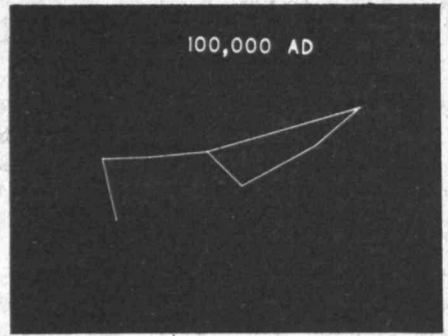
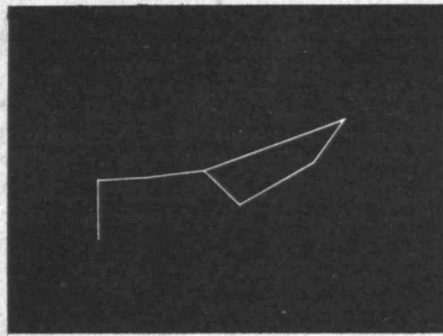
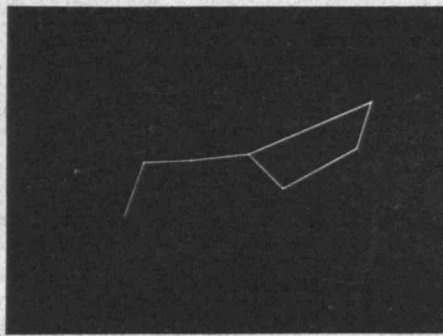
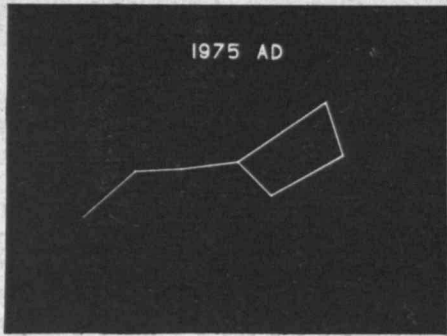


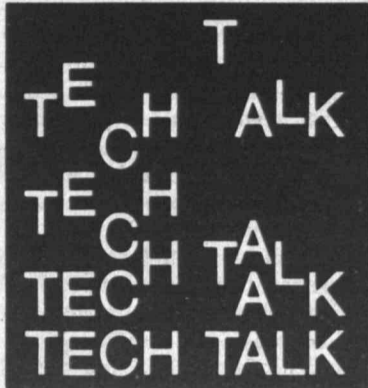
In 100,000 AD: The Great Dipper Will Be the 'Big Scoop'



The Big Dipper just won't hold water as a constellation in the year 100,000, according to this progression from one of Dr. M. Littleton Meeks' astronomy films.

—Story below—

Massachusetts
Institute
of Technology



December 5, 1973
Volume 18
Number 22

Eons Flow By in Minutes In New Astronomy Films

By DENNIS MEREDITH
Staff Writer

Interplanetary space probes, Skylab, pulsars, quasars, and Kohoutek, the Christmas comet—all have served to heighten popular interest in astronomy enormously. But many students and interested laymen have been discouraged by a seemingly impenetrable wall of abstractions and mathematics surrounding the subject.

Dr. M. Littleton Meeks, a radio astronomer at the MIT-operated Haystack Radio Observatory, has begun using computer-animated films to break through that wall.

A series of films he has conceived and written proves that, in astronomy at least, one picture is worth much more than a thousand words.

Students watching the films are zipped through space faster than the speed of light and whisked through eons of astronomical time in a matter of seconds—all the results of complex calculations by a digital computer.

"Twenty Jumps from Here to Galaxies" is the title of a children's lecture to be given by Professor Alar Toomre for benefit of the Technology Children's Center. Sky watchers waiting for Kohoutek can survey other aspects of the heavens in a forthcoming Hayden corridor exhibit, *The Stars, The Moon*. Stories on Page 2.

The series, produced by the Houghton Mifflin Company of Boston, consists of eight, 8-minute films under the general title *Explorations in Space and Time*. The films feature such visual goodies as—A computer-controlled 100,000-year race through time while watching the Big Dipper evolve out of its dipper-ness,

—A look at computer-calculated motions of the stars as they swarm through space ahead, behind, and to the side of the sun's path through space, and

—30,000-fold zoom-ins to show closeups of stars and star systems.

Dr. Meeks and his colleague, computer animator Sherrill F. Martin, produced the eight 16-mm color sound movies using an IBM 360 75 computer and a Calcomp cathode-ray tube display unit capable of plotting points of varying intensity. Thus, the filmmakers not only could have the computer display the results of its calculations of the stars' motions through space, but could also show the stars' individual intensities as they would appear from earth.

After programming the computer and loading data from a star catalog on magnetic tape, the operators could direct the computer to pan across the sky, advance in time, or zoom in on particular stars. To produce a film in color, the animators photographed the titles, lines illustrating constellation outlines, etc., on separate rolls and superimposed them with color filters inserted on the final negative. With the addition of exotic electronic music, scored for the films by Lyle Davidson of the New England Conservatory of Music, the films acquired the emotional feeling of transportation through space and time.

"Although these films are intended for a college audience," said Dr. Meeks, "we have found in test screenings that elementary school students, as well as astronomy graduate students find them interesting, and we believe that they are sufficiently understandable to be incorporated, for example, in planetarium presentations for general audiences."

Dr. Meeks' eight films cover the basic motions of attracting bodies, the Doppler effect, planetary motion, the motion of stars, star clusters, multiple star systems, Sirius and its companion white dwarf star, and Algol the Demon Star. Dr. Meeks will show his films and discuss the uses of computer animation in astronomy at a Dec. 11 astrophysics colloquium at 4pm in Room 37-252.

December Fuel Looks Adequate But Conservation Need Stressed

MIT should have enough oil to get through the month of December without dipping into its reserves, but faces an uncertain situation in January and February, William R. Dickson, director of the Department of Physical Plant, said yesterday.

Mr. Dickson said that many Institute employees "aren't paying too much attention" to energy conservation measures and he appealed again for their cooperation.

He added that the situation involving the Institute's electrical consumption was "fast reaching a critical state." He repeated his call for a voluntary ban on the use of electric heaters, saying, "These are killers as far as electrical consumption is concerned and they're popping up all over the place." He indicated he might seek to have the space heaters prohibited officially if necessary.

In another development, Mr. Dickson said the Institute had been informed Tuesday that a number of buildings heated with steam supplied by the Cambridge Steam Corp. would have to do with less steam this winter.

"We were notified that the Cambridge Steam Corporation is reducing our allotment to 72 percent of last year's," he said.

He said this meant there would have to be a concentrated effort to save energy in the affected buildings. He identified these as The Horace Sayford Ford Building, the Grover M. Hermann Building, the Alfred P. Sloan Building, the Eastgate Married Student Housing, other smaller buildings on the east campus and the new cancer research facility under construction.

The seriousness of the energy situation facing universities was

underscored Tuesday with the announcement that Tufts had rearranged its academic calendar to save fuel during the winter months. Other schools have taken similar steps.

A Tufts spokesman said the calendar was changed to enable the main campus in Medford to close down for a part of each of the four winter months. This was done, it was explained, because oil is allocated on a month-to-month basis and Tufts does not have storage facilities for reserves.

The major change calls for the substitution of an extended winter recess period, from Feb. 9 to March 8, for the traditional week-long spring recess. This will mean moving commencement back from June 2 to a date to be announced.

The changes affect the under-
(Continued on page 3)

Student Aid Asked for Buildings 'Tune-Up'

Can a building be finely tuned, like a car, to get better mileage out of the energy that goes into it?

Thomas E. Shepherd Jr. is convinced it can—based on a pilot program conducted at MIT last summer—and he is enlisting the help of students to tune up the Institute's buildings.

"What we need is a lot of detailed attention to little problems and a lot of hands to record data," said Mr. Shepherd, who is superintendent of utilities. "We need to know about the lighting levels in every room, the window area, whether there are thermostats or exhaust hoods, what the temperature is under various conditions and how it might fluctuate over a day or week when you do something to the heating system."

One answer to the problem of obtaining this information, it seemed to Mr. Shepherd and others, was the three-week Independent Activities Period between the first and second terms in which the students are free to tackle special projects.

"The IAP seemed ready-made for this kind of a project," Mr. Shepherd said. "There are a number of courses in different departments dealing with this kind of thing—there is one in Earth and Planetary Sciences, for example,

and another in Architecture—and so this is really a spin-off from the students' regular studies in many cases."

The project recalls a suggestion made at the November faculty meeting by Louis D. Smullin, head of the Department of Electrical Engineering and Dugald Caleb Jackson, Professor of Electrical Engineering.

He said that the Institute might call upon the expertise available within various departments to tackle energy conservation as "a serious technical problem."

In this way, he said, the Institute might be used "as a pilot model to show that, technically, it can be made to run normally" despite energy shortages.

No Paper

Tech Talk will not be published on Dec. 26, 1973, and Jan. 2, 1974 because of extended weekends over the year-end holidays. In addition to Christmas and New Year's Day, the Institute will be closed on Monday, Dec. 24, and on Monday, Dec. 31. Regular publication will resume on Jan. 9, 1974.

The IAP project also is somewhat parallel to one proposed as a UROP (Undergraduate Research Opportunities Program) by the New England Consortium on Environmental Protection (NECEP).

NECEP has suggested a potential project for MIT undergraduates that involves exploring energy conservation techniques and methods with member companies and corporations of the Greater Boston Chamber of Commerce.

After identifying the energy flow within several companies and firms, the students would test the effectiveness of alternate ways to reduce energy consumption.

Sponsoring the IAP project (176B) with the Physical Plant are David C. White, Ford Professor of Engineering and director of the Energy Laboratory; Peter Griffith, professor of mechanical engineering, and Leon R. Glicksman, lecturer in mechanical engineering and a member of the Energy Laboratory staff.

An organizational meeting will be held the first day of IAP, Jan. 7, at 2pm in Room 3-133.

"We will give the students tips on what we've done, and what can be done, along with the charts, drawings and plans that they'll
(Continued on page 6)

MIT Giving a Subject on Failure as a Dominating Theme in Society

The following story appeared in the Dec. 1, 1973, edition of the New York Times. © New York Times.

By ROBERT REINHOLD

Special to The New York Times
CAMBRIDGE, Mass., Nov. 30—Nothing seems to work these days. The mail is late, the railroads are bankrupt, products fail, fuel is scarce and Government seems helpless to cope. Few forces seem to dominate modern life like the fear of failure—failure in school, business, marriage, health.

Indeed, the theme of failure has become so dominant a one in our times that scholars and students at the Massachusetts Institute of Technology have organized a course to dissect its anatomy, explore its causes and effects, and ponder ways in which to cope with it.

If anything has come out of a semester of free-swinging debate, it is that failure is a much more complex and elusive notion than most would have thought—and that failure is often an essential stepping stone to success.

The new course, called "Failure of Human Systems," is the brainchild of Frank P. Davidson, a lawyer who has made a fair success of himself in such diverse careers as farmhand, futurist, systems analyst, and specialist in "macro-engineering," or the study of all the complex human and institutional aspects of engineering projects.

"I was struck that so many of the institutions of society are really set up to deal with failure," he said, citing the courts and prisons, bankruptcy and tort law, the welfare system, the insurance industry, medicine and the military as examples. "I thought we should take an analytical look at failure."

As a result, representatives of such diverse disciplines as sociology, architecture, medicine, engineering, urban planning, theology and law gather weekly to "examine the individual, organizational, societal and ethical implications and consequences of serious failure as an essential

component of the normal everyday living, learning, coping and succeeding experience."

In fact, the seminar has spent much of the term simply groping for an adequate definition of failure, one, for example, that does not become circular by setting up "failure" and "success" as opposites and then defining one in terms of the other.

Prof. Elting Morison, an historian, suggested that failure was "the inability of a mechanism or a man to fulfill the function for which it was designed." But this was not comprehensive enough.

One of the course instructors, Stephen C. Ehrmann, a graduate who is majoring in "future studies" at MIT's Alfred P. Sloan School of Management, offered a dual definition.

The first part, which he dubbed "failure-bad," carries heavy negative overtones of inadequacy and guilt—failure to achieve a generally desired, goal. The other, which he called "failure-learn," describes the kind of failure in-

involved when a child makes a mistake that helps him learn something, or when a scientist's experiment fails, thereby steering him toward a better theory.

"It is very rare to have a significant success without a failure first," Mr. Ehrmann said in an interview. "But on the other hand, if you have a significant success you're probably doomed to failure."

This duality has pervaded much of the discussion as the seminar ranged from personal failure to the collapse of huge institutional systems. Dr. Merton J. Kahne, who has seen not a few personal failures as chief of psychiatry at MIT, said that his and other social scientific professions have become too preoccupied with personal failure and tended to label people who deviate from accepted norms.

"In a technical environment, error is considered an exciting thing," he said. "If a top-notch physicist were to become aware of a flaw in the chain of reasoning there would be great excitement.

But in the social sciences people take things personally and defend their ideas. People become committed to ideas."

