

IN BRIEF

FACULTY MEETING

President Charles M. Vest will preside at his first regular meeting of the faculty today (Wednesday, Oct. 17) at 3:15pm in Huntington Hall (Rm 10-250). Agenda items include:

—A faculty resolution on the leadership transition by Professor Henry D. Jacoby.

—A report on the status of the study panel on policies related to demonstrations, also by Professor Jacoby.

—A report and motion by the Committee on ROTC by Professor Alvin S. Drake.

A reception in the Compton Gallery (Rm 10-150) will follow the meeting.

INSIDE

The Report of the President for 1989-90 is included as an eight-page supplement in Tech Talk today.

HOLIDAY BONUS

MIT will have a special holiday closing on Monday, Dec. 24, in addition to the regular December 25 closing for Christmas Day. The usual pay practices applying to special holiday closings will be in effect.

BOOK DEALS

Beginning Friday, Oct. 19, the Libraries will be holding a series of mini-sales of used books and other materials outside the storage area in the basement of Building 14S. Books from a variety of subject areas will be available at bargain rates to the MIT community only. In addition to this week, sales will be held November 2, 16 and 30, and December 14, 11:30am-2pm.

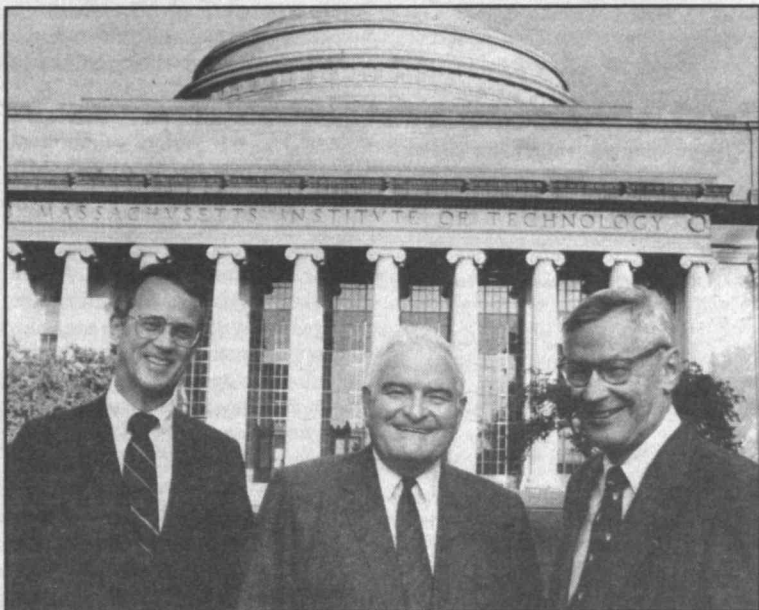
NO PARKING

Due to parking restrictions mandated by the City of Cambridge, the commercial lot on Main Street will be closed effective Friday, Oct. 19. That lot will, however, be available for replacement parking for West Garage, which will be closed Monday, Oct. 22-Friday, Nov. 30, for maintenance repairs.

KIDSPACE

Technology Children's Center (TCC) has a few openings in its full-time (Monday-Friday, 8am-5:30pm) day-care program. Children aged two years, nine months to five are eligible for the program at Eastgate. In addition to full-time care, TCC offers half-day (8:30am-1pm) and extended-day (8:30am-3pm) nursery-school programs available for two, three or five days per week.

TCC accepts applications for children aged one year, nine months for its waiting list for the next year. Children are admitted on a first-come, first-served basis, with preference for children within the MIT community. For more information, call Olga Slocum at x3-5907.



MIT's new president Charles M. Vest, former president and new Corporation chairman Paul E. Gray, and former chairman David S. Saxon stand in Killian Court. Photo by Donna Coveney

HACKERS HIDE DOORWAY

Vest Takes Office As 15th President

■ By Kenneth D. Campbell
News Office

Dr. Charles M. Vest took office Monday, Oct. 15 as the 15th president of MIT, and was greeted with a friendly student hack.

The doorway to his office complex was sealed and hidden by a bulletin board with clippings from "The Tech" headlined, "Vest takes over Monday." The bulletin board, constructed with 2x4s, was moved aside to a place of honor and humor in the hallway. The hack was so successful that a high administrative official thought for a minute he was on the wrong floor. The anonymous student hackers also gave Dr. Vest a bottle of champagne.

At a Monday afternoon meeting with MIT's United Way solicitors, Dr. Vest referred to the bulletin board that sealed off his office and said jokingly, "My first major policy is that we're going to keep that. The first time issues get hot on campus, we'll pull it out."

President Vest, 49, a native of West Virginia, comes to MIT from the University of Michigan, where he was provost and professor of mechanical engineering. He succeeds Dr. Paul E. Gray, who served as president for ten years from 1980 to 1990 and became (continued on page 8)

CAMPAIGN STARTS TODAY

United Way Offers Donor Choice

This year's United Way campaign begins today, October 17, with an ice-cream kickoff and a welcome new addition: extended donor choice, or the opportunity to direct your contributions to a specific agency, even if it's not affiliated with the United Way.

Every year the United Way collects monies from the MIT community and other local companies and universities

and distributes those funds to more than 200 health and human-service agencies in the Greater Boston area. Not surprisingly, however, that number does not include every worthy agency.

"For a number of years, there has been interest at MIT in being able to make charitable contributions by payroll deduction to a broader range of agencies than are represented by the

18 YEARS AT MIT

Wrighton Appointed As Provost by Vest

President Charles M. Vest Tuesday announced the appointment of Professor Mark S. Wrighton, 41, the head of the Chemistry Department since 1987 and widely considered one of the nation's leading scientists, as provost of the university.

President Vest, who took office Monday, said in a letter distributed to faculty Tuesday morning that Dr. Wrighton's appointment as the chief academic officer of MIT was effective immediately. Dr. Wrighton succeeds John M. Deutch, also a professor of chemistry, who served as provost for the past five years.

Dr. Vest thanked the 1,000-member faculty for their recommendations on the appointment of the provost. He said he has received scores of letters and has met with more than 100 faculty members in the past four months.

"Through the process," wrote President Vest, "it became clear to me that Mark Wrighton, currently head of the Department of Chemistry and CIBA-GEIGY Professor of Chemistry, possesses the qualities you expect in a provost. His intellect, devotion to teaching, willingness to serve others, knowledge of the Institute, and dedication to MIT are exemplary. His ability to frame administrative issues with a clear understanding of the faculty perspective on programs of research and education will serve us well in his capacity as MIT's chief academic officer. I look forward, as I am sure you do, to working with Mark in his new role," Dr. Vest said.

The provost is the principal deputy to the MIT president and the chief academic officer. The provost, with the president, provides leadership for



Professor Wrighton

the university's policies, plans and priorities as they affect all academic programs, including education and research. The head of the Schools of Engineering, Science, Management, Architecture and Planning, and the Humanities and Social Sciences report to him, as do the associate provosts for research, for educational policy and programs, and for the arts, the director of Libraries and the director of the Lincoln Laboratory in Lexington, Mass.

Dr. Wrighton, who has been a member of the MIT faculty since 1972, became a full professor at MIT at the age of 27. He has been featured over the past decade in Fortune, Science Digest, US News & World Report, Business Week and Esquire as one of the nation's leading scientists. He has received numerous awards, including the American Chemical Society's award in 1980 as the nation's leading young researcher in pure chemistry, and a John D. and Catherine T. MacArthur Foundation fellowship in 1983.

The holder of 11 patents, Dr. Wrighton is the author of more than 250 research papers and the co-author of a book, *Organometallic Photochemistry*. He also has edited two volumes of the American Chemical Society's *Advances in Chemistry* series. He has been a visiting lecturer at more than 30 colleges and universities in the United States, Britain, Canada and Sweden.

(continued on page 8)

FIRST CONFERENCE

Supporters and Critics Examine Nuclear Power

■ By Eugene F. Mallove
News Office

If heated public debate has failed to resolve the critical issue of nuclear power's future in the US, maybe a calm, private exchange of views between opponents and supporters would help.

The First MIT International Conference on the Next Generation of Nuclear Power Technology was designed to do just that.

About 80 nuclear industry experts, present and former regulatory officials,

and critics of nuclear power gathered at the Royal Sonesta Hotel in Cambridge, invited by conference chairman Professor Michael W. Golay of the Department of Nuclear Engineering. For two days earlier this month nuclear power safety, economics, and waste disposal received a thorough airing.

Nor will this be the last such meeting. Plans are to have conferences at roughly 18-month intervals, Professor Golay said. These will be part of the Department's newly launched Program in Advanced Nuclear Power Studies—intended to supplement MIT's research

on advanced reactors with public education and international outreach.

Many views remained fixed perhaps, but at least a small step was taken toward a hoped-for consensus. It was a "forum where all the different constituencies could be engaged," said Professor Golay. The conference had an international flavor too, with representatives from Canada, Germany, Italy, Japan, the Netherlands, and South Korea.

The International Conference Series will seek to promote greater consensus among diverse constituencies

on the acceptability of future nuclear power technology.

The Next Generation

With the threat of possible global warming from increased fossil-fuel use, and the all-too-apparent vulnerability of oil supplies, will a new generation of nuclear power plants emerge as electricity demand grows and older units are decommissioned? That difficult question brought a wide-ranging debate about safety issues and, more important,

(continued on page 5)

Student Notices

*-Open to public
 **-Open to MIT community only
 ***-Open to members only

ANNOUNCEMENTS

Career Services and Preprofessional Advising Recruitment Presentations*—Oct 17: *The Analytical Sciences Corp/TASC*, 6-8pm, Rm 4-145. *Goldman, Sachs & Co.*, 7-9pm, Rm 4-163. *Schlumberger*, 7-9pm, Rm 4-153. *Lockheed Sanders*, 7-9pm, Rm 4-149. Oct 18: *Hewlett Associates*, 4:30-5:30pm, Rm 4-145. *McKinsey & Co.*, 7-9pm, Rm 4-145. *Prudential Bache*, 7-9pm, Rm 4-163. Oct 22: *S. D. Warren Research*, 7-8pm, Rm 4-149. *Lord Corporation*, 7-9pm, Rm 4-153. *Electronics Data System*, 7-9pm, Rm 4-145. *The Travelers*, 7-9pm, Rm 8-105. Oct 23: *Ford Motor Co. Engine Division*, 3:30-4:30pm, Mezzanine Lounge, Student Ctr. *Intel Corp.*, 5-7pm, Rm 8-105. *Boeing Seattle & Boeing Philadelphia*, 7-9pm, Rm 4-145. *Merrill Lynch Capital Markets*, 7-9pm, Rm 4-149. *Aetna Life & Casualty*, 7-9pm, Rm 4-153. Oct 24: *MIT Lincoln Lab*, 4:30-6:30pm, Rm 4-149. *GTE*, 4:30-6pm, Rm 4-145. *The LEK Partnership*, 7-9pm, Rm 4-153. *First Boston*, 7-9pm, Rm 4-163. Oct 25: *Amoco Corporation*, 11am-6pm, Lobby 13. *Deloitte & Touche*, 5-6:30pm, Rm 4-153. *Bank of Boston*, 6-8pm, Rm 4-159.

Booksales**—Oct 19: First of a series of small booksales sponsored by the MIT Libraries, 11:30am-2pm, basement of the Hayden Library (outside the library storage facility in Bldg 14S). Additional Sales will be held every other Friday, same time & location as above, on Nov 2, 16, 30, Dec 14. Books from a variety of subject areas will be included. Open to the MIT community only.

Help SAVE (Share A Vital Earth)*—Oct 22-24: Buy recycled products or a Dis Bozo mug, Lobby 10.

MIT Radio Society Ham Exams*—The MIT Radio Society administers ham radio exams at all levels, on the next to last Wednesday of each month, at 7:30pm, Rm 1-150. Exam fee: \$4.95. Next date is Oct 24. Info x3-3776.

Free Museum of Science Admission for MIT Students*—With MIT student ID, provided by Mass Beta chapter of Tau Beta Pi, the National Engineering Honor Society. Reduced admission to special exhibits.

MIT Student Furniture Exchange**—great bargains, used furniture and more, Tues/Th, 10am-2pm, 25 Windsor St (MIT Museum bldg, 1st fl). Donations welcome. x3-4293.

Arts Hotline—Recorded information on all art events at MIT may be obtained by dialing x3-ARTS. Material is updated every Monday morning.

Nightline**—a student-run campus hotline open every evening of the term, 7pm-7am. If you need information about anything or you just want to chat, give us a call. We're here to listen. x3-8800.

RELIGIOUS ACTIVITIES

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

Baptist Student Fellowship**—Weekly Worship and Bible Study each Tuesday at 6pm in the chapel; snack supper fellowship immediately preceding at 312 Memorial Drive, 5:15pm. Graduate Student Study every other Thursday at 1pm, 312 Memorial Drive, beginning Sept. 13. Info x3-2328.

Morning Bible Studies**—Fri, 7:30-8:30am, L-217. Ed Bayless, x3456 Linc.

Noon Bible Study*—Every Wed, Rm 1-132, bring lunch. Ralph Burgess, x3-8121. (Since 1965.) (Graduate Christian Fellowship.)

MIT Bible Study Group*—The Economy of God, a look at God's eternal purpose to dispense Himself into man based on the revelation of the Bible, Fri, 8pm, Student Ctr Rm 407. Singing, prayer, Bible reading, fellowship.

Tech Catholic Community**—Masses: Sat, 5pm; Sun, 10am & 5pm. Tues & Thurs, 5:05pm, Fri, 12:05pm, MIT Chapel. Info x3-2981.

MIT Christian Community**—Come and join monthly lunch and discussion on God and Christians at MIT with your fellow faculty, staff, administrators, and grad students. Next lunch meeting Oct 24, 12-1pm, Student Ctr Dining Rm #2. Info: Park x3-2875.

MIT Christian Impact*—The weekly meeting for the ministry of Campus Crusade for Christ. Wind up the week: relax, snack, sing, laugh through skits and gain practical insight from God's Word. Meets Friday 7:17pm, Student Ctr, 3rd flr.

United Christian Fellowship**—Large group meetings. Join us for a time of worship, prayer, and Biblical teachings, Fridays, 7pm, Rm 6-321.

Christian Science Organization at MIT*—Weekly Testimony meetings, Thurs, 8pm, MIT Chapel.

Graduate Christian Fellowship**—Come join other grad students, faculty and staff in learning about and growing in the Christian faith. Activities open to both Christians and those interested in learning more about Christianity. Info: John Keen x3-7706, Dave Otis x3-2198.

MIT Hillel*—Oct 17: Israeli Folk Dancing, 7:30pm, Student Ctr. Oct 19: Parents Weekend Program: "Religious & Community Life at MIT," 2:30pm, Student Ctr. Shabbat Services, 5:30pm. Shabbat Dinner, 6:45, Walker. "Update on the Crisis in the Middle East," 8:30pm, Walker Hall Blue Rm. Oct 21: Regional Israel Conference, contact Hillel for information. Oct 22: "How a Jew Reads: The Talmud," a mini-course with Rabbi Dan Shevitz, 7-8pm, Hillel. Oct 24, 31: Israeli Folk Dancing, 7:30pm, Student Ctr. Study Break, 9pm. Oct 26: Shabbat Services, 5:30pm. Shabbat Dinner, 6:45pm, Walker. Grad Student Shabbat Dinner, 7pm, Ashdown West Dining Rm. "Imps, Demons, & Other Jewish Hobgoblins," an Oneq Program with Rabbi Dan Shevitz, 8:30pm, Walker Blue Rm. Info: x3-2982.

MIT Islamic Society*—5 daily prayers in the prayer room, Ashdown House (Bldg W-1) west bsmt. Friday congregation: 1:10-1:45pm in Ashdown House (Bldg W-1) west bsmt. Info: x8-9755.

Lincoln Laboratory Noon Bible Studies*—Tues & Thurs, Kiln Brook III, Rm 239. Annie Lescard, x2899 Linc.

Lutheran Ministry and Episcopal Ministry**—Weekly Service of Holy Communion—Wed, 5:10pm, MIT Chapel. Supper follows at 312 Memorial Drive. For further info, call x3-2325/2983.

MIT Vedanta Society*—Meditation and discourse on the Bhagavad Gita. Swami Sarvagatana, MIT Religious Counselor. Classes held Fridays 5:15pm, starting Oct 5. MIT Chapel.

OPPORTUNITIES

Harry S Truman Scholarships. Awards from \$8000-\$10,000 per year to current juniors interested in a career in government and related public service at the federal, state, or local level. Must be US citizens or nationals. MIT can nominate up to four juniors for the 1991 national awards. Awards cover graduate or professional school expenses in the following categories: tuition, fees, books, and room and board to a maximum of three years. For application materials and more information contact Ms Jocelyn Kalajian, E51-228 or call x3-4044. Deadline: 9am on Nov 5.

National Science Foundation Graduate Research Fellowships for 1991. Three-year graduate fellowships. Must be US citizen or national. Stipend is \$13,500 for a 12-month tenure with a cost-of-education allowance of \$6,000 in lieu of tuition and fees. Women in Engineering graduate fellowships available. Applicants are expected to take GRE General Test and Subject Test. Further application requirements and information available in the Dean of the Graduate School Office, Rm 3-138. Deadline for fellowship application Part 1 is Nov 9. Deadline for Part 2 is Dec 7.

National Science Foundation Minority Graduate Research Fellowships for 1991. Three-year graduate fellowships. Must be US citizen or national of one of the following ethnic minority groups: American Indian, Black, Hispanic, Native Alaskan (Eskimo or Aleut), or Native Pacific Islander (Polynesian or Micronesian). Stipend is \$13,500 for a 12-month tenure with a cost-of-education allowance of \$6,000 in lieu of tuition and fees. Women in Engineering graduate fellowships available. Applicants are expected to take GRE General Test and Subject Test. Further application requirements and information available in the Dean of the Graduate School Office, Rm 3-138. Deadline for fellowship application Part 1 is Nov 9. Deadline for Part 2 is Dec 7.

INTERNATIONAL

MIT-Japan Program. Go to Japan for a year of fun and excitement—all expenses paid—with the MIT-Japan Program. Further info: x3-2839.

STUDENT JOBS

There are more job listings available at the Student Employment Office, Rm 5-119. The Student Employment Office has many "one time only" jobs. Many students find these jobs a good way to earn money fast.

On Campus, Non-Technical. The MIT Information Systems Microcomputer Training Lab has a position available during Open Lab from 1-4pm on Fridays. The applicant should be knowledgeable in various applications on the IBM and Mac including Word, Excel, Filemaker, Lotus, and Word Perfect. Duties: set up the lab equipment, assist computer users with their questions, and some record keeping. Hours: 1-4pm on Fridays. Salary: \$7/hr. Contact: Cheryl Jones x3-5312.

On Campus, Non-Technical. Childcare needed at MIT. Begins October 29th. One child age 6. Experience required. Job located in person's office. Hours: Monday and Wednesday 2:15pm-4:15pm. Contact: Prof Zuhur at x3-5101 or 776-7673

Off Campus, Technical. Computer Programming. Requires experience working with C. Fortran knowledge recommended. IBM experience required. Hours: 30-50 hours total. Salary: \$20-\$30/hr. Contact: Dr. Ladin at 332-5954 Address: steokinetics, 82 Stuart Rd, Newton, MA 02159

Off Campus, Non-Technical. Direct care work with emotionally disturbed adolescent girls. No experience necessary. Located in Quincy (15 minutes South of Boston). One year commitment (negotiable). Hours: 9pm Saturday to 9pm Sunday. Salary: \$5.75/hr. Contact: Kim Stopak or Jim Wilbur at 783-4410

Off Campus, Non-Technical. Part time receptionist needed. Duties include: answering phones, greeting visitors, light typing. Need immediately. Hours: 20 hrs/wk (two students needed for a total of 40 hrs/wk). Salary: \$8.50/hr. Contact: Christine Davin at 252-0001 ext 203. Address: Enxy Tech (University Park at MIT), 64 Sidney St., Cambridge 02139

VOLUNTEERS

The MIT Public Service Center has compiled the following volunteer opportunities.

Walk for Housing. Habitat for Humanity of Boston is holding its Second Annual Walk for Housing on Saturday, Oct 27. For more information concerning the 8-mile walk, call 455-9971 or drop by the Public Service Center.

Adopt A Rubber Duckie. The United Cerebral Palsy Association of MetroBoston, inc., is sponsoring a rubber duckie race down the Charles River on Oct 28. For \$5, you can adopt a duck and win major prizes if your duck does well! For more info contact the Public Service Center, Rm 3-123, x3-0742.

TILL. Toward Independent Living and Learning, Inc. is a non-profit agency serving developmentally disabled clients. They are currently looking for volunteers willing to dedicate 2-3 hours per week, or every other week, helping out with such activities as bowling, swimming, softball, and social events. Enthusiasm and a little patience are the only required skills. For more info call Doug Knotts at 329-6150.

UROP

MIT and Wellesley students are invited to join with faculty members in pursuit of research projects of mutual fascination. Fall term projects are now posted on the bulletin boards in the infinite corridor by the Admissions Office and in our office. For further information, read details on procedures in the participation section of the directory.

Faculty supervisors wishing to have projects listed should send project descriptions to the UROP office. Questions? Contact UROP at x3-7306, 20B-140.

Separation and Fractionation of Particle-Fluid Mixtures. Experimental tasks on a new centrifuge for the continuous separation and fractionation of particle-fluid mixtures including making the prototype/simulator operational and assessing its actual performance vis-a-vis theoretical and numerical models. Faculty supervisor: Harvey Greenspan, 2-343, x3-4982.

Environmental Data Base. Person needed to assist in the construction of an emerging environmental technologies data base. Person will be responsible for gathering some data and entering it into the computer using "Filemaker" on a Mac. Some telephoning of developers may be necessary. Good communication and writing skills. Prior experience with "Filemaker" helpful. Faculty supervisor: Dr. John Ehrenfeld, E40-241; x3-1694.

Biology. This research program deals with a study of the conformation of proteins and nucleic acids as studied by x-ray diffraction analysis. Materials are purified and then crystallized and x-ray diffraction analysis is used to determine whether they are suitable for three-dimensional structure determination. No prior experience is needed. Faculty supervisor: Prof Alexander Rich, x3-4715; contact: Dr. ChulHee Kang, x3-4710.

Media Laboratory. Students to work on tasks related to administration of the Lab's network and machines. Useful skills include familiarity with the following computer software and hardware: Unix, Macintosh, Vax, DecStation, Sun 3 and 4, HP 9000 and Network monitoring software. Most desirable is the aptitude and eagerness to learn a variety of tricks and techniques about computer behavior. Faculty supervisor: Mark Sausville, saus@media-lab.media.mit.edu, E15-473C, x3-0325.

United Way Campaign Begins

(continued from page 1)
 umbrella groups, like Community Works, and their member agencies are also eligible.

