

Serendipitous Study In Biodegradation

'Alvin' and the Sandwich

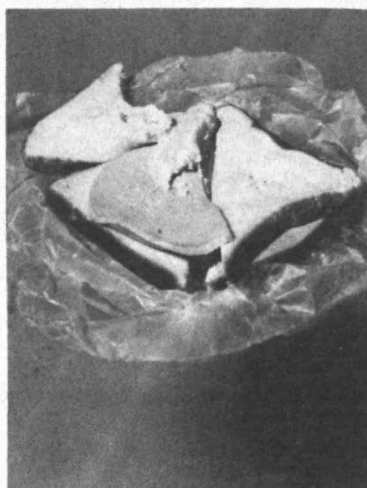
This article, written by H. W. Jannasch, senior scientist, and C. O. Wirsén, research associate at the Woods Hole Oceanographic Institution, originally appeared in the December 1972 issue of *Oceanus*, and is reprinted here with permission.

At her accidental sinking in October 1968, the research submarine 'Alvin' managed to set up a splendid experiment. When she went down in 1500 meters of water,

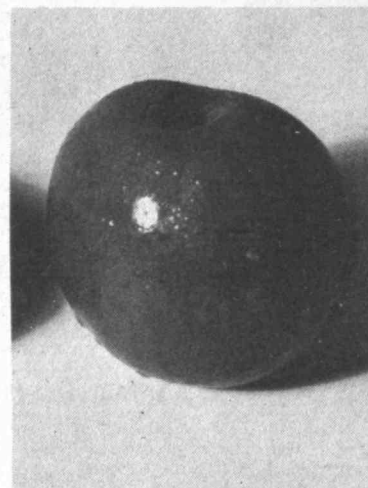
she took with her a collection of organic materials that could not have been selected with more ingenuity for a study on biodegradation in the deep-sea. There were carbohydrates in the form of starch and sugars, proteins in solid and liquid form, lipids and even packages of intact plant cells representing live membrane structures—in short: a box lunch containing bread with mayonnaise and ham, bouillon and fresh apples.

'Alvin' broke surface again in September 1969 after resting almost one year on the ocean floor. In the excitement over her successful recovery, the oceanographers almost overlooked the striking outcome of 'Alvin' degradation experiment: the food in the box lunch was practically untouched by decay, although containing the usual amount of bacteria.

The broth, although being the
(Continued on page 6)



Inside the baloney was still pink, the sandwich looked unspoiled.



Apple appeared pickled but had not lost consistency, fragrance.
—Photos by H. W. Jannasch



Conductor David Epstein rehearses the MIT Symphony Orchestra in preparation for a 10-day cross-country tour starting March 23 in Philadelphia. The 90-plus-member orchestra will play in concert

halls in Dallas (March 24), San Francisco (March 26), Los Angeles (March 30), and conclude the tour in Chicago (April 1).

—Photo by Marc PoKempner

CITY APPROVES

Students Map Taxi Plan to Aid Elderly

Getting around Cambridge is going to be easier for thousands of elderly people, thanks to the efforts of four MIT students.

The City Council Monday approved an amendment to city ordinances to permit taxis to charge flat fees to senior citizens. The idea is a variation on the dial-a-ride plan and was devised by four graduate students: Rebecca Livengood from Westfield, N.J. (Urban Studies and Planning), Martin Flusberg from the Bronx (Civil Engineering), Lee Jacobson from Philadelphia (Architecture) and Barry Sherman from Sharon (Civil Engineering).

The plan was developed in close collaboration with representatives of the Cambridge senior citizens and the taxi companies serving the city.

Under the plan an elderly person wanting to make a trip in Cambridge would call a special dispatcher a day in advance. The dispatcher would group the passenger with others with destinations in the same area.

The students have divided Cambridge into six zones arranged in such a way that no ride crosses

more than three. A ride within one zone would cost 75 cents and additional zones would cost 20 cents each. The maximum fare would be \$1.35 (or \$1.50 if a proposed rate increase is approved).

The new service, to be available during off-peak hours (9am-3:30pm and 6-8pm daily) and all day Saturdays, is scheduled to be-

gin operation experimentally in April.

If the service proves popular during the six-month experimental phase, the taxi companies will continue on a self-sustaining basis.

The plan evolved as an adjunct to MIT's Housing Program in
(Continued on page 6)

Chemistry Student Injured In Laboratory Explosion

Flora Chow, a senior in chemistry, was reported in excellent condition Monday at Massachusetts General Hospital where she is being treated for burns and lacerations sustained in a laboratory explosion Sunday at MIT.

Miss Chow, 21, from Randallstown, Md., was alone in Room 18-125 conducting a chemical experiment when the explosion occurred. Joseph McDermott, a graduate student working in a lab nearby, heard the blast and Miss Chow's scream and rushed to her

aid.

The explosion set fire to Miss Chow's hair. McDermott immediately extinguished the flames and summoned the Campus Patrol. The Campus Patrol arrived in seconds and took Miss Chow to the hospital.

Miss Chow sustained second degree burns on her face, one small third degree burn on her neck, and many small lacerations on her neck and arms caused by flying glass. She was wearing safety glasses which prevented injury to her eyes.

BUDGET REPORT

'72 'Operating Gap' Lowest in 4 Years

MIT will end the 1972-1973 fiscal year with an "operating gap" of approximately \$2.4 million, according to Chancellor Paul E. Gray.

In remarks to the faculty, Dr. Gray said that the figure was the lowest in four years and was at a level that would not require the use for operating purposes of any of the Institute's unrestricted gifts, grants, and bequests for the year.

The operating gap is defined as being the excess of expenses over revenues, which must be met by unrestricted funds. The \$75 million Educational and General Operating Budget covers all of MIT except for the direct expenses and offsetting direct revenues for sponsored research.

The initial budget for the current year, assembled last spring, anticipated a gap of \$3.2 million. That figure now stands at \$2.7 million and is forecast to be \$2.4 million at the end of the fiscal year in June.

Dr. Gray attributed the changes to three major causes: no decline in enrollment, careful stewardship of resources by operating managers, and significant budget reductions in all operating expense areas.

However, he cautioned "Budget reduction efforts are near the bottom of the barrel in the mode of incremental reductions. Continued cutting will require selective elimination of activities and services."

On the other hand, Dr. Gray reported that the operating gap is likely to increase to about \$6 million in the 1973-1974 year as a consequence of the divestment of the Draper Laboratory, now expected on July 1, 1973. The impact of the divestment could range in the first year from as little as \$2.1 million to as much as \$3.6 million. The estimate of \$6 million for the operating gap includes a \$2.7 million figure as the first year impact of the revenue loss associated with the divestment.

In succeeding years the continuing impact of the divestment will be about \$1.4 million per year, according to Gray.

The operating gaps are met with funds derived from patent income, use of facilities allowances and unrestricted gifts, grants and bequests.

(Continued on page 8)

Man-Powered Craft Ready For Roll-Out

A man-powered airplane designed and built by MIT students will be displayed March 3 at roll-out ceremonies at L. G. Hanscom Field in Bedford.

Construction has been completed on the biplane, which resembles an early Wright brothers' craft, and the roll-out will signal the beginning of tests, which, if all goes well, will culminate in an attempt to achieve flight and compete for a \$25,000 prize for the first successful man-powered flying machine.

The Saturday noon roll-out will be at a hanger at the Bedford Flight Facility of the Charles Stark Draper Laboratory, where the plane was built.

Traditional roll-out ceremonies for major new aircraft are usually lavish affairs, replete with rich food, music, drink and dignitaries, but the six-student MIT team plans a comparatively modest event—with no refreshments, but hopefully the press.

On deck for the roll-out will be the student team, led by Robert M. Peterson, 22, of El Segundo, Calif., and Paul L. Hooper, Jr., 22, of Danvers; Charles S. Draper, president of the laboratory; Rene Miller, head of the Department of Aeronautics and Astronautics and project coordinator; Eugene E. Covert and James W. Mar, professors of aeronautics and astronautics and faculty advisors; and Steven Garboski, of Whitehouse Station, N.J., a pilot and bicycle racer who is a principal sponsor of the project.

Representatives of supporting firms are also expected to attend. They include the Schwinn Bicycle
(Continued on page 6)



Women faculty and students interested in the engineering profession gathered at a tea last week to discuss ways of encouraging women to enter the field as well as the atmosphere for women students in the

School of Engineering. Left to right are Sherry Grobstein, a junior in electrical engineering, Professor Heather N. Lechtman of humanities, and Professor Sheila E. Widnall of aeronautics.

MECHANICAL ENGINEERING

Gregor Named Administrative Officer

Carl A. Gregor has been appointed administrative officer of the Department of Mechanical Engineering, Professor Ascher H. Shapiro, head of the department, has announced.

Mr. Gregor succeeds Charles E. Barringer who recently became assistant dean of the School of Engineering. Mr. Gregor has been with the mechanical engineering department since 1971, first as an administrative assistant and later as assistant administrative officer.

"In his new position, Mr. Gregor will be responsible for the development and administration of

the department's budget, for space management and for supporting the faculty with respect to the financial aspects of its broad sponsored research program," Professor Shapiro said.

A graduate of Bentley College in Waltham, Mr. Gregor majored in controllership. He first came to MIT in 1959 after having served in the Air Force. Working in the Research Laboratory of Electronics, he learned the administrative structure of a research laboratory from the ground up. He remained at RLE until 1967 except for 1961-62 when he returned to active duty with the Air Force.

In 1967 Mr. Gregor joined the Division of Sponsored Research as an administrative assistant in the Property Office which is responsible for all government and MIT equipment. He was responsible for data conversion from manual to computer systems.

Leaving the Property Office in 1969, Mr. Gregor spent a short time in the DSR Procurement Office. In 1970 he became administrative assistant to the DSR fiscal officer and was responsible for reporting MIT's grant expenditures monthly to the Department of Health, Education and Welfare. Mr. Gregor resides in Boston.

Blood Drive Kicks Off March 5

The Red Cross Bloodmobile will arrive on campus for the Institute's 10-day Spring Blood Drive on Monday, March 5, in an attempt to collect 2,500 pints of needed blood.

According to economist Sylvia Porter, more than 6.5 million pints of blood are needed in the US each year, but of the 110 million possible donors only 3 million supply the nation's blood needs.