Dr. Kahne saw another positive function of failure in providing a point of departure for social change. "It may be that people need to label something negatively to move in another way," he said.

The question of institutional failure was addressed by J. Herbert Hollomon, a former Government official who is now head of MIT's Center for Policy Alternatives. "I have never been in an institution where I felt any essential agreement between the head and the actors on what the objectives should be," he told a recent session. "So failure is inevitable. For example, I cannot find what the objective of undergraduate engineering is at MIT. Therefore either the student will fail or the institution will. It is highly unlikely that their two objectives will agree after the fact."

The relationship between institutional and personal failure has been a recurring issue. To Mr. Davidson, who has played a role in planning the channel tunnel between England and France, one of the main lessons of the semester's exercise is that what is often seen as purely personal failure is really institutional failure—failure of prisons, schools, government and so on.

Mr. Davidson is a senior research associate with the Systems Dynamics Group at MIT, a center that attempts to study complex systems by reducing them to their components and building mathematical models to simulate them.

He believes this method can be turned to good use in studying the causes and effects of institutional failure. "Our effort to deal with failure ought to be less naive," he said. "We must look at larger systems."

Just such an effort is being made by many of the 20 students enrolled in the course, which is part of a growing effort by the once-coldly technical institution to look at the human and institutional aspects of advancing technology. By studying individual cases of failure, some of the students are trying to build abstract models of failure.

Sponsored jointly by the School of Engineering, the School of Management and the Department of Urban Studies, the course is led by Mr. Davidson, Dr. Kahne and Mr. Ehrmann, along with C. Lawrence Meador, a graduate student studying man-machine decision systems and long-range planning, and Prof. Thomas B. Sheridan, an engineer who specializes in communication theory.

They have invited a variety of guests, among them: Harold J. Berman, a Harvard law professor, to talk about the failure of legal systems and revolution; Edwin Diamond, a journalist and critic of the news media, to speak about the failure of magazines and newspapers; Carroll L. Wilson, an MIT management professor, to discuss failure in international affairs and Rene H. Miller, head of aeronautical engineering at MIT, to treat failure in the aviation industry.

All of the probing thus far has been very tentative and inconclusive. But Mr. Davidson hopes it will eventually result in more than just abstract debate. "I am hoping we will be graduating modern-day Lincoln Steffenses—to take institutions that are obviously not working and reform them."

Choral Society Concert Dec. 9

The MIT Choral Society, under the direction of John Oliver, will present a concert at 3pm, Sunday, Dec. 9, in Kresge Auditorium.

The program will offer Haydn's *Te Deum*, the Stravinsky Mass and Mozart's Mass in C Minor, K. 427.

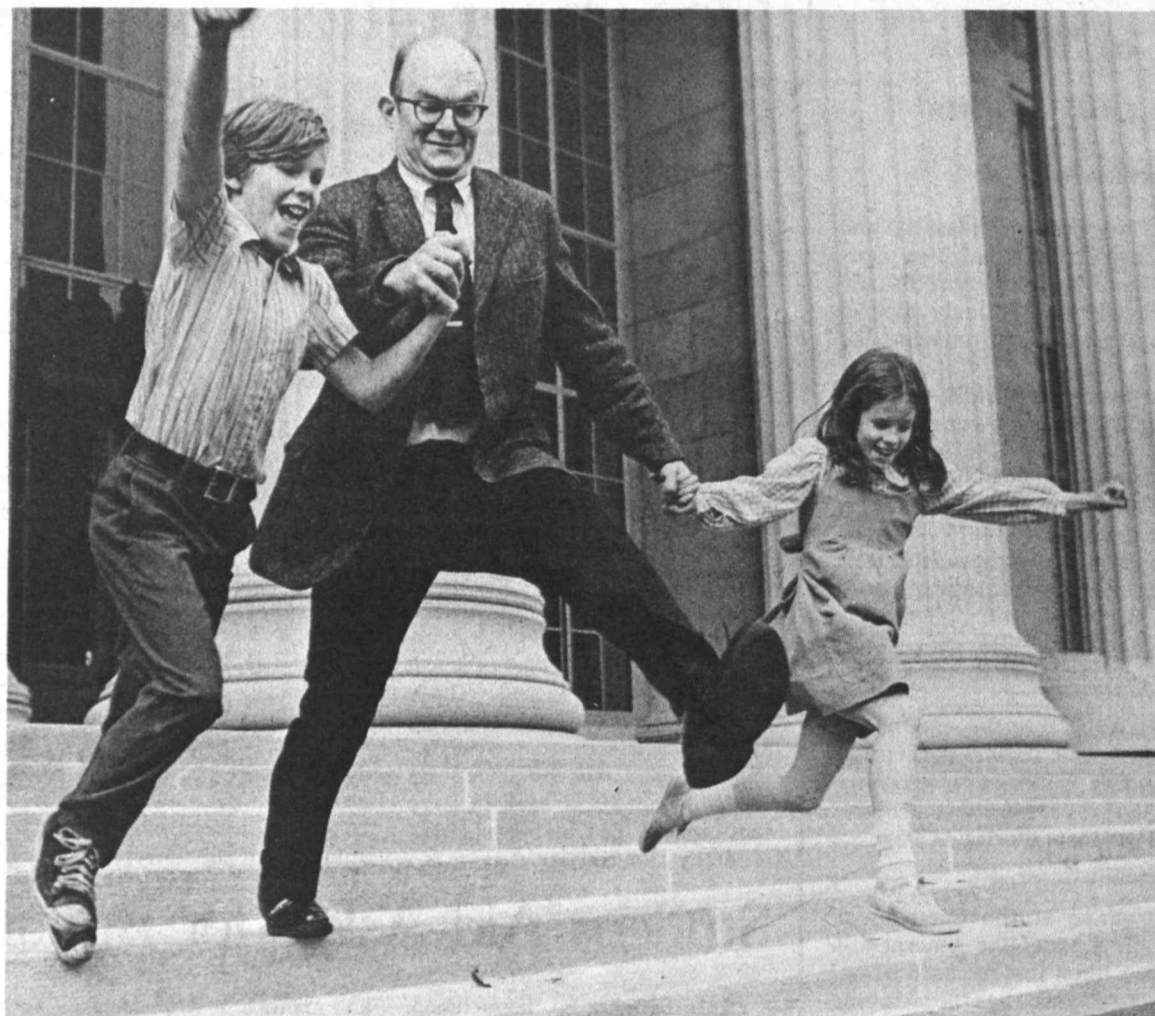
The Choral Society consists of 100 singers, all members of the MIT community, and four professional soloists. The soloists are Mary Lee Cirella, of Watertown, soprano; Judith Nicosia, of Princeton, N.J., mezzo-soprano; Richard Burke, of Hopkinton, tenor; and Robert Woods, of Cleveland, O., baritone.

John Oliver is also director of the MIT Schola Cantorum, the MIT Glee Club and the Tanglewood Festival Chorus, a chorus with the Boston Symphony Orchestra.

Ticket prices are \$3 for reserved seats, \$2 for unreserved seats, and \$1 for MIT students for unreserved seats. For reservations call Ext. 3-2906.

3 Representatives Elected by Forum

The MIT Women's Forum has elected Dorothy Bowe, Carol Grossman and Professor Vera Kistiakowsky as its representatives to a new advisory committee to Mary Rowe, special assistant to the president and chancellor for women and work.



MIT Professor Alar Toomre isn't quite as lithe as Mary Poppins, perhaps, but he joins his children, Erik, 11, and Anya, 9, in bounding down the steps to the Great Court to help publicize children's lecture, "Twenty Jumps From Here to Galaxies." Dr. Toomre, professor of applied mathematics in the Department of Mathematics, is giving the lecture Sunday at 3pm in Room 26-100 for the benefit of the

Technology Children's Center. The lecture—aimed at children six to 12 years of age, but open to all children over six—includes a film made by Professor Toomre showing a computer simulation of galaxies colliding. Proceeds from the annual lecture—a \$1 donation is requested—will be used for nursery school renovations.

—Photo by Margo Foote

Hayden Exhibit to Open

Viewing the Stars and the Moon in Photos

Sky watchers waiting for Kohoutek can survey other aspects of the heavens at a black and white photography exhibition, entitled *The Stars, The Moon*, to open Dec. 14 in the MIT Hayden Corridor Gallery.

The first section of the show, *The Stars*, is made up of 14-by-17-inch photographs taken at the California Institute of Technology's Mount Palomar Observatory.

A 48-inch Schmidt camera was used to produce the photographs. This camera photographs stars which are about 160,000 times fainter than the faintest stars visible to the naked eye.

The Stars photographs are part

of an unbound set of 1,870 photographs which comprise the National Geographic Society-Mount Palomar Observatory Sky Atlas. The Atlas, which is kept in MIT's Boston Stein Club Map Room in the Science Library, offers one of the most detailed surveys of the Northern celestial sphere.

The Moon, the second section of the exhibition, includes numerous high and medium resolution 24-by-20-inch photographs made by the National Aeronautics and Space Administration's five lunar orbiter satellites in 1966-67. The lunar orbiter missions were specifically designed to provide photography for mapping the moon.

The photographs have been loaned for the exhibition by the Department of Earth and Planetary Sciences' Planetary Astronomy Laboratory.

Included in *The Moon* series are close-ups of the moon's surface and views of the moon's far side.

The exhibition, sponsored by the Committee on the Visual Arts, will remain on view through Jan. 12, 1974.

MIT Press Catalogue

The 1973 fall catalogue of books to be published by the MIT Press during the remainder of the year is available at the Press and the MIT Coop.

TECH TALK

December 5, 1973

Volume 18, Number 22

Tech Talk is published 50 times a year by the News Office, Massachusetts Institute of Technology. Director: Robert M. Byers; Managing Director, News Office Publications: William T. Struble; Assistant Directors: Joanne Miller, Margo Foote (Photojournalist); Charles H. Ball, Dennis L. Meredith, Robert C. DiIorio; Business Manager: Paul E. Johnson; Reporters: Sally M. Hamilton; Damon P. Wright; Calendar of Events/Want Ads: Susan E. Walker.

Address news and editorial comment to MIT News Office, Room 5-111, Massachusetts Institute of Technology, Cambridge, Ma. 02139. Telephone Ext. 3-2701.

Mail subscriptions are \$5 per year. Checks should be made payable to MIT and mailed to Business Manager, Room 5-122, MIT, Cambridge. Telephone Ext. 3-3676.



Dr. Harold E. Edgerton, Institute Professor Emeritus, greets his friend Jacques-Yves Cousteau, world famous undersea explorer. Cousteau visited the Institute Monday, before he received an award from the New England Aquarium for his service to

the environment. Cousteau and Dr. Edgerton, who has developed underwater cameras and strobe lights for the explorer have been associated on a number of projects in recent years.

—Photo by Margo Foote

Third ADP Session To Begin on Feb. 12

The third session of MIT's Administrative Development Program will begin Feb. 12 and applications will be due Dec. 28.

Dr. David E. Berlew, senior lecturer in organization studies at the Alfred P. Sloan School of Management, will lead the session, which will concentrate on organizational behavior.

Classes will begin Tuesday, Feb. 12, and continue from 9am to noon each Tuesday for about eight weeks.

Meetings to discuss ADP III have been scheduled at 1pm Tuesday, Dec. 11, and at noon on Thursday, Dec. 13. Both meetings will be in the Bush Room (10-105).

More than 50 MIT administrators are participating in ADP I or ADP II. Many will be on hand at the ADP III information meetings to answer questions.

Members of the administrative staff (including DSR and Lincoln administrative staff members), exempt administrative staff, and library and academic adminis-

trative staff, are eligible for the program.

Application forms will be available at the Dec. 11 and Dec. 13 meetings. They also can be obtained from Jan Morgan, Office of Personnel Development, Room E19-734, Ext. 3-1676.

A subcommittee of the Personnel Policy Committee will select approximately 30 participants for ADP III. The subcommittee will aim at a broadly representative group.

One of the objectives of the program is to provide for an exchange of experience and opinion between administrators from different parts of the Institute, different levels of responsibility and different backgrounds.

The fall session of ADP also will run about eight weeks and will concentrate on financial administration and control.

Applicants who were deferred for ADP I and ADP II will be contacted to determine whether they still wish to be considered for the program.

Students Asked To Pay Visits To High Schools

The Admissions Office has issued its annual call for undergraduates to visit their high schools during Christmas vacation.

Each year several hundred students do visit their former high schools, according to Peter H. Richardson, director of Admissions.

"Our students," he said, "are a valuable source of information both for their former teachers and for prospective MIT students. Their personal experiences at MIT present a far more accurate picture of college life—particularly at MIT—than can be presented in any handbook."

Admissions officers responsible for the various geographic areas will be available on a drop-in basis 2-4pm, Dec. 12, 13 and 14, to discuss admissions and other aspects of MIT with students who plan to visit high schools.

Will MIT Have a Pitcher in the Majors?

"The time when MIT has a pitcher in the majors is drawing closer," wrote Peter Gammons in the *Boston Globe*.

