

1974 IAP Spirit Is Rated High

By JOANNE MILLER
Staff Writer

MIT students, who could stay home or follow the sun, chose instead to return to Cambridge for Independent Activities Period (IAP) in January, with a greater enthusiasm than ever before.

"It's heartening to see such positive response to the between-semester break, especially this year when IAP has become a permanent part of the academic calendar," Joel Orlen, assistant to the MIT Provost and chairman of the IAP Coordinating Committee, said.

Previously IAP was a three year experiment aimed at allowing MIT students to pursue interests not normally available during term-time or to delve deeper into academic subjects without pressure. Students may attend IAP or not, as they please, and may also participate on an occasional or part-time basis.

According to preliminary figures compiled by the IAP Coordinating Committee, as much as 91% of dormitory residents were on campus during part of IAP. The percentage of fraternity residents ranged from 69% to 77% in a sample of fraternity houses surveyed.

Homework Assignments

Altogether 508 activities were planned for the period, including lecture series, seminars, laboratories, workshops, mini-courses and individual study. Incomplete returns indicate that approximately 89% of the activities took place.

Most popular courses in terms of attendance were: Very Introductory 360/370 Programming with 125 enrollees; Reading: Development of Comprehension and Speed, 120; and Couple Dancing, 109. A total of 519 signed up for

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Alumni Assn. Officials Move



MESSRS. SEVERANCE, LEHMANN AND EDGERLY pose behind the door of their new office space in the main campus complex.

—Photo by Margo Foote

New office space for the MIT Alumni Association has been established in Rm. 7-206 (Ext. 3-4040).

Donald P. Severance, executive vice president of the Alumni Association, will maintain his chief office there. Also included are offices for William S. Edgerly, president of the Association this year, and Frederick G. Lehmann, financial vice president and treasurer and director of the Alumni Fund. Mr. Lehmann's principal office, however, will remain in Rm. E19-439.

"The alumni," Mr. Severance said, "have traditionally played a significant role in the affairs of the Institute. Creating an office for the Alumni Association in the central administrative area acknowledges its role in the continued growth

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"Arts and University" Symposium Will Include Fuller, Motherwell

Prominent artists and educators—including Buckminster Fuller and the American artist Robert Motherwell—will gather at MIT in February for two days of discussion elucidating the role of the arts in the university and their development at MIT.

They will participate in a symposium and associated work-forums to be held Feb. 6, 7 under the title, "Arts and the University—The Visual Arts at MIT." The events, which will be open to the public, are being sponsored by the MIT Center for Advanced Visual Studies (CAVS) and the School of Architecture and Planning, with the support of the

Council for the Arts at MIT.

Organizers of the symposium are Gyorgy Kepes, Institute Professor emeritus and director of CAVS, and William L. Porter, dean of the School of Architecture and Planning.

The symposium will seek a "horizon" for the arts in a university in general and particularly MIT and the work-forums will illuminate aspects of art work at MIT "at the level of search and research," Professors Kepes and Porter said.

Dean Porter will be chairman also of the opening work-forum 2-4:30pm Feb. 6, and Robert

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Fuel Costs Increased \$600,000

By CHARLES H. BALL
Staff Writer

Energy costs will run about \$600,000 beyond the amount budgeted for them in the current fiscal year, Institute officials said this week.

Last spring, when the budget was being prepared, energy costs for the year ahead were estimated at \$3.2 million, which included a built-in inflation factor of 15%.

By September, however, price increases had outstripped the 15% estimate and an additional \$700,000 was added to the energy account—raising the total energy budget to \$3.9 million.

But even this will be insufficient, officials said this week.

Thomas E. Shepherd Jr., superintendent of utilities, said that energy costs for the year ending this June 30—for fuel oil, electricity, steam and gas—now seem certain to reach \$4.5 million.

Savings Near \$800,000

This would account for the anticipated \$600,000 over-run in energy costs.

The situation would have been worse, officials said, except for enforced savings brought about by the energy shortage.

Earlier, Shepherd had estimated that energy conservation measures, combined with reduced fuel oil allocations averaging 20-30%, would save about \$600,000 by the end of the fiscal year. But it now appears that these savings will approach \$800,000, he said.

Reserve Funds

Thus, energy costs for the year could have gone as high as \$5.3 million except for these savings, he said.

Officials said the rising costs—the price of No. 6 heating oil has gone in three years from \$1.86 a barrel to \$12.37 and electricity from 1.15 cents per kilowatt-hour to 2.4 cents—had made it necessary for the community to intensify efforts to save energy.

Chancellor Paul E. Gray said he hoped that unbudgeted energy costs for the year, like the operating gap, could be met with unrestricted income or reserve funds.

Article on Peril

Stuart H. Cowen, vice president for financial operations, said that higher energy costs "cannot fail to have a substantial impact on room and dining charges and on indirect cost rates for research projects in fiscal 1975 and, of course, on tuition as well in later years should the higher costs continue."

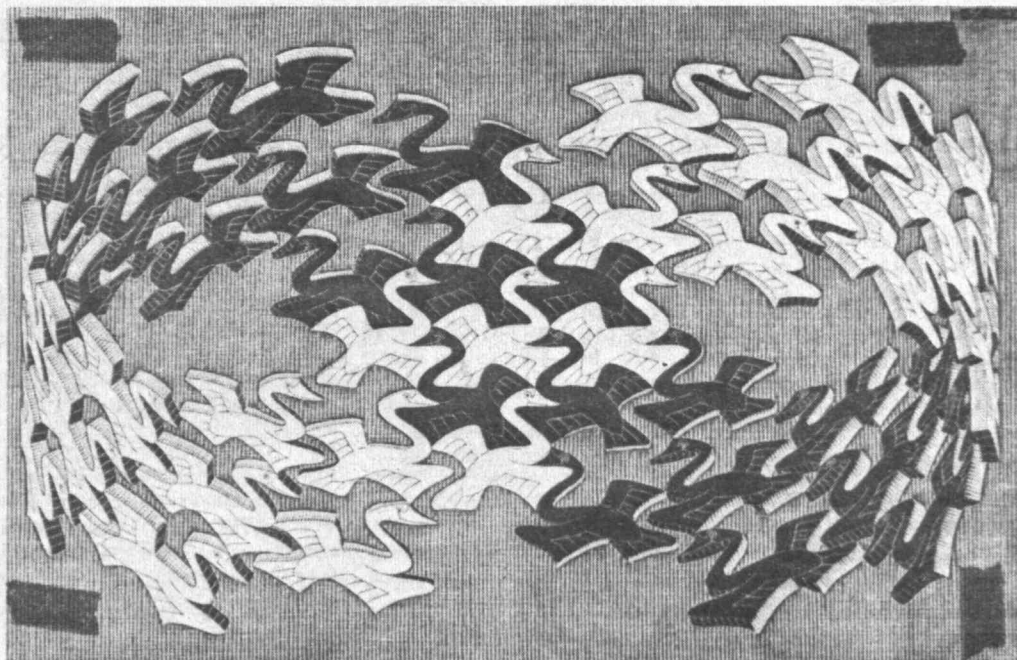
MIT's experience is being repeated throughout New England.

The *New York Times*, in an article Monday by Robert Reinhold headlined, "Fuel Costs Peril New England Colleges," reported: **Comparatively Cheap**

"The colleges and universities of New England, which had just about scrimped their way back to financial security, are now watching their best-laid plans for

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MIT Receives Gift of 10 Original Escher Prints



"SWANS," one of 10 Escher prints in recent gift to MIT.

MIT has received a gift of 10 original prints by M.C. Escher, the late Dutch artist who felt as great a kinship with the world of science as with his fellow artists.

The works, which will be added to the MIT Permanent Collection, were donated by Dr. Charles E. Reed, of New York City, an MIT alumnus. Dr. Reed, who is senior vice president of the General Electric Co., is a member of the Institute's Corporation Development Committee and of the Visiting Committee of the Department of Aeronautics and Astronautics.

Dr. Reed has been a collector of Escher prints and purchased a number of them from the artist himself at the latter's studio in Baarn, The Netherlands.

Escher's works have evoked special interest among scientists and engineers because of his unusual artistic representations embodying spatial and mathematical concepts. His prints have been reproduced in *Scientific American* and in books on mathematics and physics.

The Escher prints donated to MIT span 29

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Concert Band Touring Ohio, Pennsylvania

BY WILLIAM T. STRUBLE
Staff Writer

The MIT Concert Band, with John Corley conducting, is scheduled to play a concert today in Pittsburgh, Pa.—one of four being given by the 71-member band for high school and college audiences in Pennsylvania and Ohio during its current, week-long 25th anniversary winter tour.

The band left MIT last Sunday morning by bus with an itinerary that called for concerts at McKinley High School, Niles, O., (Jan. 28); Upper Arlington High School, Columbus, O., (Jan. 29); Mt. Lebanon High School, Pittsburgh, Pa. (Jan. 30); and at Indiana University of Pennsylvania, Indiana, Pa. (Jan. 31).

The band, scheduled to return to MIT on Friday, Feb. 1, will give a home concert at 8:30pm Friday, Feb. 8, in Kresge Auditorium.

