

Grants Strengthen CAVS Program

The Center for Advanced Visual Studies has received a \$100,000 grant from the Samuel H. Kress Foundation to be divided over a two-year period.

The first \$50,000, received earlier this fall, has been matched by a grant of the same amount from the National Endowment for the Arts.

The two grants will be used to further the innovative creative work that has taken place at the Center since it was established in 1967, according to Institute Professor Gyorgy Kepes, director of the Center. He says, "The Center's main purpose is to explore new artistic objectives of civic scale and environmental dimensions."

Professor Kepes sees the Center as a "needed confluence between scientific and technological know-

ledge and artistic creativity. It is a research center, or maybe more correctly a 'search center', for new creative objectives, new formats in art."

The aims of the Center are threefold. Professor Kepes explains, "First, to investigate the possibilities of creative work on a civic scale that could give new artistic dimensions to our urban environment, and thus revitalize civic awareness to environmental values. Second, to develop participatory art forms—spectacles, events and pageantry that might bring a new sense of community to isolated individual lives. Third, to learn to use new techniques of communications media to develop our sensibilities as well as our consciousness of our present ecological and social situation."

Artists of achievement are invited to the Center to become fellows for one or two years. They spend part of their time working on cooperative projects of an environmental and civic nature and the rest of the time they work individually. "However, artists are not invited here to be only receivers, tapping the Institute's technological competence, but also to be givers, as members of



Professor Kepes.

our cultural community in which they have both opportunities and responsibilities," Professor Kepes says.

He continues, "An intimate working relationship between artists, physicists, social scientists, electronic and computer engineers, students and faculty can lead to important new insights for all involved. The Center for Advanced Visual Studies is a unique interdisciplinary enterprise that if carried out consistently could have long range significance."

Parking Rules Outlined for Snow Emergencies

The MIT Parking Committee has issued the following statement concerning the use of Institute parking facilities during snow emergencies:

The City of Cambridge has issued its annual notice concerning regulations which are to be in effect during a snow emergency. Please note that a Cambridge violation, during a snow emergency, involves a \$15 fine, a \$12 tow charge and \$2 per day for storage. Thus, a single violation could result in a minimum cost to the offender of \$29.

In order to lessen the impact of these regulations upon the members of our community, and others who do not have parking permits, and to increase our efficiency in snow removal, the following procedures should be followed during the period when a snow emergency has been declared by either the City of Cambridge, or by MIT.

1. Notice of a Cambridge snow emergency will be given by radio. An MIT emergency will be given on the slide screen in the corridor of Building 3 and at parking lots.

2. The East Open, Kresge, Sloan and Main (except for Medical) parking lots will be closed from 5pm-7am and persons having permits for these areas may park overnight in the East, Albany and West Garages. These areas are also open to per-

sons not having parking permits, but such persons must vacate the garages by 7am.

3. In addition, the Monroe Street Parking Lot will be open to all who wish to use this area. Students and staff who elect to use this lot will not be required to vacate this lot by 7am.

4. All cars with Hayward stickers should park in the Hayward Street Garage.

5. There will be absolutely no parking at any time on Amherst Alley, from Danforth Street to Westgate, and all fire lanes must be kept clear.

6. The Westgate lot will be posted with a clearly marked sign so that overnight parking can be concentrated in a single area to facilitate snow removal. Cars from the Westgate Apartments could be moved the following day into the cleared area thus allowing unhampered snow removal from the rest of the lot.

7. Even after the snow emergency is over, areas in certain lots may be temporarily posted for no parking in order to facilitate the use of the snow melter and other clean-up operations. Such areas will be clearly marked.

Northwest Sector Explored by CJAC

A plan to develop high-quality housing in the "northwest sector" on lands formerly occupied by the Simplex Wire and Cable Corporation may prove too expensive to be practical, the Corporation Joint Advisory Committee on Institute-wide Affairs (CJAC) was told last Thursday night.

The plan, developed according to ground rules which CJAC had endorsed a year and a half ago, would lead to monthly rents for a 1000 square-foot two-bedroom apartment in the range of \$400.

Mr. Dick Dover, MIT's project director for the northwest sector, explained that there might not be enough MIT-affiliated people willing and able to pay the rents to fill the planned 1200 units.

Vice President Kenneth R. Wadleigh, '43, noted that a development on that scale—about \$40 million worth of construction—would be "a very risky undertaking." But D. Reid Weedon, Jr., '41, added that it might be impossible to undertake the project on a smaller scale: "unless you substantially change the character of the area, you don't stand a chance of renting an apartment at \$400 per month."

The objectives of a high-quality housing development in the northwest sector are to enhance the educational atmosphere of the Institute by having more faculty and staff members and students living near the campus, to make it easier to recruit faculty staff members by having better and more convenient housing available, to improve the campus and city environment, and to add to the

city's tax rolls.

Mr. Dover presented an "experimental plan" of 1200 units, distributed with a density of 80 units per acre. Although no architectural design has been developed for the housing facilities, "we are talking about something with the same cost, features, and density as Harvard's Peabody Terrace—in other words, not low cost housing." A detailed economic analysis of such a project led to the cost figure of \$400 per month, plus or minus about \$70.

Mr. Dover's plan calls for high quality construction, covered parking facilities, and a high level of site amenities (landscaping, lighting, paving, etc.). Mr. Wadleigh explained, "we felt that the development should be done right if it were to be done at all."

Construction costs are projected at \$31,000 per unit, financed with non-MIT funds, including whatever low-cost financing programs are available (e.g. a state program which provides low-cost funds on the condition that at least one quarter of the units in the development be provided to low-income families as subsidized housing; thus 300 of the units would be rented at about \$108 per month, while the other 900 would be rented at the normal rate). The land is owned by MIT and for the purposes of analysis its cost is set at \$580,000 per acre. Since the land was bought from the Institute's investment portfolio, a 5% return is necessary (if the return were dropped to 4½%, the average per apartment

(Continued on page 2)

Faculty Hold Meeting Today

A regular meeting of the faculty will be held this afternoon (December 15) at 3:15 in Room 10-250.

Items on the agenda include reports from the Committee on Nominations and from the Special Task Force on Education. (The Task Force Report was published in Tech Talk, December 8, 1971.) In addition Professor Hartley Rogers, Chairman of the Faculty, will discuss the agenda for future faculty meeting; and Chancellor Paul E. Gray will speak on budgetary prospects. The meeting will close with remarks by President Jerome B. Wiesner.

Non-members of the faculty are welcome to observe faculty meetings. The seating areas set aside for faculty members and for other members of the community will be clearly marked.

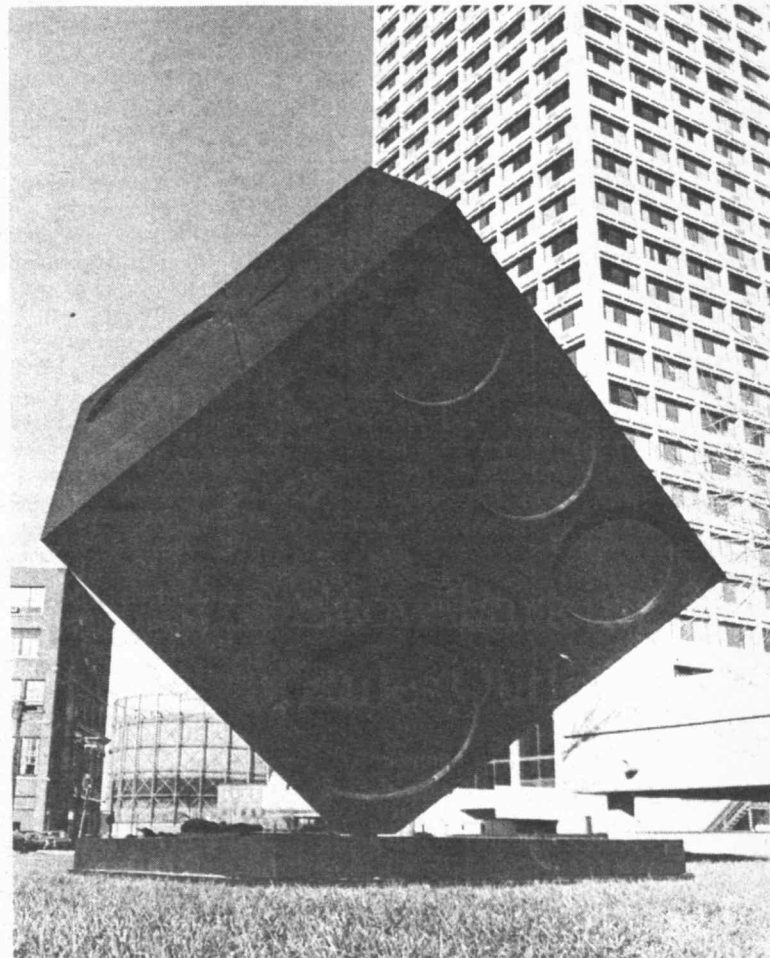
Dining Hall Hours Posted

The Institute Dining Services will operate on a reduced schedule during the Christmas holiday.

The Faculty Club will be closed from Friday, December 24 through Sunday, January 2.

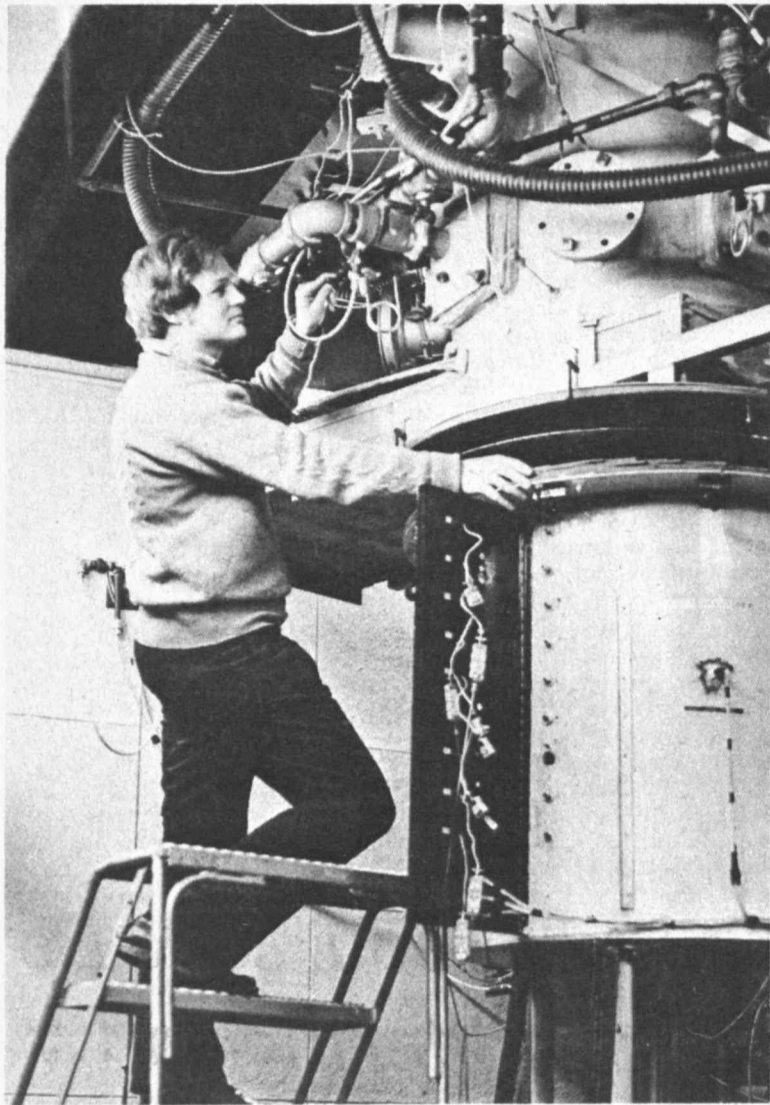
The dining halls in Ashdown House, Baker, McCormick and MacGregor will close after dinner on Wednesday, December 22 and will not reopen until Wednesday, January 5.

The Student Center dining room, Lobdell, will serve lunch on Thursday, December 23; breakfast, lunch and dinner on Monday, December 27 through Thursday, December 30. However, Lobdell will be closed for the long Christmas and New Year's Day weekends (Friday-Sunday, December 24-26, and Friday-Sunday, (Continued on page 7)



This is "Cube in Seven Parts" by Bernard Rosenthal, now standing on the plaza at the Hermann Building. Other sculptures are pictured on page 5. The story is on page 3.

—Photo by Alfred Anderson, '71



Joseph Rogers, G, a member of the research group investigating municipal incinerator design, adjusts the setting of an intake port to the over-fire chamber of the group's model incinerator.—Photo by Margo Foote

CJAC Outlines Plans for Simplex Property

(Continued from page 1)

rent would be reduced by only about \$4 per month).

A survey conducted this year by the MIT planning Office indicated that of the faculty and staff, 269 were willing to pay between \$300 and \$399 per month rent, and only 105 were willing to pay over \$400 per month. For graduate students, the figures are 98 and 48. Although that is far short of the 900 needed to fill the non-subsidized units, Mr. Dover feels that actual demand might be higher than the figures indicate.

Analysis of MIT salaries shows that for many people, the ability to pay is higher than willingness to pay. Furthermore, people now living outside Cambridge have to use a car (at about \$1,000 per year) to commute to the Institute. Housing costs in the Boston area have risen significantly since the survey was made earlier this year; and those responding to the survey were not aware of the particularly attractive nature of the housing planned for the north-west sector. Finally, if the housing units are developed as condominiums (an alternative which Mr. Dover mentioned), demand might be greater.

Despite all the risks involved in such a venture, Mr. Wadleigh said, "everything tells us that if we are going to build, we should build now. Construction costs appear to

be about to stabilize—at an annual increase of about 10%." An alternative to proceeding immediately with the major plan would be to build cheaper low-rise by using designed to last about ten years and hope that the situation would improve in the future. But it appears likely that construction costs will only be higher in ten years, Mr. Wadleigh said, and there would be the additional problem of dislocation of the tenants of the temporary structures. It is desired to include in the housing a development a small amount of "sympathetic commercial development—a place where you can get a quart of milk or a newspaper." The prospects for the commercial side of the development have not been thoroughly studied, Mr. Dover reported, but it is clear that in that part of Cambridge, "the market is soft and the competition is strong."