The player he was referring to is Alan F. (Al) Dopfel, a 1972 management graduate from Brockton, Mass., who Gammons said was "the top pitcher in the Arizona Instructional League with an 8-0 record."

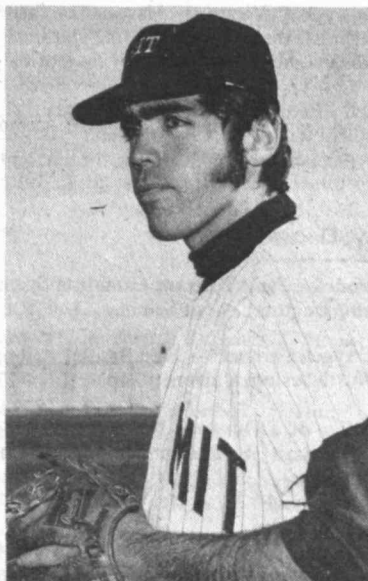
The 23-year-old right-hander, the property of the California Angels, pitched in the instructional league from September to mid-November. Now he has followed the sun to Puerto Rico, where he is pitching for the Mayaguez club in the winter league there.

Dopfel, whose heroics at MIT included a no-hitter against Brandeis and a one-hitter against Bates (he struck out 19 in that game for an MIT record), pitched last summer for the El Paso Sun Kings, a Class AA Angels farm team, in the Texas League. The summer before that, his first in professional baseball, he pitched in Shreveport, La.

He is still waiting to receive his assignment for next summer, his mother said last week.

Mrs. Dopfel said her son was looking forward to pitching in the Puerto Rican league, where a number of major leaguers play during the off-season.

She said he is anxious to hear from friends and promises to answer letters. His address is the Mayaguez Baseball Club Inc., 18 E. Sol, Mayaguez, P.R., 00708.



Pitcher Dopfel

Fuel Supply Unsure After First of Year

(Continued from page 1)

graduate schools on the Medford Campus and the Graduate School of Arts and Sciences. They will not affect the medical or dental schools or the Fletcher School of Law and Diplomacy.

In the meantime, the energy crisis continues to involve members of the MIT community in different ways. Dr. Morris A. Adelman, professor of economics, was featured Monday on the NBC Nightly News as an expert on the economics of oil policy. He was interviewed as part of a continuing series on the energy crisis.

At MIT, Mr. Dickson said his projection on fuel consumption during December was based "on the anticipation that the Institute will receive not less than 75 percent of its normal allotment of oil."

"It would appear, with the savings program initiated last month and with the two holiday periods in the latter part of the month, that we should be able to get through the month without dipping too heavily, if at all, into our oil reserves," he said. He said that the reserves amounted to 380,000 gallons, but added that this would last "only five or six days in a period of cold weather."

The holiday periods Mr. Dickson referred to are two four-day weekends made possible by special closings announced earlier on Monday, Dec. 24, and Monday, Dec. 31, before Christmas and New Year's Day.

Mr. Dickson said his department planned to lower temperatures even below weekend levels, where possible, during those periods.

He said temperatures are maintained at about 65 degrees on weekends because of the people remaining on campus, but might be lowered to about 50 degrees in areas closed down during the holiday recesses.

"Our role will be to shut down as many areas as we can, discipline by discipline," he explained. "The computation center is trying to close, for example, and we also hope to close most of the libraries."

Mr. Dickson said he expects to

start January "in reasonably sound condition" as far as fuel is concerned.

But he cautioned that with the onset of the coldest weather of the winter, "the economies to date would not allow us to operate in January and February without using reserve supplies."

As a result, he said, it appears it will be necessary to institute additional fuel saving measures.

"We started with the big things, and now we are concentrating on the smaller things," he said. "Each day new measures are being put into effect."

He mentioned again what MIT employees can do to save energy:

Close venetian blinds and drapes at night and on weekends; keep windows closed; keep doors opening into corridors closed; keep books, papers, coats, etc., off registers or forced hot air registers; turn thermostats down to at least 65 at night and on weekends, and by at least four degrees during the day, and don't use electric space heaters.

Employees also are urged to submit energy saving suggestions by calling ENCON (3-6266), the special telephone extension the Department of the Physical Plant has established for this purpose.

The department also announced yesterday that it has adopted a system of color coding to identify light fixtures where bulbs have been removed intentionally to save power.

It asked that members of the community not report burn-outs without referring to the color code, which has these categories:

Red Sticker—Indicates that all bulbs have been removed from the fixtures.

Green Sticker—Indicates that some, but not all, of the bulbs have been intentionally removed.

No Sticker—Means that the fixture has not been chosen for bulb removal and that burn-outs should be reported as usual.

All requests for bulb replacement or removal (where light reduction is believed acceptable to conserve energy) should be made to the control center at Ext. 3-4948.

IPS Seminar On Security Of Computers

MIT's Information Processing Services (IPS) will present the second in a series of computer security seminars at 3:30pm, Dec. 13 in the Mezzanine Lounge of the Student Center.

The seminar will include a review of the computer security research project with which the IPS has been involved for the last 18 months.

MIT's role in the project—which is funded by IBM—has been to study user communities with regard to computer security requirements and to install and evaluate the IBM Resource Security System (RSS) with emphasis on access control requirements and mechanisms.

Speakers will be Robert C. Daley, director of the Programming Development Office; Brenda Ferriero, RSS project manager; Stuart E. Madnick, assistant professor of management science, Alfred P. Sloan School of Management, and Robert H. Scott, IPS director.

Corporation Meets

A regular quarterly meeting of the MIT Corporation will be held Friday, Dec. 7. The executive committee of the Corporation will meet Thursday morning, Dec. 6. On Thursday, Dec. 6, the MIT Corporation Development Committee will hold its annual meeting.

Lobby 7 Concert

A noon-hour concert of violin and guitar music will be presented today, Wednesday, Dec. 5, in the Building 7 lobby. Program selections will range from classical music to country western fiddle tunes. Musicians for the concert will be Maria Rhines, violin, and Yara Cadwalader, guitar.

Obituary

Myron Matz, 60

Dr. Myron H. Matz, 60, of Belmont, a part-time dermatologist in the Medical Department since 1963, died on Sunday, Dec. 2. Dr. Matz leaves his wife, Ruth, a daughter, Laura Elliot and son, Andrew Matz.

THE INSTITUTE CALENDAR

December 5
through
December 14

If your club or other activity is planning to meet during vacation or IAP, please contact the Calendar Editor by 12 noon, Fri, Dec 14. Otherwise, your notice will be removed from the calendar listings and will not be reinstated until a new listing is received.

Events of Special Interest

SALT: Technological Impact on Progress and Prospects* - Sidney Drell, deputy director, Stanford Linear Accelerator Center. MIT-Harvard Arms Control Seminar. Wed, Dec 5, 4-6pm, Rm 9-150.

Auction* - Over 180 science fiction magazines, including 23 issues of *Astounding Stories* ('31-'41) and over 60 issues of *Amazing* (30's & 40's). Thurs, Dec 6, 4-6pm, Rm 1-236. Info, MIT SFS, x9144 Dorm or SF library Stu Ctr Rm 421.

Holiday Arts & Crafts Sale* - Come do your Christmas shopping at the Technology Wives Organization annual sale. Thurs, Dec 6, 8am-7pm, Bldg 10 Lobby.

Children's Christmas Party* - Technology Wives Organization party, with a mime play, "Suitcase Circus." Sat, Dec 8, 10am-12n, Sala. Refreshments. Admission 50 cents.

The Loch Ness Monster* - Tim Dinsdale. LSC/UA Lecture. Mon, Dec 10, 8:15pm, 26-100. Free. Mr Dinsdale was here two years ago and will return with more slides and films of Nessie. A panel discussion will follow.

Seminars and Lectures

Wednesday, December 5

Present Crisis as Seen From the UN* - Frans Alting von Geuseu, Netherlands Delegate to the United Nations, former Political Science visiting professor. CIS Informal Luncheon/Seminar. 12:30-2pm, Rm E53-482.

A Simulation Model for Compositional and Perceptual Musical Activity - Dr. Otto E. Laske, Institute voor Sonologie, Rijksuniversiteit te Utrecht, The Netherlands. Artificial Intelligence Lab Seminar. 1-3pm, 8th fl common rm, 545 Tech Square.

Computer Molecular Dynamics of Solids* - O.L. Deutsch, G. Nuclear Engineering Doctoral Seminar. 2pm, Rm 24-307.

Kinetics, Modeling and Design of Microbial Processes* - Dr. Elmer L. Gaden, Jr, chemical engineering, Columbia University. Microbiology and Biochemical Engineering Seminar. 3pm, Rm 16-134. To schedule consultation call A.L. Demain, x3-1711.

Non-Linear-Nodal Methods for Solving Neutron Diffusion Equations* - J. Mason, G. Nuclear Engineering Doctoral Seminar. 3pm, Rm NW12-222.

Application of the One-Equation Turbine Model for Flow in an Infinite Bare Rod Bundle* - P. Carajilescov, G. Nuclear Engineering Doctoral Seminar. 4pm, Rm NW12-222.

Chemistry and Pharmacology of Snake Toxins* - Dr. Chen-Yuan Lee, National Taiwan University. Biology Colloquium. 4:30pm, Rm 4-270.

Thursday, December 6

PDP II Users Meeting* - Report on DECUS 73, 2:30pm, Rm 39-540, Coffee, 2pm.

The M-Ary Pure State Quantum Detection Problem* - Prof. R. Kennedy, electrical engineering, RLE, RLE & Electrical Engineering Communication Theory Seminar. 3-4pm, Rm 26-217.

Psychoacoustics and Hi-Fi; Spatial Localization* - M.F. Davis, G; C.L. Searle, Clarence Joseph LeBel Professor of Electrical Engineering. Student Branch of IEEE Lecture (second of three). 4pm, Rm 9-150.

Constraints in Regulation of Air Transport: Energy, Service, Economic Growth* - Robert D. Timm, chairman, Civil Aeronautics Board. Flight Transportation Seminar. 4pm, Rm 35-225. Coffee 3:30pm, Rm 33-411A.

Fluctuations in One-Dimensional Magnets* - Dr. R.J. Birgenau, Bell Telephone Labs. Physics Colloquium. 4:15pm, Rm 26-100. Refreshments 3:45pm, Rm 26-110.

Friday, December 7

Laser Fusion at Los Alamos* - Dr. Richard Morse, Los Alamos Research Lab. Laser Physics Seminar. 11am, Rm 26-414. Coffee 10:30am.

Putting Technology into Technology Assessment* - Aaron

Gellman, Wharton School of Business, University of Pennsylvania. Center for Transportation Studies Luncheon/Seminar. 12n, Stu Ctr, Mezzanine Lge. Buffet \$2, lecture free.

Science Advise for the President* - Dr. George Kistiakowsky, visiting scholar, CIS, former presidential science advisor. Science and Public Policy Seminar. 2-4pm, Rm E53-482.

The Sahel-Sudano Region* - speaker to be announced. Center for Policy Alternatives Seminar Series. 3-4pm, Rm 1-236. Coffee. Information, x3-7142.

The Design of Low Emission Automotive Steam Power Plant* - Walter D. Syniuta, manager, mechanical systems, Scientific Energy Systems Corporation. Mechanical Engineering Seminar. 3pm, Rm 3-133. Coffee 4pm, Rm 1-114.

Symbolic Computations in Plasma Physics** - Prof. A. Bers, electrical engineering. RLE Plasma Dynamics Seminar. 4pm, Rm 36-261.

Glass Spheres for Buoyancy in the Deep Ocean* - Sam Raymond, Benthos Co. Ocean Engineering Tankard Seminar. 4-5pm, Rm 5-134.

Monday, December 10

Association for Women Students Seminar** - Sidney Turner, special assistant to Governor Sargent for women's affairs. 4-6pm, Rm 3-310. Refreshments. Men and women welcome.

Coordinated Nitrene Intermediates in Reactions of Azido Metal Complexes* - Fred Basolo, Arthur D. Little Visiting Professor, Northwestern University. 4pm, Rm 4-270.

Sediment Movement by Shoaling Internal Waves* - Dr. David Caccione, Office of Naval Research, Boston Branch. Civil Engineering Water Resources and Hydrodynamics Seminar. 4-5pm, Rm 48-316. Coffee 3:45pm, Rm 48-110.

Solutions and Nonlinear Waves* - Mark J. Ablowitz, mathematics, Clarkson College of Technology. Applied Mathematics Colloquium. 4pm, Rm 2-338. Tea 3:30pm, Rm 2-349.

Measurements of Thermal Properties in Biological Materials, Part II: Noninvasive Techniques - Integrated System Using Laser Heating and Infrared Temperature Measurement* - H. Fredrick Bowman, W. Peter Hansen and T.A. Balasubramaniam, mechanical engineering, Northeastern University. Harvard-MIT Program in Health Sciences and Technology/Interdisciplinary Program in Biomaterials Science Seminar. 4pm, Rm 37-212.

Research Applied to National Needs* - Dr. Holt Ashley, director, office of exploratory research, National Science Foundation. Aero/Astro Seminar. 4pm, Rm 37-252.

