, a senior in biology from Moraga, Calif., "Use of Small Organ Perfusion for Endotoxin Clearance Studies," Boston Veterans Administration Hospital.

NSF Summer Grants Open

The MIT Department of Nutrition and Food Science and Alfred P. Sloan School of Management are accepting applications from undergraduates interested in conducting research this summer as part of the National Science Foundation's Undergraduate Research Participation Program. Application deadline is April 18.

Ten to 12 stipends of \$900 each are available in each MIT department. The overall program this year will provide research grants for 1,462 college students in the US.

Project director for the nutrition and food science research is Dr. Charles L. Cooney, associate professor of biochemical engineering. This is the sixth consecutive year that the department and Dr. Cooney have been selected for the program. Applications can be obtained from the department's undergraduate office (Rm 16-321). Students with questions should call Ms. Debbie McCoy, x3-5804.

Dr. Peter P.S. Chen, assistant professor of management science, is project director for the Sloan School research, which will be on database and information systems. Interested students may obtain information and applications

from his office (Rm E53-329, x3-2656 or x3-2781).

Additional funding for MIT projects can be arranged through the Undergraduate Research Opportunities Program (UROP) and other departmental sources. Information is available in the UROP office, x3-5049.

Two MIT Press Books Win National Awards

Two books published by the MIT Press have won awards in the first annual competition for technical, scientific and medical books and journals sponsored by the Association of American Publishers.

The MIT Press book, *The Innovation Decision in Soviet Industry* by Joseph S. Berliner, received the TSM award in the field of business and government. The MIT Press journal, *Oppositions: A Journal for Ideas and Criticism in Architecture*, was selected as the outstanding journal.

Little, Brown & Co., Inc., Boston, received two TSM awards and McGraw-Hill Publishing Co., Inc., New York City, received one.

Princeton Composer - Pianist To Speak Here Next Week

Edward T. Cone, distinguished composer, concert pianist and musicologist, will give a lecture, "Three Ways to Read a Detective Story—Or a Brahms Intermezzo," at 4pm Thursday, April 21, in the MIT Music Library (Room 14E-109).

The lecture, open to the public without charge, is part of the Faculty Seminar on Music, Linguistics and Aesthetics of the MIT School of Humanities and Social Science.

Mr. Cone, professor of music at Princeton University, has been closely associated as undergraduate, graduate student, and teacher with the role of music in Princeton's liberal arts curriculum.

He was the first Princetonian to have an original musical composition accepted as a senior thesis. He received the B.A. degree in 1939 and the M.A. degree in 1942. Before joining the Princeton faculty in 1946 he studied composition with Roger Sessions (and later taught with him) and piano with K.U. Schnabel and Edward Steuermann.

Mr. Cone, who has made many appearances as concert pianist in recent years, is a versatile composer. He has written works for piano, songs, choral pieces, chamber works, and orchestral selections. Several compositions have been honored in prize competitions, and his works have been featured in New York concerts sponsored by the League of Composers. His most recent premiere was *Serenade* (for flute and three strings), played by the Princeton Ensemble at the Guggenheim Museum, New York City, in January, 1977.

In 1975, Mr. Cone received a Deems Taylor Award of the American Society of Composers, Authors and Publishers (ASCAP) for his book, *The Composer's Voice* (University of California Press, 1974). He is author of *Musical Form and Musical Performance* (W.W. Norton, 1968) and co-editor with Benjamin Boretz of *Perspectives on Schoenberg and Stravinsky* (Princeton University Press, 1968), *Perspectives on American Composers* (Norton, 1971), *Perspectives on Contemporary Music Theory* (Norton, 1972), and *Perspectives on Notation and Performance* (Norton, 1975).

The lecture is part of the Faculty Seminar on Music, Linguistics and Aesthetics, organized three years ago by faculty from several Boston area universities. The seminar has focused on three areas of interdisciplinary research: the relationship

between music and linguistics with linguistics providing models for music analysis; the relationship between music analysis and the study of perception in experimental psychology; and the analysis of musical expression of affect, particularly in opera. The seminar meets in closed sessions as well as at public lectures.

Two Appointed To Associates Program Posts

Cynthia C. Bloomquist, former MIT Industrial Liaison Officer, and Walter Lehmann, market planning manager for Stewart Warner Corp., were recently appointed assistant directors of the MIT Associates Program.

The appointments were announced by Thomas R. Henneberry, acting director. Founded in 1961, the Associates Program facilitates a flow of knowledge between the MIT faculty and the industrial community. Until recently, firms participating in the program have primarily been New England-based. Since 1975 the program has undergone expansion, and now has 45 member firms, including some in the south and midwest.

Ms. Bloomquist received the SB degree from MIT in interdisciplinary science in 1970. She was assistant director of the MIT Admissions Office from 1970-1974 where she wrote and designed *MIT Today*, a pamphlet used in recruiting applicants for MIT. She joined the Industrial Liaison Office in November, 1974, where her duties included management and budgetary responsibility for ILO's publications section.

Mr. Lehmann received the BS in mechanical engineering from Cornell University in 1966 and the SM from MIT's Sloan School of Management in 1975. He worked as project engineer for Hewlett Packard Corp.'s Waltham, Mass. division 1966-69, when he joined Polaroid Corp. as a project manager and senior engineer. Since 1975 he has been employed as market planning manager of Stewart Warner Corp.'s Bassic division, Bridgeport, Ct.

CAES Acquires Video Subjects

As part of a cooperative effort in continuing education, the MIT Center for Advanced Engineering Study is distributing for sale or rent three short color videotape subjects developed at Colorado State University.

The subjects are *Engineering Economy*, *Quality Control* and *Network Analysis and Design*.

John T. Fitch, director of technology-based educational development and marketing at the MIT center, said each of the three subjects contains complete study guides which include comments, reading assignments, problems and problem solutions.

Engineering Economy and *Quality Control* were prepared by Sanford B. Thayer, professor of mechanical engineering at Colorado State.

The 10 videotapes in *Engineering Economy* deal with the economic analysis of investment alternatives. Ways to evaluate the interest rates, income taxes and the timing of cash flows are explained. No math beyond simple arithmetic is used.

Quality Control presents in its 30-minute videotapes the essentials of a modern quality control program for a manufacturing company. Topics include control charts, acceptance sampling plans, specifications and tolerances and product liability. The 10-videotape series can be used as an introduction or as a review of quality control, Mr. Fitch said.

Network Analysis and Design, prepared by Aram Budak, professor of electrical engineering at Colorado State, offers two sets of videotapes. The first set of eight tapes deals with circuit analysis techniques in the frequency domain. The second set of 12

Xerox Joins VI A Co-op Program

Xerox Corporation's Palo Alto Research Center has joined the university-industry cooperative program sponsored by MIT's Department of Electrical Engineering and Computer Science. Xerox's first two students will begin working in June.

A total of 172 MIT students are presently enrolled in what is known as the VI-A Program, said John A. Tucker, director.

VI-A is a work-study program that takes five years and leads to simultaneous awards of bachelor and master degrees in electrical engineering and computer science. Students spend a year on the job, spread over four three-month periods. Student projects in the fifth year are the basis for master-degree theses.

The program was conceived in 1907 by MIT with the cooperation of the General Electric Co., which is still a participant. The first students were enrolled in 1917 and the program has continued uninterrupted since then.

The popularity of Course VI-A has risen markedly in recent years. This year 162 students—53.1 percent of the eligible sophomores—applied for admission to the program, Mr. Tucker said. VI-A is the largest program of its type at MIT.

They will compete for the 81 job openings that have been made available by the organizations affiliated with the program—Avco Corp., Bell Laboratories, Inc., Communications Satellite Group, Digital Equipment Corp., Charles Stark Draper Laboratory, General Electric Co., Gen Rad, Hewlett-Packard Co., Honeywell, Inc., Lincoln Laboratory, IBM Corp., Naval Surface Weapons Center, Naval Underwater Systems Center, RCA, Raytheon Co., Texas Instruments, Inc., and Xerox Corp.

"Taken together, these companies cover a very broad spectrum of electrical technology including electronics, power, communications, control, computation, medical electronics and instrumentation," Mr. Tucker said. "Work assignments with these companies provide opportunities for first-hand acquaintance with all phases of manufacturing, testing, design, development, research, technical planning and administration."

Faculty advisers from the department are assigned to each participating organization. They serve as liaison between the campus and the students on work assignments. The adviser also visits the students at the company during the work periods.

Dr. Fernando J. Corbato, associate head of the department, will be the first adviser to the Xerox Palo Alto facility.

Shapiro to Speak

Dr. Irwin I. Shapiro, professor of geophysics and physics, will speak on "The Exploding Universe" at the seminar luncheon of the MIT Women's League at 11:30am Wednesday (April 20) in the Emma Rogers Room (Room 10-340).

The seminar luncheons are part of a series entitled "What Are We Doing Out There?" Luncheon (\$2.25) by reservation will begin at 1pm. Reservations may be made with Mary Pinson, Room 10-342, telephone 253-3656.

Guard, Reserve Policy

Because of recent inquiries, the Office of Personnel Services has restated MIT's policies with regard to employee service in National Guard and Reserve forces.

Long-standing MIT policies, which reflect the Institute's support of participation in these forces, are as follows:

Employees' job and career opportunities will not be limited or reduced because of their service in the Guard or Reserve.

Employees will be granted leaves of absence for military training in the Guard or Reserve without sacrifice of vacation time.

videotapes is aimed at circuit designers who want to learn about modern operational amplifiers.

Noted Pianist Will Give MIT Concert and Lecture

Pianist Richard Bunker, who brings new music to the serious listener, will give a recital of American piano music from 1904 to 1977 at 8pm Friday, April 22, in MIT's Kresge Auditorium.

He will give a lecture/demonstration on how to prepare a piano for performance of contemporary music at 1:30pm Thursday, April 21, also in Kresge Auditorium.

Both the lecture/demonstration and concert, sponsored by the MIT Music Section, will be open to the public free of charge.

The concert will open with *The Alcotts* (1904-15) by Charles Ives, *nach bach*, *Fantasy for Pianist* (1966) by George Rochberg, and *Ragtime Nightingale* (1915) by Joseph Lamb.

Bunker will play one of his recent compositions, *3 Bolts Out of the Blues* (1976-77) followed by *Prelude No. 4* for piano and electronic sounds (1966) by Morton Subotnick and two works that reflect the early development of John Cage as a major composer for piano—*Quest* (1935) and *And The Earth Shall Bear Again* (1942).

Following intermission the concert will continue with *Rosetti Noise*, from *Madrigals of the Rose Angel* (1972) and *Piano Piece* (1971-72) by Harold Budd followed by three more works by Cage, each composed for a different dancer—*In a Landscape* (1948), *In the Name of the Holocaust* (1942) and *Primitive* (1942).

The concert will conclude with performances of *Cadence IV* (1970) by Henri Lazarof, *That Old Second-Venezianese-School Rag* (1972) by Tom Benjamin, and *Paul Revere's Ride* (1904) by E.T. Paull.