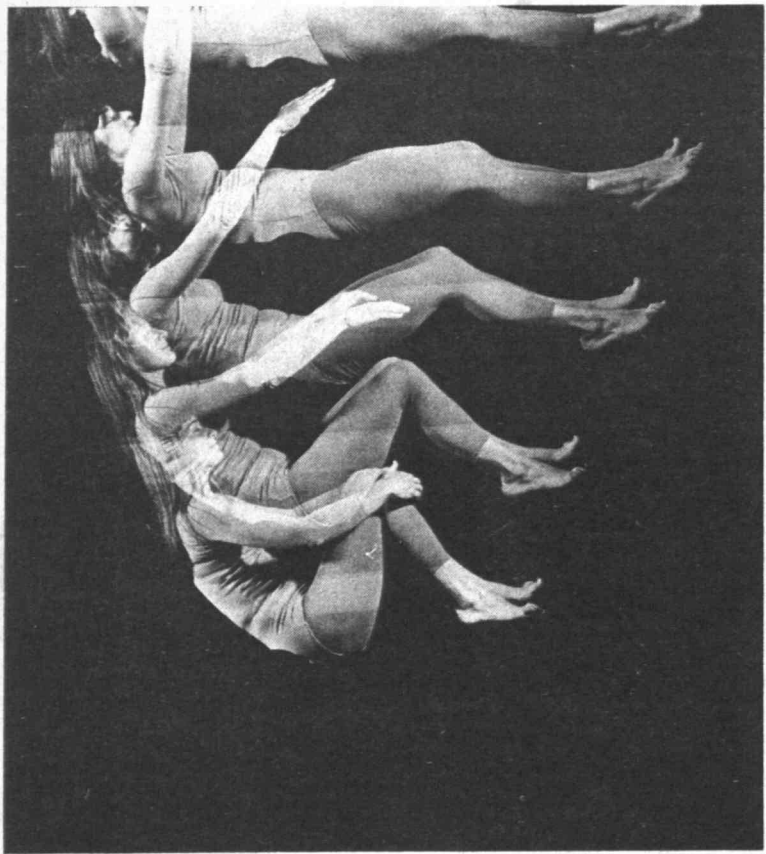
Why don't people donate blood? The Red Cross lists some excuses and some facts:

"They'll take too much and I'll feel weak." The average adult has about 10 to 12 pints of blood and new blood is always being manufactured. The less than a pint given during a donation is replaced within a few hours.

"My blood isn't the right type." Everyone's blood is the right type, and even the rare types—O-negative, A-negative, B-negative and AB-negative—are in constant demand.

"I'm too young" or "I'm too thin." Anyone between the ages of 18 and 65 may donate. And 110 pounds is the minimum weight requirement. Those who have doubts may check with their physicians, and the Red Cross nurses review each donor's history.

A lot of people think about giving blood but finally say "I'm too scared." Most people are apprehensive before their first donation, but it's usually because they don't know what to expect. Talk to a veteran donor or go with a friend.



—Photo by Charles Miller

Maggie Coming to Lobby 7

Maggie Lettvin—"The Beautiful Machine"—and a group of her exercise class students will demonstrate body development and shaping exercises in the lobby of Building 7 at 1pm on Thursday, March 1.

The class, now offered as a two-credit course, is held daily in du Pont Athletic Center, Mondays, Wednesdays and Fridays from 12 to 1 and Tuesdays and Thursdays from 1 to 2.

Maggie, wife of Professor Jerome Y. Lettvin, has been teaching the course for almost eight years. She is author of *The*

Beautiful Machine, published by Knopf in May 1972, and appears in a Channel 2 series of the same name.

Maggie is planning another exercise class for persons who can't work her MIT class into their schedules. Classes will be held Monday through Friday from 7pm to 8pm in Harvard Square, exact location still undesignated, and anyone 65 or older will receive free instruction. A small fee will be charged for others. Prospective class members contact Maggie at 8 Blanchard Road, Cambridge, or call 354-5528 between 5 and 6pm.

Meeting to Focus On Lung Devices

A symposium to stimulate interdisciplinary research on pulmonary assist devices for acute lung disease will be held March 5 at MIT.

Sponsored by the Harvard-MIT Program in Health Sciences and Technology, the symposium will be centered on the topic, "Clinical Pulmonary Assist Devices—Membrane Lung Gas Exchange in Acute Pulmonary Failure."

Membrane lungs are devices that allow gas diffusion directly between the blood and a gas phase, with minimal destruction of cellular and protein elements of the blood.

Several "sandwich" type gas exchangers that have recently become available commercially provide partial and total perfusion of the blood outside the patient's body. Medical centers across the country have used the devices with encouraging results, but problems associated with the required use of anticoagulants place limits on the clinical applications of the gas exchangers.

The afternoon meeting in the penthouse of the Faculty Club will begin at 1:15. Welcoming remarks will be made by Professor Robert W. Mann, of mechanical engineering and Principal Investigator

in the Biomaterials Research Program. Moderator and a speaker will be Dr. Warren M. Zapol, M.D., of Harvard Medical School and the department of anaesthesia, Massachusetts General Hospital.

Other speakers will be Henning Pontoppidan, M.D., also of Harvard Medical School and the department of anaesthesia, MGH; Clark K. Colton, Ph.D., of the MIT department of chemical engineering; and Philip A. Drinker, Ph.D., of Harvard Medical School, the department of surgery (bio-engineering) of Peter Bent Brigham Hospital, and the MIT mechanical engineering department.

The working meeting will be a state-of-the-art review in membrane oxygenation and acute pulmonary disease and will explore areas for future collaborative research, according to Irving Berstein, Ph.D., research and development officer of the health sciences program. He said the program welcomes inquiries from persons who wish to learn about the field and explore participation in interdisciplinary research among engineers, physicians, and scientists.

Information on registration may be obtained from Dr. Berstein in Room 26-142., Ext. 3-1553.

New England Engineering Award Goes to Forrester

Professor Jay W. Forrester is the 31st recipient of the Engineering Societies of New England award presented to him February 22 at the Engineer's Week luncheon at the Sheraton Boston Hotel.

The award recognizes "A living engineer, resident of New England, who, by outstanding achievement merits recognition of his accomplished works as well as his character, by his fellow engineers of the New England states."

Professor Forrester presently holds the Germeshausen Professorship, a revolving chair established in 1968 to support MIT's interests in combining humanitarian advances with technological progress.

Professor Forrester's current research is focused on the development of a national economic model. He also supervises a continuation of on-going research in industrial dynamics, urban dynamics and world dynamics.

Before becoming Professor of Management in 1956, Dr. Forrester was one of the nation's leading engineers in the design and application of large-scale digital computers and he holds the basic patent on "random-access, coincident-current magnetic storage" which is now the standard "memory" device for digital computers. He has written many widely known papers in engineering and management and has become a social philosopher whose writings have achieved worldwide recognition.

Harpsichordist To Play Bach

Harpsichordist Joseph Payne will present a free concert of works by J.S. Bach in Kresge Auditorium on Monday, March 12, at 8pm.

Sponsored by the MIT music faculty, the concert will consist of six preludes and fugues from Book II of Bach's *Well-Tempered Clavier* and *The Goldberg Variations*.

'Work' Report In Book Form

Work in America, the recently released report from the US Department of Health Education and Welfare, has been published in book form by the MIT Press.

The report, product of a year-long study by a special task force, has received national attention. It is a comprehensive summary that examines work in the United States as a central feature of the lives of individuals and in society.

TECH TALK

Volume 17, Number 33
February 28, 1973

Editor

Joanne Miller

Staff

Ellen Burbank
Robert M. Byers
Sally Hamilton
Linda Omohundro
Peter Spackman
William T. Struble

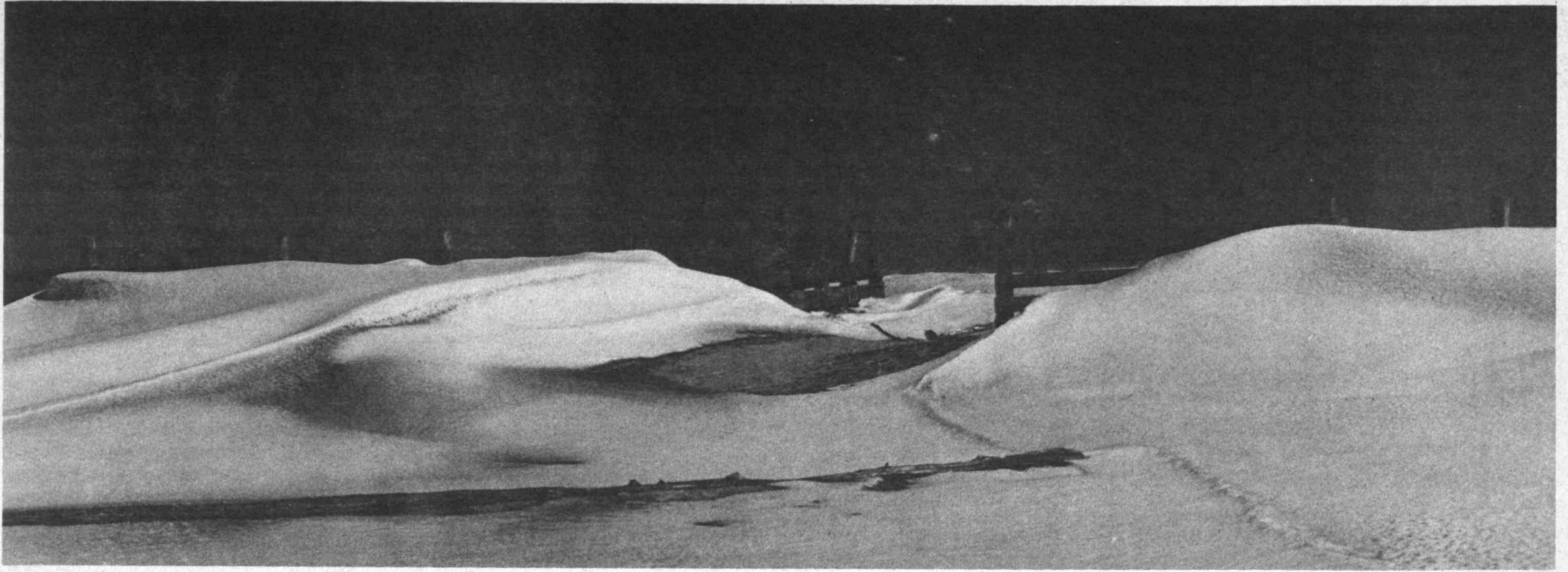
Business Manager

Paul E. Johnson

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

Mail subscriptions are \$5 per year. Checks should be made payable to MIT, and mailed to the Business Manager, Room 5-122, MIT, Cambridge, Mass. 02139.

Please address all news and comment to the editorial office, Room 5-111, Ext. 3-3277.



"Snowscape, Crane's Beach" by Gregory Smith.

New Patent Policy Ups Inventor Share

A significant change in the Institute's patent policy was announced to the MIT faculty at its meeting last Wednesday.

Dr. Albert G. Hill, Vice President for Research and Chairman of the Committee on Inventions and Copyrights, told the meeting that, effective July 1, 1973, the Institute will increase the inventor's share of the patent royalties earned from the licensing of MIT inventions.

Under the new policy, an MIT inventor will normally receive 35 percent of the first \$50,000 of gross royalties, 25 percent of the next \$50,000 and 15 percent of all gross royalties earned thereafter. At the present time, the inventor's share of gross royalties is a flat 12 percent.

Increased royalty sharing with inventors is only one of several major changes in the Institute's patent policy and operations during the past two years, Dr. Hill

said. During that period the DSR Patent Section staff has been reduced 80 percent and prosecution of patent applications shifted primarily to outside patent law firms.

The Office of Patent Administration, which is responsible for the licensing of MIT inventions, is now part of DSR and, in conjunction with the Patent Section, reports to the DSR General Counsel. These organizational changes are designed to speed up response time, provide greater professional expertise, and ensure that patent prosecution and licensing activities are closely integrated.