In general, the only requirements for eligibility are that an organization is registered as a health and human-service agency in Massachusetts and has 501 (c) (3) tax-exempt status. If you have a question about whether a particular agency is eligible, call the United Way's donor choice Hotline at (617) 574-9366.

Those who would like their gifts distributed to a variety of different United Way agencies can still do so by checking either "Community Care" or "Targeted Community Care" on the pledge card.

The traditional Community Care authorizes the United Way to distribute your gift to any of its member agencies. This option is still important, as many United Way agencies are not well known and may not receive funds any other way.

Targeted Community Care allows you to direct funds to one of the following causes: Children and Youth; Health Care; Education, Treatment, and Research; Drug and Alcohol Abuse; Employment and Training; The Hungry and Homeless; Physical Abuse, Neglect, and Violence; The Elderly and Community Advocacy and Equal Opportunity. Your monies are then distributed only to agencies serving that purpose.

Last year's United Way campaign here at MIT raised \$261,000, or 90 percent of the \$290,000 goal. Overall participation was 22 percent. This year's goal is \$300,000.

Key to meeting that goal are the people in each department or lab who

organize United Way donations—the chief solicitors.

On Monday, in his first official function as president of MIT, Dr. Vest honored the three top solicitors in last year's campaign, each of whom doubled or almost doubled the percent participation of their particular departments. Congratulations and a copy of the book *MIT: A Portrait* went to Julie Mitchell and Dr. Leigh Fern of the Medical Department for increasing participation from 21.6 percent in 1988 to 43.6 percent in 1989, and to Michael Pelletier of the Department of Brain and Cognitive Sciences for increasing participation from 13.5 percent in 1988 to 25.2 percent in 1989.

Apparently there are no real tricks to increasing participation: just persistence. Mr. Pelletier sent three mailings to his colleagues, while Ms. Mitchell and Dr. Fern tried the personal touch. "We made sure everybody got a personal visit from us," Dr. Fern said.

In addition to the chief solicitors, principals in this year's campaign include H.E. (Gene) Brammer, director of Physical Plant and campaign chair; David H. Marks, professor of civil engineering and campaign co-chair; and Nancy A. Drago, acting manager of the Quarter Century Club and campaign coordinator. If you have any questions, any of these people would be happy to help.

The ice-cream kickoff will start at 11:30am on the plaza between E15 and E17. All members of the MIT community are invited to drop by for free scoops. (If it rains, come to the atrium of E23, the Medical Building.)

The campaign is scheduled to run through November 20.

Community Invited To Talks, Tours

All members of the MIT community are invited to attend the talks, presentations and lab tours that are part of this year's Family Weekend beginning Friday, Oct. 19, at 10am and continuing through Sunday, Oct. 21.

Talks on Friday include "The Birth of the Cosmos" at 1pm in the Student Center Mezzanine Lounge by Professor Alan Guth of physics; "Can Earth-

quakes Be Predicted?" at 2:30pm in Kresge's Little Theatre by Professor Thomas Jordan of earth, atmospheric, and planetary sciences; and "Television of Tomorrow" at 4pm also in the Little Theatre by Professor Michael Bove of the Media Laboratory.

In addition, the Nuclear Reactor Laboratory, the Francis Bitter National Magnet Laboratory, the MIT Museum, and the Plasma Fusion Center will all be giving tours Friday. Please sign up in the Bush Room (10-105) beginning at 8am Friday if you're interested in attending a tour.

For a complete schedule of Family Weekend events call x3-8200.

TECH TALK

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Physics of Advanced Heterostructure Field-Effect Transistors. Junior in Electrical Engineering or Physics, 6.012 experience, an interest in semiconductor device physics needed for research on Heterostructure Field-Effect Transistors based on compound semiconductors. Project will involve using advanced instrumentation (computer-controlled semiconductor parameter analyzer, and sub-micron wafer prober. Faculty supervisor: Prof Jesus del Alamo, 13-3062, x3-4764, alamo@caf.
Wednesday, October 17: Channel 8: 11am-12:30pm—Live coverage of the MIT Optics and Quantum Electronics Seminar. 10-11pm—"Calling the Shots," "Athletes at Risk," "Prevention and Intervention." Presented for National Collegiate Alcohol Awareness Week by the MIT Health Education Service.
Thursday, October 18: Channel 8 10-11pm—"Athletes at Risk," "Prevention and Intervention," "Calling the Shots." Presented for National Collegiate Alcohol Awareness Week by the MIT Health Education Service.
Monday, October 22: Channel 8: 4-5:30pm—Live coverage of the MIT EECS Colloquium.
Tuesday, October 23: Channel 8: 4-5:30pm—Live coverage of the MIT VLSI Seminar.
Wednesday, October 24: Channel 8: 11am-12:30pm—Live coverage of the MIT Optics and Quantum Electronics Seminar.
Thursday, October 25: Channel 8: 3:30-5pm—Live coverage of the MIT Distinguished Lecturer Series.

50TH ANNIVERSARY

LIDS Symposium Will Look Backward and Forward

A pioneering MIT laboratory which made major contributions to victory in World War II and which later developed the techniques that made automatic control of machine tools possible will celebrate its 50th anniversary October 24-26.

The milestone will be observed with an MIT Museum exhibit, a two-day symposium at Kresge Auditorium and a banquet at the Cambridge Marriott Hotel.

The symposium is titled, "From Servo-Loops to Fiber Nets: Systems, Communication and Control: 50 Years and Beyond."

Preregistration is required for all events. The activities in Kresge may be attended by members of the MIT community if seats are available.

The laboratory has had three names in its long history: The Servomechanisms Laboratory (1940-1959); the Electronic Systems Laboratory (1959-1978), and the Laboratory for Information and Decision Systems (September 1978 to the present). The current codirectors are Professors Sanjoy K. Mitter and Robert G.

Gallager, both of the Department of Electrical Engineering and Computer Science. They are also cochairmen of the symposium. In a joint statement announcing the event, they said:

"The fields of control, communications, signal processing, and automation are undergoing revolutionary changes and there is concern about the United States being able to maintain its leadership role in these vital technologies. . . .

"The symposium will have a retrospective component and a component concerned with current research, but these components will be used as vehicles to explore where we are going. Predicting the future is always hazardous but we may well be able to invent it."

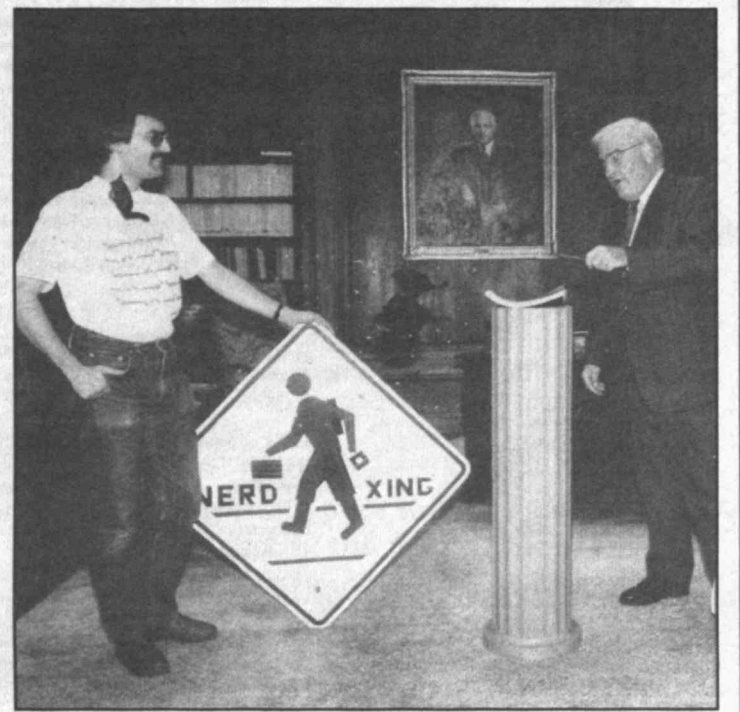
The retrospective look will begin at 6pm Wednesday, Oct. 24, at an historical exhibit and reception at the MIT Museum. Photographs, films and equipment from the laboratory's past will be included.

The look to the future will be provided by the speakers, which include the laboratory's codirectors and other

faculty; William F. Powers, program manager, car product development, Ford Motor Company; Stuart Personick, assistant vice president, network systems and services research, Bellcore; Irwin Jacobs, president, chief executive officer, Qualcomm, Inc.; and Aaron Cohen, director of NASA's Johnson Space Flight Center, who will be the speaker at a banquet that begins at 7pm October 25 at the Marriott Hotel in Kendall Square.

A concluding panel discussion will discuss "Visions of Tomorrow." The moderator will be Dr. Alexander Levis, senior research scientist at the laboratory.

Panelists will be Dr. G. David Forney, vice president, Motorola; Dr. Robert Kahn, president, Corporation for National Research Initiatives; Dr. Eugene Wong, associate director for physical sciences and engineering, US Office of Science and Technology Policy, and Professor George Zames, MacDonald Professor of Electrical Engineering, McGill University. The respondents will be Professors Gallager and Mitter.



HACKBOOK--A piece of balloon flies past former MIT hackster Brian Leibowitz after Chairman Paul E. Gray burst the balloon to obtain his copy of a new book on MIT hacks, or pranks, authored by Leibowitz, Class of 1982, and published by The MIT Museum. The 168-page, soft cover book—*The Journal of the Institute for Hacks, Tom Foolery and Pranks at MIT*—offers a history of hacking at MIT in nearly 100 anecdotes and twice that many photographs. A reviewer for *The Tech* has called the book "a joyful ride through our school's rich history of good, clean fun." Using a balloon to conceal the book recalled a hack that gained national attention in 1982 when MIT fraternity members inflated a black weather balloon on the Harvard Stadium football field during the annual Harvard-Yale game. Other hacking artifacts were displayed at the presentation ceremony. *The Journal of the IHTFP*—the title itself is a long-standing MIT joke that cannot be repeated here—is available from The MIT Museum Shop for \$19.95. Photo by Donna Coveney

COPIES AVAILABLE

Sexual Harassment Report Issued

The MIT Committee on Sexual Harassment, concluding a study it began last November, presented its report last week to Professor John M. Deutch, outgoing provost.

The report will be reprinted in *Tech Talk* as a supplement in the near future.

The committee was chaired by Professor Samuel Jay Keyser. Members, appointed by Professor Deutch, were drawn from the Academic Council, the faculty, the administration, the staff, postdoctoral fellows and students.

Professor Deutch, in accepting the report, proposed eight priority steps to be taken in the areas of policies, educa-

tion and procedures in order to make progress in implementing the recommendations of the report.

The report and Professor Deutch's recommendations for implementation were favorably received by the Academic Council at its October 9 and 16 meetings.

Dr. Paul E. Gray, in an October 12 letter to council members, pointed out the importance of each academic and administrative senior officer and supervisor taking responsibility for seeing that sexual harassment at MIT is prevented and stopped. He asked each council member to "take on the chal-

lenge to make MIT a community that is free of harassment and, beyond that, is a community that understands, accepts, and even celebrates individual differences." Dr. Charles M. Vest, who became MIT president three days after Dr. Gray's letter, noted the importance of this issue and made clear his interest in seeing progress toward the goals outlined in the report.

The report will next be discussed by the Faculty Policy Committee at its meeting next week. Copies of the report will be available at the Information Office, at the reserve desks at the libraries, and on Project Athena.

SIGN-UP TIME

CSF Road Race Set for November 3

The Tenth Annual MIT Community Service Fund Road Race will take place on Saturday, Nov. 3, starting at 9:30am. The four-mile race will follow the traditional course beginning at the Walter C. Wood Sailing Pavilion on Memorial Drive, proceeding along the river to the Museum of Science, returning along Storrow Drive and over the Harvard Bridge and ending at McDermott Court.

The entry fee is \$7 (\$8 for post-entry) and all members of MIT including Lincoln Laboratory as well as members of the Wellesley and Draper communities are eligible to participate in the race. Prizes will be awarded to the overall male and female winners,

and Masters champions (male and female over 40). In addition a trophy will be awarded to the living group with the highest percentage of participation in the race, and there will also be many drawing prizes.

All proceeds from the race will go to the MIT Community Service Fund which was formed in 1968 to provide funds to support the work of MIT volunteers in community service and action projects in Cambridge.

The race sponsors this year include Draper Lab, MIT Credit Union, MIT Dining Service, MIT Graphic Arts Service, BayBank Harvard Trust, and the Boston Sail Loft.

Prizes have been donated by:

Marathon Sports, Toscanini's Ice Cream, New Balance, Medford Sporting Goods, Nike, and Bertucci's.

The first 400 registrants will receive a free T-shirt and all participants will be eligible for the drawings for prizes.

Applications for the race will appear in the October 24 *Tech Talk*. Applications will also be available in Rm 5-208, at the Athletic Department Equipment Desk, and in the Sports Publicity Office, Rm W32-129.

All applications should be submitted to room 5-208, care of Sarah Eusden. Pre-entry closes on Wednesday, Oct. 31.

Volunteers are needed now and on race day. Call x3-0942 to help.

Wallace Lecture to Focus on Future

Susan M. Lee Bales, science advisor to the Chief of Naval Operations, will discuss "The New Road: Ocean and Naval Engineering in the 1990s" Wednesday, Oct. 24, at 3pm in Rm 9-150.

The talk will focus on the integration of new variables into a calculus for the nation's investment in science and technology with emphasis on issues relevant to the country as a maritime power.

Ms. Bales will also address the

challenge to develop technologies that have both commercial and defense applications.

Before her present assignment, Ms. Bales was head of the Ocean Environment Group at the David Taylor Research Center. A recipient of the Navy Meritorious Civilian Service Medal, she has also served as vice president of the American Society of Naval Engineers.

The lecture is the ninth Robert Bruce Wallace Lecture, a series endowed by

Mr. and Mrs. A.H. Chatfield of Rockport, Maine, and named for Mrs. Chatfield's father. Robert Bruce Wallace was a member of the MIT Class of 1898 who made major contributions to the development of the US maritime industry.

The program will also include presentation of the Wallace Academic Prize to a student in ocean engineering in recognition of scholarship and leadership. The Prize provides a stipend and a full year's tuition at MIT.

SCHOLARS EXPECTED

Conference to Launch Cultural Studies Project

An array of internationally famous scholars will participate in a conference this Friday and Saturday, Oct. 19 and 20, convened as the inaugural event of The Cultural Studies Project at MIT.

Dr. David Thorburn, professor of literature, termed the conference, *Epidemics: Perspectives in Cultural Studies*, "one of the most significant events in the nonsciences in the history of the Institute."

Professor Thorburn is director of The Cultural Studies Project, an interdisciplinary initiative sponsored by the School of Humanities and Social Science and the Office of the Provost.

"The Project is a response to fundamental changes in the nature and scope of humanistic scholarship and also a response to the special circumstances of the humanities at MIT," he said.

Dr. Thorburn also is cochairman of the conference, with Dr. David M. Halperin, professor of literature, and Dr. Kenneth R. Manning, professor of the history of science and head of The Writing Program.

Speakers include Professor Allan M. Brandt of the University of North Carolina, who has written what is considered to be the definitive history of venereal diseases; Dr. Daniel Pollock, a medical epidemiologist at the National Centers for Disease Control in Atlanta, Ga., and Simon Watney of Great Britain, who has written extensively on AIDS.

The sessions will be held in Killian Hall in Building 14 and in Rm 6-120. They are open to the MIT community and to the public.

The conference's focus on epidem-

ics and disease, Professor Thorburn said, "demonstrates ways in which new forms of humanistic research can help to illuminate topics often thought to fall outside the humanities."

It is also a "concrete illustration of what cultural studies is," he said, "in this instance by deploying medical, historical, literary and anthropological perspectives in the study of how societies define and attempt to deal with epidemics."

"In recent decades the individual disciplines that constitute the humanities and social sciences have enlarged and often radically altered their scope and method," he added. "This emerging scholarship has blurred the boundaries separating traditional disciplines and has conferred decisive importance on the category of 'culture.'"

An important aspect of The Cultural Studies Project, he explained, is to investigate various forms of graduate level and postdoctoral level programs of research and studies in the humanities. MIT currently offers only undergraduate courses in this area.

The Project's ultimate goal, Dr. Thorburn said in the October issue of the MIT Faculty Newsletter, is the establishment of the Institute of a Center for Cultural Study, which would offer internal and external fellowships and provide a continuing presence at MIT of world-class interdisciplinary humanistic scholarship.

More immediately, he said, the Project will sponsor scholarly conferences and lectures, and also an ongoing initiative to explore the humanistic uses of computing resources.

Science Council Nominations Wanted

Professor Gene M. Brown, dean of the School of Science, has issued a call for nominations for the Science Council Prize for excellence in undergraduate teaching.

The prize recognizes outstanding instructional performance and is intended to emphasize the importance the Science Council places on teaching. Those eligible include any faculty member in the School of Science who

has achieved distinction in his or her teaching. The prize carries a \$5,000 honorarium.

Nominations may be made by any member of the community. The Science Council will select the recipient based on the advice of a nominating committee composed of Professors Robert L. Jaffe, (physics), Daniel S. Kemp (chemistry), and Monty Krieger (biology), chairman.

Institute Calendar

*-Open to public
**-Open to MIT community only
***-Open to members only

October 17 - 18

■ SPECIAL INTEREST

Supercomputing Course (in 2 sessions)—Oct 17:** Vectorization and Performance Analysis on CRAY-2, with Firooz Partovi, Senior Consultant, MITSF. **Oct 19:** Source Code Maintenance on CRAY-2, with James Purdon, Applications Analyst, Cray Research, Inc. Sponsored by the MIT Supercomputer Facility, 2-4pm, Rm 1-277. Call x3-8033 to register.

Oxford and Cambridge Society of New England—Oct 25: Members of the MIT community who are graduates of Oxford and Cambridge Universities are invited to a reception sponsored by the Oxford and Cambridge Society of New England to meet recently arrived Oxbridgians, 7:30-9:30pm, Lower Common Rm, Adams House, Harvard Univ.

From Servo-Loops to Fiber Nets: Systems, Communication and Control—50 Years and Beyond—Oct 25-26:** A symposium to celebrate the 50th anniversary of the Laboratory for Information and Decision Systems. Kresge Auditorium. Registration on a space available basis. Call x3-0213 or x3-2691 for registration and more information.

UNICEF*—Halloween is not the same without Unicef. Children's collection boxes are available now in the Child Care Office, Rm 4-144, or call x3-1592.

■ SEMINARS & LECTURES

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.

WEDNESDAY, OCTOBER 17

Recent Advances in Short Pulse Solid State Lasers—I Duling, Naval Research Laboratory.** EECS/RLE Seminar Series on Optics and Quantum Electronics, 11am-12pm, Rm 34-401B.

The Future of the Surface Navy*—Ernst Frankel, MIT. MIT Seminar on Technology, Defense, and Arms Control in a Changing World, 12-2pm, Rm E38-714. Bring a lunch, drinks provided.

Microsoft Word (for the Mac) User Group Meeting*—Monthly meeting featuring question and answer session and a demo on using Word to create mathematical documents. All levels of users welcome, 12-1pm, Rm 37-252 (Marlar Lounge).

Rose Lunchbox Series—**Speaker to be announced. Sponsored by the Center for Real Estate Development, 12pm, Rm W31-301. Info: x3-4373.

My Favorite Oceans*—Invited Speakers. Oceanography Sack Lunch Seminar, 12:10pm, Rm 54-915.

Cretaceous/Tertiary Boundary Impacts—Dr Alan Hildebrand, Univ of Arizona.** Sponsored by the Dept of Earth, Atmospheric, and Planetary Sciences, 4-5pm, Rm 54-915.

The Bithorax Complex is Organized in DNA Domains that are Sequentially and Independently Opened Along the Chromosome!!!!??*—François Karch, Université de Genève. Whitehead Institute Seminar, 4pm, Whitehead 7th fl seminar room.

Fractals in Thermal Physics and Contact Mechanics of Rough Surfaces—Arun Majumdar, Arizona State Univ.** Thermal Science Seminar, 4pm, Rm 5-234.

Trade and Investment with Eastern Europe—Lester Thurow, moderator.** A panel discussion featuring distinguished speakers from industry, government, and academia. Sloan Business Forum, 4:30pm, Rm E51-329.

Sultanism*—Houchang Chehabi, Harvard.** Joint Seminar on Political Development, 5:30pm, MIT Faculty Club. Open to members only. Contact David Lane 495-2644.

THURSDAY, OCTOBER 18

R:Base User Group*—Information Systems Noontime Seminar and meeting of R:Base users to exchange ideas, present problems and solutions and see demos to help you to use R:Base more efficiently. All levels of users welcome, 12-1pm, Rm 37-187.

Managing Safety in Air Transport Operations*—James R Riedmeyer, Flight Safety Foundation, Inc. Sponsored by the Flight Transportation Laboratory, 2-3:30pm, Rm 33-319.

Researchers as Intellectual Detectives and Curiosity Seekers—Nam P Suh, MIT.** Sponsored by the Laboratory for Manufacturing and Productivity, 3-4pm, Rm 35-520.

Methanol as a Fuel for Internal Combustion Engines: A Review—Andrzej Kowalewicz, Radom Tech Univ, Poland/MIT.** Sloan Automotive/Gas Dynamics Laboratories Seminar Series, 4-5pm, Rm 31-161. Refreshments, 3:45pm.

Optimal Flow Control in Scheduling Manufacturing Systems with Stochastic Capacity*—Michael Caramanis, Visiting Scientist, MIT; Boston Univ. Sponsored by the Laboratory for Information and Decision Systems, 4pm, Rm 37-212.

Planning and Teaching an Engineering Subject—Donald Sadoway, Edward Crawley, MIT.** Sponsored by the Faculty Instructional Resources Program, School of Engineering, seminar series on "Teaching at MIT," 4pm, Rm 1-236.

The Origin of Structure in the Universe—Michael Turner, Univ of Chicago and Fermilab.** Physics Colloquium, 4:15pm, Rm 10-250. Refreshments, 3:45pm, Rm 26-110.

Taipei Rebels, Taiwanese Ghosts, and Tiananmen: Saturated Symbols and the Limits of Hegemony*—Robert Weller, Boston Univ. Sponsored by the Center for International Studies, Peoples and States: Ethnic Identity and Struggle, 4:30-6:30pm, Rm E38-714. Refreshments.

FRIDAY, OCTOBER 19

Information Management in Japanese Universities—Katsuya Muraoka, Rishso Univ; Yoichiro Yamashita, Chuo Univ; Mitsuyuki Harada, Tokai Univ.** Sponsored by the Industrial Liaison Program and School Systems International, Inc, 9am, Sea Grant Conference Rm, E38, 3rd fl.

2D Airfoil Optimization—Tom Sorensen, MIT.** Fluid Dynamics Seminar, 12-1pm, Rm 33-206.

