Massachusetts Institute of Technology

TECH TALK

October 22, 1975
Volume 20
Number 12

MIT Will Cooperate With SERI

MIT in reply to a number of inquiries, said today it will assist, where it can, national or regional efforts to ensure that a Solar Energy Research Institute—to be established by the federal government—"achieves its full potential as a national resource."

A policy document issued by Dr. Thomas F. Jones, MIT vice president for research, said the federal government's decision to build the solar research institute "has stimulated widespread interest in its nature and location and regional interest in its potential relationship to the Massachusetts Institute of Technology."

In light of that interest, Dr. Jones said, it is timely "to reiterate MIT's general commitment to participation in activities that serve the public good and that are consistent with its basic educational mission . . ."

The MIT policy statement was sent to the office of John J. Marino, Massachusetts commissioner of commerce and development; to the New England Council; and to the Massachusetts Science and Technology Foundation as a response to inquiries.

The statement outlined MIT's deep involvement in programs concerned with the availablility and utilization of energy and said the Institute "has established the MIT Energy Laboratory, which integrates academic and professional staff to provide a focal point and a coordination for its full range of energy technologies." Among the specific examples of ongoing teaching or research programs cited were:

The more efficient use of fossil fuel; nuclear engineering; nuclear reactor safety; magnetohydrodynamic electric power systems; fusion reactor designs; windpower systems; biomass conversion, the

(Continued on page 6)

PROFESSOR DAVID BALTIMORE cuts the cake at a party given in his honor in the Department of Biology, following a press conference at which he discussed the work for which he received the Nobel Prize.

Baltimore Wins Nobel Prize

Dr. David Baltimore, American Cancer Society Professor of Microbiology in MIT's Department of Biology and head of the tumor virology group at the MIT Cancer Research Center, Thursday (Oct. 16) was named one of three recipients of the 1975 Nobel Prize in Medicine and Physiology by the Nobel Foundation of Stockholm, Sweden.

Dr. Baltimore, Dr. Howard M. Temin of the McArdle Laboratory for Cancer Research at the University of Wisconsin at Madison, Wis., and Dr. Renato Dulbecco of the Imperial Cancer Research Fund in London, England, were named co-winners of the 1975 prize. They were specifically cited "for their discoveries concerning the interaction between tumor viruses and the genetic material of the cell," according to the announcement made by the Karolinska Institute of Stockholm on behalf of the Nobel Foundation and the Royal Swedish Academy of Sciences.

Dr. Baltimore, 37, has made outstanding achievements in virus research, particularly polio virus and viruses that cause cancer in animals.

His work has helped elucidate the mechanism by which various viruses —strands of genetic information surrounded by a protein coat—insert this information into cells, commandeering the cell machinery to make more viruses.

One of his best-known achievements is his 1970 co-discovery of reverse transcriptase, an enzyme which enables viruses with RNA rather than DNA to insert virus genetic information into the host cell's genes. This enzyme was discovered independently by Dr. Baltimore and by Dr. Temin at Wisconsin.

Normally, genetic information is transcribed from DNA to RNA, which then translates the information into proteins—major structural and catalytic agents in the living cell. Reverse transcriptase transcribes the information in the reverse direction, from RNA to DNA.

Studies by Dr. Baltimore and other researchers have shown that this enzyme is found in viruses called RNA tumor viruses, which cause cancer in some animals. Its discovery was an important step in understanding how cancer-causing viruses work.

Dr. Baltimore is also widely known for his work on polio and mengo viruses. He demonstrated the mechanism by which viruses of this type manufacture their RNA and proteins, and studied the enzymes involved in this process.

His studies demonstrated for the first time that such viruses make their proteins in a unique way. They first make a large protein which then gets broken down into smaller proteins as these are required for specific biologic needs. This is unlike bacterial viruses, which manufacture their proteins initially in the size needed.

Dr. Baltimore has also become increasingly interested in immunology. He and co-workers in his laboratories have studied the role of an enzyme called terminal transferase in

(Continued on page 3)

Affirmative Action Stressed

Report Urges Vision

MIT and the nation must have the vision to look ahead, to foresee problems, to grasp what could be and to plan to get there, the president and chancellor of MIT said in their annual report issued this week.

"At a time when the newspapers carry stories on cities on the verge of bankruptcy, universities in serious financial straits, many people in fear of job loss, and belt-tightening in virtually every domain, talk of visions of a rosy future may seem quixotic in the extreme," said President Jerome B. Wiesner and Chancellor Paul E. Gray.

"But vision is precisely what is needed, for only a well-articulated view of what the future *could be* gives focus and heart to the efforts to get from here to there," they said in the "Report of the President and Chancellor for the Academic Year 1974-75."

Dr. Wiesner and Dr. Gray said that "such efforts require not the reactive stance which is implied by the word 'challenge,' but a positive vision of the leadership role that an institution like MIT should play in the education of bright and concerned young men and women, in the exploration of new realms of theory and practice, and in the cooperative evolution of an increasingly responsive and humane society."

The report said that MIT "is alive and well, though not without its problems," and added that the mood on campus "remains forward looking, creative and hopeful."

The report included these developments:

—Undergraduate and graduate

(Continued on page 8)

There Was A Rainbow Over Our Shoulder

INFLATED MOONLIT RAINBOW of polyethylene tubing and dangling neon rods created a shimmering red spectacle over MIT last Thursday night. Attracting passers-by and amateur photographers, the 300-foot long arc over Briggs Athletic Field was created for MIT's five-day ARTTRANSITION conference on art and technology, which continued through Sunday. Otto Piene, director of MIT's Center for Advanced Visual Studies, and MIT research fellow Alijandro Sina, who designed the outdoor sky event, said the glowing of 75 neon rods was achieved by a high frequency, high voltage, ultra-low power system, activated by a standard car battery and spark plug. Fourteen tanks of helium—each containing 22 cubic feet of gas—were used to lift the arc out of the darkness as it was unfurled from a huge wooden spool. Winds ranging from the west up to 20 mph created strobe-like patterns along the length of the rainbow at several times during its two-hour appearance. This time-exposure photograph by MIT staff photographer Calvin Campbell was made with Tri-X film and ambient light sources at a distance of about 150 feet from the rainbow's midpoint.

—MIT Photo by Calvin Campbell

INSTITUTE NOTICES

New UROP Listings

For more detailed information on UROP opportunities listed, MIT undergraduates should call or visit the Undergraduate Research Opportunities Program Office, Room 20B-141, Ext. 3-5049 or 3-4849 unless otherwise specified in the listing. Undergraduates are also urged to check with the UROP bulletin board in the main corridor of the Institute.

Project MAC

The CSR division of Project MAC is offering a UROP project for undergraduates that involves planning and development of measurement tools for the Multics systems, and application of these tools and analysis of measurement results. The students will learn to understand the mechanism of a complex time-sharing system and the problems of evaluating and maintaining performance of such systems. Sufficient programming experience (preferably PL/1) and some knowledge of the basic principles and concepts of a time-sharing system is required. Experience in system programming is especially valuable. Contact Prof. Liba Svobodova, Rm. NE 43-535 (545 Technology Square), x3-3489, MW 10-12, and 3-5.

Department of Nutrition
International Nutrition Planning Program

The program is creating reference standards and testing hypotheses concerning anthropometric measurements in children up to five years, in collaboration with pediatricians in the Boston/Cambridge area. Several of the measurements—thigh circumference and skinfolds—have not previously been standardized over portions of this age range. It is expected that the thigh circumference reference standards will be applicable in identifying undernutrition in infants in rural areas of developing countries, and may also be useful in prediagnosing infant obesity in the US. Student participation will consist of writing or using packaged computer programs to establish reference norms and to test hypotheses, as well as some measuring of infants in pediatricians' offices. Good experience for pre-med students. Some knowledge of computer programming and of statistics is required. Contact Marian Zeitlan, x3-3134 or x3-3131, Rm. 20A-208 or Rm. 20A-222.

Organic Chemistry

The project deals with the synthesis, chemical characterization and measurement of biological activities of peptides and their derivatives. Research involves specific peptides which bind to selected sites of surfaces of proteins or on the surface of transfer RNA molecules. The student will work in conjunction with an experienced peptide chemist. Contact Prof. Alexander Rich, x3-4715 or Dr. M. Gorecki, x3-4710.

Massachusetts General Hospital

An opportunity exists for an undergraduate interested in participating in a research project involving human hemoglobin in solution, intact red cells and the processes that influence its relationship with oxygen. Advanced level of related laboratory experience is desirable.

Boston Biomedical Research Institute

The Department of Muscle Research at the BBRI is carrying out an investigation to elucidate the mechanisms of muscle contraction and the cause of several diseases (hypertrophy, myotonia, and muscular dystrophy) in which muscle tissue is defective. Suggested projects include enzymatic studies on muscle proteins and membrane systems of the muscle cell, electron microscopy of protein aggregates and mechanical measurement of single muscle fibers.

Tufts Medical School

Multiple antibiotic resistance in bacteria is a major health problem. This laboratory is studying this plasmid-mediated infectious resistance which can be transferred easily among various bacterial species. The approach is to isolate the piece of extra-chromosomal DNA (R factor) away from the bacterial cell and to study control of its replication and transfer. Other work concentrates on the regulation of expression of certain antibiotic resistance genes, most notably that to tetracycline. Students interested in joining an ongoing basic science project with clear medical-health relevance are invited to participate.

Massachusetts Internship Program

The Massachusetts Internship Office is a state-run organization which locates internship positions for students with state and local agencies. The Office works through university field-work and internship programs which provide College Work-Study Funding and academic credit for the work. The Internship Office would like to establish a computer-based information system which would keep track of available internship positions and provide this information to the universities. A student would be involved in the planning and development of the system. A feasibility study will also be conducted to determine if the proposal system is cost effective. Pay available through College Work-Study or from the Internship Office. The system should be ready for implementation by the end of February.

Education

Students considering a career in secondary education are invited to participate in a project in Special Education and/or Computer Science Education

Special Education—(practical engineering concepts for the physically handicapped). Credit. **Computer Science**—A student would participate in an experimental course in computer science that covers a wide range of computer-related topics. Pay or credit.

Quadex Corporation Cambridge, Ma.

Quadex Corporation is a manufacturer of minicomputer based application systems for text processing and related functions. Two classes of software are being developed—systems and applications. The systems software consists of an operating system, a data management system, and a compiler for a PL/I-like high level language. The applications systems, which are developed and run under the systems software, are primarily in the area of multi-terminal text processing and data management. An opportunity exists for an undergraduate to do applied research in the systems software area.

Boston Energy Office

The Boston Energy Office is a student staffed organization situated under the Boston Air Pollution Control Commission. The Office provides initiative and applies expertise and manpower to innovative projects in addressing energy issues that affect Boston. Projects are available in energy conservation and energy policy analysis.

Charles Stark Draper Laboratory Cambridge, Ma.

The CSDL has a number of projects available for student participation. Among these are computer and math education, electronic instrumentation, computer software development, and bio-engineering. The CSDL is located near MIT and many of the staff have close ties with the Institute.

Graduate Studies

The following descriptions of selected graduate fellowships have been received recently by the Graduate School Office. More complete descriptions are available in the office, Rm 3-136.

Graduate Fellowships for Mexican Americans, Native Americans and Puerto Ricans

The Graduate Fellowships Program has announced that a limited number of graduate fellowships will be awarded to Mexican Americans, Native Americans (Aleuts, Eskimos, Indians, Native Hawaiians), and Puerto Ricans who wish to pursue a doctorate and a career in higher education. Applicants must be citizens of the US and must be enrolled in or planning to enter an accredited US graduate school. Awards, which are for one year but are renewable, provide tuition and fees, a $300 book allowance, a monthly stipend of $300, and a dependency allowance of $50 per month for each dependent. Deadline: January 15, 1976.

Announcements

Freshman Evaluation Forms—Instructor turn-in deadline for Freshman Evaluation Forms is today.

Preprofessional Meetings—Loyola University Law School** interviews with Raymond G. Decker, dean of admissions, Mon, Oct 27, 9am-12n, sign up in office. **Duke University Law School** interviews with Prof Joel Fleishman, chairman of Admissions Committee, Mon, Oct 27, 1-4pm, sign up in office. **Harvard Law School** group meeting with Alfred C. W. Daniels, assistant dean, Tues, Oct 28, 12n, Rm 4-148. **Boston College Law School** interviews with Prof. Robert Berry, Wed, Oct 29, 2:30-5pm, sign up in Preprofessional office. **Dickinson College of Law** group meeting with Louis Del Duca, director of admissions, Thurs, Oct 30, 11am, Rm 10-179. Preprofessional Advising & Education Office, Rm 10-186. x3-4158.

Biomedical Engineering Doctoral Oral Exams—Deadline for submitting applications is Mon, Nov 3. Information and applications available Rm 37-219.

GSC Meeting—Full Council meeting Wed, Oct 29, 5:30pm, Walker Blue Rm. Dinner meeting, so leave your name with cashier. RSVP so your name can be added to the list.

Tour of Advent Cor—Tues, Oct. 28, 1:30pm, sponsored by EE&CS Stu-Fac Committee and IEEE. Tickets available Rm 38-476.

English Classes for Foreign Students—New class beginning Wed, Oct 29, lasting 7 weeks. Course 23.41 gives 9 units of credit, counts as humanities elective for undergraduates. Speaking Skills meets Wed, 6pm, Rm 14E-311. Writing & Composition Thurs (Oct 30), 7 pm, Rm 4-151. Info: Linda Sibley, Wed 10am-12n; Barbara Raigher, Thurs 2-4pm; Rm 14N-221, x3-3925.

Discount Tickets—Available for Wed, Oct 29 BSO open rehearsal. TCA, Stu Ctr Rm 450, x3-4885. TCA opens 11 am Mon-Fri.

MITHELP—Sessions available for students with weak backgrounds in algebra, trig, analytic geometry and logs & exponentials. Info: inquire daytimes, FAC Office, Rm 7-103, x3-6771; Mon thru Thurs evgs, 7-8pm, Rm 4-155.

IPC Non-Credit Computer Courses—Preregister with Lynne Penney, Rm 39-427, x3-6320. **Overview of the Operating Systems at the Center:** Wed & Thurs, Oct 22 & 23, 10-11:30am. **Introduction to Terminal Use:** Fri, Oct 24, 4-6pm. **Elementary Fortran:** Oct 27, 29, 31, Nov 3, 5, 4:30-5:30pm. **Elementary PL/1:** Oct 29, 31, Nov 3, 5, 7 & 10, 2-4pm.

Immed openings in MIT Day Care Ctr for chldrn 3-5 yrs. Info, Child Care office, Rm 4-144, x3-1592.

Placement

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

Wednesday, October 22—Energy Research & Dev Admin. Div of Naval Reactors: NUY Grad School of Bus Admin: Woodrow Wilson School of Public & Int'l Affairs, Princeton Univ. **Thursday, October 23**—Northwestern Univ. Grad Sch of Mgt; St. Regis Paper Co. **Friday, October 24**—The MITRE Corp; Union Carbide Corp. PhD Geology.

Monday, October 27—Argonne Ntnl Lab; Campania Shell de Venezuela NV; Owens-Corning Fiberglas Corp; EI dupont de Nemours & Co, Inc; IBM Corp; Northern Research Z& Eng Corp; Sanders Assoc, Inc; Continental Oil Co.§ **Wednesday, october 29**—EI duPont de Nemours & Co, Inc; Consolidated Edison Co of NY; Engelhard Minerals & Chemicals Corp, Engelhard Minerals & Chemicals Div; General Electric Co; Hercules Inc; Pfizer Inc; Naval Undersea Ctr, Dept of the Navy; Naval Underwater Sys Ctr; RJ Reynolds Industries, Inc. **Thursday, October 30**—General Electric Co; Naval Undersea Ctr, Dept of the Navy; Hughes Aircraft Co: Electro-Optical & Data Sys Grp, Radar Avionics, Micro-Elrctronic Products & Connecting Devices Civ, Hughes Research Labs; EDS Nuclear Inc; Proctor Z& Gamble; Manu Plant Mgt Product Development & R&D; Schlumberger Well Services. **Friday, October 31**—Hughes Aircraft Co: Electro-Optical & Data Sys Grp, Radar Avionics, Hughes Research Labs; Proctor & Gamble Co, Engineering Div; The Ctr for Naval Analysis; GTE Sylvania; Schlumberger Well Services.

Club Notes

Arab Students' Club—Meeting Thurs, Oct 23, 8 pm, Walker Intl Student Lge (2nd fl).

MIT Baha'i Association*—Will gather Mon, 5pm, Rm 8-105, every other week (Nov. 3 & 17, Dec 1 & 15).

MIT Ballroom Dancing Club**—The club will be very active this term with frequent workshops & dances. New members welcome at all functions. Info & times: Carl Sharon or Doug King, 536-1300.

Beefaroni Chess Club*—Alternative chess club. Interested in playing relaxed serious chess: Info: Gary Kaitz, 494-8234 or x5-6304 Dorm.

Bridge Club*—ACBL Duplicate Bridge. Open pairs Tues & Thurs, 7pm, Stu Ctr Rm 473.

MIT/DL Bridge Club**—ACBL Duplicate Bridge. Tues, 6pm, Walker Memorial Blue Rm.

MIT Chess Club*—Meetings Sat, 12n-7pm, Stu Ctr 407.

MIT Concert Band**—Players needed, especially percussionists (or people with musical background to learn percussion) and solo quality flutist. Mon 7:30pm, Wed 8pm, Kresge. Info: Ruth Cross, x5-6691 Dorm, or come to a rehearsal.

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

Math Club*—Meeting Sun, 2pm, Rm 4-182.

Psi Club*—For all graduates of Silva Mind Control. Thurs, 5pm, Rm 1-132.

Shotokan Karate Club**—Rigorous Training for intercollegiate competition & self-defense, given by 6th degree black belt. Mon & Wed, 8pm, duPont wrestling rm; Sat, 1pm, duPont 2nd fl dance rm.

Space Abitat Study Group*—Interdisciplinary studies on space colonization. Wed, 7:30pm, Rm 24-407.

Strategic Games Society—Sat, 1pm-1am, Walker Rm 309 & 318. Offers opponents and discounts on merchandise to members plus gaming & periodical library. Info: Paul Bean, 266-6108.

Student Homophile League*—Gay Lounge, Rm 50-306, open daily for lunch & random other hours, x5-6745 Dorm Tom, Contact Line, x3-5440, provides info, referrals, counseling or just talking to gay persons. Meetings 1st & 3rd Sun every month, Gay Lge. Consult bulletin board, Bldg 3, for info.

Student Information ProcessingBoard*—Meetings Mon, 7:30pm, Rm 39-200. Info: x3-7788.

Technique—MIT yearbook needs photographers, writers & workers. Sat, 11am, Stu Ctr Rm 451, x3-2980.

Tiddlywinks Association*—Wed, 8 pm, Stu Ctr Rm 473.

MIT UHF Repeater Association*—Meeting Thurs, Oct 23, 9:30pm, New (Fr/Grmn) House (House 6) Lge.

MIT Wheelmen*—Meetings Tues, 7:30pm, Rm 1-203.

Religious

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

Bible Study*—Enjoy the good word of God. Fri, 12n, Int'l Students Lge, Walker 2nd fl, Mem Dr side.

Black Christian Fellowship*—Bible study Wed, 7pm, Masterton Lge, E Campus. Prayer group Mon-Fri, 12:15pm, Walcott 310, E Campus.

Campus Crusade for Christ*—Family Time Fri, 7:45pm, Rm 37-252.

Celebration of Holy Communion**—MIT Lutheran & Episcopal Ministry. Wed, 5:05pm, Chapel. Supper following, 312 Memorial Dr.

Christian Worship Service*—Sun, 10:45am, Chapel. Refreshments following service.

Hillel*—Traditional services, Fri, 5:30pm, Kosher Kitchen & Sat. 9am, Chapel.

Islamic Society**—Prayers Fri, 1pm, Kresge rehearsal Rm B.

Meditation & Gita*—Led by Swami Saravagatananda. Fri, 5:15pm, Chapel.

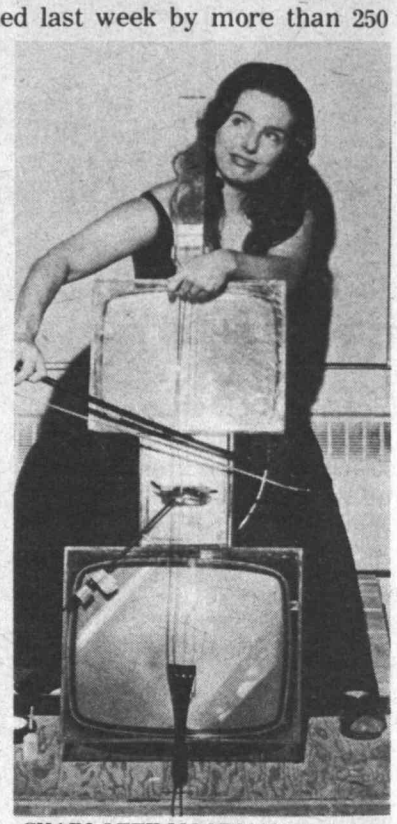
Prayer Time**—Lunch hour Bible classes led by Miriam R. Eccles. Fri, 1-2pm, Rm 20E-226. All are welcome.

Technological Revolution Arrives in Art World

By PATRICIA M. MARONI
Staff Writer

A technological revolution in art is here—with videodisc systems about to replace encyclopedias in the home and masterpieces to be created out of coastline and sky instead of canvas and oils.

This was a conclusion reached last week by more than 250 visiting artists and paid registrants to ARTTRANSITION, a five-day international conference on art and technology sponsored by MIT, the National Endowment for the Humanities, the MIT Center for Advanced Visual Studies, and the University Film Study Center.



CHARLOTTE MOORMAN performs "Concerto for TV Cello and Video Tapes" at MIT's Center for Advanced Visual Studies during ARTTRANSITION, a five-day conference which attracted some of the world's best-known avant-garde artists.

Otto Piene, director of CAVS and ARTTRANSITION co-chairman, and Virginia Gunter, project director for the conference, called the series of special performances and academic discussions "one of the most successful and stimulating gatherings of artists and theoreticians who will lead art out of traditional practices and into the multi-faceted world of public art with large audiences."

The numbers of persons attending public performances during ARTTRANSITION often exceeded the seating capacity of Kresge Little Theatre and the Institute of Contemporary Art, Ms. Gunter said.

Among the highlights of public events to which tickets were sold were Charlotte Moorman's "TV Cello Concerto," Wednesday evening, Oct. 15, a creative dance performance by Patricia Rohm at Boston's Institute of Contemporary Art on Saturday, Oct. 18, and Ron Hays' video showing of "A Visualization of an Experience Within Music"—to be repeated tomorrow, Oct. 23, at the Waldorf Astoria Grand Ballroom in New York to celebrate the 30th anniversary of the United Nations.

Two benchmark events of ARTTRANSITION's environmental segment were a 300-foot-long neon rainbow designed by Otto Piene and CAVS fellow Alejandro Sina, and Joan Brigham's and Stan Vanderbeek's steam curtain, which drifted up from a bed of dry ice between the Center for Advanced Visual Studies and the MIT Chapel.

The first sky event, on the evening of Thursday, Oct. 16, made use of a polyethylene tube filled with helium and anchored at both ends to Briggs Athletic Field to form an arc. Approximately 75 two-foot-long neon rods spaced four feet apart and activated by a standard car battery and spark plug cast a red glow to the rainbow, which rose to 150 feet at its midpoint.

ARTTRANSITION visitors to the steam curtain display Oct. 18 and 19 grew playful as colorful film images projected onto the vaporous "wall" invited them to step into the passageway between CAVS and the chapel. "The illusions of three-dimensional space created by the steam, the darkness, and the strobe-like cinematic effects was breathtaking," one visitor remarked.