Bunker's dedication to 20th century American music stems from his exposure to and his 1966 performance of John Cage's "The Perilous Night" Suite for Prepared Piano. He has written many treatises on notation and *The Well-Prepared Piano* (1973), a book—recently serialized in Japanese and now under revision—prompted by respect for Cage's talents. To provide piano players with access to the instrument's interior—necessary for performance of some modern works—he designed a special music rack.

Bunker has given the premieres of works by George Rochberg, Olly Wilson, Morton Subotnick, Henri Lazarof, Barney Childs, and many others. Fascinated with turn-of-the-century salon art, he has revived such masterworks as Blind Tom's *Battle of Manassas* and E.T. Paull's *Paul Revere's Ride*.

In 1971, Bunker went to California State College at Dominguez Hills to help develop an electronic music program. He is now director of the college's Electronic Music Studio.

He has given concerts at colleges and universities across the U.S., recorded for BBC, Norwegian and Pacifica broadcasting facilities, and made several recordings, including "The Perilous Night and Other New Sounds in American Music" (Avant AV-1008).

In 1971 he received a grant from The Rockefeller Foundation to commission new works from young American composers. Recently he has received grants from the Nissan and Toyota corporations for research into contemporary Japanese music.



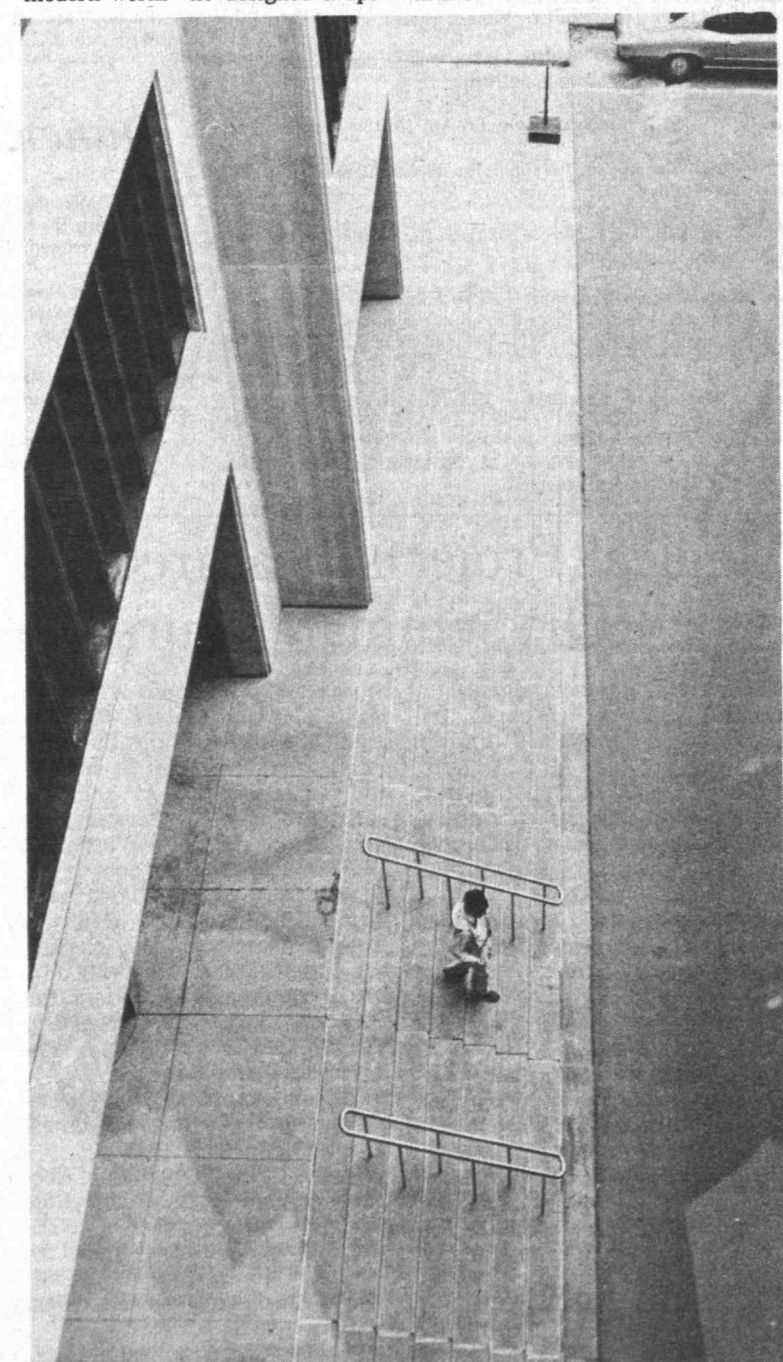
PIANIST RICHARD BUNKER

cial music rack. Bunker has given the premieres of works by George Rochberg, Olly Wilson, Morton Subotnick, Henri Lazarof, Barney Childs, and many others. Fascinated with turn-of-the-century salon art, he has revived such masterworks as Blind Tom's *Battle of Manassas* and E.T. Paull's *Paul Revere's Ride*.

In 1971, Bunker went to California State College at Dominguez Hills to help develop an electronic music program. He is now director of the college's Electronic Music Studio.

He has given concerts at colleges and universities across the U.S., recorded for BBC, Norwegian and Pacifica broadcasting facilities, and made several recordings, including "The Perilous Night and Other New Sounds in American Music" (Avant AV-1008).

In 1971 he received a grant from The Rockefeller Foundation to commission new works from young American composers. Recently he has received grants from the Nissan and Toyota corporations for research into contemporary Japanese music.



LONE PERSON walking down steps behind Bldg. 9 is shown from above in photograph by Calvin Campbell. The photograph was taken from the walkway connecting Bldgs. 9 and 13.

Obituaries

Frank Castro

Frank Castro, a retired foreman at Lincoln Laboratory, died Saturday, April 2.

He worked at Lincoln Lab from 1956 until his retirement in 1975. He was 66.

A former Melrose resident, Mr. Castro was living in Hallendale, Fla., at the time of his death. He is survived by his wife, Eleanor.

Thomas Davin

Thomas I. Davin, a retired custodian in Physical Plant, died Tuesday, April 5, in Hillsboro, N.H. He was 77.

Mr. Davin came to work at MIT in 1949. He was a Boston resident until his retirement, in 1964.

He is survived by his wife, Gladys E. (Pratt), and two sons, Thomas R. Davin of Bath, Me., and Robert W. Davin of Wellesley, Mass.

Elmo Wilkinson

Elmo Wilkinson, a guard at Lincoln Laboratory, died Monday, March 28, in Nashua, N.H.

Mr. Wilkinson, 57, worked as a stock clerk in MIT's Physics Department from 1964-65. In 1965 he transferred to Lincoln Lab, where he was employed as a guard until the time of his death.

He is survived by his wife, Helen, and several grown children.

Computing Revolution Like Industrial Revolution

As the result of "remarkable advances" in computer electronics, society is "on the verge of an information revolution that may have an impact as great as the industrial revolution of the past."

That is the view of Professor Stuart E. Madnick of MIT's Alfred P. Sloan School of Management. His work was highlighted at a recent press briefing held by *Science* magazine to announce a special issue devoted to electronics, the largest published by *Science* in over a decade.

"We have seen advances that have taken us from the ENIAC computer of 1946, weighing 30 tons, consuming 150 kilowatts of electricity and costing \$400,000, to the current-day microprocessor integrated circuit occupying less than a quarter of a square inch of space and costing less than \$20 in quantity," Professor Madnick says. (The ENIAC computer, for Electronic Numerical Integrator and Calculator, was the first electronic computer.)

"In contrast, it has been said that if we had seen comparable advances in the automotive industry, it would now be possible to buy a Rolls Royce for \$2.50 and get 2 million miles per gallon—and be well on our way toward alleviating the energy crisis."

While the public thinks of the computer largely in terms of numerical computation, Professor Madnick says, it is in "information processing" that the computer's impact will be most significant.

"It is all well and good that for \$20 or so we can now perform 500,000 additions per second—but how does that help us address the problems of today?" he asks.

The computer, he answers, provides more effective ways to store, process and manage information—information that is needed to make decisions and increase operational efficiency in a modern society that could otherwise become overwhelmed by the "complexity, interdependence and rapidity of events."

This computerized processing of information, he says, "will help us deal with some of the major problems of today, such as the scarcity of resources, the distribution of human services and the need to improve overall productivity, particularly in the service industries."

There have been signs of the coming "information revolution," according to Professor Madnick, in such developments as "the electronic calculator, which has brought arithmetic liberation to millions, and the electronic TV game, which has

established a new form of home entertainment."

But these provide only a glimpse of future applications which, Professor Madnick believes, offer "tremendous potential" for "greatly increasing our operational efficiency and decision-making effectiveness in business and eventually in personal dealings."

"Information flow—especially in the form of paper, such as letters, bills, checks, etc.—represent major expenses and bottlenecks to efficient operations in many industries," he says.

"We are now at a point where it is essentially cheaper to store information in a computer than on paper. Coupling computer advances with developments in communications, we are now able to tie together efficiently most of the key steps in the generation, dissemination and processing of information—such as computerized word processing typewriters, electronic filing, electronic mail and information analysis."

Operational versions of such systems already exist in several companies and governmental agencies, he says, and should become generally available by the mid-1980s.

Although operational efficiency is important, Professor Madnick notes that the "computer's potential is most desperately needed to support decision making in both government and industry."

"The recent decade has clearly put our ability to manage our resources, our organizations, and ourselves to the test," he says, and "the future will require harder and more complex decisions."

As examples of such uses of computers, Professor Madnick described ongoing research at MIT associated with the NEEMIS information system, developed to assist energy policymakers in addressing the problems brought on by various aspects of the energy crisis, and a birth defects medical information system, developed to assist doctors and researchers in recognizing and categorizing birth defects.

Professor Madnick is in charge of MIT's major management information technology courses. He has assisted in the founding of a new research center, the Center for Information Systems Research, at the Sloan School and is the principal investigator of several major research projects associated with the design, effectiveness, and implementation of information systems. He is the author of several books and articles in the field of computer science and management information systems.

No Paper
April 20

Tech Talk will not be published next week. Regular publication will resume Wednesday, April 27.

ILO Names New Officer

The appointment of Seichi Tsutsumi as an officer in the MIT Industrial Liaison Program has been announced by Dr. Samuel A. Goldblith, director of industrial liaison.

Mr. Tsutsumi will work with ILP member firms located in England as well as with a number of firms in the United States.

A graduate of the University of California at Davis, Mr. Tsutsumi received the bachelor degree in chemical engineering in 1966 and completed the course requirements for a master degree in 1968 at South Dakota School of Mining and Technology.

Until 1970 he was an engineer with E.I. du Pont de Nemours & Co. in Washington, Del., and from 1970 to 1975 he was with the Children's Hospital Research Center in Boston. From 1975 until early this year he was with the MIT Department of Nutrition and Food Science and before joining ILP he was with Jarrel-Ash Co. in Waltham.

Mr. Tsutsumi, his wife, Emily, and their four-year-old daughter live in Somerville.



MIT Collection Featured In New Hayden Exhibition

Contemporary paintings, sculptures, and works on paper given to the MIT Permanent Collection in the past several months will be the focus of an exhibition, "Recent Gifts: Acquisitions and Loans," to be held in the MIT Hayden Gallery, April 15-30.

The exhibition is sponsored by the MIT Committee on the Visual Arts.