Fire Science—The New Fire Safety Engineering—Howard Emmons, Harvard.** Sponsored by the Chemical Engineering Dept, 3pm, Rm 66-110.

Steady State Tokamak Reactor with Neoclassical Current of Electrons and Alpha-Particles—V Kolesnichenko, Institute for Nuclear Research, Kiev, USSR.** Plasma Fusion Center Seminar Series, 4pm, Rm NW17-218.

MONDAY, OCTOBER 22

Job Attitudes: A Lay Epistemology Perspective*—Shmuel Ellis, MIT. Sloan School of Management Research Seminar in Organization Studies, 12-1:30pm, Rm E52-598.

Attitude Dynamics of a Spinning Tethered System in LEO—Marco Quadrelli, MIT/Aeritalia.** Dept of Aeronautics and Astronautics, Materials, Structures and Aeroelasticity Seminar Series, 3pm, Rm 33-206.

Maglev USA—High-Speed Transportation—Richard Thornton, MIT.** EECS Colloquium Series, 4-5pm, Rm 34-101. Refreshments, 3:30pm.

Spatial Evolution of Boundary-Layer Transition—Prof Thorwald Herbert, Ohio State.** Applied Mathematics Colloquium, 4pm, Rm 2-338. Refreshments, 3:30pm, Rm 2-349.

Molecular Dynamics Computations of Rarefied Gas Flows—Prof Isaac Greber, Case Western.** Fluid Mechanics Seminar Series, 4-5pm, Rm 5-234.

Opportunities in Hydrologic Sciences*—Peter S Eagleson, MIT. Sponsored by the Ralph M Parsons Laboratory for Water Resources and Hydrodynamics, 4pm, Rm 48-316.

The Origins of STS at MIT—George O'Har, MIT.** Sponsored by the Program in Science, Technology and Society, 4-6pm, Rm E51-004.

Overview of Current Research in Hydrology and Water Resource Systems*—Faculty, Parsons Laboratory. Sponsored by the Ralph M Parsons Laboratory for Water Resources and Hydrodynamics, 4pm, Rm 48-316.

Comet Rendezvous and Asteroid Flyby—Dr Doug Bernard, JPL.** MIT/Draper Joint Seminar Series in Dynamics, Guidance and Control, 4:15pm, Draper 1409-B.

TUESDAY, OCTOBER 23

Progress in Light Ion Fusion*—Dr Paul Mix, Sandia National Laboratories. Plasma Fusion Center Seminar Series, 11am, Rm NW17-218.

UNIX for the Macintosh*—Jay McSweeney, Apple engineer. Information Systems Noontime Seminar demonstrating AUX 2.0, Macintosh's UNIX operating system, 12-1pm, Rm 9-150.

Total Force Policy*—Frank A Tapparo, Office of Assistant Secretary of Defense. Sponsored by the Defense and Arms Control Studies Program, 3-5pm, Rm E38-715.

Eating, Weight Gain, and Mood: Why You're Going to be Fatter at the End of the Fall Term Than You Were When You Got Here—Judith Wurtman, MIT.** "MIT. In Reality: Today's Issues, Tomorrow's World," a seminar series co-sponsored by the Context Support Office and the Undergraduate Association, 4pm, Rm 6-120. Refreshments, 3:30pm.

Panel discussion on Central Asian migration*—Thomas Barfield, Boston Univ. Sponsored by the Center for International Studies, Inter-University Seminar on International Migration, 4-6pm, Rm E38-615. Refreshments.

Medium Scale Integration of Optoelectronic Devices—P J Anthony, AT&T Bell Laboratories.** VLSI Seminar, 4pm, Rm 34-101. Reception, 3:30pm.

Analytical Models for Unsteady Losses—Gerd Fritsch, MIT.** Gas Turbine Laboratory Seminar, 4:15pm, Rm 31-161. Refreshments, 4pm.

The Quest for Omega: Comparison of Density and Peculiar Velocity Fields—Amos Yahil, SUNY Stony Brook.** Astrophysics Colloquium, Center for Space REsearch, 4:15pm, Rm 37-252. Refreshments, 3:45pm.

Architecture and the State: Entertaining Dreams, Metaphores, and Symbols in Design—Jerome Sirlin, stage set designer.** 7:30pm, Bartos Theater. Reception to follow.

WEDNESDAY, OCTOBER 24

Achieving High Optical Interconnection Bandwidths and Densities Using Optically Powered OEIC's—S R Forrest, Univ of Southern California.** EECS/RLE Seminar Series on Optics and Quantum Electronics, 11am-12pm, Rm 34-401B.

Technical Findings Underlying the Challenger Disaster*—Gene Covert, MIT, member of the Challenger Commission. MIT Seminar on Technology, Defense, and Arms Control in a Changing World, 12-2pm, Rm E38-714. Bring a lunch, drinks provided.

Tour of the Internet*—Joanne Costello, Network Services. Information Systems Noontime Seminar introducing the basic concepts of this international network and the services and resources available to you. 12-1pm, Rm 37-252 (Marlar Lounge).

VDT Safety*—Donald Haes, MIT Associate Radiation Protection Officer. Information Systems Noontime Seminar discussing the issues of working with computer video display terminals, including current scientific findings. 12-1pm, Rm E40-298.

Rose Lunchbox Series—**Sponsored by the Center for Real Estate Development, 12pm, Rm W31-301. More info: x3-4373.

A New Kind of Resonance of Internal Waves*—Dr Benoit Cushman-Roisin, Dartmouth College. Oceanography Sack Lunch Seminar, 12:10pm, Rm 54-427.

The New Road: Ocean and Naval Engineering in the 1990s*—Susan M Lee Bales, Science Advisor to the Chief of Naval Operations. Ninth Robert Bruck Wallace Lecture, sponsored by the Dept of Ocean Engineering, 3pm, Rm 9-150.

Modes of Continental Lithospheric Extension*—Dr Roger Buck, Lamont-Doherty Geological Observatory. Sponsored by the Dept of Earth, Atmospheric, and Planetary Sciences, 4-5pm, Rm 54-915.

On the Physics of Lower Hybrid Wave Absorption in Tuman-3*—Victor Golant, Ioffe Institute, Leningrad. Plasma Fusion Center Seminar Series, 4pm, Rm NW17-218.

THURSDAY, OCTOBER 25

Word for Windows*—Jean Grobe, Microsoft. Information Systems Noontime Seminar, demonstrating this new powerful and easy to use word processor that has recently been making news, 12-1pm, Rm 37-187.

Writing Clinic - Editor's Tools*—IS editors Steve Csipke, and Robyn Fizz, will discuss tools available to help you brush up on basic editing and publications skills. The focus will be on useful print references rather than electronic tools, 12-12:30pm, Rm 1-203.

The Health of the Ocean, or Boston Harbor is not the Sargasso Sea—John A Knauss, US Dept of Commerce.** 18th Annual MIT Sea Grant Lecture, 3-4pm, Rm 9-150. Reception following. RSVP x3-7041.

The Design of Design Procedures—Steven Eppinger, MIT.** Sponsored by the Laboratory for Manufacturing and Productivity, 3-4pm, Rm 35-520.

Communications and the New Europe—R Michael Tyler, Booz, Allen & Hamilton; Klaus Grewlich, Deutsche Bundespost-Telekom; Representative from European Commission.** Sponsored by the MIT Communications Forum, 4-6pm, Bartos Theatre (E15-070).

Extinction, Stabilization, and Flammability in Combustion Systems—C K Law, Princeton University.** Hotel Lecture Series, Sloan Automotive/Gas Dynamics Laboratories Seminar Series, 4-5pm, Rm 31-161. Refreshments, 3:45pm.

Dissipative MHD Evolution of High Beta Tokamaks in the Second Stable Regime*—H R Strauss. Plasma Fusion Center Seminar Series, 4pm, Rm NW17-218.

Black Holes at the Centers of Galaxies—Jeremy Goodman, Princeton.** Physics Colloquium, 4:15pm, Rm 10-250. Refreshments, 3:45pm, Rm 26-110.

FRIDAY, OCTOBER 26

Railroads and Information Systems: A View of the Future*—James Drogan, Sr Industry Marketing Representative, IBM. Center for Transportation Studies Luncheon Seminar Series, 12:45-2pm, Rm 10-105. Luncheon (optional), 12-12:45pm, \$2/students, \$5/non-students.

Adsorbent Heterogeneity and Mixed Gas Adsorption—Shivaji Sircar, Air Products and Chemicals, Inc.** Sponsored by the Chemical Engineering Dept, 3pm, Rm 66-110.

Combustion Research at the Institute for Thermodynamics at the Technical University of Munich—Messrs R Beauvais and G Strube.** Sloan Automotive/Gas Dynamics Laboratories Seminar Series, 4-5pm, Rm 31-161. Refreshments, 3:45pm.

Improved Confinement Regimes in Tuman-3*—Victor Golant, Ioffe Institute, Leningrad. Plasma Fusion Center Seminar Series, 4pm, Rm NW17-218.

■ READINGS

Poetry at the Media Lab*—Oct 18: Sharon Olds. Sponsored by the MIT Council for the Arts and MIT's Literature department. 7:30pm, Bartos Theatre. More info: x3-0312.

■ COMMUNITY INTEREST

AARP—Oct 23:** "How to go About Filing a Power of Attorney on Health Care," by Dana Gallup, attorney from Cambridge. Sponsored by the MIT Cambridge Chapter of the American Association of Retired Persons, 5:15-7pm, with refreshments at 4:30pm, Twenty Chimneys, Stratton Student Center.

Alcoholics Anonymous (AA)—**Meetings every Tues, 12-1pm; Thurs, 12-1pm, Rm E23-364. For info call Alice, x3-4911.

Al-Anon—**Meetings every Fri, noon-1pm, Health Education Conference Rm E23-297; every Tues, noon-1pm, Rm 1-246; and every Mon, 12-1pm, Lincoln Lab Bldg 1218, Family Support Ctr. The only requirement for membership is that there be a problem of alcoholism in a relative or friend. Call Alice, x3-4911.

Alcohol Support Group—**Meetings every Wednesday, 7:30-9am, sponsored by MIT Social Work Service. For info call Alice, x3-4911.

MIT/DL Bridge Club—Oct 23:** Special Jubilee Banner exhibiting some 30 pages of historical events, in celebration of the 25th anniversary of the Club. Early members and participants are especially invited, come and see the Banner contents and participate in a duplicate bridge game. 6pm, Rm 491 Student Ctr. Refreshments.

Co-Dependents Anonymous (CoDA)*—Meetings every Thurs, 6:30-8pm, Rm 66-144. Info: Alice, x3-4911.

Graduate Student and Postdoc Parents Support Group*—Co-leaders: Dawn Metcalf, MIT Social Worker, and Rae Goodell, MIT Coordinator of Parent Programs. Ongoing, meets weekly. Info: Dawn Metcalf, x3-4911, Rm E23-344, or Rae Goodell, x3-1592, Rm 4-144.

Informal Embroidery Group—**MIT Women's League. Fall schedule: Oct 17, Nov 7 & 21, Dec 12, 10:30am-1:30pm, Rm 10-340. Info: x3-3656.

Boston Mutagenesis Group*—Meetings are held the first Wednesday of the month in the 6th floor conference room, E17, 7pm. Speakers from MIT, Harvard and other local schools discuss their research; related topics include mutagenesis, carcinogenesis, cellular repair systems and DNA damage in prokaryotic and eukaryotic cells. Info: Kara Best x3-6729.

Narcotics Anonymous*—Meetings at MIT, every Mon, 1-2pm, Rm E23-364 (MIT Medical Dept). Call 569-0021.

Overeaters Anonymous (OA)*—Meets Thurs, 1-2pm, Rm E23-364. Only requirement for membership is the desire to stop eating compulsively. Info: Alice, x3-4911.

Office Workers Issues Group—**Women's Forum informal support staff meetings, Wed, 12:10-1pm, Rm 8-219. Bring your lunch; network or talk about office worker's issues.

Parenting Programs*/—Oct 22-Dec 17:** "Active Parenting of Teens," co-led by Myra Rodrigues, MIT Medical Dept, & Rae Goodell, MIT Coordinator of Parent Programs, Mondays, 12-1:30pm, Rm E23-364. Preregistration and \$15 book purchase required. **Oct 23-Dec 11:** "Without Spanking or Spoiling: Discipline from Age One Through Five," Rae Goodell, MIT Coordinator of Parent Programs, Tuesdays, 12-1:30pm, Rm 4-152. Preregistration and \$9.95 book purchase required. **Oct 25:** "Children in Day Care: Its Effects on Child Development," Kathy Simons, MIT Child Care Office, 12-1:30pm, Rm 6-233. Sponsored by the MIT Child Care Office. More info: x3-1592.

Wives' Group—Oct 17:** "What to Visit in the Boston Area and How to Find Out About It," by Tunie Hamlen, New England Sights. **Oct 24:** "A Tour of MIT For Spouses." Meet in the Atrium, Bldg E25, 23 Carleton St. Meetings are from 3-4:45pm, Rm 491 Student Ctr. Babysitting in Rm 407. All women in MIT community welcome. Info: x3-1614.

■ HEALTH EDUCATION

Child Care Briefings*—Oct 24, Nov 7, 21, Dec 5, 19: Introductory seminars repeated every two weeks on Wednesdays for men and women seeking general information about Boston-area child care options and issues. 12-1:30pm, Rm 4-144.

Nursing Mothers' Support Group—**Pregnant and breastfeeding women at MIT meet to gain confidence and share info and practical tips. First Tues of each month, 10-11am and third Weds of each month, 4-5pm, Rm E23-297. Babies welcome. Info: Margery Wilson 868-7218.

Working Mothers Support Group—**An ongoing support group that meets to discuss parenting-related issues in a casual atmosphere. Meets every other Wednesday, 12-1:30pm (drop in anytime), Rm E23-364. Info: Janette Hyde x3-4290.

Focus on Health—Oct 22:** "Making the Most of Your Health Care Choices." Connie Bean. 12-1:30pm, Rm 10-340. A Series for Women sponsored by the MIT Women's League. Brown bag your lunch, beverages will be provided. More info: Cleo Schimmel, 621-0322.

■ MITAC

Ticket locations and hours: Tickets may be purchased at the MITAC Office, Rm 20A-023 (x3-7990), 10am-3pm Monday-Friday. Lincoln Lab sales in Rm A-218, 1-2pm Tuesday-Friday. Friday ticket sales in Lobby 10 and E19, 12-1:15pm. Further details on events are included in MITAC's monthly flyer. To avoid disappointment, make reservations and purchase tickets early. Because MITAC is nonprofit, refunds are not available.

MITAC, the MIT Activities Committee, offers discount movie tickets for General Cinema (\$3.75/ea) and Entertainment Cinema (\$4/ea). Tickets are good 7 days a week, any performance. Showcase tickets (\$4.25/ea) are valid Monday-Thursday only. Loew's Discount Tickets have arrived, \$4/ea (not valid the first 2 weeks a new movie is released).

Jacques Brel is Alive and Well and Living in Paris—Oct 18: Hasty Pudding Theatre, 8pm, tkts \$22.50/ea (reg. \$25).

Charlie Prose at the Danversport Yacht Club—Nov 1: Bus lvs Hayward Lot at 5:15pm, dinner served at 7pm, show begins 8pm, bus arrives Hayward Lot ~10pm. Tkts \$39/pp, must be purchased by Oct 18.

Auto Show—Nov 3-12: Bayside Expo Center, tkts \$5/ea (reg \$7).

Woman in Mind—Nov 8: A comedy at the Lyric Stage, 8pm, tkts \$12.50/ea (reg. \$14.50), must be purchased by Oct 25.

Big Band Swing Weekend at the Mill House Inn—Nov 10-11: Round-trip bus, 1 night's lodging, welcome reception, champagne, dinner followed by Big Band music, ballroom dancing lessons, continental breakfast, champagne brunch, & more. Bus lvs Hayward Lot 9am Sat, returns 6-7pm Sun. \$117/pp/dbl occup. reserve by Oct 29.

Dance Theatre of Harlem—Nov 16: Wang Center, 8pm, tkts \$29.50/ea (reg \$32).

Thanksgiving Preparations at Old Sturbridge Village—Nov 18: See how families during the 1830s celebrated the holiday. Bus leaves Hayward Lot 9am, returns ~5:15pm. Cost: \$22/adult; \$17/child (ages 6-15); \$12/children under 6.

Tired of automotive woes? Discount coupons now avail for Merchants Tire & Car Care, 10% off all reg automotive svcs, 5% off all regular priced tires. Avail in MITAC office.

Massachusetts Institute of Technology



Report of the President 1989-90

It has been an extraordinary year. In Eastern Europe and the Soviet Union, the political order underwent changes that not only caught the world by surprise, but also seem to be as deep as they are far-reaching. In South Africa, the government and the people have begun, in the midst of tragic turmoil, to take some steps that could lead to the end of apartheid and to the enfranchisement of the majority. In the Arab world, a brutal act of aggression has changed fundamentally the order of things: a change whose consequences will be far reaching and quite beyond estimation. In this country, people, and young people especially, once again raised the banners of political action for human rights — for women, gays, people of color, and people with AIDS. And we, and neighbors around the globe, began to see the planet as our mutual home, one in drastic need of repair and exacting maintenance.

At MIT, the impact of these issues came right in, as it should. This place, much more than most, has to be of the world and therefore must take explicit recognition of these profound changes on the world scene. It has been our tradition to do so. Indeed, it is our mission to do so.

This year, as I reflect on the ten years of my presidency, I do so against the background of this turbulent period. Further, if I were to take the present moment as a predictor of the next decade, I would say that increasingly we will see politics, economics, and environmental issues at virtually any point on the globe bearing in significantly on other lands and other peoples. And I would say that MIT will be in the thick of things — for that is what we are all about.

At the time of my inaugural, I outlined what I saw to be the major challenge for MIT in the 1980s — and that was to forge educational and research programs that anticipated and responded to the social, political, and economic conditions of the coming years and, indeed, the coming century. Meeting that challenge, I said, required that we both preserve MIT's historic intellectual focus, with its insistence on excellence, and also transform our programs to meet the needs of the future.

The Elements of Excellence

Ten years later, I would say that the elements of excellence remain the same. These elements begin, of course, with a remarkable faculty and an extraordinary group of students. We are a culture that recognizes and rewards high achievement and, what is more expects it. Accordingly, we do our utmost to provide the setting, the resources, and the encouragement for all associated with MIT to do their best and to be their best. And they do: for a creative, entrepreneurial spirit permeates this place, as does a sense that what happens at MIT makes a difference in the world. These values and conditions must be preserved; they are our bedrock. But it is not easy to maintain excellence in this time of uncertain resources for research, of diminished federal aid to needy students, and of growing public concern and skepticism about the costs, the benefits, and even the values of private higher education.

First among the challenges to sustaining excellence are those things intimately connected to attracting and keeping the best faculty. Many of the faculty who came to MIT and sister institutions in the period of rapid growth following World War II are, or soon will be, retiring. We and other universities will be seeking their successors at a time when fewer people are preparing for faculty careers than are needed to meet the future demand. Accordingly, our ability to continue to attract world-class faculty will depend in the first instance on our ability to be competitive in salaries. It will depend relatedly on our ability to recognize the constraints and the difficulties posed by dual careers, and, quite possibly, it will depend on our ability to help faculty find and afford housing in the high-cost Boston market. Finally, and ultimately, it will depend on our ability to provide an environment in which education and research can proceed with maximum vigor and effectiveness.

Second, and coupled very importantly to the quality of the faculty, are those issues related to attracting the very best students and to providing them with both the education and the support outside the classroom and laboratory — housing, counseling, health services, and opportunities for relaxation and recreation — that will insure their success. Above all, we must provide adequate financial aid. Nearly 2,500 — some 57 percent — of our undergraduates, received financial assistance from the Institute or from other sources this past year. In 1990-91, with the price of tuition, room and board at \$20,700, the average need for those students will be \$15,500 per year. This need, which includes self-help, will be met from a variety of sources, including increasing amounts from the Institute, from its alumni and alumnae, and from friends.

In regard to student aid, I would note in particular two significant and continuing trends during

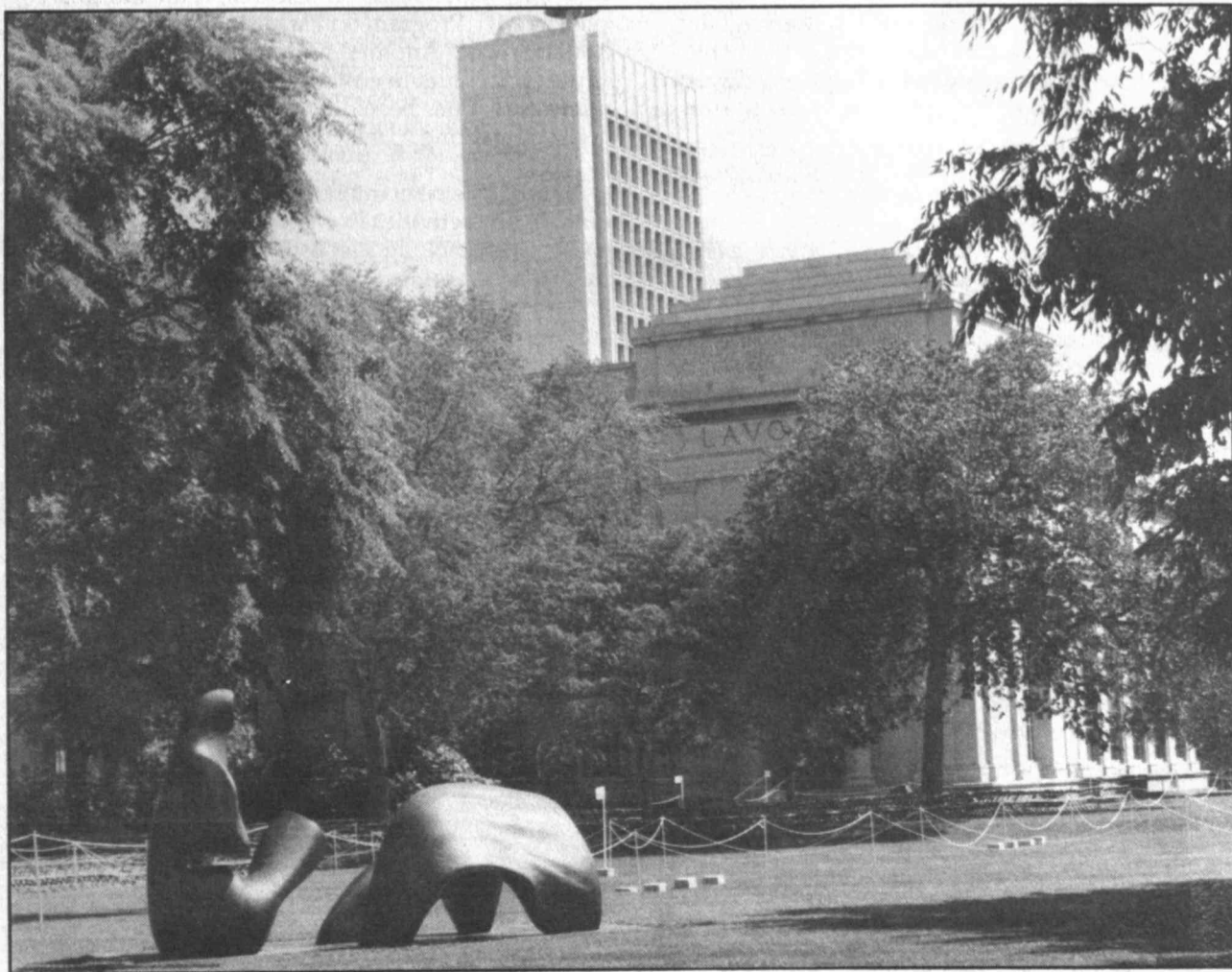
the past decade. The first is the decline in the federal share of the scholarship grants awarded to MIT undergraduates. In 1980-81 that share was 32 percent; by 1989-90 it had shrunk to less than 13 percent. The second is the increase over the past decade in the Institute's own annual commitment of unrestricted funds — that is, funds in addition to those provided from the endowment — that were allocated to undergraduate scholarships. These increased from \$1.5 million in 1980-81 to \$9.6 million in 1989-90.