Panel discussions during the five-day conference focused on "The Artist as Educator," "New Media/Video/Communication," "The Expansion of the Arts," as well as the technology of film, large-scale art, and new art, science, and technology. They included such speakers as Deac Rossell, film and photography critic for the *Boston Globe*, Jasia Reichardt, director of London's Whitechapel Art Gallery, Gyorgy Kepes, founder and director emeritus of MIT's Center for Advanced Visual Studies, Muriel Cooper, media director of the MIT Press, Douglas Davis, video artist and critic for *Newsweek* and *Art in America*, and environmental artist Christo, whose latest work involves the wrapping of one million square feet of California coastline.

ARTTRANSITION co-chairman Peter Feinstein said the conference confirmed that all art forms were in a period of transition and that various financial support systems would have to follow this trend "as ornithology follows the birds." President Wiesner served as chairman of the conference.

The conclusion of the five-day event was marked by Hollis Frampton's films, "Summer Solstice/Autumnal Equinox/Winter Solstice"—which are part of a 45-hour work designed to be viewed each day, "as one would read an encyclopedia or a novel." The Sunday evening presentation motivated one viewer to say, "I like the way Frampton uses each movie frame as if it were a semantic unit. In this sense, he's one of the best missionaries of ARTTRANSITION to bridge the gap between art and science."

Echoes

50 Years Ago

The Fall meeting of the American Welding Society was held on the MIT campus. Estimated attendance was 15 thousand.

The summer surveying camp at East Machias, Maine announced a new facility for research work on earth movements and geodesy.

40 Years Ago

President Compton commended the Freshman Council and representatives from the sophomore class in their ruling to outlaw throwing garbage at participants in the annual Field Day activities.

The Beaver Key Society initiated new members at a dinner meeting.

25 Years Ago

President Killian disclosed long-term plans for campus development and it was announced that $16 of the $20 million had been raised by the Development Program.

Fifty-eight foreign nations were represented at Tech this year, a statistic that rivaled United Nations representation of 59 countries.

(Prepared by Ethel Newell, MIT Historical Collections, x3-4444.)

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David Baltimore Named Co-recipient of Nobel

DR. JAMES R. KILLIAN, JR., honorary chairman of the MIT Corporation, congratulates Professor David Baltimore at party held to celebrate the news that Professor Baltimore had received the Nobel Prize.

PROFESSOR DAVID BALTIMORE meets the press at a press conference in the Center for Cancer Research, following the announcement that he had received the Nobel Prize.

PRESIDENT JEROME B. WIESNER and Professor David Baltimore at Professor Baltimore's press conference.

(Continued from page 1)

the immune system. They found that this enzyme, normally found in thymocytes, precursors to cells of the immune system, is also found in cells of patients with acute lymphoblastic leukemia.

Yet another achievement of Dr. Baltimore and his co-workers was the synthesis of part of the gene for globin, the protein part of hemoglobin. The work was reported in early 1972 almost simultaneously by his laboratory and by laboratories in New York and Bethesda, Md.

This was the first time that scientists had synthesized even part of a mammalian gene. The ability to do such "genetic engineering" has raised questions about the ethics, dangers and potential benefits of such research. Dr. Baltimore has shared these concerns and has been active in scientific discussions on these questions, notably at the recent Asilomar Conference in California which issues a set of recommendations on how and whether certain kinds of genetic experiments should be done.

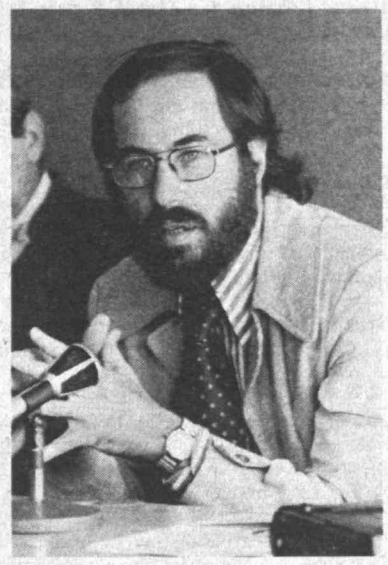
Dr. Baltimore is presently on sabbatical leave from MIT as visiting professor at The Rockefeller University in New York City. His wife, Dr. Alice Huang, associate professor in the Department of Microbiology and Molecular Genetics at Harvard Medical School, is also on sabbatical at The Rockefeller University. They are the parents of a 14-month-old daughter, Lauren Rachel Baltimore.

Researchers in Dr. Baltimore's laboratories at MIT are presently studying various aspects of the interactions between viruses—RNA tumor viruses, the polio virus, and the vesicular stomatitus virus—and the cells they infect. They are also continuing studies of terminal transferase.

Three other members of the MIT faculty are also Nobel laureates. They are: Dr. Har G. Khorana, Alfred P. Sloan Professor of Biology and Chemistry, who shared the 1968 prize in medicine and physiology; Dr. Salvador E. Luria, Institute Professor and director of the Center for Cancer Research, who received the prize in physiology or medicine in 1969; and Dr. Paul A. Samuelson, Institute Professor and professor of economics, who received the prize in economic science in 1970.

Other Nobel laureates who have worked, taught or studied at MIT include: Dr. Charles H. Townes, who was Provost at MIT when he received the Nobel prize in physics in 1964; alumni Dr. Richard P. Feynman and Dr. William Shockley (physics) and Dr. Robert S. Mulliken and Dr. Robert B. Woodward (chemistry); and former visiting professor Dr. Donald Glaser and Dr. Isador Rabi (physics).

Dr. Baltimore was born in New York City on March 7, 1938. He received his BA from Swarthmore College in 1960 with high honors in chemistry. Dr. Temin was graduated from Swarthmore in 1955. During 1960-61, Dr. Baltimore was at MIT taking graduate subjects toward his PhD. From 1961 to 1964 he



attended Rockefeller University, from which he received his PhD in 1964. Dr. Baltimore has been a postdoctoral fellow at MIT, at the Albert Einstein College of Medicine, Bronx, N.Y., and a research associate at the Salk Institute for Biological Studies, La Jolla, California.

While at the Salk Institute, from 1965 to 1968, Dr. Baltimore worked with Dr. Dulbecco who was there at that time. Dr. Temin has also worked with Dr. Dulbecco at Salk.

Dr. Baltimore returned to MIT in 1968 as associate professor of microbiology and was appointed professor of biology in 1972 and American Cancer Society Professor of Microbiology in 1973. The American Cancer Society provides the major support for Dr. Baltimore throughout his cancer research career.

Dr. Baltimore has received numerous honors and awards.

He received the first Gustav Stern Award in Virology in 1970, for his achievements in virus research, particularly on polio and mengo viruses. In 1971 he and Dr. Temin were awarded the Warren Triennial Prize from the Massachusetts General Hospital, for their simultaneous discovery of reverse transcriptase.

In 1974 Dr. Baltimore was elected to the National Academy of Sciences, in recognition of his distinguished achievements. In that same year he received the US Steel Foundation award in Molecular Biology from the NAS for his research into the relation between viruses and cancer.

In October of 1974 he and Dr. Temin were among seven recipients of the 17th Annual Gairdner Foundation Awards, which are awarded for contributions to the conquest of disease and the relief of human suffering.

Dr. Baltimore has been editor of the *Journal of Virology* since 1969 and of the *Journal of Molecular Biology* since 1971. Dr. Baltimore served on the National Science Foundation Advisory Panel for Genetic Biology from 1969 to 1972, the Cancer Research Center Review Committee of the National Institutes of Health from 1971 to 1973 and presently serves on the Cancer Special Program Advisory Committee of the National Institutes of Health.

Foreign Students Offered Courses

A seven-week mini-semester of English classes for foreign students, open to undergraduates, graduate students and post-doctoral fellows, will begin Wednesday, Oct. 29.

The English class will have two sections: Speaking Skills, meeting Wednesday evenings at 6:00 in 14E-311, beginning Oct. 29, and Writing and Composition, meeting Thursday evenings at 7:00 in 4-151, beginning Oct. 30. The class (23.41) gives nine units of credit and counts as a humanities elective for undergraduates. For further information, contact Linda Sibley (Wednesdays 10am-12) or Barbara Raither Thursdays 2-4pm) in 14N-221, x3-3925.

Lobby Music Today

The Central Maine Power Music Company, a seven member group who play stainless steel instruments, will give a concert at noon, today (Wednesday, Oct. 22) in the lobby of the Rogers Building (Bldg. 7). The ensemble recently completed engagements at the Hayden Planetarium at Boston's Museum of Science and at the Massachusetts College of Art.

Diamond on TV

Edwin Diamond, lecturer in the MIT Department of Political Science, will discuss his new book, *The Tin Kazoo*, which debunks many of the myths associated with television, on WCVB-TV's Good Morning Show Nov. 13. The program begins at 9am on Channel 5.

Faculty Will Take Up Ad Hoc Committee Motions in November

Two motions suggested by the faculty's Ad Hoc Committee on International Institutional Commitments were discussed extensively at last week's regular monthly faculty meeting and will come up again at the meeting in November.

Professor Charles Kindleberger, Ford International Professor of Economics in the Department of Economics and chairman of the ad hoc committee, said at least one of two motions offered by the committee last week will be modified and resubmitted at the faculty's regular meeting in November.

President Jerome B. Wiesner established the committee last April, on a motion passed by the faculty following discussions of the procedures followed when MIT entered into an agreement with the Atomic Energy Organization of Iran for the training of Iranian graduate students in nuclear engineering.

At the meeting last week, the ad hoc committee offered two motions. One was a resolution urging that, in the future, there should be greater involvement of the Committee on Graduate School Policy and the CEP when degree or non-degree programs involving international commitments are under consideration. The second proposed an amendment to the faculty's rules to establish a standing Committee on International Institutional Commitments.

The first motion could have been acted on at the October meeting, but the second motion, calling for change in a Faculty rule, was required to be laid over for one more meeting before action.

Most of the discussion centered around questions by faculty members about the range and the nature of programs to be reviewed, the origin of initiative for review, and the extent to which non-degree programs should be included. Further discussion and action on both motions was postponed until the meeting of Nov. 19.

Also last week, President Wiesner reported to the faculty that a formal proposal has been transmitted to the Boston School Department for a contract under which MIT would help the school system develop East Boston High School and the Joseph E. Barnes Middle School from general schools serving that specific section of the city to technical magnet schools drawing a large proportion of their students from throughout the city beginning in September of 1976.

Federal District Judge W. Arthur Garrity, in his Phase II desegregation order to the Boston schools, ordered the school system to enter into contracts with several area colleges and universities looking toward the development of a diverse array of special educational programs. Judge Garrity paired MIT with East Boston High School and the Barnes Middle School.

President Wiesner said an MIT committee of Faculty and Staff organized by Walter L. Milne, special assistant to the president for urban relations, and Dr. Barbara S. Nelson, assistant to the president and chancellor, prepared the proposal following conferences with public school officials. President Wiesner urged faculty, students and staff interested in becoming associated with the effort to contact the committee.

Members of the committee include:

Professor Alan Altshuler of the Sloan School of Management; Professor Louis L. Bucciarelli of the School of Humanities and Social Science; James Champy, executive vice president of the MIT Alumni Association; Professor James Fay of the Department of Mechanical Engineering; Professor Merton Flemings of the Department of Metallurgy and Materials Science; Professor Frank Jones of the Department of Urban Studies and Planning; Professor John King of the Department of Physics; Professor Margaret Mac Vicar of the Department of Physics and director of the Undergraduate Research Opportunities Program; Professor W. Ted Martin of the Department of Mathematics and the Division of Study and Research in Education (DSRE); Dr. Louis Menand of the Department of Political Science and the Office of the Provost; Professor Seymour Papert of the DSRE; Dr. K. Nagaraja Rao of the Center for Policy Alternatives; Robert H. Scott, director of Information Processing Services; Dr. Benson Snyder, director of DSRE; John P. Terry, director of Upward Bound; Dr. Myron Tribus, director of the Center for Advanced Engineering Study; and Dr. Bruce Wedlock, director of the Lowell Institute School.

Blood Drive Seeks Donors, 'You Can't Give in Office'

Reminding the MIT community that "You can't give at the office," MIT student volunteers are now actively soliciting donors for the MIT Fall Blood Drive, which begins Wednesday, Oct. 29 in the Sala de Puerto Rico in the Student Center.

The drive will run from Wednesday, Oct. 29 through Friday, Oct. 31 and Monday, Nov. 3 through Friday, Nov. 7. On Thursday, Oct. 30 and Monday, Nov. 3, the drive will be opened from 2:30pm to 8:15pm. All other days the hours will be from 9:45am to 3:30pm.

"This is one donation which has to be delivered in person," said Jean Hunter, chairperson of the drive. "You can't stay in your office. So we encourage all donors to make appointments in advance to prevent waiting." Appointment forms can be picked up at the Blood Drive Table in the lobby of Building 10, in all dorms, fraternities and in the Technology Community Association Office in the Student Center. Donors who are 17 years of age must have a parental letter of consent.

This year, drive organizers are emphasizing person-to-person solicitation to attract as many donors as possible.

As an added incentive for students to volunteer as donors, the Blood Drive plans to sponsor a beer contest, subject to IFC and DormCon approval. The two fraternities and two sub-dorm groups with the largest number of donors in proportion to the number of members in the group will each win a half keg of beer.

All donors will be treated to refreshments and classical music. Kosher food will also be available.

Anyone who needs additional appointment forms, would like to volunteer to help with the drive or has any questions about the drive should call the TCA office, x3-7911 or x3-4885. Members of the MIT community who have questions about members of their families receiving blood should contact Norma Loomis in the Medical Department, x3-4371.

Buchwald Coming

Members of the MIT community will have a chance to spend "an evening with Art Buchwald" when the famous humor columnist appears Nov. 10 under the sponsorship of the Lecture Series Committee. The event will be at 8pm in Kresge Auditorium. Tickets at $1 will be available to MIT people at all LSC movies.

THE INSTITUTE CALENDAR

October 22 through November 2

Events of Special Interest

Annual 2.70 Introduction to Deisgn "Cantest" – Finals Thurs, Oct 23, 12n, Rm 26-100. Each student has designed & built a device which will attempt to claim territory from an opponent "Cantestant."

Does the State Own its Scientists? The Viewpoint of a Recently-Released Russian Refusenik* – **Alexander Goldfarb,** molecular biology, Wiezmann Institute of Science, formerly of Kurchatov Institute of Atomic Energy. MIT Hillel & MIT Committee for Azbel, Lerner & Levich Descussion & Lecture. Tues, Oct 28, 5pm, Rm 10-105. Coffee. Info: x3-2982 (Hillel) or x3-6879.

Energy Problem I: The General Problem and Alternate Solutions* – **Hans A. Bethe,** Compton Lecturer, Nobel Prize-winning physicist from Cornell University's Laboratory for Nuclear Science. Compton Lecture. Wed, Oct 29, 4:30pm, Kresge.

Symposium on Biology and Cancer Research at MIT** – Dedication of Grover Higdon Laboratories in the Center for Cancer Research. Introductory remarks: **Salvador E. Luria,** Institute Professor, director of the Center. Speakers & topics: **Herman N. Eisen,** Immunology and Cancer; **Phillip A. Sharp,** Virology and Cancer; **Richard Hynes,** Developmental Biology and Cancer. All professors of biology from the Center. Thurs, Oct 30, 10am, Rm 54-100.

Open Reading* – Sponsored by MIT Writing Program. Come, read your work, listen to others, enjoy Halloween refreshments. Thurs, Oct 30, 3:30-6:30pm, Crafts library, Senior Hse. Info: Writing Program, x3-7894.

Blood Drive* – Fall blood drive will be held Wed, Oct 29-Fri, Nov 7, Sala. Hours: Wed, Oct 29, Fri, Oct 31 & Tues-Fri, Nov 4-7, 9:45am-3:30pm; Thurs, Oct 30 & Mon, Nov 3, 2:30-8:15pm. Appointments preferred, cards available in Bldg 10 Lobby, living groups, TCA office, Stu Ctr Rm 450. Info: x3-4885 or x3-7911.

Seminars and Lectures

Wednesday, October 22

Human Magnesium Metabolism* – **Warrne Wacker, MD,** director of Harvard Community Health Services. Nutrition & Food Science Seminar. 9am, Rm E18-408.

Social Implications of Two-Way Cable Technology* – **Zale Anis,G.** Mechanical Engineering Systems & Design Division Seminar. 12:05pm, Rm 3-465. Bring lunch, coffee & tea provided.

Politics in South Africa* – **Ernest Wentzel,** leading South African Liberal Lawyer. MIT-Harvard African Luncheon, Seminar. 12:30pm, Harvard CFIA, 6 Divinity Ave, Seminar Rm 1.

Study of the Wind-Driven Equatorial Ocean Circulation* – **Mark Cane,** Goddard Institute of Space Studies. Oceanography Sack Lunch Seminar. 1pm, Rm 54-611. Bring lunch, coffee provided.

Non-Linear Iterative Schemes for the Finite Element Equations* – **Tony Shober,** G. Nuclear Engineering Doctoral Seminar. 3pm, Rm NW12-222.

History of MIT's Department of Chemical Engineering* – **Raymond F. Baddour,** Lammot duPont Professor of Chemical Engineering, head of the department, director of Environmental Laboratory. AIChE seminar. 3:30pm, Rm 12-124.

Nonverbal Communication and the Education of Children* – **Paul Byers,** Columbia Teachers College. Humanities 21.116 Nonverbal Communication Seminar. 4pm, Rm 9-355.

Some Comments on Civil Engineering Education* – **F.E. Richart,** University of Michigan. Civil Engineering Constructed Facilities Division Seminar. 4pm, Rm 3-370.

Proliferation and Counterforce: The Two Dangers* – **Stuart Symington,** US Senator from Missouri. Joint MIT-Harvard Arms Control Seminar. 4pm, Rm 18, Harvard Yen-Ching Institute, 2 Divinity Ave.

The Science of Bacteriology and the Profession of Medicine* – **Theodore M. Brown,** director, Program in Health, Medicine & Society, City College of the City University of New York. Technology Studies Seminar. 4pm, Rm 20D-205. Coffee 3:30pm.

Art and Science* – **Jasia Reichardt,** director of Whitechapel Gallery, London. Aesthetics in Science & Technology Course guest lecture. 7-10pm Rm 3-133.

Thursday, October 23

Time Evolution of Self Consistent Toroidal Discharges* – **James McCune,** aero/astro. Plasma Theory Seminar. 11am, Rm 36-261.

Education in the Year 2000 – On the Need for Fundamental Rethinking of the Issues* – **Bertrand Schwartz,** visiting professor. CAES-DSRE Seminar. 2pm, Rm 20C-117.

Bridge Design Criteria* – **Paul Grundy,** Monash University, Melbourne, Australia. Civil Engineering Constructed Facilities Division Seminar. 2pm, Rm 1-353. Coffee.

An Approach to Highly-Integrated Computer-Maintained Cellular Assays – **Frank Manning,** Project Mac. Project MAC Seminar. 3pm, Conference rm 512A, 545 Technology Square. Refreshments 2:30pm.

Plastic Substrates and Metallization Processes Used in Printed Circuit Industry** – **George Messner,** Photocircuits Corp, Division of Killmorgan. Mechanical Engineering Polymer Processing Program Seminar. 4pm, Rm 37-187. Coffee 3:45pm.

Nonlinear Dynamic Models of Interacting Element-Cycles in Aquatic Ecosytems* – **Alician V. Quinlan,** research associate, mechanical engineering, MIT & Harvard. Thermal-Fluids Seminar. 4pm, Rm 3-343.

Michelangelo and the Metaphor of the Body** – **Leo Steinberg,** Benjamin Franklin Professor, history of art, University of Pennsylvania. Humanitas, An Evolving Perspective Seminar on Technology & Culture. 4pm, Rm 9-150.

Friday, October 24

Bizarre, Marginal and Unexploited Transportation* **Jacques Istel,** founder of Sport Parachuting & Investor in Transportation. Center for Transportation Studies Seminar. Buffet 12n ($1), seminar 12:45pm (free), Stu Ctr Mezzanine Lge.

Polyelectrolytes Past, Present and Future* – **J. Th. G. Overbeek,** visiting professor from University of Utrecht. Chemical Engineering Seminar. 2pm, Rm 10-105.

Computerized X-Ray Tomography of the Brain* – **Saul Aronow,** Radiological Sciences Laboratory, MGH. Nuclear Engineering Biomedical Applications of Radiation Seminar. 3:45pm, Rm NW12-222 Coffee 3:30pm.

A MHD Analysis of Divertors * – **Alan H. Boozer,** Princeton Plasma Physics Laboratory. Plasma Dynamics Seminar. 4pm, Rm 36-261.

Long Range Forces Between Metals and Insulators (Experimental) – **L.J. Slutsky,** University of Washington. Materials Science Colloquium. 4pm, Rm 9-150. Tea 3:30pm.

Monday, October 27

The Utility View of Nuclear Power* – **Edward Howard,** vice president of nuclear organization, Boston Edison. Nuclear Engineering Seminar. 3:30pm, Rm NW12-222. Coffee 3pm.

Recent Advances in Network Optimization* – **Thomas Magnanti,** Sloan School. Controls in Communication Seminar. 4pm, Rm 39-500.

The Use of Water Quality Models in Decision-Making* – **Tavit Najarian,** Resource Analysis, Inc. Cambridge. Ralph M. Parsons Laboratory for Water Resources and Hydrodynamics Seminar. 4pm, Rm 48-316. Coffee 3:45pm, Rm 48-410.

Toward the Rules for Constructing and Embryo: Adhesion-Guided Multicellular Assembly* – **Macolm Steinberg,** biology, Princeton University. Applied Mathematics Colloquium. 4pm, Rm 2-338. Coffee 3:30pm, Rm 2-349.

Tuesday, October 28,

Self-Consistent Analysis of a Tokamak Discharge Including Resistive, Inertial and Viscous Effects* – **Paul Chrisman,** G. Nuclear Engineering Doctoral Seminar. 12n, Rm 38-166.

Scale Modeling for Fun and Profit* – **Richard H. Lyon,** mechanical engineering. Applied Mechanics Seminar. 3pm, Rm 3-133. Coffee 4pm, Rm 1-114.

The Interactions Between Transfer RNA and Ribosomes* – **Dr. Volker A. Erdmann,** Max-Plank Institut fur Molekulare Genetik, Berlin. 4:30pm, Rm 6-120. Coffee 4pm, 5th fl vestibule, Bldg 56.

Gas Turbines for Electrical Power* – **Donald J. Jordan,** manager of industrial & marine gas turbine engineering, United Technolgies Corp. Aero/Astro General Seminar. 4pm, Rm 35-225. Coffee 3:30pm, Rm 33-222.

The Present and Future State of Inertial Guidance* – **Charles Stark Draper,** Institute Professor Emeritus. New Technologies and International Security, CIS Seminar. 4pm, Rm E53-482.

Energy Conservation* – **Elias P. Gyftopoulos,** Ford Professor of Engineering. Energy Assessment Group Seminar. 4pm, Rm 24-115.

The Moon: The Debate After Apollo* – **Thomas Gold,** Mount Holyoke College. Physics Colloquium. 4:15pm, Rm 37-252. Coffee 3:45pm.

The Domestic Economic Crisis* – **Frank Ackerman,** co-editor of Dollars and Sense, a journal by members of the Union of Radical Polictical Economists. SACC Talk & Discussion. 7:30pm, Stu Ctr West Lge.

Wednesday, October 29

Nutrition & Food Science Seminar* – **George Blackburn, MD,** director of Nutritional Support Services, New England Deaconess Hospital; surgery, Harvard Medical School. 9am, MIT Clinical Research Center, Rm E18-408.