The works are important contributions to the Collection from noted artists and patrons, three of whom are members of the Council for the Arts at MIT. Donors include Mr. and Mrs. I. M. Pei, Joan and Roger Sonnabend, Theodore Roszak, Sydney Wragge, and the Albert A. List Family Collection. Funds gathered by the Departments of Chemistry and Urban Studies and Planning supported some acquisitions. The gifts add dimension to the documentation of American art in process that characterizes much of the Collection.

Featured are two artists who fashioned their styles from a sensibility related to Pop Art. Chryssa's *Study for the Gates to Times Square #6*, a gift of Joan Sonnabend, is a key piece in the neon sculpture genre. A painting and sculpture from Trova's *Falling Man* series are excellent examples of his depersonalized figure imagery developed in the 1960s. The painting, from the Albert A. List Family Collection, and the sculpture, from Mr. and Mrs. Pei, demonstrate Trova's facility in both media.

On loan from the artist, Roszak's eight-foot high pastel drawing delineates the surface texture of MIT Chapel Bell Tower designed by him in 1953-55.

Another show highlight, Kepes's *Whispering Winter Whites*, a lyrical abstraction painted in 1962, incorporates sand with oil. Kepes is Institute

Professor Emeritus, professor of visual design emeritus, and founder and director emeritus of the Center for Advanced Visual Studies at MIT.

Sheet glass color studies for Bell's monumental, environmental sculpture, *The Iceberg and Its Shadow*, on long-term loan from the Albert A. List Family Collection, will also be shown. *The Iceberg* was exhibited in Hayden Gallery in January. A segment of it is now sited in the lobby of the Sloan Building.

Other works on exhibit will include two paintings by former Bauhaus instructor Herbert Bayer, a large canvas by New York artist Natvar Bhavsar, a relief sculpture by Jim Huntington, and three newly published lithographs by British artist Richard Smith.

The quality and unique nature of MIT's visual arts program has attracted the attention of many well-known collectors and enthusiastic supporters of the arts. Increased interest in the MIT Collection has been stimulated by the growing number of outstanding contemporary works, many purchased with the one percent art allowance required for Institute construction projects. Holdings now number more than 800 objects sited throughout campus in public spaces, indoors and out. The Collection enhances the environment and aspires to be a "museum without walls."

Other important gifts in recent years include Henry Moore's large bronze sculpture in Killian Court, *Three Piece Reclining Figure, Draped*, a gift from the Eugene McDermott family and other friends of MIT, and Picasso's *Figure Decoupee*, an anonymous gift, located outside the Hermann Building.

Hayden Gallery is open Monday through Saturday, 10am-4pm.

Animal Facility Work Underway



CONSTRUCTION IS UNDER WAY on MIT's new animal care facility on this site on the north side of Vassar Street between the Cyclotron (Building 44) and the Parsons Laboratory for Water Resources and Hydrodynamics (Building 48), in right center of photo. Technology Square buildings are at left. The new building,

intended to house the Division of Laboratory Animal Medicine of the Medical Department, is scheduled for completion sometime next fall. Dr. James G. Fox, associate professor of laboratory animal medicine, heads the division.

Ceramicist Wins Society Award

An MIT graduate student has won the Electromechanical Society's F.M. Becket Award. He is James D. Hodge of Murray, Utah, a student in the Department of Materials Science and Engineering.

The award commemorates F.M. Becket, former society president. It consists of a stipend for summer research and study abroad. Mr. Hodge will study with Professor Hermann Schmalzried at the Institute for Physical Chemistry,

Technical University of Hannover, Germany. Professor Schmalzried, who gave the Williams Lectures at MIT in 1975, is one of the world's leading scientists in solid state chemistry.

Hodge, a recent graduate of the University of Utah, is a National Science Foundation Fellow working with the ceramic group of the materials science department. He has published five articles in refereed journals.

Coop Schedules Open Meeting

To better respond to the demands placed on the Tech Coop by students, faculty and staff, the Harvard Cooperative Society is inviting members of the MIT community to an open meeting to be held 4:30 to 5:30pm Thursday, April 21, in the Mezzanine Lounge of the Student Center.

Members of the management and of the board of directors will be

present. MIT representatives on the Board are Philip A. Stoddard, MIT vice president of operations; Donald P. Severance, director of the Volunteer Leadership Appeal; Gary L. Lilien, assistant professor of management science; Cynthia Cole and Douglas Knott, undergraduate students; and Max Donath and Robert Wasson, graduate students.

Medical Department Schedules Meetings

Beginning Thursday noon, April 28, the MIT Medical Department will offer a series of weekly meetings to discuss issues for children of single, separated, divorced and remarried parents.

The parent group will be led by Lora Tessman, PhD of the Psychiatry Service, and health educators Connie Bean, MS Public Health, and Elizabeth Hormann, EdM.

Dr. Tessman will offer a second group for teenagers living with di-

vorced or remarried parents. No date has yet been set for this second group.

Both groups will be offered without charge to all members of the MIT community. Call 253-1316 for information and registration. Teenagers may call or have their parents call Dr. Tessman at 253-2916 or 253-2917 to arrange an initial get-acquainted appointment.

Athans Elected Fellow of AAAS

Dr. Michael Athans, professor of systems science and engineering in the MIT Department of Electrical Engineering and Computer Science and director of the MIT Electronic Systems Laboratory, has been elected a Fellow of the American Association for the Advancement of Science "for contributions to the theory and applications of optimal control and estimation."

A graduate of the University of California at Berkeley and an MIT faculty member since 1964, Dr. Athans is co-author of three textbooks and more than 200 journal articles, conference papers and technical reports.

Wildlife Studies Exhibit Opens

Wildlife studies by artist Nancy Begin of Topsfield are on exhibit at the MIT Faculty Club through April.

Oils, watercolors, and etchings of ducks, geese, raccoons, and other wild animals are hung in the Club bar area. Ink drawings of similar game are in the corridor display case. The drawings will illustrate a book, *Woodcock in the Alders*, being written by Donald Jelly. Most of the animals are shown in Massachusetts habitats.

Ms. Begin's studio is the outdoors, most frequently the land she owns and hunts on in Essex, Mass. She studies her subjects while hunting and also takes photo-

graphs for reference.

Ms. Begin graduated from the Art Institute of Boston in 1975, has had four one-woman shows at MIT, and has participated in a group show at Macivor Reddie Gallery, Beacon St., Boston. In 1976 she had one-woman shows at the Glass Basket in Beverly Farms, and at the Topsfield Public Library. Her works are sold by Abercrombie & Fitch, New York City and Murray Hill, N.J.

CLASSIFIED ADS X3-3270

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 Institute 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. 3-3270 or mailed to Room 5-111. **Please submit all ads before noon, Friday, Apr 22. They will be printed on a first come first serve basis as space permits.**

For Sale, Etc.

IPC stereo compact syst w/8 track player/rcrd & speakers, hardly used, ask \$70. Joaquin, x3-2673.

Guild F-212, 12 string, 1 yr, exc cond, list \$560, ask \$250 w/case. Linda, x381 Linc.

Polaroid Super Shooter Plus, rec'd gift, b nw: timer, case, film, \$25. David, x3-3068.

Rollei auto slide proj, 110/220V, \$49; set of study & typwrtr desks & chr, \$29; '73 Opel Manta Luxus, 39 K, elec rear wndw defrost, am radio, Michelin XAS's, snows, 1,495. x3-2716.

'70 Buick Le Sabre, 4 dr sedan, 102 K, \$400; baby crib, carriage, bathtub; port b&w 12" TV, refrig, Kurt, x3-7197.

Bos Symp Chamber Plyrs Cncrt tkcts (2), Sun, Apr 17, \$5. John, x7554 Linc.

Free U move, lg wd jungle gym. W.D. Burnham, x3-3145.

VW Beetle roof rack, gd cond, \$8; Bates saddle bags w/brackets to fit Honda CB-450 or CB 750, \$40 or best. Bob Saliga, x7454 Linc.

Graflex speed graphic 4x5 camera w/film hldrs & chg bag, \$125. Bill, x5-9338 Dorm.

Craftsman elec lwn mwr, 18" blade w/catcher, \$60; Sears sd-by-sd refrig, 19.1 cu ft, \$250. Rick, x5845 Linc.

Red Sox '77 games, part of seas tkct: 13 dates, 16 games, 2 adj box sts in sec 30, \$143, additional games w/same sts nego. x3-6906.

M 10 sp Royce Union bike, perf cond, \$90. Stephanie, x3-6870.

BSR turntbl in orig carton w/dustcvr, ADC crtrd, \$28. Charlie, 247-8691.

Zeiss I Koflex, TLR, 2 1/4 sq format, old, but gd cond, \$100. Lee, x3-1541, lve msg.

Gd sideboards (wint & mahog), cheap, can deliver. Carl or Bob, x3-6059.

New Hanksraft humidifier, wks 12 hrs, \$6.50; RCA solid state amfm radio, nds repair, \$5; ny Royal Robbins mt climbing boots, f sz 7, \$30. x3-6025.

Ethetic molded foam rubber chr, suit for LR or BR, w/washable rd fitted cvr, gd cond, \$50 or best; 2 wdn stools, exc cond, \$10/both; Panasonic 12" b&w TV, exc cond, \$65 or best; BSR McDonald trntbl, exc cond, \$65 or best. x3-3503.

M 3 sp 24" Rudge bike, gd for f, gd cond, well maint, nw br & tires, \$35. Mitch, x3-5128.

Land, 4 acres, avail for farming, will nego some type of contract. Details: x8-4600 Draper.

Kenmore Delux dishwasher, butcher chkr, exc cond, \$100. Helen, x3-7137.

Mr Coffee II, br nw coffee mach, \$30 in discount stores, \$18. x3-2235.

Philco b&w 24" TV, perf cond, \$70. Call 646-0181.

Sturdy pine chests, 4 mdls, handsome furn mdls to used shipping mdls. x5-6676 Dorm.

Dual 1218 turntable, ADC-VLM crtrd, exc cond. \$75 or best. Andy, x3-6886.

Pwr supplies, + and - 15V @1a, 20V @200ma, 12V @200ma, 20V @45ma, 20V @750ma, 6.6V @200ma, \$10 ea; 5V @ 5a, \$15 ea. Marc, x3-6313.

Antique LC Smith sci typwrtr, gd wrking cond, nw ribbon, keys inc delta, pi, integral, subtrct 2, 3, in addition to full reg chr set, \$50. Debbie, x3-4885, 11-3.

Pioneer 424 12W/ch, 2 yrs, pr Acousti-Phase Microphase spkrs. \$150. Andrew, x5-9440 Dorm.

KNABE upright piano, gd cond, \$425 firm. Call 354-0105, evgs.

Harman Kardon amp 800+, Lenco turntable, \$250/both, v gd cond. Don, x8-1425 Draper.

Moving, must sell: apt sz Maytag wshr & Whirlpl dryer, \$100 for both; Krakauer Bros upright piano, \$350; Admiral refrig, 12 cu ft, 1 yr, \$180; all exc cond, also plants, bkcase, K tbl, lmps, bureau, double bed, etc, reasonable. Peg, x3-7786, 9am-12n.