Clearly, financial aid for our undergraduates, and our determination to raise it from the private sector, simply must remain a priority if we are to bring to MIT the very best young men and women of each generation.

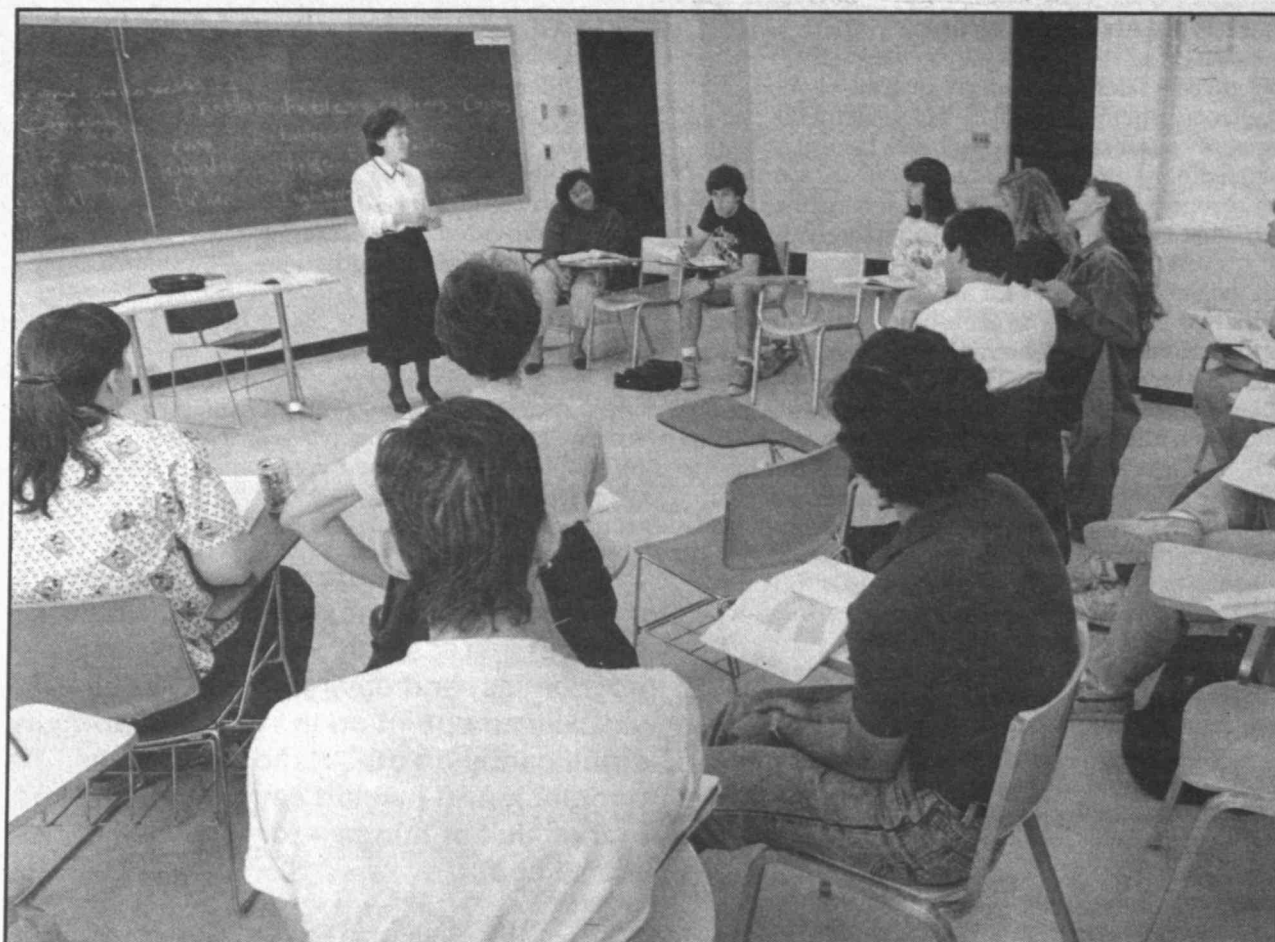
... if I were to take the present moment as a predictor of the next decade, I would say that increasingly we will see politics, economics, and environmental issues at virtually any point on the globe bearing in significantly on other lands and other peoples. And I would say that MIT will be in the thick of things — for that is what we are all about.

In regard to graduate students, our ability to attract outstanding young men and women depends equally critically on the availability of financial support in the form of research assistantships, teaching assistantships, fellowships and traineeships. In the last four decades much of this support has been provided through programs of the federal government which recognized explicitly the importance of graduate education to our national and global well-being. Unfortunately, that federal mandate has weakened to a distressing degree. For example, during the twenty-year period from 1969 to 1989 federally funded graduate fellowships and traineeships declined drastically — from a peak of about 60,000 to fewer than 14,000. That massive decrease was only partially offset by a modest increase in the availability of research assistantships. In light of that pattern, it is hardly surprising that the number of U.S. citizens pursuing doctoral level education in engineering and the physical sciences declined markedly during this period, to the great detriment of the country's economic competitiveness and of other national goals.

Despite these changes in federal support, MIT's own graduate programs have remained strong. During the past academic year (excluding the summer), MIT generated or processed nearly \$85 million of graduate student support. But more than two-thirds of this amount was in the form of assistantships, with less than 9 percent coming as federal fellowships and traineeships. These latter



Linda C. Marinilli



Bradford F. Herzog

types of support enable graduate students to take the necessary time to focus their academic interests before choosing a thesis topic, something not so easily done when one's support is coming from a specific research grant. Obviously, a decreased dependence on research funding, coupled with an attendant increase in fellowship support, could add significantly to the quality of student and faculty life and help ensure the continued excellence of graduate education at MIT.

Students and faculty do represent, then, the two elements of excellence that combine to make the fundamental excellence that is MIT. We cannot have one without the other, and if we don't have both we will have neither. It is often said that good students come here because of the opportunity to be taught and to work with our remarkable faculty, and that is surely true. But it is equally true that superlative faculty choose to come here because of the opportunity to interact daily with students of such outstanding quality as MIT's. These are the two indispensable determinants of the Institute's future. Because of them, I finish my term with the abiding conviction that there is no other place in the United States, indeed no other place in the world, better able than MIT to develop and sustain excellence.

Institutional Challenge and Renewal

And what of those things that ten years ago I felt needed to be changed? My agenda for institutional renewal then included the need, as I saw it, to:

- Rededicate science and technology as socially powerful activities
- Pay renewed attention to the pace, coherence, and intellectual impact of undergraduate education
- Improve the human environment and sense of community of MIT.

At the time, with the five-year *Leadership Campaign* coming to a successful conclusion just three months before my term began, I also naively deluded myself into thinking that I would be the president who held office between major fundraising campaigns. It was not to be, and fundraising became a major challenge: not only with the launching of the *Campaign for the future*, but also with the recognition that fundraising in private universities has of necessity become an ongoing, intensive enterprise involving the faculty and senior officers as well as a professional development staff and a large core of dedicated volunteers.

Rededicating Science and Technology as Socially Powerful Activities

At my inaugural in September of 1980 I stressed, as I looked ahead, that science and technology should be rededicated "as socially powerful

activities", that they might serve the nation and the world even more effectively. In the past decade, in addition to the many basic advances achieved throughout the Institute, we have seen a special strengthening of interest and activity in the MIT tradition of socially useful education and research. Over the decade there have been, for example, a number of major initiatives focussed on economic competitiveness, including in particular the landmark study by the MIT Commission on Industrial Productivity, which was reported in the widely acclaimed book *Made in America: Regaining the Productive Edge*.

The Schools of Engineering and of Management, to cite a related example, recently graduated the first students in their collaborative Leaders for Manufacturing program, which is designed to produce for U.S. industry a new generation of skilled managers with strong engineering backgrounds. These two schools are collaborating also in developing a New Products Program, which is intended to contribute to the understanding of successful product design and to work directly with industry to educate students in the fundamentals needed by industrial product teams.

Throughout the decade there has been also growing interest and activity in the environment and in waste control and management. One example, with a focus on research, is the interdisciplinary MIT Program on Hazardous Substances Management. Another, with a focus on education, is the curriculum in environmental engineering sciences that has been developed by the faculty in civil engineering.

There have been interesting initiatives in areas outside our activities in engineering and science as well. These include, just by way of example, the new degree program in real estate development, and additional support for our program for professional science writers, which is intended to strengthen their ability to explain developments in science and engineering to the public. There is also an expanding interest at MIT in science education at elementary and high school levels, as evidenced by increasing faculty and student activities in local area schools. These range from summer seminars for high school teachers run by MIT faculty to student tutorials designed to explain and demonstrate scientific principles.

There is also at MIT a variety of new programs of international dimensions. Just one recent example is the interdisciplinary Center for Global Change Science, which focuses on the scientific questions, such as stratospheric ozone levels,

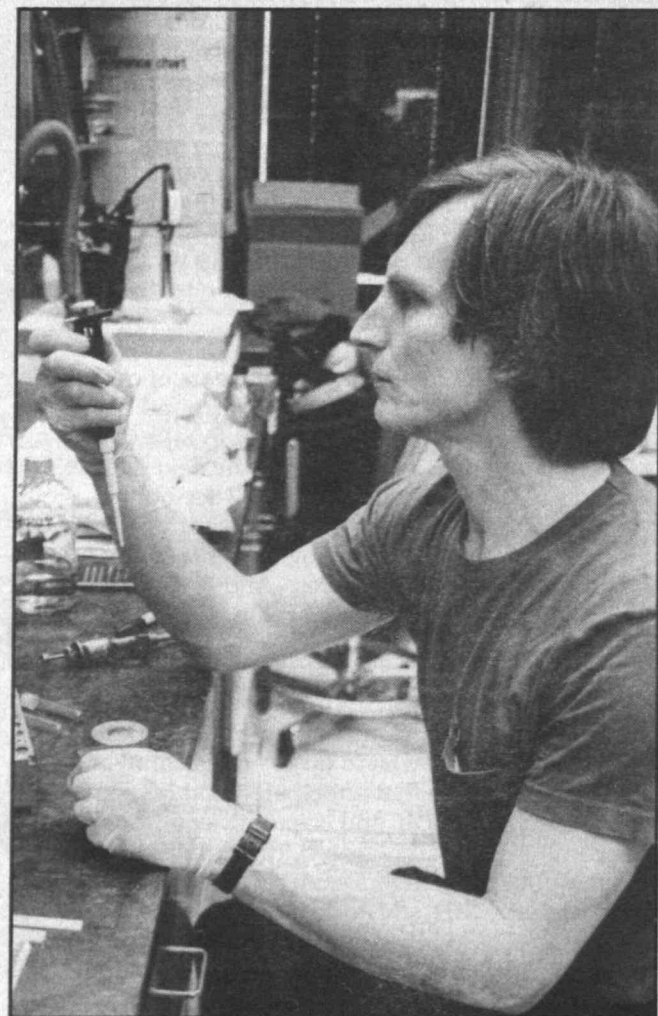
We have seen a special strengthening of interest and activity in the MIT tradition of socially useful education and research.

Students and faculty do represent, then, the two elements of excellence that combine to make the fundamental excellence that is MIT... These are the two indispensable determinants of the Institute's future.

involved in predicting possible changes in global environment. There are many other programs and activities that grow out of the international character of MIT. The Institute has always been such, of course, and one need spend only a few days here or watch the graduates as they receive their degrees to understand that our student body, in particular, is an international community. This past year, in fact, more than 2,000 of our students, over one-fifth of the whole, were citizens of other countries. And more than 1,100 international scholars from sixty-three countries visited — and these are only the formally recorded visits — virtually every department, laboratory and center at the Institute.

But the considerations and the forces which grow out of our international dimensions are changing. Global politics, global economy, and especially the global environment are all signs of times to come. This is true not only for our graduates but for MIT as an institution. We have an international perspective in our approach to education, and in our research programs we are dealing increasingly with issues which are fundamentally international in character. The issue of global climate change, to which I have just referred, is a fine example of that. Whatever conclusions we come to about the significance of the greenhouse effect, and of the time scales and consequences of global warming, one thing is certain — and that is that there are no solutions to these problems unless they are global in character. They must be addressed on a worldwide basis, and MIT will play an important role in this and other major issues that are international in character and significance.

As the vision of one world moves ever, and inexorably, closer to reality, there has been in some quarters over the past decade in the United States a growing and troubling parochialism. The antidote to the hurtful aspects of this movement, especially insofar as it impacts adversely on MIT and other research universities, must come from a renewed assessment of the many issues involved. Accordingly, the provost and I have commissioned a faculty group to undertake a "Study on the International Relationships of MIT" to help us better understand and come to grips with the role of MIT as a player on the world stage.



Robert Newman

Pace, Coherence, Intellectual Impact of Education at MIT

Education — particularly undergraduate education — is at the center of MIT. I felt ten years ago, and I believe today, that we need to keep a special focus on our undergraduate educational programs. I say that in full recognition that MIT is an institution with multiple missions — undergraduate education, graduate education, research, public service. All are important, but our central purpose is related to undergraduate education, and our undergraduate students are a continuous renewing force for the institution and for everyone associated with it. Eighteen-year-olds, when they come here, are open — and extraordinarily so — to new ideas, to new challenges, to new initiatives. They come with a kind of openness and wonderment and willingness to try new things which is almost indescribable. Each year, in late August, when the freshmen arrive on this campus, the electricity is palpable. These youngest students are not only a continuous renewing force, but they are, fundamentally, the intellectual glue that holds together this institution of five schools and twenty-two departments and countless interdepartmental laboratories and centers.

The significance of the Institute's commitment to undergraduate education and the significance of the undergraduates as the cohesive force for MIT was clearly recognized and applauded in the report of an evaluation team representing the New England Association of Schools and Colleges that reaffirmed the Institute's undergraduate degree accreditation, following a visit here last fall. Commenting on the academic program, that report said:

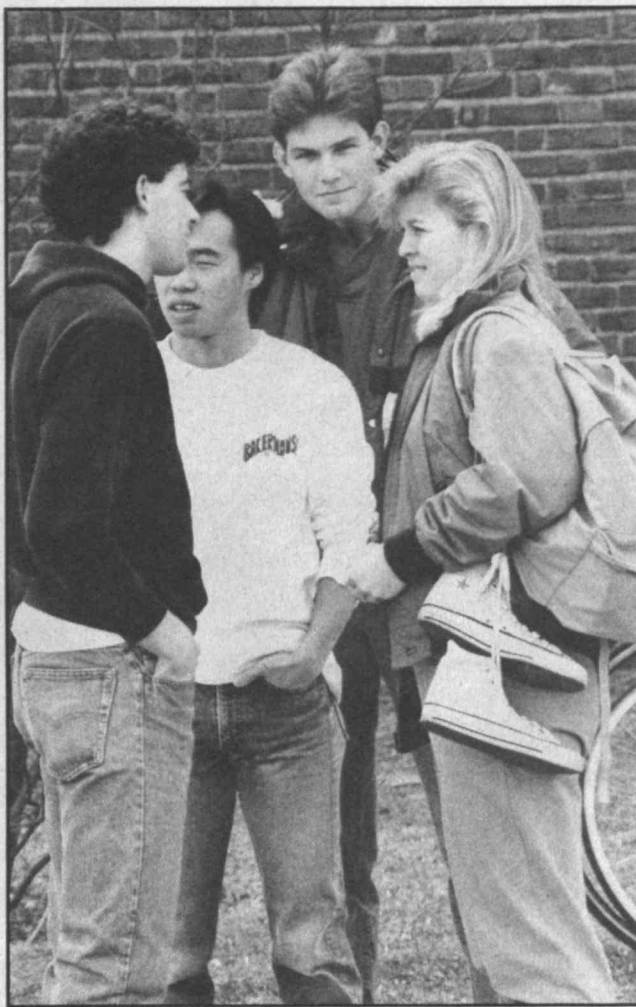
MIT provides an undergraduate education remarkable for its rigor, its demands, and its quality. Its undergraduate students are motivated, talented, industrious, and loyal to their institution, sharing a sense of satisfaction and pride in meeting and matching the demanding requirements of the faculty. They enjoy MIT and are its strongest advocates.

We are impressed, too, by the dedication of many members of the faculty, administration, and professional staff to whom we spoke, and their deep sense of concern for the quality of the undergraduate experience.

In the last few years, the MIT faculty has paid particular attention to the curriculum, to grading, and to the context — in and out of the classroom — in which education occurs. Those efforts that have focussed on review and revision of the undergraduate curriculum have been particularly intense. They are ongoing, and are far from finished. But significant steps have been taken. As examples, and only by way of illustration, I would cite the strengthening of our educational opportunities outside of science and engineering by the major revision in the General Institute Requirements in the humanities, arts, and social sciences; the further development of Athena, our system of high-powered workstations for educational enhancement; the integration of the Writing Requirement into the curriculum; the decision by the faculty to establish a sequence in modern biology as part of the General Institute Requirement in science; and the appointment, for the first time, of an associate provost for the arts in response to the strong recommendation of a faculty committee.

All of these steps, and others, have been intended to help create the richer educational environment which many of us believe will be required for undergraduates who will come into their prime early in the new century. The structure of undergraduate engineering education in particular, at MIT and elsewhere, is quite generally considered to be overconstrained. In looking toward reform, the MIT Commission on Engineering Education has stressed that

Undergraduate education in engineering should prepare its graduates for leadership in technology, for professional excellence, and for rich lives of learning and reflection, through education in science and engineering with an emphasis on fundamentals, in essential partnership with the social sciences and the humanities, for the advancement of engineering and the betterment of society.



Trina Arnett

Yet in all of these developments we are neither moving toward nor seeking to become a general university. We intend to remain true to our founding mission, by which we were established "for the advancement and development of science and its application to industry, the arts, agriculture, and commerce." But a new era will require a new breed of technologist, a new breed of alumnus, and in our undergraduate education we must do our best to anticipate those requirements and prepare our students not only for productive and rewarding careers in a new century, and in a new world, but also for a lifetime of independent and integrated learning and intellectual self-renewal.

As we think about the intellectual content of the undergraduate program, we need to have some cautions in mind. If there is one thing that I believe has not changed for the better in the past ten years, it is what has been called the pace and pressure of the place. There is still a kind of breathlessness in the undergraduate educational process, and, for that matter, in the graduate process as well. We all seem to have a tendency to try to do one more thing, take one more course, squeeze in one more activity, and place too little value on what can be learned from relaxing a bit, from learning a little more from one's colleagues and peers, and from taking the pace a little slower. While I have talked for ten years about the notion that we would all be better off if we could turn the throttle back a bit, I have gotten very little resonance on that. That is an unresolved and significant issue related to the quality of the lives of most of us who study and work here. It needs to be continually thought about and, to the extent possible, addressed.



Bradford F. Herzog

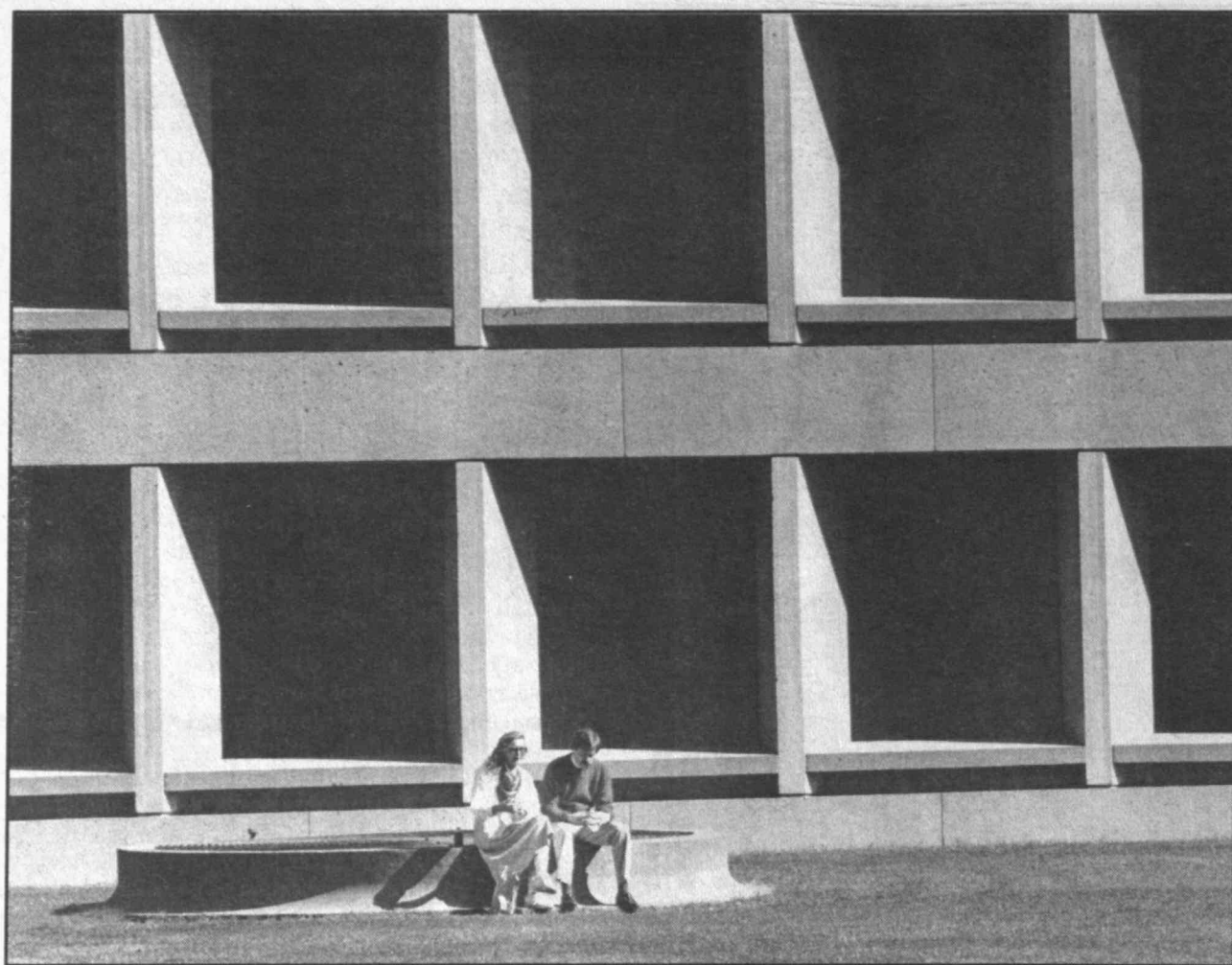
... a new era will require a new breed of technologist, a new breed of alumnus, and in our undergraduate education we must do our best to anticipate those requirements and prepare our students not only for productive and rewarding careers in a new century, and in a new world, but also for a lifetime of independent and integrated learning and intellectual self-renewal.