Emily Dickinson on her Birthday* - Tillie Olsen, writer-in-residence. Humanities Women, Writers and Writing Lecture. 8pm, Stu Ctr Mezzanine Lge. Refreshments, free.

Tuesday, December 11

Proposed (?) Synchrotron Radiation Experiment in the Alcatraz Device (or the Blind Leading the Blind)* - David Komm, G. Nuclear Engineering Doctoral Seminar. 12n, Rm 38-166.

The Structure and Effective Use of Biological Abstracts and Bioresearch Index** - Ann Farren, BIOSIS. Science Library Seminar. 1-3pm for those with no prior experience, 3-5pm for workshop to improve skills, Rm 14-0615. Coffee. Information, Ann Devilliers, x3-3528.

OECD and International Pollution Control* - Alexander Cochrane, Environmental Secretariat of OECD. CIS Seminar. 3:30-5:30pm, Rm E53-482.

Stochastic Modeling and Dynamic Estimation of Air Pollution* - Adewunmi Desalu, Electronic Systems Lab. Electrical Engineering Decision and Control Sciences Group Seminar. 4pm, Rm 37-212.

Psychoacoustics and Hi-Fi; 4-Channel and All That* - M.F. Davis, G., C.L. Searle, Clarence Joseph LeBel Professor of Electrical Engineering. Student Branch of IEEE Lecture (last of three). 4pm, Rm 9-150.

Fluid-Mechanical Anomalies of the Human Microcirculation* - Prof. C. Forbes Dewey, mechanical engineering. Interdepartmental Fluid Mechanics Seminar. 4pm, Rm 2-338. Coffee 3:30pm, Rm 2-349.

Computer Animated Films for Teaching Astronomy* - M.L. Meeks, Haystack Observatory. Astrophysics Colloquium. 4:15pm, Rm 37-252, Coffee 4pm.

Endogenous Type C Viruses in Mammalian Cells* - Dr. George J. Todaro, National Institute of Health, National Cancer Institute. Biology Colloquium. 4:30pm, Rm 6-120. Coffee 4pm, Rm 56-620.

Housing and Economics*** - Secretary Thomas I. Atkins, executive officer, Communities and Development, Boston. Community Fellows Program Seminar. 5-6pm, Rm E40-169.

Wednesday, December 12

A Highly Modular Fault Tolerant Computer System* - Basil Smith, G. Aero/Astro Doctoral Thesis Seminar. 2pm, Rm 33-206.

Synthetic Oxygen Carriers* - Fred Basolo, Arthur D. Little Visiting Professor, Northwestern University. 4pm, Rm 4-270.

Implementation of a Dynamic Programming Model for Commodity Purchasing* - Basil A. Kalyon, Harvard University Graduate School of Business Administration, Operations Research Center Seminar. 4pm, Rm 24-121. Coffee & donuts.

Energy Crisis and US Foreign Policy in the Middle East* - Dr. Arnold Soloway, author of *Truth and Peace in the Middle East*; Dr. Ernst G. Frankel, ocean engineering. American Israeli Dialogue Seminar Series. 8:30pm, Stu Ctr Mezzanine Lge.

Thursday, December 13

Computer Security - Research and Implications* - R.H. Scott, R.C. Daley, B.L. Ferriero & S.E. Mednick, MIT. Information Processing Services Seminar. 3:30pm, Stu Ctr Mezzanine Lge. Coffee 3pm.

Closed Cycle Hot Gas Engines* - Prof. Joseph L. Smith, Jr, mechanical engineering. Thermodynamics Seminar. 4pm, Rm 3-343. Coffee.

Comets Today* - Prof. Fred Whipple, Harvard University. Physics Colloquium. 4:15pm, Rm 26-100. Refreshments 3:45pm, Rm 26-110.

Pharmacologic Studies on the Central Nervous System Regulation of Food and Water Intake* - David Lehr, M.D., Prof, chairman of pharmacology, New York Medical College. Nutrition and Food Science Seminar. 4:15pm, Rm 54-100. Coffee 4pm.

Transfer of Technology; a Desegregated Model* - Dr. Alexander Nowicki, International Bank for Reconstruction and Development. Technology Adaptation Program Seminar. 4:30pm, Rm 9-150.

Friday, December 14

Underwater Photography* - Dr. Kenneth R. H. Read, biology, Boston University. Course 6.163 Lecture. 12n, Rm 10-250.

Confinement and Scaling in Tokamaks** - Dr. J. Clarke, Oak Ridge National Lab. RLE, Plasma Dynamics Seminar. 4pm, Rm 36-261.

Mechanism of Substitution Reactions of Metal Carbonyls* - Fred Basolo, Arthur D. Little Visiting Professor, Northwestern University. 4pm, Rm 4-270.

Challenge to Higher Education: A Greater and More Responsible Access?* - Dr. John Monro, Miles College, Birmingham, Alabama. Resident: Dr. Kenneth B. Clark, Institute Lecturer, MIT; president, Metropolitan Applied Research Center, NYC. Technology and Culture Seminar. 5:30pm, Rm 9-150. Buffet 7pm, Stu Ctr. Open discussion 7:30-9pm.

Community Meetings

Introductory PL/1 for FORTRAN Programmers - Non-credit course, consisting of lectures, exercises & machine problems. Nov 28, 29, Dec 3, 5, 7, 10, 12, 14, 17 & 19, 11am-12:30pm, Rm 39-530. Fee: \$15. Preregister, Lynne Penney, Rm 39-427, x3-6320.

Student Committee on Educational Policy* - Review & planning meeting on academic projects. Wed, Dec 5, 7:30pm, Stu Ctr Rm 353.

Family Day Care Program*** - Day Care parents will meet to discuss developmental stages of pre-school children. Fri, Dec 7, 9:30am, Rm 1-236.

Children's Christmas Party** - Sponsored by Research Development and Technical Employees Union, Sun, Dec 9, 1:30-5pm, Sala. Open to Union Members and their children.

Steamship Historical Society* - Dorothy Nash will speak on "The Adventures of a Ship Watcher." Fri, Dec 7 8pm, Stu Ctr West Lge.

Women's Forum* - Tillie Olsen, writer-in-residence, will speak on her career as a writer. Mon, Dec 10, 12n, Bush Rm 10-105.

MIT Community Players* - Meeting, with scenes prepared in the recent acting workshop. Mon, Dec 10, 7:30pm, Stu Ctr Mezzanine Lge. Refreshments.

Interested Law Students* - Ms. Sally Begley, director of admissions, Antioch School of Law, will conduct a group meeting, sponsored by Preprofessional Office. Tues, Dec 11, 3-4pm, Rm 10-179.

SCEP - Meeting Wed, Dec 12 has been cancelled.

MIT Club of Boston Christmas Luncheon Meeting - Buffet with eggnog, the "MIT Logarithms." Thurs, Dec 13, 12:15-1:30pm, Aquarium Restaurant. Cost \$4, pay at door. Reservations, Leena, x3-3878.

Preprofessional Meetings* - Dr. William Fleeson, associate dean, University of Connecticut Health Center, Wed, Dec 5, 12n-1pm, Rm 4-149. Stephen Fogg, Boston College Law School, Thurs, Dec 13, 3-5pm, Rm 10-186.

Student Art Association** - Open drawing workshop. Tues, 7:30pm, Stu Ctr Rm 429.

M.I.T. Open House Committee** - Thurs, 7:15pm, Rm 26-065.

Urban Action Volunteer & Resource Center - Volunteer tutors, teachers urgently needed in Cambridge and Boston schools, as well as volunteers for other community agencies. Mon-Fri, 9am-5pm, Stu Ctr Rm 437, or call x3-2894.

Course Evaluation** - Sponsored by TCA & SCEP. Come help out. Info, lve msg at TCA, Stu Ctr Rm 450, x3-4885.

MIT Club Notes and Meetings

Bridge Club* - ACBL Duplicate Bridge. Matchpoint pairs Thurs, 8-11:30pm; beginners Fri, 10pm-12m; small IMP-scored team of 4 events (advance registration required) Fri, 8pm & Sat, 2pm; Charity Game (sectional rally), open pairs, Fri, Dec 14, 8pm; all Stu Ctr Rm 407. Jeff, x3-5285 or 864-5571.

Chess Club** - Sat, Sun, 1:30-5pm, Stu Ctr Rm 473.

Chinese Choral Society* - Singing. Sun, 3-6pm, Stu Ctr Rm 473.

Classical Guitar Society - Classes, group or private. Mon & Thurs, 5-8pm; Sat, 8am-12n; Rm 4-146, 148, 149. New group class for beginners every month. Vo Ta Han, 494-8353.

Fencing Club** - Wed & Thurs, 6:30-9:30pm, duPont.

Figure Skating Club** - Practice Wed, 11am-12n, Ice Rink. Must have athletic card.

Folk Dance Club* - International, Sun, 7:30-11pm Sala. Balkan, Tues, 7:30-11pm, Stu Ctr Rm 491. Israeli, Thurs, 7:15-10:15pm, T Club Lge, duPont. Afternoon Dance Break, Fri, 12:30-1:30pm, Kresge Oval.

Goju Karate Club* - Mon, Thurs, 7pm, Stu Ctr Rm 407. Beginners enter class first week of each month. Info, Terry or Dick, 440-9631.

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

Judo Club** - Sport and self defense. Mr. M.H. Yanagi, 5th degree Black Belt, chief instructor. Mon, Wed, Fri, 5pm; Sat 1pm, Exercise Rm, duPont Gym. Beginners welcome. Info, Mike Portnoff, x3-7319.

Kung Fu Club** - Northern Praying Mantis, Tues, 7-9pm, T Club Lge, Thurs, 7-9pm, 4th fl 139 Main St. Info, H.C. Wong, 876-5071.

MIT Karate Club** - Evening classes Mon, Wed, 8-10pm, duPont Wrestling Rm. John Miller, x3-1588.

MIT Magazine: Free Parking - Weekly meeting. Sun, 8pm, Walker Mem Rm 316.

MIT Scuba Club*** - Pool session Wed, Dec 12, 8-10pm, Alumni Pool.

MIT Wheelmen* - Wholesale parts orders placed, racing & touring events planned, informal discussion of everything about bicycling. Wed, 7:30pm, Rm 1-203.

Outing Club* - Mon & Thurs, 5-6pm, Stu Ctr Rm 461.

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

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

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

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

Tech Engineering News** - General staff meeting. Sun, 5pm, Stu Ctr Rm 453.

Technique*** - Yearbook staff meetings. Sat, 11am & Wed, 7:30pm, Stu ctr Rm 451.

Tech Squares*** - Western style square dancing. Tues, 8-11pm, Sala. Admission \$1, first time free.

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

Volleyball Club** - Serious volleyball, eventually leading to participation in Boston area tournaments. Sun (except vacations), 2-4pm, duPont Gym.

Women's Gymnastics Club* - Mon-Fri, 5-7pm, duPont Gym. Info, Ursula, x3-5954.

Wellesley Events

Photographs by Wynn Bullock* - A selection of his works from the past four decades. Thru Dec 17. Main Corridor Gallery, Jewett Art Center.

Social Events

24-Hour Coffee House* - Inexpensive food, candy, non-alcoholic drinks are sold. Relax, play games, read. Daily, Stu Ctr, 2nd fl center lge.

Pot Luck Coffeehouse** - Live entertainment, cider, donuts, coffee. 8:30pm-12m, W20 Mezzanine Lge, 3rd fl. Performers & others interested in helping out, call Doug, x8766 Dorm.

Friday Afternoon Club** - Music, conversation and all the cold draft you can drink. Fri, 6pm, the Thirsty Ear, Ashdown Basement. Admission \$1 men, 50 cents women. Must be over 18.

Muddy Charles Pub** - Join your friends for music, beer, wine, snacks, conversation. Mon-Fri, 11:30am-2pm, 4-8pm, 110 Walker. Call GSC, x3-2195.

Deutscher Tisch - Wir treffen uns freitags von 1-2 in Lobdell, um auf Deutsch und uber Deutschland zu reden. Wir sind an der schwarz-rot-goldenen Tischflagge zu erkennen.

Movies

Henry V* - Humanities. Wed, Dec 5, 7pm, Rm 10-250.

The Red Desert* - Humanities. Wed, Dec 5, 7pm, Rm 14N-0615.

The Concert for Bangladesh - LSC. Fri, Dec 7, 7pm, 9:30pm, Rm 26-100. Admission 50 cents, ID required.

Greed (Eric von Stroheim)* - Film Society. Fri, Dec 7, 7:30pm, 9:30pm, Rm 6-120. Donation \$1.

King of Hearts - Midnite Movie Series. Fri, Dec 7, 12m, Sala. Free, ID required. Bring your own blanket.

The Godfather - LSC. Sat, Dec 8, 6:30pm, 10:00pm, Kresge Auditorium. Admission 50 cents, ID required.

Der Dritte (The Third)* - Foreign Literature. German, no subtitles. Sat, Dec 8, 8:30pm, Rm 26-100.