AR-XA Manual and Garrard 72 B Automatic trntbls, ask \$40 each; Phonemate 300 phone answering mach, ansrns phone & tks mgs, ask \$75. Brad, x5-8316 Dorm, kp trying.

Gas dryer, 5 yrs, gd cond, \$50; playpen, car seat, 2 Nipi-Naps, 1 dresser tbl, potty chr, Call 322-1934.

Magnavox stereo, \$50; crib, \$20; stroller, \$10; truck, \$20; wnt spoke clock, \$10. Call 861-7772.

'73 Volvo 145 wgn, incl AC, amfm stereo, fuel inj, auto, roof rack, snows, PS/PB, \$3,300 or best. Call 492-8835 evgs.

Wheel, 15". \$7; factory shop manual, \$10; both for '73 Chevy 1/2 tn pick-up. x7357 Linc.

Garrard SL72-B trntbl w/base, dust cvr, dust bug, & new Shure M91ED crtrd, gd cond, \$50. Larry, x5-7118 Dorm.

F 16" Schwinn bike, \$35. Bob, x5892 Linc.

Orvation guitar, exc cond, \$300. Doug, 266-2968.

RCA TV, 16", \$45; trunk, 38"x21", \$21; both exc cond, Lax, x3-7560.

Custom made brn leather vest, m or f, worn 3x, orig \$45, ask \$30. Susan, x3-4701.

Pr Dodge Dart 13" rims, \$5; pr 14" rims for Merc, \$10. Roy, x5506 Linc.

Assembled 17ft Foboat kayak/canoe kit, seats 2, paddles, rack incl, \$200 or best. Ree, x3-2053 aft 3:30.

Pr radials Semperit, 195/70, SR 14, br nw, tubeless ww, ask \$45 each; 24", 3 spd Raleigh f bike, \$60. Call 862-3952.

Boat: 16ft Evenrude gull wng w/90hp eng, nds wkr, negs or trade for van. Nancy x3-7649.

Lge brn bean bag chr, \$12; pine bkcase 9x15x48, \$12; good, dirty, wndw fan, \$10; many math books, pots & pans, nego; Miranda FV 35mm SLR camera, sep light meter, \$100 or best. x3-7579.

Whirlpool port 2 spd, 3 cycle washer, larger load than most (9 lb), exc cond, 3 1/2 yrs, avail mid May, \$150 or best. Sue, x3-2701.

Moving south, nw Sycamore 100% wool dbl-breasted bl wnter coat, sz 16, orig \$180, now \$85. x433, Linc.

Vehicles

'64 Dodge Dart, very dependable, nds body wk and tires, 170 slant 6, pwr st, push button tranny, exc mech cond. \$350 or best. Call 266-2715.

'64 Olds Cutlass, p st & br, runs v wl, 3 nw tires, snows, \$175. Call 862-1298, evgs.

'67 VW sq bk, run cond, \$150 or best. Lon, x3-2007 Tues, & Thurs.

'68 VW Bug, runs well, nw batt, int exc, ask \$325. Call 924-1496.

'68 Ford Torino Squire wgn, 6 cyl, 68 K, \$450 or best. Dan, x8-2895 Draper.

'69 Chevy wgn, pwr st & br, sm V8, exc cond, \$400 nego. Ray, x5-9581 Dorm, evgs.

'69 Ply wgn, to sell immed, recently renewed, ask \$400. Call 536-0819, evgs.

'69 Ford Torino wgn, 86 K, many nw prts, \$250 or best. Call 696-3750.

'68 VW Bug, eng & trans in gd shape, body nds some work, could be used for parts, ask \$375. Bill, x3-5788.

'69 Ford Cntry Sq wgn, V-8, AC, pr st, roof rack, 77K, runs well, some body rust, \$900. Fran, x3-4940.

'70 VW Bug, 65 K, 2 nw tires, runs great, 30 mpg on hghwy, reliable, \$725. x5-6689 Dorm.

'70 Toyota Corolla wgn, 2 dr, std, 2 nw tires, gd cond, \$750. Michael, 868-3243 evgs.

'70 Chrysler HTP, hi mileage, gd cond shocks, brks, universal, radiator, 2 nw tires, rently tuned, snows mounted incl-kill switch, nw inspection sticker, ask \$825. Rocky, x3-4834.

'71 Chrysler town & cntry wgn, full pwr, stereo tape deck, cruise cntrl, \$1,100 as is. Bob, x8-4143 Draper.

'72 Toyota Corolla Deluxe Cpe, exc cond, lo mileage, nw tires & snows, \$1,725. Linda, x7656 Linc.

'72 Toyota Corolla wgn, 65 K, clean, top cond, \$1,250. x3-5822.

'72 Shasta 16' travel trlr, lk nw, heat, B, refrig, sleeps 5, \$1,475 firm. Bob, x3-6402.

'72 Chevy Blazer, auto, 4 whl dr, \$3,000 or best. x5572 Linc.

'72 Vega, nw motor, 28K, many nw parts, xtra snows, bad fender, \$700. Dan, x7269 Linc.

'72 Chevy Nova, 3 sp std, pwr st, vinyl rf, gd cond, 53 K. x3-2772.

'73 Suzuki TS185 mtrcyc, \$150; 15' outbrd racing hull w/trlr & equip. x5-6633 Dorm.

'73 Nova, cstm, 4 dr, auto, 61K, runs well, \$1,650. George, x3-6367.

'73 Fiat 850 sport, beautiful yel, nw conv top, gd radials, \$1,500. Ken, x7614 Linc.

'73 VW, yel, radio, tape deck, bike rack, 56K, \$2,000. Call 484-7982.

'74 Opel Manta Luxus, 28 mpg, top cond thruout, ask \$1,850. John, x638 Linc.

'74 Suzuki GT 380, lo milage. Al, 267-3577.

'74 Fiat 128, 40K, 2 door, 4 spd, front wheel dr, red w/tan int, exc cond, \$1550. Kathy, x3-5754.

'74 Grand Torino wgn, powder blu, p st & br, fm stereo radio, stl belt radials, roof racks, 302 eng, 27K, exc cond, \$2,900. Cliff, x5531 Linc.

'75 Cosworth Vega #1424, every option, full wrnty, must sell, best. Tom, x3-5227.

'75 Triumph TR7, amfm radio, AC, lo mileage, must sell. Call 776-8501.

'75 VW Campmobile, 26K, exc cond. Phil Johnson, x276 Linc.

'76 Toyota Celica Gt, 11K, 5 sp, AC, stereo amfm, vinyl rf, dp yel/tan, exc cond, \$3,750 or best. Call 924-4433, evgs.

'76 AMC Gold Pacer, pwr st, auto, exc cond, b/w upholst, \$4,000 or best. Call 494-8777 aft 5.

Housing

Arl, 2 lovely furn rms & priv B ovrlngk park, K privileges nego, \$150. Call 648-8138.

Bos, Comm Ave, Copley Sq area, 1 1/2 BR, mod K & B, frpl, carpeted, off st prkng, avail 6/1 sublet w/opt, \$275. Call 267-4829.

Bos, Back Bay, 2 BR w/old Bos charm, high ceilings, paneling, hrdwd fl, frpl, mod K w/dw & disp, sundeck w/view of Charles, 15 min walk to MIT, \$350 incl heat. Call 267-8360, kp try.

Camb, Inman Sq, sub Jun & July, furn BR apt, \$125 incl util. x3-7271.

Camb, sum sub, 6/1-9/1, 2BR, LR, DR, B, K, furn, 7 min to MIT & T, \$350 for 2BR, \$200 for 1, incl heat & util. Call 354-0524 aft 5.

Camb, nr Orson Welles, BR sub 6/15-8/31 w/opt, MIT affil, rel quiet, \$198. Some furniture for sale. Jennifer, x3-7140.

Camb, Mass Ave by Orson Welles, spac BR apt suitable for 2 or 3, sub 6/1 to 8/15, \$225 incl util. x3-5445.

Som, near Camb border, beaut 2 BR apt, AC, dw & disp, ww, lease or sub avail immed, \$275 incl ht. Call 628-7966.

Natick, 8 rm ranch, 4BR, 1 1/2 B, garage, frpl, patio, carpet, fncd in yrd, nr schools & shops, \$450 + util. Call 655-1916, afta.

Naples, ME, 2 hse lots, each 45,000 sq ft w/150 ft frontage on blk top rd, wooded, state percolation test, 1/2 mi Long Lake & 4 mi Naples Village, 20 min Pleasant Mt ski area, \$5,000 ea or \$9,000 both. Call 646-2794 evgs.

Dntwn Montreal, 3 1/2 rm fully furn lux apt, avail 6/4-7/31, balc, pool, sauna, etc, overlks mts & city, ideal for vac or McGill U, or hosp during visiting appts, \$1,200/8wks, x3-6804.

Animals

Gerbils, 5wks, free to gd home. x5-6318 Dorm, evgs.

Lost and Found

Found: nr Kresge, maroon MIT wndbrkr. Rod, x5-7196 Dorm.

Lost: bunch of keys in brn leather case. Call 494-8869.

Found: near Kresge pkg lot, 2 plstc cont w/film negs. x3-2311.

Found: f ring on outdoor track, describe to claim. x5-8425 Dorm.

Wanted

Vespa. Call 321-6176 aft 5:30.

Nd lge trunk brought cheaply from Sandwich MA to Chinatown, Bos, asap, fits in station wgn. x3-3454.

Reg babysitter for 5 yr old 3-4 aft/wk from 12n-4pm, Chestnut Hill. Jessie, x3-3141.

Boys 16"-18" bike. x3-5717.

Two rims for '73 Chevelle. Helen, x3-2218.

Ashdown dresser w/mir; ovrtfdd loveseat or sm sofa. Joan, x3-4052.

Pkg place for sum, conv to MIT. x3-7902.

Transp wntd for 2 chrs (1 str back, 1 easy, 30"x-26"x34") from Clearwater FL to Bos area, wl pay. x3-3405.

Furn apt for parents of MIT grad stu visiting this summer. Sunil, 661-7794.

Stu to work at Magnet Lab moving capacitor banks, hrs flex, wl pay. Alan, x3-5402.

Used, qn or kg sz waterbed w/ or w/o frame. Jim, 547-2067 evgs.

House or apt in Camb to sub sum mos starting June. Brian, x3-5585.

Used refrig in gd cond. x5-6675 Dorm.

Alum or fbrlgs canoe, 12'-14', less than 50 lbs pref. Gerry, x8-1343 Draper.

Co-op students seek sum rental or house-sitting in Cntrl Mass or NH area, natives of rural environ, we w take care of your gardens & farm animals, refs avail. Mark, 494-0271.

VW older Bus or Beetle req mech wk w/reasonable body. x7494 Linc.

Roommates

Brkline, Coolidge Cntr area, 2 f to sublet spac, nice 3 BR hse, pkg, quiet, close to T, furn, 5/1 or 6/1 thru 8/31, \$123 per person. Edna, x3-5226.

Brookline, Beacon St, 2 F, spac 4BR, 2BR, LR w/frpl, eat-in K, avail now. x3-4276.

Camb, Cent Sq, independent f seeks f for spac, sunny 2BR apt, sum sub, \$135 incl util. Call 661-5982.