Quality of Life and Making a Pluralistic Community Work

As we enter this last decade of the twentieth century, we are all aware that higher education is about halfway through a continuous twenty-year decline in the number of young people coming of college age. When that age population begins to increase again at the beginning of the next century, the social and racial mix of the cohort will be enormously different from what it was in the 1960s and 1970s. It has been said, indeed, that the twenty-first century will be the first post-European century in American history. That is, an absolute majority of young people born in the United States will be born of parents of other than northern European background — whether Asian, or African, or Hispanic. That will represent a major change in the character of our society and will be reflected as well in the mix of young people who attend college. Considering that, we need to recognize also that we have not been very effective, until the last few years, in reaching out to those portions of the population who are not of the historically dominant ethnic background in this country.

Mirroring in part our changing society, MIT undergraduates have changed in these past years from a majority of white males to a student body where no single group dominates. All today are minorities. Racial-ethnic minorities have become in the aggregate more than 40 percent of the freshman class, compared to 18 percent in 1980. At the start of the decade, fewer than one in five of our undergraduates were women, compared to one in three today. And white males are now 36 percent of the undergraduate student body as compared to 60 percent a decade ago. In the graduate school and on the faculty, however, white males still predominate overwhelmingly; and it is clear that major efforts are required on many fronts to increase the numbers of women and, especially, of minorities in these constituencies.

We need the resolve to contribute to a climate of mutual respect and affirmation of each person's dignity and humanity as well as of our own. Put simply, mutual respect matters. And it will be absolutely essential to making our evolving pluralism work even better than it does.



Bradford F. Herzog

Nonetheless, we are becoming a more diverse community, and we need to pay particular attention, therefore, to fostering civility, mutual respect, and a shared sense of purpose. That was easier in earlier times, perhaps, when our mission was more tightly focused and the population was less diverse. Today there is a more pressing challenge for all — faculty, students, staff — to strive to learn from and live in harmony with people whose experience, outlook, talents, and expectations may be very different from their own and different from the historical character of MIT.

To understand and accept others as they are, we need the capacity to eschew stereotypes and prejudice and to examine critically our own systems of values. For our students especially, this is the essence of growth and development. We need the resolve to contribute to a climate of mutual respect and affirmation of each person's dignity and humanity as well as of our own. Put simply, mutual respect matters. And it will be absolutely essential to making our evolving pluralism work even better than it does.

Enhancing and Securing the Financial Foundation of MIT

I turn now to matters related to enhancing and securing our financial foundation. Securing that foundation is complicated by the fact that MIT's operating budget, left to itself, continuously grows out of balance. The reasons for that, which I have discussed on many occasions with the various constituencies of the Institute, are the limits on our income streams. This unstable state of our basic financial structure has been the rule for the nineteen years that I have been involved in the oversight of the operating budget. And we have not, any of us, over this long period of time discovered how to deal with the budget in a way that did not leave it subject to fragile balancing, and subject to growing out of balance. To fix this problem in a manner that has some permanence will require an invention that we haven't yet found. In the meantime, we must attack the problem with a planning and budgeting process of unrelenting vigor.

Almost everything we face — problems and opportunities alike — can be denumerated, of course, in dollars. The cost pressures, especially those most critical to our ability to support our faculty and students, are enormous. The pressures on faculty salaries and those associated with student aid create constant cost imperatives, as I have already noted. At a place like MIT we also have the permanent obligation to support new academic enterprises, for doing some things this year that we didn't do last, to keep in the forefront of what Vannevar Bush called "the endless frontier" of science and engineering.

We have, in addition, basic requirements for classroom and laboratory renewal and for occasional expansion of the physical plant, in a time when there is no longer any significant federal support for our necessary infrastructure. To help meet our most urgent facility needs we have employed a variety of approaches in recent years — such as the novel organizational arrangement with the Whitehead Institute for Biomedical Research, renovating and recycling an old manufacturing building for graduate student housing, and giving special priority in our capital campaign to our indispensable need for a new biology building.

The lack of a national policy for a federal role in the building of academic research facilities has led to the growing practice of earmarking or otherwise allocating construction funds on bases often totally unrelated to the scientific merit of the project. Both directly and indirectly that is a cost to science. The federal government has also added in other ways to the cost squeeze on our universities, most notably in its constant drive to provide less, and sometimes considerably less, than full reimbursement for the expense of research.

That is perhaps inevitable in the present political climate, and it's undoubtedly going to continue. I find no policymaker in Washington who will agree anymore to the proposition that the government should pay the full cost of the research that it sponsors. One way or another, these legitimate expenses are going to be discounted and capped, to the impairment of the health of our universities. Even more regrettably, there is today a querulous tone to academic relations with Washington that has changed the character of the association and diminished its effectiveness. This is a radical change from the years following World War II, when a government-university partnership began that brought to full flower the country's unsurpassed system of higher education and its world leadership in science and technology. We need to rebuild both the sense and the substance of that old partnership.

The Congress is struggling, as we are all aware of course, with the important and seemingly intractable budget deficit. And it seems unable, or at least finds it very hard, to support the proposition that investment in higher education, including research and student financial aid, is truly an investment in the long-term national interest that ought to be regarded differently from all those other things it is concerned about in trying to balance the budget.

Happily, MIT alumni and friends in the private sector subscribe to the concept of investment and, as a result, the progress of the *Campaign of the future* has been truly astonishing. Indeed, driven by the enthusiasm and generosity of MIT's donors

In trying to address at MIT the many educational issues and intellectual opportunities of the last decade, I have tried to maintain that delicate balance between preservation and transformation.

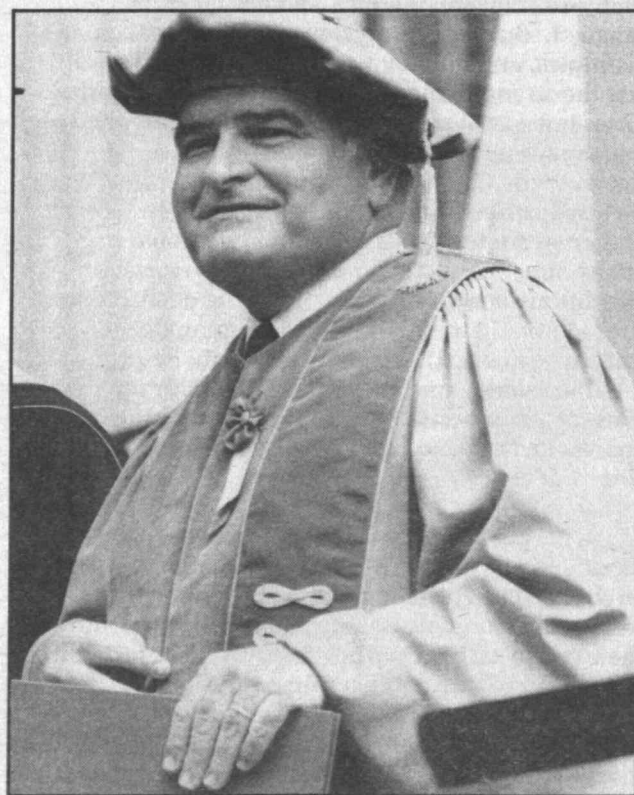
and volunteers, the *Campaign* has achieved such a rapid rate of success that in March of 1990 the Corporation voted to raise its goal from \$550 million to \$700 million, a 27 percent increase. And by the end of the 1990 fiscal year, the campaign total had reached \$517 million, with a number of important new records established. These included the \$103 million in cash and securities and the more than \$16 million raised by the Alumni Fund — both new highs for one year.

While the campaign goals have been increased, in light of this heartening record, the priorities themselves are little changed from those set down at the start of the drive in October of 1987. Increasing MIT's overall endowment remains a most critical aim. The priorities, as revised, fall into five areas: Faculty chairs, \$110 million; Student Support, \$120 million; Academic Programs, \$300 million for a wide range of areas such as brain science, materials, engineering education, and management of technology, to name a few; Facilities, \$70 million, with special priority for the urgently needed biology building; and, finally, \$100 million in Unrestricted Funds to provide the flexibility to respond to unexpected needs or important new fields.

With two years remaining in the *Campaign*, I am confident that an effective volunteer corps, a dedicated staff, and the continuing generosity of individuals, corporations and foundations will help MIT reach, and even exceed, the most ambitious goal we have ever set.

Conclusion

In trying to address at MIT the many educational issues and intellectual opportunities of the last decade, I have tried to maintain that delicate balance between preservation and transformation. Change doesn't come easily to institutions or individuals. And it has been for me a puzzlement as to why it is that our faculty and students — separately and together — generally have quite open and liberal views on almost any question, except when it comes to institutional change. Then they can be colossally conservative. I don't fully understand it, but I think it relates in a measure to a sense of parochialism which we occasionally find at MIT. We seem sometimes to have the attitude



Jim Harrison

I have seen my role over this past decade as helping the institution try to preserve its historic intellectual focus and its insistence on excellence, while at the same time encouraging the faculty and the staff to transform our programs to serve the evolving needs of the future.

that the way we do things is, if not the only way, surely the best way. We could learn some things from other places — as has been impressed upon me as I watched the progress of my own four children through four very different colleges and different undergraduate experiences.

I have seen my role over this past decade as helping the institution try to preserve its historic intellectual focus and its insistence on excellence, while at the same time encouraging the faculty and the staff to transform our programs to serve the evolving needs of the future. In all of this, a major goal has been to sustain and improve an environment that allows the faculty and the students to do their best.

The hard part in this, of course, is making the distinctions between what to preserve and what to transform. And the second, even harder, part is trying, once you've figured out what ought to change, to make it happen.

There have been, in these ten years, enormous rewards. It is rewarding to learn something new and significant practically every day, and there are countless opportunities for that around here. It has been very rewarding to get to know so many people — faculty, students, staff, alumni — for whom MIT holds a special place. And it has been, above all, most rewarding to be able to serve this university in the best way I can and to give back in small measure some of what I have received in the nearly four decades that I have been privileged to be part of this great institution.

In all of this I have had a primary, unflagging partner, someone who has been an ambassador of the Institute throughout the world, a community builder here at home, and a model of what caring, committed service is all about. I refer, of course, to Priscilla Gray. Because the Institute has been part of our life together for more than thirty years, we have had the good fortune to work together for MIT for that span of time. We now look forward in our new roles to continuing that most pleasant of occupations.

PAUL E. GRAY
September 1990

IN SPECIAL RECOGNITION

This year's report is an occasion for me to salute many of my close colleagues who have or soon will be making career changes.

First, of course, is David S. Saxon, Chairman of the Corporation, who is retiring after seven years in that post. An MIT alumnus, Dr. Saxon's distinguished academic career at the University of California enabled him to bring a fresh perspective and new ideas to the Institute's trusteeship, and under his leadership the organization and activities of the Corporation took on a renewed vigor. I could not have wished for a more supportive colleague as chairman and confidential adviser, and no board could have received more committed, loyal, and creative leadership from its chairman.

Late in January, my closest colleague in the day-to-day administration of the Institute, John M. Deutch, announced that he would be stepping down after five years as provost. Professor Deutch, the Karl Taylor Compton Professor of Chemistry, intends to return to teaching and research in physical chemistry and to continue his work on public policy issues. He is clearly the most effective academic administrator I have ever encountered, combining an extraordinary grasp of the intellectual scope of the Institute with great skill and effectiveness as an academic leader and budget manager. His service as provost has strengthened the Institute, and I feel very fortunate to have had him as a colleague and friend.

In February, Ann F. Friedlaender, dean of the School of Humanities and Social Science, announced her intention to resign as dean. Professor Friedlaender, who was the first woman to become an academic dean at MIT (in September 1984), has been deeply involved in the ongoing reassessment of the Institute's undergraduate program. She has been a thoughtful, persuasive leader in building programmatic bridges with the other Schools (Engineering, in particular), as well as in bringing about curriculum changes that



File Photo

have strengthened the humanities, arts and social sciences in the core academic program. During her tenure, MIT also established its first formal program for minor studies in these fields. Dr. Friedlaender, who holds dual appointments as professor in the Departments of Economics and Civil Engineering, will be returning to the Economics Department to teach, do research, and pursue her interests in economics and public policy.

In June, Professor Philip S. Khoury was named acting dean of the School of Humanities and Social Science. A professor of history, Dr. Khoury has been associate dean of the School of Humanities and Social Science since 1987 and has been much involved in the School's ongoing reassessment of the undergraduate curriculum.

In the spring, Shirley M. McBay, dean for student affairs since April 1980, resigned her post effective June 30, 1990 and began a two-year leave from MIT to become founding president of the national Quality Education for Minorities Network — an enterprise that will focus on improving pre-college education. This program grows out of a two-year national study conceived and directed by Dean McBay. Dr. McBay brought wisdom and high standards to every aspect of her work at MIT. With clarity, dedication, and perseverance, she helped move us towards the goal of being a community characterized by diversity and civility.

Professor Arthur C. Smith, professor of electrical engineering, graduate officer in the Department of Electrical Engineering and Computer Science, and former chairman of the faculty, was appointed to a one-year term as acting dean for student affairs, effective July 1.

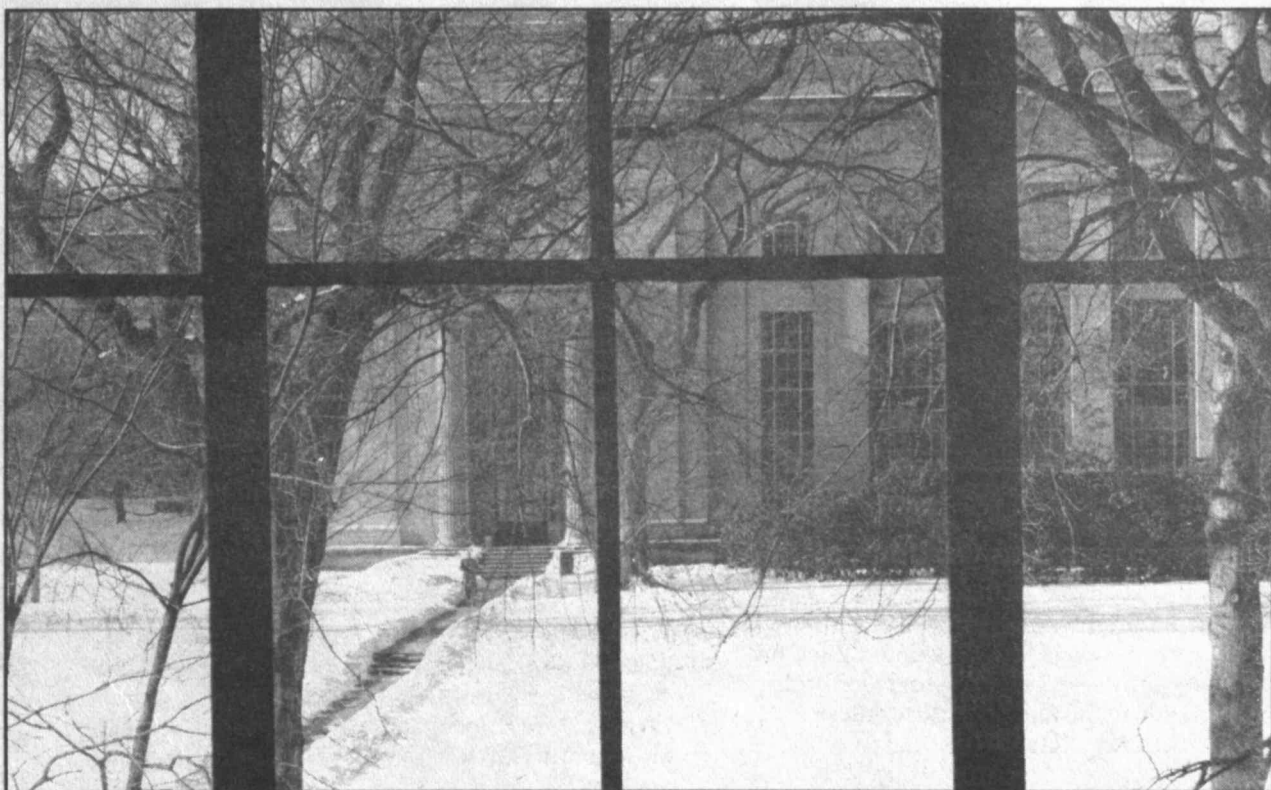
In June, Kenneth A. Smith, Associate Provost, Vice President for Research, and Director of Whitaker College, announced his intention to relinquish those responsibilities, after a decade of distinguished administrative service. Professor Smith, who holds the Gilliland Chair in Chemical Engineering, has provided thoughtful guidance and policy direction for several of the large inter-departmental laboratories at MIT, has helped work through major changes in academic organization, and has moved us toward much more effective policies and practices in the area of intellectual property.

In the spring, Gerald L. Wilson, dean of the School of Engineering since 1981, announced his intention to resign. Dean Wilson, the Vannevar Bush Professor, holds a joint appointment in the Department of Electrical Engineering and Computer Science and the Department of Mechanical Engineering. During his tenure as dean, the School of Engineering has played a key role in helping create and develop several significant Institute programs, notably Project Athena, the School of Engineering Commission on Undergraduate Education, and the Leaders for Manufacturing Program. Dean Wilson's focus in the School on issues of national productivity was a major factor leading to the appointment and ultimate success of the MIT Commission on Industrial Productivity, and he has been a leading spokesman on the need to make fundamental changes in the education of engineers nationwide.

In July of last year, Walter L. Milne, Assistant to the Chairman and to the President, announced his plans to retire. Mr. Milne, who began his career at MIT in 1951 as a member of the News Office, joined the Office of the President in 1958 during the tenure of Julius A. Stratton. He has served MIT's chairmen and presidents ever since, and we have all benefitted greatly from his wisdom and sound judgment. Walter Milne is "Mr. MIT" in the Cambridge community and on Capitol Hill, fostering mutual understanding, respect, and clear communication among politicians, presidents, and professors.

In the spring, Professor David Baltimore, the founding director of the MIT-affiliated Whitehead Institute for Biomedical Research, was selected President of Rockefeller University in New York. On July 1, Gerald R. Fink, American Cancer Society Professor of Genetics at the Whitehead Institute and in the Department of Biology, assumed the post of Director of the Whitehead Institute.

New department or program heads announced during the past year were: Lawrence S. Bacow, Director, Center for Real Estate Development; Alan Brody, Director, Music and Theater Arts Section, Department of Humanities; Claude R. Canizares, Director, Center for Space Research; Ronald C. Davidson, Associate Director, Plasma Fusion Center; Isabelle de Courtivron, Head, Foreign Languages and Literature Section, Department of Humanities; Simon Foner, Associate Director, Francis Bitter National Magnet Laboratory; Robert G. Griffin, Associate Director, Francis



Nancy Ferrari

Bitter National Magnet Laboratory; Earll M. Murman, Head, Department of Aeronautics and Astronautics; John W. Negele, Director, Center for Theoretical Physics; Wayne O'Neil, Head, Department of Linguistics and Philosophy; Peter C. Perdue, Head, History Section, Department of Humanities; Donald A. Schon, Head, Department of Urban Studies and Planning; and Peter Temin, Head, Department of Economics.

Major changes in the Institute's central administration during the year included the appointment or promotion of the following individuals: Harmon E. (Gene) Brammer, Director, Physical Plant; Thomas R. Moebus, Director, Industrial Liaison Program; Judy Jackson (J.J.) Pitts, Assistant Dean for Student Affairs and Director of the Office of Minority Education; and Peter Reich, Chief of Psychiatry, Medical Department.

* * *

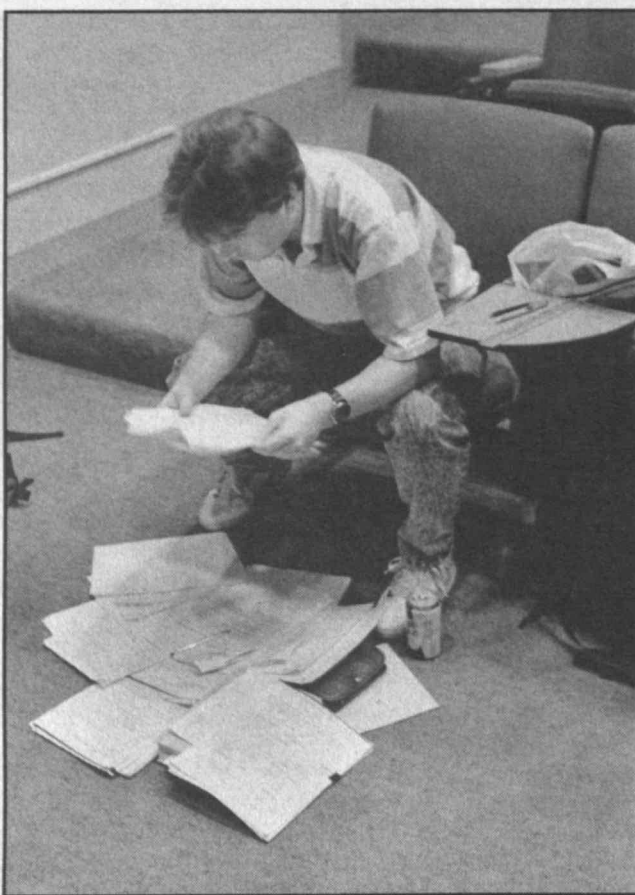
The honors and achievements of MIT faculty and staff have been many this past year. In this part of the report I mention some of the individual efforts and awards which have given such distinction to the Institute.