Programs for the tour concerts will be drawn from the band's 1974 tour repertoire, which includes: Suite for Band, Opus 60, by John Bovicchi; "Portraits," by Nicholas A. Caiazza; "Jericho," by Morton Gould; "Lads of Wamphray," by Percy Grainger; Canzona and Overture, by Peter Hazzard; Music for Winds and Percussion, by Richard Hervig; Invention on Two American Tunes, by Andrew Kazdin; Fantasia on a Folk Theme, and March for a Festival, by Edward J. Madden; Essay for Band, by William Maloof; "Apocalyptic," by George Rochberg, and Circus Polka, by Igor Stravinsky.

Formed in the fall of 1948, the MIT Concert Band devotes itself to original works for symphonic band and has performed music by 20th century composers such as Hindemith, Milhaud, and Arnold Schonberg as well as works of earlier composers.

In previous concert tours the band has performed in the Festival of Contemporary Music in New York City, the winter carnival of the city of Quebec, in New York's Town Hall and in many colleges and high schools in the eastern US and Canada.

John Corley, who holds numerous positions in the Boston area as conductor and trumpet instrumentalist, has been conductor of the MIT Concert Band since its inception. He has appeared as guest conductor of the Boston Pops Orchestra and the Cambridge Festival Orchestra and is presently conductor of the Hingham (Mass.) Symphony Orchestra. He is a member of the music education department and conductor of the wind ensemble of the Boston Conservatory of Music and is a member of the board of advisors of the Berklee College of Music.

A new subject in Italian opera will be offered this spring—one of four changes in subject listings just announced by the Music Section.

To be taught by composer John Harbison, associate professor of music, the subject 21.885 will include a study of the music of Scarlatti, Monteverdi, Bellini and Rossini as an historical overview of Italian musical theater. Operas of Verdi will be studied in some detail, emphasizing libretto construction, problems of stagecraft and musical organization. Italian Opera will be given at 11:30am Tuesdays and Thursdays in the Music Library. Prerequisite is 21.81.

Lessons on Persian and Korean musical instruments will be available this spring to students enrolled in Non-Western Music (21.883), taught by Donald Sur, associate professor of music. Enrollment will be on a first-come, first-served basis by means of a sign-up sheet posted on Professor Sur's door (Room 14N-229C). Non-

Western Music meets at noon Mondays, Wednesdays and Fridays in Room 4-160.

Contrary to catalogue listings, two other subjects will be given this spring. Electronic Music Composition (21.828), taught by composer Barry L. Vercoe, assistant professor of music, was listed in the General Catalogue as offered in the fall term. The subject will meet at 4pm Mondays, Wednesdays and Fridays in Room 26-305.

The second subject, Music in the Romantic Period (21.86), was listed as not offered but will, in fact, be given. Classes will meet Mondays, Wednesdays and Fridays at 3pm in Room 4-160. Music in the Romantic Period will be taught by Rufus E. Hallmark, Jr., assistant professor of music, who also announced a spring undergraduate seminar—Music and Musicians (21.S07)—that will involve students and professional musicians in a series of classes and related concerts and recitals.

For example, the first seminar meeting on Feb. 11 will be with Stephen Erdely, violinist and member of the MIT music faculty, and his wife, Beatrice, who played a concert of violin and piano sonatas—their first appearance in Boston—last Friday in Kresge Auditorium. In the afternoon the Erdelys and the class will discuss two sonatas by Beethoven and Bartok. That evening, the Erdelys will give an open performance of the sonatas in Burton-Conner dining room.

Coincidentally, Music and Musicians will be taught by husband and wife—Professor Hallmark and his wife Anne Vaughn Hallmark, instructor in music at MIT. Professor Hallmark is a musicologist, specializing in 19th century German lieder, and a singer who is tenor soloist at Emanuel Church, Boston, and with the Boston Camerata. His wife is a musicologist specializing in the Middle Ages as well as a pianist. She is also teaching a graduate seminar in medieval music at the New England Conservatory of Music this term.

The Hallmarks are junior faculty residents in Burton-Conner and 21.S07 grew out of the musical events they have sponsored for house residents.

Additional performances in the Music and Musicians series will be announced.

An audience of some 600 persons applauded the performance of the Erdelys at their Friday evening concert.

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Energy Issues Will Lead Off Discussions In New Technology Studies Panel Series

Five MIT faculty members will join in discussion of energy issues on Wednesday, Feb. 6, to lead off a series of panel discussions on energy planned during February and March by the Technology Studies Steering Committee.

The panels, according to the organizers, will pay special attention to nuclear-related energy issues and are designed "to encourage Institute-wide discussion of a number of related issues of great current interest."

This, they said, is in keeping with one of the major goals of the Technology Studies program, which is to help bridge the gap separating the humanities and social sciences from science and engineering.

The Feb. 6 panel, which will be held at 4pm in Room 26-100, will be a discussion of energy issues in general and economic issues in particular.

The participants and their topics will be:

Dr. Robert M. Solow, Institute professor and professor of economics—"Effects of Energy Shortages on the US Economy."

Dr. Paul W. MacAvoy, professor of management—"Supply and Demand for Natural Gas."

Dr. Paul L. Joskow, assistant professor of economics—"Pricing of Energy Products."

Dr. Morris A. Adelman, professor of economics—"Politics and Economics of the International Oil Market."

Dr. Henry D. Jacoby, professor of management—"The New England Energy Situation."

The panel was organized by Dr. Joel R. Yellin, a research associate in the Center for Policy Alternatives and a lecturer in the

Department of Political Science.

Dr. Yellin, who will serve as moderator, said each panelist would speak about 15 minutes and that a question-and-answer period would follow.

The second panel being planned a few weeks later, will be a discussion of nuclear reactor safety by Dr. Norman C. Rasmussen, professor of nuclear engineering, and Dr. Henry W. Kendall, professor of physics.

Dr. Rasmussen, working as a consultant to the Atomic Energy Commission, is director of a study being conducted by the AEC on reactor safety. An AEC official was quoted recently as saying that preliminary results suggest the possibility that there will never be a major accident in a nuclear power plant. Dr. Kendall is an outspoken critic of present reactor safety practices.

The subjects of other panels now in early stages of planning are:

Regulation of the Atomic Power Industry.

Security of Fissile Materials.

The Government's Role in Setting Science and Technology Policy for Energy Production.

The organizers said that the planning of the series had involved wide consultation with professionals in the energy field.

The organizing committee, besides Dr. Yellin, includes Dr. Irving Kaplan, professor of nuclear engineering; Dr. Jerome Y. Lettvin, professor of communications physiology, and Dr. Nathan Sivin, professor of the history of science and of Chinese culture.

Technology Studies Steering Committee is responsible for planning and overseeing the new program of humanistic studies of

science and technology now being initially staffed in the School of Humanities and Social Science.

Its members, in addition to Drs. Kaplan, Lettvin and Sivin, are: Dr. Maurice S. Fox, professor of genetics; Dr. Harold J. Hanham (the chairman), dean of the School of Humanities and Social Science and professor of history and political science; Dr. Arthur D. Kaledin, associate professor of history; Dr. Philip Morrison, Institute professor and professor of physics; Dr. Judah L. Schwartz, professor of engineering science and education; Dr. Cyril S. Smith, Institute professor emeritus, professor of metallurgy emeritus and professor of the history of science and Technology emeritus; Louis D. Smullin, Dugald Caleb Jackson, professor of electrical engineering; Dr. Leon Trilling, professor of aeronautics and astronautics, and Dr. Judith Wechsler, assistant professor of the history of art.

Towing Hurts

Getting towed in Cambridge during a snow emergency will cost you \$42 this year, according to George Teso, traffic director for the city.

During the Jan. 9-10 snowstorm, 550 vehicles were ticketed and 223 cars were towed, resulting in faster and more efficient plowing of city streets. Mr. Teso said that similar ticketing and towing procedures will be employed whenever snow plowing is necessary.

Snow emergency information is posted on all streets and radio and television announcements are made when a snow emergency is declared.

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. Undergraduates are also urged to check with the UROP bulletin board in the main corridor of the Institute.

Center for Materials Science and Engineering

Photochromic glasses, which have become important commercial products during the past decade, have found greatest application in the area of ophthalmic products. Their full utilization will depend, however, upon an ability to control the photochromic response, particularly the degree of darkening, the time constants of the recovery process and their thermal sensitivity. Presently, the physical bases of these response characteristics remain to be elucidated satisfactorily and this lack of understanding serves to limit technological developments. The thrust of a potential UROP project will be primarily experimental in nature, and will focus upon the processes of controlled precipitation and crystallization which lie at the heart of the technology, and upon the effects of the composition, thermal treatment and external influences on the photochromic behavior. The optical and electrical characteristics of the glasses produced will be evaluated and related to suggested models for photochromism in the materials. For further information contact Professor Donald Uhlmann, Room 13-4077, or the UROP office, Room 20B-141, Ext. 3-5049.

Electrical Engineering Department

The Boston City Hospital Nursing Home Care Program is an innovative project aimed at improving health care provided to patients in Boston area nursing homes. The primary emphasis of the program is on the utilization of nurse practitioners as "physician expanders." We are currently involved in examining the utilization and effectiveness of nurse practitioners as health care providers. Several undergraduates can join us in this research; they would be involved in time and motion studies of the nurse practitioners and physicians employed by the project. Opportunities also exist to investigate other aspects of health care delivery in chronic care facilities such as nursing homes. If interested, contact Professor Roger Mark, Room 36-781, Ext. 3-7818 or Howard Brodie, Room 36-781, Ext. 3-2514.