Since the reorganization there has been a marked increase in the number of patent applications filed and patent licenses negotiated, Dr. Hill said. He expressed hope that the new policy change would provide a further incentive for participation in the patent process.

Sorenson to Aid in Operations Planning

Richard A. Sorenson, associate dean for student affairs, will become executive assistant to the vice president for operations, Philip A. Stoddard, effective March 1.

In his new role, Mr. Sorenson will have executive responsibility in operations planning and coordination particularly with respect to future development of student facilities and services.

"Mr. Sorenson brings broad experience in student and community needs as well as a familiarity with many of the operational aspects of the Institute," Mr. Stoddard said in announcing the

appointment.

Mr. Sorenson will replace Laurence H. Bishoff who became assistant director for administration in the Medical Department in September.

Mr. Sorenson will provide general assistance across all areas including Physical Plant, the Safety Office, Housing and Food Services, Graphic Arts Services, Audio Visual Services and Campus Patrol. He will be involved with equal opportunity and career development programs and with budget coordination.

"I will miss my association with the Dean's Office very much," Mr.

Hayden to Show Gregory Smith Photos

Photographs by Gregory Smith, a member of the MIT Corporation and the former president of the Eastman Gelatine Corporation, will be exhibited in the Hayden Corridor Gallery from February 28 through March 15.

Under sponsorship of the Committee on the Visual Arts, the exhibit brings together some 40 black and white documentary prints. Several of the works portray Smith's native Marblehead, including photographs of ships, the sea, cemeteries and churches. Other works depict the archeological sites at Stonehenge, England, British cathedrals, and landscapes taken at Yosemite, Death Valley, Cape Cod and Maine.

"Mr. Smith's works are representative of much good photography being produced today by amateur photographers who are professional businessmen with an avocation for photography," said Minor White, professor of photography. "These men are making valuable contributions to photography."

Mr. Smith studied photography

with Ansel Adams, at the latter's summer workshop in Yosemite, and with Paul Caponigro. His works have been exhibited at the Eastman House in Rochester, N.Y., the DeCordova Museum in Lincoln, and at several galleries in the Boston area.

After receiving the S.B. and S.M. degrees in chemical engineering from MIT in 1930 and 1931, Mr. Smith joined the Eastman Kodak Company, Rochester, N.Y. In 1949, he was transferred to the Eastman Gelatine Corporation, of which he was president from 1957 to 1972. He is a past or present director of several organizations, including the Salzburg Seminar in American Studies, the Massachu-

setts Bay Fund, the Massachusetts Dental Service Corporation and the World Affairs Council. He has served on the board of trustees of the Salem Hospital and the J.B. Thomas Hospital, Peabody.

Mr. Smith has served MIT in several capacities. From 1967-68, he was president of the Alumni Association and in 1968 he was elected to the MIT Corporation and served on its first Joint Advisory Committee on Institute-wide Affairs. Since retiring from the Eastman Gelatine Corporation, he has been coordinating the off-campus medical program for the Undergraduate Research Opportunities Program, on a volunteer basis.

Fenced Lot With Guard To Secure MIT Bicycles

An enclosed, guarded bicycle parking lot for students, faculty and employees will open soon, the Institute's Committee on Parking has announced.

Located under the portico on the south side of Building 13 and facing the courtyard near the Medical Department, the bike lot will be fenced and guarded by a student attendant. Initially, the attendant will be on duty from 8am to 6pm Monday through Friday, but hours will be adjusted to meet users' needs.

After regular hours the Campus Patrol will be available to unlock the bicycle park. An extension telephone will be installed in a guard house just outside the lot.

To ensure security, a check-in / check-out system will be used. When a bike owner parks his wheels, he will receive a numbered chit, half of which will remain with the bicycle. To retrieve the bike, he must turn in the chit.

The Planning Office and Campus Patrol hope the parking lot will encourage use of bicycles and eliminate hazards created by locking bikes in stairways, hall-

ways and other public areas. The recent safety inspection by the US Department of Labor called such hazards serious safety violations.

Students interested in working as attendants in the lot should call Daniel Langdale, director of student employment, Room 5-119, Ext. 3-4973.

Questions about the operation of the bicycle park should be directed to Captain James Olivieri of Campus Patrol, Ext. 3-2998.

IAP Made Permanent

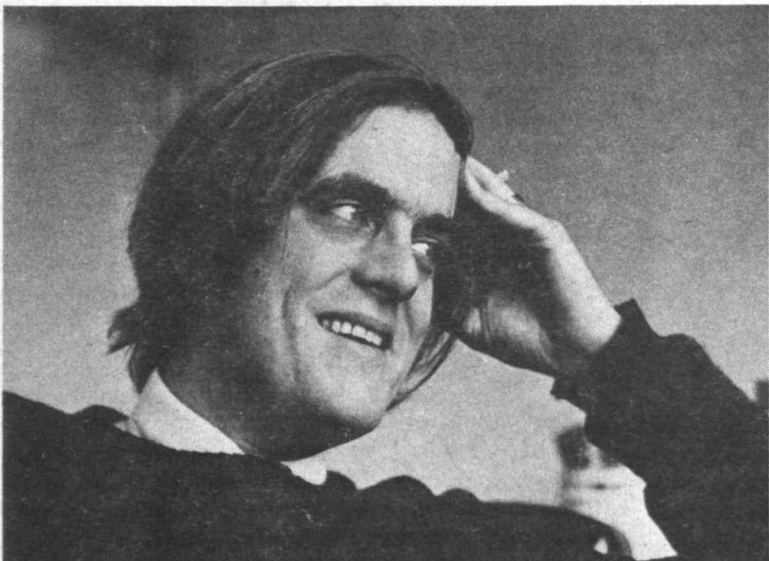
The January Independent Activities Period (IAP) has become a permanent part of the Institute's academic calendar.

The faculty voted overwhelmingly to retain IAP and to accept the recommendations of the IAP policy committee.

Two amendments to the recommendation were offered and passed. One will allow letter grades to be given for intensive IAP versions of regular-term subjects that offer letter grades. The other alters the language of the recommendation concerning faculty responsibility during IAP.

In other business, the faculty voted to receive the report of the Special Faculty Committee on MIRVS and discharge the committee and heard a report on changes in the Institute's patent policy.

At the beginning of the meeting the faculty voted to confer the following degrees: 117 doctorates, 26 engineers, 167 masters and 156 bachelors.



Mr. Sorenson

—Photo by Margo Foote

Sorenson said, "but I am also looking forward to working in a new area. I will retain contact with students through the housing and dining services, and in liaison work in student facilities development."

A native of Portland, Oregon, Mr. Sorenson received the B.S. degree in history from the University of Oregon in 1962. He was assistant to the executive vice president of the United States National Bank for more than two years and assistant dean of men at the University of Oregon for two years before coming to MIT in 1967.

Mr. Sorenson is married to the former Virginia Pomfrey. They have three children and reside in Winchester.

Annual Dinner

The MIT Employees' Federal Credit Union will hold its annual banquet on Saturday, March 24, at 7pm at the Montvale Plaza in Stoneham.

Tickets will be available beginning Friday, March 2, at \$9 per person, and will be sold on a first come, first serve basis. Each CU member will be limited to two tickets.

Credit Union Offices are located in Room E19-601 and Lincoln Laboratory A-010. On Friday, these offices will be open at 9am and 10am respectively.

Recycle Starts

The Institute's paper recycling program began on Monday, February 26. Members of the community are urged to cooperate by disposing of paper waste in special wastebaskets provided for this purpose. Questions about the recycling program should be directed to Physical Plant, Ext. 3-4757.

THE INSTITUTE CALENDAR

February 28
through
March 9

Events of Special Interest

Maggie Lettvin's Exercise Class
Will be held in Bldg 7 Lobby for all, Thurs, Mar 1, 1pm.

Seminars and Lectures

Wednesday, February 28

The Future of Radical School Reform*
Allen Graubard, Cambridge Policy Studies Institute. Education Colloquium. 12n, Rm 37-252.

Fiscal 1974 Federal and Defense Budget
Prof. William Kaufmann, political science. Political Science and Center for International Studies Seminar. 12:30pm, Rm E52-482. Bring lunch.

Reactor Pressure Vessels are Safe*
Dr. William Cooper, vice president and technical director, Teledyne Materials Research. Nuclear Engineering Seminar. 3:30pm, Rm NW12-222. Refreshments, 3pm.

Poincare Invariance and Dual Models
Dr. Pierre Ramond, Yale. Joint Theoretical Physics Seminar. 4pm, Rm 6-120. Coffee, 3:30pm.

The Environmental Area: One Man's View
Louis I. Stern, Dames and Moore. Career Seminar. 4pm, Emma Rogers Rm 10-340.

Joyful Technology and the Polis*
Prof. John O'Neill, sociology, York University. Technology and Culture "Images of Man" Series. 5:15pm, Rm 9-150. Followed by buffet dinner and discussion.

The Rise and Fall of the East European Jew
Multi-media lecture and presentation. Hillel Lecture. 7:30pm, Student Center West Lounge.

Thursday, March 1

Capital Budgeting and Financial Management in Manufacturing
Prof. M. Scholes, management. Production, Automation and Manufacturing Seminar. 4pm, Rm 37-212.

Thermodynamics as a Spin-Off from Hydro and Steam Technology
Prof. Joseph H. Keenan, mechanical engineering. Thermodynamics Seminar. 4pm, Rm 3-343. Coffee.

Tracking in an Upgraded Air Traffic Control System
Dr. Herman Vandevenne, Lincoln Lab, Decision and Control Sciences Seminar. 4pm, Rm 39-400.

Trace Metal Studies in Boston Harbor*
Dr. Thomas R. Gilbert, new England Aquarium. Analytical Chemistry Seminar. 4pm, Rm 8-105.

On the Excited and Self-Excited Flexural Non-Linear Vibrations of Rotating Shafts*
Dr. Angnieszka Muszynska, Polish Academy of Science. Interdepartmental Acoustics Seminar. 4pm, Rm 3-370. Coffee, 3:30pm, Rm 1-114.

Why Was the Ideal French Physicist ca. 1900 not Expected to Be Speculative? Social Circumstances and the Nature of Research
Dr. Spencer Weart, University of California at Berkeley. Commentators: Prof. Elting Morison, 1926 Killian Professor, and Prof. Laszlo Tisza, physics. Technology Studies Workshop. 4pm, Rm 14E-304. Coffee, 3:45pm.

Chemotaxis as a Potential Neuromodel
Dr. Daniel P. Koshland, biochemistry, University of California, Berkeley. Biology Colloquium. 4:30pm, Rm 6-120. Refreshments, 4pm, Rm 56-520.

Understanding Unequal economic Opportunity: The Role of Schooling, IQ, and Family Economic Status*
Sam Bowles, economics, Harvard. Graduate Economics Association Seminar Series. 4:30-6pm, Bldg E52 Penthouse.

Electrons in Unsolids
Laura M. Roth, Abby Mauze Rockefeller Visiting Professor of Physics. Physics Colloquium. 4:30pm, Rm 26-100. Refreshments, 4pm, Rm 26-110.