Five MIT faculty members were elected to the National Academy of Engineering. Elected were: Robert S. Langer, Jr., Department of Chemical Engineering; Earll M. Murman, Department of Aeronautics and Astronautics; Kenneth A. Smith, Associate Provost and Vice President for Research; Julian Szekely, Department of Materials Science and Engineering; and Ioannis V. Yannas, Department of Mechanical Engineering and Department of Materials Science and Engineering.

New members of the National Academy of Sciences this year included three MIT faculty members and an MIT senior research associate. Those elected were: Kenneth L. Hale, Ferrari P. Ward Professor of Modern Languages and Linguistics in the Department of Linguistics and Philosophy; Peter Molnar, senior research scientist in the Department of Earth, Atmospheric, and Planetary Sciences; Paul R. Schimmel, professor of biochemistry and biophysics in the Department of Biology; and Vernon R. Young, professor of nutritional biochemistry in the School of Science's Clinical Research Center.

Elected in the late spring as new Fellows of the American Academy of Arts and Sciences were: Olivier Blanchard, professor of economics in the Department of Economics and J. David Litster, Director of the Francis Bitter National Magnet Laboratory and professor in the Department of Physics.

In July 1989, John Harbison, the nationally recognized composer who has been a member of



Bradford F. Herzog

the MIT music faculty for twenty years, was the recipient of a John D. and Catherine T. MacArthur Foundation fellowship. The fellowships were created to allow extraordinarily talented individuals from all walks of life to work at their highest potential without interference and free of financial constraints. In its announcement, the MacArthur Foundation said: "John Harbison...is a composer, performer, conductor, writer, organizer and promoter of contemporary music. His knowledge of Western music is extensive, and he is an important and articulate essayist."

Professor Marvin L. Minsky, whose contributions have made him one of the most influential leaders in the field of artificial intelligence, was awarded the prestigious Japan Prize for 1990 in the field of technology of integration. Awarded since 1985, the Japan Prizes are given to scientists who are recognized as having accomplished original and outstanding achievements in science and technology, thus contributing to the progress of science and technology and the promotion of peace and prosperity of humankind. Dr. Minsky was cited for the "establishment of artificial intelligence as a new discipline and the proposal of its fundamental principles." Dr. Minsky, the Toshiba Professor of Media Arts and Sciences in the Department of Electrical Engineering and Computer Science and the Killian lecturer for the 1989-90 year, is noted in the field of artificial intelligence for his approaches to problems of symbolic representation, knowledge representation, semantics, machine perception, and learning.



Bradford F. Herzog

Professor T. Francis Ogilvie, head of the Department of Ocean Engineering, was named the first recipient of the William H. Webb Medal "for outstanding contributions to education in naval architecture, marine or ocean engineering." The gold medal was awarded by the Society of Naval Architects and Marine Engineers.

In the fall, Professor Eugene B. Skolnikoff, of the Department of Political Science and the Center for International Studies, received the Order of the Rising Sun, Gold Rays, Neck Ribbon from the Government of Japan for "his many contributions to the promotion of friendship and mutual understanding between Japan and the United States." The award recognized in particular Professor Skolnikoff's work on energy-related issues.

Dr. Jay W. Forrester, Germeshausen Professor of Management, Emeritus, in the Sloan School of Management, was named corecipient of the National Medal of Technology along with Robert E. Everett, who received the S.M. in electrical engineering from MIT and is the former president of the Mitre Corporation. The medal, which was awarded by President George Bush, recognizes individuals and companies that have made exceptional contributions to the well-being of the nation through the development or application of technology. The Medal of Technology citation praised Professor Forrester and Mr. Everett "for their creative work in developing technologies and applying computers to real-time applications. Their important contributions proved vital to national and free world defense and opened a new era of world business." Both Dr. Forrester and Mr. Everett did their groundbreaking computer work after World War II in MIT's Digital Computer Laboratory, where Professor Forrester was director and Mr. Everett associate director.

Within the Institute, Professor George H. Buchi, one of the world's leading figures in organic chemistry, was selected as the 1990-91 recipient of the James R. Killian Jr. Faculty Achievement Award. The Killian Award recognizes extraordinary professional accomplishments and service to MIT. It was established in 1971 as a tribute to the late Dr. Killian, MIT's tenth president and former chairman of the Corporation. The selection committee's citation credited Dr. Buchi, the Camille and Henry Dreyfus Professor of Chemistry, for his contributions in photochemistry, natural products, and molecular toxicology, which comprise cornerstones of these diverse areas of organic chemistry. The citation went on to say: "His creativity and style in organic chemistry have inspired fundamental work by others....His contributions in research and education have added to the quality of life globally, and his colleagues and students have derived direct benefit from his wisdom, dedication to excellence, and friendship."

In the spring, Stephen L. Buchwald, Associate Professor of Chemistry, was named the 1990 recipient of the Harold E. Edgerton Faculty Achievement Award. The award is given annually to a junior faculty member in recognition of exceptional teaching, research, and scholarship. An innovative and creative organometallic chemist, Professor Buchwald was cited by the selection committee for his research "at the heart of chemistry: making new molecular substances, proving their structure, and establishing their properties" and for his interest in and dedication to the education of his students.

* * *

The Institute was saddened this year by the deaths of several longtime friends and colleagues.

Richard B. Adler died on February 6 at the age of 67. A leading figure in semiconductor electronics, electromagnetic theory, and circuit theory, Professor Adler was instrumental in bringing transistor-based, solid-state electronics into the undergraduate engineering curriculum. He began teaching at MIT in 1949, led the solid-state and transistor group at the Lincoln Laboratory from 1951 to 1952, was associate head of the Department of Electrical Engineering and Computer Science from 1978 to 1989, and codirected the Microsystems Technology Laboratories from 1989 until his death.

MIT Corporation member E. Rudge Allen died on January 5. He was 62 years old. Mr. Allen received bachelor's degrees from MIT in 1948 and 1949 in chemical engineering and general engineering, respectively. He served on the Alumni Fund Board from 1972 to 1975, was vice president of the Alumni Association from 1983 to 1986, and served on the Corporation Development Committee since 1973. Mr. Allen was Executive Vice President and Director of Fayeze Sarofim & Co. of Houston.

Horacio Caminos, professor emeritus of architecture, died on February 18 at the age of 75. Professor Caminos's work focused primarily on the design of lowcost housing for developing countries, and in the School of Architecture and Planning he created a program in urban settlement design for students from developing countries. From 1940 to 1950 Professor Caminos taught in Argentina at the University of Tucuman and in 1952 became professor of architecture at North Carolina State College. Teacher, architect, and recipient of numerous awards, he authored *Urbanization Primer* (1978) and *Education or Catastrophe*. Professor Caminos retired from MIT in 1984 after twenty-three years on the faculty.

Harold E. "Doc" Edgerton, 86, died on January 4. Best known as the inventor of the stroboscope, used in high-speed photography, and as the MIT professor whose office door was always open, Dr. Edgerton was also a deep-sea explorer, marine archaeologist, and entrepreneur. After graduating from the University of Nebraska with a degree in electrical engineering in 1925, he joined General Electric Co. in Schenectady, New York for a year. In 1927 he received a master's degree and in 1931 the Sc.D., both from MIT. He joined the MIT faculty in 1932. In 1952 at the request of the National Geographic Society, he collaborated with Jacques Cousteau to develop an underwater camera. He was a major contributor to the development of scanning sonar as a tool for underwater exploration. Dr. Edgerton was the recipient of numerous awards and honors, the author of nearly 150 articles, and was a cofounder of EG&G, Inc., a company specializing in electronic technology.

Yuk Wing Lee, professor emeritus of the Department of Electrical Engineering and Computer Science, died on November 8 at the age of 85. Professor Lee received the S.B. degree in 1927, the S.M. in 1928, and the Sc.D. in 1930, all from MIT. After holding professorships at three universities in China, he joined the MIT faculty in 1946, became professor in 1960, and retired in 1969. Known for his pioneering work in statistical communication theory, Professor Lee authored many articles, papers, and the book, *Statistical Theory of Communication*.

J. C. R. Licklider, professor emeritus in the Department of Electrical Engineering and Computer Science, died in June at the age of 75. Recognized for his pioneering work on computer time-sharing, virtual memory, and resource sharing, as well as on computer-human interaction, Professor Licklider joined the MIT faculty as an associate professor in 1950. In 1957, he went to Bolt Beranek and Newman, Inc. as vice president, and in 1962 he became director for information processing techniques and for behavioral sciences with the Advanced Research Projects Agency. In 1968 he returned to MIT as director of Project MAC and professor in the Department of Electrical Engineering. With the exception of 1974-75, when he directed the Information Processing Techniques Office in Washington, he remained at MIT until his death.

Philip Mandel, professor emeritus in the Department of Ocean Engineering, died on December 18. He was 69. A 1942 graduate of the University of Michigan with degrees in naval architecture and mathematics, his research interests were in ship design, ship maneuvering, control and seakeeping. Prior to coming to MIT in 1957, he was a naval architect with the Bureau of Ships. The author of two texts, *Ship Maneuvering and Control* and *Water, Air, and Interface Vehicles*, Professor Mandel retired from MIT in 1980 after twenty-three years on the faculty.

H. W. McCurdy, MIT Corporation member since 1945, died on November 13. Mr. McCurdy held an MIT degree in mechanical engineering

(1922). He was captain of the first varsity crew at MIT and recently provided a gift to the crew program, establishing the H. W. McCurdy Coaching Chair. At the time of his retirement in 1963, he was chairman of the board of the Puget Sound Bridge and Dredging Company.

Professor Emeritus John T. Norton died on July 18 at the age of 90. While at MIT, he received the S.B. degree in physics in 1918, joined the faculty in 1926, and received the Sc.D. degree in 1932. As author, teacher, and researcher, his interest lay in the interaction of physics and metallurgy. As an MIT administrator, he served from 1956 to 1958 as chairman of the faculty and during 1961 as acting dean of the Graduate School. He retired from MIT after thirty-eight years of faculty service. Dr. Norton was one of the founders of AMRAY, Inc., the nation's largest manufacturer of scanning electron microscopes.

Egon Orowan, 87, of the Department of Mechanical Engineering, died on August 3. In 1950 Professor Orowan accepted a visiting faculty position at MIT and joined the faculty later that same year. His primary research interest was the concept of dislocations, but also included the mechanisms of earthquakes and formation of mountains. His undergraduate training in engineering paved the way for later recognition as a unique teacher of materials science. Professor Orowan retired from MIT in 1968.

Professor H. P. Whitaker, professor emeritus of the Department of Aeronautics and Astronautics, died on November 22. Professor Whitaker received the S.B. degree from MIT in 1944 and the S.M. in 1959. He pioneered research on automatic flight control systems for airplanes and rockets and served as consultant to the Draper Laboratory. Professor Whitaker joined the MIT faculty in 1947 and retired in 1983.

Walter Wrigley, professor emeritus of instrumentation and astronautics, died on November 9; he was 76. Professor Wrigley received the S.B. in physics from MIT in 1934 and the Sc.D. in 1941. He worked for the Sperry Gyroscope Company from 1940 to 1946 and returned to MIT in 1946 as assistant director of the Instrumentation Laboratory, which later became the Charles Stark Draper Laboratory. He became associate professor in 1946 and educational director of the Instrumentation Laboratory in 1956. Professor Wrigley wrote several papers and books on navigational instruments and counts among his graduate students four who later became astronauts. He retired from MIT in 1975.

STATISTICS FOR THE YEAR

Registration

In 1989-90 student enrollment was 9,536, compared with 9,500 in 1988-89. This total was comprised of 4,307 undergraduates (compared with 4,325 the previous year), and 5,229 graduate students (compared with 5,175 the previous year). The international student population was 2,044, representing 8 percent of the undergraduate and 32 percent of the graduate populations. These students were citizens of 102 countries. Students with permanent residence status are included with U. S. citizens.

In 1989-90, there were 2,519 women students (1,460 undergraduate and 1,059 graduate) at the Institute, compared with 2,429 (1,412 undergraduate and 1,017 graduate) in 1988-89. In September 1989, 349 first-year women entered MIT, representing 33 percent of the freshman class.

In 1989-90, there were, as self-reported by students, 1,798 minority students (1,449 undergraduate and 349 graduate) at the Institute compared with 1,637 (1,331 undergraduate and 306 graduate) in 1988-89. Minority students included 350 Black Americans (non-Hispanic), 25 Native Americans, 394 Hispanic Americans and 1,029 Asian Americans. The first-year class entering in September 1989 included 421 minority students, representing 40 percent of the class.

Degrees Awarded

Degrees awarded by the Institute in 1989-90 included 1,101 bachelor's degrees, 1,087 master's degrees, 36 engineer's degrees, and 509 doctoral degrees — a total of 2,733 (compared with 2,794 in 1988-89).

Student Financial Aid

During the academic year 1989-90 the undergraduate student financial aid program was again characterized by an increase in the overall need for financial aid and in the aggregate amount of grants made available. There was an increase in the amount of Technology Loans and in Guaranteed Student Loans obtained from commercial sources; but awards from the Perkins Loan Program decreased.

A total of 2,475 undergraduates who demonstrated the need for assistance (57 percent of the enrollment) received nearly \$24 million in grant aid and almost \$9 million in student loans from all sources. The total, almost \$33 million, represents a 15 percent increase in aid compared to last year.



David H. Henshaw

Grant assistance to undergraduates was provided by \$8.3 million in income from the scholarship endowment, by \$1.1 million in outside gifts, by \$3 million in federal grants (including ROTC scholarships), and by \$2.1 million in direct grants from non-federal outside sources to needy students. In addition, \$9.6 million in scholarships from MIT's unrestricted funds was provided to undergraduates, inclusive of the special program of scholarship aid to minority group students which represented \$141,000, and the MIT Opportunity Awards which accounted for just under \$500,000. An additional 436 students received grants from outside agencies, irrespective of need. The undergraduate scholarship endowment was increased by the addition of \$8.3 million in new funds (exceeding by far the largest previous annual increase), raising the principal of the endowment by 15.4 percent, to \$62.3 million.

Loans totaling nearly \$9 million were made to needy undergraduates — an 11 percent increase from last year. Of this amount \$1.2 million came from the Technology Loan Fund, \$3.2 million from the Perkins Loan Program, and \$4.6 million obtained by undergraduates from state-administered Guaranteed Loan Programs and other outside sources.

Graduate students obtained \$2.6 million from the Technology Loan Fund. In addition, \$343,000 was loaned by MIT under the Guaranteed Student Loan Program. The total, \$2.9 million, represents a 5 percent increase from last year's level. Graduate students obtained \$3.5 million from outside sources under the Guaranteed Student Loan Program — 7 percent less than last year. The total loaned by MIT to both graduate and undergraduate students was \$11.8 million, a 9 percent increase over last year.

(Note: All of the numbers reported in this section reflect awards from the academic year perspective, and so will not agree exactly with the records based on the fiscal year that are reported by the Comptroller or the Treasurer.)

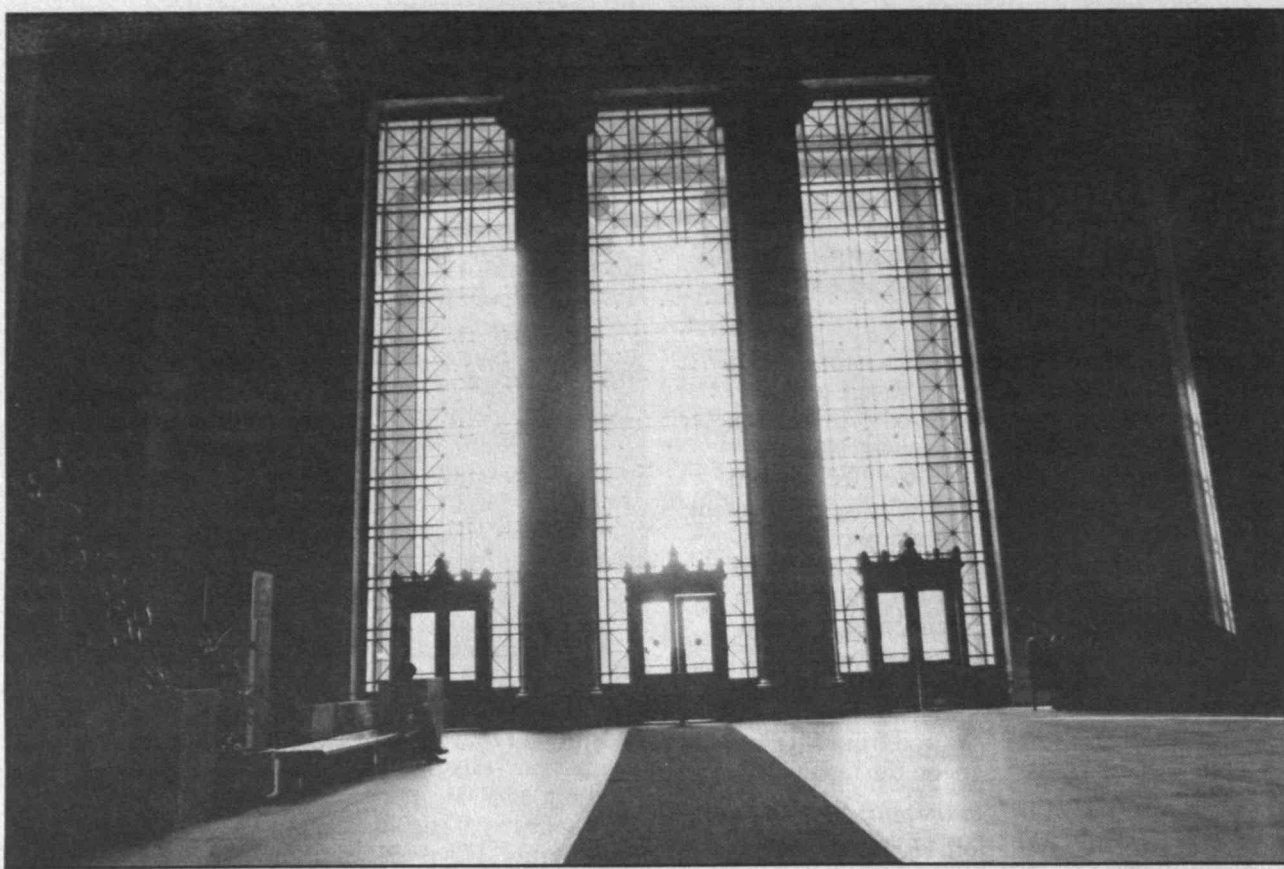
Career Services and Preprofessional Advising

The increasing emphasis in industry on product quality has led many companies to put a heavier stress on quality in their hiring, which has kept a flow of employers coming to MIT in spite of generally reduced hiring needs. Indeed, the flow has even increased. A total of 477 employers made recruiting visits in 1989-90, more than in any year since the 1960s. They included 457 private companies and non-profit organizations, and twenty government agencies. One out of six came from the West Coast.

Perhaps discouraged by the news of fewer opportunities, fewer students had interviews — 1,538 compared with 1,830 the year before — but they had over 10,000 interviews, more than in 1988-89.

The throng of recruiters did not translate into much of a boost in salaries. For the second year in a row, offers in many technical areas barely kept pace with inflation. In Electrical Engineering and Computer Science, the department with the most students reporting offers, offers to bachelors in computer science were up 4.6 percent (to \$36,100) — roughly keeping up with the Consumer Price Index — but offers to bachelors in electrical engineering were up only 2.3 percent (to \$34,300) and offers to masters rose 2.4 percent (to \$41,700). Offers to Ph.D.s and Sc.D.s, averaging \$55,000, did not rise at all. Better news came from Chemical Engineering, where offers to bachelors rose 6.4 percent (to \$35,700) and offers to masters rose 4.9 percent (to \$38,400). The Career Development Office at the Sloan School reports offers by manufacturing firms to Sloan master's candidates rising at a similar rate — 4.4 percent — but offers from non-manufacturing firms rising as much as 7.1 percent.

The number of MIT applicants to medical school dropped back slightly to 119, compared with 130 in 1988-89. The total is in line with previous years, but with a trend towards students deferring their candidacy rather than applying as seniors. This year's applicant pool consisted of seventy-six undergraduates, six graduate students, and thirty-seven alumni. Final results are not yet in but we know that all of the graduate students were accepted, 79 percent of the undergraduates, and 70 percent of the alumni. The overall acceptance rate to date is 77 percent.



Simson L. Garfinke

In 1989-90 student enrollment was 9,536, compared with 9,500 in 1988-89... Degrees awarded by the Institute in 1989-90 included 1,101 bachelor's degrees, 1,087 master's degrees, 36 engineer's degrees, and 509 doctoral degrees — a total of 2,733...

notes receivable, and amounts due from educational plant, had a book value of \$1.29 billion and a market value of \$1.72 billion compared to last year's book value of \$1.14 billion and market value of \$1.52 billion.

Physical Plant and Campus Environment

Major design and construction activities this year included the substantial completion of a project to renovate an existing early 20th century masonry manufacturing complex to a 190-bed graduate student residence. This air-conditioned facility at 143 Albany Street contains eighty-eight apartments (studio to four bedrooms) and was scheduled for occupancy this past summer. Construction of the South Hall Ring at the Bates Linear Accelerator continued during the year, and work continues on the renovation and expansion of the Rotch Library in Building 7. The new addition will expand the library from 9,800 to 27,000 gross square feet. Planning and design work for the new Biology Building at 31 Ames Street continues. Construction of the proposed six-story facility is scheduled to begin early in 1991, with completion expected in mid to late 1993. In March, work began on renovations to the President's House, which include handicap access, air conditioning in the public spaces, and an improved heating and ventilating system. The planning and design work for the conversion of the building at 38 Memorial Drive to academic uses is also underway. Demolition of the Office of Naval Research Generator Building, which houses the 10-MV Van de Graaf generator, was begun.

The benefits of Phase I of the Institute's energy conservation rebate program, which was completed this year, were evident. At current prices, the Institute will realize an annual net savings of over \$1 million as a result of this program. The success of Phase I has generated a new, more permanent program, Phase II, which is just beginning.

As a conservation measure, MIT has initiated a paper recycling program to recover all white ledger and computer paper discarded at the Institute. A pilot program was implemented in several East Campus buildings this spring. The response was so positive that the program is now being expanded throughout MIT.

After many failed attempts, the Institute was finally successful in purchasing a piece of property for the purpose of housing Alpha Phi Sorority. The purchase of the property, located at 477-479 Commonwealth Avenue in Boston, was made conditional on Alpha Phi's securing zoning and licensing approval for the use of the buildings as a sorority house. After a long and complex process, the necessary permits were obtained. The planning and design process for the renovation of the property was initiated, with the expectation that members of Alpha Phi will occupy the house in the summer of 1991.

Gifts

Gifts, grants and bequests to MIT from private donors in 1989-90 were \$113.2 million, the Institute's highest historical gift total. This amount includes cash, securities, and real estate gifts totaling \$103.2 million, and \$10 million of equipment gifts. The Alumni Fund reported gifts of \$16.2 million, a new high and 12 percent above last year. The Fund benefitted from the increase in the size of gifts from thousands of donors — a result of David Koch's \$1 million Challenge Fund, which matched most increases on a one-for-two basis.