Camb, 1 space in 4BR apt at cntr of Main St & Mass Ave, start 5/1 or 6/1, \$87.50 incl heat. x3-5384.

BR in priv hse, shr B, K, avail 5/1, \$130, no pets, sec dep, refs. Call 868-9835.

Miscellaneous

Typing, fast & acc, theses, reports, term papers, long or short jobs. Sandy, x3-4342.

Typing, gen, tech, theses, fast & accurate, IBM Selec. x3-1713.

Working way thru school, typing done, reasonable, fast & accurate, Selec typwrtr. Cathy x3-5127.

Exp work done: ext/int painting, wallpaping, roofing, refs avail. Bill Morris or Tom Greene, 266-2968.

Fast, accurate typing, IBM Selec, papers, theses. Call 484-4979 early morns, evgs, wkends.

Easter gifts for little girls, handmade, washable Holly Hobby dolls, \$17. J. May, x8-2843 Draper.

POSITIONS AVAILABLE

This list includes all non-academic jobs currently available on the MIT campus. Duplicate lists are posted on the Women's Kiosk in Building 7, outside the offices of the Special Assistants for Women and Work (10-215) and Minority Affairs (10-211), and in the Personnel Office (E19-239). Personnel Interviews will refer any qualified applicants on all biweekly jobs as soon as possible after their receipt in Personnel.

Persons who are NOT MIT employees should call the Personnel Office on extension 3-4251.

Employees at the Institute should continue to contact their Personnel Officers to apply for positions for which they feel they qualify.

Dick Higham	3-4278
Pat Williams	3-1594
Carolyn Scheer	3-1595
(Secretary — Ann Perkins)	
Virginia Bishop	3-1591
Mike Parr	3-4266
Ken Hewitt	3-4267
(Secretary — Paulette Chiles)	
Sally Hansen	3-4275
Lewis Redding	3-2928
Richard Cerrato	3-4269
(Secretary — Jenni Leibman)	

Sponsored Research Staff, Instrumentation Physicist/Engineer in the Energy Lab to work on solution and application of optical electromagnetic and diagnostic techniques used in experimental research on fluid mechanical fluidynamics, thermal radiation and fossil derived fuels combustion and emission characteristic studies. Will design and implement the following diagnostic techniques: Laser Doppler Velocimetry, Laser Schlieren Holographic Interferometry and Spectroscopy. A Ph.D. in Physics or Engineering and at least 4 years postdoctoral and industrial experience in optical measurements involving radiative transfer and interferometric optics. A strong background in electronic instrumentation is also necessary. R77-72 (4/13).

Academic Staff, Assistant Librarian, in the Dewey Library to be responsible for the selection, acquisition and servicing of state, U.S. and U.N. documents for the library. Will also perform reference service and conduct orientation tours. M.L.S. from an accredited library school, experience working with documents and organizational skills required. A degree in a social science and knowledge of library systems analysis techniques is desirable. C77-7 (4/13).

Academic Staff, Aeronautics and Astronautics Librarian to be responsible for the entire operation of library including collection development, technical reports processing, information and circulation services. M.L.S. from an accredited Library school, a minimum of three years professional experience in a science or engineering library, knowledge of technical report literature and administrative experience required. Knowledge of microforms and microform equipment, undergraduate degree in science or engineering desirable. C77-8 (4/13).

Academic Staff, Humanities Librarian, will be responsible for the administration of the Humanities Library; supervise 14 professional and clerical support staff members in areas of collections development, bibliographic instruction, reference and informational services; maintain Reserve Book room, Microform Center and Music library. Will also be responsible for all library services including catalogue information, interlibrary loan and technical reports checklist. M.L.S. from an accredited library school, extensive academic library experience, administrative experience required. Reading knowledge of foreign languages desirable. C77-9 (4/13).

Sponsored Research Staff, Plasma Physicist, in the National Magnet Laboratory to design, operate and interpret data from the Alcator thermonuclear experiment; design and operate plasma diagnostic experiments; carry out studies for future tokamak devices. A Ph.D. in plasma physics required. Background in tokamak design, plasma diagnostics or interpretation of tokamak data desirable. R77-73, R77-74 (4/13).

Sponsored Research Staff, in the National Magnet Laboratory to carry out experimental studies of biological membranes using high resolution nuclear magnetic resonance techniques. A Ph.D. in physics, chemistry, biology or a related field required. Applicants' theses should have been on some aspect of nuclear magnetic resonance. Temp. for 1 year, but may be extended to 2 years. R77-75 (4/13).

Sponsored Research Staff, Technical Writer, in the National Magnet Laboratory to write and edit reports, technical papers, contracts and proposals for magnetohydrodynamic power and fusion development programs; carry out bibliographic searches; compile technical data files. A bachelors or masters degree in the physical sciences, plus 5 years technical writing and editing experience required. R77-68 (4/6).

Sponsored Research Staff, Senior Design Engineer, in the National Magnet Laboratory to initiate and control technical programs for development of superconducting magnets for magnetohydrodynamic power generation; design superconducting magnets; prepare specifications, proposal requests and reports; supervise design teams working on electrical electromagnetic, mechanical and thermal problems in large superconducting magnet systems. An engineering degree (preferably in electrical engineering), extensive experience in design of large electrical machines and related project management required. Technical writing experience also necessary. Experience with superconducting magnets and/or cryogenics and with use of computational techniques in engineering design desirable. R77-67 (4/6).

Admin. Staff, Director of the MIT Alumni Fund to perform long-range planning for MIT Alumni Fund; develop and administer the annual Alumni Fund program; organize and support efforts of alumni volunteers, and work closely with the Institute's administration and faculty. Alumni and/or development experience preferred. A77-15 (4/6).

Admin. Staff, Editor/Writer, in Information Processing Services to be responsible for preparation and publication of monthly computing newsletter and computer user documentation; edit; write; prepare layouts; develop graphics; assure document accuracy; teach and consult on text editing/formatting (word processing); handle supervisory and budget related duties. A Bachelor's degree or equivalent experience, some technical editing experience required. Some experience in computers and computer based word processing desirable. A77-16 (4/6).

Academic Staff, Tech. Asst., experimental biologist in Civil Engineering Div. of Water Resources and Environmental Engineering to work on research projects to study physiological aspects of phytoplankton ecology; supervise phytoplankton culture collection; use continuous culture apparatus; do chemical analyses; execute specific experiments dealing with nutrient uptake and algae growth dynamics. A Bachelor's degree in Biology, Chemistry or a related field as well as laboratory experience required. C77-5 (4/6).

Academic Staff, Technical Asst. in Nutrition and Food Science, Genetic Toxicology group. Primary duties include preparation of cultures of human lymphoblasts in continuous suspension culture; growth of human fibroblasts; preparation of tissue culture. Work will involve testing of known and suspected mutagens. A Bachelor's degree in a biological science and/or chemistry, as well as experience in tissue culture techniques is required. C77-6 (4/6).

Sponsored Research Staff, Subcontract Administrator, in the National Magnet Laboratory to prepare, negotiate and administer subcontracts and major purchase orders; provide professional guidance to technical personnel on procurement policies and procedures; secure data on vendor capabilities; monitor vendor performance. A minimum of 5 years experience in all phases of procurement with emphasis on subcontract preparation and administration required. R77-70 (4/6).

Admin. Staff, Consultant Trainer, in the Office of Personnel Development to assist in planning, design, implementation and follow-up services for training programs and organization development activities; conduct supervisory training for technical research staff (in affirmative action and equal employment opportunity). Degree in behavioral science desirable. Must have experience in some of the following areas: supervisory training, management development, organization development, affirmative action, process-oriented group work with adults, and training program evaluation. Also required is a minimum of 50 hours of small group training experience with adults in such areas, and report, proposal and process documentation writing skills. Applicants may be asked to present a 1 to 2 hour training activity to Dept. staff. A77-14 (3/16).

Administrative Staff, Applications Programmer, in the Office of Administrative Information Systems to write new or modified programs; prepare logic diagrams and data flow; test and debug programs; assist users with program problems. Will also attend instructional classes, seminars, etc., as necessary, to develop and maintain skill. Programming experience in a professional capacity as well as an Associate's degree required. A76-44.

Exempt, Administrative Assistant, in the Experimental Study Group, an educational program in which undergraduate student participants follow individualized curricula. Duties will include student recruitment, freshmen orientation activities; organization of social events; responsibility for accounting and budgeting; counseling of student participants, and supervision of student employees. Will also perform a variety of other duties related to the Group's administration. Organizational skill, experience with accounting procedures, sensitivity to issues important to college students required. Applicants must be able to type self-generated material. Administrative experience and familiarity with MIT preferred. E77-15 (4/13).

Exempt, Engineering Asst. in the Energy Lab to conduct various phases of complex test procedures; collect data from a large electrothermal research facility. Duties will include test preparation, data collection, correlation and analysis. Will also

supervise several technicians. A Bachelors degree in Engineering Technology, a minimum of 5 years applicable experience, and a background which demonstrates ingenuity in design, construction and operation of highly technical electro-mechanical and electronic subsystems and instrumentation required. E77-13 (4/6).

Exempt, Technical Asst., in Environmental Medical Service to assist in development and operation of a Service Laboratory to evaluate potential personnel exposures to biological hazards; assist in establishing a Registry of Biological Organisms used in MIT laboratories and assist in implementing E.M.S. recommendations for biohazard control. A Bachelor's degree in biology or microbiology plus Medical Technologist experience, or equivalent combination of education and experience required. Proven laboratory skills, ability to function with minimal supervision, good communication skills also necessary. E77-14 (4/6).

Exempt, Resident House Manager, in Housing and Food Services to manage 350 unit student and family housing complex; assuming total responsibility for its operation; oversee housekeeping, maintenance; participate in budget preparation and monitoring, and in planning long-range housekeeping and maintenance programs. A minimum of 3 years experience in employee supervision and evaluation and in housekeeping and maintenance of large buildings required. A high school diploma, or equivalent, strong administrative skills including a basic knowledge of accounting, budgeting and clerical procedures also necessary. The selected applicant must live in the apartment complex. E77-11 (4/6).

Exempt, Admin. Asst., in Physical Plant to assist Manager of Student Center, Kresge Auditorium and Chapel; coordinate all activities including arranging for technical requirement of specific events and for building maintenance. Will also assure safety of facility users; handle billing and purchasing as necessary; compile and maintain statistics; supervise personnel assigned to areas. Applicants should be experienced in concert, theater and other event preparation and breakdown, be able to work with minimal supervision and to work shifts as necessary, including evenings and weekends. E77-12 (4/6).

Admin. Asst. V in the Center for International Studies to administer research grants; maintain financial records and prepare related reports. Will also type correspondence and manuscripts; supervise a documentation center; arrange travel and appointments. Excellent typing, secretarial experience, ability to transcribe machine dictation required. Knowledge of a foreign language helpful. R77-135 (4/13).

Secretary IV to the Linguistics Group in the Research Laboratory of Electronics to handle general secretarial duties to support the Group's activities as well as provide secretarial service to 3 faculty/Group members. Excellent typing and organization skills plus at least 1 year secretarial experience and ability to work with frequent interruption required. B77-130 (4/13).