Members of CJAC and spectators suggested various alternate funding mechanisms. Among them were selling part of the enterprise as tax shelter, or including gift money in the financing. The discussion led to no definite conclusions, however.

James A. Champy, '63, CJAC chairman, reported that at its December meeting the Corporation had accepted CJAC's recommendation that the Corporation form an advisory committee on institutional investment.

Municipal Incinerator Model Developed by Chem E Group

A nine-man research group in the Fuels Research Laboratory of the Department of Chemical Engineering has developed a model incinerator that may lead to a more efficient and effective municipal incinerator design.

To generate data on the burning of multiple kinds of solid waste that make up municipal refuse, the group has designed, built and tested an experimental apparatus that simulates the combustion conditions of the fuel bed of a typical traveling grade incinerator.

The project is supported by the Bureau of Solid Waste Management of the Environmental Protection Agency and has two main objectives: to find an easily monitorable index of incinerator burn-out that can be used in feed-back control devices; and to obtain data from which to design better air distribution within and above the fuel bed. The research group is headed by Professors Glen C. Williams, Adel F. Sarofim and Jack B. Howard of chemical engineering.

The MIT experimental incinerator is a cylindrical apparatus, divided into two sections, that simulates the vertical section of a bed of burning refuse. The top section, or overfire chamber, is supplied air through a combination of 12 nozzle-ports and ignites the fuel bed by radiant heat.

Some 50 separate measurements are made during a run and collected on a Data Acquisition System for later computer analysis and correlation. Preliminary results indicate that CO₂ emission may be the simple measure of the degree of residue burn-out that is being sought.

The main problem of incinerating solid wastes is that they may be anything at all, from paper bags to bedsprings. This results in a host of problems—particulate and gaseous emissions, incomplete burning, high cost, difficult operation, and use of supplementary fuels. The cheapest and most frequently employed method of disposing of the one billion pounds per day of municipal trash is sanitary landfill. But population

pressure on available land makes landfill increasingly less attractive and more costly. In cities incineration is often the only feasible method, yet incinerator design is still for the most part an empirical art: you take a feeder and a burner, attach a stack and run the thing the best way you can.

"It's not generally realized that solid waste incineration is one of the most complex processes in use," Professor Sarofim notes. "It's a far more complicated process than burning coal, for example, for electric power generation, but while no one would consider anything but the best engineering management for a power station, somehow people refuse to connect engineering with the incineration of waste. It's just a lot of trash—why bother about it? But that's why, nine times out of ten, when you see a heavy plume of smoke on the skyline it's a municipal incinerator."

"This attitude is probably changing," Professor Sarofim continues. "Although there's not yet much interest in this country in using the energy and products of waste incineration, several European cities are experimenting with firing boilers with supplementary solid waste fuel."

"The Issy-Molineux incinerator in Paris, which I visited at the time of the MIT Summer Study on Solid Waste Management, burned municipal waste at extremely high temperatures. The overfire and bed combustion were monitored over TV by highly trained engineers. Not only were they using waste to fire the boilers for power, but the burn-out residue was so clean and uniform that it's being used as road-surfacing in places where gravel is expensive."

Energy Conservation Effort Shows Promise

The Institute's effort to conserve energy and energy costs has shown outstanding results over the last seven months, according to Donald Whiston, deputy director of Physical Plant.

During the first four months of the 1971-72 fiscal year, electric power usage has been decreased by more than one million kilowatt hours as compared to the same period in 1970-71. This represents a 3.1 percent decrease, reversing the budget prediction of an increase in power consumption. At present unit prices, this indicates a savings of \$15,000.

It must be realized, however, that unit electric power rates have risen 21 percent in the past year. This reflects increased fuel costs to the power company as well as the effect of increased costs incurred from the use of fuel with a lower sulfur content. More importantly, the price increase amplifies the necessity of reduced energy consumption.

With nighttime coming earlier now, people are urged to continue their efforts and to be even more frugal in their use of lights and

other electrical appliances. Mr. Whiston offers one suggestion: "When leaving your office unattended, turn out the lights. Visitors may think you've left for the day, but the fact that your office is dark indicates your concern for energy conservation."

The Physical Plant Department is directing efforts toward saving fuel heating costs by controlling air ventilation after hours and on weekends in buildings where such procedures are feasible. The community can assist in this endeavor and contribute to substantial savings by operating laboratories and office spaces at a cooler temperature than in the past.

Comments and suggestions on this energy conservation program are welcomed and should be directed to Donald Whiston, Room E18-260, Ext. 4755.

Radcliffe Offers Institute Grants

The Radcliffe Institute is offering research fellowships for 1972-73 to women in New England who are engaged in, or preparing for, careers in college teaching. Selection of recipients of the awards is based on evaluation of the proposed research projects and on the applicants' qualifications. Candidates are expected to hold the Ph.D. degree or its equivalent in training and experience. Individual stipends are awarded according to need. More information and application forms may be obtained from the Dean, Radcliffe Institute, 3 James Street, Cambridge.

Ashdown House Space Available

Several openings for single graduate students are available in Ashdown House for the spring term. Students interested in living in the graduate residence should apply as soon as possible. Call or visit John Woodbury, house manager, in his Ashdown office, Ext. 2963.

TECH TALK

Volume 16, Number 24
December 15, 1971

Editor
Joanne Miller

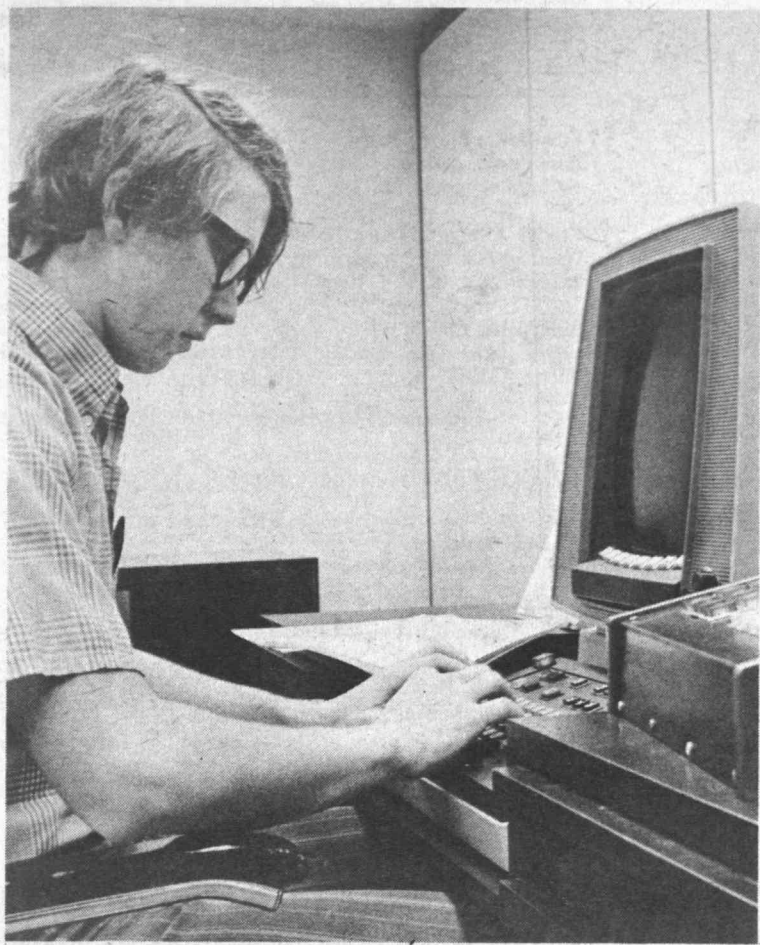
Staff
Robert M. Byers
Peter M. Close
Linda Omohundro
Ty Rabe

Business Manager
Paul E. Johnson

Tech Talk is published 50 times a year by the Institute Information Services, 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 \$7.50 per year. Checks should be made payable to Bursar, MIT, and mailed to the Editor, Room 5-111, MIT, Cambridge, Mass. 02139.

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



Richard Henige, '75, uses the BRISC terminal at Intrex.

—Photo by Bob Lyon

Library Council Grant Furtheres Intrex Work

The Council on Library Resources has made a \$400,000 grant to MIT to support for one year an experimental, computer-operated technical library that could be a prototype for information retrieval systems in libraries of the future.

The grant is the sixth of a series made by the Council to support the project, called Intrex, since its inception in 1967. Other support for Project Intrex has come from the National Science Foundation, the Carnegie Corporation, and the Independence Foundation.

Project Intrex (for information transfer experiments) arose out of a summer study at Woods Hole, Massachusetts in 1965 when a group of computer scientists, physicists, engineers and librarians met to consider possible applications of computer technology to library bibliographical systems and to outline the directions of a research program. What has been called the "information explosion" has presented libraries and scholars with severe information retrieval problems. At present some 36,000 books are published annually in the United States, and an estimated 35,000 specialized journals print nearly a million and a half articles each year.

Studies leading to the design of the Intrex system were begun five years ago at MIT under the direction of Professor Carl F.J. Overhage, who previously headed Lincoln Laboratory. The prototype system now in operation was developed by the Electronics Systems Laboratory under the direction of Professor J. Francis Reintjes.

The new grant from the Council on Library Resources will be

used for these experimental operations during the current 1971-72 year.

Although user consoles differ somewhat to test the effect of various configurations, each terminal contains two basic components, an electric typewriter with which to communicate with the computer and a means by which the computer can display requested information. At some terminals the computer responds via the typewriter itself, printing out a hard copy of the bibliographical information the user wants. At other stations, computer response is displayed on a cathode ray tube (CRT) that is about as big as a medium-sized TV screen. The information appears as a printed message on the screen, and once this word-image has been generated by the computer, it is turned over to a holding device within the console, which keeps the image sharp and flicker-free as long as the user wishes to study it, thus allowing the computer to turn its attention to other requests.

The Intrex user conducts literature searches by typing out questions and commands on the typewriter keyboard. One attractive feature of the system is that the computer instructs the novice user how to use the system as he proceeds, and anyone who can type the word "begin" (the code word for the instruction program) can start work almost at once. Intrex conducts catalog searches at extremely high speed, and can provide information not only by author, title, and subject, but can also count the number of articles on a specific topic, relate one field to another, and display on the CRT screen article abstracts, bibliographical data, and even full

Letter, New Observer Open Communications with Parents

"The energy with which freshmen are testing and applying their intellectual and interpersonal skills in the challenging university atmosphere is impressive," wrote Dean J. Daniel Nyhart in a letter which was mailed this week to their parents. "I trust that you will be able to capture some of this excitement in your conversations with your son or daughter."

The letter was the first in a series the Dean's Office plans in an effort to improve communications between the Institute and parents.

Under separate cover parents will also receive the first issue of a revised publication, the *Observer*, a copy of the *IAP Guide* and sample copies of several campus publications. The *Observer* was developed by the Institute Information Services in cooperation with the Office of the Dean for Student Affairs. It is a collection of news clippings about the Institute from campus, local and national newspapers and magazines.

Dean Nyhart says he "hopes the series of letters will not only give parents background on some of the events at the Institute, but also help them keep abreast of issues of the moment."

The first letter covers a broad range of topics. The fall semester's events are lightly sketched: the successful Residence/Orientation week, the bombing, an apparently low level of drug usage and a return to more traditional approaches to activities and academics.

The letter focuses on the Institute's belief in the maturity of the students and how that belief shapes policy. "We consider undergraduates to be young adults," he says, "and we try to relate to them accordingly."

Freshmen will also receive a copy of the initial letter. A similar letter will be written for parents of upperclassmen in the near future. (Both the letters and the texts.

Since it is not economically feasible to store entire texts in the computer memory, Intrex's full text capacity is contained on microfilm sheets called microfiche. Upon user command, the computer selects the desired microfiche from an automated file and it is photographically reproduced on the CRT screen. Using a panel of control buttons, the user can flip the "pages" of the image, and magnify the text for easy readability. In addition to the display, there is also a reproduction station where users may obtain hard-copy reproductions if they wish to retain printed copies of the material.

Current studies of Project Intrex include not only the ongoing research on user reactions to a machine-oriented library system, but also research aimed at determining the factors entailed in a large-scale operational system — cost/benefit analyses, improved software, augmented cataloging and data input.

media sampler will provide general, public communication between the Institute and parents.)

In commenting on the series of letters, Dean Nyhart emphasized "Our communications are, with few exceptions, directly with the students. We place great importance on good communications between parent and student, but do not seek to intrude."

In addition to the *Observer* and the *IAP Guide*, the sampler contains news on good communications between parent and student, but do not seek to intrude."

In addition to the *Observer* and the *IAP Guide*, the sampler contains copies of *Ergo*, *Tech Talk*, *The Tech* and *Thursday*, and flyers describing *Rain* and *Technology Review*. Subscription information on the publications is included and parents are invited to subscribe to any which appeal

to them.

Tech Engineering News has already conducted a successful subscription campaign and the year-book, *Technique*, will get in touch with parents in the spring.

The *Observer* was devised by Robert Byers of the News Office and William T. Struble of the Office of Publications. The first edition contains news articles from *The New York Times*, *The Washington Post* and other nationally known publications in addition to the views of the campus papers. Mr. Byers said that the *Observer* need not be limited to parents. "The news clipping format," he said, "is a compact method of reporting campus highlights and could prove useful for diverse audiences."

Sampler copies of the *Observer* are available in the Information Center, Room 7-111.

Calculus Course to Be CAES Offering on TV

The Center for Advanced Engineering Study (CAES) will offer its self-study subject, "Calculus Revisited," on WGBX Channel 44 television in the Boston area beginning January 5, 1972.

The unusual "refresher" course is designed for working engineers, industrial scientists and math teachers. "Calculus Revisited" is the first CAES course to be offered on television and represents an effort by the Center to make its materials more widely available to the public.

Each of the 38 televised calculus lectures by Herbert I. Gross, senior lecturer at CAES, will be broadcast over WGBX twice—once in the afternoon and once at night. In addition, the afternoon lectures at 3pm Mondays and Wednesdays will include a problem session with viewers telephoning in questions. Repeat broadcasts at 10:30pm Tuesdays and Thursdays will consist of the lectures only.

Students who register for the course (fee \$75) will receive a complete set of printed material including four volumes of study guides, a set of supplementary notes, and a book of photographs of the chalkboards to serve as lecture notes. The study guide contains step-by-step assignments, problems, pretests, quizzes and solutions.