Recent Ideas in Telescope Design* – **Frank Melsheimer,** research engineer, Lick Observatory. Mechanical Engineering Systems & Design Division Semianr. 12:05pm, Rm 3-465. Bring lunch, coffee & tea provided.

Internal Waves/Microstructure in the Main Thermocline Near Bermuda* – **Charles Eriksen,** Woods Hole Oceanographic Institute. Oceanography Sack Lunch Seminar. 1pm, Rm 54-611. Bring lunch, coffee available.

Uranium Self Shielding in Fast Breeder Reactor Blankets* – **Osman Kadiroglu,** G. Nuclear Engineering Doctoral Seminar. 3pm, Rm NW 12-222.

New Developments in Design for Multifamily Housing* – **N. John Habraken,** head of Department of Architecture. Architecture Seminar. 4pm, Rm 3-370.

Self-Restraint in Science?A Case Study of the 'Moratorium' in DNA Research* – **Charles Weiner,** history of science and technology. Technology Studies Seminar. 4pm, Rm20D-205. Coffee 3:30pm.

Thursday, October 30

Electrostatic Linear Mode Conversion in a Parabolic Density Profile* – **George Johnston,** research associate, RLE. Plasma Theory Seminar. 11am, Rm 36-261.

Generation of Sub-Picosecond Pulses with a Mode-Locked Dye Laser* – **C.V. Shank,** Bell Telephone Laboratories. EE & CS Optics Seminar. 2pm, Rm 36-428.

Radiation Processing of Polymer Films** – **Wayne Moreau,** IBM Corporation. Mechanical Engineering Polymer Processing Seminar. 4pm, Rm 37-187. Coffee 3:45pm.

The Effects of Low Cost International Telecommunications: Report of the Datanet Project* – **Arthur B. Corte,** co-director of Datanet Project; **Ithiel de Sola Pool,** Arthur and Ruth Sloan Professor of Political Science, director of MT Research Program on Communications Policy. CIS Seminar, 4pm, Rm 37-252.

The Copernican Revolution** - **Owen Ginergerich,** astronomy, history of science, Harvard University. Humanitas, an Evolving Perspective Seminar on Technology & Culture. 4pm, Rm 9-150.

Mechanism of DNA Replication: Repair vs Duplication* – **Rudolf Werner, MD,** biochemistry, University of Miami School of Medicine. Nutrition & Food Science S Seminar. 4pm, Rm 16-134.

Experiment on Controlled Fusion in Self-Colliding Beams (MIGMA)* – **Bogdan Maglich,** MIGMA, Fusion Energy Corp, Princeton, NJ. Physics Colloquium. 4:15pm, Rm 26-100. Refreshments 3:45pm, Rm 26-110.

Superships* – **Eldon Greenberg,** Center for Law and Social Policy. Energy and the Environment Seminar sponsored by MIT Sea Grant Program, Lowell Institute, and the New England Aquarium. 7pm, New England Aquarium Auditorium.

Friday, October 31

Molecular Interpretation of Rubber Elasticity* – **P.J. Flory,** visiting professor, chemical engineering. Chemical Engineering Seminar. 2pm, Rm 10-105.

Solid Surface Characterization by Physical Absorption of Gases* – **Fred Putnam,** Carnegie-Mellon University. Chemical Engineering Seminar. 3pm, Rm 10-105.

The Sack 'Em Up Men – A History of Grave Robbing* – **Saul Benison,** history & history of medicine, University of Cincinnati; environmental health, University of Cincinnati Medical School. First Annual Halloween Concourse Forum. 4pm, Rm 6-120.

Impurities in Tokomaks* – **B. Ya'akobi,** University of Rochester. Plasma Dynamics Seminar. 4pm, Rm 36-261.

Community Meetings

Technology Wives Organization – All wives are urged to attend first meeting Wed, Oct 22, 7:30pm, Stu Ctr Mezzanine Lge. Panel of 6 administrators will acquaint us with MIT Services, program, activities, refreshments.

Community Service Fund Lottery – Lottery tickets on sale Thurs, Oct 23 - Thurs, Oct 30, 11:30am-1:30pm daily, Lobby of Bldgs 7 & 10, E19 & Lobdell. Tickets $1, 3 for $2.

Sophomores: Class of '78 Meeting – Sun, Oct 26, 8pm, Stu Ctr West Lge. Discussion of class ring (company, design, etc). What do YOU want? Send ideas &/or attend meeting. Refreshments. Sophomores only. Next meeting Sun, Nov. 2.

MIT Women's Forum** – Meetings Mon, 12n, Rm 10-105 (Tues in case of holiday). **Mon, Oct 27:** Discussion of Action Oriented Projects.

Parent's Discussion Group** – Dr. Russell Merritt, medical department, will speak on "Early Childhood Nutrition – its Effect on Health and Development." Mon, Oct 27, 12:30pm, 3rd fl conference rm, Infirmary. Refreshments.

Toward an Alternative Zionism in the Diaspora* – Round table discussion with MIT-Brandeis peace action group, PIPA (Peace between Israel, Palestinians and Arab states.) Sponsored by MIT Hillel. Mon, Oct 27, 8pm, Stu Ctr Mezzanine Lge.

Basic Pistol Marksmanship Course** – Begins Thurs, Oct 23, 6:30pm, duPont Pistol Range, for 5 Thurs. Open to first 20 adult members of MIT to apply. Fee: $20, incl all costs. Tom McLennan, x3-3296 or Andy Platais, x8-1417 Draper.

Discussion Group for New Women Graduate Students** – Sponsored by Graduate School Office, DSA. New and continuing members welcome. Fri, 12n-1:30pm, Rm 7-133. Lunch provided.

The Wives Discussion Group** – Led by Myra Rodrigues, social worker: Charlotte Schwartz sociologist and Carol Hulsizer. Wed, 2:15pm, Stu Ctr West Lge. Coffee. Babysitting in Stu Ctr Rm 473.

MIT Diet Workshop** – Thurs, 12n-1pm, Stu Ctr Rm 491.

Wellesley Events

Color Photography Now* – Color works of contemporary photographers. Thru Mon, Oct 27, Mon-Fri, 8:30am-5pm; Sat, 8:30am-12n & 1-5pm; Sun, 2-5pm, Wellesley College Museum. Free.

One Hundred Years: Selections from the Permanent Collection in Honor of the Wellesley College Centennial* – Thru Thurs, Oct 30, Mon-Fri 8:30am-5pm; Sat, 8:30am-12n & 1-5pm; Sun, 2-5pm, Wellesley College Museum. Free.

Social Events

Hillel Brunch* – Replenish your body and mind. Rabbi Arnold Wolf will discuss "Jews and Christians in the '70's." Sun Oct 26, 11am, Rm 10-105. Cost $1.25 members, $1.50 others.

Strat's Rat – Sat, Nov 1, 8:30pm, Sala. Light & dark beer, 16oz/$.25. Wine available. Live announcer & records by WTBS. Free, college ID required.

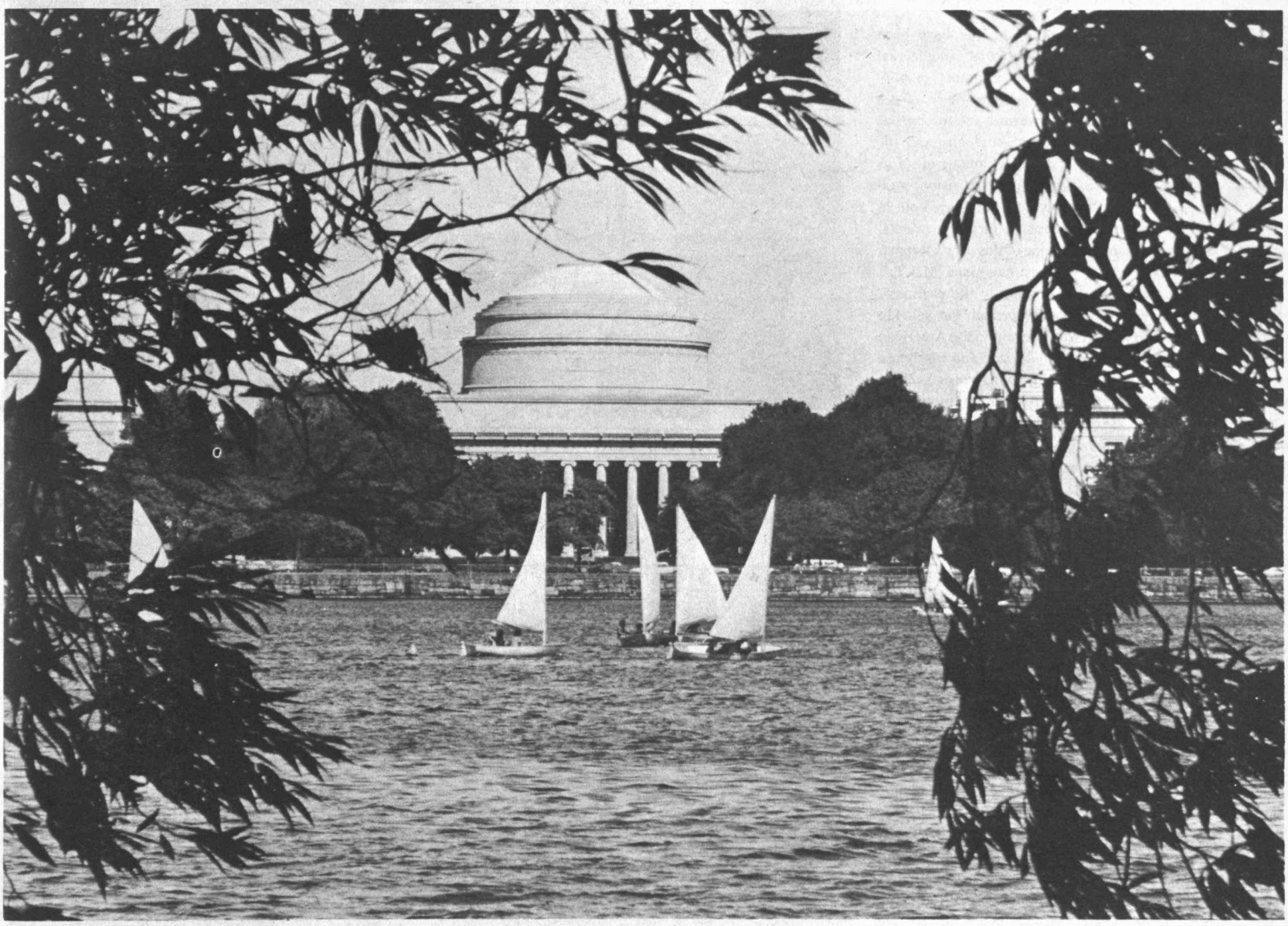
24 Hour Coffeehouse* – Enjoy relaxing conversation, piano playing, games, inexpensive food, candy & drinks. Open 24 hours per day, 7 days per week, Stu Ctr 2nd fl lge.

REPORT OF THE PRESIDENT AND THE CHANCELLOR

FOR THE ACADEMIC YEAR

1974-1975

MASSACHUSETTS INSTITUTE OF TECHNOLOGY



M.I.T. is alive and well, though not without its problems. A glance through out past annual Reports reveals that we have seen each recent year as a new and perhaps increasing challenge — a mixture of constraints and opportunities, some self-generated but most a reflection of conditions in the country itself. One wonders in passing if each year *is* increasingly a challenge or whether, as we muse in these Reports, we should not reach for a better word to describe the rapidly changing state of the Institute and the society in which it functions.

These are, to be sure, troubled times, and the conjunction of recession, inflation, the diminution of trust, and a general sense of social malaise are causing strains in most institutions and organizations, M.I.T. included. But there have been challenging times before in the history of the Institute — moments when even its very survival seemed to be in doubt — such as in the aftermath of the Civil War and in the severe depression of the 1870s. The Institute has lived through many times when the society seemed confused and drifting; it has emerged from each of these periods basically stronger and better prepared to carry on its work. Frequently such times have been moments of great opportunity as well as anxiety for they usually involved a rediscovery of the essence of the Institute.

We should take heart from the outcome of those earlier periods as we strive to maintain and add to M.I.T.'s special strengths, and to encourage the development of those activities and attitudes that will make M.I.T. a vital and important place in the future. Such efforts require not the reactive stance which is implied by the word "challenge" but a positive vision of the leadership role that an institution like M.I.T. should play in the education of bright and concerned young men and women, in the exploration of new realms of theory and practice, and in the cooperative evolution of an increasingly responsive and humane society. At a time when the newspapers carry stories on cities on the verge of bankruptcy, universities in serious financial straits, many people in fear of job loss, and belt-tightening in virtually every domain, talk of visions of a rosy future may seem quixotic in the extreme. But vision is precisely what is needed, for only a well-articulated view of what the future *could be* gives focus and heart to the efforts to get from here to there.

The components of our vision for M.I.T. have been discussed in many contexts — continued intellectual excellence, outstanding departments and programs, responsiveness to major technical and socio-technical needs of our world-wide society, the encouraging of warmth and responsiveness as well as analytic precision in our students, and the achievement of fairness, equity, and respect among all of us who work and study here. The affirmation of that vision, well-grounded in the current life of the Institute and played out in the daily activities of hundreds of people — faculty, students, and staff alike, is the fundamental theme of this year's Report.

In recent annual Reports we have examined M.I.T.'s teaching and research activities in relation to the technical, social and economic milieu and stressed especially our belief in the potential for learning and growth inherent in the American society. We also discussed the need to develop and wisely use new technology to help satisfy many growing needs such as food, raw materials, energy, environmental protection, housing, and health care. We described M.I.T.'s strong efforts to understand and to help moderate the nation's problems both through its traditional roles in teaching and research, and through substantial efforts to align M.I.T.'s own processes and community relationships with current societal objectives.

At the same time a less positive theme has run through our recent Reports, the ever more painful effort to keep the Institute's budget from running away and the many new tasks and constraints — affirmative action, control of information to insure privacy, occupational safety, regulations affecting the laboratory use of animals, controls on human experimentation, etc. — imposed in addition to older, more familiar ones. Together these trends have placed increasingly heavy pressures and workloads on everyone in the Institute — those men and women who provide vital support services, secretaries, administrators, faculty, researchers, students, and especially department chairmen — adding greatly to the strain that would in any event be inherent in a rapidly evolving academic program. In the Reports of our colleagues, the Deans, Vice Presidents, Department Heads, and Laboratory Directors, there is much reference to the stresses that come from trying to do more with less. The constraints are real; in some cases externally imposed, in other cases self-imposed. But mingled in these same reports are imaginative ways to actually achieve more with less, accounts of rigorous examination of priorities and newly emerging areas of growth and development.

The resulting mood on the campus is hard to define. In fact, the mood varies greatly from time to time, area to area, and individual to individual. It can perhaps be described as a mixture of enthusiasm and tautness. The overall thrust remains forward looking, creative, and hopeful. But the tensions brought about by fiscal pressures, after years of social pressures and turmoil, are clearly growing, introducing concerns which drain energies from creative activities. These drains are not unique to M.I.T. In fact, though pressures may be as great at the Institute as elsewhere, the consequent unhappiness appears to be less so — perhaps due to the purposefulness of the M.I.T. programs.

Next year, as we continue the essential efforts to control the financial picture, we intend to give special attention to ways of moderating the resulting tensions, particularly those created by the increasing administrative demands upon individuals' time. The Institute is learning to live in a new period in which rapid growth cannot be maintained, but in which the same kind of vitality and change that come easily with apparently unlimited growth are especially needed. Now they must come more from inner resources, intellectual and financial — and they do, but not without considerable discomfort.

M.I.T.'s programs continue to appeal to students. Undergraduate and graduate student enrollments have risen this year, as have applications for next year in both categories. There were approximately 145 more freshmen in the Class of 1978 (a total of 1,040) than in the previous year when the class was unusually small because of dormitory space limitations. One hundred and ten more graduate students were also in attendance in spite of the shortage of funds for fellowships and teaching and research assistantships.

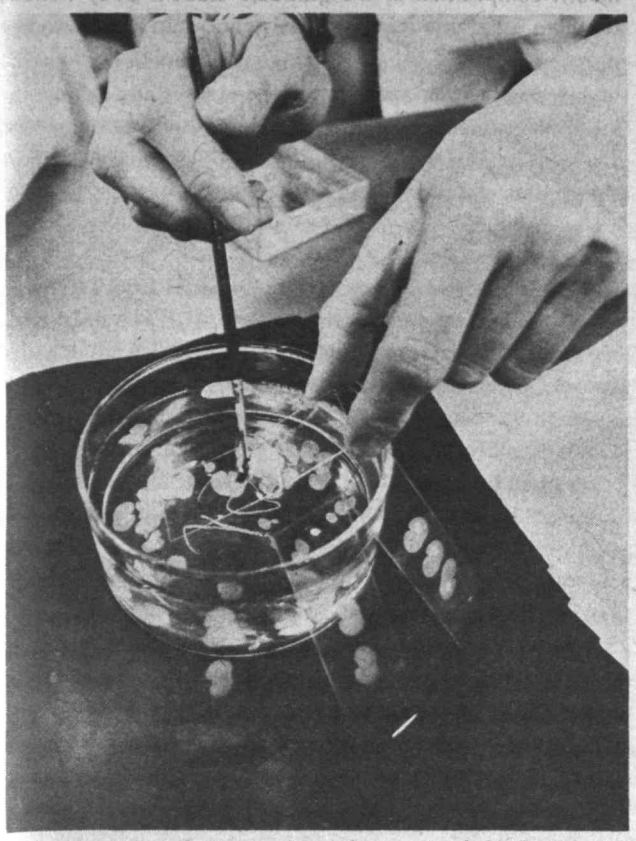
In last year's Report we reviewed the evolution over the past 15 years of M.I.T.'s undergraduate education. This year we had hoped to do a similar review of what had happened to graduate education at M.I.T. during the same period. However, we soon became aware that neither the data nor the conceptualizations to do a thorough job were readily available. Since the last formal review of graduate education was conducted nearly ten years ago — when Federal support for graduate education was perhaps near its peak — there has been much change in terms of financial support, research interests, career opportunities (academic institutions, industry, and government), composition of the graduate student body (fellows, teaching assistants, research assistants, minorities, women, non-U.S. citizens) to name just some of the dimensions that need to be examined actively.

Since the rapid expansion of the Graduate School paralleled the expansion of research both on the campus and in the country more generally, there is a need for a deeper understanding of how this expansion reflects the state of the several fields and what influence basic and mission-oriented research have had in each instance. During this same period there has come about a fairly drastic increase in the postdoctoral population; hence the structure of the basic M.I.T. "learning family" — faculty, undergraduate and graduate students, postdoctoral fellows and other research associates in addition to technical support of personnel — has changed quite considerably.

Finally there is a need to understand better the changing cost of graduate education as well as the changing social environment of graduate students. We feel sufficiently the need to gain a deeper understanding of this entire complex of issues that we propose — at this propitious moment when Professor Kenneth R. Wadleigh has just become Dean of the Graduate School — to have a group of faculty and administration study this area during the current academic year. We hope to report our findings next year at this time.

Some of the trends in undergraduate education, as discussed in last year's Report, continue. The great interest in health careers is sustained as indicated by the fact that 186 men and women applied to medical schools from M.I.T. this past year, 115 were seniors and the rest alumni and juniors. This emphasis has placed a heavy teaching load on the Department of Biology and created an increased, but not yet troublesome, demand for some chemistry subjects. At the same time, there is a substantial decline in law as a career among M.I.T. students, no doubt reflecting the fact that job opportunities for recent law school graduates are less available than they were a few years ago.

"Cloud One," a weather balloon displayed in the Rogers Lobby, was a joint project of the Center for Advanced Visual Studies and the Department of Electrical Engineering and Computer Science.



Brain research is being performed as part of the Program in Health Sciences and Technology.

Perhaps the most important trend to emerge in recent years is the increasing fraction of the undergraduate student body choosing one of the engineering options, reversing a decline that had persisted for a number of prior years. Approximately 45 percent of this year's sophomores who designated a major are enrolled in the School of Engineering. This brings the total undergraduate enrollment in engineering to 44 percent for the Classes of '76, '77, and '78, up from 36 percent in 1971-72. There is no obvious reason, perhaps not even a single reason for this welcome development. We know that the nationwide decline in engineering enrollments has stopped, no doubt due to the relatively better employment prospects that engineering enjoys at this moment compared to many other careers, but the resurgence of student interest in the engineering professions appears to be more pronounced at M.I.T. than elsewhere.

We would like to believe that renewed student interest in engineering as a career is a reflection of the School's own efforts at renewal and its rededication to furthering the evolution of the engineering profession in response to broadened professional scope, including the engineering sciences and technologies, the process of engineering (i.e., the conception and development of reliable and economical technical solutions) and the process of planning responsible uses of technology.

The growing conflict between the many new opportunities for teaching and research that were developing and the mounting financial pressures and resulting budget reductions in the departments caused the Dean of Engineering, Alfred A.H. Keil, to seek and obtain the participation of the School's faculty and staff in a comprehensive process of self-appraisal. The objective of this effort was to identify alternative courses of action which would assure the quality and meaningfulness — the greatness — as well as the financial viability of the School. A number of panels, each with assigned responsibilities, and a coordinating committee consisting of the chairmen of these panels were established. In all, more than 100 members of the School's faculty and staff were involved in the process. The panels have now completed their work and have submitted their reports. These reports, which contain upwards of 50 recommendations, are being synthesized into a final report to be distributed to the faculty early in the 1975-76 academic year. The recommendations in the report deal with issues such as the academic and administrative structure of the School, the School's planning and budgeting process, the academic calendar, approaches to new educational and research programs for the School, and financial and student administrative processes.

One recommendation which may well have importance for other parts of the Institute was the introduction of a program planning and budgeting process which would permit the integration of individual program elements in terms of priority, intensity, and cost. In order to deal responsibly with both the constraints of financial pressures and new opportunities for advancing the School's teaching and research programs, the School of Engineering has actually begun the implementation of this recommendation with the preparation of the budget for fiscal year 1976. Preliminary discussions of the other recommendations have occurred already at Engineering Council and further discussions with the Council and the School's faculty are anticipated for the fall.

A major turning point appears to have been reached in the long effort to create a humanities and arts program for M.I.T. that simultaneously reflects the humanistic goals of a liberal education — the values, historical insights, and cognitive styles that it seeks to make one sensitive to — and still links sufficiently to the modern world of engineering and science. Several developments contribute to this sense of movement. The new Institute Requirement in the Humanities, Arts, and Social Sciences approved by the faculty in spring, 1974, and reported last year, is off to a good start judging by student and faculty reactions. The new arrangement provides students with a much broader range of choices for their electives in this category in the freshman and sophomore years. At the same time, it takes the almost overwhelming load off the few subjects that formerly were allowed to satisfy the Humanities Requirement.