Secretary IV to a faculty member in the Economics Department to type correspondence, reports, class materials; answer phones; arrange meetings and travel; maintain files, records and log of book orders. Occasional technical typing necessary. Excellent typing skill and familiarity with dictation equipment required B77-134 (4/13).

Secretary IV to 3 faculty members in the information systems area of the Sloan School. Type, distribute course materials, proposals, reports, containing technical terminology; arrange travel and appointments; maintain files; initiate and maintain accounting records; handle payroll reports. Good secretarial skills including the ability to transcribe machine dictation. Position includes good deal of student contact. Non-smoking office. B77-132 (4/13).

Secretary IV to Research Associate and professional staff in the Center for Policy Alternatives, a multi-disciplinary center which analyzes current issues: type correspondence, reports from written draft and machine dictation; arrange travel and meetings; answer routine correspondence independently. Will be trained to use word processing equipment. Excellent typing, organization and machine transcription skills required. College training; knowledge of French, Hebrew, shorthand/speedwriting desirable. B77-126 (4/6).

Secretary III/IV in the Audit Division to handle receptionist duties; file; type; transcribe machine dictation. Type statistical and financial reports. Excellent typing and English grammar skills required. B77-125 (4/6).

Secretary III-IV to faculty members and research staff in Chemical Engineering. Type classroom material, proposals, reports; arrange meetings; coordinate travel; interact with students. Excellent technical typing skill, ability to transcribe machine dictation, organizational ability required. B77-70 (2/16).

Secretary III to subcontract administrator in the National Magnet Laboratory: type correspondence, proposals, other materials; maintain files; answer phones; arrange appointments and travel. Secretarial school training or a minimum of 1 year secretarial experience required. B77-123 (4/6).

Secretary III, part-time, in the Alumni Assn. will handle general secretarial duties; type letters, manuscripts; answer phones; fill publication orders; perform other clerical assignments as necessary. Good typing and English grammar skills required. 20 hrs./wk. B77-122 (4/6).

Secretary III part-time, in the Research Laboratory of Electronics to assist other secretary in providing secretarial services to faculty and research staff; type; file; xerox; answer phones. Will be trained in technical typing. Good typing skills and at least 1 years secretarial experience required. 20-25 hrs per week, preferably Mon., Wed. and Fri. B77-117 (4/16).

Secretary III in Mechanical Engineering to provide secretarial support to faculty member and other secretary: type reports, proposals, technical papers and correspondence; handle additional office duties as necessary. High school graduate, or equivalent, and good typing skill required. B77-119 (4/6).

Sr. Library Asst. IV in Barker Engineering Library to assist literature selection librarian in acquisition of new materials for electrical engineering, ocean engineering, applied mathematics and reference collections. Check catalogues to determine current holdings; search various references for bibliographic information; order materials; maintain file of outstanding orders; act as liaison with Collections Department. Will also coordinate microfiche activity with Microreproduction Laboratory; assist in training other library assistants. College training, accurate typing, organization skills required. Library experience or graduate course work in library science plus bibliographic knowledge also necessary. B77-120 (4/6).

Sr. Clerk IV, part-time, in the Libraries Computerized bibliographic search service: will maintain central communication desk; answer inquiries of prospective service users; conduct preliminary interviews with users; review and distribute printouts; handle billing and accounting records; monitor expenditures; maintain files; type correspondence; handle other clerical duties as required. Typing skill required. Accounting background and familiarity with MIT accounting system preferred. Applicants must be able to interact with a wide variety of people. Familiarity with library operations and with abstracting and indexing services helpful. 20 hrs./wk. B77-136 (4/13).

Clerk IV in the Medical Dept. Division of Laboratory Animal Medicine to monitor accounts; verify monthly statements; assist in preparing fiscal reports and annual budget proposals; prepare monthly billing; act as liaison with ac-

'Startling Turnabout'

Giving Up Cheap Energy One Solution to Energy Crisis

By CHARLES H. BALL
Staff Writer

The only way for the United States to solve the current energy problem is to give up low-cost energy, according to two MIT economists.

Professors Robert E. Hall and Robert S. Pindyck, writing in the spring issue of *The Public Interest*, acknowledge that their plan would represent a "startling turnabout" in the nation's traditional policy of providing cheap energy to consumers. This policy can only be maintained, however, they report, by importing ever-greater amounts of oil.

"The economics of this nation's energy problem involves little more than the principle that higher prices result in less demand and more supply," they write. "Consumers want cheap energy, but producers need higher prices to justify expanded production."

Dr. Hall is professor of economics in the MIT Department of Economics. Dr. Pindyck is associate professor of management in MIT's Alfred P. Sloan School of Management. Both are recognized authorities on economic issues related to energy.

The MIT researchers report that the price of energy to US consumers has been held far below the world average—about 30 percent at present—through such means as price controls on interstate natural gas, depletion allowances to reduce the tax burden on fossil fuel producers and heavy tax on

domestically-produced oil in order to finance the subsidization of imports.

Measures such as these, they write, "have caused demand to rise more rapidly than production, and energy imports have risen to fill the gap between demand and production."

They cite recent evidence that demand falls about 1% for each 4% increase in price and supply rises by about 1% for each 5% increase in price. Because of present US policy, then, "consumption is about 8% higher than it would be otherwise, and supply is about 6% lower."

This analysis suggests, they say, that present low-price policies have the effect of increasing oil imports by a net of about 5 million barrels a day. Since total imports are only about 7 million barrels daily, this leads to the "striking conclusion," they write, that the import problem "is largely one of our own making."

In the next two or three years, Professors Hall and Pindyck say, "national energy policy will be forced to resolve the conflict between low prices and self-sufficiency."

They feel that methods to reduce energy consumption that involve forced conservation, such as controlling the types of cars people can buy, the speeds at which they drive or the amount of heating and lighting they may use, would have little impact.

"The energy crisis has long since

shaken out much of the pure waste of energy that existed before," Professors Hall and Pindyck say, "and most of the waste that remains is largely the result of selling energy at a price well below its true value."

"Controls unnecessarily limit people's choices, and make them worse off by making their lives colder and dimmer and limiting their ability to travel," they continue. "The problems of enforcing the 55 mph speed limit call attention to the difficulty of making effective any policy for limiting demand below the level that people would freely choose given the price of energy. It is not realistic to project large energy savings from the legislation of reduced temperatures in homes or offices, or reduced travel. Attempts to do so simply discredit the government."

The economists also warn against the "mistaken policy" of asking taxpayers to finance the difference between the high cost of producing energy in the US and the

low price that consumers are asked to pay. Typical of such future subsidies, they say, are those being proposed for developers of synthetic fuels and shale oil projects. Rather than subsidize costly new energy sources that are not commercially viable, they write, it is preferable to purchase oil from abroad at world market prices.

What should be done? The two economists advocate five measures:

—Use an extension of the food stamp program to protect the poor from the resulting higher prices (retail natural gas prices would increase by about 40 to 50% by 1982, and residential fuel oil prices by about 25 to 30%). The cost of the program would be about \$2 billion a year, "only a 15% increase in the cost of the current food stamp program." The expanded stamp program would be aimed at the lowest 20% of the income distribution and "would be much less costly to the taxpayer than subsidizing the energy consumption of all consumers."

—Eliminate all price controls on oil and natural gas. Domestic supplies and new discoveries will increase with the greater incentives of higher prices, and consumption will decrease.

—Defuse the threat of future embargoes by OPEC (Organization of Petroleum Exporting Countries) with crude oil reserves and with standby programs to limit oil consumption, increase energy stamp allotments (to offset increased energy prices during an embargo) and expand the economy (to offset effects of an embargo on unemployment and the gross national product). "An anti-embargo policy is essential to prevent OPEC, especially its Arab members, from influencing US international policy" and undermining national security.

—Let the government support basic energy research, especially on non-conventional sources, but keep the government out of the development and production phases of energy supply.

Ph.D. Candidate Named One of 15 Luce Scholars

Michael J. Freiling, an MIT doctoral candidate in applied mathematics, is one of 15 winners throughout the nation in the 1977-78 Luce Scholars Competition program.

As a Luce Scholar, Freiling will spend about 10 months in Japan, starting in the fall, working at a computer research facility.

The purpose of the four-year-old program, sponsored by The Henry Luce Foundation, is to give potential American leaders firsthand knowledge of Asia at a formative time in their careers as a way of developing a new level of understanding between East and West.

The 1977-78 Scholars—nine men and six women—will attend an orientation program at the Chinese University of Hong Kong and then fan out across Asia to take up assignments tailored to their career interests and preparation.

They were selected from nominations submitted by a group of 60 cooperating colleges and universities. Dr. Lucian W. Pye, Ford International Professor of Political Science at MIT, was a member of the selection committee.

MIT has had winners in each of the three years it has participated in the program.

Freiling, son of Mr. and Mrs. Edward C. Freiling of Fredericksburg, Va., received a BS degree in computer science at the University of San Francisco in 1972 and is a candidate this June for the PhD in applied mathematics at MIT.



He has been a research assistant at MIT since 1972, specializing in the field of artificial intelligence. He has worked on the staff of RUNE, MIT's journal of arts and letters.

His previous awards include a Phi Beta Chi Award in 1972 as the most outstanding student in science at the University of San Francisco.

The other MIT Luce Scholars are Julie A. Moir, in 1975-76, who worked for a year at the Nakane Gardening Research Institute in Kyoto, Japan, and James R. Richardson IV, who is presently in Hong Kong attached to the Sha Tin New Town Development Office. Both are graduate students in the Department of Architecture.

MIT will be selecting nominees for the 1978-79 program in early autumn. Inquiries should be addressed to Professor Eugene B. Skolnikoff (E53-473), the director of the Center for International Studies, which administers the program at MIT.

—Look for ways to undermine the OPEC cartel, especially through schemes that encourage competitive price-cutting by the member nations. "Today's high world price for energy is directly the result of the monopoly power of OPEC. The difficult problems of energy policy would largely disappear if OPEC were to disintegrate...the US should do whatever it can to weaken the cartel."

According to Professors Hall and Pindyck, these policies would lead to a total energy demand by 1980 of the equivalent of 41 million barrels of oil per day, with domestic production providing 36 million of this. The price would be about \$12.50 per barrel or equivalent.

If present low-cost policies are continued, they say, demand may be as much as 45 million barrels daily and domestic production only 32 million. The price per barrel might be under \$8 but the true cost of energy to consumers including taxes to support imports and subsidize non-conventional sources, would be much higher.

TCC Lecture: Earthquakes And Animals

Why do animals seem to sense the onset of an earthquake several days before it occurs?

This question and others will be discussed by Dr. William F. Brace, Cecil and Ida Green Professor of Geology in the Department of Earth and Planetary Sciences, at the final lecture of the Technology Children's Center Lecture Series.

Dr. Brace will give a talk entitled "Earthquakes" in which he will describe for a young audience—approximately 8 to 12 years old—the problems of predicting earthquakes. It will be held on Sunday, April 24, at 3pm in Room 9-150.

In his lecture, Dr. Brace will present some of the fundamentals of geology and use them to explain why some areas are more likely to have earthquakes than others.