The *Campaign for the future* announced on October 22, 1987 with \$210 million in gifts and pledges, reached 517.5 million by the end of the fiscal year. This is an increase of almost exactly \$100 million since the previous year end. In March, the Corporation voted to increase the *Campaign* goal from \$550 million to \$700 million by the end of June 1992. The major objectives of the *Campaign* are support for faculty, student financial aid, academic initiatives throughout the Institute, new and renovated facilities, and unrestricted funds. The success of the *Campaign* to date is due in no small measure to the active involvement of so many volunteers and faculty, as well as the dedication and hard work of the staff.

Finances

As reported by the Vice President for Financial Operations and the Treasurer, the total financial operations of the Institute, including sponsored research, amounted to \$1.06 billion — an increase of 12.3 percent over 1988-89. Education and general expenses — excluding the direct expenses of departmental and interdepartmental research and the Lincoln Laboratory — amounted to \$446.9 million during 1989-90, compared with \$405.3 million in 1988-89. The direct expenses of departmental and interdepartmental sponsored research on campus increased from \$198.8 million to \$220.7 million, and direct expenses of the Lincoln Laboratory's sponsored research increased from \$343.1 million to \$396 million. Current revenues used to meet the Institute's operating expenses totaled \$1.05 billion, augmented by \$7.5 million in current gifts and \$3.5 million of other fund balances.

At the end of the 1990 fiscal year, the Institute's investments, excluding retirement funds, student



This image, loaned by the Film Archives of the Museum of Modern Art, was part of the inspiration for the 1985 remake of America's *Godzilla* monster movie by a Japanese film company. The Japanese version will be screened on campus Monday, Oct. 22, as part of the Japanese Cult Classic Film Festival presented by the MIT Japan Program. Among its other attractions: Raymond Burr appears again, and the movie is dubbed badly, in English. Huntington Hall (10-250), at 7:30pm. \$2 donation. Information at x3-8095.

North Shore Music Theatre Corporate Discounts! Enjoy top-notch theatrical productions at \$3 off all Broadway shows. Call 922-8500 for ticket reservations.

Museum of Fine Arts—The Council for the Arts has 10 passes employees may borrow for free admission. Call the MIT libraries, x3-5651, for availability. At Lincoln Lab, MFA passes are available in A-150.

Arlington Capitol Theatre discounts! Commercial, 2nd run, and art-type films, only \$2.50/pp with MIT ID (reg. \$3.50/pp). Located at 204 Mass Ave, call 648-4340 for more info.

■ SOCIAL ACTIVITIES

French Lunch Table**—Come to lunch and speak French; every Tuesday from 1-2pm in Walker dining hall. Look for the table with the tablecloth. All levels welcome. Sponsored by the Foreign Languages & Literatures Section.

German Lunch Table**—Come to lunch and speak German; every Monday from 1:15-2pm in Walker dining hall. Look for German flag. All levels welcome. Sponsored by the Foreign Languages & Literatures Section.

Japanese Lunch Table. Bring a bag lunch and talk with native Japanese speakers. Special cultural event each month. Beginning Japanese speakers especially welcome. Sponsored by the MIT Japan Program, the Dept of Foreign Languages and Literatures, and the MIT Japanese Wives' Group. Meets Tuesdays at 1pm in Walker 220. More info: Susan Sherwood x3-8095.

■ MOVIES

Japanese Cult Classic Film Festival*—Oct 22: *Godzilla 1985*. A remake of the original *Godzilla* monster movie, again with an appearance by Raymond Burr. Dubbed. Sponsored by the MIT Japan Program. 7:30pm, Rm 10-250, \$2 donation.

Admission to below Lecture Series Committee Movies is \$1.50, and MIT or Wellesley identification is required. For the latest Lecture Series Committee movie and lecture information, call the LSC Movieline, x8-8881.

LSC Movies**—Oct 19: *Total Recall*, 6pm, 9pm, midnight, Rm 26-100. Oct 20: *Another 48 Hrs*, 7 & 9:30pm, Rm 26-100. Oct 21: *Seven Year Itch*, 6:30 & 9:30pm, Rm 10-250. Oct 27: *Tremors*, 7 & 9:30pm, Rm 26-100. Oct 27: *An American Werewolf in London*, 7 & 9:30pm, Rm 26-100. Oct 28: *Wall Street*, 6:30 & 9:30pm, Rm 10-250.

■ THEATER

Call the Theatre & Dance Performance Hot-Line at x3-4720 for complete up-to-date information on theatre and dance performances at MIT.

As You Like It*—Oct 18-21, 25-27: MIT Shakespeare Ensemble production, directed by Kermit Dunkelberg, Pilgrim Theater Company and lecturer in theater arts at MIT. 8pm, Sala de Puerto Rico, Student Ctr. Tks \$6, \$5/students & seniors.

■ MUSIC

For recorded information on upcoming concerts and lectures call the MIT Music and Theater Arts Concert Line, x3-9800. Updated weekly.

Guest Artist Series*—Oct 19: Cavani String Quartet in a program of Mozart, Bartok and Tchaikovsky, 8pm, Kresge Auditorium.

MIT Staff Noon Series*—Oct 19: Bach Cantata; John Oliver, conductor; student soloists. Oct 26: Gloria Raymond, mezzo-soprano; Karen Sauer, piano. 12pm, Killian Hall.

MIT Chapel Series*—Oct 18: Urosh Dojchinovich, Yugoslavian guitarist. Oct 25:

Jean Danton, soprano; Thomas Stumpf, organ/harpisichard; John Bumpstead, cello; oboe TBA. 12pm, MIT Chapel.

MIT Affiliated Artist Series*—Oct 27: Longwood Symphony Orchestra, Aaron Kula, conductor; Marek Zebrowski, piano. 8pm, Kresge Auditorium. MIT Students, free w/ ID. Tks \$10, \$7 at door.

■ DANCE

MIT Ballroom Dance Club Workshops*—Oct 21: Cha Cha 1, 1-2pm; Foxtrot 2, 2-3:30pm; Tango 4, 4:30-5:30pm. General dancing, 3:30-4:30pm (free). Morss Hall, Walker Memorial. Oct 27: Halloween Party, 8-12pm, Morss Hall, Walker Memorial. Oct 28: Viennese Waltz 1, 1-2pm; Cha Cha 2, 2-3:30pm; Foxtrot 3, 4:30-5:30pm, Sala de Puerto Rico. Membership through June 1991: Students, \$5, MIT/Wellesley affiliates, \$7; others, \$15. Workshop admission fees range from 50¢ to \$4 depending on membership and level. No partner necessary, info x8-6554.

MIT Folk Dance Club*—Three nights of dancing. Sunday: International Dancing, 7-11pm, Sala de Puerto Rico, Student Center, with Early Teaching from 7-7:30pm. Tuesday: Advanced Balkan Dancing, 7-11pm, Rm 491, Student Center. Wednesday: Israeli Dancing, 7-11pm, Lobby 13, with Early Teaching from 7-7:30pm. Info: x3-FOLK.

Aerobics Classes*—Sponsored by the MIT Dance Club, Every Mon, Wed, Fri, 6-7pm, Bldg W31 Dance Studio. For fees and more info, call Julia, 492-1369.

Yoga*—Ongoing classes in traditional Hatha and Iyengar style. Beginners: Mon, 5:10pm; Intermediate/Advanced: Mon, 6:30pm, Rm 10-340. For information call Ei Turchinetz, 862-2613.

Kundalini Yoga*—Monday classes, 6-7pm, Rm 1-134. Beginners welcome. For information call Andy Rothstein 232-3257.

MIT Dance Workshop Classes*—An activity of the Theatre Arts program taught by members of the Beth Soll & Co, MIT's resident dance company. Beginning Modern Technique, M,W, 3:30-5pm, T-Club Lounge, Dupont Ctr; Intermediate Modern Technique, Tu, Th, 5:30-7pm, Walker-201; Composition/Improvisation, Tu 1-2:30pm, Walker-201; Technique/Repertory/Improvisation, Wed 11-12:30, Walker-201. Tap, Fri 12-1:30pm, Walker-201. Info: x3-2877.

■ EXHIBITS

LIST VISUAL ARTS CTR

Synthetic Spaces: Holography at MIT. Part of the 5-year anniversary celebration of I.M. Pei's Wiesner Bldg. Through Nov 18. Oct 21: Gallery Talk with Dr. Stephen Benton, Guest Curator Betsy Connors, and the holographers, 3pm. **Satellite Intelligence: New Art from Boston and San Diego.** Works by 12 artists from two like-sized cities with relative geographic proximity to primary art centers (New York and Los Angeles). Through Nov 18.

THE MIT MUSEUM

MIT Museum Bldg (N52)—Awon Orisa: The Gods. Africanisms in the Americas. An exploration of the manifestation of Yoruba religious beliefs in the Americas. Through Dec 16. Oct 18: Slide Lecture: "African Survivals in the Americas: A Visual Interpretation," by Dr. Reginald Jackson, 7pm. **Doc Edgerton: Stopping Time.** Photographs, instruments, and memorabilia documenting the late Harold Edgerton's invention and use of the strobe light. Ongoing. **Light Sculptures by Bill Parker.** Vivid interactive light sculptures, each with its own personality and set of moods. Ongoing. **Holography: Types and Applications.** Scientific, medical, technical and artistic imaging drawn from the work of the Spatial Imaging Group at MIT's Media Lab. Ongoing. **Math in 3D: Geometric Sculptures by Morton G. Bradley, Jr.** Colorful revolving sculptures based on

mathematical formulae. Ongoing. **Visual AIDS III.** Poster collection reflecting the issues and cultural attitudes of diverse organizations and countries. Through Dec 1. Tues-Fri 9-5; Sat-Sun 1-5.

HART NAUTICAL GALLERY

Ongoing exhibits: **George Owen '94: Yacht Designer**—Ship Models, Half Models in Naval Architecture. Ongoing. 77 Mass Ave, Mon-Sun 9am-8pm.

CORRIDOR EXHIBITS

Corridor Exhibits: Bldg 1 & 5, 2nd floor: **John Ripley Freeman.** Lobby, Bldg 4: **Norbert Wiener, Karl Taylor Compton.** Community Service Fund, Ellen Swallow Richards. **Women at MIT.** An overview of the admission of women at MIT. Five photographic panels with text documenting the circumstances that increased the number of women in the classroom since Ellen Swallow Richards. Bldg 6: **Laboratory for Physical Chemistry.** Bldg 4: **Edgerton's Strobe Alley:** Exhibits of high-speed photography. (Corridor Exhibit).

COMPTON GALLERY

Lawrence B Anderson '30: Artist, Educator, Architect. An installation celebrating the distinguished career of the former dean of the MIT School of Architecture. Through Dec 14. **Microscopes.** Color photographs by AT&T photographer Charles Lewis. Microprocessor chips, glass fibers, crystals, magnetic bubbles shot at speeds up to 1/720,000th of a second and magnified as much as a billion times. Ongoing. 77 Massachusetts Ave. Hours: Mon-Fri 9-5.

OTHER EXHIBITS

Staying Healthy*—Oct 28-Nov 30: An exhibition of drawings by the youngest members of the MIT Health Plans. Oct 28: Opening Reception and Halloween Party, 2-3:30pm, come in costume! Music, balloons, games, refreshments. Bldg E23.

Institute Archives and Special Collections—Jerome C. Hunsaker, Father of Aeronautics at MIT: Chronicles his founding of aeronautics at the Institute; his design and construction of Navy airships and NC-4, the first airplane to cross the Atlantic, and his role in leading the Dept of Aeronautical Engineering from 1939-51. **The Tech Show:** "Engineering is interfering with fun... Wish my four year stretch were over and done." That's from 1947 but it could be sung today. Portrays an MIT institution with a 92 year history.

■ SPORTS

Graduate Soccer Club Upcoming Home Games*—Oct 27: vs Canary Sq, 12pm. Sponsored by the Graduate Student Council and the MIT Athletic Dept. Games played at Omni-Turf.

Home Intercollegiate Contests*—Oct 18: M's V Soccer vs Curry College, 3:30pm. W's Volleyball vs WPI, 7pm. Oct 20: M's V Sailing, Oberg Trophy, 9:30am. Oct 21: M's V Sailing, Invitational @ BC/MIT, 9:30am. Oct 23: W's Soccer vs Colby Sawyer, 3pm. Oct 24: M's V Soccer vs Northeastern, 3pm. JV Soccer vs Emerson, 7pm. Oct 25: M's V Soccer vs Stonehill College, 3pm. Oct 27: M's V Sailing, Schell Trophy, 9:30am. Field Hockey vs New Eight Tournament. Oct 28: M's V Sailing, Schell Trophy, 9:30am.

■ WELLESLEY EVENTS

Jewett Arts Center*—Photographs by Lee Friedlander 1956-1987. Main Gallery. Edgerton, Gohlke, Papageorge and Siskind: A Photographic Portfolio. Corridor Gallery. Through Dec 23. Museum hours: 10-5 MThFSat, 10-9 TuW, 2-5 Sun.

Send notices for Wednesday, October 24, through Sunday, November 4, 1990 to Calendar Editor Rm 5-111, before 12 noon Friday, October 19.

Supporters and Critics Examine Nuclear Power

(continued from page 1)

the public's perceptions of nuclear power.

In addition to small, "safety-focused" reactors, Professors Golay and Neil E. Todreas of nuclear engineering favored including among the options to be pursued a moderate evolution to a next generation of light-water reactors with additional safety features. Critics of nuclear power, such as Professor Henry Kendall of the MIT Physics Department, Dr. Jan Beyea, senior scientist with the National Audubon Society, and Dr. Howard Ris, executive director of the Union of Concerned Scientists, suggested that technological improvements alone will not sell nuclear power to a divided public. Without what they termed "openness" and changes in the regulatory process that put critics in the decision loop, the public will not accept new-generation nuclear power plants, they said.

Yet Dr. Beyea did not entirely dismiss nuclear power. "I think nuclear power should not be our first line of defense," he said, "but should be considered our insurance policy if solar electricity fails us." He favors reliance on energy efficiency, conservation, and solar power—courses whose benefits nuclear advocates did not deny, but which they viewed as insufficient for the burgeoning energy needs of the world.

Dr. Alvin M. Weinberg of Oak Ridge Associated Universities in Tennessee pressed opponents further, trying to get them to define what kind of nuclear power, if any, they would accept. They were evasive. He termed these technically well-versed critics members of a "skeptical elite," on whose shoulders the future of nuclear power might rest.

Alternative Designs

Professor Lawrence M. Lidsky of nuclear engineering gave his views about "passively safe" nuclear reactors on which he does research. He said, "The public will not accept new nuclear-power plants unless the plants can survive a test which demands that the reactor have absolutely no impact on the public, even in a worst-case accident. A worst-case accident would be, for example, one in which a reactor simultaneously loses its coolant, has its control rods malfunction, and has the control room taken over by a malicious operator."

Lidsky's colleague Professor Golay disagreed, arguing that a radical departure in design might be useful but was not essential. He said the public might accept a new evolutionary generation of light-water plants when the supply of electric power and environmental factors nudged them in that direction—given the success of these plants in many countries.

The gulf that separates proponents and critics was evident when nuclear supporters argued that the 1979 Three-Mile Island (TMI) nuclear-power plant accident was a good demonstration of built-in safety features, while critics denied this. Lidsky, on neutral ground, argued that while TMI was a successful "test," it was also the "best example of why complex reactors relying on layers of 'defense-in-depth' are difficult to test." Too many different situations can arise for which tests are needed to give evidence of safety, Lidsky said.

Economic factors too came into focus when two representatives from the shipbuilding industry described how modular construction techniques in their industry applied to building nuclear plants could lower costs. A consensus emerged on the need to standardize components and systems in the nuclear-power industry. Standardizing may be difficult, however, in view of safety requirements that continue to change; its benefits may not be realized until several plants have been built.

Winning the Public

Debate occurred over the public's perception of nuclear power. Some figures were cited to show that the average American fears nuclear power far more than do risk assessment experts, while other statistics suggested that most citizens believe nuclear power will or should play an important role. On the whole, agreement was evident that the public not only has little faith in most nuclear-technology organizations, but that it will be difficult to regain its trust.

Dr. Bertram Wolfe of General Electric said that the US had a surplus of electric-generating capacity until about a year ago. "You could be against everything and it didn't matter," he said. Now we are "coming to an era of need for new capacity," he warned. While nonelectric use of energy fell five percent in the 1973-89 period, electricity consumption grew 53 percent, he noted.

William H. Young, assistant secretary for nuclear energy at DOE, projected that the US would need 250 gigawatts (billion watts) more electric generating capacity between 1995 and 2010, and predicted that our first new nuclear plant would be completed by the end of this decade. Dr. Andrew C. Kadak, president of the Massachusetts-based Yankee Atomic Electric Company felt that "public support for nuclear power is coming back." He remarked, "The Clean Air Act about to be passed is, in effect, pro-nuclear legislation."

Professor Lidsky observed, however, "There is no nuclear imperative. We have enough fossil fuel to get us through 2030. As a practical matter, he said, "If the 'socio-political' problem is not solved, the utilities will not buy nuclear power. In a democracy, the public can be as irrational as it pleases." Dr. Lidsky also added that, "the public is certainly not irrational in its suspicion of the nuclear industry."

The disposal of high-level waste from nuclear-power plants was also considered. Debate focused on the alternatives: long-term (over 100,000 years) underground storage or some kind of fuel reprocessing or treatment to change waste storage to a 300- to 500-year problem.

John F. Ahearn, executive director of Sigma Xi and a former NRC Commissioner, addressed the disposal question in detail, exploring its political and technical aspects. A rigid political impasse has developed, he noted, over underground storage of nuclear wastes. We should defer this program, he suggested, and engage a national effort toward carefully monitored surface-storage of wastes for an indefinite period—until public attitudes and waste technologies mature enough to permit agreement on underground storage.

Dr. Yoon Chang of Argonne National Laboratory outlined the promise and challenge of using the Integral Fast Reactor to consume high-level wastes (HLW) from other reactors. If successful, this approach could alleviate the HLW disposal problem. However, Professor Thomas Pigford of the University of California at Berkeley thought that optimism about this route may be premature, because problems in its chemical processing are not yet solved. In any event, the approach would be costly and unavailable for the next 15 years, he noted.

Proceedings of the meeting will be available next January.

Crewel Classes

Priscilla Gray will continue her classes in crewel embroidery beginning Tuesday, Oct. 23, in the Emma Rogers Room (10-340). Advanced Crewel will meet 11:15am-12:30pm, with Crewel Embroidery III from 12:30-1:30pm. To register, please call Mrs. Gray at x3-0064. There will be a beginning crewel class offered in February 1991.

Classified Ads

Tech Talk ads are intended for personal and private transactions between members of the MIT community...

INSTRUCTIONS: Ads are limited to one (of approximately 30 words) per issue and may not be repeated in successive issues...

All extensions listed below are campus numbers unless otherwise specified, i.e., Dorm, Linc, Draper, etc.

MIT-owned equipment may be disposed of through the Property Office.

Deadline is noon Friday before publication.

FOR SALE

- M's 10-sp bike, \$65; bkcase, \$25; brass bucket, \$45; projector, carousel, \$45 & \$65; elec water kettle, nw, \$15; stainless steel place setting for 6, \$20. Call 332-8251.

- Baby grand piano, Chickering, walnut finish, 12 yrs, 1 ownr, music professor, exc cond, \$4500. Call x3-0618 or 508-369-4928.

- Free to affectionate human(s), two 5-mo kittens, brother & sister, b&w, raised w/kids, gentle, v loving, great mousers, had all shots, giving away due to asthma. Jacqui x3-9759.

VEHICLES

- Honda NX250 motorcycle for on/off road use, perf for commuting, askg \$1000. Call 776-0560 eves.

- 1974 Mercedes Benz 450SE, all options, Southern car in mint cond, meticulously maint, all records, new paint, \$7950. Jim x3-2048 or 617-934-6782.

- 1988 Nissan Sentra wgn, 5-sp, 41K, gray, a/c, cloth sts, AM/FM, nw rear trs, mint cond, 40+ mpg, \$6200 or bst. Janet x3-8242 or 508-875-5168.

- Lincoln: Hse for rent on priv country rd, avail Nov 1, 4BR, 2b, fam rm w/fplc, LR w/fplc, form DR, d&d, laundry rm, deck, Sudbury River view, short term OK. Kim x3-6366.

Free Workshops for Grad Students

Information Systems is now sponsoring workshops for graduate students who are using the Macintosh computer to prepare their theses...

consultants will answer questions, offer tips, or show shortcuts and advanced techniques. Since space is limited, advance signup is suggested.

- Somerville, Davis Sq: 3BR, lrg, sunny, porch, pets negot, gas ht, \$925+. Inman Sq: 2BR, lrg, newly painted, yd, \$750+. Call x3-5322 or 628-9043.

- Belmont: Cushing Sq, prof F roommate wanted for lrg sunny 2BR apt w/lots of closets & storage space, nr T, prkg avail, no pets/smk, \$400+. Barbara x3-2566.

WANTED

- Printer wanted: dot matrix, parallel, hopefully under \$100. Alex, dorm x5-7135 lv mssg.

- Watertown: shr huge beaut 10-rm 3 bath Victorian w/3 others, prkg, free laundry, hdwd & ceramic tile flrs, yd, quiet street, nr T, \$400. Call x3-8510 or 926-6959.

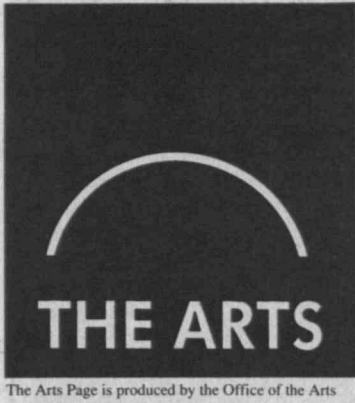
ROOMMATES

- Arlington Hts: F or M to shr 3BR apt in sunny Vict hse w/1M, 1F, 1 cat, off-st prkg, w/d, fully furn, on bus line to Hvd Sq & Alewife, \$325/mo + util. Karen x3-9325 or 646-9010.

- Russian language services, interpreting, translating, word processing, editing. Call 662-3153.

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION. Required by 39 U.S.C.3685. 1A. Title of Publication: Tech Talk. 1B. Publication No.: 002157.