Bolt Beranek and Newman, Inc., Cambridge

Using several PDP-10's and other computers, the Computer Systems Division has several large R&D programs underway on the forefront of computer technology: (1) Computer Communications - Computer Network—This division did much of the basic work on the ARPA Network; (2) Computer Applications in Life Sciences and Medicine—This division works in more than a dozen biomedical projects ranging from computer algorithms to generate 3D models of drug molecules to telephone communication systems for the deaf and/or speechless; (3) Computer Applications for Data Handling—Project possibilities include text editing using storage tube displays, communications between a large time-sharing computer and a remote mini computer-based graphics terminal and large-scale generalized file-management techniques; and (4) Computer Applications in Signal Processing—Projects involve world-wide seismic data handling and handling of underwater acoustic array data.

Sigma Xi - Undergraduate Research Awards

The Society of Sigma Xi is an honorary organization dedicated to the encouragement of scientific research. The MIT Chapter of Sigma Xi has awarded a grant to UROP for the support of undergraduate students in the field of applied science. MIT undergraduates with an idea for a worthwhile scientific project and who have not as yet identified a sponsor are encouraged to submit proposals to Sigma Xi in care of the UROP Office, Room 20B-141, Ext. 3-4849. Proposals are now being accepted for materials and supplies support and should include: (1) a detailed description of the project; (2) an itemized budget of materials and supplies; and (3) signatures of the undergraduate and his faculty supervisor.

Boston University Medical Center

Several research opportunities exist for students interested in utilizing tunable dye laser Raman spectroscopy in biomedical applications. Four suggested research topics are: (1) Determination of the microscopic basis of aggregation using single cell hemoglobin molecules; (2) Determination of the molecular events associated with illumination of rhodopsin in the rod outer segment of the retina; (3) Confirmational studies of membrane-active molecules in well defined media; and (4) Atherosclerosis: What is the

nature of cholesterol involvement? For further information contact Professor Eugene Stanley, Room 13-2114, Ext. 3-1743, Ext. 3-6879 or the UROP Office, Room 20B-141, Ext. 3-5049.

Mechanical Engineering Department

This project will involve experiments at the Polaroid Corporation using an electronic feedback system to help groups of people to get at issues efficiently, to develop consensus, and to participate effectively in establishing goals and priorities in an industrial environment. The experiments may be extended outside of the industrial setting to include groups in a suburban town working on educational policies and other community issues. Questions to be explored in these experiments are: Does the electronic feedback apparatus help or hinder group dialogue? If it does help, in what special ways does it help? What are the techniques of successfully making use of this apparatus (special techniques of discussion leadership, etc.)? What modifications to the apparatus are suggested from the experiments? Does the work with small groups of six to 20 people give any indications of the value that this apparatus might be in getting feedback from substantially larger numbers of people in an industrial situation? Contact Professor Thomas B. Sheridan, Room 1-108, Ext. 3-2228.

Office of Consumer Affairs Boston

The Consumer Complaint Division of the Executive Office of Consumer Affairs was set up to assist consumers in handling a wide range of consumer problems in a personal and direct manner. One possible area of investigation is the operation of the Small Claims Court in greater Boston. Specific areas for examination include: Who brings actions in small claims court (how often do companies use them to get default judgement)? Are clerks of the courts helpful, or rather do they attempt to dissuade consumers from bringing actions? Does the judge give the consumer a chance to speak his mind or is there a foreboding atmosphere in the courtroom? What are the verdicts? Another possible area of investigation is in the automotive field. Complaints relative to automobiles outnumber complaints about any other product. One possible project would be to examine the repair frequency of different automobiles and practices of particular dealers (both good and bad). Regulations of practices could be proposed by the Office of Consumer Affairs.

Testing Set For World's Longest Yoyo

Any well-managed yoyo can creep, walk, sleep and go round-the-world.

But how about dropping a yoyo nearly 300 feet from the roof of a 21-story building?

A group of MIT students plan to do just that next Monday (Feb. 4) to see whether they have been successful in designing and building "the world's longest and largest yoyo."

The event is scheduled for 1pm from the roof of the 295-foot high Cecil and Ida Green Building.

Dr. James H. Williams Jr., Esther and Harold E. Edgerton Assistant Professor of Mechanical Engineering, supervised about 10 students in the yoyo project during the Independent Activities Period.

He said the group, as expected, encountered "all sorts of problems," but already has run tests on the yoyo.

"It's go at this point," Dr. Williams said, although he added there is still some question "about how much pumping we will have to do to get it to wind itself."

He said the students expect to use a 1½-horsepower motor to pump the yoyo, although this may be changed.

He said the students had designed and built a structure that extends about 15 feet out from the roof. It will be used as the control arm for the yoyo, which will be lowered almost to the ground.

The yoyo—its dimensions were not revealed—is made of steel and will be hung by a special cord made of advanced fibre material, he said.

Frat Independent

The residents of 34 The Fenway have announced that their house from now on will be called Fenway House to establish themselves as an independent cooperative and disassociate themselves from the national fraternity, Sigma Alpha Mu.

All members of the group share in the upkeep of the building and preparation of meals. Membership is on an "open bid" basis and there are no pledging or initiation procedures. Fenway House will retain its membership in the Inter-Fraternity Council.

Mrs. Barrett Ends 39 Years Chem. E. Honors Retiree



Mrs. Barrett receives silver-tray gift.

—Photo by Margo Foote

At a recent department reception, business associates of long standing, friends and well-wishers gathered in the Lewis Conference Room to offer best wishes to Mrs. Margaret S. Barrett on the occasion of her retirement from the staff of the Department of Chemical Engineering after 39 years at MIT—34 of them with Chemical Engineering.

Joining MIT in 1935 to work with Professor Earl B. Millard on his book on physical chemistry, followed by an assignment with Nathaniel McL. Sage, Sr., in the Division of Industrial Cooperation, Mrs. Barrett moved to Chemical Engineering in 1940 to work with Dr. Walter G. Whitman in headquarters and served in this capacity until Professor Whitman's retirement in 1960.

During this 20-year period she assisted Dr. Warren K. Lewis, acting department head, and the late Dr. Edwin R. Gilliland, acting head and head upon Professor

Whitman's retirement. In 1959 she became Senior Administrative Assistant, and from 1966 to 1969 she was Administrative Officer of the Department.

January, 1970, saw the first appearance of the *Chemical Engineering Newsletter* under Mrs. Barrett's direction. During this period she continued her association with the Institute by handling administration of the MIT Undergraduate Seminar Program as well as serving as a consultant to the department.

"Mrs. Barrett has had an important role in the department and in the Institute," Professor Raymond F. Baddour, department head, said. "She has made many contributions to the operation of the department and has been a helpful and constructive source of information and advice to students and staff. For many years she administered the placement work for our graduate students, and in this assignment did an outstanding public relations job for the department with the companies that come to interview students.

"For more than three decades, three successive department heads learned to rely on her knowledge, judgment and loyalty to the department and to the Institute. There are few graduates who are not aware of her extraordinary service to the Department."

A highlight of the department reception was the presentation of a silver tray by Professor Baddour to Mrs. Barrett carrying the inscription "In deepest appreciation for your invaluable contributions, Chemical Engineering Department, MIT 1973."

Fuel Costs

(Continued from page 1)

balanced budgets collapse under the weight of staggering fuel bills."

The article said that New England schools had been hit particularly hard because of their heavy reliance on imported residual oil—No. 6—"the once-cheap molasses-thick sludge left over after gasoline and other petroleum products are distilled from crude oil."

"Institutions in other parts of the country tend to rely more on domestic coal and natural gas, which remain comparatively cheap," the story said.

Blood Drive In March

MIT—the leading donor of blood to the Red Cross in Massachusetts—will have a major blood drive in March.

Last year, the MIT community gave more than 4,000 pints of blood—an amount sufficient, under Red Cross rules, to provide coverage for non-donors as well as donors.

This means that unlimited blood coverage is available



presently to all students, faculty, staff, employees, Office of Sponsored Programs staff, Lincoln Laboratory personnel, Draper Laboratory personnel and retired personnel, as well as their children, spouses, brothers, sisters, parents, grandparents and parents-in-law.

"Aside from the usual humanitarian considerations, this is one of the important reasons for giving blood at MIT," Gail M. Rubin, the chairman, said. "It benefits everyone, and everyone who can should give."

The March drive, one of two major blood drives during the school year, will be held March 4-8 and 11-15.

The slogan for the drive is, "Lie Down and be Counted." Appointment forms will be mailed to all Institute personnel on Feb. 7. Evening hours will be available, and information can be obtained at x3-7911 and x3-4885.

Miss Rubin, a sophomore in math from Yonkers, New York, is a member of Technology Community Association, a student service group that is directing the blood drive.

Noon Hour Concerts To Resume Feb. 7

Thursday Noon Hour Concerts in the MIT Chapel will resume Feb. 7 with a concert of music by Monteverdi, Handel and Pustav Holst performed by Sandra Stuart, soprano; Janet Packer, violin; Peter Belmont, cello; and John Cook, harpsichord.

Sandra Stuart, of Boston, is the wife of John Cook, harpsichordist and director of the concerts. Janet Packer, of Cambridge, 1970 graduate of Wellesley, is the former concert master of the MIT Symphony Orchestra. Peter Belmont, of Lexington, graduated from MIT in 1960.