The communications gap between the humanities, broadly construed, and science and engineering has been a perennial issue and recent efforts to bridge the gap between these "cultures" are most promising. The experimental *Technology Studies Program* is an important illustration of such an effort. During the past year Technology Studies was transformed from a set of good intentions into an academic program of research projects, colloquia, and planning for undergraduate and graduate subjects to be offered in 1975-76. The primary emphasis is on the historical, social, and political dimensions of science and engineering — anchoring the intellectual work simultaneously in specific scientific and technological content and in a disciplined understanding of the social change which often attends technical progress. Although the Program's purview includes such diverse disciplines as history, anthropology, sociology, art history, and education, it is focused on increasing our understanding of the role of values in the planning of research, the acceptance, rejection, and use of innovation, the formation of technological communities, and changes which take place in larger communities as a result of technological developments. proposed the creation of a major center for examining the problems of a technological society in their humanistic dimensions, examining the influences of science and technology on contemporary civilization as well as their historical roots and their implications for the future. Both undergraduate and graduate students would be associated with these activities, together with postdoctoral fellows and Senior Lecturers who have had a wide range of experience dealing with these problems. The *Concourse Program,* an alternative route for freshmen, is perhaps the most ambitious ongoing M.I.T. effort to unify the intellectual disciplines represented in the first year. In this program, which accepts approximately 50 first-year students, the humanities and science subjects are taught in an integrated manner by a group of faculty members drawn from the Schools of Engineering, Science, and Humanities and Social Science. Finally, a new *Oral History Program* focusing on science and technology has been established. Many of the great figures of contemporary science and technology have been associated with M.I.T. and for many years we have hoped to document their perceptions of the major events in which they have been a part. This new program will, at least in part, prevent the future loss of priceless historical accounts. Equally important, it will provide students with opportunities to merge an interest in history and science.

While serious revitalizing efforts are taking place in the Institute's basic programs, we also can report continued progress in four newer programs which are natural outgrowths of the interests of M.I.T. faculty and students in conjunction with major contemporary issues — the Harvard-M.I.T. Program in Health Sciences and Technology, the Center for Cancer Research, the Energy Laboratory, and the Division for Study and Research in Education. The Program in Health Sciences and Technology has achieved a milestone in the graduation of its first class. The 25 students admitted for the M.D. part of the Program in 1971, finished in June of the past year. The Program continues to grow and develop and now involves 100 medical students of whom 20 percent are concurrently enrolled for both the M.D. and Ph.D. degrees. The new curriculum, as envisioned at the beginning, has been developed to permit deeper penetration of the physical sciences and engineering into medicine. A spectrum of academic offerings, previously not available, is under way or under development. The special subjects developed and taught for students in the Program are also available to other students, especially the many M.I.T. students interested in health careers or biomedical engineering.

The Program is in the process of establishing medical engineering departments or centers at the Harvard Medical School teaching hospitals to further collaborative efforts between medical staffs and engineers. These departments, like hospital departments of surgery, pathology, etc., will provide new training opportunities for students and represent the recognition of medical engineering as a significant medical profession. The Program has, as anticipated, also facilitated collaborative research involving interdisciplinary teams — physicians, engineers, scientists — from Harvard Medical School, its teaching hospitals, and M.I.T. These research projects range from fundamental science to clinical evaluation in human beings. Research programs currently under way or being planned include biomaterials science, cancer radiation therapy, rehabilitation engineering, a biomedical engineering center, and studies of the health effects of energy production.

The Center for Cancer Research, begun two years ago, has grown in size and complexity to the point where it now includes some 70 researchers — faculty, students, and professional staff, mostly from the Department of Biology — and occupies specially designed facilities in the Seeley G. Mudd Building which was dedicated in March. The basic research is addressed toward the understanding, diagnosing, and treating of cancer. Experimental research now includes, in addition to work on animal cells and on isolated cells in cultures, research of a fundamental and diagnostic nature on material from hospital patients, particularly on leukemia.

The Center's research is organized in three groups: 1) the Virology Group which is concerned with RNA tumor viruses and with adenoviruses; 2) the Cellular and Developmental Biology Group which studies the process of mutation, changes in cellular membrane protein, and the abnormal expression of various genes in cancer cells; and 3) the Immunology Group which concentrates on studies of specific antigens on cancer cells, on the structure of the antibody molecules involved in the rejection, and on the development of immunological response.

This Center is well on the way to being a major national resource in the understanding of cancer, providing the opportunity for faculty and students from a number of research groups and departments to work together on a major biological and medical venture.

During the past year the Energy Laboratory, now completing its second year of operation, increased its visibility and viability as the focal point of energy-related research at M.I.T. There has been a clarification and delineation of the research areas of the Laboratory, and funding levels have risen appreciably. The Laboratory is now managed as four units with specific research interests: 1) Energy Management and Economics Studies; 2) Nuclear, Environmental and Electric Power Studies; 3) Fossil Fuel Research; and 4) Special Programs - (small new efforts, end-use technology, alternate energy technology).

Though the Laboratory is still in a developmental stage, it now has a key role in energy-related activities at M.I.T., and its associated faculty and staff members have made significant contributions to the formulation of national energy plans through both technical advice and policy-related studies. Currently some 55 faculty members from ten departments and all five schools are involved, together with 85 students and 45 technical staff members in a relatively open and effective learning environment in close articulation with other Institute activities.

During the past year an advisory board of energy experts from outside M.I.T. has been established. This board reviews the work of the Laboratory on a periodic basis and brings close working knowledge of energy problems to bear in advising the Laboratory on its current programs and future plans.

The year 1974-75 was also the second year of operation for the Division for Study and Research in Education, another effort to increase the options and opportunities of faculty and students. The D.S.R.E. has a pioneering and difficult role at M.I.T., attempting to develop a research and teaching program in the field of learning based upon M.I.T.'s many special competences (for example, the programs in the brain sciences, linguistics, computers and artificial intelligence), and related as well to the particular problems of a specialized learning environment such as that at M.I.T. The expectation is to provide a focal point for research and teaching which will contribute to the deep understanding of learning processes in individuals and groups and thus hopefully point the way to more effective educational methods. Administratively, we are seeking to achieve the advantages of an academic department and an interdisciplinary laboratory.

The Division offered a number of regular subjects and seminars during the fall and spring semesters which enabled the graduate students associated with the Division to obtain a broad introduction to its areas of specialization. These subjects also served as electives for undergraduate and graduate students from other parts of the Institute. Eight graduate students were involved in an interdisciplinary Ph.D. program administered by the Division in collaboration with other M.I.T. departments. The number is expected to be approximately 12 next year. In addition, the Division is cooperating in a new Master of Science Program with emphasis on science and education.

* * * * *

Within the general context of a forward momentum pressing against financial and social constraints there were, as in every year, particular events which by their extraordinary nature deserve special mention. Some are academic, others the result of events in the world around us. We select a few each year for special mention to highlight scientific or technological milestones, to demonstrate the complexity of the world in which the Institute now lives, and to call attention to those new elements which are likely to be part of the intellectual and social history of the Institute for some time to come.

'J' PARTICLE

One of the Institute's great strengths is the extent to which faculty and students are involved in extending our understanding of basic science. Fundamental curiosity about the origins of the universe, the nature of matter, the origins of life, and why it all works the way it does, absorbs the energies of many at the Institute today, as earlier versions of those same questions puzzled our forbearers throughout mankind's history. The work continues day by day and occasionally, and often unpredictably, a major breakthrough occurs. One such occurred this year with the simultaneous and spectacular discovery, at the Brookhaven National Laboratory and Stanford Linear Accelerator Center, of a new kind of elementary subnuclear particle — the 'J' Particle. Professor Samuel C. C. Ting of M.I.T.'s Laboratory for Nuclear Science headed the team of M.I.T. and Brookhaven physicists which found the particle in the course of a systematic search for such phenomena while bombarding a stationary proton target with protons. The 'J' Particle is the first in a series of new and unexpected particles whose properties still elude classification. Its discovery presents a major challenge to theorists in the effort to explain just what the 'J' Particle is.

On November 27, a special convocation was held at the Institute to hear Professor Ting describe his discovery. At that time, Professor Victor Weisskopf described the immediate reaction of the physics community as follows:

> Some say it may be a new type of meson carrying a new quantum number called 'charm' by some physicists. Others say it may be the carrier of the weak interaction force within the proton that holds it together. It is most probably not a quark. It just doesn't have the right properties... I subscribe at this time to the statement that it is as yet something completely mysterious coming to us from the world of the subnucleus and nobody knows what it is.

ALCATOR

The Alcator high density plasma experiment has come to fruition during the past year. After several years of construction and debugging, this unique M.I.T. contribution to the U.S. efforts to understand the confinement of highly ionized plasmas and ultimately how to derive energy from nuclear fusion reactions is now working extremely well. By taking advantage of cryogenic techniques, and other specialized knowledge existing at the Francis Bitter National Magnet Laboratory and elsewhere at M.I.T., it has been possible to build a machine which advanced the art in several important aspects. The machine operates reliably at extremely high magnetic fields over a wide range of current densities and for relatively long confinement times, and has achieved a denser plasma than any other fusion machine of its kind. Among its kind of device, Alcator is now one of the most promising and interesting in the world and experiments with it are having considerable impact on the U.S. plasma confinement program.

ALUMNI SURVEY

An important part of M.I.T.'s educational and research mission involves its alumni. We always have sought a strong and mutually rewarding partnership with our graduates. In a time of changing expectations and increased demands on educational institutions, we feel an increasing pull to involve alumni in the life and work of M.I.T. To begin a renewed effort in this direction, we conducted last year, a major survey of alumni views and attitudes about the Institute. The Survey consisted of extensive open-ended telephone interviews of a randomly selected sample of several hundred, stratified to be representative of undergraduate and graduate alumni of all ages. The results were remarkable for the scope and richness of alumni opinion and caring about the Institute which they revealed. The findings speak to alumni as individuals, to the M.I.T. Alumni Association as an organization, and to those of us who seek to guide the Institute in its fundamental academic mission.

What we heard first and foremost from our alumni was the view that an M.I.T. education cannot be matched. Most alumni were quick to say that there is no other place like this, and that if they were of college age, they would come to M.I.T. again for the knowledge, the prestige, and the value of learning how to work hard. At the same time, there were some questions raised by alumni about the impact of M.I.T. on their lives while they were students here — the personal cost of living in what some described as an extremely competitive or austere environment — a pressure-cooker which left too little time for personal growth and the development of a larger perspective. In that sense, some alumni felt that they may have paid too high a price for the M.I.T. degree.

This concern, which also is voiced by some of today's students, leads us to ask whether we can identify and moderate or remove those experiences which tend to detract from, rather than enhance, the quality of the education our students receive here. We must continue to grapple with this question — to make the living and learning environment of the campus as educationally and personally fulfilling as possible.

Another insight we gained from the Survey was that while there was a great deal of support among alumni for the developments in educational and research programs — and a strong interest in M.I.T. — alumni generally knew relatively little about what goes on at the Institute today. It seems clear that most alumni still view the Institute through the eyes of their experience here as students. While they may speak of M.I.T. as a dynamic, changing institution, most of them continue to hold to the image of their own years on campus.

Is there any way that we can supplement this powerful, attitude-shaping experience, rooted in the past, with a current understanding that will enable alumni to carry with them a living portrait of M.I.T.? Obviously, this is a very important matter to us. For, to a large extent, in the eyes of the world, M.I.T. is and will continue to be what alumni think and say it is.

The only sure way to know the M.I.T. of today is to be a part of it. Many alumni — as individuals — have stayed close to the campus by participating in programs and activities at the heart of the Institute, such as serving on visiting committees, screening prospective students, and providing leadership for the Alumni Fund.

The question before us now is how to expand the opportunity for these and many more close ties and working relationships. One obvious area, of course, would be a program of alumni education. We have tried for years to define the educational needs of alumni, but without great success. Perhaps we have had too narrow a model of what lifelong learning might be. In addition to the traditional courses and seminar programs, perhaps we need to invent new models. Some of these may be worked into the new communications programs organized by the Alumni Association under the leadership of James A. Champy, its new Executive Vice President. Other programs might be collaborative activities which bring together alumni, faculty, and students in partnerships where the roles of the teacher and the learner are flexible and interchangeable, depending on the nature of the activity that brings them together.

At any rate, it seems clear to us that the most meaningful involvements of alumni with the Institute will develop when we find more ways to bring alumni into the life and work of the faculty and students who are here today. We hope to be able to report on significant progress in this area soon.

INTERNATIONAL PROGRAMS

For many years M.I.T. has been an international institution. Our programs have benefited from the participation of exceptionally able students from virtually every country in the world, and our foreign alumni now carry increasingly important responsibilities in their homelands. M.I.T.'s faculty members tend to be international in their professional and scholarly orientation and as a result, research projects at the Institute frequently have substantial international implications. The Institute also from time to time has joined in efforts to develop new institutions in other countries. During the past year, substantial projects were undertaken in Iran and in Venezuela. Important contributions of capital were made by several Japanese organizations. Research projects in Brazil and Europe developed in prior years have been continued and the feasibility of M.I.T. working with alumni and others in Spain on the development of a new institution there has been under consideration.

In undertaking any of these international activities, the interests of those faculty members who would be most directly involved in a project have been and will continue to be a major consideration for the Institute. But clearly, concern about the consequences for all those who would be affected, both at M.I.T. and in the country in question, will continue to be an important element in the Institute's consideration of these undertakings. As a result of the growing volume and complexity of M.I.T.'s international activities over recent years and because there is reason to believe the rate of M.I.T.'s activity in this domain may accelerate, we have asked Professor William F. Pounds, Dean of the Sloan School of Management, to be responsible for coordinating M.I.T.'s various international activities. During the year we named an ad hoc advisory committee of faculty and students chaired by Professor C. P. Kindleberger to review the process whereby M.I.T. undertakes international institutional commitments, including especially the process used in connection with a special program developed by the Department of Nuclear Engineering in Iran, and to recommend to us any changes in that process which the Committee believes would be in the best long-term interest of the Institute. The Committee will report its recommendations during the coming fall term.

PHASE II, BOSTON SCHOOL DESEGREGATION

As the academic year drew to a close, M.I.T. was asked to lend its talents to the amelioration of yet another kind of social problem. In mid-May, Federal Court Judge W. Arthur Garrity issued the so-called "Phase II" desegregation order for the Boston Public Schools, one part of which required the School Department to seek the help of area colleges, universities, and businesses in developing a more diverse array of educational programs through which young people in Boston might voluntarily choose schools outside their local neighborhood, thereby increasing the racial diversity in each school. Each of 22 colleges and universities was "paired" with a school or school district; the specific request to the Institute was to work with the School Department to develop a city-wide "magnet" technical high school and a city-wide "magnet" technical middle school (grades 6-8) in schools located in the neighborhood of East Boston.

This was an unexpected request and we explored it very carefully. It is clear that we are being asked to help with an *educational* task for which we have some competence but little experience, and intertwined with that task is a social issue which is highly controversial. After considerable discussion and consultation during the summer months it became clear that involvement in this task would provide an opportunity for those M.I.T. faculty, students, and staff who wished to participate in an effort with considerable learning potential for all participants; that new funds could be sought to defray the costs of such participation; and that there was, in fact, a feeling on the part of many at M.I.T. that this was an important commitment for the Institute to make. We have therefore embarked on a year-long planning process in collaboration with the Boston School Department.

There are, as always, different views within M.I.T. about how large in scale the effort should be, what educational style is most appropriate for schools of this type, what technical subjects are wisest to recommend when the students will enter the job market several years from now, etc. Discussion of such issues is sometimes heated and we think that is a good sign. This is a project which captures the interest of significant numbers of people at the Institute and the diversity of views is an accurate reflection of the diversity within M.I.T. — diversity which has always been a very considerable strength. We believe that in addition to providing a different range of public service opportunities and contexts for learning, the issues which the project raises are very close to the basic intellectual purposes of the Institute and engagement with them should provide considerable intellectual return to M.I.T. itself.

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During the past few years the Institute has had continuing concern for the objectives and processes of affirmative action. This phrase has come to include essentially all aspects of the task of equalizing opportunities in education and employment for minorities and women, and of increasing their representation on the faculty, in other areas of employment at M.I.T., and in the fields and professions for which we prepare students. It is ironic that this effort reaches its peak of urgency at just the time when universities are experiencing pressures from other quarters that are more intense than at any time since the Second World War. The devastating impact of inflation and the difficulties of obtaining support for the new intellectual ventures which we must undertake if we are to remain true to our charter and our potential, combine to make this a difficult time for the social change implied by the objectives of affirmative action.

We could not have predicted the severity of these pressures on us. Nevertheless, the following paragraphs from the Institute's Affirmative Action Plan express accurately now, as they did in 1973, our commitment:

> As a major educational institution, a large-scale employer, and an influence on our society through its students, its alumni, and its employees, the Institute stands committed to the principle of equality of opportunity in employment and in education.
>
> In its most elementary and comprehensive form, our adherence to the concept of equality of opportunity requires that we strive toward a condition in which considerations of race, sex, national origin, and religion are irrelevant as determinants of the access an individual has to opportunities

for education, for employment, for achievement, and for personal fulfillment. Rather, the controlling factors in all such matters must be individual ability, interest, and merit ...

While the Institute is obliged, as a major Federal contractor, to develop and sustain a program of Affirmative Action, our commitment to these matters transcends legal or contractual requirements. We undertake these actions and adopt these policies not because we are required to, but because it is right and proper that we do so.

The question of progress on our commitment has been much on our minds in recent months, and because both of us have long-standing personal interests in these aspects of the social fabric of M.I.T., we take this opportunity to summarize our thinking on these important matters.

Our feelings are mixed. We look to the past with a sense of both satisfaction at the effort expended and frustration at our inability to reach all of our objectives. We look to the future with a blend of optimism and uncertainty. It is clear that the need for affirmative action programs in the form of "crisis measures" will diminish, as educational institutions move toward a new mode of operation in which minorities and women are better represented and in which inequitable barriers are eliminated. It is equally clear, however, that some of the vexing problems and challenges will be with us at least through this decade and perhaps beyond. Affirmative action steps will and must continue to be taken at M.I.T. and in all other American institutions until equality of opportunity is not only an accepted concept but an intrinsic part of the fabric of organizations.

At M.I.T. the development of programs specifically aimed at increasing the representation of minorities in the student body began in 1968. At that time we admitted about a dozen black undergraduate applicants, including about six who offered convincing evidence of high motivation and of exceptional academic ability, even though their competitive test scores were not high enough to guarantee admission. While this program was of modest scale, it did have the effect of roughly doubling the number of black Americans in the first-year class. Furthermore, it provided crucial first-hand experience with the problems of educating students whose social backgrounds and prior educational experience differed from the usual first-year class.

Beginning with the 1968 academic year we undertook also extensive recruitment of black applicants for undergraduate admission. As a result of these efforts, the corresponding applicant pool increased more than tenfold: from an average of about 30 in 1968 and prior years to approximately 330. We evaluated most of these applicants outside the usual decision process with the intent of admitting those who, on the basis of our best judgment applied to their records as a whole, appeared to have a good chance of successfully pursuing undergraduate programs at M.I.T.

Those students who seemed likely to benefit from a summer of review and a somewhat more gradual transition to the M.I.T. undergraduate environment were invited to take part in a special summer program which has come to be known as Project Interphase.

Our efforts aimed at increasing the number of minority students who would benefit from an M.I.T. education have evolved to reflect the experience we have gained over the past years. We still aim at admitting all those minority applicants who seem to us to have a good chance of doing well here. Project Interphase has changed in detail and in the balance of its activities; it still provides an important and highly valued way of "letting the clutch out gently" for some of the minority students who come here; and we still engage in widespread recruiting efforts to find those who are both interested and best qualified.

As a result of these efforts, the enrollment of minority students in the first year has grown to 4-6 percent of the class (the corresponding fraction for the black American subgroup is 3-5 percent). There has been no significant increase either in the number of minority applicants or in the admitted subgroup in the past few years. In fact, this fall there is a decline in the number of minority students particularly in the black subgroup, just as there was a decline, reversed in the next year, in 1973. The number of minority applicants appears to be quite sensitive to economic conditions and to the general public perception of the job market for scientists and engineers.

The situation of women in the undergraduate student body has improved in important ways in recent years. There has been considerable growth in the number of women undergraduates, from 2-3 percent of the class in the fifties and early sixties to 15-20 percent in recent years. This growth is due in part to the provision of more housing for women and in part to recruitment efforts in the last two years. Since 1971 women and men have been admitted on a strictly competitive sex-blind basis.

The pool of young women who might reasonably become applicants for admission here appears to be quite large. Thus, the proportion of the class that is female may increase as we continue to encourage women to view career opportunities in the sciences and in engineering as attractive professional goals.

Efforts to increase the number of minorities among the graduate student population at M.I.T. began in 1968 as well. Because graduate admissions are decentralized, with each of the 23 departments granting graduate degrees responsible for its own process and decisions, it is difficult to generalize about these efforts. In most cases recruitment has centered on widespread mailings of information about the department, and on personal contacts with professional associates at schools having significant minority undergraduate enrollments. Most departments have admitted minority students in straightforward competition with other applicants. Other organizations, such as the Sloan School and the School of Engineering, have participated effectively in national programs directed at increasing the number of minority students in those fields. In addition, a few departments, such as Physics, have developed special graduate programs aimed at minority students who would, without special help, be unlikely to be admitted.

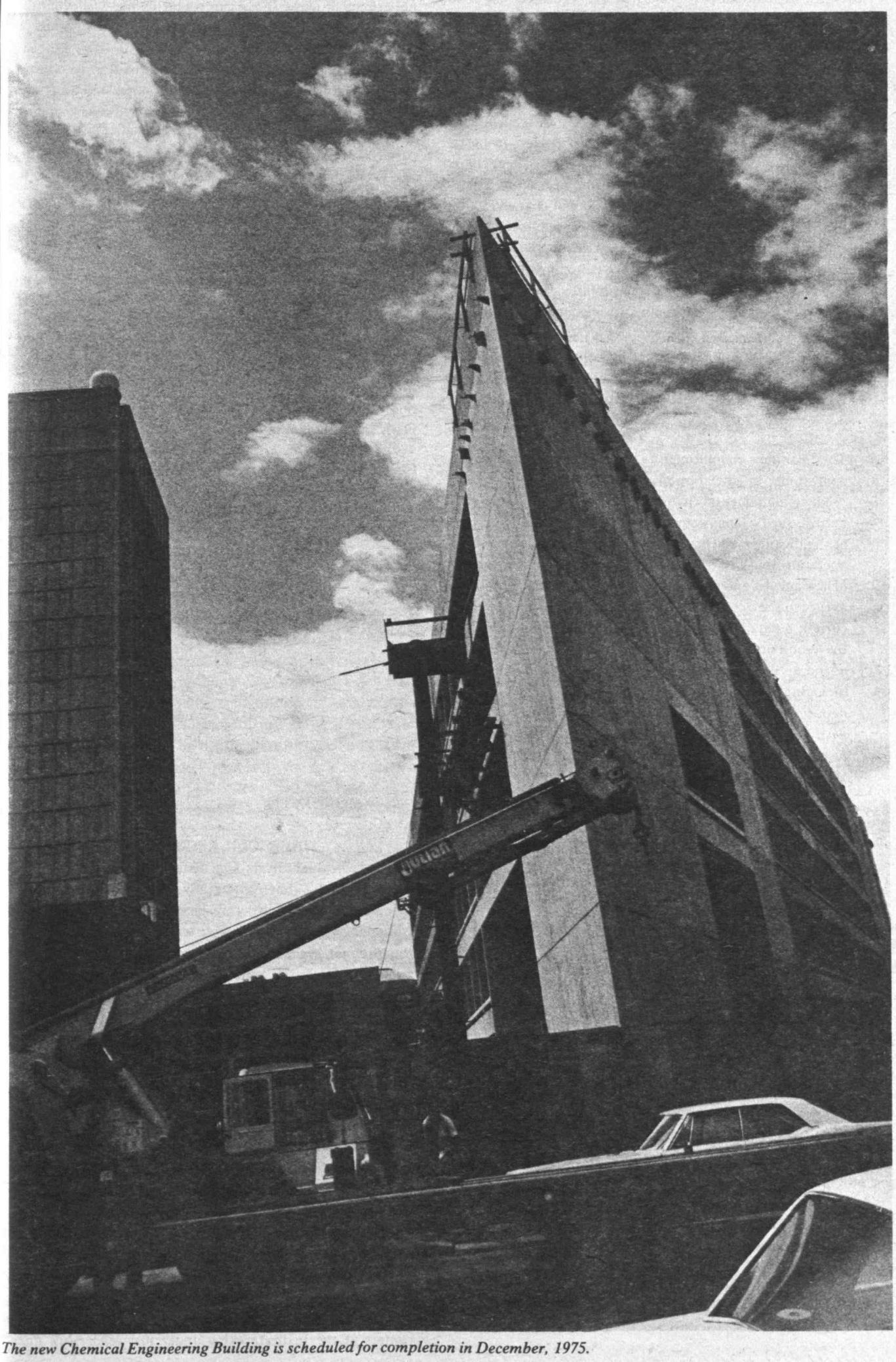
As a result of these efforts, the number of minority students in the Graduate School has increased dramatically — from about 0.5 percent in 1968 to approximately 4 percent in 1974-75. These students are not distributed across the schools and departments in the same proportion as non-minority students. A larger than average fraction are enrolled in the School of Architecture and Planning and a smaller than average fraction are enrolled in the Schools of Science and Engineering.