Friday, March 2

Chemical Engineering 10.992 Seminars
A. Schneider, "Flow of Pure Liquids through Microporous Vycor," 2pm; J. Dearth, "Hydraulic Effects in Cyclically Operated Tray Absorbers," 3pm. Rm 10-105.

Comparison of Absolute and Convective Instabilities in a Beam-Plasma Experiment
Dr. Milos Seidel, Stevens Institute. Plasma Dynamics Seminar. 4pm, Rm 26-214.

Strength of Polymers
Prof. Ali Argon, mechanical engineering. Mechanical engineering Seminar. 3pm, Rm 3-270. Coffee, 4pm, Rm 1-114.

Neutron Scattering and the Dynamics of the b.c.c. - Hexagonal Lattice Instability in a Zr-Nb Alloy*
Prof. S. C. Moss, physics, University of Houston. Materials Science Colloquium. 4pm, Rm 9-150. Refreshments, 3:30.

Monday, March 5

The Problem of Technical Inputs in Public Policy Issues
Prof. Eugene B. Skolnikoff, political science. Technology and Culture Seminar. 12n, Student Center, Dining Rm 3. No reservations. Lunch \$2.

Recent Emigres from Russia, Israel and Europe
Dr. Zev Katz, research associate, CIS Seminar. 12:30pm, Rm E53-482. Bring your own lunch.

Free Motion of a Sphere in a Rotating Fluid
Dr. Hans Moll, visiting scientist, civil engineering. Water Resources and Hydrodynamics Seminar. 4pm, Rm 48-316.

A Neural Model of Attention, Reinforcement and Discrimination Learning*
Prof. Stephen Grossberg, associate professor. Applied Mathematics Colloquium. 4pm, Rm 2-338. Coffee, 3:30, Rm 2-349.

Artificial Enzyme Membranes
Dr. Daniel Thomas, Universite de Roven. Health Sciences and Technology Seminar. 4pm, Rm 37-212.

Fracture in Fiber Reinforced Polymers*
Prof. F. J. McGarry. Seminars on Polymer Mechanical Behavior. 4pm, Rm 3-133.

Ultra Fast Diffusion in Metals
Prof. David Turnbull, Harvard. Physical Metallurgy Seminars. 4pm, Rm 13-2101.

Tuesday, March 6

Ship Characteristics Definition—A New Approach
Reuvan Leopold, technical director of ship concept design, Naval Ship Engineering Center. Ocean Engineering Seminar. 4pm, Rm 3-446. Coffee, 3:30.

Anti-Matter in the Universe?
Dr. Gary Steigman, Yale University. Astrophysics Colloquium. 4:15pm, Rm 37-252. Coffee 4pm.

Gas Turbines for Power and Air Transportation—A Look at the Future*
Dr. M. E. Shank, Pratt & Whitney Aircraft. Aero/Astro General Seminar. 4pm, Rm 33-206. Coffee 3:30, Rm 33-411.

Perceptual Aspects of Character Recognition, Part III
Prof. Barry Blesser, Charles Cox, Theodore Kuklinski. CIPG Seminar. 4pm, Rm 20B-224. Refreshments, 3:30pm.

The Three Dimensional Structure of Yeast Phenylalanine Transfer RNA
Dr. Alexander Rich, biology. Biology Colloquium. 4:30pm, Rm 6-120. Refreshments, 4pm, Rm 56-520.

National Offshore Mining Environmental Study*
John Padan, NOMES program director; Robert Blumberg, director Commonwealth Division of Mineral Resources and NOMES associate program director. Marine Technology Society, New England Section. 8pm, Student Center Rm 407. Free. Social hour, 7pm, \$1. For information, 542-5100 ext. 360.

Cosmic Background Radiation
Prof. Rainer Weiss. Society of Physics Students. 7:30pm, Rm 37-252.

Wednesday, March 7

A Personal Computer for Kids*
Dr. Alan C. Kay, Head, Learning Research Group, Xerox Research Center. Education Division Colloquium. 12n, Rm 9-150.

Basic Aspects of Cell to Cell Adhesion
Dr. Mirdza E. Neiders, oral pathology, University of New York, Buffalo, School of Dentistry. Oral Science Seminar. 3-5pm, Rm E18-301.

Fast Reactor Theory and Code Development
Dr. Weston Stacey, associate director Applied Physics Division, Argonne National Lab. Nuclear Engineering Seminar. 3:30pm, NW12-222. Coffee, 3pm.

A Federal Program on Building Practice for Disaster Mitigation*
Dr. Richard Wright, National Bureau of Standards. Civil Engineering Seminar. 4pm, Rm 1-353. Coffee, 3:30pm.

Thursday, March 8

Operations Control in Manufacturing
Prof. W. Hausman. Production, Automation and Manufacturing Seminar Series. 3:30pm, Rm 37-212.

Crossed Beam Correlation Technique Applied to Turbulance Measurements
Dr. Rusi Damkevala, Cambridge Collaborative. Interdepartmental Acoustics Seminar. 4pm, Rm 3-370. Coffee, 3:30, Rm 1-114.

Measuring 10⁻¹⁷ Time Intervals: A New Window on the Nucleus
Prof. George M. Temmer, Rutgers. Physics Colloquium. 4:30pm, Rm 26-100. Coffee, 4pm, Rm 26-110.

Friday, March 9

Chemical Engineering 10.992 Seminars
R. Freedman, "A Study of the Mass Transfer and Wall Shear Stress in a Model of the Human Iliac Bifurcation and their Relation to Atherogenesis," 2pm; V. Vilker, "Ultrafiltration of Biological Macromolecules," 3pm, Rm 10-105.

Jet Mixing from Biological Pores and Channels with Osmotic Boundary Conditions
Prof. Sheldon Weinbaum, mechanical engineering, The City University of New York, New York. Mechanical Engineering Seminar. 3pm, Rm 3-270. Coffee, 4pm, Rm 1-114.

Non-Linear Evolution of Parametric Instabilities
Dr. Ernest Valeo, Princeton. Plasma Dynamics Seminar, 4pm, Rm 26-214.

Transport Properties of Eu-Chalcogenides
Dr. Yaacov Shapira, National Magnet Lab. Materials Science Colloquium Seminar. 4pm, Rm 9-150.

A Class Perspective on Urban Economics
Bill Tabb, economics, Queens College. Graduate Economics Association Seminar Series. 4:30-6pm, Penthouse, Bldg E52.

Temperature-Sensitive Locomotor Mutants in Drosophila or H. Shi-ts
Dr. David Suzuki, zoology, University of British Columbia. Biology Colloquium. 4:30pm, Rm 54-100.

Community Meetings

Technology Matrons' Seminar
Prof. John Collins, management, former mayor of Boston, of "Urban Needs and National Policies." Wed, Feb 28, 11:30am, Rm 10-105.

Advisory Committee on Shareholder Responsibility, Thursday, Mar 1, 5pm, Rm 10-300.

Women's Forum
Open meeting concerned with Consciousness Raising Group. Monday, March 5, 12n, Rm 10-105.

Courses and Careers
Dean of Student Affairs, Carola Eisenberg, Robert Weatherall, Director of Placement and the Deans of the Six Schools or the representatives will discuss the how's and why's of choosing a major and/or a career. Tues, Wed, Mar 6&7, 9:30pm, Rm 9-150.

MIT Club Notes and Meetings

Bridge Club*
ACBL Duplicate Bridge. Thurs, 7pm, Student Center Rm 47. Admission: MIT community, 50 cents; others, 75 cents.

Chinese Students Club**
Mandarin class, every Tues, 7:30-9:30pm, Rm 5-231. \$5 charge. Contact Victor Zue, 273-0326.

Ergo
Staff meeting. Every Sun, 7pm, Student Center Rm 443.

Judo Club**
H. Yanagi, 5th degree black belt, chief instructor. Mon, Wed, F, 5-6:30pm; Sat, 1-3pm; duPont Exercise Rm. M. Portnoff, X3-595.

Karate Club**
Beginner and intermediate classes in Goju style. Mon and Wed, 7:30pm, duPont T-Club Lounge. For info, call X3-2018.

Kung Fu Club**
Northern Praying Mantis. Tues, Thurs, 7-9pm, duPont Athletic Center. For info, call H. C. Wong, 876-5071.

MIT Club of Boston**
Bruno Brodfeld, chief environmental engineering, Stone and Webster Engineering Corporation, will discuss "Ecology." Thurs, March 8, 12n, Aquarium Restaurant, 100 Atlantic Ave, Boston. Lunch \$3.60 at door. Reservations: Mrs. Crossley, X3-3878.

MIT/DL Duplicate Bridge Club**
Every Tues, 6pm, Student Center Rm 473.

MIT Wheelmen**
All aspects of bicycles and bicycling discussed, events planned and help given. Every Thurs, 7:30pm, Rm 1-246. Call Harv X2384 Dorm.

Rugby Club**
Practice sessions; Tues, Thurs, 8pm; Sat, 1pm; meet in duPont Gym.

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

Scuba Club
Dry session. Wed, Feb 28, 8pm. Rm 20E-017.

Student Homophile League*
Meeting and coffee hour. Every Sun, 4-6pm, Rm 14E-307. All men and women welcome. For gay help (anonymous) at MIT, contact student gay tutor, 492-7871, anytime.

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

Tae Kwon Do Club
Tues, Thurs, 5-7pm; Sat, 11am-1pm. duPont T-Club Lounge. Contact Jae Kim, dorm X9212, 9236 or 9120.

Tech Engineering News**
General staff meeting, every Sun, 5pm, Rm W20-453.

Technique
Staff meetings. Every Saturday, 11am, Student Center Rm 451.

Tech Squares*
Western style square dancing. Every Tues, 8-11pm, Sala de Puerto Rico. \$1. First time free.

Tiddlywinks Association*
Every Wed, 8pm, Student Center Rm 491.

Undergraduate Association
Meeting of Subcommittee on Grievances. Sun, Mar 4, 3pm, Rm W20-401.

Unicycle Club
Testing session for beginner, intermediate or advanced rating unicyclist. Sunday, March 4, 1pm, Walker Gym.

Social Events

Friday Afternoon Club**

Music, conversation and all the cold draft Budweiser you can drink. Every Friday, 6pm, the Thirsty Ear in Ashdown basement. Admission: men \$1, women 50 cents. Must be over 21.

Muddy Charles Pub**

Join your friends for music, beer, wine, snacks, conversation at the Muddy Charles Pub, 110 Walker. New hours: Monday-Friday, 1:30am-2pm and 4-7:30pm; Saturday, 7-12pm. Starting January 1, nightly specials will include: Mondays, all wines 25 cents; Tuesdays through Thursdays, free pretzels and chips. Call GSC, X3-2195.

CC Pot Luck Coffeehouse*

Live entertainment every Friday and Saturday, 8:30pm to 12m. Student Center Mezzanine Lounge. Free coffee, cider, doughnuts. Sponsored by Student Center Committee. Volunteers to perform or otherwise help out, call Paul Mailman, dorm X9626, or Doug Fried, dorm X8767.