Photo Exhibition Open to Feb. 8

A group of works in progress by four young Boston photographers—Dennis Barna, Tom Fiorelli, Andrew Gordon and Steve Halpern—will be on display at the Photography Laboratory, through Friday (Feb. 8).

The show was organized by Jonathan W. Green, a MIT associate professor of architecture, and Barry D. Cohen, Rochester, N.Y., a junior in architecture.

Population Growth Still World Peril

By ROBERT C. DIORIO

Staff Writer

Although years of population planning programs have had some success, the growth rate in developing countries has not declined significantly, according to a professor at the Alfred P. Sloan School of Management.

"We are still in a situation where a single major crop failure in Southeast Asia has the potential to produce widespread famine and social chaos in the developing world," Dr. Glenn Lee Urban told the United Nations Fund for Population in an address earlier this week (Jan. 28).

Dr. Urban said effective management of population programs could help avert such a crisis.

He urged the United Nations to take the lead in applying to population programs the operations research tools developed for industry.

Planning Programs

"The United Nations is the major hope for population planning because with its prestige, its resources and its leadership it can provide the technology, funding, programs and management needed to avert the growth crisis which may overtake us—as the energy crisis did—if we continue to ignore the signs," Dr. Urban said.

An associate professor of management science at MIT's Sloan School, Dr. Urban outlined during his address a management model for population planning programs.

The operations research model building methodology has been applied successfully in Atlanta, Ga., where the number of active participants in population planning programs rose from 11,000 in 1969 to 25,000 in 1972, Dr. Urban said.

The model has also been used in programs in Los Angeles, New England and Memphis, Tenn.

Dr. Urban and other MIT faculty members also are working to establish a management model for the Philippines government which is striving to arrive at a growth rate of 2 per cent by 1980.

Ethically Acceptable

An expert in operations research, Dr. Urban became committed to population planning in 1970 during a four-month visit to Calcutta to study new-product marketing.

"I was, of course, interested in population planning before I went to Calcutta, but I returned totally committed after seeing what population growth, food shortages and other problems have done in that part of the world. I saw how low humanity goes before it gives up."

The world's other major problems cannot be dealt with effectively until the population problem is solved, Dr. Urban said.

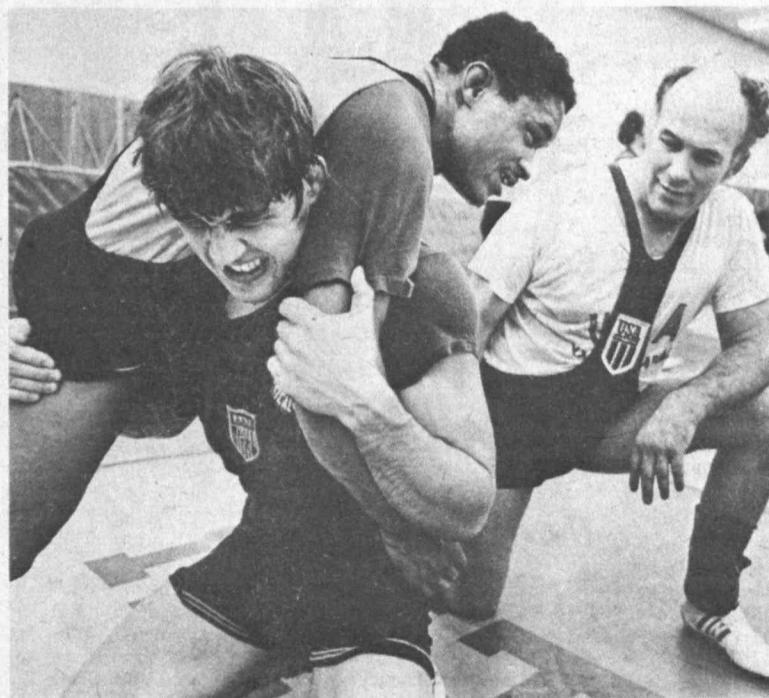
"The only alternatives to population planning," he said, "are restrictive methods imposed by governments and those are not ethically acceptable."

Woodwind Concert In Music Library

The newly-formed South Street Wind Octet—young professional and amateur musicians from the Boston area—will present a concert at the MIT Music Library, 5pm, Thursday, (Feb. 7), under sponsorship of the MIT Music Section.

The group, organized last summer, has performed at Brandeis and Harvard. The MIT concert will feature the Mozart *Serenade in C minor, K. 388* and two Beethoven pieces—*Rondino in E flat* and the *Sextet in E flat, opus 71*.

USA Wrestlers at MIT



CHAMPION WRESTLERS, members of a 10-man US team now in Russia for the International Invitational Wrestling Tournament Feb. 1-3, worked out last week at MIT's David Flett du Pont Athletic Center, the training site for the squad. The Russian trip is part of a sports exchange program developed by the Amateur Athletic Union (AAU). Grappling are the team captain, Lt. Lloyd Keaser of the Marine Corp, top, who won a world championship in Teheran, Iran, in September, and John Peterson of Wisconsin, a World Cup champion and 1972 Olympic silver medalist. Keaser is a graduate of the U.S. Naval Academy and Peterson of Stout State University in Wisconsin. With them is Jim Peckham, athletic director at Emerson College, who is coach of the team. Peckham was assistant coach of the 1972 U.S. Olympic team. —Photo by Margo Foote

Transportation Research Accounts for Environment

By DENNIS MEREDITH
Staff Writer

Over the past five years transportation planners have found that public reaction to their work has begun to be punctuated more with question marks than with periods. Environmentalists, community groups, and ordinary citizens have begun questioning the need for various highway projects, bridges, tunnels, airports, pipelines, traffic interchanges, and practically every other kind of transportation project.

Transportation planners had a tendency to view such questioners as outsiders, blockers-of-progress, people who lay down in front of bulldozers.

Today, however, society has begun responding to these voices—incorporating them into the planning process, rather than forcing them to work from without. Such incorporation is the main thrust of transportation policies being developed by Professor Marvin Manheim and his colleagues in MIT's Department of Civil Engineering and the Urban Systems

Laboratory.

In one project, Professor Manheim and his colleagues were commissioned by the Federal Highway Administration to develop a set of guidelines to be used by state highway departments. The departments have been required by recent federal legislation to revise their operating procedures so as to take environmental, social, and economic factors into better account in their planning.

The MIT researchers are also conducting research for the California Department of Transportation on incorporating environmental and social factors in their transportation planning, and in assisting the department as it becomes a planning agency for all modes of transportation.

"Though our research projects deal specifically with transportation planning, our processes could be applied to any area," said Professor Manheim. "We aim at instilling into organizations in general the means to change in an orderly manner

in response to outside demands."

In their work for the Federal Highway Administration, Professor Manheim and his colleagues advocated—not a set of rigid guidelines to be handed the state agencies—but a set of process guidelines, which would allow each state department to revise its organizations in its own way in order to bring about more effective inclusion of environmental, social and economic effects in their planning. Under the new federal guidelines, each state was required to submit an "action plan" which detailed this reorganization. If these plans were not submitted on schedule, the states' federal highway funding would be withheld. These plans were submitted for approval last Fall.

"Rather than having the federal government issue hard and fast rules, we wanted to change the kinds of pressures put on the highway planning professionals, and let them adapt to the pressures in their own way," said Professor Manheim.

"For instance, until now the principal aim of the highway planner was to get his project completed on time. His promotions and professional standing were dependent on building the highway, regardless of the intrinsic value of the project.

"Because of this set of values, the hierarchy of professionals placed highest those who most directly contributed to the building process. The professional pecking order put the designer highest, and the planner next to him. On the bottom was the social scientist and the environmentalist, because his output was not specifically applicable to the finished product, and in many cases represented a hindrance.

"By changing the emphasis of the planning process from construction to consultation, the planner's charge will not necessarily be to build, but to consult with the involved communities to clarify what they want. The planner would become more of a diagnostician.

"Such a situation would allow the public not only to influence the final decisions in transportation planning, but what is studied in the first place in developing those decisions."

THE INSTITUTE CALENDAR

January 30
through
February 8

Events of Special Interest

Arts and the University – The Visual Arts at MIT* – Prominent artists and educators will participate in a symposium and work-forums organized by Gyorgy Kepes, Institute Professor Emeritus and director of CAVS, and William L. Porter, dean of the School of Architecture and Planning. Work-forums will be chaired by Dean Porter on Wed, Feb 6, 2-4:30pm, Stu Ctr West Lge, and by Robert Gardner, acting director, Carpenter Center, Harvard, Thurs, Feb 7, 10am-12:30pm, Stu Ctr West Lge. The symposium, introduced by Roy Lamson, special assistant to the president for arts, will be Thurs, Feb 7, 2pm, Kresge Auditorium.

Seminars and Lectures

Wednesday, January 30

Preview of Spring Recruiting at MIT* – Robert K. Weatherall, director, career planning & placement. Placement Office Seminar. 1-3pm, Rm 10-105.

Finding Economic Methods for Global Transport of Natural Gas* – Dr. Elizabeth M. Drake, chemical engineering. Chemical Engineering Seminar. 1pm, Rm 12-102.