The number of women in the Graduate School has also increased in recent years. During the period from 1968-75 the proportion of women has doubled, standing now at about 12 percent. This increase is the result both of modest recruitment efforts during the past four years and of an increased consciousness in young women about career opportunities in science-based and engineering fields.

For both minority and female graduate students, financial aid is often a major determinant of the decisions affecting graduate study. Applicants often approach graduate study with a heavy burden of educational debt from their years as undergraduates; many have family responsibilities as well. Consequently, the limited number of first-year tuition scholarships for minority graduate students and the Ida M. Green Fellowships, awarded primarily to women, are of particular importance in these efforts, and more financial resources of these kinds are needed.

With the exception of scholars of oriental origin, very few minority persons or women have served on the M.I.T. faculty until quite recently. While the historical record is not entirely clear in this regard, it appears that there were, in 1968, just three black Americans and fewer than a dozen women in the ranks of the faculty. While these very small numbers are not surprising in fields such as engineering and management (in which the number of doctoral degrees that have gone to women and to blacks has, until this decade, been less than 1 percent) one might have expected a stronger representation of women in the humanities, in the social sciences, and in some of the fields of science.

While our concern with increased opportunities for women and minorities spans the entire range of employment at the Institute, we have placed special emphasis on faculty. The growing numbers of minority and female students at the Institute look for persons of similar background on the faculty both as evidence of a serious and lasting commitment to these issues, and as like-minded associates in an environment which



The new Chemical Engineering Building is scheduled for completion in December, 1975.

sometimes appears to offer few familiar and comfortable points of reference. Although both the thrust of affirmative action requirements and our own concern for these matters is aimed at developing a society in which racial background and sex are of little consequence in employment and educational opportunity, it is clear that minority and female faculty will be especially needed as models and as mentors for students.

Beyond these considerations, strong representation of women and minorities on the M.I.T. faculty contributes greatly to the richness and diversity of this community. In an educational institution both the expansion of knowledge and the growth and development of individuals depend crucially on personal relationships and associations. In such a setting what one knows and understands, and how one communicates that knowledge is important, but what one *is* matters as well, and we are persuaded that the Institute becomes a stronger, more effective place as it draws on the full range of human talent and experience.

Our affirmative action efforts in the area of faculty have produced significant changes in the past few years. In 1975 there were 18 black Americans on the faculty. While this number falls well short of the goal we set for ourselves six years ago, it represents solid progress. At the same time the number of women on the faculty has increased to 54, which comes to about 80 percent of our goal. All departments have widened their search for highly qualified individuals and have made special efforts to seek out women and minority candidates. We have, of course, held rigorously to the principle of selecting the best qualified candidate, also recognizing that minority and female candidates frequently bring special and important qualities. We are convinced that these efforts and these appointments have strengthened a faculty which was already among the most distinguished in the world.

These increases in numbers of faculty appointments over the years do not adequately reflect our total effort in seeking out and recruiting faculty, particularly in those fields in which the pools of highly qualified minorities and women are very small. Over the past two years, a number of minorities and women declined firm offers of faculty appointments from various academic departments. Some of these negative decisions came after months of search and patient negotiation. The increase in minority and women faculty came during a period in which there was virtually no growth within the faculty ranks and in which several departments were accomplishing modest reductions in size.

Our record of accomplishment in other employment categories is mixed. While we have met, or come close to meeting, our objectives in the hourly, office-clerical, and exempt areas of employment, we have fallen far short of our objectives in the areas of administrative staff and research staff, particularly with respect to minorities. In the area of research staff the problem is not unlike that of faculty. Until quite recently minorities have been grossly underrepresented in engineering and science, with the result that the relevant pools of qualified persons are small.

PROBLEMS AND OPPORTUNITIES

As we appraise our present situation and look toward the immediate future, several areas of concern, and of opportunity, are evident:

— First, we appear to have reached a plateau in our efforts to increase the number of qualified minority applicants for our undergraduate programs. We now know that the group of minority young people who have the necessary secondary school background in mathematics and science is quite small in comparison with the entire secondary school population, and it may not be possible to attract to the Institute a significantly larger proportion of that group than we do at present. Consequently, future increases in the number of minority students who pursue careers in engineering and in the physical sciences are contingent on the degree to which young people can be informed about opportunities in these fields much earlier — probably in junior high school — and encouraged to study the necessary mathematics and science. Such information and encouragement have, in the larger society, traditionally come from parents and friends, and it is just this influence which is largely absent for minority students as a consequence of the virtual exclusion of minorities from these fields in the past. While it is not clear what role the Institute can play in addressing this problem, we need to be more imaginative in our efforts than just recruiting from the available pool at the high-school level.

— The Institute has always embodied very high standards of performance for members of the faculty. Appointments at all levels and promotions to the senior ranks have been based on effectiveness in teaching and research in a highly competitive environment. Minority and female members of the faculty experience these same pressures for excellence, and strive, as a matter of course, to high standards of personal accomplishment. At the same time, however, these individuals are the objects of a set of pressures that are a direct consequence of their minority and/or female status. They often are prevailed upon to carry committee responsibilities that go well beyond average assignments of this kind, and these assignments are frequently related to equal opportunity or affirmative action matters. They are invariably sought out by minority and women students who look to them for academic, career, and personal counseling and for succor and evidence of familiar stability in an unfamiliar, sometimes uncongenial, environment. Out of a deep sense of duty most minority and women faculty undertake tutoring and counseling responsibilities that go well beyond either the expectations or the examples of their professional colleagues. Finally, they function in a society in which the residual minutiae of racism and sexism often represent a persistent grating distraction. Thus, while the needs of professional growth and development represent a significant challenge to essentially all young members of university faculties in the present climate of retrenchment, the task is doubly difficult for most of our female and minority colleagues. We have an obligation to be understanding of these pressures and to provide a supportive and sympathetic environment. Several departments address these concerns by insuring that every junior faculty colleague has a senior mentor, who can provide advice and counsel; the central administration has tried to provide a sympathetic ear and to build sufficient support structures for women and minorities.

— It has been clear for some time that some minority members of the M.I.T. community doubt the sincerity and durability of our commitment to affirmative action in employment and education, and that these doubts arise, at least in part, because no black or other minority person serves in a senior position of line responsibility in the administration. There can be no assurance that this situation will change in the near future. Budgetary pressures have caused us to undertake a careful review of all administrative functions and our interest must remain focused on the trimming of functions and on the consolidation of responsibilities. In this climate, shared by most other universities, we must make still further efforts to insure that the perspectives of minorities and women are considered in the evolution of Institute policy and practice, particularly in those situations in which they do not currently participate directly.

— The Institute's commitment to the principle of equality of opportunity in education and employment is intended to produce fundamental change in our internal processes and norms. Such change comes about as the cumulative result of significant small changes in most aspects of our mode of operation, and these in turn require adherence to a variety of new policies and procedures. Some of these changes, such as the requirement that every department prepare and keep current a detailed operational affirmative action plan, or the requirement that new appointments be preceded by adequate documented searches for qualified candidates, including minorities and females, are perceived by some department chairmen and administrative officers as undesirable bureaucratic mechanisms which interfere with the primary tasks of making a strong institution greater. There are, of course, substantial risks associated with the internal mechanics of affirmative action. Procedures can outlive their utility and become unproductive bureaucratic encumbrances, and the mechanics of change can become counterproductive if they are allowed to undercut the fundamental importance of individual quality and merit in an academic community. We must remain alert to these hazards and be flexible and willing to adapt the specific procedures of affirmative action programs to change the institution to such a degree that the program is no longer needed — the sooner the better.

These problems and the need to make continued progress toward the objectives for equal opportunity in education and employment that we have set for ourselves are high priority tasks. They compete for attention with the other important tasks which we have mentioned — efforts to trim budgets, the search for additional resources, the development of new programs and organizations in emerging areas of academic interests such an energy and health, and the continuing challenge of shaping our undergraduate programs to meet the needs of new generations of students. All these programs are important to the future of the Institute; no simple linear ranking of priorities is possible. We must make progress simultaneously on all these issues. This we intend to do.

* * * * *

A most important event of the past academic year was the vote of the Corporation of December 6, 1974, to accept the recommendation of the Corporation Development Committee for a capital campaign that would seek to increase the Institute's endowment for the support of the students and faculty, to provide funds for the continued development of many vital academic and research programs, and to permit the construction of a small number of vitally needed facilities.

Planning for the M.I.T. Leadership Campaign (involving the Chairman and Honorary Chairman of the Corporation, as well as the President, Chancellor, Provost, Vice President for Resource Development, and many other members of the M.I.T. community), gave a special coherence and urgency to last year's review of the Institute's programs and purpose. That review, much more intensive than normal, brought into sharp focus the very special role of M.I.T. in the world of industry, science, and technology and highlighted the many programs at M.I.T. that have relevance to current problems of our society. Our efforts to focus more precisely than is usual on the Institute's special purposes and strengths, its special audiences, friends and sponsors, and on the many vital areas of research in which it is pioneering, made us appreciate afresh the extraordinary world-wide leadership role held by M.I.T. We find in our travels that the M.I.T. style of technical education, broadly defined, its applied research, and its close links with industry and government are admired and emulated all over the world. We are expected to set the direction and pace for the future; hence the name for this new campaign. The responsibility of living up to the varied expectations placed on M.I.T. is awesome but also inspiring.

The plan to expand the resource base of M.I.T. could hardly have come at a more propitious time, for the extraordinary range of fiscal and social problems now bedeviling the nation are reflected, not surprisingly, on the campus. All operations cost more. The new programs in energy, health, materials and natural resources, and productivity improvement, while financed primarily from the outside, require some continuing Institute funds for their effective development. Existing financial resources, even with their normal growth patterns, would be inadequate to simultaneously meet these two major demands. But the normal growth patterns do not now exist. Endowment values have fallen in recent times and endowment income is down for obvious reasons. Budget cuts and controls based upon strict economies and staff reductions have served to maintain an acceptable — if somewhat pained — financial posture during the past several years despite the major impact of the Draper Laboratory divestment, legally mandated administrative functions, the steep escalation in energy costs, rampant inflation, and the leveling off of funds available for research support. However, these pressures leave little funds for academic initiatives, either needed modernization in existing teaching and research programs, or for the newly initiated programs.

The Leadership Campaign, with its dual emphasis on the support of faculty through endowment and program development, will insure the dynamism of the current efforts, and at the same time add to the financial foundations of the Institute so that it can remain a vigorous, independent institution during the turbulent years that lie ahead. It will require much attention of the senior officers in the years ahead but it is a commitment of time that we believe is essential to the continued vitality and well-being of M.I.T.

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IN SPECIAL RECOGNITION

The individual efforts and distinctions on the part of the faculty at M.I.T. have been many during the past year. Four members of the faculty were elected to membership in the National Academy of Sciences; ten members were elected to the National Academy of Engineering; and seven were elected to membership in the American Academy of Arts and Sciences. These elections, and numerous other honors and awards, attest to the continued high quality of the M.I.T. faculty and to the dedication of its individual members to scholarship of the highest order.

Of special note during the year were the appointments of three members of the faculty to the distinguished rank of Institute Professor: Dr. Morris Cohen, Professor of Metallurgy; Professor Walter A. Rosenblith, Provost; and Dr. Ascher H. Shapiro, Ford Professor of Engineering. Dr. Cohen was additionally honored as the third recipient of the James R. Killian Faculty Achievement Award.

The past year saw several appointments to senior posts that should receive special mention. Professor Bruce Mazlish was appointed Head of the Department of Humanities and Professor Norman C. Rasmussen, Head of the Department of Nuclear Engineering. In addition, several laboratories and centers at the Institute came under new leadership during

1974-75. Professor Otto Piene was appointed Director of the Center for Advanced Visual Studies; Professor Benson R. Snyder, Director of the Division for Study and Research in Education; Professor Arthur P. Solomon, Director of the Harvard-M.I.T. Joint Center for Urban Studies; Dr. Myron Tribus, Director of the Center for Advanced Engineering Studies; and Professor Patrick H. Winston, Director of the Artificial Intelligence Laboratory.

Several new appointments to senior administrative positions also should receive special mention. Dr. Thomas F. Jones was appointed Vice President for Research upon the retirement of Professor Albert G. Hill; Jay K. Lucker was appointed Director of Libraries upon the retirement of Natalie N. Nicholson; Glenn P. Strehle was elected Treasurer of the Corporation upon the retirement of Joseph J. Snyder; Dr. Kenneth R. Wadleigh was appointed Dean of the Graduate School upon the retirement of Professor Irwin W. Sizer; and Frank Urbanowski has been named Director of the M.I.T. Press.

The past year also marked the retirement of eight distinguished members of the faculty. Their years of service to the Institute and to their students will long be remembered and appreciated. They are Associate Dean Sanborn C. Brown, Professor in the Department of Physics; Professor Harold A. Freeman, Department of Economics; Professor Robert J. Hansen, Department of Civil Engineering; Professor Albert G. Hill, Department of Physics; Assistant Professor Benjamin R. Martin, Jr., Department of Athletics; Elting E. Morison, Elizabeth and James Killian Class of 1926 Professor, School of Humanities and Social Sciences; Professor Irwin W. Sizer, Department of Biology; and Professor Prescott A. Smith, Department of Mechanical Engineering.

Of particular sadness to us during the year were the untimely deaths of several respected colleagues and advisors.

James M. Barker, Life Member of the Corporation, died in July, 1974, after a long illness. During his nearly 40 years of service in the Institute's governing body he served as a wise and spirited advisor. As student, former staff member in civil engineering, counselor and friend to five M.I.T. Presidents, and as a leader in alumni affairs, he played a major role in the life of the Institute.

Bradley Dewey, Life Member of the Corporation, died in October, 1974. Member of the Class of 1909, he was a pioneer in the development and use of synthetic rubber, a distinguished chemical engineer and a leader in the U.S. chemical industry. His interest in the life and development of the Institute was a cource of unflagging strength.

William D. Coolidge, a distinguished inventor who developed the modern X-ray tube and the ductile tungsten filament used in electric lightbulbs, died in February, 1975. Member of the Class of 1896, Dr. Coolidge went on to a long and distinguished career, of which the Institute is proud to have been a part.

Antoine M. Gaudin, Richards Professor Emeritus of Mineral Engineering, died in August, 1974, following a long illness. He was an internationally recognized pioneer in the field of process metallurgy, distinguished especially by his research on uranium recovery. Dr. Gaudin joined the M.I.T. faculty in 1939, serving as mentor and advisor to generations of students and younger faculty members until his retirement in 1966.

Warren K. Lewis, Professor Emeritus of Chemical Engineering, died in March, 1975. Regarded as the father of modern chemcial engineering, Professor Lewis was known to generations of M.I.T. students as a hard-driving teacher in the adversary tradition, tempered by a soft heart and a rich stock of funny stories. Among his students many have become members of the M.I.T. faculty and distinguished scientists; his influence on all of us and on the Institute has been deeply felt.

William H. McAdams, a pioneer in the field of chemical engineering and Professor Emeritus of Chemical Engineering, died in May, 1975. Together with the late Professors William H. Walker and Warren K. Lewis, Professor McAdams was instrumental in the development of chemical engineering as a distinct discipline.

Major General James McCormack (USAF, Ret.), who served M.I.T. as Vice President for Industrial and Governmental Relations, died in January, 1975. A distinguished public servant, he served with distinction in a variety of crucial posts in a period of rapid change in science and technology.

These men have been outstanding examples of strength and dedication to science and technology in the service of humanity; they will be remembered and honored by generations of their students, friends, and associates.

Jerome B. Wiesner, *President*
Paul E. Gray, *Chancellor*

October 3, 1975

STATISTICS FOR THE YEAR

The following paragraphs report briefly on the various aspects of the Institute's activities and operations during 1974-75.

REGISTRATION

In 1974-75, student enrollment was 8,050, an increase of 162 over the 7,888 enrolled in 1973-74. This total was comprised of 4,136 undergraduate and 3,914 graduate students.

Graduate students who entered M.I.T. last year held degrees from 336 colleges and universities, 210 American and 126 foreign. The foreign student population was 1,412, representing 18 percent of the total enrolled. The foreign students were citizens of 93 countries.

Degrees awarded by the Institute in 1974-75 included 1,027 bachelor's degrees, 856 master's degrees, 107 engineer's degrees, 362 doctoral degrees — a total of 2,352.

The number of women at M.I.T., both graduate and undergraduate, has increased continuously. In 1974-75, there were 1,111 women students at the Institute, compared with 921 in 1973-74. In September, 1974, 211 first-year women entered M.I.T., representing 20 percent of the entering class. In 1974-75, a total of 232 degrees were awarded to women.

STUDENT FINANCIAL AID

During 1974-75, the student financial aid program was characterized by significant increases in total awards, in loans made, and in the amount of scholarship assistance. The number of individuals assisted increased for the first time in four years.

A total of 1,791 undergraduates who demonstrated the need for assistance (44 percent of the enrollment) received $3,582,814 in scholarship aid and $2,192,268 in loans. The total of $5,775,082 represented an 18 percent increase in direct aid over last year.

Scholarship assistance was provided by the scholarship endowment in the amount of $1,918,629, by outside gifts for scholarships in the amount of $531,162, by direct grants to needy students totaling $617,442, and by scholarship assistance from M.I.T.'s own operating funds in the amount of $376,840. The special program of scholarship aid to minority group students represented an additional $138,741 from specially designated funds. An additional 390 students received direct grants from outside agencies, irrespective of need, in the amount of $854,738. Outside scholarship support thus totaled $2,003,342, a substantial increase over last year's total. A significant portion of the increase was again due to increased funding of the Federal government's grant-aid program. The undergraduate scholarship endowment was increased significantly by the addition of $1,019,408 in new funds, which raised the principal of the endowment to $22,003,115.

Loans totaling $2,192,268 were made to needy undergraduates. Of this amount $591,073 came from the Technology Loan Fund, $1,592,195 from the National Defense Loan Fund, and the remainder from other M.I.T. loan funds. An additional $400,713 was obtained by undergraduates from state administered Guaranteed Loan Programs and other outside sources.

Graduate students obtained $999,729 from the Technology Loan Fund. Of this total, $410,670 was loaned under the Guaranteed Loan Program and qualified for Federal interest subsidies and guarantees. In addition, graduate students borrowed $76,160 from the National Direct Student Loan Program. The total loaned by M.I.T. to both graduate and undergraduate students was $3,268,157, an increase of $531,824 over last year's total.

CAREER PLANNING AND PLACEMENT

In spite of the continuing recession, the Institute's graduates found their talents generally in demand. Their good fortune intrigued newspaper reporters covering the employment market for college graduates. Hearing about the job offers received by M.I.T. students, they would contrast this with the bleak picture they had been given at other colleges. Then they would reflect a moment and say: "Ah, but M.I.T., of course, is different."

It is a measure of the Institute's reputation that the number of employers coming to interview in the Career Planning and Placement Office rose slightly over the year before. More firms came recruiting than in any year since 1969-70. There was also an increase in recruiting activity at the Sloan School. Salaries paid to graduates in engineering about kept pace with the cost of living, a significant phenomenon in the economic climate that has prevailed for the last few years. The most handsomely rewarded member of the senior class was a chemical engineer who went to work for an oil company in Saudi Arabia. Salaries paid to Sloan graduates rose less sharply than salaries in engineering, but a Sloan degree still held its own as a prized credential.

Demand for Ph.D. degree candidates in fields other than engineering was less strong. The data on the June class still needs to be sorted and analyzed to see how the Ph.D.s in individual fields fared in the job market.

Considerable attention was given during the year to helping students in architecture. Informal statistics released in April by the American Institute of Architects put the unemployment rate among professional architects at 25 percent. Students in architecture are fully aware of the economic realities, but for many, architecture is the one profession worth pursuing and they will gladly accept any job as a stop gap if it will keep them in touch with the profession. The Career Planning and Placement Office hopes to add a part-time staff member in 1975-76 to expand its help to students in architecture, planning, humanities, and the social sciences.

The Office, in conjunction with the Office of the Dean for Student Affairs, offered a seminar in the fall term in which undergraduates visited professionals at their place of work. The seminar was particularly intended to help students see at first hand the kinds of career opportunity for which M.I.T. offers preparation. The seminar attracted a small but enthusiastic class, including some upperclassmen as well as freshmen, and is being offered again in 1975-76.

The recession made itself felt in the area of alumni placement. The number of alumni registering with the Office rose appreciably, to some 620 from 557 the previous year, and the number of job vacancies reported to the Office fell significantly. Many registrants said that they had not had to look for a job since they graduated, sometimes 20 years ago. A large portion of staff time was devoted to counseling on career alternatives and approaches to job hunting.

FINANCES

As reported by the Treasurer, the total financial operations of the Institute, including sponsored research, increased from the level of 1973-74. Educational and general expenses — excluding the direct expenses of departmental and interdepartmental research, and the Lincoln Laboratory — amounted to $92,860,000 during 1974-75, compared to $82,962,000 in 1973-74. Reflected in the finances of the Institute was the decrease in the use in operations of unrestricted funds to $4,596,000, compared with $5,309,000 in the preceding year. In addition, the Research Reserve was drawn on in 1974-75 in the amount of $480,000, compared with $2,781,000 in 1973-74.

The direct expenses of general departmental and interdepartmental sponsored research increased from $59,436,000 to $64,992,000, and the direct expenses of major laboratories and special departmental research decreased from $76,989,000 to $74,084,000.

The construction program of the Institute continued to make progress in 1974-75, with the book value of educational plant facilities increasing from $190,029,000 to $197,500,000.

At the end of the fiscal year, the Institute's investments, excluding retirement funds, had a book value of $340,038,000 and a market value of $402,491,000. This compares to book and market totals of $340,866,000 and $388,176,000 last year.

GIFTS

Gifts, grants, and bequests to M.I.T. from private donors decreased from $21,406,000 in fiscal year 1973-74 to $20,282,000 in fiscal year 1974-75. The latter figure includes unrestricted direct gifts to the Alumni Fund of $715,000, which constituted part of the total of $3,327,000 reported by the Alumni Fund in 1974-75.

PHYSICAL PLANT AND CAMPUS ENVIRONMENT

Several phased projects were completed during the year. The renovation of the east wing of Ashdown House for graduate students was completed in August, 1974, in time for the students to move in before the beginning of the fall term; the west wing had been completed the previous November. The Seeley G. Mudd Building, including the Cell Culture Center and the remainder of the Center for Cancer Research, was also finished and occupied during the year.

The George R. Wallace, Jr. Geophysical Laboratory, described as the best equipped geophysical observatory in the world, was dedicated in May, 1975. The underground observatory in Westford, Massachusetts, is capable of detecting earthquakes anywhere in the world. It also will be used to evaluate earthquake risk in New England and to test seismic instruments before being placed on the moon or other planets.