Professor Brace has visited China, where scientists have had the most success with earthquake prediction. He will show slides of Chinese high school students assisting in the study of earthquakes. He will also explore reports that animals behaved strangely for several days before the damaging Guatemala earthquake last year.

Technology Children's Center Lectures have been held once a year for a number of years at MIT to provide support for pre-school nursery and day care programs at the Institute. This is the first year that the lectures have been expanded into a series. A \$1 donation is requested.

Valentine Given Change in Title

MIT Treasurer Glenn P. Strehle has announced a change in title for one of his principal assistants, Kimball Valentine, Jr. Mr. Valentine has been Assistant to the Treasurer and Insurance Officer. His new title is Insurance and Legal Administration Officer.

Mr. Strehle pointed out Mr. Valentine's responsibilities include insurance administration as well as tax and legal matters for the Institute. He works with departments, student groups, staff and employees providing legal guidance and liaison and has primary responsibility for the Institute's real estate taxes and payments to Cambridge and other towns in lieu of taxes.

A graduate of Amherst, Mr. Valentine holds the JD degree from the University of Chicago and the LL.M. degree from Boston University.

est Founder To Speak Here

Werner Erhard, founder of *est*, an educational organization concerned with increased self-awareness, will speak at MIT Friday, April 29, at two events sponsored by the MIT Lecture Series Committee.

At 12 noon Mr. Erhard will hold an informal luncheon meeting with students in the Sala de Puerto Rico in the Student Center. He will give a short talk and answer questions for the remainder of the hour. No tickets are necessary.

He will deliver a formal lecture at 3:30pm in Rm 54-100. Admission will be by invitation, but a limited number of tickets will be available to the MIT community in the Lobby of Bldg. 10 beginning Wednesday, April 20, from 11am-2pm. Tickets are free, one per MIT ID. Information on Mr. Erhard's talks will also be available at the booth.

Mr. Erhard will discuss the relationship between the experience of transformation and its implications for systems-oriented research and education. He will discuss the parallel development in recent years of the growth of systems theory and analysis and the consciousness movement.

A former consultant in business management and executive development, Mr. Erhard founded *est* in 1971. It is an educational organization which conducts trainings, seminars and special programs which focus in the experience of transformation, communication and awareness.

In recent years Mr. Erhard has spoken at conferences and before other groups, discussing the implications of the transformation experience for areas such as education and alcoholism and drug abuse. He has also held training sessions in federal prisons with inmates and guards.

counting office; handle general typing and filing. Graduation from 2 year Business School or substantial related experience necessary. Typing skill required; familiarity with medical terminology preferred. B77-11 (3/23).

Clerk III/IV in Administrative Computing Services: will type electronic data processing documentation (documents and reports); file; perform related clerical duties as necessary. Accurate typing is required. B77-50.

Sr. Clerk III in the Registrar's office to assist in processing undergraduate and advanced degree applications; order and maintain file of diplomas; prepare diploma and attendance list for June Commencement. May also assist veterans in completing appropriate forms. Good typing skill required. Proofreading ability and college training helpful. B77-133 (4/13).

Clerk III, part-time, in Civil Engineering to type; handle routine bookkeeping duties; answer phones; file; perform tasks related to operation of a computer facility. Typing and organization skills required. 15-20 hrs./wk. B77-129 (4/13).

Sr. Clerk III Publications Office Assistant, in Information Processing Services to distribute technical publications; maintain and update reference manuals; prepare new user packets; handle related clerical duties as necessary. Ability to handle detailed work including cash transactions with accuracy, typing skill, flexibility for changing assignments required. Non-smoking office. B77-116 (4/6).

Technician A, hourly, in the Environmental Medical Service at Bates Linear Accelerator, Middleton, Ma. Will work as a member of the rotating Radiation Protection Office crew. Duties include radiation surveys, security searches, environmental monitoring, decontamination, radiation shielding, instrument calibration and general radiation protection activities. At least 2 years day technical school training which emphasized Radiation or Health Physics plus 2 years applicable experience required. H77-58 (4/13).

Machinist A, hourly, in the Chemistry Department to perform work using all commonly used machine tools; set up and operate tools working to close tolerances from blue prints, specifications, verbal instruction or sketches; make such tools, dies, jigs and fixtures as may be required in the work. May direct and train machinists of lower grade. A minimum of 5 years applicable experience as a machinist required. H77-59 (4/13).

Hourly, Electrician, in Physical Plant to install and maintain all types of electrical equipment and systems, working from blueprints, verbal instructions or sketches as necessary. A Mass. State license and a minimum of 5 years applicable experience required. Applicants must be able to work all shifts as required and may be required to work an irregular schedule as determined by the needs of the electrical shop. Some electronic experience desirable. H77-52, H77-53 (4/6).

The following positions were still available at *Tech Talk* deadline. The date following each position is the date of the most recent *Tech Talk* issue in which the position was described.

ADMINISTRATIVE STAFF:
A76-52, Applications Programmer, Off. of Admin. Info. Syst. (12/1)
A77-3, Systems Prog., Info. Processing Serv. (2/16)
A77-8, Asst. Dir./Prog. Admin., Off. of Spons. Prog. (3/2)
A77-11, Asst. Dir., Admissions Off. (3/16)
A77-13, Stud. Financial Aid Officer, Stud. Fin. Aid (3/23)

BIWEEKLY:
B76-613, Sec. IV, Ctr. for Policy Alternatives (12/1)
B77-11, Clerk III, Div. of Lab. Animal Medicine (4/6)
B77-25, Asst. Computer Oper. III, Off. of Admin. Computer Serv. (2/2)
B77-26, Sec. IV, Civil Eng. (2/2)
B77-58, Sec. IV, Urban Studies Planning (3/2)
B77-59, Sec. IV, Civil Eng. (3/2)
B77-70, Sec. III-IV, Chemical Engineering (3/2)
B77-88, Sr. Lib. Asst. IV, Rotch Lib. (3/16)
B77-89, Clerk Typist III, Physical Plant (3/16)
B77-102, Sec. IV, MIT Sea Grant Prog. (3/23)
B77-106, Sec. IV, Humanities (4/6)
B77-108, Sec. IV, Resource Dev. (4/6)
B77-114, Sec. IV, Medical Dept. (4/6)

ACADEMIC STAFF:
C77-2, Tech. Asst., Chemistry (3/16)
C77-4, Tech. Asst., Biology (4/6)

SPONS. RES. STAFF:
D76-17, Biochemist, Res. Lab. of Elec. (2/25)
D76-121, Res. Engineer, Energy Lab. (7/28)
D76-123, Staff Biophysicist or Biochemist, National Magnet Lab. (7/28)
D76-126, Immunologist, Clinical Res. Ctr. (8/11)
D76-180, postdoc. res., Physics, Lab. for Nuclear Sci. (10/13)
D76-182, Staff Engineer, Elec. Eng. & Comp. Sci. (10/13)
D76-187, Postdoc. Scientist, Ctr. for Space Res. (10/13)
D76-188, Postdoc. Scientist, Ctr. for Space Res. (10/13)
D76-220, Research Analyst, Ctr. for Policy Alternatives (11/24)
D76-225, Sci. Applications Prog., Lab. for Nuclear Sci. (1/5)
D76-232, High Energy Physics Res., Bates Linear Accelerator (1/5)
D76-233, High Energy Physics Res., Bates Linear Accelerator (1/5)
D76-243, Metallurgist, National Magnet Lab. (1/12)
D76-244, Manager, Combustion Facility, Energy Lab. (1/12)
D76-246, High Magnetic Field Res., National Magnet Lab. (2/9)
R77-6, Staff Scientist, Arteriosclerosis Ctr. (1/19)
R77-9, Systems Analyst, Elec. Eng. (1/26)
R77-14, Staff Petrographer, Earth & Planetary Sci. (2/2)
R77-16, Prog. Mgr., Energy Lab. (2/9)
R77-17, Systems Theory Res., Elec. Syst. Lab. (2/9)
R77-21, Energy Analyst, Energy Lab. (2/16)
R77-22, Astro Physics Res., Ctr. for Space Res. (2/16)
R77-26, Planetary Radar Data Analysis, Earth & Planetary Sci. (3/2)
R77-33, postdoc. res., Physics, Ctr. for Theoretical Physics (3/9)
R77-34, postdoc. res., Physics, Ctr. for Theoretical Physics (3/9)
R77-35, postdoc. res., Physics, Ctr. for Theoretical Physics (3/9)
R77-36, postdoc. res., Physics, Ctr. for Theoretical Physics (3/9)
R77-37, High Energy Physics res., Lab. for Nuclear Sci. (3/9)
R77-39, Chemical Eng., Energy Lab. (3/9)
R77-43, Sr. Elec. Eng., Plasma Fusion Ctr. (3/16)
R77-44, Tech. Asst., Psychology (3/23)
R77-49, Res. Eng., Energy Lab. (3/23)
R77-50, Economist/Econometrician, Energy Lab. (3/23)
R77-51, Sr. Res. Eng., Energy Lab. (3/23)
R77-53, postdoc. res., Physics, Res. Lab. of Elec. (4/6)
R77-54, Design Eng., National Magnet Lab. (4/6)
R77-56, Thermal/fluid science res., Energy Lab. (4/6)

EXEMPT:
E76-41, Principal Oper., Physical Plant (12/1)
E77-3, Mech. Shop Super., Physical Plant (1/26)
E77-5, Real Time Diagnostic Syst., Prog., Haystack Observatory (2/2)
E77-7, House Manager, Housing Dept. (2/16)
E77-10, Metal Shop Super., Physical Plant (3/16)

HOURLY:
H77-29, 2nd. Class Engineer, Physical Plant (3/9)

The following positions have been FILLED since the last issue of *TECH TALK*:
B76-644 Sr. Clk. III CANCEL
B77-111 Sec. V
A77-12 Admin. Staff
E77-9 Exempt
B77-100 Sec. IV
R77-47 Spons. Res. Staff
C77-3 Acad Staff
B77-112 Sr. Lib. Asst. IV
B77-128 Driver-Utility CANCEL
B77-99 Sec. III
R77-42 Spons. Res. Staff
B77-121 Sec. IV
B77-18 Sr. Clk. III
H77-66 Tech. C

The following positions are on HOLD pending final decision:
B77-109 Lib. Asst. III
H77-28 2nd. Class Firer
B77-124 Clk. Typist III
B77-95 Sr. Clk. IV
H77-57 Lab. Aid

Canon Carr

(Continued from page 1)

relief, reconciliation and rehabilitation efforts of the World Council of Churches during and after the Nigerian Civil War.

Canon Carr originally had been scheduled to speak at MIT on March 4, but his appearance had to be postponed because of an emergency meeting of the officers of the All Africa Conference of Churches. The meeting was called to consider developments at that time in connection with the death of the Anglican Archbishop of Uganda, Janani Luwum.

The Ugandan government reported that Luwum had been killed in an auto crash within hours of his arrest on charges of plotting against President Idi Amin.

Canon Carr said he had received reports that Luwum had been shot. He also expressed outrage over the archbishop's secret burial, saying, "Even the racist and minority regimes in Rhodesia or South Africa are not as callous in their treatment of the dead."

Canon Carr denounced President Amin and called for the imposition of a diplomatic boycott on Uganda. He said that international organizations should be discouraged from holding meetings in Uganda "as long as President Amin's repressive regime continues to violate human rights with such impunity."