Bonnie and Clyde - LSC. Sun, Dec 9, 8pm, Rm 10-250. Admission 50 cents.

Millhouse* - Humanities. Mon, Dec 10, 7pm, Rm 10-250. Free.

Pride and Prejudice* - Humanities. Tues, Dec 11, 7pm, Rm 4-370. Free.

Z (Costa Gavras)* - Humanities. Thurs, Dec 13, 7pm, Rm 10-250. Free.

The Time Travellers - Midnite Movie Series. Fri, Dec 14, 12m, Sala. Free, ID required. Bring your own blanket.

Music

Chamber Music Society Concert* - Works by Mozart, Ibert, Reicha and Danzi. Conducted by William Draper. Wed, Dec 5, 5pm, Music Library.

Noon Hour Concert Series* - The Mordor String Quartet performing Hindemith and Brahms. Thurs, Dec 6, 12n, Chapel. Free.

MIT Festival Jazz Ensemble* - Directed by Herb Pomeroy, with Halbert White Sextet & MIT Concert Jazz Band present annual fall concert. Fri, Dec 7, 8:30pm, Kresge Auditorium. Free tickets available to MIT Community in Bldg 10 Lobby, or \$1 at door.

Chamber Music Society* - Free Concert, Sat Dec 8, 3:30pm, Kresge.

Concert* - MIT Choral Society. Program includes Haydn, Stravinsky, Mozart. Sun, Dec 9, 3pm, Kresge Auditorium. Tickets: \$3 reserved seats, \$2 unreserved, and \$1 for MIT student unreserved seats; on sale Bldg 10 Lobby & at door. Reservations, x3-2906.

Noon Hour Concert Series* - John Gibbons, harpsichordist, will perform Bach Partitas No 5 & 6. Thurs, Dec 13, 12n, Chapel. Free.

Recorder Ensemble** - Music provided, but bring instruments and any music you wish to play. Tues, 7pm, ESG Hdqtrs, 6th fl bldg 24. All aficionados welcome, freshmen are encouraged to attend. Details, David Dreyfus, x3-7787.

Theater

Rashomon* - MIT Community Players present a play written by Fay and Michael Kanin, directed by Phoebe Wray. Thurs, Fri, Sat, Dec 6,7,8,13,14,&15, 8pm, Kresge Little Theatre. Tickets \$2.50, \$2/students. Available at door or in Bldg 10 Lobby.

Exhibitions

Tech Model Railroad Club* - Fall Open House. Bring the children. Sat, Dec 8, 2-5:30pm, 7:30pm-11pm, Rm 20E-214. Free.

Hayden Gallery* - Collages, prints and graphics by the German artist Kurt Schwitters in the Main Gallery and silkscreen prints by Corita Kent in the Corridor Gallery, through Sat, Dec 8. Gallery hours Mon-Sat, 10am-4pm. Free.

Photography Exhibition* - 8x10 Contact Prints by Ron Rosenstock. Opens Tues, Dec 4, Creative Photography Gallery, 120 Mass Ave. Mon-Fri 9am-10pm, Sat, Sun, 12n-6pm, Free.

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

Music Library Exhibit - In honor of St. Cecilia, patron saint of music. Scores, books, pictures.

Athletics

Wednesday, December 5* - JV/F&V Fencing. Harvard, 7pm, duPont Fencing Rm.

Thursday, December 6* - Var B Basketball. Boston University, 7:30pm, Rockwell Cage.

Friday, December 7* - V Rifle. Wentworth, 6:30pm, duPont Rifle Range.

Saturday, December 8* - F/V Basketball. Trinity, 6:15pm, 8:15pm, Rockwell Cage. V Fencing. Brooklyn College, 2pm, duPont Fencing Rm. Gymnastics. Lowell Tech, 2pm, duPont Gym. V Hockey. Wesleyan, 7pm, Ice Rink. Swimming. Springfield, 2pm,

Alumni Pool. Indoor Track. Worcester Polytechnic Institute, Brandeis, 1pm, Rockwell Cage.

Sunday, December 9* - Gymnastics. Pennsylvania, 2pm, duPont Gym.

Religious Services and Activities

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

Campus Crusade for Christ/College Life Family Time* - Singing, sharing, prayer & teaching from God's Word. Fri, 7-9:30pm, Rm 1-132.

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

Christian Bible Discussion Group* - Thurs, 1pm, Rm 20B-031. Prof. Schimmel, x3-6739, or Ralph Burgess, x3-2415.

Christian Science Organization* - Meetings, including testimonies of healing. Tues, 7:15pm, Chapel.

Hillel:* Services - Mon-Fri, 8am, Rm 7-102; Fri, Traditional 4:15pm, Kosher Kitchen, Non-Traditional 7:45pm, Chapel; Sat, 9am, Chapel. **Classes** - many interesting classes offered, for full schedule call Hillel office, x3-2982. **Shabbos Meal** - enjoy a traditional Fri evening meal at Kosher Kitchen, must order by Tues each week. Info and to order, Herbie Levine, x8403 Dorm.

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

Latter Day Saints Student Association* - Discussion of beliefs. Tues, 8am, Stu Ctr West Lge.

Protestant Communion Service* - Wed, 5:05pm, Chapel.

Protestant Worship Services* - Sun, 11am, Chapel.

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

Roman Catholic Holiday Mass Schedule* - Feast of the Immaculate Conception, Sat, Dec 8, 8am, 5:05pm, Chapel.

United Christian Fellowship* - Christians for Dinner and Sharing Meeting. Thurs, dinner, 5pm Walker, followed by singing, sharing, prayer 6pm, Rm 6-321.

United Christian Fellowship* - Group study of world religions & Jesus Christ from biblical perspective. Sun, 9:30-10:30am, Rm 5-216.

Westgate Bible Study Meeting* - Includes study of the Gospel of Mark. Wed, 8pm, apt 1202 Westgate I.

Announcements

Unicef Greeting Cards - Also notes, datebooks, available at TCA Office, Stu Ctr Rm 450. Wide selection now, but they go very fast! Call x3-4885, stop by today.

MIT Dramashop - Tryouts & technical position sign-ups for all aspects of IAP production of Shakespeare's *Measure for Measure*, directed by Prof. P.A. Gurney. Tryouts Dec 10, 11, 13, 7:30pm, Kresge Little Theatre, production early Feb. Humanities credits available. Questions or unable to attend, x3-2908.

Creative Photography 4.051 ottery - Sign up now in Bldg W31, 3rd fl. Only way to get in course is by lottery. Last day for signing up is Thurs, Dec 13.

Placement Interviews

The following companies will be interviewing Thurs, Dec 6 and Fri, Dec 7. Those interested may sign up in the Career Planning and Placement Office, Mon-Fri, 9am-4pm, E19-455, x3-4733.

Thursday, December 6 - Firestone Tire & Rubber Co.

Friday, December 7 - Carnegie-Mellon University - Graduate School of Industrial Administration.

New IAP Listings

Boston Bikeway Design Group - Organizational meeting for IAP course sponsored by Urban Studies & Architecture. Thurs, Dec 6, 5pm, Rm 9-517. Info, x3-5115.

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

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

Send notices for December 12 through December 21 to the Calendar Editor, Room 5-111, Ext 3-3279, by noon Friday, December 7.

Students Asked to Assist In Energy 'Tune-Up' Effort

(Continued from page 1)

need," Mr. Shepherd said. "But we expect them to do a great deal of the work themselves, including interpretation of the data."

Among the students he has heard from already, Mr. Shepherd said, is one who was involved in a similar project last summer for the Raytheon Company.

"And we've also been contacted

MIT Will Play Black College For First Time

MIT has scheduled its first varsity athletic contest with a black college this fall.

The basketball team, which opened its season Saturday with an 83-51 win over Yeshiva University of New York, will play Howard University of Washington, DC., at Howard on Jan. 28. MIT will then be host to Howard next season on a date to be announced.

Ross H. Smith, director of athletics and professor of physical education, said one of the reasons for arranging the games was "to cooperate with the spirit of the Institute's Affirmative Action Program."

"This is also a way," he said, "of exposing the MIT athletic program to the black community."

Professor Smith said he was also trying to arrange a baseball game with Howard.

Charities Drive Collects \$74,812

The MIT United Way and United Black Appeal campaign—now in its fourth week—has netted \$74,812, according to Lily T. Hosticka, campaign coordinator. The United Way campaign has raised \$64,399 of this total—a figure far short of this year's goal of \$150,000. The United Black Appeal, with no announced goal, has raised \$10,413 of the \$74,812 total.

New UROP Listings

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

Reminder—The deadline for National Science Foundation Student Originated Studies proposals and Undergraduate Research Participation proposals is Dec. 7, 1973.

Eloranta Summer Fellowship Program

A very limited number of summer research fellowships for MIT undergraduates will be awarded this spring under the Eloranta Fellowship Program. Designed to increase opportunities for intellectually profitable use of the summer months, the fellowships have been made possible by a gift from Dr. Edwin H. Land as a memorial to the late Peter J. Eloranta, member of the Class of 1968. The fellowships support unique research or study projects, under the guidance of responsible agencies or individuals, in the United States or abroad. The proposed summer program may involve research or study experiences at a university or at an industrial or governmental laboratory. To apply for a fellowship, a study cut submits a written proposal outlining plans for his summer project and indicating how he thinks the project will contribute to his overall education objectives. The fellowships are awarded on the basis of a student's past accomplishments and the potential value of the proposed summer program. Applications for these fellowships for the summer of 1974 should be submitted by Feb. 19, 1974 to Mr. Leonard Gallagher, Room 5-119, x3-4971. No special form is necessary. Students seeking further information should check with Mr. Gallagher.

Sigma Xi—Undergraduate Research Awards
The Society of Sigma Xi is an honorary organization dedicated to the encouragement

by a group from Westgate who want to do their own thing there," Mr. Shepherd said.

"That's fine with us," he said. "If the students want to work on their dormitory buildings, or the Student Center, for example, that's OK, too."

The Student Center, Mr. Shepherd said, is an example of how a building's systems need to be scrutinized, along with other elements.

"We had a situation there," Mr. Shepherd recalled, "where the air conditioning system was working against the heating system." In the first year of operation, he said, the building used 96,000,000 pounds of steam—but this had been reduced to 46,000,000 pounds by last year through energy conservation measures.

Mr. Shepherd said he hopes eventually, through tuning up MIT's buildings, to achieve the kind of savings realized from the six-week pilot program conducted last summer in Buildings E18 and E19.

A detailed analysis of the 250,000 square feet of building space by a retired engineer hired especially for the study identified a number of changes that could be made in such areas as lighting, temperature, window frames and fan systems.

"We cut the lighting consumption by eight percent," Mr. Shepherd said, "and we have a projected reduction in the ventilating fan system—once we put in a central system—of 11 percent. By also adjusting temperatures, we're talking about an energy saving of 20 percent—and these have fuel implications, of course."

The success of the pilot program has led MIT to launch a search for a full-time environmental engineer to organize and direct the Institute's energy conservation program.

The program also has called upon the services of August L. Hesselschwerdt Jr., professor of mechanical engineering, emeritus, who has been serving as a consultant.

of scientific research. The MIT Chapter of Sigma Xi has awarded a grant to UROP for the support of undergraduate students in the field of applied science. Undergraduates who have an idea for worthwhile scientific project and have not as yet identified a sponsor are encouraged to submit proposals to Sigma Xi in care of the UROP office, Room 20B-141, x3-4849. Proposals are now being accepted for materials and supplies support and should include: (1) a detailed description of the project; (2) an itemized budget of materials and supplies and (3) signatures of the undergraduate and faculty supervisor. A member of Sigma Xi and a UROP staff member will review proposals as they are submitted.

Harvard Medical Boston

A laboratory at Harvard Medical School is involved in the development of an innovative electron probe microanalyzer capable of localizing any element heavier than boron with a spatial resolution of less than one micron and sensitivity of less than 10-15 grams. Thus, the instrument is capable of chemical localization and quantitation on a subcellular scale, as well as complete elemental analysis of liquid samples of 10-10 liters or less. Specific potential projects suggested include: (1) design and construction of a controlled temperature refrigerated stage for the electron probe; (2) design and construction of an automated system for driving the electron probe spectrometers motors; (3) experimental and theoretical study of the effect of beam bombardment on the biological sample analyzed with the electron probe; and (4) experimental study of the freezing rate of a simple model and of biological material in different quenching medium.

New England Consortium on Environmental Protection (NECEP) Boston

NECEP has suggested a potential project for MIT undergraduates entitled "Energy Conservation and the Boston Chamber of Commerce." The project involves exploring energy conservation techniques and methods with the member companies and corporations of the Greater Boston Chamber of Commerce.

Payday Advanced

Officials of the MIT Payroll Office have announced that staff payday has been moved up from Monday, Dec. 31, to Friday, Dec. 28, because of the special Dec. 31 holiday closing of the Institute announced in last week's Tech Talk.

Jazz Concert To Feature 3 Student Groups

A jazz concert featuring three MIT undergraduate groups—the Festival Jazz Ensemble, the Concert Jazz Band and the Halbert White Sextet—will be held at MIT at 8:30pm, Friday, Dec. 7 in Kresge Auditorium.