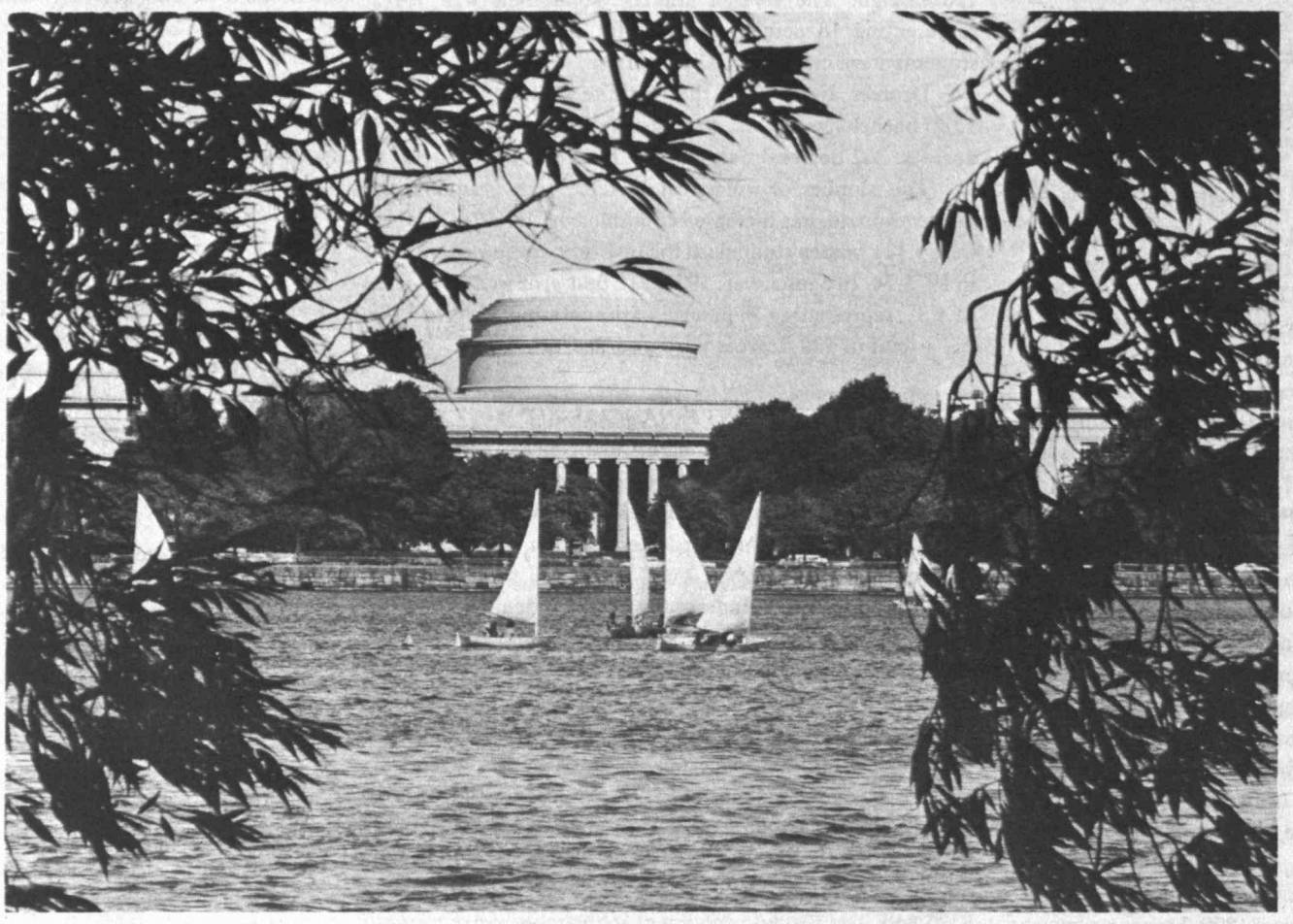
Work progressed during the year on the Chemical Engineering Building, the West Campus undergraduate house, and the installation of Refrigeration Machine No. 4 at the central utilities plant. This 4,000-ton unit brings the central plant refrigeration capacity to 10,500 tons and represents the last of the original central plant programmed units.

The new 300 student undergraduate dormitory on the West Campus, located on Memorial Drive adjacent to MacGregor House, is scheduled for completion in time for occupancy the last week of August, 1975.

* * * * *

REPORT OF THE PRESIDENT

AND THE CHANCELLOR



MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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CAMBRIDGE, MASSACHUSETTS 02139

REPORT OF THE PRESIDENT AND THE CHANCELLOR

1974-1975

er 30's Singles Club – Lunchtime meeting in Stu Ctr East Lge all dining room off Lobdell) Fri, 12:30-1:30pm, New members ays invited. Alice x3-3400 or Marty, x8-1206 Draper.

ovies

ulet* – Humanities Film. Olivier version. Wed, Oct 22, 4pm, Rm -100. Free.

ating Flows; Stratified Flow* – Fluid Mechanics Films. Wed, t 22, 4pm, Rm 39-400. Free.

e Trobriand Islander* – Humanities Film. Thurs, Oct 23, 2pm, m 16-310. Free.

thering Heights* – Humanities Film. Thurs, Oct 23, 7pm, Rm -250. Free.

ild Child: Lord of the Flies* – Humanities Films. Thurs, Oct 23, m, Rm 4-270. Free.

mmanuelle* – French House film. Thurs, Oct 23, 8 & 10pm, Rm -100. Admission $1.50 at door.

odern Times** – LSC. Fri, Oct 24, 7 & 9:30pm, Rm 26-100. dmission $.50 ID required.

y Name is Ivan (Tarkovsky)* – Film Society. Fri, Oct 24, 7:30 & 30pm, Rm 6-120. Admission $1.

0 Motels** – Midnight Novie. Fri, Oct 24, 12m, Sala. Free, ID quired. Bring blanket.

e Taking of Pelham** – LSC. Sat, Oct 24, 7 & 9:30pm, Rm -100. Admission $.50, ID required.

ng Way from Home; The Water Margin* – Chinese Students Club ovies. Sun, Oct 26 2 & 4pm, respectively, Kresge. Admission $2 ult, $1 children & members.

a Gale Lab Jaa* – Sangram. Indian movie with English subtitles. n, Oct 26, 2:30pm, Rm 26-100. Admission $1.

spicion** – LSC. Sun, Oct 26, 6:30 & 9pm, Rm 26-100. dmission $.50, ID required.

aginero; Yanomamo* – Humanities Films. Mon, Oct 27, 4:30pm, m 14N-0615. Free.

mmanuelle* – French House film. Mon, Oct 27, 8 & 10pm, Rm -100. Admission, $1.50 at door.

rticity; Secondary Flow* – Fluid Mechanics Films. Tues, Oct 28, m, Rm 39-400. Free.

development; One Step Away (Pincus)* – Cities on Film Series (San Francisco) sponsored by Undergraduate Urban Studies Program. Tues, Oct 28, 7pm, Rm 7-431.

Stagecoach* – Humanities Film. Tues, Oct 28, 7pm, Rm 10-250. Free.

Vorticity; Secondary Flow* – Fluid Mechanics Films. Wed, Oct 29, 4pm, Rm 39-400. Free.

Amarcord** – LSC. Fri, Oct 31, 7 & 10pm, Kresge. Admission $.50 ID required.

Lady with the Dog (Heifitz)* – Film Society. Fri, Oct 31, 7:30 & 9:30pm, Rm 6-120.Admission $1.

Psycho** – MidNite Movie. Fri, Oct 31, 12m, Sala. Free, ID required.Bring blanket.

Monty Python and the Holy Grail** – LSC. Sat, Nov 1, 7 & 9:30pm, Kresge. Admission $.50, ID required.

The Raven** – LSC. Sun, Nov 2, 6:30 & 9pm, Rm 26-100. Admission $.50, ID required.

Music

Concert* – Sandor Vegh, violinist, in all Bach program. Sponsored by Music Section. Wed, Oct 22, 8pm, Kresge. Free. (Note: Vegh will conduct 2 master classes for students Tues, Oct 21 & Fri, Oct 24. Call Music Office. x3-3210, for details)

MIT Symphony Orchestra* – Program of Tchaikovsky, Mozart (Sandor Vegh, soloist), Walter Piston. Sat, Oct 25, 8:30pm, Kresge. Admission $1 at door.

Harp Recital* – Kathleen Bride performing works by Grandjany, Hindemith, Godefroid, Dussek & Tournier. Sponsored by Humanities Department & American Harp Society. Sun, Oct 26, 2pm, Sala. Tickets $2, available at door or in Bldg 10 Lobby on Wed & Thurs, Oct 22 & 23.

Chamber Music Society Concerts* – Wed, 5:15pm, music library, Bldg 14E.

Dance

Contra Dance Workshop* – Sponsored by MIT Folk Dance Club. Taught by Ted Sanella. Sat, Nov 1, 2-5:30pm, Sala. Admission $1., $.50 with MIT or NEFFA ID.

MIT Folk Dance Club* – International: beg-intermed Sun, 7:30-11pm, Sala. **Balkan:** advanced Tues, 7:30-11pm. Stu Ctr Rm 491. **Israeli:** all levels Thurs, 7:30-11pm, Sala. **Easy International:** Fri, 12n, Kresge Oval of Bldg 7 Lobby, depending on weather.

Exhibitions

Hayden Gallery Exhibit* – Photo-murals, transparencies, films & diagrams supplement works of environmental artist Clarence Schmidt. Thru Wed, Oct 19, 10am-4pm, daily & 6-9pm, Tues. Free.

Works on Paper* – Exhibit by Marvin Brown, Thru Wed, Oct 19, Hayden Corridor Gallery. Open daily free.

Rotch Library Exhibit* – Leslie Field, sophomore, Course X, will display pastels & still lifes. Thru Fri, Oct 31, Rotch Library, Rm 7-238.

Faculty Club Exhibit* – Still lifes by Ruth Boyce. Oct, Mon-Fri, 9am-11pm, 6th fl Faculty Club .

Creative Photography Lab Exhibit* – Works by Abe Frajndlich & Mark Orlove. Opening Wed, Oct 15, 7-9pm, Exhibit thru Tues, Nov 18. Hours: 10am-10pm.

MIT Historical Collections* – Permanent exhibition Mon-Fri, 9am-5pm, Bldg N52, 2nd floor. **Bicentennial Exhibit:** Katharine Dexter McCormick, '04 exhibit in Bldg 4 corridors.

Schumann at Work on a Song* – Music Library exhibit of manuscript facsimiles & pictures. Daily Bldg 14E.

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

Athletics

Home Schedule* – Thursday, October 23 – W Tennis. SMU, 4pm, duPont courts. **Saturday, October 25 – JV/F, V Cross Country,** Brandeis, 1pm, Franklin Park **Tuesday, October 28 – V Soccer.** Tufts, 3pm, Briggs Field. **Wednesday, October 29 – JV/F Soccer.** Phillips Exeter, 3pm, Briggs Field. **Friday, October 31 – JV/F** Soccer. Babson, 3pm, Briggs Field. **Saturday, November 1 – V Sailing.** Colby 2pm, Charles River Lower Basin. **Saturday, November 1 & Sunday, November 2 – V Sailing.** Schell Trophy, 9:30am, Charles River Lower Basin.

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

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

Send notices fot October 29 through November 9 to the Calendar Editor, Room 5-111, Ext. 3-3279, before noon Friday, October 24.

IAP Ideas Must Be In By Oct. 29

The deadline for submitting activity proposals for MIT's sixth annual Independent Activities Period (IAP) Jan. 5-28 is Wednesday, Oct. 29, according to Joel Orlen, assistant to the provost and director of IAP administration.

Applications for special funds to subsidize IAP activities should also be submitted by that date to Margaret S. Richardson, administrative assistant in the physics departments. Professor Michael Feld is chairman of the IAP Policy Committee for the third year.

General listings of IAP activities will appear in a first guide scheduled for distribution Nov. 12-13. The deadline for submitting copy to the final IAP guide is Wednesday, Nov. 26, with distribution scheduled for Thursday, Dec. 11.

Some of the activites proposed to date include a seminar on Boston of the former Mayor James Michael Curley era, an ice show, courses for the MIT community in reading development, recreational exercise and the elements of design.

Joan S. Friebely of Institute Information Services, who is in charge of production of the two guides, said proposals had also been received for an Institute-wide historical retrospective, using nineteenth century films housed in MIT Historical Collections and narrated by Mrs. Karl T. Compton and President Emeritus Julius A. Stratton.

Last year, close to 500 activities were offered during IAP. The month-long period was initiated in 1969 as an experiment in calendar reform, to ease academic pressure between semesters and give students and staff an opportunity for leisurely research into subjects that interested them.

Wives Group Meets Today

The Wives' Discussion Group—an informal group of American and foreign wives of students, staff, faculty and visiting scientists who meet Wednesdays at 2:15pm in the West Lounge of the MIT Student Center—issued an invitation this week to interested persons to join the group.

Baby sitting is provided. The group helps newcomers get acquainted, learn about community resources, and become familiar with MIT and the communities in which they are living.

The meeting today (Wednesday, Oct. 22) with Helena McDonough, nurse midwife, and Norma Loomis, manager of the Student Insurance Program, both from the MIT Medical Department, will focus on women's medical concerns.

The group has produced *The Wives' Notebook*, a collection of practical suggestions and information about how to locate help and discover opportunities in the Boston area. The Notebook is particularly useful to families from foreign countries and seeks to answer typical questions raised by newcomers to MIT. It includes information about how to find educational opportunities, employment, child care, medical and legal assistance, and places to shop. Copies are available for $2 from Jane Herscher in the Medical Department (Room 11-203A, Ext. 3-4911).

For further information on today's meeting or other activities of the group, call any of the three discussion leaders: Myra Rodrigues, a social worker in the MIT Medical Department, Ext. 3-1684; Charlotte Schwartz, a sociologist in the Medical Department, Ext. 3-2916; and Carol Hulsizer, a faculty resident at Ashdown House, Ext. 3-2968.

League Honors Phyllis Wallace

Dr. Phyllis A. Wallace, professor at MIT's Sloan School of Management, has been awarded the National Business League's Eartha M. White award for exemplary dedication to the cause of minority entrepreneurship and management education.

The League, founded 75 years ago in Boston by Booker T. Washington, established the annual award to honor pioneer black women in the field of management.

The award is named for Eartha M. White, a member of the League from its earliest days until her death in 1974, a personal friend of Booker T. Washington, and a successful businesswoman in the Jacksonville, Fla., area. She was the first woman to be an officer of the league.

A Halloween-style Open Reading will be sponsored by the MIT Writing Program Thursday, Oct. 30, from 3:30 to 6:30 in the Crafts Library, Senior House. Members of the MIT community are invited to read their writings and listen to others. Haloween refreshments will be served. For more information, call the Writing Program, x3-7894.

Nurses Sought

The MIT Medical Department needs "occasional nurses"—registered nurses willing to work an occasional eight-hour shift to supplement the department's regular nursing staff.

"Demand for extra nurses usually arises in the Infirmary's Inpatient Unit or Evening Ambulatory Clinic during peak periods or when vacations and sickness reduce our staff of nurses," according to Sally Wright, Medical Department Personnel Officer.

Nurses interested in working, even if they can work only a few times during a year, should contact Mrs. Pauline Jones, Director of Nurses, at 253-1770.

Kraus Recital

Pianist Andrew Kraus will give a recital 5:15pm, Thursday, Oct. 23 in the MIT Music Library. Mr. Kraus, who is currently completing his doctorate in music at Boston University where he is a piano assistant to Bela Nagy, will perform Chopin's Sonata in B minor and Liszt's Hungarian Rhapsodies.

Morse to Speak

Richard S. Morse, president of the MIT Development Foundation, will be the guest speaker at a meeting of the Harvard Business School Club at 5:30pm Wednesday, Nov. 5, at the Harvard Club. MIT Alumni have been invited to attend the meeting.

Harpist Kathleen Bride will present a recital, 2pm, Sunday, Oct. 26, in the Sala de Puerto Rico in the Student Center. Ms. Bride, a graduate of the Juilliard School of Music in New York, where she studied with the late Marcel Grandjany, will perform works by Grandjany, Hindemith, Godefroid, Dussek, and Tournier.

The concert is sponsored by the Department of Humanities and the Boston Chapter of the American Harp Society. Tickets will be available in the Bldg. 10 lobby, Oct. 22 and 23 and at the door to the Sala. A donation of $2 per person is asked.

ILO in Europe

MIT's Industrial Liaison Program, through which member companies can utilize the resources of the university, is sponsoring three special European programs in Zurich, Switzerland, in January.

Two sessions will be held Jan.12-16, one on "Fermentation Technology" under the direction of Professor Daniel I.C. Wang of the Department of Nutrition and Food Science, and the other on "The Mighty Mini." This will be a close look at minicomputers microprocessors and their applications to real world problems, directed by Professor Hoo-min D. Toong of the Department of Electrical Engineering.

The third program on "Corporate Management in the New Social and Economic Climate" will be held Jan. 19-23 and will be chaired by Professor Emeritus of Economics, Everett E. Hagen.

Law Forum Sets Program

Four lawyers are participating in the fall series of the MIT Forum on the Law Profession, an opportunity for students to meet informally with members of the legal profession who have different legal careers.

Jeptha H. Wade, Boston attorney, MIT alumnus ('45) and a member of the MIT Corporation, opened the series Tuesday (Oct. 21) with a talk on "The Diversity of Practice in a Large Firm."

Judge David S. Nelson of the Superior Court of Massachusetts, will speak on "A View from the Bench" at the second session of the Forum Monday (Oct. 27), at 4pm in the West Lounge of the Student Center.

Arthur Z. Gray, president of the Union Pacific Foundation, New York, and a Wall Street lawyer, will speak Nov. 4 on "An Overview of the Legal Profession" and Nov. 5 on "Aspects of a Practicing Lawyer's Life." Both Mr. Gray's talks will be in the Spofford Room, Rm. 1-236, at 4pm.

The series will conclude Nov. 10 with Molly T. Geraghty, assistant dean. Northeastern Law School. Ms. Geraghty will speak on "Law Careers Today: A Law School Dean's Perspective" at 4pm in the West Lounge of the Student Center.

All interested members of the MIT community are invited to attend the series, jointly sponsored by the Pre-Professional Advising and Education Office and the Law Related Studies Program.

Women in Science

Tanya Atwater, assistant professor of marine geology in the MIT Department of Earth and Planetary Sciences, was one of several women to address more than 500 high school and college freshmen students at a two-day symposium on science careers for women sponsored by the Smithsonian-Harvard Center for Astrophysics last Friday and Saturday. The symposium, "Earth in the Cosmos: Space for Women," focused on the potential for women seeking careers in astronomy, geophysics and the space sciences.

Wheatley Appointed By Alumni

Nancy J. Wheatley, MIT '71, who has been assistant dean for student affairs, has been appointed regional director for New England of the MIT Alumni Association.

Ms. Wheatley is one of five new regional directors named by the alumni association in a new staff organization designed to improve support of many MIT activities carried on by alumni outside Cambridge.

Ms. Wheatley

Ms. Wheatley received her SB degree in physical science. She served as administrative assistant for the Unified Science Study Program of the Education Research Center from September, 1971, to June, 1972, when she joined the staff of the Dean for Student Affairs. In the latter office, her responsibilities included work with the Undergraduate Seminar Program, the Freshman Advisory Council, Residence Orientation Week, undergraduate and graduate housing programs, and personal counseling of students.

She is married to David W. Brown, MIT '69, and resides in Andover.

SERI

(Continued from page 1)

economic and social effects of regulation, supply and energy policy issues, as well as solar energy.

MIT's involvement in solar energy dates to the 1930s when researchers at the Institute developed many of the basic concepts and technologies now being used for solar heating of water and buildings, the statement said.

"Presently, researchers at MIT are involved in many phases of work on solar energy. This summer a group of active research staff and faculty met to study numerous solar-energy alternatives, to consider how MIT might most usefully contribute to the development and implementation of solar energy, and to recommend specific activities for MIT to initiate internally.

"It was the group's feeling that MIT in addition to continuing developmental efforts of importance in the near future would also continue fundamental research with a long-term view towards the realization of technologies now known but not economically competitive and the development of new scientific approaches to the use of solar energy."

The policy statement said "that there will be many intersections of interest as well as opportunities for mutually beneficial interaction" between MIT and the Solar Energy Research Institute. Some examples are: long-range research; systems design and analyses; economic assessments of potential technologies; independent evaluations of demonstration units; projects that require interdisciplinary capabilities or a strong liaison with industry; augmenting and developing central research and testing facilities; facilitating communication among researchers, industry and the public."

Such collaborations "would naturally be more convenient" if the new federal facility were located near MIT, the statement said, and arrangements could be made for the staff of the solar research facility to make use of MIT's library, computers and specialized equipment.

Students could do research or theses at the facility with joint supervision, joint symposia could be conducted, MIT faculty could participate in the research institute's work on a consulting or short-term leave basis, staff members of the Solar Energy Research Institute might serve as adjunct MIT professors, and joint research projects could be initiated, the statement said in citing other potential benefits to locating the new facility near MIT.

Although it is not clear what form of governance the Solar Energy Research Institute will have, its goals are likely to make it appropriate for MIT as an institution or for individuals associated with MIT to participate in that governance if they are asked to do so, the document concluded.

Hungarian Physicist Named Visiting Mauzé Professor

Dr. Judit Nemeth, professor of physics at Eotvos University in Budapest, Hungary, has been appointed Abby Rockefeller Mauze Visiting Professor in the Department of Physics, for six months beginning Sept. 1.

Professor Nemeth has worked in nuclear physics (nuclear structure calculations and studies of fission and alpha decay of nuclei) and astrophysics (neutron stars).

During her stay—her first visit to MIT—she will be affiliated with the Center for Theoretical Physics.

The Abby Rockefeller Mauzé Visiting Professorship was funded in 1963 through gifts of Laurence S. Rockefeller and the Rockefeller Brothers Fund to honor their sister, Mrs. Mauzé, a leader in the advancement of women in the professions, industry and the arts.

The same fund also supports the permanent Abby Rockefeller Mauzé Professorship, held since 1973 by Dr. Mildred S. Dresselhaus of the Department of Electrical Engineering and Computer Science.

120 MIT Rowers In Charles Regatta

More than 120 members of the MIT community will test their rowing skills and endurance as they compete in the Head-of-the-Charles Regatta, the annual day-long fall rowing festival on the Charles River, Sunday, Oct. 26.

Starting times are scheduled from 10am to 4pm. Spectators can view the event from any point along the three-mile course, from the Boston University Bridge to the Charles River Reservation, three miles upstream. Programs will be available at the starting point and at several points along the river.

MIT will have a total of 22 shells competing in 13 of the Regatta's 18 racing categories. Included in the MIT entries are 37 women rowers.

The 1973 varsity heavy-weight team, including Gregory Chisholm, now a member of the MIT Corporation, will reunite for this year's Regatta. Coming from as far away as Toronto, Canada and Palm Beach, Fla., the 1973 team will compete in the Elite Eight category. Competing in the same event will be the 1975 second varsity heavyweight crew, which competed internationally in the Henley Regatta in Henley, England this past summer. The Elite Eight contest is the last event of the day and is scheduled to begin at approximately 4:00pm.

The Head-of-the-Charles is the world's largest one-day regatta. It is patterned after the world-famous Head-of-the-River race in England. This is the eleventh running of the race.

Entrants in each event are started at about 15 second intervals and computers record the starting and finishing times of each entry to within a tenth of a second.

The first five finishers in each event will receive sculptured bronze medals. Some races offer additional trophies.