Anyone who wants certification for having successfully completed the course may take a final exam at the Institute in June, 1972. Those passing the exam will receive a Certificate of Satisfactory Completion from CAES.

"Calculus Revisited," which will extend until June 22, 1972, covers the calculus of a single variable. Although designed as a refresher course, much of the material will seem new even to those who have studied calculus in the

past. The course emphasizes unifying threads—fundamental ideas that tie traditionally disparate subject areas together (algebra and geometry, differential and integral calculus).

Interested candidates for the course should write or visit the Center for Advanced Engineering Study, Room 9-253, Ext. 7400, for additional information and application forms.

Artists' Work on Display

Monumental sculptures by American artists Louise Nevelson, Bernard Rosenthal, Alexander Liberman, George Sugarman and Clement Meadmore are on display at various sites across the campus.

On exhibit through the winter, the five sculptures have been lent to MIT by the Lippincott Foundation. The works were recently part of a major sculpture exhibit held at Boston City Hall. Max Wasserman, MIT '35, donated the funds to the Committee on the Visual Arts for the transportation of the works from City Hall and for their installation at MIT.

The sculptures are located outside the Hermann Building, in front of the Center for Advanced Engineering Studies, outside the Bush Building lobby, between the Student Center and Kresge Auditorium, and in front of the Student Center.

The Committee hopes to acquire more pieces of modern sculpture in the near future. All of the Institute's art is purchased with funds donated to the Committee on the Visual Arts, specifically for art acquisitions. Most of the donors are MIT alumni. Frequently, individuals will donate pieces of art they think will be suitably displayed at MIT.

THE INSTITUTE CALENDAR

December 15
through
December 24

Events of Special Interest

Christmas Print Sale and Exhibition*

Sponsored by the Committee on the Visual Arts through Monday, December 20. Sale hours: Wednesday, Friday and Saturday, 10am-5pm; Thursday, 10am-9pm; Sunday 1-5pm; Monday 10am-5pm. Hayden Corridor Gallery.

Student Art Association*

Annual art sale featuring pottery, tie dye, jewelry, prints, photographs. Wednesday, December 15 through Saturday, December 18, Student Center 2nd floor.

Environmental Graphics Sale*

Original silkscreen posters, \$2 or less. Sale benefits Recycling Revolution Cooperative. Wednesday, December 15 through Friday, December 17, 9am-5pm, Bldg 10 Lobby.

Seminars and Lectures

Wednesday, December 15

Education in the Israeli Army

General Yitzhak Arad, chief education officer of the Israeli Army. Educational Research Center Colloquium. 12n, Rm 10-105.

Lunch-Seminar on Yugoslavia

Robin Remington, Center for International Studies. 12n-2pm, Faculty Club.

Technical and Economic Status of Nuclear Power Plants*

Prof. Manson Benedict, nuclear engineering. Electric Power Systems Engineering Laboratory Seminar. 3pm, Rm 3-133.

Combined State and Parameter Estimation for On-Line Applications

Peter S. Maybeck, aeronautics and astronautics. Doctoral Thesis Seminar. 3pm, Rm 33-206.

Mechanisms of Cleft Palate Formation

Dr. A. Carl Verrusio, Division of Developmental Biology, American Dental Association. Oral Science Seminar. 3-5pm, Rm E18-301.

Some Aspects of the Interaction of Group Theory and System Theory

Alan S. Willsky, graduate student, aeronautics and astronautics. Decision and Control Sciences Group Seminar. 4pm, Rm 39-500.

The Origin of Metal-Bearing Submarine Hydrothermal Solutions

Dr. John B. Corliss, Dept of Geology and Geophysics, Yale University. Earth and Planetary Sciences Seminar. 4pm, rm54-100.

Pulsars

Prof. Thomas Gold, Cornell University. Special Astrophysics Seminar. 4:15pm, Rm 37-252. Coffee, 4pm.

Thursday, December 16

The Design of Abstract Machine Models and Their Programming Languages*

Prof. W.M. Waite, University of Colorado. Project MAC Seminar. 3:30pm, 545 Tech Sq, 5th floor Conference Rm. Coffee, 3pm.

Some Remarks on Rationality, Self-Interest and Time*

Derek Parfit, Oxford University. Philosophy Seminar. 4:30 pm, Rm 10-105.

Parenteral Alimentation in Children*

Dr. Robert Filler, Associate Clinical Professor of Surgery, and Dr. John Das, Lecturer in Surgery, Children's Hospital. Nutrition and Food Sciences Seminar. 4:30pm, Rm 16-134. Coffee, 4:15pm.

The Head on the Shield of Pallas

Prof. Jerome Y. Lettvin, biology. Physics Colloquium. 4:30pm, Rm 26-100. Punch and cookies, 4pm, Rm 26-110.

Friday, December 17

Reflections on Attica, Prison, and Justice*

Videotape replay of speech given at Harvard by Tom Wicker, associate editor, *New York Times*. Educational Research Center Colloquium. 12n, Rm 9-150.

Mass Transfer with Reversible Reaction through Thin Films*

J. Meldon, chemical engineering. 2pm, Rm 10-275.

Nickel-Zinc Batteries*

O. Hammond, chemical engineering. 3pm, Rm 10-275.

Monday, December 20

Role of Cyclic AMP in Function of Blood Platelets**

Dr. Edwin W. Salzman, associate professor, Harvard Medical School. Harvard/MIT Bio-Material Seminar. 4:30pm, Rm 14E-311.

Student Meetings

Student Information Processing Board Meeting

Every Monday, 7:30pm, Rm 39-200.

Thursday Staff Meeting**

Every Thursday, 8pm, 2nd floor, Walker.

Technique Staff Meeting

Every Saturday, 11am, Student Center Rm 457.

Tech Engineering News Staff Meeting

Every Sunday, 5pm, TEN Office, Student Center Rm 453.

ERGO Staff Meeting

Every Sunday, 6pm, Student Center Rm 443.

MIT Club Notes

Book of the Week*

Informal discussion over dinner of *Deschooling Society* by Ivan Illich. Wednesday, December 15, 5:15-7:15pm, Ashdown Dining Hall (table near door). Call James Snell, 523-1198.

Scuba Club Pool Session**

Wednesday, December 15, 8pm, Alumni Pool.

Baker House SPAZ Jogging Club**

Daily, 10:45pm, Baker 2nd Floor West.

Hobby Shop**

Open weekdays, 10am-4:30pm, duPont Gym basement. Fee: students \$6/term or \$10/year; community, \$15/year. Call X4343.

Tiddlywinks Association*

Every Monday, 8-11:30pm, Student Center Rm 473.

Judo Club**

Every Monday, Wednesday, Friday, 5pm; every Saturday 1pm. DuPont Gym Exercise Rm. Beginners welcome.

Outing Club*

Every Monday, Thursday, 5pm, Student Center Rm 473.

Classical Guitar Society**

Classical and Flamenco guitar classes: private, Monday, 7-9pm; group, Thursdays, 5-8pm. All in Rm 1-136. Call 661-0297.

Fencing Club**

Every Tuesday, 6-9pm, duPont Fencing Rm.

Table Tennis Club***

Meeting and practice. Every Wednesday, 7:30-10pm, duPont Gym T-Club Lounge.

Soaring Association*

Ground school, first Thursday every month; general meeting, third Thursday every month. 7:30pm, Student Center Rm 473.

Science Fiction Society*

Every Friday, 5pm, Rm 1-236.

Indian Folk Dance and Lore***

Boston Indian Council, Inc. Every Friday, 7-11pm, Student Center Rm 407.

Student Homophile League*

Meeting and Mixer. Every Friday, 7:30pm, Mission Church, 33 Bowdoin St, Boston.

Bridge Club**

Duplicate bridge. Every Saturday, 1-5pm, Student Center Rm 473. Admission: \$2 per term or 75 cents per session.

Chess Club**

Every Saturday, Sunday, 1:30-5:30pm, Student Center Rm 407.

Tech Model Railroad Club**

Every Saturday, 4pm, Rm 20E-210.

MIT/DL Duplicate Bridge Club**

Every Sunday, 7pm, Walker Blue Rm. Every Tuesday, 6pm, Student Center Rm 491.

Dance

Modern Dance Technique Class**

Elementary/Intermediate. Every Monday, Wednesday, Friday, 5:15pm. Every Sunday, 1pm. McCormick Gym.

Folk Dance Club*

Balkan folk dancing. Every Tuesday, 7:30-11pm, Student Center Rm 407.

Tech Squares*

Every Tuesday, 8-11pm, Rm 10-105. Call dorm X0888 or 492-5453.

Dance Workshop**

Modern dance classes in McCormick Gym: elementary, Tuesdays, Thursdays, 10am, 2pm; intermediate, Tuesdays, Thursdays, 12pm general, Thursdays, 7pm. Admission: \$2 for community, free for students. Call Cha-Rie Tang, dorm X0908.

Folk Dance Club*

Israeli folk dancing. Every Thursday, 7:30-10pm, duPont Gym T-Club Lounge.

Friday Afternoon Dance Break*

International folk dancing on the oval lawn in front of Kresge. Every Friday, 12:30-1:30pm.

Folk Dance Club*

International folk dancing. Every Sunday, 7:30-11pm, Sala de Puerto Rico.

Mixers

Muddy Charles Pub **

Join your friends at the Muddy Charles Pub, 110 Walker, daily 10:30am-7:30pm. Call X2158.

Friday Afternoon Club **

Music, conversation and all the cold draft Budweiser you can drink. Featuring folk singer Rich Holloway. Every Friday, 5:30pm. Ashdown basement Games Rm. Admission: men \$1, women free. Must be over 21.

Music

Thursday Noonhour Concert*

Bach Cantata 140 "Wachet Auf" with soprano Sandra Stuart, bass Richard Butler and the Chamber Orchestra. Thursday, December 16, 12:10-1pm, Chapel.

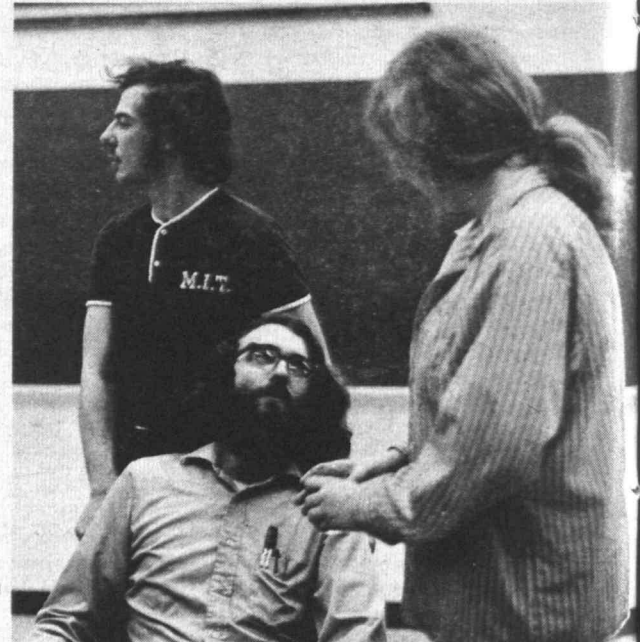
Mixed Chorus

Informal singing group. Every Monday, 9:30pm, McCormick. Call Sue, dorm X0990.

Theater and Shows

MIT Community Players *

Anton Chekhov's classic drama, *The Sea Gull*. Wednesday, December 15 through Saturday, December 18, 8:30pm, Kresge Little Theatre. Call X4720.



Left to right, Al Solish, '72, Lewis Morton and Sully Bon... rehearse for the Community Player's production of *The Sea Gull* by Anton Chekhov.

Exhibitions

Exhibition of Paintings by Susan E. Schur

On display at the Faculty Club through mid-January.

Photographs by Josh Collins*

On display in the Rotch Library through February 4.

Art LaZar Exhibition*

Creative Photography Gallery (3rd floor duPont Gym), 12n-7pm. December 10 through mid January.

Report of the Ad Hoc Committee on the M.I.T. Library System

Massachusetts Institute of Technology

December 15, 1971

Members

Boruch A. Brody

Department of Philosophy

James G. Corum

Graduate Student, Department of Philosophy

Robert M. Fano

Department of Electrical Engineering

Roy Kaplow

Department of Metallurgy and Materials Science

Daniel Kleppner

Department of Physics

Roger H. Koch

Undergraduate Student, Department of Architecture

Henry A. Millon

Department of Architecture

Peter Temin

Department of Economics

Jerrod W. Wilcox

Alfred P. Sloan School of Management

Robert A. Alberty, Chairman

School of Science

As President Howard W. Johnson pointed out in his charge to the Committee on May 19, 1971, the expenditures of the Libraries have grown from \$600,000 in 1961 to \$2,714,000 in 1970, and the number of separate library units and reading rooms has expanded significantly. The President went on to say that the financial pressures on the Institute represent one of the most important constraints of the library system in the years to come. To put the library costs in some perspective, the 1971 Treasurer's Report shows that the operating expenses of the Libraries totaled \$3,030,000 in comparison with expenditures of \$27,918,000 for instruction and unsponsored research and direct costs of \$49,015,000 for sponsored departmental and interdepartmental research, excluding Lincoln Laboratory and Draper Laboratory. None of these figures include plant operation and maintenance, or general and administrative support expenses. The library expenses (which were borne in part by special funds totaling \$619,000) can be broken down as follows:

	1971
Salary and Employee Benefits	\$2,015,000
Books, journals, serials, and binding	592,000
Data processing expense	123,000
Other operating expense	300,000
TOTAL	\$3,030,000

The plant costs for the Libraries are estimated as \$623,000. The various reading rooms which are not administered centrally cost about \$46,000 in general funds and \$153,000 in DSR funds: Draper and Lincoln Laboratories are excluded from these figures. Thus the total library costs excluding Lincoln and Draper are about \$3.8 million per year, excluding general and administrative support outside of the Libraries. The record of MIT library expenditures over the last ten years is described in Appendix A.