Movies

Film and Lecture Series*

Architecture 4.097. Lawrence Alloway discusses "The Semiology of Pop Films." II, Wed, Feb 28, 2pm, Rm E21-010 followed by screening of "For a Few Dollars More." 7pm. Free.

Play It Again Sam**

LSC. Fri, Mar 2, 7pm and 9:30pm, Kresge. Tickets 50 cents. Must show MIT or Wellesley ID.

Nights of Cabiria*

Film Society. Fri, Mar 2, 7:30pm and 9:30pm, Bldg E21. Tickets \$1.

SCC: Midsummer Night's Dream

Student Center Committee Midnight Movie Series. Fri, Mar 2, 12m, Sala de Puerto Rico. MIT or Wellesley ID. Free.

Sometimes a Great Notion**

LSC. Sat, Mar 3, 7pm and 9:30pm, Rm 26-100, Rm 26-100. Tickets 50 cents. Must show MIT or Wellesley ID.

Island of Lost Souls*

LSC. Sun, Mar 4, 7pm, Rm 10-250. Tickets 50 cents. No ID required.

Film and Lecture Series*

Architecture 4.097. Lawrence Alloway discusses "The Semiology of Pop Films." III, Wed, Mar 7, 2pm Rm E21-010 followed by screening of "Get Carter," 7pm. Free.

Strike (Eisenstein)

Humanities 21.05 movie. Thurs, March 8, 7pm, Rm 10-250. Free.

The Bicycle Thief and Castro Street*

Film Society. Fri, Mar 9, 7:30pm and 9:30pm, Bldg E21. Tickets \$1.

You Only Live Twice**

LSC. Fri, Mar 9, 7:30pm and 9:30pm, Rm 26-100. Tickets 50 cents. Must show MIT or Wellesley ID.

SCC: Rebel Without a Cause*

Student Center Committee Midnight Movie Series. Fri, Mar 9, 12m, Sala de Puerto Rico, MIT and Wellesley ID required. Free.

Dance Free Films*

Movies (16mm), dancing, multimedia happening, audience participation. Architecture student project. Every Thurs, Fri, Sat, 7-12pm, Odd Fellows Hall, 536 Mass Ave, Cambridge. Tickets: \$1 or 75 cents w/costume. Fruit and cider.

Music

Noonhour Concert*

Ars Antiqua de Paris. Thurs, Mar 1, 12n, Chapel. Free.

Sarod Concert*

Ali Akbar-Khan, India's Sarod wizard. SANGAM. Fri, Mar 2, 8pm, Kresge. Tickets: \$3 or \$5.

Noonhour Concert*

Marian Ruhl, soprano. Thurs, Mar 8, 12n, Chapel. Free.

Glee Club

Rehearsals Works by Stravinsky, Brahms, Mozart, Schubert. Tues, Wed, Thurs 5pm, Kresge.

Theater and Shows

The Knack*

Ann Jellicoe play performed by MIT Community Players. Directed by Karen Matson. Thurs-Sat, Mar 1, 2, 3, 8pm, Little Theater. Tickets \$2. Reservations, X3-4720.

Dance

Folk Dance Club*

International, Sun, 7:30-11pm, Sala. Balkan, Tues, 7:30-11pm, Student Center Rm 491. Israeli, Thurs, 7:15-10:15pm, duPont T-Club Lounge. Afternoon dance break, Fri, 12:30-1:30pm, Bldg 7 Lobby.

Modern Dance**

Intermediate. Every Sat, 11am, McCormick Gym, Beginning Feb 24. Ten classes, \$5 registration.

Tech Squares*

Western style square dancing. Every Tues, 8-11pm, Sala de Puerto Rico. Admission \$1 (first time is free).

Exhibitions

Imaginary Architecture

Exhibition of works by Friedrich St. Florian, fellow at Center for Advanced Visual Studies. Hayden Gallery, Feb 16-March, open 10am-4pm, Mon-Sat.

Visual Design Experiments by Science and Engineering Students*

Organized by Prof. Robert Preusser. Hayden Corridor Gallery, Through Feb 27. Corridor Gallery is always open.

Photographs by Gregory Smith*

Hayden Corridor Gallery, Feb 28 through Mar 15.

Music Library Exhibit

Photographs of early instruments up to 1600. Daily, Rm 14E-109.

Hart Nautical Museum*

Exhibits include "Ocean Engineering Summer Laboratory Projects 1971 and 1972," and "Tugs and Towing." Bldg. 5, first floor.

Athletics

Freshman Basketball

Philips Andover. Wed, Feb 28, 3pm, Rockwell Cage.

Women's Basketball*

Lowell State. Thurs, Mar 1, 7:30pm, Rockwell Cage.

Women's Fencing*

URI. Fri, Mar 2, 4pm, duPont Fencing Rm.

Rifle

League Finals. Sun, Mar 10, 8am, duPont Rifle Range.

Religious Services and Activities

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

Campus Crusade for Christ/College Life*

Family time, fellowship and teachings from God's Word. Every Fri, 7-9:30pm, Rm 1-132.

Christian Bible Discussion Group*

Every Thurs, 1pm, Rm 20B-031. Call Prof. Schimmel, X3-6739, or Ralph Burgess, X3-2415.

Christian Science Organization

Every Tues, 7:15pm, Rm 8-314.

Hillel Services*

Mon-Fri, 8am, Rm 7-108; Fri, 8:15am, Chapel; Sat, 9am, Chapel.

Yiddish classes, Thursdays, 7pm-9pm, Rm 1-242; Hebrew classes, Wednesdays: Beg 6pm-7pm, intermed 5pm-6pm, Rm 1-203. For adv classes, X3-2982. Mekhila classes, Friday 11:45am, Hillel Office 312 Memorial Drive.

Islamic Society*

Prayers, every Fri, 12:15pm, Kresge Rehearsal Rm B. Discussions on the Qur'anic interpretations of various aspects of life, every Sat, 4pm, ISC Lounge, Walker 2nd floor, coffee served.

Protestant Worship Service*

Every Sunday, 11am, Chapel.

Roman Catholic Masses *

Weekly Masses in the Chapel: Sunday, 9:15am, 12:15pm, 5:15pm; Wednesday, 5:05pm; Friday, 12:05pm.

Graduate Study Opportunities

Collamore-Rogers Fellowship For Women Graduate Students

The Dean of the Graduate School has announced a fellowship for a woman graduate student at MIT beginning with the 1973-74 academic year. This fellowship is being established as part of MIT's continuing interest in attracting more women to its Graduate School.

The fellowship will be financed from Graduate School Office endowed funds, in particular the Collamore Fund and the Rogers Fund. Income from both these endowments was set up for the purpose of aiding women students in their graduate studies. The fellowship will pay full tuition for the academic year plus a stipend of \$2700 for living expenses. Competition will be Institute-wide and eligibility will be extended to new as well as enrolled women graduate students. Nominations will be made by departments (with only one nomination per department) and can be initiated by faculty or students through the department head. Final selection of the awardee will be made by the Graduate School Office staff and will be based on the student's need and professional promise.

In order for an award to be made by April 1, 1973, to be used for the coming academic year, departments must submit nominations to the Dean of the Graduate School by March 15, 1973. Inquiries should be addressed to Jeanne Richard, Room 3-134, Ext. 3-4869.

Foreign Study Opportunities

Exploration Scholarship Program

Joint sponsorship of the US Office of Education, Educational Expeditions International of Belmont, Mass.,

Vedanta Society*

Services, every Fri, 5:15pm, Chapel. Followed by discussion hour, 6pm, Lobdell Dining Room.

United Christian Fellowship *

Christians for dinner, food, fellowship. Every Wed, 5pm, Walker (at the sign of the fish). Followed by singing, praying, sharing meeting, 6pm, Rm 14E-303.

Zen Society *

Meditation meetings. Monday through Friday, 8-9am, Chapel. Call 492-4945.

Announcements

Prelaw Students

William Keogh, associate dean, Stanford School of Law. Wed, Feb 28, 5pm, Rm 8-105.

Premedical Students

Bryan Williams, associate dean for student affairs, University of Texas Medical School. Thurs, Mar 1, 12n-1:00pm, Rm 7-102. Group meeting. Tues, Feb 27, 5pm, Rm 10-250.

Rental Typewriters

Now available at Student Center Library. MIT ID required.

R/O Week

Work has started on organizing R/O Week for next year. If you have any modifications, new ideas or are interested in helping out, leave name at FAC Office, Rm 7-103.

Dining Service

20 Chimneys

Open at 11:45am for lunch service, for 2 week experiment, Regular menu.

Wednesday, February 28

Lunch: Old fashioned meat loaf with gravy. Dinner: Yankee pot roast w/beef au jus.

Thursday, March 1

Lunch: Chicken fricasse w/noodles. Dinner: Italian spaghetti w/meat balls & garlic bread.

Friday, March 2

Lunch: Fish and chips w/red dripping sauce. Dinner: Seafood Newburg over toast points.

Monday, March 5

Lunch: Green pepper steak on a bulkie roll. Dinner: Baked pork chops w/applesauce.

Tuesday, March 6

Lunch: Baked stuffed frankfurters w/Tom sauce. Dinner: Shortribs of beef w/gravy.

Wednesday, March 7

Lunch: Chili con carne w/corn chips. Dinner: Canadian bacon w/peach slices.

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

Send notices for March 7 through March 16 to the Calendar Editor, Room 5-111, Ext. 3-3279, by noon Friday, March 2.

and the Explorers Club of New York City. Scholarships will be awarded in the fields of astronomy, archaeology, anthropology, ecology, marine biology, and geology. Summer expeditions of from one to eight weeks will be led by prominent scientists to research sites in Africa, the Middle East, Europe, Asia, South and Central America and the US.

Students between the ages of 15 and 21 will compete regionally for the scholarships. Scholarship assistance includes air fare to the expedition site and all other expenses. Candidates must be competent and be of good health and strength. Opportunities will also be available for other students and teachers to take part who are able to pay their own expenses. Deadline for submitting applications is March 16.

Application forms are available from any of the ten HEW regional offices by mail or telephone. The Boston HEW Office is located in the JFK Federal Building and the telephone number is 223-7205. For further details see Professor Locke or Paula Kelly, Room 10-303, Ext. 3-5243.

Other Opportunities

The Office of Dean for Student Affairs is now accepting applications from MIT graduate students for tutor positions in the Housemaster-Tutor program.

Students should have at least one year of graduate work at MIT and been a resident of one of the Institute Houses as an undergraduate or been a campus resident of another university as an undergraduate. Seniors who have lived on-campus and who will be first year graduate students are also eligible.

Qualified, interested students may obtain more information from Miss Seelinger in Room 7-133.

(Continued from page 1)

most perishable material, was perfectly palatable. Four of us are living proof of this fact. The apples exhibited a pickled appearance. But the way the salt water had penetrated into the fruit tissue indicated that the membrane functions were hardly affected. Enzymes were still active, and the acidity of the fruit juice was not different from that of a fresh apple. The bread and meat appeared almost fresh except for being soaked with seawater.