GETTING IN SHAPE FOR THE BIG RACE, MIT freshman lightweight crew coach, Peter Billings (MIT '73), practices for the elite lightweight singles competition in the Head-of-the-Charles Regatta, to be held Sunday (Oct. 26).

CLASSIFIED ADS

Ads are limited to one per person per issue and may not be repeated in successive issues. All ads must be accompanied by full name and Institute extension. Only Institute extensions may be listed. Members of the community who have no extensions may submit ads by coming in person to the Tech Talk office, Room 5-111, and presenting Institute identification. Ads may be telephoned to Ext. 3-3270 or mailed to room 5-105. Please submit all ads before noon, Friday, October 24. They will be printed on a first come, first served basis as space permits.

For Sale, Etc.

Tempus fugit, order beaut hand crocheted shawl now, your choice of color(s), taking Xmas orders, $25. Diane, x8-1766 Draper.

Pr 5.60x15 VW stud snows w/rims, yr old, best. Ed, x3-3854.

Nw Dunbar drum tbl, 18" diam, bureled olive wd, retail $656, best. VV, x3-6363.

Banjo, Vega Wonder, 5 str, lk nw, $325. x3-1492.

Peaches, $.05/lb. Sharon, x5-8668 Dorm.

Dbl matt, spr, $40 nego. Bill, x3-2503.

ESS amp 1 towers, virtually nw $500 or best; Akai GX-285D open reel tape deck, $45 or best. Tom Downey, 536-1300.

Schwinn exercise bike, exc cond, $45. Barbara, x3-5284.

Polaroid camera mdl 420 w/focus flash attach, case perf cond, $50; ping pong tbl, rec sz, folds up to 1 man play, 4 paddles, net, balls, gd cond, $35. x5597 Linc.

Schwinn 3 spd m 26x1.75 midweight bike, horn, lug carrier, $50. Dan, x3-2422.

'71 AMF Skidabller, 295 cc, nw eng, rebit susp, $300 or best. Charlene, x3-4933.

Hifi components, 25-50% off on most brands. Bob, x3-4242.

M 3 spd bike, 4 mos, $55. Michel, x3-5343.

Sheepskin coat, sz 38, $50; stud VW snows, $30; alto rcrdr, $12; sea shells, $10; GSR mtr, $12. Steve, x3-5427.

Tires, (3) 6.00x13 Delta ww, (2) 6.50 x13 Delta stud snows, used 2 seas; 5 wire whls, 6.00x13. Steve, x8-3754 Draper.

Wd desk, $25; closet, $15; chest drsrs, $25. Call, 491-0080.

Blk Les Paul cstm guitar, '70 Humbuckers Grover tuning pegs, hard case, ask $300. Rick, x8-2332 Draper.

Pr Gdyr E78x14 snows, 2 yrs old, $16/pr. x3-3969.

Dishwasher, $30; lg oak desk, $25; dbl box spr & matt w/mtl frame, Carrie, x3-4905.

Kodak Inst M105 movie proj, $40; cocktail tbl, $10; 2 tires, 6.50x13, 1 mtd, $20. Call, 494-8738, evgs.

M leath coat sz med, $45; f rabbit jckt, med, $70; Argus slide proj, $12. x3-2716.

Violin, Schroetter mdl 3/4 sz, gd cond, fine tune, w/case, $55. x3-5235.

Refrig, $30; 2 org tweed rugs, 9x12 & 6x9, best; dbl matt & box spr, $20. x3-3354.

Cherry 5 drwr med brn chest-on-chest, 45" H, 32" W, 17½" D, v gd cond, $69. Gerry, x8-1288 Draper.

Contemp pipe-frame brn enamel loveseat, 4 foam cshns, cstm Merimekko print covers, $125. Call, 899-9844, aft 6pm.

Dynamaster Omeglass 195 cm skis, little used, $165 or best. Jack Frailey, x3-4974.

Bckl ski boots, f sz 7½ M; beaut taupe f suede coat, sz 10, skeerling lined; lg brn Indian purse, best. Julie, x3-4434.

Pr radial snows, 13", fit Fiat, etc. Tony, x3-4622.

Pr Semperit radial snows, 1.55 SR 13. 5 K ov Vt driving on Fiat 125, $20/ea or best. Call, 491-8275, aft 6pm.

Sanyo FT433M under dash car stereo, amfm, cassette player & rcrdr, w/mic, FF, rewind, pause switch, lockmnt brkt, 2 wks old, $110 nego, Ted, 738-8624.

M sz 9½ ski boots, cost about $90 nw, ask $25. Helen, x3-5678.

Lg solid oak desk, 27x60", 9 drwrs, dark clr, $150 or best. Lois, 628-0348.

Pr VW snows, stud ww, VW rims, gd cond, $35. Billy, x366 Linc.

K sz box spr & foam matt, 12 yrs, $30. Ronald, x7632 Linc.

Wht thermal drapes, extend 20' w/wall mtd gold rod/hrdwre, $80; 10x12 oval rug, lite gold wool, pad, $60; wrought iron chandelier, $15. GE ductless range hood, $15. Andy, x8-3104 Draper.

LR chrs, 2, $35 or best; 2 elec mixers; krook lock, $7; framed mirrors; AC, sm fan; some hsehold items. x3-1732, kp try.

Old player piano, nds lots work, still sounds gd, in Foxboro, U move, free. Sam Benichasa, x8-3686 Draper.

Riding lawnmower, delux Huffy, 8 hp, 36" cut, floating deck, orig $479, now $250. Ellen, x3-2691.

Rugs, $20-$25; blstrs, $15; elec tea kettle, $10; guitar, $25; cassette player/changer, $75; tripod, $25; chr; knick-knack shlvs; paintings; etc. Bruce, x3-2297.

Pr stud snows & rims for Volvo wgn, $35; gas lock, $5. Call, 325-2813, aft 5:30.

Refrig, 2 yrs, 10 cu ft, $125; sm dresser, $15. Mark, x3-7729.

Wollensak mono tape recrdr, $30; Oster massager outfit, $10; f dressy blk coat, sz 10, $25; 4 pr 45" draw drapes, $3/ea. Larry, x3-4749.

Free couch & chr, pick up. Barbara, x3-5957.

SX70 Polaroid Land camera, instant pic, orig $140, $70. JK, x8-3977 Draper.

Solignor 200mm tele lens, $90; Revue 35 mm wide angle, $50 or best. Bruni, x3-6726.

Db. bed w/firm horsehair matt, box spr, $20; want med sz desk/w drwrs. Alan Robock 787-0227, evgs.

F nw grn down insulated parka, sz, sm, $50. Call, 547-7651, aft 5.

Collection slvr dollars, 1878-1935, 54 dif in album, $270 firm; roll or 20 mixed, $90. Call, 332-1819.

Aquarium, 30 gal w/compl set-up, $35. John, x3-6933.

Rock skis; 207 cm Rossignol Strato, 207 Dynamic VR-17, 2-5 Head Compgs, 185 Spaulding Sideral, $10-$30; nw Spaulding Sideral, 210 cm -$25, 205cm-$45; used Lange comp 8½ N, $30; Lange highbk comp, 9 N, $50. Call, 354-5885.

Wstghse port dishwash, old but exc cond, $30 or best. Demetris, x3-5557.

Nikon FTN w/50mm fl.4 Nikkor, 105mm f2.5 Nikkor prtrt lens, cu lenses, fltrs, case more, all perf, ask $425, no sep. Paul, 444-9596.

Antique marble top buffet, wd inlay design, v gd cond, best over $150; Sears dishwash, gd cond, $80 or best. x3-2576.

More plants some lg, some sm, come take a look in Rm 26-257 or call Steve, x3-5959.

Vehicles

'64 Chevy Imp. 283 V8, over 100 K, nds rings or gd for parts, body auto trans, brakes, electrical ok, 6 tires, best. Jerry, x3-2380.

'66 Corvair, 4 spd, positraction, gd cond, mtd snows, $250 or best. Frank, x8-1576 Draper.

'67 Mustang, perf cond, nds tune up, has snows, ask $350. James, x3-2489.

'67 Ply Belvedere, gd body, snows, nds work $100 or best. Call, 494-8929.

'67 Mustang conv, auto, nw trans, nw batt, amfm, snows, p st & br, gd cond, $600. Giorgio, 354-5917.

'67 Cadillac Coupe de Ville, 2 dr, exc body & run cond, rebit eng, 4 v gd tires & int, best. Call, 729-7235.

'68 Mustang, sm 8, exc mileage, marroon w/blk vinyl top, p st & br, radio, runs & looks nw, stud snows, best over $1,000. Jack, x8-3528 Draper.

'68 Peugeot wgn, nds body work, Ken or Israel, x3-3664.

'69 VW Sqbk, decrepit body, mech gd, radials, stud snows, ask $600. Steven, 729-8013.

'69 Volvo 142S, ask $1,600. x3-3666.

'69 Triumph Spitfire, nds work, $350. Mike, 267-2867.

'70 Maverick, 62 K, snows & rims, exc cond, $695. Mark, x3-2991.

'70 AMC Hornet, exc cond, $950. Luis, x3-3211.

'70 Opel Rally, gd gas mileage, exc cond, $1,190 or best. Tom, x3-2211.

'73 Ford Pinto, exc cond, bge, 49 K, radio, 4 spd, 5 nw tires, 3 dr, must sell, best. Call, 734-5132, aft 8pm.

'73 Superbeetle, red, sunrf, fac stereo radio, other xtras, still under wrnty, nw sticker. JD, x8-4455 Draper.

'74 Chevy Malibu, exc cond, nw snows, $2,400. Nomura, x3-6732.

'74 Yamaha TX500A, low mileage, luggage rack, sissy bar, shop man, hlmt, exc cond, no reas offer ref. Saturnino, x3-3880.

'74 Honda 360 CB, luggage rack, exc cond, $800. Rodney Cook, x3-5318.

'75 Harley Davidson mrtcycl, SX 50. Ron, 587-1512.

Honda CB450, rebit eng beg of sum, $650 firm, Denise, x645 Linc.

'71 Dodge pick-up, 8' bed, camper cap, nds eng work but still bargain, $1,000. x3-6246.

Housing

Arl, 2 BR apt (lg & sm), LR w/ww, lg K w/dining area, ref, dw; B, nice fenced bk yrd, dead-end str nr Mass Ave, $275 incl ht & gas. June, x7103 Linc.

Bos, S End, 5 min Copley Sq, grdn apt in ownr-occupied res, BR, mod exposed brick, all elec K, disp, $185 + util. Martha, x3-2759.

Newton Ctr, 4 BR hse, avail 12/14-2/1, full B 7 2½B, furn bsmnt, LR, DR, den, incl daily dusting by live-in help, fam only. Robert, x3-6303.

Stoughton, contemp 3 BR 2 fl twnhse condo, sale or lse, 2½ B, den, encl garage & patio, cent AC, ww, tennis & pool, play areas, 30 min MIT car or train. Dave, 762-4300, x576.

N Wayland, 3 BR, 2 B ranch or Indscpd acre, 2 car garage, 1st fl fam rm, rec rm, eat-in K, $58,500. Larry, x3-2691.

Gunstock ski chalet, 3 BR, indr pool, $210-$275/wk. x8-4415 Draper.

Lakefront 5 rm cottage, elec ht, nw wiring, plumbing; septic, 45 min N of Bos on NH brdr, nds some finish work, under $20,000, some financing avail to qual parties. x3-4040.

Animals

Yr old creme hamster, gd health, Habitrail cage, exercise ball, other access, $30 value for $10. x5817 Linc.

Frndly, obedient shep-collie pup, about 7 mos, nds home, found & don't have rm for 2nd dog. x3-5203.

Lost and Found

Lost: sterling slvr cross ballpt pen in Fac Club DR, Fri, Oct 10. David, x8-1143 Draper.

Wanted

Someone to take '68 Dodge Dart, std from Chicago, Ill to Bos. Bob, 438-2721.

Narrator, approx 27-40 hrs, gd spking voice, acting exp for short 16mm film. David, 492-2960.

Freezer for K. Call, 641-0680.

Books for Amer Indians in prison, pref on Ind history, law, sociology, arts, wl take anything. Debby, x409 Linc.

Spinet piano, reas gd cond. Evelyn, x3-4269.

Jr hi sch age babysitter in Wtrtwn, Arsenal area, also adult, home days, avail to care for sch age child when sick. Gretchen, x3-4433.

Babysitter for home, 12n-3pm daily. Call, 876-7945.

M 3 spd bike, x5-7657 Dorm, evgs.

Plug in unit for Bechman mdl 6127 freq counter, wl borrow or buy. Terry Lockhart, x3-1606.

Nikkormat FTN w/ or w/out 50 mm lens. Bill Moberg, x3-1835.

Refrig. Mark or Moe, x5-6622 Dorm.

Fbrglas skis, 150 cm, Solomon bndgs. Eve, x3-6069.

Exper prsn to care fo4 3 yr old 30 hrs/wk (40 hrs during fac) in our Bkine home, x3-2526.

Roommates

Tang rm avail 12/1 in m 3 BR apt, MIT affil. Pierre, x3-6081.

Share 7 rm apt nr Arl Ctr w/2 f grad stus, sunny, mod, $90 + util. Call, 643-5730, evgs.

Parking

Note to parking sticker swappers; please remember to inform your supervisor and the Campus Patrol of the exchange you have made so that their records accurately reflect your new parking area.

Wl swap Monroe for Albany or West. John, x3-4744.

Ride Sherman St, N Camb, area to MIT 9-5:30, Mon-Fri, or when conv for you. Michelle, x3-2918.

Ride, Back Bay-MIT, 9-5, wl share exp. Nadine, x3-2768.

Miscellaneous

All typing, IBM, fast, accurate & reas. Carmen, x3-2362.

Typing, theses, reports, stat, IBM Correct Selec, fast & accurate. Jean x3-7410.

Scholar & expert typist has time in NH to type theses, manu, etc, perf on IBM Exec, pick up & deliver ea Mon in Bos/Camb area, work grnteed. Susie, x3-4400.

Gen contracting, int & ext, roofing, gutters, additions, free estimates, satisfac grntd. Norman Berube, x3-5333.

Typing w/editing done, anything, effic MIT wife. Mike, x3-6275.

Fr stu, bilingual Canad & Amer stus nded for psych exper w/pay. Lve name & nmbr w/Judy, x3-6047.

Grmn trans, tutoring, conversation all levels, by native spkr, Irene, x3-7068.

Typing, term papers, theses, manu, reports, etc. Sandy, x3-4342.

POSITIONS AVAILABLE

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

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

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

Dick Higham	*3-4278*
Pat Williams	*3-1594*
(secretary — Dixie Chin)	
Virginia Bishop	*3-1591*
Mike Parr	*3-4266*
(secretary — Joy Dukowitz)	
Sally Hansen	*3-4275*
Jack Newcomb	*3-4269*
Evelyn Perez	*3-2928*
(secretary — Susan Bracht)	
Ken Hewitt	*3-6512*
Carolyn Scheer	*3-6511*
(secretary — Ellen Schena)	

Admin. Staff, Alumni Regional Director, Mit Alumni Assn., for the Southern US District will be responsible for all Association programs in the area: (Alumni Fund, Club and Relations activities). Duties include interaction with MIT alumni, faculty, administration and considerable travel. MIT degree or extensive knowledge of the Institute required. A75-62 (10/22).

Spons. Res. Staff in the Artificial Intelligence Lab to work in the vision research group. BS in Elec. Engineering, proficiency in analog electronics, experience with Op-Amps and their application, FET amplifiers and switches, servo amplifier design, D.C. motor drivers, video signal processing, vidicon cameras required. D75-210 (10/22).

Spons. Res. Staff, Systems Programmer in Laboratory for Nuclear Science (Linear Accelerator, Middleton, Ma.) will maintain and extend RT-11 and RSX-11D real-time operating systems on a tightly coupled dual processor configuration of PDP-11/45 computers with a variety of non-standard peripherals including CAMAC and a GT40 interactive graphics computer. Thorough knowledge of DEC PDP-11 machine code and I/O handling and a minimum of one year's experience as a systems programmer on an RSX-11D real-time operating system required. Strong computer science background at BS level or equivalent desired. D75-120.

Spons. Res. Staff, temporary, in the Artificial Intelligence Lab to work in machine vision research using PDP 11 assembly language. Projects analysis of motion via recognition of body parts in a photographic sequence, optimum use of the pin-diode system for picture taking and real time tracking, arm-eye coordination in finding, following, and manipulating object. BS required. Experience with real time vision systems preferred. Temp. through 9/30/76. D75-204 (10/15).

Spons. Res. Staff, Research Engineer, in Economics to perform engineering and economic analysis of technologies for the Technology Adaption Program: literature searching; technical evaluation; cost benefit analysis; computer simulation of potential intermediate technologies. Graduate degree in engineering or economics required. Relevant experience in technological assessment or economic analysis desirable. D75-205 (10/15).

Spons. Res. Staff, Tech Asst. in the Center for Cancer Research to provide tissue culture and other media for cell biology group: prepare and sterilize solutions to specification with stringent quality control. BA in Chemistry or Biology, mechanical aptitude and some relevant experience required. D75-206 (10/15).

Admin. Staff, Appliations Programmer in Office of Administrative Information Systems: write and maintain business applications programs from detail program specifications; test, debug and document programs according to prescribed standards. Associate's degree or equivalent, 1-2 years COBOL experience using OS or DOS, knowledge of buisness systems required. Autocoder or BAL experience preferred. A75-59.

Unit Coordinator, Exempt, in the MIT Infirmary will provide administrative and clerical support to Nursing Service, coordinating all non-nursing functions of inpatient units: maintain supplies of medical equipment, food, and other supplies; act as liaison with Institute sources and outside vendors concerning delivery, quality of services, and with Medical business office on billing matters; prepare statistical and other reports; assist in preparation of nursing staff work schedule and maintain related records. Bachelor's degree in business administration of health related field preferred. Minimum of 2 years working experience preferably in a medical setting, organization skills required. E75-39 (10/15).

Tech. Asst. V, Veterinary Technician, in Medical Department's Division of Lab Animal Medicine to maintain surgery rooms and provide post operative care for the animals. A BA from established school which specifically trains veterinary technicians is required. Appliant must be able to perform routine clinical diagnostic tests and must be familiar with techniques involved in treatment and surgery of lab animals. B75-565 (10/15).

Tech Asst IV, temporary, part-time, in the Psychology Dept. will prepare testing materials, administer tests to 2-16 year old subjects; code and analyze data. BA in linguistics, experience working with children required. Experience with tape equipment, experiment design, data analysis helpful. B75-578 (10/22).

Secretary V to faculty research staff, student assistants in Civil Engineering will perform varied secretarial duties including the organization of an office to support a new research project; prepare correspondence indenendently; arrange meetings, seminars; monitor budgets; coordinate work of other clerical staff in peak periods. Excellent secretarial, organizational skills required. B75-588 (10/22).

Secretary V in Resource Development to handle a very busy appointment calendar; arrange travel and meetings; plan and execute special projects; supervise other secretary; handle some dictation. Minimum of 2 years secretarial experience, tact in dealing with prominent people in industry and government required. Applicants must have organization skill and the ability to carry out research assignments. College training preferred. B75-561 (10/15).

Secretary IV-V in Preprofessional Advising and Education Office (Dean for Student Affairs) to handle varied duties to support functions of Office: coordinate schedules, publicity for law and medical school representatives' visits; advise students on professional school application procedures; collect and compile statistical data; maintain student records; coordinate office workload. Type routine correspondence and statistical reports. Typing skills, ability to interact well with people and to work with minimal supervision required. Non-smoking office. B75-587 (10/22),

Secretary IV to two Assistant Directors, Development Office to prepare correspondence for senior officers, research documents and formal proposals; maintain files, calendars. handle telephone and mail. Excellent typing skills facility with machine dictation, discretion, tact, ability to interact with Institute personnel at all levels required. Sense of professional teamwork highly desirable. B75-584 (10/22).

Secretary IV to Assistant Director, Space Administration, Planning Office will perform general secretarial duties as well as administrative services for the Committee for Space Planning: type reports and correspondence from machine dictation; assist in space assignment process and in the maintenance of space assignment record system; prepare simple graphics material for reports and presentation. Typing and machine transcription skills necessary. B75-586 (10/22).

Secretary IV in Medical Department to handle secretarial duties for two full-time physicians: answer phones, schedule appointments, transcribe medical reports, case histories, routine correspondence, administrative reports, and minutes of meetings. Will maintain files; chaperone female patient examinations. May be asked to attend and take notes during administrative meetings. Must be mature, sensitive, an excellent typist and able to transcribe medical terminology. Previous secretarial experience necessary. B75-566 (10/15).

Secretary IV to Assistant Director, Center for Advanced Engineering Study will handle varied duties related to Center's academic programs; handle admissions, registration, tuition payment processes; assign office space to students; provide advice and information to students on Institute and Boston area resoutces; type proposals and correspondence relating to specific projects; arrange conferences. Excellent organization skills, capacity for detail and typing skill required. B75-568 (10/15).

Secretary IV to Assistant Director for Administration and Administrative Assistant in the Center for Advanced Engineering Study will type correspondence and reports, maintain account and other special files; handle copying facility and video service billing processes ; order supplies; assist with payroll preparation. Facility with figures, typing skill, ability to work independently and to use dictation equipment required. B75-569. (10/15).

Secretary III, in Materials Science and Engineering, to act as Headquarter's receptionist for Dept. Head and three staff members. Duties involve typing forms, memos, correspondence, filing, doing errands, answering phone, receiving visitors. Applicant should be motivated, willing to help perform varied duties, able to work under pressure. Typing skills required. B75-585 (10/22).

Jr. Library Asst. II, part-time, in the Student Center Library will prepare books and reprints for shelving; make minor book repairs; assist library users; assist in inventory and other shelf maintenance activities. High school graduate, or equivalent, accurate typing required. 15 hrs/wk (M-F, 2pm-5pm). B75-583 (10/22).

Lib. Gen. Asst. III in Dewey Library Reserve Book Section to process reserve book lists: maintain circulation records and statistics; prepare overdue notices; collect fines; maintain physical order of reserve shelves. Will supervise student assistants and perform other library duties as required. Position includes some prescheduled evening or weekend work at main reference desk. Organization skills and some typing required. Previous library experience preferred. B75-563 (10/15).

Sr. Clerk IV, Production Asst, MIT Press to handle complete production of all reprints, imports, two journals, several new books. Work involves cost estimating, purchasing, monitoring spending, drawing up book specifications, checking proof, ordering supplies, maintaining records. Job requires excellent organizational skills, good typing, ability to work independently, under heavy pressure and with many people. Knowledge of publishing preferred. Production knowledge helpful. B75-579(10/22).

Microfilmer II-III in the Libraries Microreproduction Lab to handle varied micrographic techniques; planetary and rotary camera filming; microfiche production, photographic enlarging; other related methods. Mechanical aptitude, interest in technical photography required. Experience in microphotograpgy, darkroom experience desirable. 40 hr/wk. B75-567 (10/15).

Sr. Clerk III to the Interior Designer, General Purchasing Office will perform a variety of secretaryial and clerical functions: answer phone; maintain schedules; type furniture and related purchase orders; maintain purchase order and interior design files. Good typing and organization skills required. Familiarity with MIT procedures helpful. Non-smoking office. B75-575 (10/22).

Clerk Typist III in MIT Development Office to perform duties relating to fund-raising efforts of the Institute: filing; updating of files; typing — all in support of Analysts in the Development Office. Accuracy and neatness required. B75-571 (10/15).

Clerk II-III, part-time, in Center for Space Research Computer Programming division: maintain tape library; coordinate computer run schedule; maintain data listings; perform general clerical tasks as required. High school graduate, or equivalent, required. 20 hrs/wk. B75-559 (10/15).