Over the last decade the budget of the MIT Libraries has grown substantially faster than the over-all Institute budget. While part of this growth resulted from the need of expanding substantially particular collections such as the Dewey and Rotch Libraries, a good part of it resulted from built-in factors and historical trends that apply to the entire library system. Among such factors is the fact that the cost of maintaining and operating the library system must necessarily grow with the size of the collection, as new publications are added to the collection each year, and the fact that both the amount of material published per year and the cost per item are increasing with time. Thus, it appears that extrapolation into the future of the current library policies implies a continuously increasing budget and need for space. If it is not possible to increase the library budget at this rate, there would probably be a deterioration in the whole library system unless there are basic changes in objectives and policies. Thus, it is necessary to identify in specific terms the support that the Libraries are expected to provide to MIT's educational and research objectives, and concentrate the library resources accordingly, in the hope that such support can indeed be provided with a budget that remains a reasonably constant percentage of the total MIT budget (the current percentage may have to be revised upward or downward).

As the number of books and journals has increased, the problem of finding adequate space for shelving has become increasingly serious. Present studies indicate that several libraries will become saturated in a year or two, with others not far behind. Even if these immediate problems can be solved, consideration of the rates of growth of collections of books and periodicals indicates that a more serious problem will have to be faced in the future.

General Conclusions

Our studies of the MIT Libraries have led us to a series of general conclusions from which a number of recommendations have been developed.

- I. The library is an integral part of MIT's over-all educational and research programs. It must not be an independent entity. Since its essential function is service, its operations must be interlaced in a most intimate way with the various

departments and laboratories and guided by measures of the effectiveness of these services.

- II. The function of the MIT library is to provide access to information. The storage of information is useful only as a means toward that end. Information comes in many forms (including pictures, film, and magnetic tape), and there are different degrees of urgency of acquiring various types of information.
- III. The relation of the library to the educational and research programs at MIT varies from field to field. For some disciplines the primary role of the Libraries is to provide access to knowledge acquired in the past; for others the primary role of the Libraries is to provide access to the very objects studied by that discipline. In the latter case the library plays a role similar to that of a laboratory.
- IV. The rate of growth of resources available for use by the MIT library is limited. The library budget cannot grow faster than that of the Institute for long, and the space for libraries cannot grow faster than the total space on campus for long.
- V. Libraries should not operate independently of other libraries. This applies both inside and outside the MIT library system. In order to provide access to all the information needed by this community, the MIT library has to cooperate with other libraries and in the future, hopefully, with new types of national or regional libraries.

Recommendations

1. Involvement of Department Heads, Faculty, and Students

Greater involvement of department heads, faculty, and students is needed in the allocation of library resources. The Executive Board on the Libraries has recently been more active, but we recommend that it participate more intimately in decisions about the library. We recommend that undergraduate, and graduate students and the Director of Information Processing Services or his delegate be made regular members of the Executive Board. The Director of Libraries has not been chairman of the Executive Board, and we believe this is proper. We recommend that the Executive Board on the Libraries have an opportunity to review budget allocations to various fields and libraries.

Since the Advisory Board of the Committee on the Libraries, which consists of one representative of each department not already represented on the Executive Board, does not appear to have functioned as was envisioned by the faculty, we recommend that it be abolished and better mechanisms be developed for the participation by faculty in decisions on library operations and on purchases of books and subscriptions to journals and serials.

Although it has been possible in the past to operate the Libraries without much faculty or student participation, we do not believe this will be a satisfactory mode of operation in the future. If it becomes necessary to reduce acquisitions or to change the allocations to various libraries because of budget restrictions and the development of new fields, there is the danger that the faculty, students and others will be penalized if resources are not used to the best advantage. A few faculty members have a great interest in the library and participate actively in book and journal selections; we need more. One way to obtain a closer coupling is through faculty-student committees for each of the libraries and reading rooms. These committees would include representatives of departments and laboratories being served by that particular library. These committees need to be directly involved in making decisions about book purchases, journal acquisitions, and cancellations. It is to be noted that the Rotch Library has a faculty committee which meets regularly and is quite effective.

2. Application of Computers

Certain day-to-day operations in the library need to be computerized to make them more efficient and information about usage needs to be collected in order to improve decision making. The volume of business of the library has increased during the last decade to the point that it is no longer possible to maintain proper control of the operation without the help of computers. Libraries are, in this respect, no different from most organizations dedicated to serving a large community of people. It isn't so much that money can be saved by computerizing clerical operations, although this may indeed be the case, but rather that the information necessary for proper coordination of activities and for the effective use of available resources can no longer be obtained through manual operations. In particular, intelligent decisions about acquisitions and disposal of material requires data on usage which cannot be effec-

Introduction

The Libraries form a large and important part of the Institute and serve a vital and varied function. The library system includes the Libraries administered by the Director of Libraries, the Barker Engineering Library, and 28 reading rooms administered by departments and laboratories.

Some 270 full-time equivalent people are employed in the Libraries administered by the Director of Libraries and the Barker Engineering Library. Of these, 79 are staff, 163 are non-staff, and 28 are students.

The Libraries occupy a total of some 190,000 square feet of floor space.

	Area (square feet)
Hayden	75,015
Dewey	24,199
Barker Engineering	27,495
Rotch	7,945
Lindgren	4,220
Student Center	18,490
Chemistry Reading Room	4,905
Aeronautics and Astronautics	4,470
Space Center Reading Room	1,335
Materials Science Reading Room	605
Other Reading Rooms	21,000
TOTAL	189,679

The Barker Engineering Library has 3,340 square feet of off-campus storage at the EPSCO Building, and the MIT Libraries have approximately 850 square feet of space at the New England Depository Library. There are 28 reading rooms in various departments and laboratories excluding Draper Laboratory and Lincoln Laboratory.

tively gathered manually. The computer system for acquisition which has been in operation in the Libraries since the beginning of 1971 has allowed the library to cancel many out-of-date unwanted orders.

We recommend that the library administration look at computer application costs as competitive with other library costs in maximizing the quality of library service.

With Projects INTREX and TIP, MIT has been a leader in the application of computers to improve the accessibility of information. The Ad Hoc Committee hopes that the resources for continued development in this area can be obtained externally and that MIT can become a leader in the application of new methods, particularly as costs of computation and electronic information storage are reduced. We feel that the Institute's Libraries would be stronger with more coordination and cooperation between different activities in this general area.

The effective use of computers in the operation of the MIT Libraries and the introduction of new computer-based library services will require considerable research and development. The Libraries should seek external support for it, and faculty and students should be encouraged to participate in it. However, we do not encourage the establishment of a research laboratory specifically devoted to library problems unless MIT should want to initiate a graduate program in library sciences. If such a laboratory were established, it would unavoidably develop research interests and commitments of its own, independent of the objectives and needs of the MIT Libraries.

Further needs for the application of computers in the MIT Libraries are discussed in Appendix B.

3. Administration of the MIT Library System

The Libraries will need new points of view and new means of fulfilling its obligations and an attitude of encouraging experimentation and innovation. We believe the faculty, students, and administration should look to the Director of Libraries for over-all coordination of library activities at the Institute.

The Barker Engineering Library should be brought back into the MIT Libraries under the Director of Libraries and the over-view of the Executive Board of the Libraries. This library has been administratively separate and has been a direct responsibility of the Provost during a period when a number of new ideas were being developed and successfully introduced into the Barker Engineering Library in connection with Project INTREX. The committee feels that the value of the Libraries will be enhanced by maximizing cooperation among the Libraries and reading rooms and by providing increased coordination in terms of management and services. In recommending that the various libraries be brought under a single management, we want to emphasize that we believe that the control of various libraries centrally should provide for a considerable variety of services to meet the needs of various parts of the Institute and should allow experimentation with new methods for satisfying these needs. As a result of the reorganization, we would like to see the Director of Libraries have an over-view of the reading rooms not included in the MIT Libraries.

We feel that the responsibilities of the Director of Libraries are in many respects analogous with those of the Director of Information Processing Services. In the future it may be necessary to greatly increase the coordination between them.

The Director of Libraries should report to the Provost. It is our expectation that the Provost may very well want an Advisory Committee, which he would chair, which would advise the administration on the whole range of library-related matters. We do not refer here to the Executive Board on the Libraries specified by *Rules and Regulations of the Faculty*, but to a presidentially appointed committee.

As spokesman for the whole MIT library system, the Director needs time to develop increasingly close relations with libraries outside of MIT and to work with others in the development of regional and national libraries discussed briefly in Appendix C.

The size of the budget, the number of personnel, the necessity for financial planning, and the need to constantly re-examine the effectiveness with which funds are spent all suggest that the Director needs the assistance of someone with the training and experience to manage the business operations of the library. We therefore recommend the appointment of a business manager to administer these operations of the Libraries. This person would report to the Director of Libraries and would be responsible for efficient purchasing, accounting and effective operations and would assist the Director in planning and budgeting. The last few years the Libraries and the Executive Board on the Libraries have found it difficult to make longer range plans because of uncertainties with respect to basic policies. We hope that our report and the subsequent discussion can clarify these issues so that, say, a three-year budget could be developed for the MIT Libraries. Such plans would have to be revised every year, but it would help to reduce the stops and starts that occur when future costs are not identified and programmed.

4. Undergraduate Students and the MIT Libraries

Library services needed by undergraduates are for the most part quite different from those needed by graduate

students and faculty, and a number of improvements can be made. Undergraduates frequently find that reserve books are not available in time; faculty often do not respond early enough. Sometimes too many books are kept on reserve too long so that books are not available for circulation. We recommend that there should be more general reading material in the library. We feel that the library needs to do a better job of preparing information about how to use the library. Further material on undergraduate library needs is in Appendix D.

5. Inter-Library Cooperation

A greater degree of cooperation between libraries needs to be developed both within MIT and between MIT and other institutions. No one believes that any university library can be self-sufficient. Although our Libraries do have a program of inter-library loan and a number of cooperative arrangements with other libraries, we see the need for vastly increased cooperation and for the development of new institutions in the area and nationally.

It is essential to establish inter-library cooperation of a degree far greater than that represented by the traditional inter-library loans. The goal is to provide users with effective and quick access to the holdings of a great number of libraries; in other words, the different libraries should appear to each user as a single library system whose internal operation is largely hidden from him. We are far from this goal even within MIT. The different libraries at MIT seem to operate largely as independent entities, sometimes in competition with one another.

We recommend rather specific negotiations designed to lead to various forms of cooperation, which might include the following: a common deposit library with access from all member libraries, reciprocal borrowing privileges between libraries, a complementary acquisitions policy on the part of several libraries, or purchases of library services from particular libraries for agreed cash payments. MIT should lose no time in initiating preliminary discussions with other universities in the Boston area.

6. Storage Space

The number of books in the MIT Libraries has increased from 710,000 in 1962 to about 1,300,000 in 1971. This corresponds with an average rate of growth of 7% per year. A 7% per year growth rate of books leads to a doubling of stack space every ten years if nothing is removed, and, once a library system is as large as that at MIT, this requires a large capital investment for storage in addition to the initial acquisition costs of the books and an increase in those operating expenses which depend on the size of the collection. What is more disquieting is that the growth rate appears to be increasing as is the growth rate of publications themselves. The Sherwood Report points out that between the turn of the century and 1954 the number of volumes increased at an average rate of 4% per year and from 1954 to 1962 at a rate of 5.6% per year. It is currently estimated that even with possible additional shelving Dewey will be saturated by 1972, Hayden by 1974, Lindgren by 1974. Rotch is already saturated.

The immediate problems of space and the data on current growth rate point up the need for a fundamental change in library policies. In the future the Libraries will have to accept the responsibility for limiting their growth, while at the same time meeting the needs of the community. This will involve developing effective methods to optimize the choice of acquisitions, and the use of more and more off-campus storage. Such storage should be accessible to the users but, more importantly, it must be possible to locate and retrieve material from on campus with a minimum of delay. Methods must be developed to allow material to be transferred routinely from high priority to low priority storage (and to be returned if needed).

7. Centralization Versus Decentralization

As described in the introduction, the MIT community is served by a variety of libraries from large centralized libraries to small reading rooms. These various types of libraries seem to be serving important functions, and we feel that no major change in the mix of libraries is indicated at this time.

Clearly the roles that the various libraries and reading rooms at MIT are expected to play vary considerably from discipline to discipline. Thus, the acquisition, retention, and operating policies should be different in different parts of the library system. Policies should, perhaps, vary from discipline to discipline within a major library. In other words, the major libraries may have to act as aggregates of smaller, specialized libraries.

As mentioned elsewhere (Section 5 and Appendix C), we feel that there should be a greater degree of cooperation and coordination among MIT Libraries and better information for the user as to the coverage in each of the various libraries.

We recommend that the degree of duplication between MIT Libraries be investigated and more definite policies developed so that the duplication can be reduced. Specifically, we question the policy that every item in a reading room must also exist in the main library that encompasses the field of the reading room. We also question the duplication of material in libraries with overlapping fields of interest, unless justified by high

frequency of use. The development of new areas of instruction and research will inevitably lead to requests for new libraries, and these will have to be judged on their merits and in terms of available funding.

From a long-range point of view it would be very attractive to combine Dewey, Rotch, and Humanities Libraries. The fields they represent overlap a great deal and a library in one place would be more convenient for users and more economical in operation. This move remains a goal that can be reached only if the resources can be found in competition with other possible projects of this scale.

8. Acquisition Policies

Better information on usage and need is required to guide the acquisition process. Usage is difficult to measure, but various measures can guide better book and journal selection and retention and the decision as to whether or not to offer other types of services. Part of the collection is used only very rarely, and it is unfortunately true that while faculty and students point out material that should be purchased, there is no feedback from the material that is not used. In the case of less frequently used materials, acquisition policies should take into account the accessibility of material from other libraries. In the case of more frequently used materials it is important to have more duplication of these materials in order to avoid delays when these materials are in use or at the bindery.

It would be highly desirable to bring new resources into acquiring enlarged collections in specific areas. Private gifts of funds should be sought. We would like to see the question raised as to whether more specialized books and journals could be paid for by grant or contract funds. Some new programs may be able to raise funds to pay for the new books and journals they need in the library. Some of this is done already, but we see the need for more. A more complete discussion of acquisition policies is given in Appendix E.

9. Additional Services

In considering priorities to determine the balance of resources to be expended in different ways, it should not always be assumed that the possible choice of services lies within those currently being offered. That is, a better over-all balance may be achieved by introducing other services—even at the expense of lessening the effort in those now available.

A variety of information services which are now well known can be mentioned.