In conclusion, the food recovered from 'Alvin' after ten months of exposure to deep-sea conditions exhibited a degree of preservation that, in the case of fruit, equaled that of careful storage, and in the case of starches and proteins appeared to surpass by far that of normal refrigeration.

Yet, there were many questions. We did not know under exactly what conditions the food was exposed to seawater in the open pressure hull. Although it seemed to be out of the question that a preservative of any kind could have leached into the water, a repeat of 'Alvin' experiment under more defined conditions seemed to be necessary.

The proposal of sinking another submersible, the 'Seacliff,' neatly

FROM 'ALVIN'S' ACCIDENT

Message on Waste Disposal

filled with groceries, was met with little enthusiasm. Furthermore, the buoy group of the Department of Physical Oceanography knew of more inexpensive ways of taking a round trip to the ocean floor. With the ready cooperation of R. H. Heinmiller and G. Volkmann, we have dropped in piggy-back fashion several containers with samples in over 5000 meters of water fastened to the mooring device of current-measuring buoys. During 1970 we recovered several of such "bio-packs" after exposure of 2 to 5 months.

The materials we studied in these experiments were, in essence, similar to those of the 'Alvin' demonstration, but as purified compounds and in a form that permitted quantitative analysis for the degree of degradation. The sample bottles were pre-inoculated with bacteria of a known type of mixed populations. Some of the bottles were provided with a device that permitted filling with seawater by pressure at a certain depth.

In order to measure the microbial consumption and produc-

tion of dissolved gases, mainly oxygen and carbon dioxide, we put samples in large syringes that compress and decompress without loss of the material. All these devices were pressure-tested. Bottles and syringes were put in sturdy boxes made from household dish pans that were perforated for free access of the surrounding water. A set of controls was kept at 3 °C in the laboratory. When the buoys were retrieved by an acoustic release mechanism, the samples of the bio-pack were fixed for immediate bio- and radio-chemical analysis.

The results of these experiments proved that the well-preserved state of the 'Alvin' lunch was no chance observation. In general, the degradation of the various materials, proceeded about 100 times

slower (600 times at the maximum) at deep-sea conditions than in the controls kept at the same temperature but at sea-level pressure.

Two points are of considerable interest: (1) an explanation of the observed phenomenon and (2) its implications.

From earlier laboratory work on the effect of hydrostatic pressure on bacterial growth and enzymatic activities, pressure alone cannot be assumed to account for the preserving effect. From our present work on "psychrophilic" bacteria, we arrived at a working hypothesis proposing a combined pressure-temperature effect. Psychrophilism is the ability of some bacteria to grow relatively fast at low temperatures. If this phenomenon is pressure-related, low

biochemical activities at deep-sea conditions become explainable.

The implications of the 'Alvin' lunch experiment are obvious. The deep-sea is not a suitable environment for dumping solid organic wastes. It appears that offshore disposal would largely eliminate a quick microbial degradation and mineralization.

Substantial amounts of waste materials might be trapped in the deep-sea, being removed from natural or technically enhanced recycling processes, and might accumulate in an uncontrollable fashion.

From more recent studies, using the re-built 'Alvin' again, we know now that a general slow-down of life processes in the deep-sea does apply not only to bacteria from the sea surface but also to the indigenous microflora and possibly to benthic animals as well.

After this needlessly dramatic initiation of deep-sea microbiology, work is continuing on a broad basis, and we hope for further cooperation by the remarkable 'Alvin.'

Pedal-Powered Airplane Completed, Ready to Test

(Continued from page 1)

Co., which donated bicycle frame and parts for propulsion; the Richmond Corporation of California, which contributed nylon

wing skin; and the FMC Corporation of Philadelphia, which donated polypropylene for wing skin.

The pedal-powered two-man plane has polypropylene-covered balsa wood wings with a span of 62 feet. The open fuselage is formed of welded aluminum tubing and the 10-foot propellor, which will turn at 240 revolutions per minute, is built up from laminated balsa sheets. Power will come from two sets of pedals and sprockets connected to the propellor by chain drive and gears.

Fragile as a butterfly, the 126-pound plane will undergo taxi tests for ground handling characteristics during the weeks following roll-out. During the tests, crew members will participate in training programs to give them the necessary physical stamina and flying skills.

The plane will finally take to the air only under a narrow range of weather conditions, with wind speed under three miles per hour and temperature between 40 and 75 degrees.

The prize the students are aiming at is a long-standing offer of about \$25,000 by British industrialist Henry Kremer for the first man-powered aircraft that can take off and fly a one-mile figure-eight course at an altitude of at least 10 feet.

Other student team members are Robert W. Walter, 22, of Inglewood, Calif., a graduate student in mechanical engineering; Edward A. Uchno, 22, of Hazelton, Pa., a fifth year student in aeronautics and biology; John H. Wendell, 19, of Omaha, Neb., a freshman; and David A. Euler, 19, of Pittsburgh, Pa., a former student. Peter J. Fecanin, 22, of Carlstadt, N.J., formerly with the group, has graduated from MIT.

Payment Due

The Student Accounts Office reminds students that the second deferred payment is due Thursday, March 1. A \$10 late payment fine has been assessed to all who failed to make the first payment as scheduled.

Fort Award Applications By March 2

Students who wish to apply for the Marron William Fort Fellowship should submit applications to Dean Clarence G. Williams (Room 3-140) no later than March 2, 1973.

Each candidate should submit an informal one-page autobiographical essay that sets forth his career plans, Dean Williams said.

The Fort Fellowship was established to encourage MIT minority seniors with high scholarly qualities to consider the possibility of graduate study at MIT.

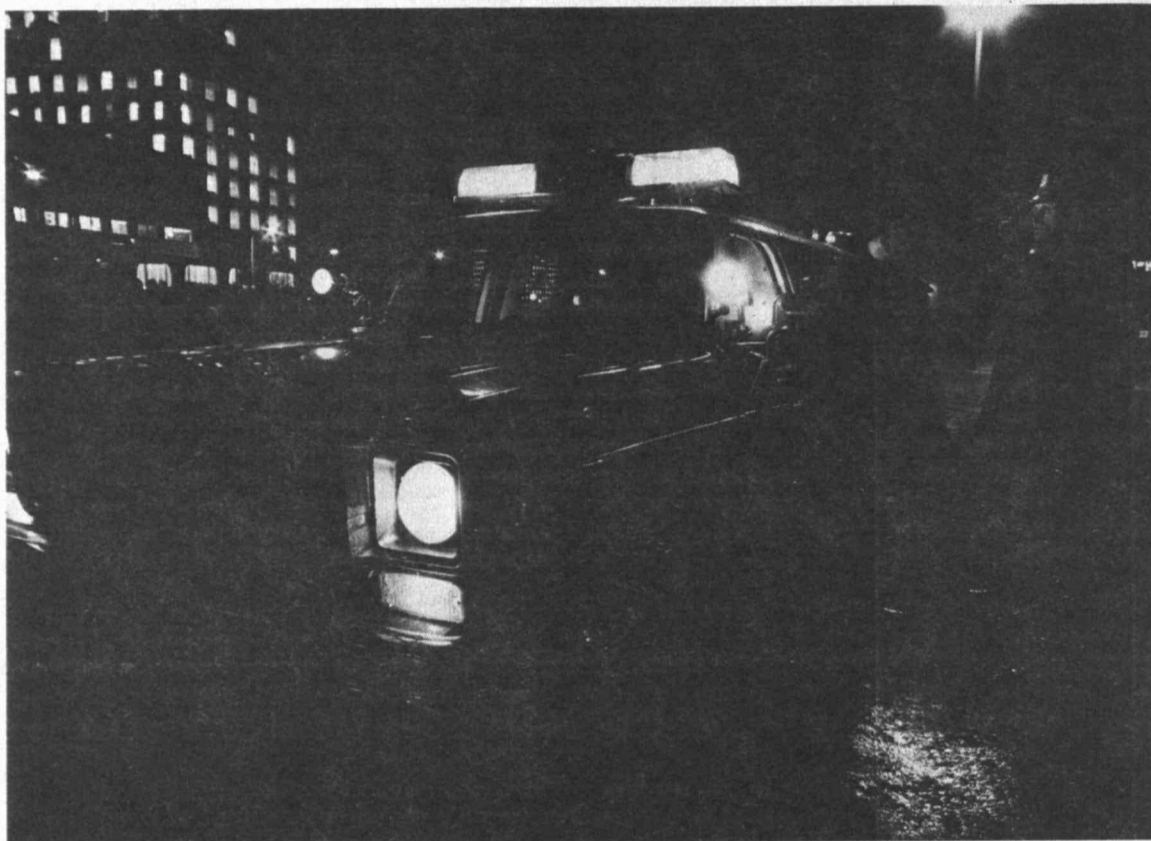
Students' Plan To Aid Elderly

(Continued from page 1)

Cambridge which will provide 684 housing units for the elderly on three sites in the city—in Cambridgeport, North Cambridge and East Cambridge. People from each neighborhood participated in planning the housing facilities and expressed a concern about transportation to other parts of the city.

The students conducted a survey of transportation needs which grew from just the three housing complexes to include all Cambridge elderly. The students believe the potential market for the taxi service is 8,000 people.

Funding for the transportation project was provided by the President's Fund for Community Affairs. It has amounted to \$12,000 in student support so far. Another \$9-10,000 is needed to get the program started.



SEEING THE LIGHT—This new wagon, recently put into service by the Campus Patrol, can brighten up any dark area with its powerful spotlights. It also has improved medical facilities such as storage space for oxygen bottles and compartments which

put first aid equipment in easy reach. Like the older wagon still in use, the new one has a cot, a scoop stretcher, a resuscitator and radiation protection equipment. The Campus Patrol made 714 ambulance runs during 1972.

—Photo by Margo Foote

Seminar: 'Joyful Technology and the Polis'

John O'Neill, professor of sociology at York University, Toronto, will discuss cultural and political revolution in a lecture entitled, "Joyful Technology and the Polis," on Wednesday, February

28. It will be the second in a continuing series of Technology and Culture Seminars.

The series, called "Images of Man" and coordinated by the Rev. John Crocker, Jr., MIT Episcopal

chaplain, explores the relationship of science and other kinds of knowledge about mankind.

Professor Martin Diskin of the MIT Humanities Department opened the series February 14 with a discussion of cultural conflict with respect to the Spanish in Mexico.

The series will offer five more lectures, each beginning at 5:15pm in Room 9-150 and followed by a buffet supper at 6:30pm in the Mezzanine Lounge of the Student Center. At 7pm respondents focus the issues of each lecture in open discussion.

Future lectures will be: "Science and Mystery in the Study of Human Language," Professor Noam A. Chomsky, linguistics, MIT, date to be determined; a lecture and speaker yet to be decided, March 21; "Contemporary Man—Between the Rim and the Axis," Professor Seyyed Hossein Nasr, philosophy, Tehran University, April 2; "The Human Import of Science," Professor Huston C. Smith, philosophy, MIT, April 25; "The Impersonality of Science," Dr. J. Bronowski, director, Salk Institute in San Diego, May 16.

Transcripts of the seminars will be available from the Chaplain's Office, 312 Memorial Drive, Ext. 3-2983.