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THE ARTS

The Arts Page is produced by the Office of the Arts

Theater and Dance are Alive — and Thriving — here at MIT

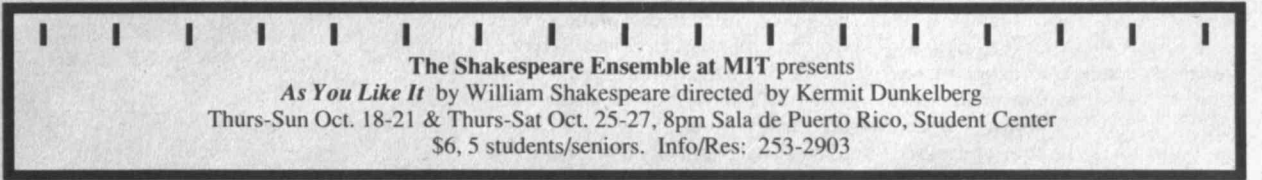
Students participate in a variety of areas — as actors, dancers, designers, directors, choreographers, playwrights, and tech crew. An individual student may dabble on a one-time basis, volunteering to hang lights for a Dance Workshop Concert and working under the supervision of a Theater Arts Technical Staff member. Another may choose to work intensively for an entire semester by taking classes in Acting and Script Analysis, while at the same time performing in a Dramashop production directed by a guest artist. Students can also make a long-term commitment, apprenticing for a year with MTG or the Shakespeare Ensemble, and continuing to work on a show each semester for the next three years. While some students may act, design, dance, or work tech crew exclusively on a student activity basis, most will at some point come into contact with the staff and faculty in the Theater Arts Section. And, with the Guest-Artists-in-Residence program, students have the opportunity to work side-by-side with professional working artists. -- Sue Downing, Theater Arts Office Manager, Guest Editor of Arts Page



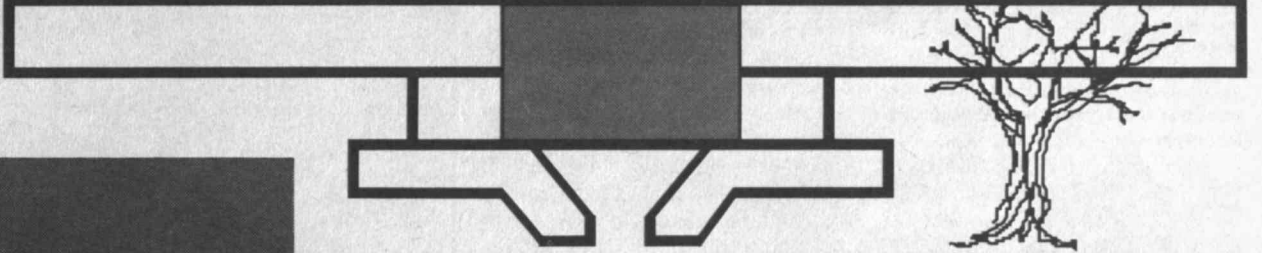
The MIT Dance Workshop presents a **Fall Dance Concert** directed by Beth Soll, featuring original choreography Friday, Nov 30 & Saturday, Dec 1 Kresge Little Theater Free Admission 253-5623



Cheryl Casquejo '91 as "Rosalind" (as "Ganymede") explains love — and women to Greg Swieringa '91 as "Orlando" in rehearsal for the Shakespeare Ensemble's *As You Like It*. (Opening October 18)



The Shakespeare Ensemble at MIT presents *As You Like It* by William Shakespeare directed by Kermit Dunkelberg Thurs-Sun Oct. 18-21 & Thurs-Sat Oct. 25-27, 8pm Sala de Puerto Rico, Student Center \$6, 5 students/seniors. Info/Res: 253-2903



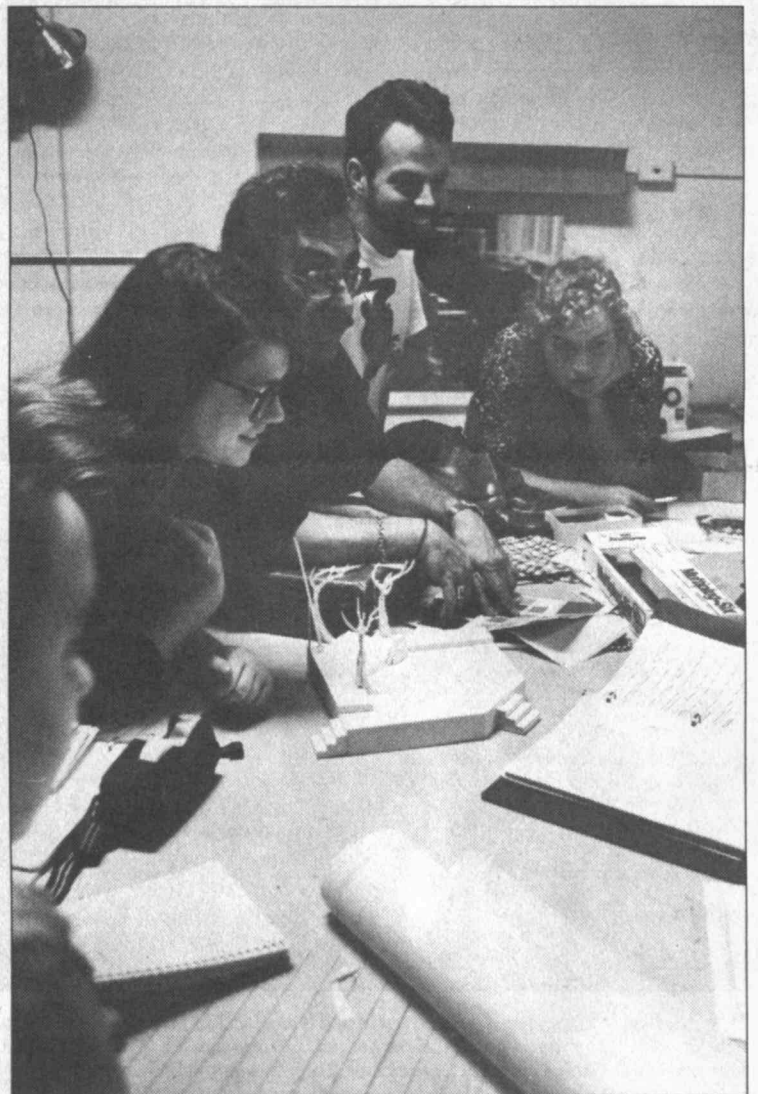
On-Stage

The MIT Gilbert & Sullivan Players present *H.M.S. Pinafore* Fri-Sun Nov 9-11 & Fri-Sun Nov 16-18 at 8:15pm Sun Nov 11 & Sat Nov 17 at 2pm 54-100 The Green Building Info/Res: 395-0154 \$8-\$5

This autumn presents a rich harvest of offerings in theater and dance with five productions opening over the next six weeks at various locations on the MIT campus. (See the icons on this page for Kresge Auditorium, the Student Center, and the Green Building.) Various student workshops (such as *The Inner Circle*, a play about AIDS, Thurs-Sat, Nov 29 -Dec 1, Killian Hall) and staged readings supplement this fare. Looking forward to IAP, we expect another half a dozen full productions highlighted by a production of *The Rake's Progress* presented by The Opera Lab, Guest-Artists-in-Residence. For up-to-date, complete information on all theater and dance performances, please call our 24-hour phoneline at 253-4720.



Guest Director Judy Braha in rehearsal with Dramashop's *Blue Window*.



Students Kelly Marold '91, Chris Crowley G, and Deborah Wells '92 discuss set model and color swatches with Bill Fregosi, Technical Coordinator, in a production meeting for the Shakespeare Ensemble's *As You Like It*. All photos this page by Christopher B. Moore

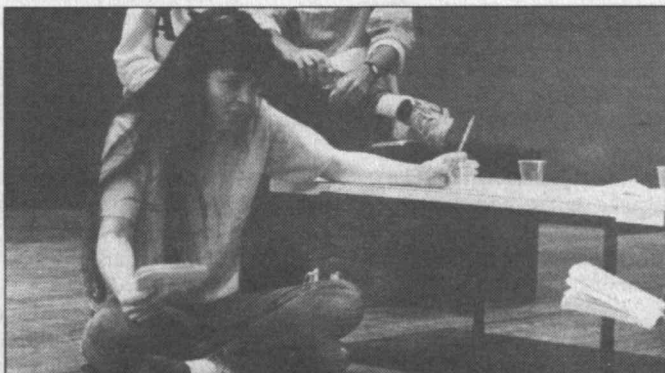


The MIT Musical Theatre Guild presents *Oklahoma!* Fri-Sun Nov 9-11 & Thu-Sat Nov 15-17 at 8pm Main Stage, Kresge Auditorium \$5 MIT students, \$9 students/seniors, \$7 MIT staff Info/Res: 253-6294

The MIT Dramashop presents *Blue Window* by Craig Lucas directed by Judy Braha Thurs-Sat Nov 1-3 & Thurs-Sat Nov 8-10 at 8pm Kresge Little Theater \$6, \$5 students/seniors Info/Res: 253-2908

Behind-the-Scenes

We hope you may enjoy the performances listed above and will find the time to attend several. What you may not realize is that months of preparation go into each of these productions. The two- or three-hour performance you may see has been the result of hundreds of hours spent by the casts and crews in rehearsals and training, design and production meetings, and shop and "put-in" hours. Each of the theater arts organizations is always looking for volunteers, specialists, and people who would like to learn more about what goes on "behind-the-scenes."



Michelle Perry '91 as "Boo" in rehearsal for *Blue Window*, "a desperate urban comedy" presented by Dramashop. (Opening November 1)

MIT Festival Jazz releases CD

NEWS FROM MUSIC--The MIT Festival Jazz Ensemble, founded by legendary jazz band leader Herb Pomeroy, releases its first compact disc this week, *JAMIT Productions* © CD dedicated to Pomeroy for his leadership and support over 22 years, 1963-85. The recording represents the Ensemble's accomplishments over the last five years under its second director, Jamshied Sharifi '83, who played and wrote for the band under Pomeroy's direction during his student days here. Sharifi also graduated from the Berklee College of Music where Pomeroy has been a senior member of the composition faculty for many years. The Festival Jazz Ensemble (FJE) performs music by Boston area student and professional composers, FJE members, and alumni. The FJE consistently has been invited to the prestigious Notre Dame Collegiate Jazz Festival and has received many awards there. It was also honored at the Boston University Jazz Festival for the last three years. FJE's disc is available from the Concerts Office, 14N-207, \$8, or \$7 with an MIT/Wellesley College student ID. The FJE and MIT's Concert Jazz Band appear this Saturday, Oct. 20, at 9pm in a free concert on Kresge main stage. 253-2826



Wrighton Appointed As Provost by Vest

(continued from page 1)

He has directed a \$1 million a year research program at MIT. In his own research, he has used chemistry to seek to mimic the photosynthesis of plants and the chemical functions of the human brain. His recent work in molecular electronics has demonstrated new kinds of devices that may prove useful in sensor applications.

Dr. Wrighton, born June 11, 1949 in Jacksonville, Fla., didn't set out to be a chemist when he enrolled at Florida State University in 1966 as an undergraduate intending to major in government, with a minor in mathematics. But he turned to chemistry when a professor "made the subject exciting" to him. He received a bachelor of science degree in chemistry with honors in 1969, receiving the Monsanto Chemistry Award. He went on to the California Institute of Technology, where he completed his doctorate in 1972 when he was only 22 years old.

After joining the MIT faculty in 1972 as an assistant professor, he advanced to associate professor in 1976 and full professor a year later, in 1977. When he was named Frederick G. Keyes Professor of Chemistry in 1981, at 32, Dr. Wrighton became one of the youngest persons ever to hold a named professorship at MIT. He was named the first holder of the CIBA GEIGY Professorship and Research Endowment in 1989.

Recognized widely for his research, he also has won praise as a teacher. He received the Chemistry Graduate Teaching Award in 1981 and was co-recipient of the MIT School of Science prize for excellence in undergraduate teaching in 1987. More than 50 MIT students have received the PhD degree under Professor Wrighton's supervision, and they now occupy significant positions in industry and academia. He

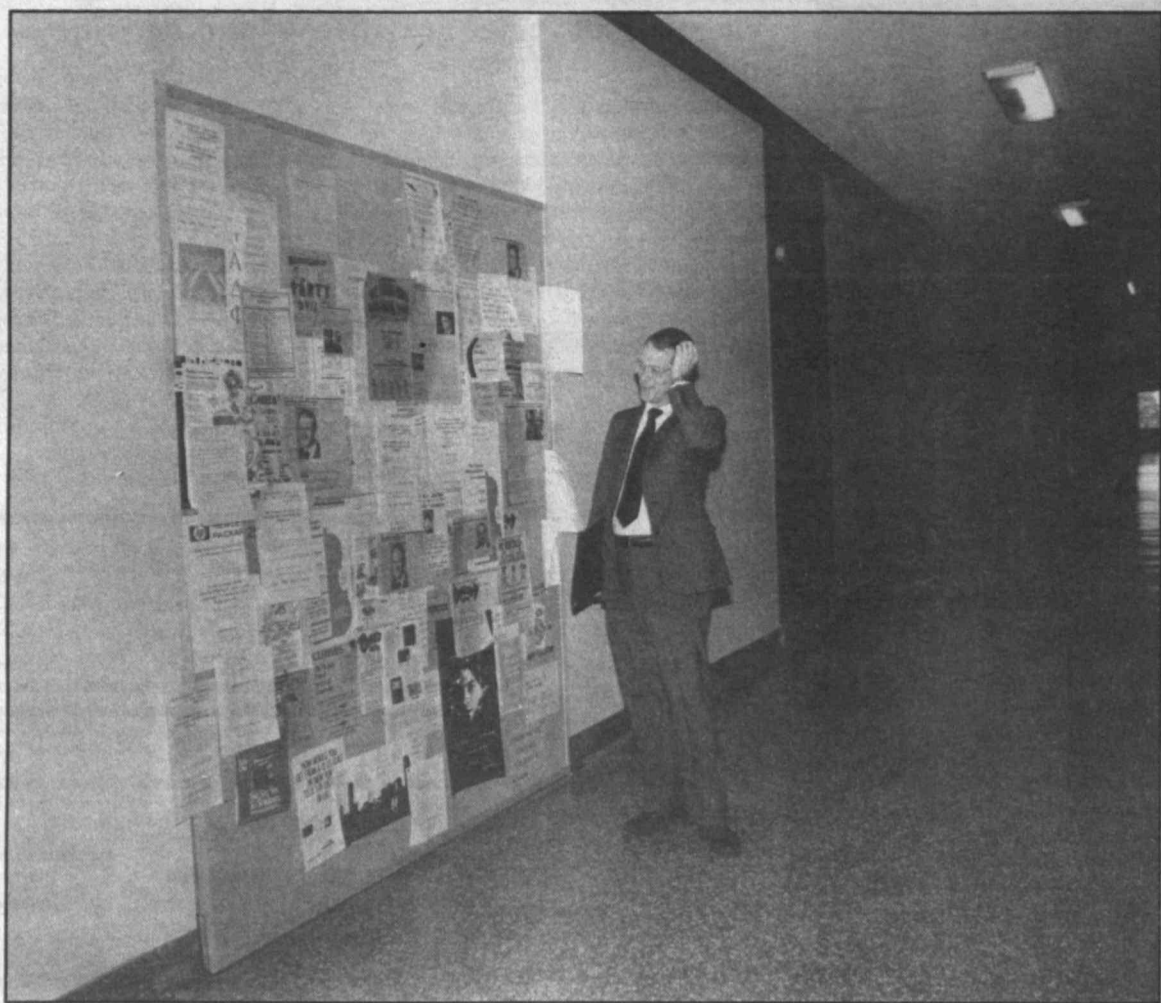
served as consulting editor for *General Chemistry* (Houghton Mifflin Co.), authored by Darrell Ebbing, which has emerged as one of the leading college textbooks on introductory chemistry.

Professor Wrighton, active in public and professional affairs, has served on numerous panels. These have included the Chemistry Research Evaluation Panel for the Air Force Office of Scientific Research, the American Physical Society Study Group on Solar Photovoltaic Energy Conversion, the Defense Sciences Research Council of the Defense Advanced Research Projects Agency and the Energy Research Advisory Board Solar Panel and its Panel on Cold Fusion. He also was a member of a National Science Foundation committee that advises the chemistry division on chemistry research priorities for the nation. In addition, he has been a consultant to industry. He chaired an American Chemical Society task force which recommended establishment of a new ACS journal, *Chemistry of Materials*, inaugurated in 1989.

His awards have included the American Chemical Society Award in Inorganic Chemistry, 1988; the Fresenius Award of Phi Lambda Upsilon, 1984; the E.O. Lawrence Memorial Award of the US Department of Energy, 1983, and the New York Academy of Sciences Halpern Award in Photochemistry, 1983. He received an honorary Doctor of Science degree from the University of West Florida in 1983. He is a Fellow of the American Academy of Arts and Sciences and the American Association for the Advancement of Science.

Dr. Wrighton and his wife, Deborah, live in Winchester, Mass., and have two children, James, 13, and Rebecca, 9.

Kenneth D. Campbell



President Charles Vest scratches his head as he views a bulletin board of presidential search newspaper clippings blocking what he thought was the doorway to his new office.
Photo by Donna Coveney

Vest Takes Office as 15th President

(continued from page 1)

chairman of the MIT Corporation on Monday. Dr. David S. Saxon, chairman since 1983 and previously president of the University of California system for eight years, becomes honorary chairman of MIT.

The transition was accomplished without fanfare. President Vest's official inaugural ceremony will take place in Killian Court on May 10.

Dr. Vest, in a brief interview, said that in the years ahead, "I am going to work with the faculty of MIT to think in very broad and long-range terms to do our best to identify what areas of science and technology will define the next generation—and ensure that, as in the past, MIT will be there to play a leadership role."

Dr. Vest said he felt privileged and excited "to come to an institution of this stature and one that I believe has such an important role to play in the future of our nation and the world. Within the context of teaching and basic research, we are engaged with the society around us—with our work with government, with industry, with the private sector, with invention and management of business. MIT is constantly looking ahead."

Commenting on MIT, Dr. Vest said, "What a remarkably warm and welcoming place this has been over the past four months to my family and myself. It has given us a great sense of community which is very meaningful to us and we hope to be able to continue to build on that theme and that spirit, to do all we can to make the community even closer together."

Dr. Vest and his wife, Rebecca, plan to move in to the President's House at 111 Memorial Drive on the last

weekend of this month. Their daughter and son are away at school—Kemper is a graduate student in international affairs at George Washington University, and John is a sophomore at the University of California, Berkeley.

Dr. Vest, who was elected MIT president by the Institute's trustees on June 18, served as provost and vice-president for academic affairs at the University of Michigan for two years, functioning in those posts as the university's chief academic officer and chief budget officer. Before that, he was dean of the university's College of Engineering for three years and associate dean for academic affairs for five years.

A faculty member in mechanical engineering at Michigan since 1968, Dr. Vest is noted for his use of holographic techniques to make precise engineering measurements. He is the author of *Holographic Interferometry*, a standard work that has been translated into Russian and Chinese.

Born in Morgantown, W. Va., September 9, 1941, he received his BS in mechanical engineering from West Virginia University in 1963, his MS from the University of Michigan in 1964, and his PhD in mechanical engineering from Michigan in 1967.



Carl M. Mueller, left, is joined by past, present and future leaders of MIT who were chosen for their positions by search committees which Mr. Mueller headed or on which he served. Others from the left are President Emeritus Jerome B. Wiesner, Corporation Chairman Paul E. Gray, Honorary Corporation Chairman David S. Saxon, President Charles M. Vest, and Walter L. Milne, who was the staff person on Mr. Mueller's presidential search committees.
Photo by Donna Coveney

HONORARY LECTURER

Mueller Named to Rare Post

Carl M. Mueller, Class of 1941, who for more than two decades served MIT as a member of the Corporation and as chairman of two presidential search committees, has been appointed an Honorary Lecturer in recognition of "his trustee leadership and unparalleled contributions."

The honor, accorded by the Corporation in a unanimous resolution, is a rare one. Only three others have been so recognized: Sir Winston Churchill, Cecil Green and Eugene McDermott. Mr. Green and Mr. McDermott were involved in creating Texas Instruments. "Serving concurrently as a member of the Executive Committee, the Investment Committee and the Development Committee for more than two decades, he has participated actively in virtually all the significant policy decisions that the Institute has made during those years. His dedicated service as participant and leader of presidential search committees has

helped to ensure the safe passage to the future of MIT's unique standard of excellence," the Corporation resolution read. The resolution was adopted unanimously at the October 5 meeting.

Mr. Mueller was chairman of the presidential search committees that led to the selection of Paul E. Gray in 1980

Saxon Elected To Honorary Post

An action Vannevar Bush took in 1971 was the model Howard W. Johnson used recently when he resigned as honorary chairman of the MIT Corporation and moved that Dr. David S. Saxon, his successor as Corporation chairman in 1983, succeed him as honorary chairman. Mr. Johnson, noting that this year is the 100th anniversary of Dr. Bush's birth, recalled that it was at the last Corporation meeting presided over by James R. Killian that Dr. Bush, then honorary chairman, observed that while it was rare to resign

and Charles M. Vest a decade later. He was a member of the search committee that resulted in the appointment of Jerome B. Wiesner as president in 1971. He also headed the search committee that led to the appointment of Dr. David S. Saxon as chairman of the Corporation in 1983.

from an honorary post, he was proposing that he do so to permit Dr. Killian to assume that post. Mr. Johnson, addressing Dr. Saxon, who was presiding at the October 5 meeting, said that following the precedent set by Dr. Bush he now proposed to resign as honorary chairman and to nominate Dr. Saxon to succeed him in this position, effective October 15. Mr. Johnson's proposal was warmly received and the vote, from which Dr. Saxon abstained, was unanimous.

MAGNET LAB DECISION

US Legislators Query NSF

Rep. Joseph P. Kennedy II and Sen. John F. Kerry, criticizing the controversial National Science Foundation decision on the magnet laboratory as "not in the best interest of our nation," have asked the National Academy of Science to investigate how the NSF awards research grants and contracts.

The Massachusetts Democrats asked the Academy to assess in particular "the role in the decision process of merit review by outside scientists and the circumstances, if any, that could lead executive agency staff to overturn recommendations of outside experts when those recommendations are based on scientific merit."

Their request came after a decision by the NSF in August which rejected MIT's proposal, favored by three outside merit review panels, and awarded the National High Magnetic Field Laboratory to Florida State University.

In a letter to Dr. Frank Press, president of the National Academy of Science, they said the decision "dismissed a rich heritage of 30 years of world-class research conducted at the Bitter Laboratory" in favor of a proposal from "a university with no record of research in magnet technology."

They said the NSF decision "threatens the competitive position of the US in magnet technology."

"This troubling NSF action sets a dangerous precedent for the decision-making process at NSF and suggests that the criteria used by the NSF for selecting major grant and contract recipients may be seriously flawed. They are ambiguous and allow for misinterpretation and abuse. Indeed, this failure of process threatens to shake the foundations of research that have been so vital to U.S. scientific leadership and to our national welfare."