- Selected dissemination of current information based on user profiles, either in a periodically provided, individualized list of article citations or (ultimately) in a pseudo-journal, a personalized collection of copies of relevant articles.
- Distribution of current journal title lists, in association with a by-request copy service.
- An internal awareness service, consisting of distribution of lists of MIT-generated reports, preprints, articles, etc.
- Expansion of the micro-fiche library and fiche reader supply, including long-term rental of readers.
- Literature surveys, retrospective searches and other library-research services, provided by library staff.

Some, if not all of these, might be essentially on a pay-as-you-go basis. Some may be available commercially and the library might then act mainly as a "broker" to achieve better service and/or economy for MIT users.

Appendix A

MIT Library Expenditures 1960-1971

The annual Treasurer's Report shows the library expenses, and Table I (see below) provides a summary for 1960 to 1971. These expenditures do not include Lincoln and Draper Laboratories or plant operation and maintenance. Data processing was not shown separately until the 1970 Treasurer's Report and is not readily available prior to that. The source of funds is shown at the bottom of the table to show that part of the increased expenditures in 1970 and 1971 is due to restricted funds received from outside MIT for the support of research.

In order to provide some perspective, the annual Treasurer's Reports have been used to construct Table II (see below) which shows the total expenditures for MIT for the same period. Different people will naturally enough have different ideas about how library expenses should be compared with other expenses of operating the Institute, but there is no question that the library expenses are sufficiently large that the changes in the future have to be looked at in the context of these other expenses.

Appendix B

Application of Computers in the MIT Libraries

Computerized Acquisition System

The MIT library currently operates a computerized acquisition system in parallel with the manual system.

This system was developed under Project TIP. The acquisition system includes data about each operation performed on a book ordered since the beginning of the year and on all issues of journals for which a subscription has been made or renewed during the year. The history of a book begins when the order is placed and ends when the book has been cataloged and placed on the shelves. It includes a variety of information in addition to the pertinent dates, such as the agency from which the book has been ordered, the MIT account to which it is to be charged, and the Library of Congress call number. One value of the system lies in its ability to generate a variety of lists on request. For instance, the system can generate the list of books that have been on order from a particular agency for more than a year. Lists such as these have resulted in the cancellation of orders for some 3,500 books since the beginning of 1971. This amounts to a saving of some \$50,000. Since such lists are generated by agency, a single letter can cancel many orders. This system has also proved valuable in detecting duplicate orders from separate libraries, and there are indications it is also saving manpower. Still, most of the savings so far and in the future will probably result from being able to manage and utilize library resources in a more effective manner. While the information necessary to cancel unfilled orders has always been available, it could not be searched fast enough by manual means to be of any use.

Another aspect of the operation of the library in which computer aids should prove very valuable is circulation. At present, no data are available on usage of individual items on which to base acquisition and storage decisions. Of course, such information could be gotten from the cards attached to each book, but this process would be inordinately long and expensive. It is difficult to estimate at this time how much money and space on campus could be saved if detailed data on circulation were available; circumstantial evidence, however, suggests that the savings may be considerable.

A considerable fraction of the current library budget, of the order of one quarter, goes into cataloging. Roughly speaking, the cost of cataloging a book is equal to the cost of the book itself when no Library of Congress card is available, and half as much when the card is available. We believe, and several librarians with whom we spoke agree, that the value to the user of the current catalog is not commensurate with the amount of money that goes into its preparation and maintenance.

The card catalog is performing two very distinct functions; namely, it acts both as an inventory of MIT holdings and as an aid to information retrieval. The fact that these two very distinct functions are performed by the same instrument and are therefore interwoven with each other leads to a very significant reduction of flexibility in the operation of the library and a limitation on the quality and extent of services that can be provided to the library users. The following are some specific examples:

1. Aid with respect to information retrieval is provided only with respect to publications that exist at MIT; even then only the Union Catalog can provide this help because the catalogs in the other libraries can speak only about the locally available publications. A side effect is a subtle pressure to acquire publications so that they can be entered in the catalog.
2. The fact that the physical location of an item is entered in all duplicate cards deemed necessary to meet the information retrieval objectives of the catalog means that any change in the location of a book becomes a prohibitively expensive proposition. As a result there is a great reluctance to storing

seldom used publications outside the main libraries. Specifically, it is difficult and expensive to move items from open shelves to dead storage and vice versa as the situation demands, and also to move items from one MIT library to another as the usage pattern changes.

3. It would be desirable for many purposes to have at several locations on the campus a complete inventory of what is available at MIT. Having the entire catalog at several locations is clearly impractical, but it might be possible to have several copies of an inventory. Furthermore, a computerized inventory is a relatively simple proposition; as a matter of fact, we are creating a computerized inventory for all new acquisitions.

4. The separation of the inventory function from the information retrieval function would open the door to providing more effective information retrieval with respect to items that are not available at MIT. We regard this as a very important objective.

On the basis of the above considerations we tentatively suggest that the current catalog be replaced (for future acquisitions) by a combination of the following services:

1. The Library of Congress cards in areas of interest to MIT should be collected without any selection process other than by field. They should be assembled in a file either in micro-fiche form or in card form, possibly simply in a linear arrangement according to Library of Congress call number. This would allow a form of browsing that should be quite useful since the file would include many items not available at MIT. Of course, at a greater cost, one could arrange these cards with duplicates according to the subject classifications specified by the Library of Congress cards. The latter extreme would probably be cost effective only if there were a national service which provided all the necessary card headings and updates so that the only cost to MIT in addition to the subscription would be the manual labor to put the cards into drawers.

2. The present computerized acquisition system should be expanded to include the physical location of each item and subject phrases supplied at the time a monograph is ordered. These subject phrases would in effect represent the reasons why the monograph is considered to be useful to the MIT community. The individual subject phrases would be separately stored in the computer system with lists of pointers pointing to the corresponding inventory items. Synonyms could be easily handled through additional pointers added later on as needed. While we are suggesting these entries for monographs that are purchased by MIT there is no reason why other items may not be included. For instance, monographs that may be of interest to the MIT community but for which a purchase decision is being deferred might be included. This would have the advantage of providing data on which purchase decisions may be more wisely made later on. Of course, subject phrases could be very readily added later on as, for example, when new interdisciplinary areas become of interest to the MIT community. Incidentally, this would open the way to the preparation of "virtual collections" in new areas, which would look very real to the user except for the fact that the items may not be stored in the same place. Once an inventory of MIT holdings together with the subject-phrase retrieval mechanism is available in a computer system, it would be an easy matter to generate, print, and distribute to interested members of the MIT community a variety

of bibliographies pertaining to disciplinary as well as interdisciplinary areas. It is entirely conceivable, moreover, that such an acquisition/inventory/retrieval system could be maintained as a joint facility with many other libraries in the region. The various staffs would then utilize a common acquisitions system but with separate data files while users of the retrieval system could have remote, on-line access to the complete collection.

We wish to re-emphasize at this point that the use of computers in the operation of the library should be tightly integrated with the rest of the operation. This implies that whoever is responsible for the computerization of any aspect of the operation of the library should be in an appropriate line position rather than in a staff position as at present. It also implies that the use of computers should be planned as part of the operation of the library and not as a separate matter. Thus, specifically, the above remarks should be taken as suggestions for consideration and as indication of the areas of concern to the Committee rather than as specific recommendations, since the Committee cannot possibly be in a position to recommend in detail an over-all reorganization of the operation of the library.

Handling of Data on Magnetic Tapes

A growing volume of data of interest to the MIT community is being made available on magnetic tapes. The question arises as to who at MIT should collect such tapes and make them available to the community. One might say that these tapes are the modern equivalent of printed matter and as such they should be the responsibility of the Libraries. On the other hand, the facilities for storing magnetic tapes are quite different from those available to the Libraries. Furthermore, magnetic tapes are of little use out of the context of a suitable computer system and programs to extract relevant information from them. From this second point of view, the Information Processing Center should be responsible for collecting magnetic tapes and making them available to the MIT community. In fact, there are two different types of data that are currently available on magnetic tapes: data pertaining to the printed literature such as *Chemical Abstracts*, and other data, such as census data, that have nothing to do with the printed literature. Collecting and making available the former should be part of the services provided by the Libraries to the community. This should be so, regardless of where the tapes are actually stored and of the agency that manages the computer facilities on which the tapes are used. This allocation of responsibility seems to be straightforward. On the other hand, it is not at all clear who should have the responsibility for collecting and making available other types of data on tapes. At present, the particular groups at MIT that are primarily interested in such data have assumed the responsibility. On the other hand, as the interest in such data becomes more widespread, it might be desirable to centralize this responsibility somewhere at MIT. It is relevant that one of the current agenda items for the Information Processing Advisory Committee is, "How can we sharpen the definition of the interfaces of responsibility for various aspects of computing in the community, i.e., what should be the responsibilities of the Information Processing Center, what are the responsibilities of users, and what are the responsibilities of academic departments, etc., with respect to the development and use of computers? Of particular importance here is the fact that budgets for performing work must be aligned with responsibilities."

In the data tapes area, the libraries must be involved in helping to define and clarify the mix of Information

Table I: MIT Libraries' Expenditures and Sources of Funds, Fiscal Years 1960 through 1971 (Thousands of Dollars)

Expenditures	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Salaries and employee benefits	357	407	440	481	532	624	857	1,082	1,227	1,287	1,760	2,016
Books, journals and binding	102	108	107	122	121	217	346	427	516	444	505	591
Data processing expense											174	123
Other operating expenses	31	65	67	72	57	39	70	131	99	171	275	300
Total	490	580	614	675	710	880	1,273	1,640	1,842	1,902	2,714	3,030
Source of Funds												
Restricted Funds	25	48	28	33	28	32	35	82	62	41	552	619
MIT General	465	532	586	642	682	848	1,238	1,558	1,780	1,861	2,162	2,411

Table II: Operating Expenses of MIT, Treasurer's Report (Thousands of Dollars)

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Instruction and unsponsored research	12,185	13,366	13,626	14,731	17,119	20,247	22,289	23,665	25,134	27,918
Sponsored research										
On campus	22,671	26,255	32,288	33,735	37,382	41,621	45,819	45,812	46,409	49,015
Off campus	57,967	75,447	84,793	91,160	94,034	103,793	106,678	108,010	99,129	87,232
Vacation	1,639	1,686	1,964	2,402	2,369	2,631	3,609	3,516	3,754	4,139
General & Administrative	805	938	1,119	1,169	1,119	1,113	1,146	1,247	1,539	1,562
Costs applicable to both instruction & research										
Libraries on campus	614	675	710	880	1,273	1,517	1,842	1,902	2,714	3,030
Plant operation and general and administrative support	11,342	12,215	13,616	15,287	15,287	20,832	23,789	24,241	29,092	31,156
Student-related expenses	1,059	1,164	1,737	976	1,250	1,596	1,788	2,341	2,194	2,679
Auxiliary activities	2,178	2,290	2,635	3,742	4,262	5,081	5,534	5,966	6,878	7,162
TOTAL	110,460	134,036	152,488	164,082	176,906	198,431	212,355	216,700	216,843	213,893

Processing Center provided services, library services, and user-maintained software. Regardless of where the responsibilities are ultimately placed, it will be necessary to plan software development and to aim for stability of service, including continuity through changes in major computer operating systems.

Research on Topics of Interest to the Libraries

Projects INTREX and TIP are two major research efforts which have been in progress at MIT on library problems. Both of them have been closely associated with the MIT Libraries, and have also utilized personnel and/or other resources from research laboratories on the MIT campus, such as the Electronic Systems Laboratory and Project MAC. They have also involved graduate students. New technology will provide the means for accomplishing the essential functions of our information systems. Computers and other devices can revolutionize the selection, storage, access, and distribution of information. We would like to see MIT be a leader in research in these fields.

Appendix C

Inter-Library Cooperation

It is important to realize that our community is not served by a single library, but by an expanding circle of libraries. Material which is used frequently should be available in the departmental or laboratory reading room, if there is one, and/or in a major on-campus library. A considerably greater volume of material is available in the Boston area, and there should be rapid and convenient means of accessing it. Still more rarely used material should be available through national libraries such as the Library of Congress and the National Library of Medicine. MIT is especially fortunate in being able to obtain less frequently used materials in the biological and health sciences from the Countway Library at Harvard Medical School and through their facilities to have access to the MEDLARS information retrieval system using computer tapes received from the US National Library of Medicine in Bethesda.

As we look ahead we see increasing need for the development of regional and national libraries to provide less-used materials. In England the National Lending Library for Science at Boston Spa was started in 1957 to supplement the internal resources of existing organizations by providing a rapid loan service to libraries and other approved borrowers. They now receive 32,000 serials and this number is increasing by about 2,000 titles a year. The aim of the library at Boston Spa is to obtain all literature which is likely to be of interest to the practicing scientist and technologist. If libraries of this general type could be established in this country, it would not be necessary for MIT to acquire and hold certain infrequently used material. It is of course less convenient for faculty, staff, and students to have to wait for the material to come in the mail, but it is so expensive per use to have some materials on hand that the trade off of time and money must be seriously considered.

A current example of inter-library cooperation is the development of means for using US census tapes being carried out jointly with Harvard University.

Achieving the necessary degree of collaboration within MIT is, clearly, a prerequisite to achieving it with other universities. The following steps would help in this respect.

1. The policy should be established that each item belongs to MIT and not to a particular library within MIT. The place where it is normally stored may change from time to time as the pattern of usage changes. Duplicate copies should be acquired only when the frequency of use clearly justifies it.
2. Fast inter-library messenger service should be established. For instance, an item available at Dewey should be delivered at Rotch within a couple of hours after it has been requested.

Appendix D

Undergraduate Students and the MIT Libraries

Undergraduate students use three types of material in the library. In order of frequency of use they are:

1. reserve material for subjects
2. general material, including books, journals, and newspapers
3. research material

Unfortunately, reserve books are often not available when students need them. This is caused by three basic problems. First, professors do not always specify reserve material completely, legibly, and early enough, possibly because of a general ignorance of the reserve book system. Second, the lack of adequate personnel to handle the flood of orders arriving at the same time delays orders, as do delays occurring in the technical services department. The additional manpower required to process books could perhaps be obtained by hiring students on a seasonal basis. Third, the volume of books ordered is perhaps unnecessarily large, due to the fact that professors may request unlimited number of books. Numbers of books requested

ranges from one to 70. In view of the large amount of book buying requested for some subjects, more control of this process is required.