The 21-member Festival Jazz Ensemble, directed by Herb Pomeroy, will perform selections of contemporary jazz written for the ensemble this year by local composers.

Mr. Pomeroy, of Brookline, is chairman of the Jazz Composition Department at the Berklee College of Music.

Appearing with the ensemble as featured soloists will be Hal L. White, Jr., of Kansas City, Mo., trumpet; Lee S. Allen of Memphis, Tenn., and Phillip L. Comeau of Haverhill, Mass., both on piano, and Leon S. Rivchun of Brockton, Mass., soprano saxophone. All are members of the Halbert White Sextet.

The Halbert sextet, which includes Joe R. VanValen of East Orange, N.J., bass guitar, and Lawrence (Pat) Somerville, of Washington, W. Va., drums, will play some of their original contemporary jazz pieces.

The rest of the jazz program will feature swing blues arrangements by the MIT Concert Jazz Band, a 19-member group under the direction of Everett D. Longstreth.

Admission will be by ticket only. Tickets are available free to the MIT community in the lobby of Building 10. Remaining seats will be sold for one dollar at the door.

After identifying the energy flow within several companies and firms, the effectiveness of alternative strategies to reduce energy consumption will be tested. As a result of this analysis, an Energy Conservation Program will be proposed for adoption as a working policy for the Greater Boston Chamber of Commerce.

Foreign Studies

Senior Nato.Senior Fellowship Program in Science for 1973-74

Sponsored by the North Atlantic Treaty Organization. The primary objective of the fellowship program is to enable universities and nonprofit scientific research institutions in the US to send senior staff members to study new scientific techniques and developments at research and education institutions in other NATO nations, or in countries cooperating with NATO. Awards will be made in the mathematical, physical, medical, biological, engineering, and social sciences, and in the history and philosophy of science. Interdisciplinary fields comprised of overlapping fields among two or more sciences are also included. Fellowships are not awarded for support of study or work in clinical, education or business areas, nor in history or social work. Tenures may range from one month to a maximum of three months. Approximately 30 awards will be offered in 1973-74.

A NATO Senior Fellow in Science will receive for each day of tenure a subsistence allowance of \$20 per day. A travel allowance, not to exceed the cost of a round-trip, air-tourist transportation via the shortest route, will normally be provided. The entire amount of the subsistence and travel allowances will be paid to the Fellow in a lump sum prior to his beginning tenure. During the period of his award, a Fellow will be permitted to receive his regular salary and/or appropriate allowances provided by his nominating institution.

Applications and further information may be obtained from the Foreign Study Office, Room 10-303, Ext. 3-5243.

Financial Aid Office Alters Parents' Reporting System

The MIT Student Financial Aid Office has announced elimination of the "Parents' Confidential Statement" of family financial information required of students seeking financial aid.

Instead, parents of all but pre-freshman and foreign student applicants will be asked to submit a photocopy of the tax return they file for 1973. The photocopies will be required between January and mid-April. As was the procedure when confidential statements were taken, parents will be asked also to give authorization permitting the aid office to acquire a certified copy of their return from the Internal Revenue Service for verification.

According to student financial aid officers, the advantages of the revised system are:

Simplicity—Parents will no longer be required to "translate"

income information from their tax returns to fit the confidential statement format.

Reliability—Family financial information will be systematically expressed under uniform guidelines, reducing or eliminating the review effort required of MIT.

Timeliness—With the photocopy, the financial aid office can analyze each applicant's need during the spring without having to wait for the certified tax return to arrive, since it can be acquired at a later date.

Under the new system, the financial aid office intends to provide award notices to applicants within three to four weeks of receipt of their family's photocopied tax return. Parents of current aid recipients are now being informed of the new procedure, say financial aid officials.

Singer zig-zag sew mach, 3mos, \$45. Bill, 868-8895.

Old but working refrig, \$20; hosp bed, full options, \$50. Lloyd, x7518 Linc.

Boots, vibram soles, b nw, nvr used, sz 9 1/2 N, \$23 or best. x3-3161, lve msg Todd Moser, Dorm.

VW ski racks w/locks, 2, nw \$8.50/ea. Liz, x3-6162.

Chldrn skts, lk nw, b sz 11, g sz 8, \$8/ea. Brian, x5326 Linc.

Rabbit fur coat, f, sz 14, \$30; Raleigh 3 spd space rider, b, \$35; chld cross cntry ski bts: Reiber sz 4M, \$10, Fabiano sz 5 1/2 M, \$10; Motorific Action hway sets, 101, 88, 87, \$20. Wayne, x8-1463 Draper.

Snows, used 1 seas, v gd cond, fit Toyota & other sm car, \$20/pr. Call, 646-0992, evgs & wknds.

Moving to Eng, must sell: dbl bed, \$40; sofa bed, \$25; tbl & sm chrs, \$2/ea; nw ski boots, f, sz 8, \$10; hrdwyer, \$5. David, x3-3982.

AM car radios: Blapunkt, Motorola, best for ea/both. Charlie, 738-5449, aft 5.

Rieker ski boots, 8 1/2 narrow lace, dbl boot w/tree, \$15. Helen, x8-3501 Draper.

Blaupunkt radio w/aerial for VW; GE elec carpet swpr, \$10. x3-4603.

Kelly snows, 2, mtd, 7.75x14, \$30/pr. x3-7759.

Hcky skts, used, sz 11 1/3, \$6 or best. x8634 Dorm.

Vivitar 200 mm lens, f3.5, \$70; f 3 spd bike, \$25; dbl pedestal oak desk, \$25; typ tbl, \$5; 1893 americanized botanical enc, 10 vol, \$20. Call, 861-7234, evgs.

Firewd, seas 1 yr, hrdwd, oak, elm, pine, kindling, buy by log, bndl, lg amt, reas. Judy, x3-6101.

Sgl 4 poster mahog bed w/bx spr & matt; sev rugs, \$45/all, nego; 5.31 lab kit, used 1 wk, was \$22, \$15 or best. Call, 267-1622.

Riedel f fig skt, sz 7 1/2, \$15. Nancy, x8-3653 Draper.

Glass bathtub & shower enc. x8-3650 Draper.

Car batt, 6 V, w/3 yr wrnty, \$20 or best; couch, buffet, \$15/ea. Ed, x3-2270.

Ice skts, m, sz 11-11 1/2, \$7. Paul, x3-5483.

Wool rug, 9x12, floral, gd cond, \$15. Call, 325-2813.

Merick Index, 8th ed. Mark, 868-4890, evgs.

TV, 23" Motorola, nds wk, free. x8-1226 Draper.

VW snows, gd cond, mtd Pinto, \$20; Argus Roundabout slide proj, 8 carousels, \$50; gold crtms, 6x3, best. Diana, x3-5831.

Baby equip, 2/3 off: full sz crib, exc cond; carriage-carbed-strlr combo, w/x seat; \$25/ea. x3-2948.

K sz bed, w/matt, bx spr, \$45; 2 stud VW snows, 5.60x15, 5 hole rims, \$25/pr. A. Oppenheim, x3-4177.

CLASSIFIED ADS

Ads are limited to one per person per issue and may not be repeated in successive issues. All ads must be accompanied by full name and Institute extension. Only Institute extensions may be listed. Members of the community who have no extensions may submit ads by coming in person to the Tech Talk office, Room 5-111, and presenting Institute identification. Ads may be telephoned to Ext. 3-3270 or mailed to room 5-105. Please submit all ads before noon, Friday, December 7.

For Sale, Etc.

Elec sew mach, \$28; dress tbl, \$9; plexiglas coffee tbls, \$12, \$15; wd bureau, \$20; wint desk, \$50; 3 pc brass top rd tbls set, \$30; chr w/ottoman, \$55; f skts, sz 5, \$7; K items. Call, 494-8323.

Judo outfit, sz 3, \$10. x8752 Dorm.

Garrard Lab 80 auto trntbl w/Shure V-15 crtrdg, compl w/bass, dust cvr, \$15. John, x3-2772.

Port typwrtr, Royal Futura man, exc cond, \$45 or best. Susan, x3-4158.

Bikes: m 10 spd \$35, g 3 spd \$30; ac, 8,000 BTU, \$150 or best; Coleman stove, \$10; airforce parka, \$40; nw army boots, vibram soles, 9 1/2 R, \$8; army fatigue jckt w/liner, sm, \$20, elec can opener, \$3. Call, 494-8377.

SCM port typwrtr w/case, 1 1/2 yrs, perf cond, \$55. Call, 227-4917, evgs.

Morse straight stitch sew mach, gd cond, \$25. Larnie, x8-3367 Draper.

Bruins tkts, 2, 2nd bal, 6 games Dec, \$50. Call, 661-9466, 8-10pm, bef Fri.

Wonder rock horse, 24" to saddle, exc cond, ask \$13. Jerry, x7763 Linc.

Super 8 reflex movie cam, pistol grip zoom lens, nw, \$80. Pat, x8-1425 Draper.

Stud snows for VW, \$15/pr. Nick, x3-2715.

Stud snows, pr, F70-14, 30 K tread left, pr cost \$85 nw. Myron, x3-2636.

Phillips GA 212 w/blank cards, \$135; Pioneer SX 626, \$245; both perf cond. X8221 Dorm, kp try.

K chrs, 2, \$2/ea; baby carriage, lk nw, \$25; brn coat, b, w/hat, sz 6-10, \$4.50; b hcky skts, sz 4, \$3.50. Mrs. Gunderson, x3-6085, pm.

Stereo component sys, exc cond, \$100. Jackie, x3-6639.

Frye boots, f, hi-lace, sq toe, sz 6, worn once, perf cond, \$48 nw, ask \$40. Bob K, x3-5043.

Zenith TV, full sz, exc cond, UHG, \$30; 2 sm fans, \$2/ea; GE f hrdry, \$7; 5' hi mahog bureau, \$20. Ava, x3-6216.

Nylon tent, slps 2 \$10; port fold crib, \$4; upright piano, u move, \$100. Richard, x3-4895.

Mahog Empire loveseat; 3-way screen; antique plant stand. Call, 232-2034.

Gibson SG guitar w/case, exc cond, \$250. Steve, x3-2981.

Pr Atlas snows, G78-14, used 3 mos, best: Susan, x3-4606.

Pr Radial stud snows, 165x15, used 1.5 K, cost \$80, \$40. Ralph, x196-380 EDC.

Blizzard skis, 205 cm, Tyrolia stepin bndgs; Kastinger boots, sz 10. Jan, x3-6807.

Coats, dresses (lg & short), skirts, blouses, pants & p suits, caftans, swtrs, scarves & mtching hats, ponchos lg & short robes, pj's, all sz 10-12. Diane, x0610 Dorm.

GE port TV, 9", \$35. Box 5170 Baker, x8367 Dorm.

Head std skis, v gd cond: 195 cm, \$70, 185 cm \$75, or best; pr Le Trappeur ski boots, sz 10, 5 bckl, gd cond, \$30. Doron, x3-7457.

Leitz 35 mm f3.5 Summaron w/optical finder for M3, v gd cond, w/fltr, \$60. Dave Tenebaum, x3-1541.

Dual 1219 auto trmtbl, exc cond, \$120 w/crttrdg. Rich, 247-7775.

Xmas trees, cut your own, take Rt 119 to NH brdr, then 2nd rd on rt (Wood Ave), Nottingham, Rindge. Call, 603-899-6646.

Magnavox port stereo, old, snds pretty gd if not spoiled, \$40; 1 lonely snow, Chevelle rim, 7.75x14, gd cond, cheap. Gary, x3-2526.

Hcky skts, sz 5, exc cond, \$10. Alan, x3-5058.

Sev cans Coors beer, best. x8244 Dorm, evgs.

Atlantic golf bag, 1 & 3 wds, \$7; Polaroid J33 Land Cam, \$6; Polaroid mdl 80, \$5; nw hcky skts, sz 13, \$15; hcky gloves, \$4.50; used Bauer hcky skts, sz 2, \$2.50. Joe Grandé, x1030 Middleton.

Movie film: 6 Kodak Super 8 clr crttrdg, cheap; 2 reflector movie fldlites, hrdly used. Chuck, x3-6395.

Deserter Dune Buggy, 2/3 fnshd, w/Corvaire eng, no tuition, must sell for less than cost parts, make it wntr project, have buggy in spr. Doug, 494-9008.

SCM 220 elec typwrtr, just cind, lubed, exc operating cond, best. Call, 494-8994.

Red & blk twd carpet, 9x10, lk nw, \$39; Zenith 4 spd stereo phono, amfm, + 60 clas rcrds & rack. Richard, 536-4308.

Storm wndws, alum, wh, 30x39, 34x51, \$15.80 ea. Bill, x5437 Linc.

Mtd WW snows, G, 78x14, nw, for Ford, \$50. x8-2004 Draper.

Ski boots, sz 8 1/2, rarely used, \$35; skis, wdn, 195 cm, \$7. Jean-Pierre, x3-3439.