User's Forum on the Dataset Security Enhancement – Use and effects of this new feature, scheduled for installation Feb 4, will be explained. Questions welcome. Information Processing Center Seminar. 2pm, Rm 39-530.

What Can Economists Say About Rationing – Martin L. Weitzman, economics. Economics Lecture (77). 2pm, Rm E52-394.

The Future of Canada? – John Porter, Harvard University of Toronto, author of *The Vertical Mosaic*. Political Science Seminar (261g). 3-5pm, Rm 1-190.

Exploration of Mars – Dr. Harold Masursky, visiting professor, US Geological Survey. Earth & Planetary Sciences Lecture (74). 4pm, Rm 54-100.

How Hi is the Fi? – The Relationships Between Psychoacoustics and Hi-Fidelity Sound* – Mark Davis, RLE. Audio Engineering Society, WTBS-FM Boston Section Meeting. 7:30pm, Rm 6-120.

The Weimar Republic: An Analogy for American Jews and Gentiles?* – Jacob Katz, sociology & history, Hebrew University, Jerusalem; Visiting Professor, Harvard. Israeli-American Forum. 8:30pm, Stu Ctr Mezzanine Lge.

Thursday, January 31

Open Forum on Graduate Student Funding** – Dean Irwin W. Sizer of the Graduate School; assistant deans Ronald Stone, Jean Richard and Clarence G. Williams, Special Assistant to the President and Chancellor for Minority Affairs; will give short presentations and answer questions. Graduate Student Council Seminar. 10am, Sala.

Diet and Metabolic Interrelations of the Essential One-Carbon Compounds During Tumor Development* – Dr. Lionel A. Poirier, National Cancer Institute. Nutrition & Food Sciences Special Seminar. 4:15pm, Rm 54-100. Coffee 4pm.

Medical Education in America: Who Gets In? What Gets Taught? Panel discussion. 1974 Helmsley Lecture Series, Preprofessional Advising & Education. 8:15pm, Schwartz Auditorium, Brandeis University.

Tuesday, February 5

Earth Resources and the Use of Satellites: Technological Advances

and International Implications* – Arnold Frutkin and William Stoney, NASA. CIS Seminar. 12:30-2pm, Rm E53-482. Coffee, bring lunch.

The Technical University in the 1980's** – Dean Alfred A. H. Keil, School of Engineering. Lincoln Lecture Series. 3:30pm, Lincoln Lab Cafeteria.

Cooperative Education in Ocean Engineering* – C. Chryssostomidis, director, XIII-C Program. Ocean Engineering Seminar. 4-5pm, Rm 5-314.

Operational Forecasting of Atmospheric SO₂ Concentrations* – David Spiegler, Environmental Research & Technology, Inc. Joint Meteorology-Boston Chapter of the American Meteorological Society Seminar. 8pm, Rm 6-120.

Wednesday, February 6

Issues and Dilemmas Regarding Satellite Communications* – Dr. John V. Harrington, COMSAT, Washington, DC. Telecommunications Policy Planning and Research Seminar. 4-6pm, Rm 9-450. Coffee.

Jerusalem: Past, Present and Future* – Moshe Aznieli, director, Redevelopment Authority of the Old City of Jerusalem. Israeli-American Forum. 8:30pm, Stu Ctr Mezzanine Lge. Slides.

Thursday, February 7

Bibliographic Aids for Library Users* – Mary Pensyl, Carole Schildhauer, Malcolm Hamilton, & Lorna Daniels. Joint MIT-Harvard Library Association Panel Discussion. 3:30pm, Rm 10-105. Refreshments.

Mathematical Programming Models in the Oil and Gas Industry in the Soviet Union* – Dzhangir Ali-ogly Babayev, division director of cybernetics, Academy of Sciences of the Azerbaydzhani SSR. Operations Research Center Seminar. 4pm, Rm 24-121. Coffee & donuts.

Mixed Culture Studies in the Chemostat* – Dr. Holger W. Jannasch, Woods Hole Oceanographic Institute. Nutrition & Food Science, Microbiology & Biochemical Engineering Seminar. 4pm, Rm 16-134.

New Jews: America and Israel* – Arthur Waskow, Institute for Policy Studies, Washington, DC. Hillel Lecture. 7:30pm, Rm 10-105. Refreshments.

Friday, February 8

The Importance of D Electrons* – Henry Ehrenreich, Gordon McKay Professor of Applied Physics, Harvard University. Materials Science Colloquium. 4pm, Rm 9-150. Refreshments 3:30pm.

Community Meetings

US Culture and Family Life – Discussion group for American and foreign student wives. Wed, Jan 30, 3:30-5pm, Medical Department (Bldg 11) 3rd fl conference rm. Info, x3-4912.

Women's Forum* – Jane Bachner, consultant on development of effective personal skills, will speak on the way women present themselves to others. Mon, Feb 4, 12n, Rm 10-105.

Law-Related Studies & Preprofessional Advising & Education Office** – Series of practicing lawyers will meet with students to describe their careers and practices. Tues, Feb 5, 3:30pm, Stu Ctr Mezzanine Lge.

Student Committee on Educational Policy – Election of chairman, treasurer, secretary & treasurer; followed by Donald Blackmer, political science, associate dean, School of Humanities and Social Science, speaking on "The New Humanities Proposal." Wed, Feb 6, 7:30pm, Stu Ctr Rm 473. Speaker, 8:15pm.

Student Committee on Educational Policy – Benson R. Snyder, Division for Study & Research in Education, will speak Thurs, Feb 7, 7:30pm, Stu Ctr Rm 400.

Technology Matrons' English Conversation Classes for Foreign Wives – Beginner, intermediate and advanced classes will meet for 18 sessions on Tues & Thurs morn. Registration: Fri, Feb 8, 10am-12n, Rm 10-340. Fee: \$20. Pre-school care will be provided for \$5. Info, Mrs. J.F. Reintjes, x3-3656 or 484-3595.

MIT Club Notes and Meetings

Association at Tang Hall – Semi-annual general meeting. Sun, Feb 3, 7:30pm, 24th fl lge. All residents encouraged to attend.

Bridge Club* – ACBL Duplicate Bridge. Matchpoint pairs Thurs, 7-10:30pm; beginners Fri, 10pm-12m, small IMP-scored team of 4 events (advance registration required) Fri, 8pm & Sat, 2pm; Sectional rated open pairs, 8:15pm, Tues Jan 22 & 7pm. Thurs Jan 31; all Stu Ctr Rm 407. Jeff, x3-5285 or 864-5571.

Chinese Choral Society – Singing Sun, 3pm, Stu Ctr 473.

Israeli Student Club – Meetings Wed, 8pm, Stu Ctr Mezzanine Lge.

LSC* – Membership meeting. Thurs, Feb 7, 6pm, Stu Ctr Rm 407.

MIT Karate Club** – Evening classes Mon, Wed, 8-10pm, duPont Wrestling Rm. Harry Koba, x3-6232.

MIT Kung Fu Club* – Chinese boxing, northern praying mantis. Meetings Tues, Thurs, 7:30pm. Call, 876-5071 or 661-8765.

MIT Outing Club* – Meetings, Mon, Thurs, 5-6pm, Stu Ctr Rm 461.

MIT Scuba Club** – Compressor hours: Mon, Fri, 4-6pm, Alumni Pool.

Strategic Games Society* – Offers opponents and discounts on merchandise to members plus gaming and periodical library. Sat, 1pm-1am, Walker Rm 318. Info, Kevin Slimak, x0389 Dorm.

Student Homophile League* – Meeting Sun, Feb 3, 4pm, Rm 14N-307. For info, talk, help in coming out, call Hotline, 494-8227. Dinner party, Sat, Feb 9. Call 494-8370 for details.

Student Information Processing Board Meeting* – Mon, 7:30pm, Rm 39-200.

TCA General Meeting* – Tues, Feb 5, 7pm, TCA office, 4th fl Stu Ctr.

Tiddlywinks Association* – Meetings Wed, 8-11pm, Stu Ctr Rm 491.

Unicycle Club* – Meetings Sun, 1-3pm, Stu Ctr Rm 407. Beginners welcome. We have unicycles.

Volleyball Club** – Practice, advanced level team competition. Tues, Thurs, 7:30-10pm; Sun, 2-4pm; duPont Gym.

White Water Club** – Pool session. Tues, Feb 2, 8-10pm, Alumni Pool.

Social Events

Hillel Coffeehouse* – Fri, 8pm, 312 Memorial Dr. basement. Refreshments.

Rock Revival* – Sponsored by the Student Center Committee, starring Little Walter of WBCN. Mon, Feb 4, 8:30 pm. Lobdell. Admission 75 cents/couple. Free Beer, punch and munchies.

Movies

Allen Ginsberg and Lawrence Ferlinghetti, Anne Sexton. Humanities Film Festival (154). Wed, Jan 30, 12:10pm, Rm 14-0615. Coffee, bring lunch.

Measure and Set Theory – Math Films (163). Wed, Jan 30, 4pm, Rm 2-190.

The Battle of Algiers* – Sponsored by the Seminar for Foreign Students and Participation in Development. Wed, Jan 30, 7pm, Rm 10-105. Admission \$1.

A Different Path* – Hillel Society Coffee House. Wed, Jan 30, 8pm, basement 312 Memorial Dr. Admission 50 cents. Refreshments.

The Madwoman of Chailot – LSC. Fri, Feb 1, 7pm, 10pm, Rm 10-250. Admission 50 cents, ID required.