We feel that the faculty and departments need to assume more responsibility for the expenditure of funds for reserved books, which total over \$30,000 per year, so that some change in their administration is required. One way would be to allocate these reserve material funds to the departments and ask them to control and review the use of these funds.

Some of the reserve book collections at locations other than the Student Center Library seem to be rather little used, and there should be a re-examination of whether these reserve collections are needed. The advantages of returning an infrequently used reserve book to the general stacks are a savings in cost and increased convenience for the few users of the book.

The MIT Libraries contain much general material, such as popular nontechnical books and journals. This material receives heavy use, and we feel more books and journals of this type should be available. We raise the question as to whether it might be possible to store such material in separate shelves and catalog it only in a simple author index, thereby bypassing much of the processing. The library could encourage gifts of used paperbacks, magazines, etc., to this collection.

There is a severe lack of knowledge among undergraduates concerning the services the Libraries provide and the information contained in various library reference materials (indexes of various sorts, etc.). Services such as inter-library loan and book purchase requests are relatively unknown but might be usefully publicized through circulars and notices in student newspapers.

Appendix E

Acquisition Policies

The role of the library varies considerably from discipline to discipline. The role with respect to any particular discipline can be split into two orthogonal components:

1. The role of providing access to knowledge acquired in the past. This component is by far the predominant one in the role of the library with respect to disciplines such as the physical sciences, architecture, some of the social sciences, and the various branches of engineering. Since such knowledge is continuously restructured and refined, the useful life of a document whose value stems entirely from the knowledge that it can provide, is relatively short, in many cases ten years or less.

2. The role as a collection of the very objects that the discipline studies, or of the images and descriptions of the objects, events, etc., that the discipline studies. This is the predominant component in disciplines such as history, environmental arts, literature, and political science. One might say that in these disciplines the library plays a role similar to that of the laboratory in the physical sciences and in engineering. Here the concept of obsolescence is not as applicable, and the value of a document, while it may vary with time, depends mainly on factors other than age.

While it is true that both components are present in the role of the library in every discipline, the function and pattern of usage of a library is bound to be very different when one or the other component predominates. At MIT, the Humanities, Rotch, and Dewey Libraries are the sources of raw material and provide the laboratory environment for several disciplines. The Science and Engineering Libraries on the other hand, serve largely as storehouses of relatively recent knowledge and as communications centers.

A reading room is primarily a communications center, and only secondarily a storehouse of knowledge. Clearly, the "second component" is totally absent. The role of the reading room, on the other hand, includes a third very different component: it is a home and common study hall for a small and well-defined community of people who have similar interests. This role cannot be performed by a central library which, by necessity, must serve large numbers of people with different interests and different needs. Simplicity, informality, small size, closeness of personal relations, and comfort are crucial to the role of a reading room.

Journal and Serial Acquisition Policy

The MIT Libraries subscribe to some 17,000 different journals and serials. In a sense the library subscribes to 17 different journals and serials for each faculty member. The total number of scientific journals and serials in the world is about 35,000, but the total number of journals and serials in all areas is of the order of 100,000. Certain journals and serials are heavily used and it is necessary to have multiple copies of them in order to serve the community. But as we go to less and less frequently used journals the cost per use becomes higher and higher. When the cost per use becomes high enough, money can be saved by not subscribing to the journal but by borrowing it when it is needed. This is, of course, done at the present time, but it appears that financial necessity will require a still more critical look at our journal and serial subscriptions.

The decision to subscribe to a journal or serial is a serious decision. If a journal costs \$50 per year, it costs \$1,000 for 20 years without inflation, plus costs of binding and of providing storage space and cataloging and handling.

A general problem we have encountered is lack of data for answering questions about the use of books, journals, serials, and the Libraries themselves. We feel that much more usage data must be collected in the future in order to make better decisions about the operation of the Libraries. We recommend that faculty committees rate current journals and serials according to expected use and that alternate ways of obtaining the less frequently used journals be developed so that it will not be necessary for MIT to purchase and store them.

The Libraries in general have sought to acquire all the materials that might be requested by students and faculty. The MIT library has not attempted to be a "library of record" and no single library can, with the possible exception of the Library of Congress. In some fields it is necessary to have some rarely used materials. In other fields this is not so necessary, and an overemphasis on collections may lead to the neglect of other important library services.

With the development of a better feedback system the various libraries could become more responsive to these various needs. The definition of what should be available in our Libraries is partly dependent upon resources, but we feel that it must be increasingly based on the educational needs, goals, usage, and specific choices between alternatives by faculty and students.

Our recommendations only acknowledge the vastness of the world's literature and the economies to be achieved by careful selection in close collaboration with the users. Furthermore, we feel that the challenges facing our library and librarians are going to be increasingly serious in all libraries and that the future leaders in the library profession are going to be those who can develop the most effective response to these challenges. Farther down the road we see many new opportunities in the information service area, but in these remarks we are directing our attention to day-to-day operations during the next several years.

Another issue in the acquisitions area concerns the speed with which new journals become available in the library. Rapid availability of new journals is of importance for the research programs at the Institute. Some, but not all, of our libraries have a problem with the speed of delivery of new journals and claiming undelivered journals. Some of the changes we would like to see which move in the direction of getting books and journals to the user more rapidly may run counter to the librarian's sense of orderly procedure and perhaps even economy of operation. Thus we raise the question as to how ordering and processing procedures can be improved, perhaps by the invention of entirely new techniques.

Book Acquisition Policy

At the present time about half of the books ordered are requested by faculty members and about half are selected by librarians. The usual policy is to buy any book requested by faculty members, even if it is available in another MIT library.

We recommend that new ways be developed to involve faculty and students in decisions about the Libraries. For example, a faculty member might be hired by the library for a month in the summer to work on collections and make recommendations on new acquisitions, cancelling journals or serials, or on moving less frequently used materials to another location.

We believe that in many cases departments have not communicated their plans for the future adequately to librarians primarily concerned with acquiring materials in their field. In the future planning of new educational and research programs must include estimates of costs of library materials and discussion of how they are to be financed.

We found it impossible to determine whether the library's current holdings are sufficient to support the new research and teaching programs that the Institute has introduced in recent years. We recommend that the faculty involved in these programs survey that question and prepare concrete proposals for meeting deficiencies. We also recommend that the library accord these proposals a high priority within the library's budgetary limitations.

One of the suggestions we have studied only briefly is that a portion of the funds for acquisition of books and journals be placed first in departmental budgets so that the department would have to take major responsibility for their best use.

Another suggestion which ought to be examined more fully than we have been able to is that the cost of operating the Library be charged, for cost accounting purposes, to the various educational and research programs, and that this be done more accurately and realistically than just on the basis of the number of students or credit hours.

In any case it is our recommendation that department heads, either directly or indirectly, must share the responsibility for the effective use of library funds expended in support of academic programs within their departments.

Sculpture by Lynda Benglis*
 Polyurethane foam sculpture, Hayden Gallery, through December

The Art of Rigging and Buoy System for Air-Sea Studies*
 MIT Nautical Museum, Bldg 5, 1st floor.

Main Corridor Exhibitions*
 Presented by students and departments. Bldgs 7, 3, 4, 8.

Religious Services and Activities

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

Dail Religious Services*
 Monday-Friday, 8am, Rm 7-102; Fridays, 7:30pm, Chapel; Saturdays, 9am, Chapel.

Christians for Dinner*
 United Christian Fellowship. Every Tuesday, 6-7pm, Walker Dining Hall (under sign of the fish).

Praying, Singing, Sharing Meeting*
 United Christian Fellowship. Every Tuesday, 7-8pm, East Campus lounge.

Christian Science Organization*
 Meeting includes testimony of healings. Every Tuesday, 7:15pm, Rm 8-134.

Christian Bible Discussion Group*
 Every Thursday, 12:15pm, Rm 20B-031. Call Prof. Schimmel, X6739, or Ralph Burgess, X2415.

Muslim Society Prayers*
 Every Friday, 1pm, Kresge Rehearsal Rm B.

Jedanta Services*
 Every Friday, 5:15pm, Chapel; discussion hour, 6pm, Ashdown Dining Hall.

Roman Catholic Mass*
 Every Sunday, 9:15am, 12:15pm, 5:15pm, Chapel.

Christian Discussion Group*
 Bible study and discussion of Christianity today. Every Sunday, 9:30-11am, McCormick Seminar Rm A. Call Ron Gamble, X6712 or X47-4279.

Christian Worship Service.*
 Every Sunday, 11am, Chapel.

Free Draft Counselling*
 Hall, 312 Memorial Drive, X2982. Call or visit 10am-5pm.

Announcements

Creative Photography 4.051.
 Lottery. Wednesday, December 15.

Wellesley-MIT Exchange
 Applications for spring 1972 cross-registration program are due Friday, December 17. Applications available in Rm 7-101. Call X1668.

* Open to the Public
 ** Open to the MIT Community Only
 *** Open to Members Only
 * Freshmen encouraged to attend.

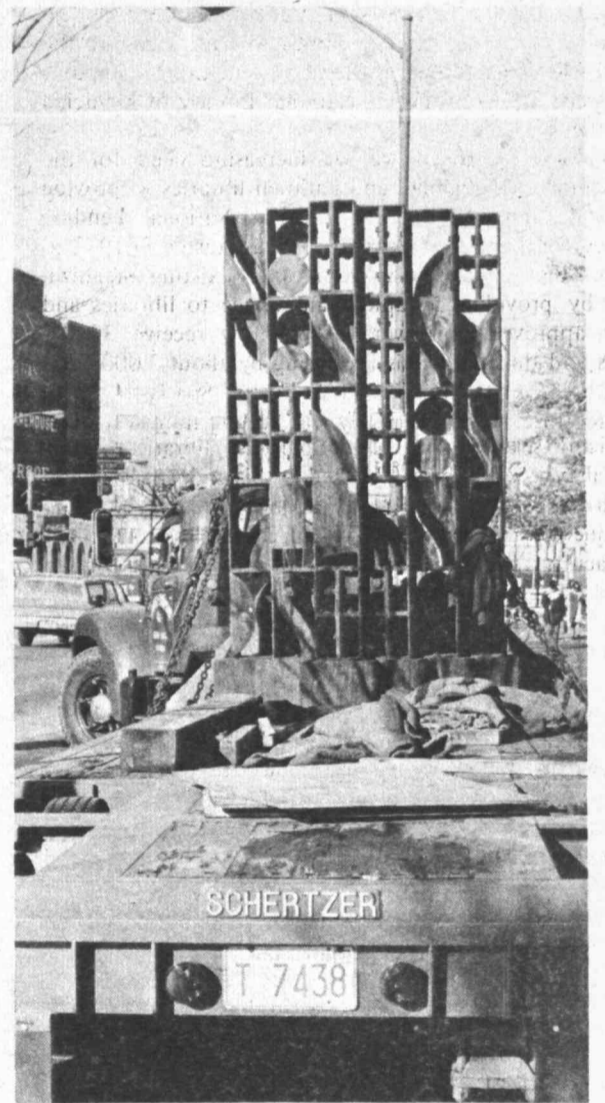
Send notices for December 22 through January 7 to the Calendar Editor, Room 5-111, Ext. 3279, by noon Friday, December 17.



--Photo by Margo Foote

Large outdoor sculptures have been lent to the Institute for exhibition during the winter. The pieces are designed to encourage viewer contact as demonstrated by students in the pictures above and below with Clement Meadmore's "Up Ended." In the center, "Atmosphere and Environment" by Louise Nevelson arrives at the Institute where it is now in position in front of the Bush Building.

Outdoor Sculpture Brightens Institute



--Photo by Bob Lyon



--Photo by Margo Foote



The annual print sale in Hayden Lobby is a popular place to browse. The sale continues through next Monday, December 20.

—Photo by Bob Lyon

Schedule Listed for Winter Physics Meeting at Institute

The Institute will play host to the 1971 Winter Meeting of the American Physical Society on Monday, Tuesday and Wednesday, December 27-29. Meeting headquarters will be in Kresge Auditorium. A number of the meeting sessions will concentrate on interdisciplinary subjects and science-related social questions.

Following is a schedule of sessions, all of which are open to the general public.

Monday, December 27

9am Physics in Medicine and Little Theatre
 8pm Kresge "Mechanism for the Transmission of Optical Information in the Eye of the Horseshoe Crab" by Frederick Dodge of Rockefeller University; "Codon--Anticodon Binding during Protein Synthesis" by J. Eisinger of Bell Labs.
 2pm Kresge New Horizons for Science and Scientists
 "Science in North Vietnam and China: An Eyewitness Report" by

Ethan Singer of MIT; "Sensuous-Intellectual Complimentarity in Science" by Thomas Blackburn of Hobart and William Smith Colleges; "The Emperor's Clothes" by Karl Linn of MIT.
 4:30pm Little Theatre Special Problems Faced by Women in Physics
 Moderator: Vera Kistiakowsky of MIT. Participants: Esther Conwell of General Telephone and Electronic Laboratories; Albert G. Hill of MIT; Margaret A. Waggoner of Smith College.
 8pm Kresge Energy for the Future
 "Man's Conquest of Energy" by M. King Hubbert of the US Geological Survey; "Nuclear Power Potential and Problems" by Norman C. Rasmussen of MIT; "Nuclear Power Reactor Safety: A New Appraisal" by H.W. Kendall of MIT.

Tuesday, December 28

2pm Kresge Physics Education for Professionals
 Moderator: Jerrold R. Zacharias of MIT. Panelists: Herman R. Branson of Lincoln College; Samuel Devons of Columbia University; Kenneth Ford of the University of Massachusetts; Gerard Holton of Harvard University; Joel N. Butler, Philip Morrison, Victor F. Weisskopf and Jerrold R. Zacharias, all of MIT.
 4:30pm Kresge Graduate Education and New Life Styles
 Moderator: Sanford C. Brown of MIT.
 7:30pm Sala de Banquet of the American Physical Society

Puerto Rico "What is Science Policy?" by President Jerome B. Wiesner.

Wednesday, December 29

2pm Room 10-250 Debate on the proposition that the number of PhDs in physics must be controlled.
 Moderator: Ronald F. Peierls of the Economic Concerns Committee of the American Institute of Physics.