Ski equip: Humanic plstc bckl boots, m, sz 12, used 10x, \$25; compl outfit for beginner: Rieker 205 cm skis w/bndgs, poles, m sz 12 leath bckl boots, all \$50. Joe Clift, 237-6885, evgs.

Embroidered afghan shpskin fur-lined coat, 3/4L, sz 14, hrdly ever worn, \$40 or best. Leah, x3-4160.

Refrig, office sz, 8 cu ft, \$40. Dave, Rm 20B-141, x3-4849.

Ski boots, f, sz 9N, Castinger, w/tree, \$30. Patton, x3-7711.

Bike, Falcon 90, m, \$200. x3-7085.

Hcky skts, b, sz 3, Bauer; girls Hyde fig skts, sz 2 1/2, used 1 seas, \$8/ea. x182-183-251 Bedford.

Storm wndws, 12, wd, 34x62; snows, pr, 9.00x15; best. Neil, x3-5296.

Dunlop stud snows, pr, 165x15, mtd VW, \$50. Chip, x3-1558.

Ski boots, m, red Caber, sz 10, gd cond, \$25. Bob, 266-8455.

Violin, 3/4 sz, w/case, \$100; child's wonder horse, \$12; both gd cond. Don, x7116 Linc.

Vehicles

'57 Classic T-Bird, 2 tops, p st & br, garaged, exc cond, best over \$2,500. 782-4139, aft 7.

'62 MGA MK II 1600 conv, beaut restored, exc cond, \$1,200. Call, 723-8443.

'62 Mercedes 190SL, 54K, radials, amfm, fbrgl's top, gd cond, ask \$1,200. Bob, x7807 Linc.

'63 TR4, 85 K, fr cond, \$500 or best. Lester, x8-1434 Draper.

'64 Dodge sta wgn, std, slant 6, nds mstr cyl & tune-up, v reliable, great for town, stckr, 1st \$100 drives away. Phil Mandel, x3-3161, lve msg.

'65 Chevy Imp, 4 dr sport mdl, \$250 or best. Roy, x3-2727.

'65 Dodge Dart, rebt trans, gd run cond, ask \$250. Izzy, x8-2878 Draper.

'65 Chrysler, 52 K, must sell, \$100. Michelle, x3-6121.

'65 Mercedes 190C, prtly rebt, nds wk. x8-3462 Draper.

'66 Pontiac Cat, 68 K, exc run cond, gd int & ext, 2 nw tires, 2 stud snows, \$500. Victor, x9830 Dorm.

'66 Corvaire, gd run cond, 4 nw tires, 2 snows, nw batt, exh, muff, \$200. Silvio, x3-6752.

'66 Dodge Dart, exc cond, std, avail 12/15. Dan, x3-3245.

'66 Olds Cutlass, exc cond, ask \$400. Naess, x3-3105.

'66 Plymouth, 68 K, V8, p st & br, cln, \$425. Tony A, x8-3706 Draper.

'67 Malibu, 80K, gd cond, \$400. Gottfried, x3-5349.

'67 Alfa Romeo Duetto, red, 51 K, \$1,300. Paul, x8-1302 Draper.

'67 Olds 98, Michelin radials, stereo r, elec wndw, seat, exc cond, ask \$550. x182-183-213 Bedford.

'67 Mustang, 6 cyl, wh w/red int, p st, r, nds some body wk, runs gd, 2 exc tires, 2 snows, ww, \$250. x8-1351 Draper.

'67 Ford Gal, not running, gd for parts, 289 eng, r, whls, tires, batt all gd, \$40. Dan, x7100 Linc.

'69 Opel GT, 38K, 5 nw tires, exc cond, \$1,450. x3-4181.

'69 Pontiac, 4 dr, exc cond, \$600. Call, 332-4179, aft 8pm.

'69 Ford LTD, 4 dr, ac, nw batt, shocks, p st & br, tuned, v comfy, perf cond, 54 K, \$1,175 or best. Tsai, x3-1916.

'69 Chevy Chevelle, 2 dr, conv, std, amfm, exc mileage, \$1,300. x3-4257.

'69 Pontiac GP, amfm stereo, r defog, p st, br, wndw, \$1,700. Dan, x461 Linc.

'70 VW sqbk, 24 K, 25 mpg, exc cond, \$2,200. Bill, x3-7578.

'70 Ford Mav, 70 K, exc cond, \$1,000. Chris, x3-5520.

'70 Volvo 144S, 30 K, exc mech cond, nw clutch, br, muff, etc, 2 nw tires, incl snows, \$2,200. x3-5115.

'71 MGB, 22 K, r, mag whls, radials, nw batt, muff, anti-theft devices, 25 mpg, v gd cond, \$1,995. Call, 536-5497.

'71 Chevy Malibu hrdtp, 22 K, gold, v gd cond, best. Paulo, 494-8468.

'71 Duster, 27 K, wh, auto, p st, lving cntry, must sell, \$1,650 or best. Abraham, x3-7472, lve msg.

'73 Ford Torino, 2 dr hdtpr, auto, r, p st, disk be, only 11 K, \$2,395. Bill, x366 Linc.

Housing

Acton, 6 rm duplex, nwly reded, lg yd, no pets, avail 12/15, \$250 + util. Call, 263-0484.

Arl, Mass Ave, 6 Rm col, 4 BR, furn, frpl, prking, nwly renovated. Marilyn, x3-4112.

Arl, sub 1/1-5/31 w/opt, mod 3 rms, ww, ac, parking, pool, \$225 incl h. Mike Thomson, x3-4194.

Camb, apt 8E Tang, BR, K, LR, B, \$111. Call, 494-8881.

Dorchester, Sawyer Ave, hse for sale or rent. Bialocki, x3-5553.

Melrose, fine old col, exc cond, conv location, priced for quick sale. Robert, x3-3697.

Som, 1 1/2 BR apt, nw carpet, nr Hrvd, on bus, avail 2/1, \$190 incl h. Stephen, x8-3617 Draper.

Som, 4 rm, 3rd fl, mod B, cln & fresh pnt, nr T, \$210 incl util. Josephine, x3-2933.

Wayland, stu apt, cpl or grad stu, wd cntryside, 25 min car Camb, rent depends on time willing to spend w/ 2 frndly, indep boys after school (as much or little); avail now. Jeanne Bamberger, x3-6211.

Winchester, nwly remodel 3 BR duplexes, avail 12/1, gd for grp of grads, \$400-\$450, nego. P. Hunter, x3-1493.

Conway, NH, lg contemp ski lge, 4 BR, 18x26 frpl LR, 2 B, plyrm, sdeck, mt view, rent wk or wknd. x3-4291.

Gunstock, NH, chalet, 3 BR, frpl, indr pool, mile to ski, 100 mi Bos, \$200/wk. x8-4415 Draper.

S NH, yr-rnd 3-4 BR hse, spring fed lake, quiet area, 55 mi MIT, avail immed, low 30's. x3-4923.

Animals

Must find homes for 3 adorable shaggy-dog pups; both parents registered pedigrees. Call 242-1646, evgs.

Bl pt siamese kittens, 2 m, \$15/ea. Dick, x8-1376 Draper.

Great Dane, f, blk, AKC, 3 mos, cropped, shots, beaut, cln, \$100 or best. Jones, 427-2840.

Kittens, 2, f, 6 wks, tiger, wh, free. Susan, x3-1627.

Lost and Found

Found: blk & gold engraved butane cig liter, initials & date 12/25/71. x3-2158.

Wanted

Bike, m, 3 spd. Tom, x8-1558 Draper.

Koch bass rcrdr, baroque fingering, direct blow, x3-7142.

East or Westgate apt, 1/6-2/3. Mrs. Wheeler, x3-1493.

Rmmate, 2 BR apt Beacon H, 2/1 or earlier, \$95. Call, 723-1737.

Rmmate, m or f, own rm, Bri nr T, \$74 + util. Mike, x8-4429 Draper.

Ice fishing gear: ice flips, traps & auger. Lou, x8-3584 Draper.

Whls, 14", for VW bus. Peter, 258-1326.

Used stereo fm rcrvr w/amp, gd cond, inexp. x7458 Linc.

Neat rmmate for 1/2 of 2 BR apt in 2 fam hse, Medford, driveway, yd, nr T, I drive to MIT daily, avail 1/15 or later, \$100 + util. Dan, x3-3190, kp try.

Ride bet MIT & Sherman St, Camb, nr Fresh Pond, 9-5. x3-7752.

Lite meter, reas sensitive, fairly narrow angle, wl pay \$10. Glenn, 492-0776.

Creative Playthings slide, gd cond. Alice, x3-3676.

Make \$25! Participate in lang experiment, stay awake 11pm-4am 1 nite. Diane, x3-5764.

Ride to New Orleans, Xmas vac, wl share driving & exp. Claire, 494-8571.

People to share lg hse, Belmont, child ok (I have 1), want warm, home-like atmosphere. Martha, 484-3122.

Used Corvaire repair man & strtr motor or someone to buy my sick car. Daryl, 899-9389, lve msg.

Rmmate, 2 f, sunny 3 BR Beac Hill apt, 2 B, LR, K, dining crnr, \$100 incl h. Ursula, x3-5954.

Rmmate, 4 BR apt, lg BR, 2/1-8/31. Larry, 547-6726.

Used b&w TV. Vyas, x3-5484.

Subjects for psychoacoustic experiments, normal hearing required, \$2/hr. Elliot, x3-2589.

Drivers & riders to SF area, lve around 12/21, share exp & driving. George, x3-2614.

Grad stu to live in 23-A Tang Hall, late Dec or early Jan. Call, 494-9194.

Cpl or sgls, share 4 BR carriage hse, W Newton, lg LR, DR, den d&d, wash & dry, 2 frpl, yd, dog, dead end st, nr T, avail 1/1, \$90 + util. Ted, 965-1577.

Sm birdcage. x3-7138.

Miscellaneous

Typing, these, manu, term papers, IBM selec. Linda, x3-7022.

Exp typist wl do theses & term papers, incl tech. x8-3494 Draper.

MIT prof nds stu to entertain boy 6, girl 5, 11:30-5:30, Thurs & Fri, also sit wkend if parent away. Liberal salary, use of car, consider rm & brd exchange. x3-1787.

Stu Staff positions avail, 12/17-1/6, full time MIT stu, sign up Sci Library. x3-5653.

Parking

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

Wl swap West for Albany or Sloan. Linda, x3-7287.

Positions Available

This list includes all non-academic jobs currently available on the MIT campus. Duplicate lists are posted each Tuesday preceding Tech Talk publication date on the Women's Kiosk in Building 7, outside the Office of Minority Affairs, 4-144, and in the Personnel Office E19-239, on the day of Tech Talk publication. Because transfer activity has been low in biweekly jobs Grades I-IV, Personnel interviewers will refer any qualified applicants on all biweekly jobs Grades I-IV as soon as possible after their receipt in Personnel. Employees at the Institute should continue to contact their Personnel Officers to apply for positions for which they feel they qualify.

Virginia Bishop 3-1591
Mike Parr 3-4266
Philip Knight 3-4267
(secretary - Joy Dukowitz)

Sally Hansen 3-4275
Jack Newcomb 3-4269
Evelyn Perez 3-2928
(secretary - Mary Ann Foti)

Dick Higham 3-4278
Pat Williams 3-1594
Claudia Liebsny 3-1595
(secretary - Dixie Chin)

New applicants should call the Personnel Office on extension 3-4251.

The following positions have been filled since the last issue of Tech Talk and are no longer available:

73-1213-R	Tech Asst - Acad Staff
73-1219-R	Secretary IV
Voucher	Secretary IV temp
73-1196-R	Secretary IV
73-1222-A	Libr Gen Asst III
73-1224-R	Microrepro Asst II
72-1201-R	Waitress
73-1018-R	Admin Staff
73-1084-A	Eng Asst Exempt

The following positions are on HOLD pending final decision:

73-1180-R	Admin Staff
73-1162-R	Secretary IV
73-1166-R	DSR Staff
73-1137-A	DSR Staff
73-1233-A	Libr DSR Staff

Administrative Staff member will work in the area of resource development dealing with individual contributors. Develop strategies and programs, prepare reports, provide advice and counsel of a legal nature for resource development activity. Some travel required to represent MIT. Must have legal training and preferably some experience as a counselor in practice or a job situation utilizing legal training. Writing and organizational ability; motivation, enthusiasm required. 73-480 (5/30).

DSR Staff member will plan, manage and execute high-quality research projects having a strongly experimental orientation. Familiarity and experience with low-speed flight and wind tunnel testing methods and advanced piloting aviation type aircraft; Ph.D. in Aerodynamics and five years applicable research and development experience required. 73-488-A (6/20).

Biochemist - DSR Staff member will participate in lipoprotein studies, and will supervise the activities of several technicians in a clinical research set-

ting. Ph.D. or M.D. in Biochemistry required, as well as experience with lipoprotein and supervising. 73-515-R.

Manager of Subsystem Development - Administrative Staff in the Programming Development Office will provide technical direction of the design, development, and maintenance of software subsystems under the OS/360, OS/VS2, and Multics Operating Systems. Minimum of 7 years professional experience, and 2 years experience in technical management, 73-912-R (9/12).