Aparajito (Satyajit Ray) – MIT Film Society. Fri, Feb 1, 7:30pm, 9:30pm, Rm 6-120. Donation \$1.

'Enormous Imbalance' Found in Ports

A study of the future of Atlantic ports by an MIT ocean engineering professor contends that a total lack of coordination in eastern US port development has produced an "enormous imbalance" in the geographical distribution and in the type of facilities for handling different forms of cargoes.

Ernst G. Frankel, professor of marine systems and director of MIT's Commodity Transportation and Economic Development, conducted the study, which was funded by the National Office of Sea Grant through the MIT Sea Grant Program, and the International Ford Foundation.

Professor Frankel called for some form of regional or national port planning. He said that modern port technology favors ports larger than any now in existence, but with single or limited purposes. Thus, he said future ports will have to serve entire regions, and will require regional planning.

Professor Frankel based the report—available as Sea Grant Report No. 72-18 from the MIT Sea Grant Program—on analysis of extensive data gathered together on US Atlantic seaboard port facilities, capacities, and operations, and projected the future demand imposed on them and their resulting ability to meet it.

According to Professor Frankel, a revolution in the design and operation of ports has taken place over the past decade because of the integration of the seaport into a complex land, air, and sea transportation system.

Unfortunately, he said most existing commercial facilities are obsolescent, and will continue to decay unless major rejuvenation steps are taken. Professor Frankel warned that as ports continue to atrophy, increased shipping costs will affect the standard of living, employment level and economic growth of the regions served by the ports.

Professor Frankel said Atlantic ports have a vast oversupply of general cargo facilities and more than sufficient containerized cargo terminals.

A major gap exists, he said, in the availability of efficient deep draft and large capacity dry and liquid bulk cargo terminals.

"Not only does this lack introduce higher cost penalties resulting from use of inefficient ocean transport and port facilities, but it may also constrain our future ability to handle the increasing quantities of such commodities required to sustain the US economy," he said.

"The major problem in US Atlantic ports appears to be the total lack of coordination of port development. Not only are ports planned, developed, and operated on a unilateral basis, but federal regulation of ports is maintained by 23 separate federal agencies."

Everyone Invited To Rock Revival

All members of the MIT community are invited to the fourth Rock Revival at 8:30pm, Monday, Feb. 4, in Lobdell sponsored by the Student Center Committee.

Star will be Little Walter of radio station WBCN. Free beer, punch and munchies will be provided. Admission is 75 cents per couple.

Tufts Vice President To Speak at Lincoln

Kathryn A. McCarthy, provost and senior vice-president, dean of the Graduate School of Arts and Sciences, and professor of physics at Tufts University, will speak at a Women's Forum meeting at Lincoln Laboratory, noon, Tuesday (Feb. 5) in Rm A-166.

RDTEU President In CP Telethon

William B. Alexander, president of the Research, Development and Technical Employees Union at MIT and an employee of Lincoln Laboratory, will appear on a telethon for the benefit of the United

"We want to encourage non-student members of the community to attend," Steven M. Wallman, Student Center Committee chairman, said. "Events that bring all members of the community together, are beneficial to everybody," he said, "so we have planned the Rock Revival to appeal to everyone."

Dr. McCarthy's talk will cover her career, Tufts' efforts to employ more women and minorities, ways women are being encouraged to attend the Tufts faculties of science and engineering and the problems of administration at a prominent university.

The telethon will be aired Saturday and Sunday, Feb. 2 and 3, on Channel 7, starting at 10pm Saturday and continuing until 6pm Sunday.

Triple Feature* - Chinese Student Club. With English subtitles. Sun, Feb 3: **Heroine in the Dust**, 1pm; **I'm Not Coming Home Tonight**, 3pm; **Jilted**, 5pm Kresge Auditorium. Admission \$2 adults, \$1 children.

Hathi Mere Saathi* - SANGAM. Indian film with English subtitles. Sun, Feb 3, 3:30pm, Rm 26-100. Admission 50 cents with ID.

Deep Inside - X-rated Registration Day Movie, LSC. Mon, Feb 4, 7:30pm, 10pm, Kresge Auditorium. Admission 50 cents, ID required.

The Mind* - Slide show sponsored by Ananda Marga Yoga Society. Mon, Feb 4, 7:30pm, Rm 10-250.

Israeli Film* - Hillel Society Coffee House, 8pm, basement 312 Memorial Dr. Admission 50 cents. Refreshments.

The Last American Hero - LSC. Fri, Feb 8, 7:30pm, 10pm, Rm 26-100. Admission 50 cents, ID required.

The World of Apu (Satyajit Ray) - MIT Film Society. Fri, Feb 8, 7:30pm, 9:30pm, Rm 6-120. Donation \$1.

Music

Lobby 7 Events* - The Mordor String Quartet. Wed, Feb 6, 12n.

Music Library Concert* - South Street Wind Octet. Peggy Pearson & Nelson Gore, oboe; Ray Jackendoff & Joel Russell, clarinet; Susan Wadsworth & Tom Stephenson, bassoon; David & Jean Hoose, horns. Thurs, Feb 7, 5pm, free.

MIT Concert Band* - Contemporary music for wood wind ensemble, sponsored by MIT Music Section. Fri, Feb 8, 8pm, Kresge Auditorium.

Theatre and Shows

Candle in the Wind* - A dramatic reading of Alexander Solzhenitsyn's play, sponsored by the Lutheran Ministry. Thurs, Jan 31 & Fri, Feb 1, 8pm, Stu Ctr West Lge. Free.

Measure for Measure* - Shakespeare's comedy, directed by Prof Albert Gurney, humanities, will be presented by the MIT dramashop. Performances are Feb 7, 8, 9, 15 & 16, 8:30pm, Kresge Auditorium. Tickets, \$2.50. Info, x3-4720.

Dance

Yoga Classes* - Sponsored by Matrons. Beginning classes: Fri, Feb 1, 21, 7:05pm, Rm 10-340; Intermediate: Mon, Feb 4, 5:30pm, Rm 10-340.

Exhibitions

Creative Photography Gallery* - Presenting an exhibition of the works of four young Boston photographers: Dennis Barna, Tom Fiorelli, Andrew Gordon and Steve Halpern. Thru Fri, Feb 8, 1-6pm, Closed Sun.

The Diaghilev Era* - Watercolors of costumes and stage designs, organized by the International Exhibitions Foundation, Washington, DC and sponsored by the Committee on the Visual Arts. Thru Sat, Feb 16, 10am-4pm, closed Sun, Hayden Gallery.

Heroines and Coquettes* - Photographs of women performers, 1875-1925, from the Harvard Theatre Collection, sponsored by the Committee on the Visual Arts. Through Sat, Feb 16, 10am-4pm, closed Sun, Hayden Gallery.

Selected Works of William W. Wurster* - Works of the late dean of the School of Architecture and Planning from 1944-50 will be presented in a photographic exhibit Mon, Feb 4-Fri, Feb 22, by the Department of Architecture.

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

Music Library Exhibit - Persian musical instruments.

Athletics

Wednesday, January 30 - V Hockey. Nichols, 7pm, ice rink. **Indoor Track**. Colby, 6pm, Rockwell Cage. **Friday, February 5** - JV/F Basketball. St. Anselms, 6:15pm, Rockwell Cage. **V Basketball**. Coast Guard, 8:15pm, Rockwell Cage. **V Wrestling**. MIT Quadrangle Tournament, 11am & 2pm, finals Sat, 1:30pm, duPont Wrestling Rm. **Saturday, February 2** - V Fencing. Brown, 2pm, duPont Fencing Rm. **V Hockey**. Connecticut, 7pm, ice rink. **Indoor Track**. Bowdoin, 1pm, Rockwell Cage. **Monday, February 4** - V Hockey. Plymouth State, 7pm, ice rink. **Wednesday, February 6** - JV/F Squash. Phillips Academy, 3pm duPont Squash Courts. **Thursday, February 7** - Basketball. Radcliffe, 7:30pm, Rockwell Cage. **JV/F Wrestling**. Emerson, 7:30pm duPont. **Wrestling Rm. Friday, February 8** - Rifle. Boston State, 6:30pm, duPont Rifle Range.

MIT Invitational Volleyball Tournament** - Featuring best college & YMCA teams in New England. Sat, Feb 9, 9:15am-6pm, duPont Gym.

Religious Services and Activities

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

Campus Crusade for Christ/College Life* - Family time, singing, prayer, teaching from God's word. Fri, 7:30pm, Rm 37-252.

Celebration of Holy Communion* - The Revs John Crocker, Episcopal Chaplain; Peter Johnson, Boston/Cambridge Ministries; and Constance Parvey, Lutheran Chaplain. Wed, 5:05pm, Chapel. Supper following, 312 Memorial Drive.

Christian Science Organization* - Weekly meetings, including testimonies of healing. Tues, 7:15pm, Rm 8-314.

Hillel*: Services - Mon-Fri, 8am, Rm 7-102; Fri, traditional 5:30pm, K kosher Kitchen, Non-Traditional 8:30pm, Chapel; Sat, 9am, Chapel. **Classes** - many interesting classes offered, for full schedule call Hillel office, x3-2982. **Shabbos Meal** - enjoy a traditional Fri evening meal at K kosher Kitchen, must order by Tues each week. Info and to order, Herbie Levine, x8403 Dorm.