Canon Carr, born in Liberia, is the first Liberian to become a graduate of theology. Following his graduation from divinity school in Liberia in 1961 and ordination into the Anglican church, he joined the staff of Trinity Cathedral in Monrovia, where he subsequently became Canon.

In 1962 he went to Geneva to work in the headquarters of the World Council of Churches on questions related to church work in Africa.

In 1964 he enrolled at the Harvard Divinity School for work in Old Testament Studies, which led to the Master of Theology degree in 1966 and to his entry into a doctoral program of studies. He was active in Boston's Black community while a student at Harvard, and was assistant minister at St. Cyprian's Episcopal Church in Boston in 1965-67.

In 1967, the World Council of Churches asked him to return to Geneva and take over a newly established Africa desk in the Council.

In this capacity, he had major responsibility for administering assistance programs to churches and to Christian Councils in Africa from churches and church-related donor agencies in other parts of the world.

In 1971, he became the first General Secretary of the All Africa Conference of Churches with headquarters in Nairobi, Kenya.

While Canon Carr has been involved in administrative and political affairs over the past years, he has continued to pursue his theological and intellectual interests and has been a visiting lecturer at Union Theological Seminary in New York.

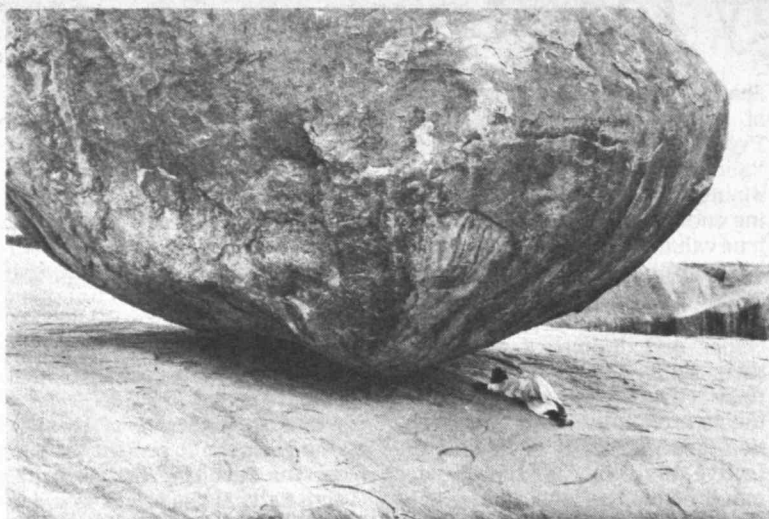
He describes himself as "basically a preacher" who tries "to relate insights obtained through study of the Holy Scriptures and of history to the struggles in which African Christians and their Churches are engaged." He is married and has five children.

Dr. Wolf Honored For Vitamin A Work

Dr. George Wolf, professor of physiological chemistry in the MIT Department of Nutrition and Food Science, is the 1977 recipient of the Osborne and Mendel Award of the Nutrition Foundation, Inc., presented at the annual meeting of the American Institute of Nutrition recently in Chicago.

The award, consisting of \$1,000 and an inscribed scroll, was given to Professor Wolf in recognition of his contributions to the understanding of the metabolic functions of vitamin A.

India Photos



MAHABALIPURAM, 1975, is included in exhibit "Photographs from India" on view in the Skidmore Room (Rm. 7-305) through April 25. The photographs were taken by Ram Rahman, an MIT senior in architecture from New Delhi. Mahabalipuram, on the south-east coast of India near Madras, is the site of some 7th century rock-cut temples. This photograph shows a person sleeping beneath one of the tremendous, uncut rocks found there.

Mathematician Plans Shakespearean Summer

(Continued from page 1)

conditions," he said.

Mr. Rothstein was attracted to the program because it was ideal financially and he could apply without going to Utah for an audition. He is one of about 17 actors chosen from all over the country who will perform there this summer. *Coriolanus*, *Romeo and Juliet*, and *The Taming of the Shrew* will be given in repertory, each produced two times a week following four weeks of rehearsals.

Mr. Rothstein is looking forward to the summer simply for the experience of doing Shakespeare. He also hopes to learn of year-round opportunities in theatre and to evaluate his own interest in the field. This interest is longstanding.

"Acting is the one thing I had a passion for all through my childhood," he said. Before he came to MIT, however, he hadn't worked on plays as demanding as Shakespeare's.

At MIT he has directed and acted in Dramashop plays, appeared in the Musical Theatre Guild's production of *A Funny Thing Happened on the Way to the Forum*, and acted in the Cambridge People's Theatre production of *The Country Wife*.

The focus of his dramatic activity has been the MIT Shakespeare Ensemble. He joined the Ensemble when it was formed in the fall of 1974, and has had a role in all its major productions. He is currently cast as Iago, "a really fantastic role," in *Othello* to be presented April 20-24 at MIT.

Prior roles have included the clown Feste in *Twelfth Night*, Old Gobbo and the Prince of Arragon, in *The Merchant of Venice*, Hotspur in *Henry IV, part 1*, and Tranio in *The Taming of the Shrew*.

"It wasn't until I got interested in Shakespeare that I thought that I could act professionally and that an acting career would be fulfilling enough," he said.

Mr. Rothstein rehearses an average of 20 hours a week when he has a lead in a Shakespeare Ensemble

NAE Elects

(Continued from page 1)

detection, the development of quantitative methods of risk assessment, and nuclear safety."

Dr. John G. Trump, professor of electrical engineering emeritus and director of the MIT High Voltage Research Laboratory, for "inventions and contributions in high-energy beam systems and their applications in medicine, industry and science."

Dr. Arthur R. Von Hippel, Institute Professor Emeritus and professor of electrophysics emeritus in the Department of Electrical Engineering and Computer Science, for "pioneering in molecular engineering and in setting a pattern for interdisciplinary materials research."

play. In addition to working on major productions he performs in and directs scenes. The Ensemble gives about two scene performances a month at MIT or in the Boston area.

Ensemble members do so much by budgeting their time and forgoing other activities.

"Murray's directing techniques are extremely efficient," he said. "He arranges rehearsals to provide a minimum of wasted time. Working with the Ensemble has increased my efficiency."

Mr. Rothstein doesn't know where his year in the theatre will lead. For now he hopes to keep his options open in both mathematics and the theatre.

Open House

(Continued from page 1)

tion and Open House is a way to emphasize our humanity."

Following are some of the activities employees, their families and guests will find at this year's Employees Open House.

The MIT Libraries are planning four activities. In Rotch Library (Rm. 7-238) there will be an exhibit of books and pamphlets on solar heating and other ways to cut home heating costs. The Humanities Library (Rm. 14S-200) is preparing special bibliographies of books for leisure reading; of travel guides for the US, Europe, the Islands, and other foreign parts, and of important reference materials to help someone choose the right college. The Library has an extensive, non-circulating collection of catalogs for US and foreign colleges and universities.

Along the same lines, the MIT Admissions and Student Financial Aid Offices will be open during Open House to offer counsel to parents whose children are nearing college age.

Another event that's new this year will be an exhibit of paramedical equipment and techniques offered by the MIT Campus Patrol, the Safety Office and the Environmental Medical Service. MIT's ambulance will be parked on the Student Center Plaza, with the remainder of the exhibit in the Student Center West Lounge.

On display in Hayden Gallery will be an exhibit entitled American Women in Architecture and Design, a major traveling exhibition that includes works from 10 MIT alumnae. Accompanying the show will be architectural theses from a number of other alumnae in Hayden Corridor.

A number of activities will appeal to those interested in transportation of various kinds. The Tech Model Railroad—always popular with adults and kids alike—will be open. Tours will be conducted through the moveable base cockpit simulator used by pilots for space orientation. On Briggs Field the Model Rocket Society will hold a low-level launch of radio-controlled models.

All-in-all, there's something for everyone at Employees Open House, so mark your calendar.

Arbatov Says in Lecture Arms Proposal Is 'One-Sided'

(Continued from page 1)

If such an agreement is reached, he said, it could lead to negotiations on other new agreements, including "a ban on new types and systems of weapons of mass destruction."

Along with nuclear disarmament, he said, steps should be undertaken toward limitation and reduction of the armed forces and of conventional armaments. "I shall risk suggesting that 20 years ought to be sufficient to make key moves toward these goals, if even not to attain them fully. Otherwise, I very much fear that mankind will enter the third millennium under highly unfavorable auspices."

Mr. Arbatov, director of the Institute of US and Canadian Studies of the USSR's Academy of Sciences, was the seventh speaker in MIT's "World Change and World Security" lecture series. He was introduced to a large Kresge Auditorium audience by Dr. Carl Kaysen, the David W. Skinner Professor in the School of Humanities and Social Science and former deputy special assistant for national security affairs under President John F. Kennedy.

On the topic of human rights, Mr. Arbatov said "it would be naive to think that you can make progress in the solution of difficult and important problems, while charging the atmosphere with hostility and mistrust." He said his comment "fully refers to the current anti-Soviet campaign in the United States speculating on civil rights."

In a section of his prepared text that he omitted during delivery of his lecture, but which he later paraphrased in response to a question, he said that statements on human rights by US officials and others appeared to be growing "into a mounting wave of policy intended to subvert the internal order established in the USSR and the other socialist countries."

"It is in glaring contradiction to the fundamental premises of peaceful coexistence of states with different social systems and

ideology," he said. "If this goes on, it will create an atmosphere of hostility and mistrust that will make the political climate totally unsuitable for constructive talks on any questions of political and military detente."

He concluded in his talk the statement: "Different societies have different criteria of values and each side will uphold its ideas and conceptions. But these natural clashes of opinion should not be permitted to grow over into a policy of pressure on other countries, into attempts made from outside with a view to altering the internal system in these countries. The cold war showed us where this leads to."

Mr. Arbatov said that detente, while not solving all problems, is a vital pre-condition to the solution of international conflicts and crises.

Detente is also crucial to the search for ways to solve the fundamental problems of development in the poorer nations, he said, because it can create a more favorable international climate.

"For instance," he said, "it would create a practical possibility for ending the so-called 'poor man's arms race,' that grossly irrational situation when huge sums of money badly needed for purposes of development are spent by countries of the Third World on extremely costly modern weapons."

Without detente, he said, "without peace, arms limitation, improvement of the international situation, broad development of mutually advantageous and equal cooperation, we shall not be able to even proceed with the solution of practically all of the problems...As I see it, the key element of policy for the future—whether it is only for the next 20 years—will be the preservation, advancement and consolidation of detente."



AT ARBATOV LECTURE Monday night were Gen. James Gavin (USA, Ret), recently retired chairman of A.D. Little Co., Cambridge (left) and Harvard economist John K. Galbraith (right). MIT President Jerome B. Wiesner (second from left) introduced Professor Carl Kaysen who, in turn, introduced Dr. Georgi Arbatov (second from right) who presented the most recent "World Change and World Order" lecture.

—MIT Photos by Calvin Campbell



MEDALLION EMBLEMATIC of the "World Change and World Order" lecture series is presented by Dr. Carl Kaysen (right) to Dr. Georgi Arbatov of the Soviet Union who spoke Monday night.