In 1910 both of these men arrived at MIT—Professor Leicester F. Hamilton, left, as an undergraduate and Professor Frederick G. Keyes as a member of the faculty. Their long and distinguished careers were interlocked in the chemistry department which Professor Keyes headed for many years and Professor Hamilton served as acting head and executive officer. They met again last week at a birthday party—his 80th—the department gave for Professor Hamilton. —Photo by Margo Foote

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 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. The deadline is noon Friday.

For Sale, Etc.

Sony TC-105A 4 track mono tape recrd, br new, \$80 or best offer. Chris, X9462 Dorm.

Plush B-2 bass guitar amp-105 watts RMS, 2 15" spkrs, exc cond, \$250 or best offer. Dave, X9419 Dorm.

Atala Racer, 10 spd, 1 yr old, hardly used. Alan, X8456 Dorm.

Framed mirror 20x20, \$10; maple rocker, \$10; walnut chr, \$7.50; sm mahog tbl, \$10. 232-2034.

Lg blue goose down parka. Top of the Mountain mfg., full 2" loft through-out, gd for artic conditions, unused, orig \$80, negot now. Dan, X0808 Dorm.

Bk shelves, 4 wall, 10"x70" w/frames, brackets, \$40. Call, X3-2160.

Aquarium, fully equip, best. Judy, X3-5100.

KLH Mod 11 stereo sys, A-1, immaculate, for dorm or apt, new \$214, now \$120. Susan X3-4159.

Nikomart cam FTN 1.2 lens, blk finish, \$280; Nikon 2.8 perspect correction lens, lk new, \$180; 19" b/w port RCA TV 181, w/VHF/UHF, 4 mo old, \$90. Ron, 484-2607.

Redwood tubs, 2, \$3 & \$2. Dr. Buyn, X3-4155.

VW tires, 4, plus 2 snows. Maskell, X8-2861 Draper.

Antique ice chest, oak w/brass hardware; steamer trunk. X426 Linc.

Used b/w 35mm enlarger, gd cond. X3-6124.

Zuckerman harpsichord, 5', \$600. Larry, X3-5783.

Clegg 50 watt 4 TCHOR 6 X-ciever w/power supply & mike, exc cond, \$90. Bill, X3-6137.

Rug 9'x6', red. Raj, X3-6857.

New milk glass pedestal cake plate, \$12.50. Carol, X359 Linc.

Mod blk leatherette sofa & match chr, used 2 wk only, orig \$450, now \$250. Jack, X7321 Linc.

Early-Amer style maple hutch, \$35. David, X8-3652 Draper.

IBM Select typewriter, fully & exc recond, \$200. Maureen X8-3591 Draper.

Wh porcelain B sink, H&C faucets, pop-up drain, plumbing attach; wh cast iron K sink, H&C faucets, plumbing attach, \$18 each. Ed, X8-3371 Draper.

Frigidaire refrig, 15 cu ft, 2 dr, 3 cu ft freezer, exc cond, \$90 will negot. Dick Gudaitis X3-2588.

Aria guitar, strap case, music bks, new strings, exc cond, \$80. Dan, X8-1354 Draper.

Wollensak 4750 cass dk, 6 mos old, orig \$220, now \$140 or best. Call Forrest, 731-1093 8pm-11pm.

Am/Fm stereo tuner-Amp, 2 spkrs, stereo head phones, 20 stereo albums, exc cond, worth over \$200, selling for \$110. Sonney, X8564 Dorms evgs.

Kenwood KR3130 & sm Advent ldsprks, as sys or individual components, both 10 mos old, exc cond. Bob, 254-2392.

Lexington, choice building land, 3 improved lots, acre each, corner Spring & Concord St. adj to 12 acres of conservation & common land, community swim pool priv, \$15,000 to \$20,000 range. X3-3148.

Pr brand new dk br men's loafers, 9D, \$10. Mary, X8-1472 Draper.

Ticket to Mahavishnu concert, 3/11, 7pm, 5th row cntr, \$6. 1st caller gets. Jeff, 261-2065 lv msg.

Harpsichord, 4'x8', buff stops, pedals, \$1200. Pat Bevans, X8-1177 Draper.

Sony HP-210A stereo sys w/Sony 210 spkrs, \$260; Sony DR-5A head phones w/TAH-10 head phone adapters, Heath AJ-15 stereo tuner, \$100; AR-2AX spks, \$195; Panasonic RS-820S stereo rrvs & cart dk w/spkrs, \$225. Lyle, X8-1387 Draper.

National Automotive Service Data Manual, comp 1937-1958 repair specifications. Don Lesley, X8-3511 Draper.

Lots of RTL. Jeff Lang, X9265 Dorm.

Epiphone 6 str acoustic guitar, 2 yrs old, exc cond, strap & case, \$75. Call John, 247-8764.

TEAC A-24 cass tape dk, 5 mos old w/orig fact carton & warr, lk new, \$100 or reas offer. Gary, 8543 Dorm.

Round tbl, 15", 3 for \$5; Sunbeam upright vac cleaner, \$20; 26" 3 drawer chest, \$10; king size headboard, \$15. Michele, 321 Linc.

Stanton 500E phono cart, new nvr used, w/warranty, \$20. Eric, X8155 Dorm.

TEAC A-24 cass dk w/Dolby, 4 mos old, exc cond, orig boxes & lit, negot price; also cass (blanks & record). Pat, X8819 or X8790 Dorm. Lv msg.

Rug 9'x12', gold wool, 6 mos old, no stains or rips, \$30. Mike, 461 Linc.

Convert Singer model sew mach stand, antiq wood; 2 LR lamps, reasonable. Cathy, X3-2285.

GE broiler oven, exc cond, \$15. Frank, X3-1852.

Pr DR chr, \$3 ea; ftstool, \$3; coffee tbl, \$10; side tbl, \$5; Olympia typewriter w/german characters, \$30; tire chains nvr used, fit 5.20-14, 5.60-14, 5.00-15, 5.00-19, 145-15, \$5; 1 6.00-13 tire, used, \$5. Mike, X3-4378.

Piano, Cable-Nelson spinet, gd cond. Rufus or Anne Hallmark X3-6931.

Nikkormat FTN, f:2 Nikkor & Tamron 135 and 35mm f:2.8 autos, extras, \$250. Camera has fact warr til 5/31. Wollensak 6150 stereo dk, 8 mos old, \$120; pr Dynaco A25 spkrs, new in boxes, \$99. Aldrich, X3-5360.

Premier cycle helmet, lg sz, full face for maximum protect, primer brown, cost \$50 now \$35. Marc, X3-2703.

Gerard rec changer SL-72-B, Orig \$110 now \$60. Charles Foster, X3-1832.

Panasonic RE767 stereo rad, walnut finish, phono & tape jacks, exc cond, best offer. Karen, 494-9209 aft 8pm.

Panasonic port ster cass record, AC & batt, exc machine, w/8 cass, orig \$140 now \$100. John, 547-9784.

Pr studded snows G78-15, mtd on Intl Travelall or Econoline rims, used less than seas, \$28/pr. John, X5487 Linc.

Sears Kenmore gas dryer, lk new, orig \$210 now \$150; Westinghouse wash mach exc cond \$75; Philco refrig freezer, gd cond \$50. Jeff X3-7528.

Vehicles

'60 Rambler, 4dr, 65K, gd eng, tires, snows, plus chains, radio, \$50. Dave, X3-7529.

'62 Mercedes 220 sedan, gd eng, clutch nds wk, \$300. Allan, 7336 Linc.

'63 Beacon jeep, full mtl cab, 4 wheel dr, 7' plow, \$700. Jim, X3-2773.

'63 Pontiac Tempest, 2dr, auto tr, gd tires, runs well, \$60. Dick, 7169 Linc.

'64 Bell Air Chev, stand 6 cyl, gd cond, \$150. Mike, X8-1376 Draper.

'65 Dodge, unusually gd cond, p st, snows, must sell, \$285 or best. X3-5349.

'66 VW Sq-Back, new tires, exc cond, must sell, \$550. Jirka, X3-2725.

'66 Chevy Nova, exc cond, 2 extra wheels w/2 extra tires, orig owner, \$300. X8-3526 Draper.

'66 Olds Delta, air cond, p st & br, auto tr, gd cond. Berzinis, X3-3161, lv msg.

'66 VW bug, exc cond, r and alarm, can be seen at MIT, \$450. Swain, X3-1830.

'67 Chry Newport, good mech cond, new tires & batt, body damaged outside, gd interior, \$300. David, 9625 Dorm.

'68 Charger, 318 eng, p st & br, r defog, 75K careful miles, exc running cond, minor body dents, \$925. Call X3-3887.

'67 Ambassador, 4dr, auto tr, p st & r, \$300; '67 VW Fastback, new eng, 4 new wh walls, 4 snows w/rims, \$600. David, X3-7925.

'68 VW Bug, green, new tires, \$500. David, X8-3355 Draper.

'69 Ford Custom Club Econoline, windows all around, gd tires, alarm, starts every time, great heater, could be fixed up as camper, \$1500. Call 536-5497.

'69 Renault 16 st wgn/sedan, rad tires, 4 cyl, \$1000 or best. Virginia, X8-3501 Draper.

'70 Ford Galaxy 500, scratched side, \$1100. Dave, X3-2816.

'71 Saab 99E, 2 dr, 4sp, 30K, immaculate cond. Anne, X3-7477.

'71 Impala Convert, gold int/ext, V8 all power, snows, 35K, will sacrifice, \$1900. X3-5274.

'72 MG Midget convert, 11K, rad tires, AM/FM, must sell, \$2000 or best. Judy, X3-6116.

Housing

S. Boston, lg studio, ktte, shower, plenty of closet space, n T, \$165.50/mo, ht, avail 6/1. Jan, X3-1590.

Salisbury, NH, mobile home, 55'x10' w/20' Expando LR, 2 BR, DR, B, nr Sunapee, 1 acre & home \$10,000, or 16 acres & home \$16,000, 800' road front on US4. X7409 Linc.

Lk Winnepesaukee chalet available for ski and summer rent. X8-4415.

Camb attract condo, riverview, 2 min fr Harv Sq, 2 BR, LR, DN, 2 B, lg K, frpl, \$485/mo. Braga-Illa 7484 Linc.

N. Camb, Fairweather St apt, avail 3/1, 5 1/2 Rm w/2BR, D, L, \$275/mo. Frank, X8-4458.

Malden, 2 apts, each w/2 BR, B, LR, DR, K, Den, Sunporch, n T, schools, store, marrieds only, w/kids or not, \$175 & \$200. Call, 666-5514.

N. Camb, sublet to 9/1, Northgate holding, n Longfellow Pk, \$245/mo. Don, X3-6221.

Ches Hill, sublet now, 2 BR, LR, lg K, w w carpet, park, pool, laundry, \$230. Dan Bloom, X3-2871.

Ski lodge, sleeps 15, n Quebec, ski the east townships w/plenty snow, \$180/wk inc util. Christine, X3-2742.

Arl, 4 yr old brick front col hse, 3 BR, 1 1/2 B, LR w/frpl & w w, PlyRm w/frpl, fenced yd, n ele sch, Cath C, T. Ed Flack, X3-2180.