Senior Clerk II in Admissions Office, to operate IBM Magnetic Card machine (will be trained) to send out over 200 letters per day to prospective students; will handle special projects during summer, prepare packets for fall mailing. Excellent typing, spelling, organization skills required. Must enjoy detailed work and be able to occasionally work under pressure. High school or business school background preferred. Non-smoking office. B75-580 (10/22).

Cashier II in Comptroller's Accounting, Cashier's office to receive and record monies due MIT; cash personal checks; distribute payroll checks. Facility with figures, ability to use adding machine, good handwriting required. Applicants should be able to deal effectively with the public. B75-573 (10/22).

Telephone Operator III in Physical Plant/Telecommunications will answer calls from inside and outside MIT. Candidate will provide directory assistance, transfer calls, assist in processing calls etc. Training and experience as switchboard operator, ability to deal with people required. Experience on Centrex Switchboard system preferred. 4 day/wk, 8¾ hrs/day; some weekend and holiday work required. B75-562 (10/15).

Computer Operator III-IV (full-time, part-time) in the Lab for Nuclear Science: will operate IBM 360/65 Operating System; perform all phases of batch processing installation (input-output, set up, console operation); act as liaison with IBM customer engineers in correcting hardware/software malfunctions; perform necessary maintenance functions such as cleaning tape drives. Ability to operate IBM 360/65 computer complex without supervision, knowledge of HASP and OS operating commands required. 40 hrs/wk; 4pm-12midnight shift. B75-549 (10/8). part-time: 20 hrs/wk, 4pm-8pm, B75-560 (10/15).

Machinist B, part-time, hourly, in Biology will work from blue prints, specifications, verbal instructions, sketches, to set up and operate machine tools. Applicants must demonstrate high familiarity and skill with all commonly used machine tools, have a minimum of two years applicable experience or be a graduate of a two year day school machinist course. 19 hrs/wk. H75-149 (10/22).

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

ADMINISTRATIVE STAFF:

A75-26, Dist. Officer, Resource Develop. (7/9)

A75-44, Proj. Planner, Planning Office (8/20)

A75-48, Director, Tech. Ed. Proj., Off. of Pres. & Chnc. (9/3)

A75-49, Asst. Director, Admissions (9/10)

A75-53, Personnel Officer, Personnel (9/24)

A75-54, Sec. for Alum. Relations, Alumni Assn. (9/24)

A75-56, Sr. Consult./Trainer, Personnel (10/8)

A75-57, Personnel Officer, Personnel (10/8)

A75-58, Industrial Liaison Officer, ILO (10/8)

A75-60, Systems Analyst, Off. of Admin. Inf. Syst. (10/8)

BIWEEKLY:

B75-195, Comp. Op IV, Off. Of Admin. Inf. Syst. (9/10)

B75-273, Sec. IV, Mt. Sc. & Eng. (7/9)

B75-290, Sec. III-IV, Energy Lab (7/23)

B75-306, Sec. IV-V, Physics (10/8)

B75-339, Sec. IV, Mech. Eng. (8/6)

B75-427, Comp. Op. IV, Off. of Admin. Inf. Syst. (9/10)

B75-475, Sec. V, Chemistry (9/17)

B75-503, Tech. Asst. IV-V, Res. Lab of Elec. (10/1)

B75-519, Sec. III, Mech. Eng. (10/1)

B75-533, Sec. IV, Civil Eng. (10/8)

B75-537, Sec. III-IV, Sloan School (10/8)

B75-542, Sec. III, School of Human./Soc. Sc. (10/15)

B75-543, Sec. IV, Chem. Eng. (10/15)

B75-545, Sec. IV, Chemistry (10/15)

B75-546, Sr. Clerk III, Lowell Institute (10/15)

B75-547, Sec. V., Civil Eng. (10/15)

B75-550, Sec. IV, Cntr. for Pol. Alt (10/15)

B75-551, Sec. IV, Cntr. for Pol. Alt. (10/15)

B75-552, Adm. Asst. V, Planning Off. (10/15)

B75-554, Sec. IV-V, Dean for Student Aff. (10/15)

ACADEMIC STAFF:

C75-28, Nursing Supervisor, Medical (10/8)

D75-8, Biophysicist, Nat. Magnet Lab (6/25)

D75-48, Economist, Energy Lab. (6/25)

D75-70, Electrical Engineer, Lab. for Nuc. Sc. (6/25)

D75-106, postdoc. res., Lab. for Nuc. Sc. (6/25)

D75-107, postdoc. res., Lab. for Nuc. Sc. (6/25)

D75-109, Medical Technologist/Technician, Clin. Res. Cntr. (9/17)

D75-111, Programmer, Artificial Intell. Lab (6/25)

D75-112, Engineer, Energy Lab (6/25)

D75-125, energy modeling, Energy Lab (8/6)

D75-126, postdoc. res., Energy Lab (8/6)

D75-127, postdoc. res., Energy Lab (8/6)

D75-129, Proj. Mngr., Cntr. for Trans. St. (8/20)

D75-138, Programmer, Proj. Mac (9/3)

D75-143, Plasma Physicist, Cent. for Space Res. (9/3)

D75-150, Systems Programmer, Hlth. Sc. & Tech. (9/3)

D75-153, Applications Programmer, Lab. for Nuc. Sc. (9/10)

D75-161, Economist/Policy Analyst, Energy Lab. (9/10)

D75-164, computer graphics, Architecture, (9/17)

D75-166, Operations Branch Mngr., Energy Lab. (9/17)

D75-167, end-use technology, Energy Lab. (9/17)

D75-169, Plasma Physicist, Res. Lab of Elec. (9/17)

D75-178, Programmer, Center for Space Res. (10/1)

D75-181, immunology, Center for Cancer Res. (10/1)

D75-201, Asst. Editor, Physics (10/15)

D75-202, Scientific Programmer, Earth & Pl. Sc. (10/15)

HOURLY:

H75-55, Tech. B., Lab. for Nuc. Sc. (6/25)

H75-117, Tech. B. Tadioactivity Center (10/15)

H75-120, Campus Patrol Officer (10/1)

H75-125, Electrician, Phys. Plant (10/8)

H75-143, 2nd Cl. Eng. (10/15)

The following positions have been FILLED since the last issue of *Tech Talk:*

B75-492	Secretary IV
B75-553	Cashier II
H75-91	Sr. Tech.
B75-535	Secretary IV
B75-531	Secretary IV
B75-515	Tech. Asst. IV
C75-26	Acad. Staff
D75-195	Spons. Res. Staff
D75-196	Spons. Res. Staff
E75-38	Exempt
B75-455	Secretary IV
B75-320	Secretary III-IV
D75-134	Spons. Res. Staff
B75-526	Secretary III-IV
B75-539	Secretary/Recept. III
B75-253	Secretary IV
A75-35	Admin. Staff
A75-51	Admin. Staff (cancl'd.)
H75-146	Cook
B750388	Secretary IV
C75-27	Acad. Staff

The following positions are on HOLD pending final decision:

D75-124	Spons. Res. Staff
A75-38	Admin. Staff
B75-564	Head, Microfilm. Serv. V
B75-570	Secretary III-IV

Nominations Are Sought

The MIT Sea Grant Program this week asked heads of academic departments to submit nominations for the second awarding of the Henry L. Doherty Professorship in Ocean Utilization.

These professorships, established through a grant to MIT from the Henry L. and Grace Doherty Charitable Foundation, Inc., aid the professional development of junior faculty members involved in expanding the wise uses of the ocean and its resources. The two-year professorships are open to all assistant professors and nontenured associate professors from any academic department or discipline concerned with new opportunities or problems in the seas.

Appointment for the next year (effective July 1, 1976) will be made based on nominations received by Dec. 31. Interested faculty should contact their department heads and the Sea Grant Program office to submit their names for nomination. Further information, and "Policies and Procedures for the Henry L. Doherty Professorship in Ocean Utilization" are available from Mr. Dean Horn, Executive Officer of the MIT Sea Grant Program.

Nominations made by the heads of academic departments will be reviewd by the Sea Grant Policy Committee and a selection committee consisting of the Provost, the Dean of the School of Engineering, the Director of the MIT Sea Grant Program, and two senior faculty members.

Selection will be based primarily on the relevance of the nominee's proposed research to current issues in ocean utilization, potential applicability of the results to solving problems, and professional benefit to the recipient. Each professorship provides up to full salary and employee benefits for the academic year.

Sakharov Nobel Draws Praise From Scientists

Dr. Herman Feshbach, professor of physics and head of the Department of Physics at MIT, has praised the selection of Russian physicist Andrei Sakharov for the 1975 Nobel Peace Prize.

"I am delighted that this award has been made to a fellow scientist," Professor Feshbach said. "Dr. Sakharov has worked bravely for freedom and justice in his own country and has made many imaginative suggestions for the resolution of the difficulties between differing ideologies, which is so important for future peace in a world with atomic bombs."

Professor Feshbach has been involved in efforts that would enable Dr. Sakharov, a critic of the Soviet system, and members of his family to visit the U.S.

Initially, Professor Feshbach recalled last week, President Jerome B. Wiesner invited the two children of Dr. Sakharov's wife and a son-in-law to come to MIT. This was at the time that Princeton University offered Dr. Sakharov a position as a visiting professor.

Then, about two years ago, Professor Feshbach offered to host the entire Sakharov family in his home and offered to be responsible for their welfare.

This offer was accepted, and is still open, but nothing has come of any of the invitations, Professor Feshbach said.

Copier Stays

The Xerox Color Copier located in the Quick Copy Center, Rm 3-003, for the past seven months on a trial basis is now a permanent feature of the center, James W. Coleman, director of Graphic Arts has announced.

The machine is capable of full color reproduction and can produce color transparencies and report covers as well as documents printed on paper measuring from 8"x10" to 8¼"x14". The cost ranges from $.70 for single color and $.85 for full color to $1.75 for transparencies.

Machine users may borrow a Color Creation Kit from the Quick Copy Center to help them design originals and to acquaint them with the copier's features.

The copier will remain in the center for as long as monthly volume continues to justify expense.

Lottery Starts

Tickets go on sale tomorrow (Thursday, Oct. 23) for "The Trip," a lottery offering trips to the Canary Islands or Mexico as prizes.

"The Trip" is sponsored by the MIT Quarter Century Club as a benefit for the MIT Community Service Fund.

Chances will be sold daily, 11:30 am-1pm in the Lobbies of Buildings 7, 10, E19, Walker and Lobdell, through Wednesday, Oct. 29. Tickets are $1 each or three for $2. The first prize winner will have a choice of trips; the second winner will receive the remaining trip.

The drawing will be held Monday, Nov. 2, at noon in the Building 7 Lobby.

Forrester Says New Perspective Needed

Dr. Jay W. Forrester, the scholar whose book, *World Dynamics*, provided the basis for the widely debated report, *Limits to Growth*, says a sharp change in perspective is necessary if growth problems are to be resolved.

Dr. Forrester, Germeshausen Professor of Management at MIT's Sloan School of Management, speaking Monday at a Houston conference, "Limits to Growth '75," called for:

— A national context for examining the problem since no unit larger than a country exists with the capability to deal with the issues.

— Stronger representation in the debate for the non-physical side of man with input from sociologists, political scientists and theologians, as well as from economists and technologists.

— A new perspective of how the business cycle interacts with longer-wave cycles in the economy.

Dr. Forrester said preliminary studies using a model of the national economy developed at MIT by the System Dynamics Group, which he heads, has indicated that "interaction between long-wave cycles and the business cycle may have led to erroneous explanations of recessions and depressions and to inappropriate policies for economic stabilization." The model, when fully assembled, will have nearly 100 times as much detail as the Limits to Growth model, Dr. Forrester said.

"The debate on limits to growth has tended to focus on the world as a whole, major regions, and on issues outside any particular person's own country. Such a broad and external perspective implies that the problem belongs to someone else. But no country can evade the social and physical limits to growth. Furthermore, only nations have effective political processes. The external perspective sees difficulties as being imposed from the outside and war against others as the solution.

"The internal perspective sees world pressures as the sum of local pressures and striking an internal balance as the solution.

"Until the inner perspective is established, major war becomes increasingly more likely as the limit to growth."

Dr. Forrester, who heads the Sloan School's System Dynamics Group, delivered a paper entitled "New Perspectives for Growth Over the Next Thirty Years," and called for:

—More emphasis on social limits and the trade-off between physical pressures and social pressures.

—More attention to national limits rather than aggregated world or regional limits.

—More awareness of the intermediate modes of dynamic behavior that lie between the short-term business cycle and the long-term cycle of growth.

Expanding on the need for emphasizing social limits, Dr. Forrester made these points:

"Much of the limits-to-growth debate has focused too narrowly on physical limits. Restricting debate to physical limits invites the rejoinder that technology can circumvent such limits. Indeed, technology might do so for quite some time. But any belief that shortages of energy and food can be overcome will be used by people and governments as an excuse to avoid facing the issue of population growth and consumption.

"Through population growth, physical pressures can be transformed into social pressures. If physical limits become less threatening, then doubts about growth will be temporarily dispelled. If physical support for a growing population appears possible, the easy course is to ignore rising population. But rising population density is surely at the root of many social stresses.

"Social limits are not relieved by more emphasis on technology. Quite the contrary, increased technology means a more complex and vulnerable society.

"The debate over physical limits seems counterproductive. It can divert governments and the public from the ultimate necessity for limiting population.

"The issue of physical limits obscures the rising threat from social limits. As population growth continues aided and abetted by intensifying technology, complexity increases. With greater complexity comes stronger tendencies for social breakdown and at the same time more vulnerability to disruption.

"The debate on growth has so far been largely between the environmentalists on one side and the economists and technologists on the other. But the issues should be broadened to include more input from sociologists, political scientists and theologians. The non-physical side of man needs stronger representation."

In calling for a national focus for action, Dr. Forrester said implementation of "effective policies for restraining growth and achieving a desirable equilibrium can not be expected on a uniform world or regional scale...

"Neither the United Nations nor the regional confederations have the courage or power to strike a balance in the trade-off between population and standard of living. Nor is it clear that the trade-off should even be desired at the world level...

"If a country believes that solutions should exist on the outside, then it follows that failure to achieve solutions can be attributed to those on the outside. The source of the problem and the potential solution are believed to lie across the border. Such is the basis for war.

"Unless population is to be restrained by war and genocide, nations must look inward. By each nation coming to terms with its own geographical capacity, international tension can be reduced."

Dr. Forrester said industrialized nations will find the transition to self-sufficiency more traumatic than many underdeveloped countries.

"Of all countries, Japan is probably the most vulnerable," he said. "Without foreign energy, foreign resources and foreign markets, Japan will be a far different place. And that time is coming...Close behind Japan in vulnerability comes Western Europe and then the United States."

"This proposal to put limits to growth in the national context is quite the reverse of most present discussions for sharing, for international trade, and for human equality," Dr. Forrester said. "All the latter concepts suggest that others have created problems and must be responsible for solutions. Such is the basis for distrust and conflict."

The MIT professor also urged that more attention should be paid to the multiplicity of "dynamic modes inherent in a national economy."

He said the System Dynamics Group at MIT is developing a model of the national economy that contains 15 industrial sectors, worker mobility networks between sectors for both labor and professionals, and household, demographic, financial and government sectors.

"When fully assembled the model will have nearly 100 times as much detail as the Limits to Growth model," he said.

The Germeshausen Professorship held by Professor Forrester was established in 1968 by Mr. and Mrs. Kenneth Germeshausen and is intended to support MIT's strong interests in combining humanitarian advance with technological change.

Mr. Germeshausen is the retired chairman of the board, EG&G, Inc., and a 1931 graduate of MIT.

Master Classes

The public is invited to attend a special master class in chamber music, conducted by Sándor Végh, one of Europe's most distinguished violinists, 4-6pm, Fiday (Oct. 24) in the MIT Music Library.

Participating in the class will be the MIT Chamber Music Society performing Bartok's First String Quartet, Number 1, and the Scholarship Quartet from the New England Conservatory of Music performing Haydn's The Frog, Opus 50, Number 6.

A master class — in which a vituoso listens to and criticizes performing chamber groups — offers an opportunity for an audience to gain a deeper understanding of classical music and the intricacies of its performance.

Sándor Végh will also be guest soloist for the MIT Symphony Orchestra concert on Saturday (Oct. 25), in addition to performing a solo concert on Oct. 22 in Kresge Auditorium.

Goldfarb to Speak

Alexander Goldfarb, formerly of the Kurchatov Institute of Atomic Energy and now professor of molecular biology at the Weizmann Institute of Science in Israel, will speak at 5pm Tuesday, Oct. 28, in Room 10-105 in a discussion and lecture sponsored by MIT Hillel and the MIT Committee for Azbel, Lerner and Levich.

Title of Professor Goldfarb's lecture will be: "Does the State Own Its Scientists? The Viewpoint of a Recently Released Russian Refusenik."

Annual Report Emphasis Is Affirmative Action, Vision

(Continued from page 1)

school enrollments have risen this year, as have applications for next year.

—The interest among undergraduates in health careers continues, as indicated by the fact that 186 men and women applied to medical schools from MIT last year.

—Also continuing, and perhaps the most important trend to emerge in recent years, is the increasing fraction of the undergraduate student body choosing one of the engineering options, reversing a decline that persisted for a number of years.

—Major progress was made in MIT's long effort to create a humanities and arts program for the Institute that simultaneously reflects the humanistic goals of a liberal education.

—The Center for Cancer Research, begun two years ago, has grown in size and complexity to the point where it now includes some 70 researchers (one of whom, Dr. David Baltimore, has just been named corecipient of the Nobel Prize in Medicine and Physiology).

—The Energy Laboratory, now completing its second year of operation, increased its visibility and viability as the focal point of energy-related research at MIT.

On a "less positive theme," the report took note of "the ever more painful effort to keep the Institute's budget from running away."

It said the decision to initiate the MIT Leadership Campaign which seeks $225 million in new funds for the Institute, "could hardly have come at a more propitious time, for the extraordinary range of fiscal and social problems now bedeviling the nation are reflected, not surprisingly, on the campus."

MIT's new programs in energy, health, materials and natural resources, "while financed primarily from the outside, require some continuing Institute funds for their effective development," the report said, adding that existing financial resources, even with normal growth patterns, would be inadequate to meet these major demands.

"But the normal growth patterns do not now exist," the report said.

"Endowment values have fallen in recent times and endowment income is down for obvious reasons. Budget cuts and controls based upon strict economies and staff reductions have served to maintain an acceptable—if somewhat pained—financial posture during the past several years, despite the major impact of the Draper Laboratory divestment, legally mandated administrative functions, the steep escalation in energy costs, rampant inflation, and the leveling off of funds available for research support. However, these pressures leave little funds for academic initiatives, either needed modernization in existing teaching and research programs, or for the newly initiated programs."

As to increased engineering enrollment, the report noted that 44 percent of this year's sophomores, juniors and seniors at MIT are enrolled in engineering, compared to 36 percent in 1971-72.

"There is no obvious reason, perhaps not even a single reason, for this welcome development," the report said. "We know that the nationwide decline in engineering enrollment has stopped, no doubt due to the relatively better employment prospects that engineering enjoys at this moment compared to many other careers, but the resurgence of student interest in the engineering professions appears to be more pronounced at MIT than elsewhere.

"We would like to believe that renewed student interest in engineering as a career is a reflection of the School's own efforts at renewal and its rededication to furthering the evolution of the engineering profession in response to broadened professional scope, including the engineering sciences and technologies, the process of engineering (i.e., the conception and development of reliable and economical technical solutions) and the process of planning responsible uses of technology."

The communications gap between the humanities and science and engineering has been a perennial issue, the report said, and recent efforts at MIT to bridge the gap have been most promising.

"The experimental *Technology Studies Program* is a most important illustration of such an effort," the president and chancellor said. "During the past year Technology Studies was transformed from a set of good intentions into an academic program of research projects, colloquia, and planning for undergraduate and graduate subjects to be offered in 1975-76. The primary emphasis is on the historical, social and political dimensions of science and engineering—anchoring the intellectual work simultaneously in specific scientific and technological content and in a disciplined understanding of the social change which often attends technical progress."

A major portion of the report was devoted to MIT's continuing efforts to fulfill its commitments to equal opportunities in education and in employment for women and minorities.

"Our feelings are mixed," the president and chancellor said. "We look to the past with a sense of both satisfaction at the effort expended and frustration at our inability to reach all of our objectives. We look to the future with a blend of optimism and uncertainty. It is clear that the need for affirmative action programs in the form of 'crisis measures' will diminish, as educational institutions move toward a new mode of operation in which minorities and women are better represented and in which inequitable barriers are eliminated. It is equally clear, however, that some of the vexing problems and challenges will be with us at least through this decade and perhaps beyond. Affirmative action steps will and must continue to be taken at MIT and in all other American institutions until equality of opportunity is not only an accepted concept but an intrinsic part of the fabric of organizations."

The report reviewed efforts at MIT over the past decade which have resulted in significant increases in enrollments by minorities (now up to four to six percent of the classes) and women (now up to 15 to 20 percent of the classes). Moreover, the faculty now includes 18 black Americans and 54 women. None of these numbers, however, match MIT's hopes and areas of concern remain for the future.

"First, we appear to have reached a plateau in our efforts to increase the number of qualified minority applicants for our undergraduate programs," the president and chancellor said. "We now know that the group of minority young people who have the necessary secondary school background in mathematics and science is quite small in comparison with the entire secondary school population, and it may not be possible to attract to the Institute a significantly larger proportion of that group than we do at present.

"Consequently, future increases in the number of minority students who pursue careers in engineering and in the physical sciences are contingent on the degree to which young people can be informed about opportunities in these fields much earlier—probably in junior high school—and encouraged to study the necessary mathematics and science. Such information and encouragement have, in the larger society, traditionally come from parents and friends, and it is just this influence which is largely absent for minority students as a consequence of the virtual exclusion of minorities from these fields in the past. While it is not clear what role the Institute can play in addressing this problem, we need to be more imaginative in our efforts than just recruiting from the available pool at the high-school level."

The president and chancellor described MIT's accomplishment in employment categories as "mixed."

"While we have met, or come close to meeting, our objectives in the hourly, office-clerical, and exempt areas of employment, we have fallen far short of our objectives in the areas of administrative staff and research staff, particularly with respect to minorities," they said. "In the area of research staff the problem is not unlike that of faculty. Until quite recently minorities have been grossly underrepresented in engineering and science, with the result that the relevant pools of qualified persons are small."

MIT's commitment to equal opportunities in education and employment, they said, are intended to produce fundamental change within the university "in our internal processes and norms."

"Such change comes about as the cumulative result of significant small changes in most aspects of our mode of operation, and these in turn require adherence to a variety of new policies and procedures," they said. "Some of these changes...are perceived by some...as undesirable bureaucratic mechanisms which interfere with the primary tasks of making a strong institution greater. There are, of course, substantial risks associated with the internal mechanics of affirmative action. Procedures can outlive their utility and become unproductive bureaucratic encumbrances, and the mechanics of change can become counterproductive if they are allowed to undercut the fundamental importance of individual quality and merit in an academic community. We must remain alert to these hazards and be flexible and willing to adapt the specific procedures of affirmative action programs to change the institution to such a degree that the program is no longer needed—the sooner the better.

"These problems and the need to make continued progress toward the objectives for equal opportunity in education and employment that we have set for ourselves are high priority tasks. They compete for attention with the other important tasks which we have mentioned—efforts to trim budgets, the search for additional resources, the development of new programs and organizations in emerging areas of academic interests such as energy and health, and the continuing challenge of shaping our undergraduate programs to meet the needs of new generations of students. All these programs are important to the future of the Institute; no simple linear ranking of priorities is possible. We must make progress simultaneously on all these issues. This we intend to do."