Islamic Society* - Juma prayers. Fri, 12:15pm, Kresge Rehearsal Rm B. Discussion on the Qur'anic Interpretations, Sat, 5pm, ISC Lge, 2nd fl Walker.

Protestant Worship Services* - Sun, 11am, Chapel. Sunday school for children 3 years and up during service in the Stu Ctr Mezzanine Lge.

Roman Catholic Masses* - Sun, 9:15am, 12:15pm, 5:15pm; Tues, 5:05pm; Thurs, 5:05pm; Fri, 12:15pm. Chapel.

United Christian Fellowship* - Meet for dinner Thurs, 5pm, Walker; singing, sharing, praying meeting, 6pm, Rm 6-321.

Westgate Bible Study* - Covering the gospel of Mark. Wed, 8pm, Westgate apt 1202. Info, 494-8778.

Announcements

Student Library Jobs - Sign up for waiting list Mon, Feb 4, 9am, Stu Ctr Library. Positions will be given out 8:30pm, Bldg 13 Lobby, in waiting list order.

Graduate Student Council - Graduate students are invited to attend a discussion of the purposes of the GSC. Fri, Feb 8, 4-8pm, Rm 10-105. Refreshments.

MIT Opera Workshop - Directed by John Cook, is recruiting for the upcoming production of "Orpheus and Euridice," an Italian opera composed by Christopher W. Gluck. The Workshop needs a large chorus, dancers, production crew, costume designers. If interested, call John Cook, x3-6961, or leave message at x3-3210.

BSU Tutorial Program - Black Student Union offers a full program of assistance to minority undergraduates for second semester. Teaching assistants available Mon-Thurs, 7:30-10:30pm, Rm 4-145, 146, 148 & 149 by appointment. Info, Karen Scott, x0351 Dorm.

Placement Interviews

The following companies will be interviewing Tues, Feb 5-Fri Feb 8. Those interested may sign up in the Career Planning and Placement Office, Mon-Fri, 9am-4pm, E19-455, x3-4733.

Tuesday, February 5 - HRB Singer, Inc.

Wednesday, February 6 - Electronic Data Systems Corp; General Cable Corp; Rockwell International.

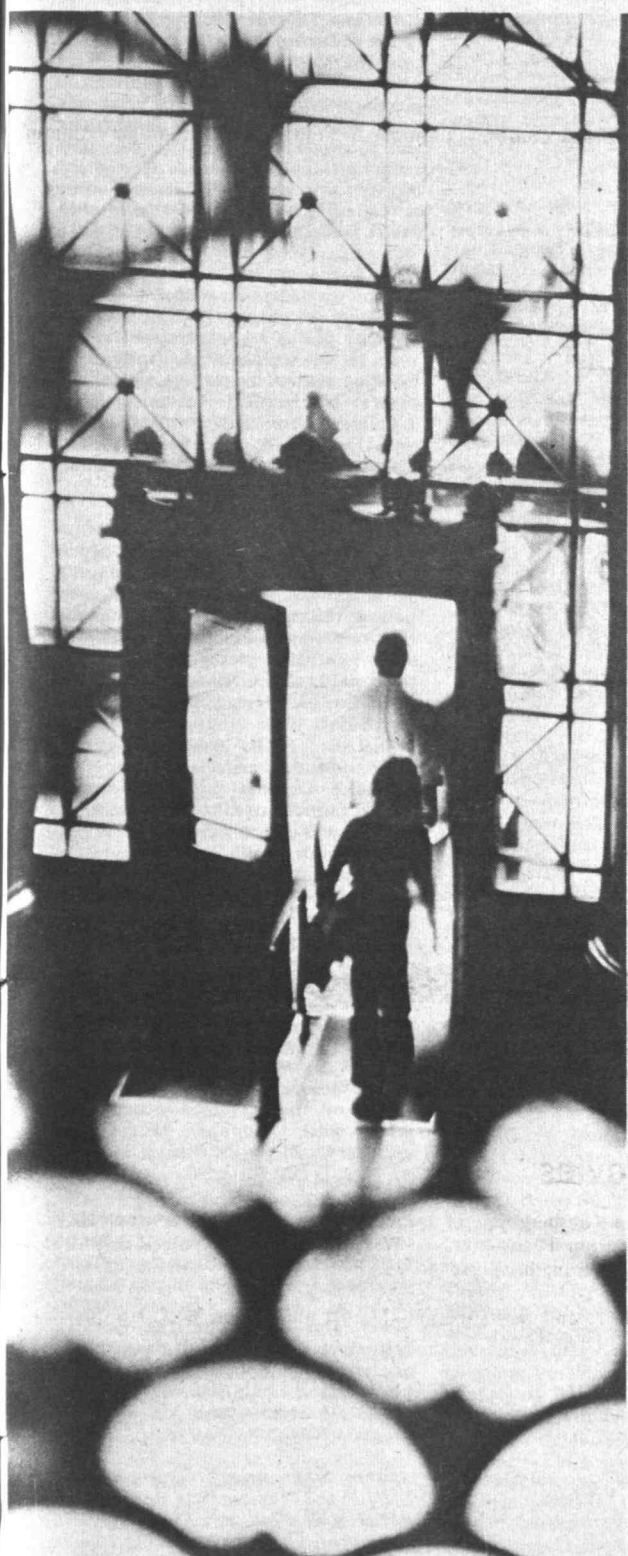
Thursday, February 7 - Rockwell International; U.S. Army Materiel Command; Boise Cascade Corp; Intermetrics, Inc; Limbach Co; St. Regis Paper Co; University of Southern California, Department of Electrical Engineering; Northeast Electronics Corp; The Warner & Swasey Co; Addressograph Multigraph Corp; Research & Development; The Aerospace Corp; Northern Research & Engineering Corp; Westinghouse Electric Corp.

Friday, February 8 - Rockwell International; Addressograph Multigraph Corp, Research & Development; The Aerospace Corp; Northern Research & Engineering Corp; Westinghouse Electric Corp; Burroughs Corp; General Dynamics; Olin Corp; Schulumberger Well Services; Polaroid Corp.

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

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

Send notices for February 6 through February 15 to the Calendar Editor, Room 5-111, Ext. 3-3279, before noon Friday, February 1.



SUNLIGHT through the window grillwork in the lobby of the William Barton Rogers Building (Bldg. 7), creating unusual light patterns on the floor.

-Photo by Margo Foote

Foreign Students Offered Series on Nation Building

A seminar series titled "Foreign Students and Participation in International Development" will be continued during the spring semester at MIT.

Arvin Khilnani, an organizer, said two dozen students are involved—most from Africa and Asia, but a number are European and American students. Khilnani, a Pakistani and a 1973 electrical engineering MIT graduate, will begin graduate study at the Sloan

Escher Prints

(Continued from page 1)

years of the artist's career and exhibit many of the techniques he employed—including lithographs, mezzotints, wood engraving, and woodcuts printed from multiple blocks. One lithograph in the group, entitled "Gravity," was colored by hand.

Each of the titled, framed prints has been classified by Escher according to the problem, observation or concept, it deals with:

"Hand With Reflecting Globe"—Lithograph, 1935. Sphere reflections.

"Sun and Moon"—Colored woodcut, 1948. Function of figures as background.

"Rippled Surface"—Lino-cut, 1950. Mirror images.

"Mosaic I"—Mezzotint, 1951. Irregular filling of plane surfaces.

"Gravity"—Lithograph, 1952. Inversion of shape of polyhedrons.

"Swans"—Wood engraving, 1956. Regular division of a plane.

"Sphere Spirals"—Woodcut, 1958. Spatial rings and spirals.

"Ascending and Descending"—Lithograph, 1960. Impossible buildings.

"Waterfall"—Lithograph, 1961. Impossible buildings.

"Square Limit"—Woodcut, 1964. Representation of infinity of number.

Escher, who died in 1972, had observed that "I ended up in the domain of mathematics" and that, although he had no training in science, he seemed to have "more in common with mathematicians than with my fellow artists."

"Escher represented a focal point of the common interests of science and art—a focus of the search for truth and order—and the gift to MIT is significant for that reason," commented Dr. Arthur L. Loeb, a leading authority on Escher.

Dr. Loeb, who was a friend of the artist, is Lecturer on Visual and Environmental Studies at the Carpenter Center, Harvard University. From 1949 to 1956 he was a member of the MIT staff and a member of the faculty of the MIT Department of Electrical Engineering from 1956 to 1963. He is author of the book, *Color and Symmetry*, which includes an analysis of Escher's work.

School of Management in September.

The series is for foreign students contemplating return home after several years in the US. It was felt, Mr. Khilnani said, that such students need a forum to explore issues not dealt with in conventional curricula.

The theoretical aspects of the seminar fall into three broad categories—definitions of development, means of achieving development, and social implications of technological development.

The case study approach will be used in the spring term in discussing problems such as population growth, urbanization and migration, and use of agricultural by-products in village development.

Faculty members involved are Professor Nathan H. Cook of the mechanical engineering department, and Dr. Merton J. Kahne, professor of social psychiatry and psychiatrist in chief at MIT.

Grad Student Aid Subject of Meeting

Tuition funding opportunities available to MIT graduate students—including research assistance, teaching fellowships, stipends and scholarships—will be discussed at an open meeting sponsored by the MIT Graduate Student Council at 10am. Thursday (Jan. 31) in the Sala de Puerto Rico.