Animals

Free f cat, blk, 9 mos old, friendly but dumb. Call 547-2863.

Wanted

Ride to MIT from Lynn Beach, will shr exp and/or dr. Linda, X3-3319.

Fem 25+ to shr 5 Rm apt w/same, n Fresh Pond, \$100/mo + ht. Bonnie X3-1598.

Rmmate (3rd), own Rm in duplex, 7 min fr Central Sq. \$100/mo inc util, lease & \$100 depos. Call 876-5968.

Rmmate for 4 BR hse, Bedford, Mass. John, X3-2513.

Furn sublet for 4/1-7/1, 2 or 3 BR hse, n Harvard/MIT. Marty, X3-2588.

Used down filled sl bag. Jane, X3-6732.

Rmmate needed to seek & share apt, rent about \$100/mo. I have furniture. Anita, X3-5677.

Apt in Camb, 1 BR or own BR in an apt. Makdes, 495-2829.

Sublet 3 or 4 BR hse, June thru Aug for U of Wisc prof, pref Newton, Arl, Lex, Bel area, w/yard. Joe, X3-5775.

Male rmmate to shr 4 BR hse, Brighton, own rm, w w, furn, \$68/mo, plus util, avail 3/1. Bob, 254-1616.

Will shelves, must be sturdy, Pez X3-3927.

Fem rmmate to shr 3 BR apt in Brighton, 4/1-8/31, own room, n T, \$95/mo + util. Janet X3-6614.

Rmmate (4th) to sublet mod Camb apt, betw Harvard & Central, n Mass Ave, lease & security \$90 inc ht. 876-5968 or 876-2098.

Woman's 3 spd bike, Jim Besancon X3-7935.

Fem rmmate to shr mod 2 BR lux apt w/fem grad std, Harvard St, Camb, ac, off-str pk, avail now, \$142.50 ht incl. Bernice 491-4534, evg, wkends.

Miscellaneous

Will do gen & thesis typing. Marsha X3-2342.

Commercial & instrument instruction, well equipped aircraft, reas rates. Bill X3-2297.

Gen or thesis typing, IBM Select, price reas & negot. Cathy, X3-6047.

Wd floors sanded & refin, professionally. Denny, X3-5606.

Positions Available

Scheduling Assistant IV: For Publications office to assist in scheduling work. Will meet and work with people of all levels within Laboratory. Poise and intelligence needed in making commitments for Publications. Will be required to answer procedural questions and to integrate official Laboratory policy in deciding each job. Minimal typing necessary. Jane Notaro, X7305 Lincoln



Ustad Ali Akbar Khan

Composer Of India In Concert

Ustad Ali Akbar Khan, a noted Indian composer, teacher and performer, will present a sarod concert in Kresge Auditorium on Friday, March 2, at 8pm.

The sarod is a relative newcomer to Indian music. The body is carved and hollowed from a single piece of well-seasoned teak, the belly is covered with skin, and the fingerboard is metal without frets. The sarod has 25 metal strings—four for melody, four for percussion, and 17 for resonance.

Khan has toured extensively in the US, Africa, Europe, Australia, Asia, and Canada. He performed in the Newport Folk Festival, the Festival from India at Philharmonic Hall, Expo '67 in Montreal, the Berkeley and Monterey Jazz Festivals, and with sitarist Ravi Shankar at the Bangla Desh benefit in New York City. In 1956 he founded the Ali Akbar College of Music in Calcutta, and in 1967 he opened a similar school in Marin County, California.

The concert is sponsored by SANGAM, the MIT Indian Students Club. Tickets, available at the door, are \$3 and \$5.

Book Outlines MD Curricula

The Committee on Preprofessional Advising and Education has prepared a new booklet entitled "Medical School Curricula" for students interested in pursuing a medical education.

The booklet contains information on accelerated M.D. degree programs, combined M.D.-Ph.D. degree programs, innovative instructional methods, early specialization opportunities, and grading systems used in US medical schools.

Because of a limited supply, copies are available only to students planning to apply to medical schools for the September, 1974, term. Reference copies are on file in the Office of Preprofessional Advising and Education, Room 10-186.

Aid Applications

The Financial Aid Office reports that some students receiving aid have not filed applications for continuing assistance in 1973-74. Forms were due January 19. Applications received after March 15 may have to be considered for aid from loan sources only.

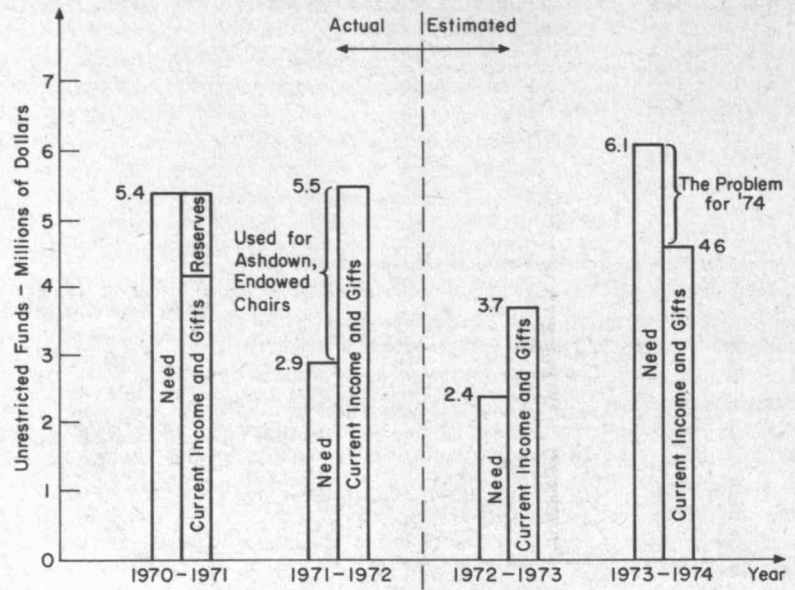
'Operating Gap' Up in Future

Budget Reductions For FY '71, '72, '73, '74 (Thousands of Dollars)

Year and Area	Act'l. Red.	Uncontr'ble. Increases	Effect. Red.
1970-71			
Academic	610	-	610
G & A	1,290	660	630
Plant	350	110	240
	<u>2,250</u>	<u>770</u>	<u>1,480</u>
1971-72			
Academic	620	-	620
G & A	640	380	260
Plant	300	570	(270)
	<u>1,560</u>	<u>950</u>	<u>610</u>
1972-73			
Academic	830	-	830
G & A	1,860	30	1,830
Plant	730	-	730
	<u>3,420</u>	<u>30</u>	<u>3,390</u>
1973-74			
Academic	485	-	485
G & A	953*	208	745
Plant	470	170	300
	<u>1,908</u>	<u>378</u>	<u>1,530</u>

*Includes \$148K in service income increases, \$200K of reductions yet to be achieved. Does not include \$797K of transfers to Draper Laboratory, Inc.

Need for, and Realization of, Unrestricted Funds in Operation



Bravo's Photos Express Mythology of Mexico

A collection of works by Mexican photographer Manuel Alvarez Bravo is on display at the Creative Photography Gallery.

The exhibit, entitled *Manuel Alvarez Bravo*, was organized in 1971 by Fred R. Parker, curator of photography at the Pasadena Art Museum and has traveled to several major American museums. The MIT showing is being sponsored by the Creative Photog-

raphy Gallery.

"It requires an unusually sensitive artist to undertake the analysis of something as intimate as the mythology of his own culture. However, even with genius, such analysis is of little value unless it finds a means of expression. The photographs in this exhibit are such expression," writes Mr. Parker in the accompanying catalogue.

The exhibit brings together a collection of black and white photographs portraying Mexico and its people. "With a camera designed for machine-like precision and objectivity, he extracts a great deal more than mere reproduction. His photographs are reflections of the collective dreams of Mexico in which inanimate earth is made animate and invisible relationships of visible things emerge," Mr. Parker writes.

Born in Mexico City in 1902, Bravo has been surrounded by art all of his life. His father and grandfather were both amateur photographers and painters. When the Mexican revolution of 1910 interrupted his schooling, he worked during the daytime and attended art and literature courses at night. In the early 1930s, Bravo became a freelance photographer, sold his first print to the Museum of Modern Art and met several photographers and artists who have strongly influenced his work, including Paul Strand, Henri Cartier-Bresson and Diego Rivera.

Bravo also taught photography both here and in Mexico, worked as a cinema cameraman, and founded a publishing company that specializes in books about Mexican art.

The Creative Photography Gallery is located at 120 Massachusetts Ave. and is open daily from 10am until 6pm.

Gene Studies Fill Journal

The entire issue of the *Journal of Molecular Biology*, Vol. 72, No. 2, December 28, 1972, is devoted to papers by Har Gobind Khorana, Alfred P. Sloan Professor of Biology and Chemistry, and his research group. The 13 articles describe the total synthesis of a gene.

(Continued from page 1)

Patent income and use of facilities allowances amount to approximately \$2.5 million per year. Unrestricted gifts, grants and bequests vary widely from year to year. These unrestricted gifts were forecast at \$2.3 million

in the 1971-1972 budget but actually amounted to \$3.7 million. The amount received this year is likely to be about \$1.3 million Dr. Gray said.

The probable outcome for the 1972-1973 fiscal year will leave \$1.3 million in unrestricted gifts, grants and bequests available for

purposes other than operations. However, Dr. Gray estimated that for 1973-1974 unrestricted income will fall \$1-2.6 million short of the need and the shortfall will have to be met from reserve funds in some form, unless operating economies or revenues not now in sight are found.

Observer Out

What are they saying about MIT?

If you want to find out, stop in the Information Center (Room 7-111) and pick up a copy of *Observer*, a periodic compilation of clippings about the Institute.

Intrex Back In Operation

The Intrex System, a computer-based retrieval system of 20,000 documents in selected areas of materials science and engineering, has resumed operation in The Barker Engineering Library.

The data base represents a collection of technical journal articles published primarily between 1967 and 1971, which have been extensively cataloged and can be retrieved by author, title or in-depth subject searches. Texts of documents found can then be displayed on the console screen via the text access subsystem.

Free copies of these documents are available on microfiche in the Engineering Library's Microfiche Service Area. Sixteen portable microfiche readers can be borrowed for one week at a time. Hard copy conversion from fiche costs 5 cents per page.

The console is in operation Monday thru Friday from 2 to 4pm. Appointments can be made by calling Ext. 3-7741. An Intrex advisor will be present during scheduled hours to provide general assistance and demonstrate special techniques.

Open demonstrations of the system will be given at 2pm on the first Monday of every month in the orientation room of the Engineering Library.

Printed publicity from

Massachusetts Institute of Technology
at the London College of Printing

First floor: The Extension
London College of Printing, Elephant & Castle SE1 6SB
12 February - 2 March Monday to Friday
9.30-6.00 admission free

A collection of printed works produced by MIT Design Services is on display through March 2 at the London College of Printing, in England. This poster was designed and printed by the college to advertise

the exhibit, which opened February 12. The show, which was initially sponsored by the New York Art Directors Club, toured other English colleges before going to London at the invitation of the faculty.