New Officers at The Tech

A new board of directors was elected to guide volume 92 of *The Tech* at a meeting last weekend. The new officers who will begin their terms in February are:

Chairman: Robert Elkin, '73
 Editor in chief: Lee Giguere, '73
 Managing editor: Sandra Cohen, '73
 Business manager: Leonard Cohen, '73
 News editors: Paul Schindler, '74
 Walter Middlebrook, '72
 Night editors: Tim Kiorpes, '72
 William Roberts, '72
 Sports editor: Bradley Billetteaux, '72
 Arts editor: David Searls, '73
 Photography editors: Sheldon Lowenthal, '74
 David Tenenbaum, '74
 Advertising manager: Alex Makowski, '72
 Contributing editors: Joseph Kashi, '72
 Michael Feirtag, '72

The Tech will be published weekly during the January Independent Activities Period, and will resume twice-weekly publication at the beginning of the spring semester.

J.R. Markham Rites to be Held in Belmont

Funeral services will be held at 11am Wednesday, December 15, at St. Joseph's Catholic Church, 345 Waverly St., Belmont, for John Raymond Markham, MIT professor emeritus of aeronautical engineering who died Sunday. Burial will follow in Belmont Cemetery. There are no visiting hours. The family requests that in lieu of flowers contributions be made to the Catholic Guild for All the Blind, 770 Centre St., Newton.

Professor Markham died at Sancta Maria Hospital as the result of complications from injuries he suffered last month when he dodged to avoid being struck by an automobile when walking near his home in Belmont. He had been hospitalized since the accident.

Born in East Cambridge July 23, 1895, Professor Markham entered MIT in 1914 and left in 1917 after the US entered World War I to join the US Army. He served as a captain in France where he met and married Mrs. Markham, the former Genevieve Triquera, who survives him.

Following the war, he returned to MIT as a research associate in aeronautical engineering and during the 1920s participated in the design and construction of a series of pioneering wind tunnels essential to the advancing of the theory of flight and the design of flight vehicles.

He was appointed assistant professor in 1930 and during that decade directed the design, construction and operation of the Wright Brothers Wind Tunnel in what was then the Department of Aeronautical Engineering. During World War II, Professor Markham helped supervise the large amount of work performed at the wind tunnel in the design and testing of US military airplanes. He was appointed associate professor in 1940 and full professor in 1947.

Following World War II, Professor Markham directed the design and construction of the Naval Supersonic Laboratory, the heart of which was MIT's Mach 3 wind tunnel. He became the laboratory's director when it was completed in 1949 and remained in that post until his retirement in 1961.

Professor Markham was a frequent consultant and advisor in wind tunnel design to the US government, to governments in South America, and to numerous

industrial firms. He was a long time member of the US Air Force Scientific Advisory Board and received the Air Force Exceptional Service Award in 1955 from Air Force Secretary Donald Quarles. He also served the National Advisory Committee on Aeronautics which later became the National Aeronautics and Space Administration. He was a Fellow of the American Institute of Aeronautics and Astronautics and a member of Sigma Xi. He was an exceptional teacher and his former students now hold positions of major responsibility in government and in the aerospace industry throughout the world.

Survivors besides Mrs. Markham include two sisters, Mary B. and Katherine P. Markham, both of Cambridge. An only son, James P. Markham, was killed at Iwo Jima while serving with the US Marine Corps during World War II.

Coach Hedlund Dies Suddenly

Former Tech track coach Oscar R. Hedlund, 84, died unexpectedly in Cambridge on December 8. Funeral services were held last Friday.

Mr. Hedlund spent 35 years (1923-1958) coaching trackmen at the Institute and during that time never missed a single practice. Reporting his retirement in 1958, *The Tech* wrote: "An era in MIT athletics ends as Oscar leaves; he has been not only a fine track mentor, but also a firm believer in the spirit of MIT athletics and a friend and advisor to countless hundreds of students."

A leading track and field sports figure in New England for 60 years, Mr. Hedlund was active in the Boston Athletic Association indoor track meets. He broke the world's indoor mile record at Madison Square Garden in 1914 and ran for the United States in the 1912 Olympics in Stockholm.

He leaves his wife, Elsie (Hilliard), of 2 Garden Court, Cambridge; a daughter, Mrs. Louise H. Mercer of Worcester; a brother, Carl of Natick; two sisters, Mrs. Norman Harding of London, England, and Mrs. Samuel Lindsay of Palm Beach, Florida.

Forum Focus: City's Future

The first 1971-72 special Political Science Forum will be held this Thursday, December 16 from 12:30 to 2:30pm in the Graduate Student Lounge. Barbara Ackermann, Sandra Graham and Robert Mondreiff, three members of the newly elected Cambridge Civic Association majority on the Cambridge City Council, will discuss the future of Cambridge. All members of the community are invited to bring their lunches and attend the forum.

Original Photo Show Planned

The MIT Committee on the Visual Arts will sponsor an exhibition of original photographs, entitled *Octave of Prayer*, next fall. Photographs for the exhibition will be selected from original works submitted to photographer Minor White, organizer of the exhibit and head of MIT's Creative Photography Laboratory. Any photographer may submit works for consideration. The final deadline for entry is February 1, 1972.

Octave of Prayer will be the third exhibition of its kind that Professor White has directed. The first was *Light* in 1968, followed by *Being Without Clothes* in 1970. The previous exhibits were also composed of original works.

Professor White, whose own works have had a strong impact on contemporary photography, has been teaching photography since 1946, and has been at MIT since 1965. He is also editor of *Aperture*, a photography quarterly which he helped found in 1952.

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 or room number. Ads may be telephoned to Ext. 3270 or mailed to Room 5-105. The deadline is 5pm Friday.

For Sale, Etc.

Chevy 14X6 wheel, \$3. X5387.

Rabbit fur coat and muff, 8-10, GD Cond, \$20. Martha, X5124.

Semperit snows, radial 165X15, 5 ply, 9K, \$50. Lynn X2528.

Outdoor Christmas Lights, 25 lamp sets. Tony, X5181.

Mother w/ babysit in Medford. X6257.

Knight stereo set, \$80; Westinghouse air cond, 5000 BTU, \$60. Ron, X5095 or 787-5658.

Upright modern dbl oven, almost new, \$150. X5797

Snows F70X14; regular tires F70X14. Jeff, X4093 after 4.

Baby carriage, \$20; Bird cage, 24" X 25" X 30", \$15; Men's leather riding boots, \$10. Call 646-3319.

Wood Skis, 135 cm, w/Tyrolia step-in bindings; Northland National 200 cm metal skis; ski rack. John, X5001.

Vose baby grand piano, exc. cond, \$600. Call 729-6899.

Airequipt slide projector, 35mm, 500w, exc cond, \$30. Ken, X3750.

Dbl bed w/ box and mat, bkcase head board, \$60; red leather rocker chr w/hassock, \$50. Call 891-5460.

Rieker man's 10m ski boots, \$30. Jon X2351 or 4923986.

Teak and oak salad bowls, med, \$30, lrg, \$34. X470 Draper 7 or 484-9137.

Fisher 500 TX amp, all transistor; 2 AR +a speakers; Dual 1219 turntbl w/ dust cover; headphones; \$800 or best. Gail, X2835 or 776-4265 evgs.

New Kolfach ski boots, 8 1/2, \$70; 2.05 Fisher Superglass skis and bindings, \$120; 51" ski poles, \$10. All \$180. Jarrell, X2540 or 267-6912 evgs.

Set and Curl hairsetter, \$15; Kodak brownie starmite camera outfit, \$10; Kodak brownie starfax camera outfit, \$10; dictionary of bible edited by Hastings, \$10. Call 265-3493.

Sears Console humidifier, 7.5 gal/day, rotating belt, auto humidistat, \$40. Gano, X8250.

Rossignol Strato Jr. 170 cm w/Dover dteps-ins, exc cond, \$65. Fred, X2361 or 259-8273.

Upright piano; Motorola stereo console; exc cond. Call 884-3063 evgs.

Tricycle, 10", like new, \$7; 20" tricycle. Call 646-8681.

Lrg pine cone wreath, \$20. Call 489-2051.

Paramount bowling balls, duck and candle pin, engraving, gd prices. X7522.

Barrington, NH, land on sm Hillside overlooking lake, \$2500. Call 646-5348.

Honeywell Pentax spotmatic H1a, like new, 50mm lens, F/1.8, shutter 1/1000, \$130. Nancy, 491-2239.

Sony ESP auto-reverse 560D stereo tapedeck; Scott LT-112B stereo tuner, w/ 120 w Scott amp. Almost new, exc cond, best offer. Call 482-6467.

Goodyear stud snows, H70X14, mounted on chevy rims. Joe, X6145.

Plath's, *The Bell Jar*; *Uris' QB VII*; *Knef's The Gift Horse*, *Addie Pray*; hard backs, exc. cond. \$1.50 ea, \$5 all. Connie X5243.

Silver BL mink stole, \$300 or best. Nancy X7426.

New combat boots, 12, \$3. Mrs. Barclay X4787

Sear elec guitar and amp, \$40. X4211.

Big strong safe, 2' X3' X2', free for taking. X392 Linc.

Raichle women's hiking boots, vibrum soles, 9, like new, \$12. Karla, X6036.

Kneissel wh stars skis, 205 cm, w/Nevada bindings, \$100. X6121

Ford rims, 15" w/tires, 8.15, 7.75, \$20; tv converter for UHF channel, \$12. Call 868-5189.

Men's bicycle, needs repair, free. X4166.

Household furnishings, lounges, tbls, dressers, etc, cheap. Call 868-9422 evgs.

Box spring, \$10, lrg legless wood/metal desk, \$25 or best. Mike, 536-3195.

Woman's raincoat, 11-12, red vinyl with pewter like trim, orig \$55, exc cond, \$15. Jeannie, X3584.

Admiral 21" tbl model TV w/stand, gd cond, \$35. X347 Draper 7.

Am Car R, \$10. Call 547-4689 evgs.

Kastinger men's buckle ski boots, 9, plastic sole, \$8. Russ, X2311.

Amana refrig, best offer. Call 332-6299 evgs.

Schwinn exercise bicycle, timer, bell spdmeter, mileage gage, \$75; twin beds, like new, \$40. X2751.

Tubeless snows, 8.25X14, gd cond, \$7 ea. Call 369-9369.

New Leitz Rondinay 35 mm dayload tank for color and B&W, \$18. Made-line, X280 Draper or 646-3954 evgs.

Elegant Chinese dresses, 9-12, greatly reduced cost. X1826 or 547-7601.

VW stud snows on 5 lug rims, \$25 pr. X4177 or 861-9491.

Canadian hockey skates, tempered steel blades, nylon guards and covers, 8, \$12.50. X2007 or 472-1614 evgs.

Used 6'3" Kneissel wood skis w/cable bindings; new lace-up boots, 9; poles; boot tree; \$50; 92X telescope, w/access, \$60. Les, X5831 or 566-5236 evgs.

New red nylon rug, 9' X 6', \$20, sm GE record player, \$10. Luiz X6894 or 354-4784 evgs.

Kenmore washer, needs new timer, free. Dave, X6540.

Wheel for '67- '70 Chevy, 15", \$5 pr. Alex, X7273.

Pentax Spotmatic II w/super multi-coated 50 mm f/1.4, 135mm f/3.5, w/ 1 yr. warranty, 65% list price. Call 491-1620.

Schwinn coaster bicycle, \$20. dorm X8641 or 491-1778.

Mod blue Danish couch, \$25. Mary, X7041.

Ocelot Jacket, 14, exc cond, new \$400, \$275 or best offer. Mary, X7745 or 731-4985 evgs.

Australian Fishcer 81" skis, stand, w/Dovre bindings, \$15; Emerson 21 B&W TV, \$55; BL pole lamp, \$5, misc tbls. Gundersen, X6085, or 33208251.

New plastic hanging bird feeder, \$4; 10M ice skates, \$10. Call 232-0484.

Violin strung as Viola, 3/4 size, \$40; Reidell boy's figure skates, 12 1/2, w/ sgl star blade, \$12; Reidell girl's skates, 3 1/2 N, \$18. Betty X2186 or 263-7848 Acton.

King size dual control elec blanket. X2509.

Elec guitar w/amp, new \$80, \$40, Cindy X4211.

Sears Draftsman saber saw, 1/2 hp, variable sp, blades, access, \$30; baby carriage, \$10; sgl bed frame, \$10. X691 Linc.

Lrg wall clock w/BL face and WH hands, batt operated, \$25. Olson, dorm X 0285.

Professional Santa Claus, Jim Lopez, avail yr. round. X443 linc or 372-5295 Haverhill.

Koflach leather ski boots, 10W, \$25. Bill, X7230.

Fual 1219, \$100; Sansui Tuner, \$80; Dynaco Speakers, \$90; Call 547-9672.

Boy's dark blue coat, 14, \$15. Beth X1715 or 266-3181.

'66 Corvair Monza, 57K, 4sp, new clutch, \$250 or best. Marv, X7096 or 254-5348.

Lafayette record changer, 4 sp, auto, \$15. Donovan, X4067.

Paramount bowling balls and bags, engraving done, candle and duck. gd prices, X7522.

Elec coffee maker, 32 cups. Moira, X6219.

Minox B camera, w/built-in lightmeter, exc cond, \$50. Call 524-0118 evgs.

Vehicles

'60 Rambler, runs, \$75 or best. Jim, X2150 or 729-7243 evgs.

'62 Alfa Romeo spyder veloce, roll bar, dual webbers, \$400 or best. Call 267-0730 evgs.

'63 VW, must sell, leaving country. Call 491-0524.

'63 Chevy Nova, 61K, tune-up, exc cond, \$300 or best. Call 536-7924 evgs.

'63 Mercury Comet S22 conv, bucket seats, winterized, \$150 firm. X7030 or 272-9794 evgs.

'63 Valiant conv, stand, r & h, new bat, gd cond, \$180. Imada, X3109 or 926-3579.

'65 VW, needs work. \$350. Call 272-6076 evgs.

'67 VW, 47k, \$800. Afonso, 623-2812 evgs.

'68 Renault 10, 4 dr, stand, R & H, \$350. Call 323-5908.

'68 Opel rallye, pwr br, 4 sp floor shift, r & h, fog lights, new bat and tires, best offer. X6092.