Participants from the Graduate School will include Dr. Irwin W. Sizer, Dean; Ronald S. Stone, executive officer and assistant dean; and Jean E. Richard, assistant dean; as well as Clarence Williams, Special Assistant to the President and Chancellor for Minority Affairs (formerly assistant dean of the Graduate School).

Rabinovitz Elected

Dr. Francine F. Rabinovitz, associate professor in the political science and urban studies departments at MIT, has been elected a council member by the American Political Science Assn.

Top Artists Due for 'Arts and University'

(Continued from page 1)

Gardner, acting director of the Carpenter Center for Visual and Environmental Studies, Harvard University, will chair a work-forum 10am-12:30pm Feb. 7. Both work-forums will be in the West Lounge of the Student Center.

An introduction to the symposium from 2-4:30pm Feb. 7 in Kresge Auditorium will be given by Roy Lamson, special assistant to the president for the arts at MIT. Participants in the Feb. 7 symposium will include Mr. Fuller, Mr. Motherwell, Professor Kepes

Questionnaire Covers Work

Response has been heavy to a questionnaire distributed last week to some 1,500 bi-weekly and exempt employees seeking opinions on salary and employment related policies at MIT.

By Monday, more than 150 employees had returned questionnaires to Susan Baram, a coordinator of the ad hoc committee which prepared the questions. Ms. Baram said respondents so far have shown strongest reactions on questions regarding salary, promotion and vacation. She said that 20% of the respondents so far have been men.

The questionnaire was devised over the last several months by a group calling itself Employees for Improved Conditions at MIT. Members of the MIT Personnel office and the Special Assistant to the President and Chancellor for Women and Work were aware of the questionnaire but were not involved in its preparation or distribution.

Persons who have not received forms may obtain them in Room 1-138.

Ms. Baram said the group plans to tabulate responses and report them at an open meeting to be held Wednesday, Feb. 20, at a place to be announced. The meeting will be focused on perhaps half a dozen questions the respondents felt most strongly about, she said, but will be open to discussion on any issue.

Following the meeting, Ms. Baram said, task forces may be formed to work on specific issues.

Designer on Jury

Muriel Cooper, media/design/production director of the MIT Press, served as a member of the five-person jury which selected books for the 50 Books of the Year Show of the American Institute of Graphic Arts.

Smith Heads Study

Professor Ross H. Smith, director of athletics, was recently elected chairman of the special energy committee of the National Collegiate Athletic Association investigating ways to conserve energy at member institutions.

PR Helpers Sought

Marty Davidoff, publicity director for the 1974 student-run Open House, is seeking volunteers to help him. Specifically he is looking for students with experience in photography, silk screening, journalism, and related skills. Those interested may call the Open House office, Ext. 3-5430, or leave a message for Davidoff at Ext. 3-1461.

Medical Service Adds Two to Staff

Dr. Louise A. Dierker and Dr. Ching-piao Chien were recently named to MIT's Medical Department psychiatric service staff.

Dr. Dierker, of Belmont, a graduate of Earlham College in Indiana, received an MD degree at Ohio State University College of Medicine in Columbus and a Master of Public Health degree from the Harvard School of Public Health. She is a clinical assistant in Psychiatry at the Massachusetts General Hospital and a candidate in training at the Boston Psychoanalytic Institute.

Dr. Chien, of Westwood, a graduate of the College of Medicine of the National Taiwan University, is director of Clinical Research as well as Community Residential Treatment Service at the Boston State Hospital and associate professor of psychiatry at the Tufts Medical School.

Professors Awarded Gas Studies Grant

Dr. Robert C. Reid and Dr. Kenneth A. Smith, MIT professors of chemical engineering, have received grants from the American Gas Association to support studies related to basic research on natural gas.

They were awarded \$19,000 for their program "Feasibility and Application of Liquefied Natural Gas (LNG) Gels." Dr. Smith also received an additional grant of \$20,000 for his program, "Coupled Turbulent Transport as Related to LNG tank roll-over." The grant was announced by Boston Gas Company.

HSSP Seeks Teachers

The MIT Educational Studies Program is recruiting teachers for the spring term of the High School Studies Program, the popular Saturday school at MIT for area high school students.

Chief criterion for becoming a teacher in the program is having a subject you want to teach, according to Brian E. Jaski, a junior in electrical engineering from Downers Grove Ill., who is director of HSSP.

There are normally 60 or more course offerings, he said, ranging from standard subjects such as programming, calculus and astronomy to theatrecraft, journalism and politics. Courses run for ten weeks.

Registration for the spring term will be held Saturday, Feb. 23; classes begin Saturday, Mar. 4. Teacher applications are due Saturday, Feb. 9. A pre-registration teacher's meeting is scheduled for Thursday, Feb. 21. For further information, call the Educational Studies Program, Ext. 3-4882.

Savings Bond Interest Raised

Interest on US Savings Bonds has been raised from 5½ to 6 percent on series E and H bonds held to maturity.

The increase, announced last month, applies to all bonds and outstanding Freedom Shares and took effect Dec. 1, 1973.

The new rate automatically applies to outstanding bonds. Series E bonds will mature in five years rather than the previous five years and 10 months. Series H bonds, which pay interest twice a year by check, will pay a higher interest until maturity. Freedom shares will receive the ½ percent increase upon redemption.

The MIT Payroll Office will accept authorizations for payroll deductions for Savings Bonds at any time. Campus contact is Edward Matheson, x3-3346; at Lincoln Laboratory, Thomas Saxon, x665.

MIT Press to Issue Critical AEC Study

MIT Press will publish soon a study by a political scientist and a nuclear engineer who contend that public hearings on nuclear plant licensing are "charades" that give the appearance but not the reality of citizen participation.

Dr. Steven Ebbin, a political scientist, and Dr. Raphael Kasper, a nuclear engineer, both at George Washington University, examined records of AEC hearings in Michigan and Vermont to arrive at their conclusions. The study, sponsored by the National Science Foundation, will be available in February.

Alumni Move

(Continued from page 1) and development of MIT."

When furnishings are complete, the offices will be a mini-museum of articles important in the history of alumni—mostly culled from MIT Historical Collections. Among many items will be: a portrait of the late Professor Robert H. Richards, founder of the Alumni Association; the Thomas Stephens portrait of Dr. James R. Killian, Jr., Honorary Chairman of the MIT Corporation; an original architect's rendering of the main campus by Welles Bosworth, '89; the desk of MIT founder William Barton Rogers and the bust of Dr. Rogers from Dr. Killian's office; and Chinese Chippendale side chairs and china cabinet from the childhood home of President Emeritus Julius Adams Stratton in Seattle, Wash.

Positions Available

(Continued from page 7)

Laboratory Assistant - Part-time in Biology will do lab work in plant tissue culture; take care of a small greenhouse; prepare media and transfer culture. Knowledge of sterile technique is required. Daily watering, fertilizing and potting require availability on weekends. 5-10 hour work week. 74-84-A (1/30).

2nd Class Engineer must have a Mass second class Engineer's license or higher. Individual must be willing to work on any shift. 73-182-R (11/24).

Technician B in the Environmental Medical Service will perform general radiation protection technician duties at the MIT reactor. Repair and calibrate instruments; conduct radiation surveys and sample preparation, decontamination and lab clean-up. Package radioactive waste and assist in construction of shields. Training and experience in electronics and radiation protection required. Afternoon shift. 40 hour work week. 73-1227-A (12/15).

1974 IAP Spirit Is Rated Best Ever

(Continued from page 1)

activities offered by the Department of Athletics.

Some students used IAP to take intensive versions of regular MIT subjects. Thirteen—more than the instructor expected—completed Statistical Mechanics and Thermodynamics, which met daily for three hours and had daily homework assignments.

Idioms and Nuances

In addition, many students used IAP for truly independent work, often arising out of previous course work. These students are difficult to count because their activities are part of regular university functions and are not reported in IAP statistics.

and Brian O'Doherty, director of the visual arts program of the National Endowment for the Arts, Washington, D.C.

Nearly a dozen active artists and art educators will participate in the work-forums. They include Jonathan Benthall, associate director of the Institute of Contemporary Art, London, England; Harold Cohen, professor of visual arts at the University of California, San Diego; Douglas Davis, art editor of Newsweek and Fellow at CAVS; Piotr Kowalski, artist and former student of Professor

Kepes; Rockne Krebs, a sculptor working with laser light;

Also, Professor Donlyn Lyndon, head of the MIT Department of Architecture; Professor Lamson; filmmaker Richard Leacock, professor of cinema at MIT; Ott Piene, artist and visiting professor of visual design, MIT; Robert O Preusser, MIT professor of visual design; Friedrich St. Florian, artist, architect and CAVS Fellow; and Judith Wechsler, assistant professor of the history of art at MIT.

Most sponsors or instructors said they had at least as many students as they anticipated, and many had more. Several courses offered in previous years were even more successful this year. Building an aluminum bicycle frame drew 20 participants last year and 40 this year, for example.

One instructor led a class of foreign students in understanding idioms and nuances of English in movies and television. During IAP they watched a series of movies, including commercials, discussed phrases they didn't understand, then watched the movies again with improved comprehension.

Last Tango

The increasing interest of MIT