'69 Charger R/T, \$1495 or best. Ralph, X7379.

'69 Roadrunner, 2 dr hdtip, 4 sp, posi-trac, exc cond, best offer. Will X7279.

'69 Kharman Ghia \$1,700 or best offer. Call 933-4392 evgs.

'70 Chevy Impala, 2 dr, sedan, pwr st, auto, low k, exc cond, \$1850. Call 469-0060.

'70 Renault 10, 4 dr, auto, 9k, \$1400. John, X6933.

'70 VW bug, r, undercoated, exc cond, \$1350. X5020 or 646-8406 evgs.

Housing

Bk Bay, furn 3 BR apt for IAP sublet. Rit 247-7717, leave name and phone.

Bk Bay, 1 BR, spacious LR w/bay window, mod K, 2 min from MIT, \$275. Call 267-2019.

Brighton, ME, Mt Pleasant cottage across lake, furn, sleeps 4, elec H, \$5,900. Dick, X7892 or 275-9373.

Boston, studio, mod K, B, lrg sunny R, exc location, sublet 1/1, gd for couple, \$180. X5981.

Canada/VT, ski lodge on 200 acres, near Jay peak, sleeps 11, come and ski East. Call 665-6620 evgs.

Lex, 4 BR contemp house, Turning Mill area, community pool, shown by appointment, mid \$50K. Call 862-3358 evgs.

NYC, Jan sublet, 3 rms, K, garden apt, S. Anderson 212-947-0765 or 212-875-2910, or Mrs. Kurland, X4414.

Rochester, VT, ski house needs 2 members, Dec-May, \$200. Jane, X4487 or 926-4367 evgs.

Walth/Lex, 2 BR garden apt, air cond, \$210, avail 2/1-6/30. X5572 Linc or 899-1753.

Watertown, 1 BR sublet, H, parking, air cond, \$205. X271 or 277 Draper 7 or 527-4642 evgs.

Westgate, furn efficiency, sublet 12/23-1/22. Ashok, X2943 or 547-3253 evgs.

Animals

Gordon setter pups, akc, gd hunting stock. Kate X6977 or 828-1434.

Abyssinian and Peruvian guinea pigs, all sizes and colors. Ken 547-6915.

F bl & wh cat, exc disposition, free to gd home. Chris, X5641 or 661-1166.

Free kittens, 10 wk old. Call 731-5137.

Lost and Found

Lost: Man's BR wallet, between Kendl sq and Vassar St near Bldg 39. Bob, x3735.

Wanted

Sew machine. Call 926-2169.

Ride to Killington ski area every Friday night or Saturday morning, back to Boston every Sunday night. Penny, X6766.

Daily ride Lexington/MIT. WI share expenses. Elsie X7987.

Use of heated garage for January, w/ pay. Steve, 661-9737 evgs.

Girl's ice skates, about 8 1/2. Anne, X3221.

Used microscope in gd cond for Christmas. Call 547-3834 or lv message at X4411.

Used men's hockey skates, 11-12. Andy X6718 or 782-8985 evgs.

Professional F rmmte to share mod apt near Cent Sq, own R, \$95. Lauren X7080 or 661-8891.

Dog for children. Arlene, X6010.

M rmmte for Brookl apt, own BR, \$80. Paul X575 Draper 7.

Independ responsible rmmte, 24-30, for 2 BR unfurn apt in Harv Sq, \$137.50 w/H and parking. Mary, X5672.

Dressmaker, make and alter, simple styles. Elaine, X3139.

M rmmte for 7 BR house in Winch, start 2/1, \$120 w/utilities, food, lrg R w/sun porch. Call 729-6180.

F rmmte to share Somerv apt, own BR, \$100, avail now. Mary X2674 or 776-6015 evgs.

Used Dyna SCA-35 amp; 13" wheels for BMW. Larry, X6096.

Miscellaneous

Want a penpal? write: Eric Omo, Yaba College of Technology, Yaba, Lagos, Nigeria, or Ola Tunde Badmus, Flat 5, Alapafuja St, Surulere, Lagos, Nigeria.

Gen/Tech typing. Call 661-1929 or X6470 evgs.

Exper babysitter avail. Call 472-8735.

WI do gen/tech typing. Ron X7273.

WI swap Monroe parking sticker for anything—Mem Dr is getting crowded. Linda, X3278.

WI do gen/tech typing. Deanna 395-5067.

WI babysit at my home, 1000 Mass Ave. Call 471-0075.

Dining Hall Schedule

(Continued from page 1)

December 31-January 2). Walker Memorial Dining Hall will serve lunch and dinner on Thursday, December 23, and lunch only on Monday, December 27 through Thursday, December 30; Walker will also be closed during the two holiday weekends. Twenty Chimneys, the grill on the third floor of the Student Center, will be closed from Monday, December 19 until Wednesday, January 5. Last but not least is Pritchett Lounge—this is the only dining service that will not abandon the Institute's appetite during the holidays. Pritchett, located on the second floor of Walker, will be open daily from 9am to 10pm throughout the vacation period.

ERC Program Funded for '72

Grants from the National Science Foundation have been announced which will enable the MIT Education Research Center to repeat next year two programs for teachers begun last summer. Under one grant of \$40,000, the Center will conduct a summer program of six to eight weeks for some 25 high school teachers. The teachers will organize themselves into smaller groups to tackle interdisciplinary projects. NSF supports summer training for secondary school science teachers at some 190 U.S. colleges and universities.

Under the second grant of \$20,000, ERC will conduct a two-week program of training for college-level teachers in the development and use of self-paced study.

Photo Lab Has LaZar Exhibit

An exhibition of photographs by freelancer Arthur LaZar is now on display at the MIT Creative Photography Gallery at 120 Massachusetts Avenue. The exhibition, which contains 50 photographs, mostly landscapes and portraits, will be on display through February 1, 1972. The Gallery is open daily from noon to 7pm.

Only 1 More TT in 1971

Because of the Christmas holidays, Tech Talk will not be published on Wednesday, December 29. Next week's paper, the December 22 issue, will be the last Tech Talk published in 1971. If anyone in the community would like an article to appear before the regular publishing schedule resumes on January 5, please call the Tech Talk office on Ext. 3277 or 3278 as soon as possible.



William Presson, left, Associate Dewey Librarian, presents a gift to Miss Klingenhagen at a reception in her honor.

Barbara Klingenhagen Retires from Libraries

Miss Barbara Klingenhagen, the first Dewey Librarian, retired earlier this month, bringing to a close a career of more than 35 years at the Institute.

She came to the Libraries in 1935 as a general assistant and in 1938 became economics librarian in a room set aside as the Dewey Library. One of her early contributions was compiling a "Subject and Author List of Theses in Course XV and Economics."

For several years Miss Klingenhagen served full time with the industrial relations section of the Department of Economics, collecting and indexing the reports and pamphlets which were the nucleus of one of the Library's few distinguished special collections. When the industrial relations library was with the collections in economics and business, Miss Klingenhagen was named Dewey Librarian.

Miss Klingenhagen was responsible for settling the Dewey Library into its first separate home in Hayden when it was opened in 1950. She has since supervised its moves to the Sloan Building in 1952 and to its present location in the Hermann Building in 1965. With the move to the Hermann Building, the library was expanded to include political science materials. Under Miss Klingenhagen's guidance, Dewey Library has grown and flourished, becoming a first-rate research tool.

Miss Klingenhagen was honored by a number of gatherings before her retirement. At an open house in Dewey Library, members of the Libraries' staff gathered together with faculty members of the departments she has served to wish her well in her retirement.

Writing in "Library Notes," Miss Natalie Nicholson, Associate Director of Libraries paid tribute to Miss Klingenhagen. "We thank her for many things: the example of excellence in all she does—for never forgetting the purpose of the library in the midst of procedural apparatus—for always going the extra mile in any request for assistance—for firm opinions well

expressed at many meetings—for devotion to faculty and students of MIT—always accompanied by a good sense of humor! May the years ahead be happy ones."

CAP Reminds Faculty on Grade Procedures

The Committee on Academic Performance reminded members of the teaching staff this week about the use of the grades "I," "O," and "OX."

In a letter to the faculty, Chairman Ernest G. Cravalho, associate professor of mechanical engineering, said that with the approach of the Independent Activities Period in January his committee is concerned about misuse of the grade "I," meaning Incomplete. When IAP was first held last January, an unexpectedly large number of "I" grades were given—in fact, four and a half times as many as the average for the five preceding years—apparently as a means of extending the first term of 1970-71 into the IAP period.

"This practice prevents some students from participating in the special activities available during this period," Professor Cravalho said. "According to Faculty Regulation 2.61, the grade of 'I' indicates that a minor part of a specific requirement has not been completed and that a passing grade in the subject is to be expected when the work is completed.

"Since the institution of this regulation in 1892, it has been the practice for the grade of 'I' to remain on the student's record regardless of whether or not he completes the subject. Thus, if the student does not complete the subject, only the grade of 'I' will appear on his permanent transcript; however, if he does complete the subject, two grades will appear—the grade of 'I' and the final grade. At no time is the grade 'I' converted to the grade of 'F' or any other grade."

Track, Hockey Teams Win from WPI, Tufts

Tech's indoor track team boosted its record to 3-1, defeating Brandeis 79 to 38 followed by WPI with 17. In this meet, Co-captain Dave Wilson kept his undefeated pole vault dual meet record unblemished with a 14 feet 6 inch effort. Wilson has won three straight including a new Tech record of 15-1½ two weeks ago.

An encouraging aspect of last Saturday's double victory was MIT's running performances. In recent seasons, Tech has had an overbalance of field event strength, but lacked a deciding running threat. Against Brandeis and WPI, Tech scored 39 points in eight events, almost half of the teams winning total.

Tech's hockey team broke into the win column last Wednesday night with a resounding 6-0 victory over Tufts. Senior Captain center, Tom Lydon topped the Tech scorer's with two goals followed by four other MIT players with one score each. Junior Mike Schulman, in his first start in the nets, blanked the Medford Jumbos with only thirteen saves.

Unfortunately, last Saturday night was a different story as visiting Wesleyan dropped the Tech sextet, 5-1. Tied 1-1 after the first period on John Kavazanjian's MIT goal, Wesleyan exploded for three tallies in the second period and eventually coasted to an easy 5-1 win. MIT's record going into this Monday's Rochester Tech game is 1-3.

MIT's basketball team experienced a tough week, dropping games to Brandeis 91-86 in overtime and Trinity 80-75. Despite this however, Tech's high scoring forward, senior Captain Harold Brown, came up with two big games. Brown scored 34 points and 10 rebounds against Brandeis, shooting a fantastic 64% from the floor. Against Trinity, Brown came back with a 25 point night which gives him 109 points for the season and a 27.3 points per game average. Brown's career total of 1088 now ranks him third on the all time scoring list, passing Bill Eagleson's, '64, 1058. With nineteen games left on the schedule, Brown has set his sights on Alex Wilson's, '67, 1224 point second place high and MIT's all time leader, Dave Jansson's 1457 points.

MIT's swimmers suffered their first defeat of the season, losing to Wesleyan 62-51 last Saturday. The engineer mermen had easily won their first two meets, 65-48 vs. RPI and 75-38 against Tufts. Despite winning only two individual events, MIT made a close meet out of the Wesleyan match. Junior Bob Paster won the 500-yard freestyle, 5:38, and senior Ed Rich won his diving specialty.

MIT's fencers ran into a surprisingly strong Brooklyn Polytech team last weekend, dropping a 16-11 decision to the visitors. Junior Peter Wong won all his three bouts in the sabre, but his efforts weren't enough as Brooklyn Poly won the overall weapon 5-4. After three matches, Wong has posted the best individual weapon record, 8-1 in sabre.

Yeats, Joyce Books Shown

Manuscripts and first editions of William Butler Yeats and James Joyce are on display in the Wellesley College Library under the title, "The Indomitable Irishry." Yeats' works dominate the display and include many carefully bound volumes of poems and plays as well as letters, autographs and

inscriptions relating to his four visits to Wellesley College. Joyce, the novelist, is represented by first and special editions of his novels and poetry. The exhibit was arranged especially for students of Yeats and Joyce at Wellesley, but is also open to the public at no charge through January 16.

IAP Features Exotic Cooking

The upcoming Independent Activities Period (IAP) will feature a special course for would-be gourmet chefs—classes in authentic Chinese cooking. A variety of dishes will be prepared, each illustrating an important technique in the art of Chinese cooking.

Enrollment is limited and a

small fee may be charged to cover food costs. The first meeting will be held on Thursday, January 6, at 4pm in Baker House Master Suite Lounge. Anyone interested in participating should call Steven Schuster on Ext. 3161 or dormline 8373, or leave a message (name, address and phone number) in Box 5230, Baker House.

Registrar Will Mail Grades

First term grade reports will be mailed to students' home addresses on Friday, January 7. Students who wish their grades to be sent to a different address should instruct the Registrar's office no later than January 5. Grade reports will be sent to the parents of first year students. The Registrar will not grant telephone requests for grades.

Intrex Indexes EE Activities

Project Intrex in cooperation with the Department of Electrical Engineering is providing a computerized on-line look-up service for IAP activities in that department. Terminals for public use will be located in EE Department headquarters (Room 4-202) and in the Barker Engineering Library.

The data base will contain up-to-date information about planned IAP activities in EE as well as descriptions of research interests of all members of the EE faculty. Instructions for using the system are available from a short "poop sheet" located next to the terminal as well as on-line.

The Intrex system is very easy to use. After identifying himself, a user desiring to know what sort of activities are offered in the area of computer music would type the command

subject computer music

Intrex would respond that it has found three activities that fit this description. The user would then type the command

output

to receive information on these activities.

Personnel at Project Intrex are looking forward to this experiment which begins now and will continue through IAP. Your use of the terminals is encouraged, and comments are solicited.

Students who are interested in this experiment and possibly in introducing others to the system may call Mr. R.S. Marcus at extension 2340, or Dr. C.W. Therrien at extension 7262.

Snow Parking Rules Outlined

(Continued from page 1)

The Parking Committee urgently requests the complete cooperation of the MIT community during a declared snow emergency. Our parking regulations will be strictly enforced and, in the event that compliance is not obtained, it may be necessary to increase our own fine structure and towing charges.