Systems Analyst - DSR Staff at the Cambridge Project will adapt Time Series processor programs for use with the Consistent System on Multics. Knowledge of calculus, econometrics, statistics, and linear algebra; extensive PL/I programming experience on Time Sharing Systems; familiarity with TSP-CSP required. position is temporary until 6/74. 73-845-R (8/29).

Environmental Engineer - Administrative Staff in Physical Plant will organize and direct an Institute-wide energy conservation program, Survey campus buildings to determine areas of possible energy economy; plan procedures; maintain the Institute's compliance with environmental requirements. BS in Electrical Engineering with a basic knowledge of building Mechanical systems for heating ventilating, and air conditioning. Experience in engineering design or operation of buildings. Experience in energy conservation helpful. 73-875-R (9/5).

Director of Personnel Development - Administrative Staff will coordinate the Career Development and Training Programs for all non-academic personnel. Responsible for organization development; assess training needs; plan and develop new training programs; coordinate existing training and development programs; develop career planning and counseling capability. Experience in organization development and career development and planning desirable. 73-1116-A (10/17).

DSR Staff in Metallurgy will perform scanning transmission electron microscopy and high spatial resolution electron probe microanalysis of biological specimens; prepare thin films to use as microanalysis standards; technical subjects. BS with experience in the performance of high spatial resolution and physical constants of thin film, or MS degree required. 73-1127-R (10/24).

Technical Librarian - Administrative Staff will design and implement procedures for organizing and maintaining an Industrial Administrative Information Systems. Process and document EDP reference manuals, technical journals, internally prepared documentation. Aid in implementation, and thereafter maintain, formal methods of interfacing with vendor support personnel. Be directly involved in process of documenting material developed by technical support group, including editing and re-writing of such material. Will also edit and re-write material for a Programmer's User's Guide Knowledge of methods for development and maintenance of a Special Library required; minimal knowledge of data processing concepts and terminology desired. 73-953-A (9/19).

Administrative Staff in the Office of Personnel Relations will assist the Wage and Salary Administrator with the development, implementation, and long term maintenance of a formal, integrated classification and salary administration program. BS degree or equivalent and 2-4 years of direct experience with the administration of a formal exempt classification and compensation system required. Familiarity with basic statistical methodology is desired. 73-1108-A (10/17).

Administrative Staff - Program Administrator in the Office of Sponsored Programs will represent the department with respect to sponsored programs in a number of academic departments and laboratories, including proposal review and submission, grant contract negotiation and post-award administration. Experience in an academic department or research laboratory working with faculty principal investigators on sponsored programs preferred. Experience in MIT financial or business administration valuable. 73-1156-A (10/31).

Systems Programmer - Administrative Staff will provide technical expertise; develop and implement methods of improving computer performance. Minimum of two years S/360 or S/370 BAL (ALP) Assembler Language Programming experience. Knowledge of teleprocessing, and COBOL or PL/1. 73-265-R (4/73).

Administrative Staff - INSITE System Programmer in the Planning Office will maintain the space inventory system (INSITE) for MIT and other institutions using the system. Develop the system and instruct consortium members in its use. Degree in a technical field (computer science, math); experience with IBM hardware, knowledge of PL/1 and Job Control Language is

essential. Ability to instruct others and coordinate programming efforts is important. 73-1259-R (12/5).

Computer Operator IV will operate IBM Model 135 and all peripheral equipment associated with it, including disk drives, tape units, card reader/punch, printers. Must have a good knowledge of DOS job control, multi-programming experience and be capable of understanding operating instructions, Midnight to 8:00am shift. 73-1221-R (11/21).

DSR Staff - Systems Analyst at Cambridge Project will adapt Time Series Processor programs for use within the Consistent System on Multics. Knowledge of calculus, econometrics, statistics, and linear algebra; extensive PL/1 programming experience on Time Sharing Systems; familiarity with TSP-CSP required. This position is temporary 7/1/74. 73-749-R (8/8).

DSR Staff in Earth and Planetary Science will interpret Mars picture data, and diffuse reflection spectral features arising from electronic transition; perform spectroscopy of asteroids and reflection spectroscopy of lunar samples; coordinate research and projects in the Planetary Astronomy Laboratory; supervise undergraduate assistants; write reports, proposals and papers. Experience in the fields of planetary surfaces, observational astronomy, igneous petrology, optical properties of solids, lunar sample analysis and computer programming. Candidate should have an academic background in geology and principles and techniques of optical astronomy. 73-1218-A (11/21).

DSR Staff - Systems Programmer at Project MAC will perform system analysis and system programming on a research version of the Multics operating system. SM or EE degree required; 2-3 years programming experience as the supervisor of some advanced operating system required. Ability to contribute to research and work with students important. 73-1137-A, 73-1234-A (10/24).

Technical Assistant - DSR Staff in Psychology will study the problems of motor control and motor coordination in mammals. Construct and design training devices for mammals; train and care for animals; manufacture micro and macroelectrodes; assist during recording sessions. BA, BS, or AB degree; familiarity with electronics and digital logic; willingness to work with animals essential. 73-1252-R (12/5).

DSR Staff - Project Engineer (part-time-temporary) in Earth and Planetary Sciences will design and construct a prototype cooled slow-scan imaging device for use on telescopes. Knowledge of charge couple devices used at low temperature, slow-scan imaging devices; experience with digital circuit design; experience with analog and digital circuiting required. 20 hour work week; 8 month job. 73-1257-R (12/5).

Planner/Architect - Administrative Staff in Planning Office will concentrate on long-range planning for existing environmental conditions, define problems, develop plans and design concepts; degree in Architecture required; degree in Planning preferred. Minimum of 5 yrs experience and the ability to work independently important. 73-880-R (9/15).

Administrative Staff Planner will direct long-range physical planning for the various efforts of the planning team; develop budgets and schedule of government agencies and community groups. Must have a Masters degree in Planning and a minimum of 5 yrs experience. 73-535-R (6/13).

DSR Staff - Electronics Engineer in the Center for Space Research will design, test and check out scientific experiments for space satellites; assist in system design; test and integrate the developed experiment in the spacecraft and participate with prelaunch support. Emphasis is placed on low noise; low level analog circuitry but thorough familiarity with digital electronics and logic design of the experiment is required. BS degree in EE with experience in the design, development and testing of solid state low level analog systems; familiarity with modern semiconductors in space applications and modern signal detection theory and applications required. 73-1241-A (11/28).

DSR Staff in the Research Laboratory of Electronics will work on problems concerning interactions of atom with the radiation field. Individual should have a recent Ph.D. degree with strong background in atomic physics and laser techniques. 73-1243-R (11/28).

Technical Instructor - Temporary Academic Staff in Physics will develop and construct, under faculty guidance, prototype experiments for an undergraduate instructional laboratory. Job involves woodworking and elementary machining of metals and some elements of electronics. BS in Physics is necessary. Job ends 6/30/74. 73-1199-R (11/14).

DSR Staff in the Center for Space Research will analyze and interpret plasma data from satellite-borne plasma experiments. Recent Ph.D. in space plasma physics or related area required. Candidate should have had direct experience with the analysis and interpretation of experimental results related to the interplanetary plasma. 73-1183-A, 73-1184-A (11/14).

Senior Secretary V in the Radioactivity Center will perform general secretarial duties necessary for smooth office functions. Contact patients and invite them to come to MIT for Studies; maintain all records; handle correspondence, travel arrangements and hospitality duties. Knowledge of medical terminology helpful; excellent skills and maturity important. 73-1197-R (9/12).

Senior Secretary V or Administrative Secretary VA to the Provost will handle general secretarial duties and assist in the processing of staff appointments. Must be able to establish priorities in order to coordinate a very busy appointment calendar. Other responsibility will include monitoring office accounts, making travel arrangements, and independently, answering correspondence. Light shorthand or speedwriting skills required. Strong secretarial experience and established organizational and administrative skills important. Maturity and good judgment essential. Knowledge of Institute procedures strongly preferred. 73-1269-R (12/5).

Secretary IV in Mechanical Engineering will handle general secretarial duties for a group of faculty, researchers, and students. Maintain accounts; type technical reports, proposals; transcribe from shorthand and machine dictation. Excellent typing required. Shorthand and dictaphone skills, ability to organize within a very busy office is important. 73-1058-R (10/10).

Senior Secretary V in the Arteriosclerosis Center will coordinate the office activities of the Director of a multifaceted medical research program. Schedule appointments, conferences, lectures, maintain student records and appointments and a variety of office files; periodically prepare reports; type manuscript reviews and other materials. Individual will have extensive telephone contact with other medical areas and patients. Good organizational skills; ability to establish priorities and supervise junior secretaries required. Knowledge of medical terminology and machine transcription helpful. 9:30-5:30. 73-1088-R (10/10).

Secretary IV* in Academic department will type correspondence, proposals, DSR reports, manuscripts, theses (much of it technical); keep DSR account records; maintain small library; compose routine letters; assist professor with details of registration. Ability to work independently and to write letters important; accurate typing essential; knowledge of shorthand, technical typing and bookkeeping preferred. 73-578-R (6/27).

Senior Secretary V to the Ocean Engineering Department Head will perform a variety of complex duties. Answer correspondence independently or from verbal instructions; maintain busy schedule of appointments; assist with salary review; act as department liaison with other Institute offices; organize and maintain departmental files; coordinate work of other secretaries during peak periods. Excellent shorthand or speedwriting, and typing skills; several years responsible secretarial experience required; ability to organize and to establish priorities; initiative and poise essential. 73-1155-R (11/7).

Secretary IV for Institute Secretary for Corporations will organize and run the office. Very accurate typing needed for some letter-perfect copy. Other typing duties required speed. Preliminary research on corporate prospects; gather backup information for visits; draft not-too-technical correspondence. Work closely with other Institute offices in obtaining pertinent data; receive visitors. Flexible, adaptable, good telephone presence. 73-1091-R (10/10).

Secretary IV to a Professor in Economics will handle all general secretarial duties; type correspondence, course material, technical manuscripts; perform editorial secretarial duties for *Econometrica*. Good typing and organizational skills required. 73-1170-R (11/7).

Secretary IV to the Director of the Industrial Liaison Office will handle all office procedures including accounting and some statistics necessary in operation of a large office. Excellent typing and shorthand skills are essential; previous experience required, preferably at MIT, business school background preferred. 73-1031-R (10/3).

Secretary IV in Mechanical Engineering will handle bookkeeping for computerized accounts; maintain budget records; prepare materials for courses;

type technical reports. Secretarial school background or previous experience preferred; knowledge of bookkeeping, keypunching, or other computer techniques helpful. Good typing and the ability to work for several people required. There is a lot of student contact in this job. 73-1194-R (11/14).

Secretary IV to the Executive Officer of Chemical Engineering will handle general secretarial duties; maintain petty cash account; receive visitors. Previous secretarial experience preferred; ability to anticipate, maturity to handle problems and work independently required. Good shorthand and typing skills necessary. 73-1191-R (11/14).

Secretary IV in Mechanical Engineering will handle general secretarial duties necessary for the smooth function of this busy office. Type technical reports, proposals, papers, class notes; answer routine correspondence; maintain files; Previous secretarial experience, excellent typing skills required; experience in technical typing, shorthand preferred; ability to establish priorities important. 73-1193-R (11/14).

Secretary IV in Nutrition will perform general office duties for three faculty; maintain files, handle correspondence. Good typing, shorthand and dictaphone skills required; some knowledge of medical, biological and/or chemical terminology helpful. 73-1230-R (11/21).

Secretary IV in Metallurgy will perform general secretarial duties for two professors. Type class material, correspondence from machine records and files; coordinate busy office schedules; handle petty cash fund. Good typing and shorthand skills required; ability to set priorities; familiarity with technical terminology and computer helpful. 73-1220-R (11/21).

Secretary IV to three psychiatrists in the Medical department will handle all secretarial duties; transcribe patient case histories; maintain accurate records. Will also assist with other secretarial projects. Excellent typing skill, maturity, ability to deal with patients important. 37½ hour work week. 73-1267-R (12/5).

Secretary IV in the Development Office will handle general office duties including a large amount of typing; will plan and layout typed material; maintain confidential files. Excellent typing skills needed for IBM Magnetic Card II typewriter. Ability to proofread important, editorial skills helpful. Maturity, tact, strong organizational skills required. 73-1253-R (12/5).

Secretary IV to Associate Director of the Alumni Fund will handle general secretarial duties for the office. Independently answer correspondence; type alumni Fund Bulletin, statistical reports, assist with the preparation of reports. Good typing and shorthand skills required; experience with MTST desirable; ability to work independently with details is essential. 73-1268-R (12/5).

Editorial Secretary IV in Aeronautics and Astronautics will handle general office duties. Type progress and research reports (some technical). Perform general editorial functions: check for accuracy, proper format, spelling, grammar, punctuation, etc. Excellent typing skill required. Basic editorial skills. Publication experience desired. 73-1249-R (12/5).

Secretary IV will handle general secretarial duties for a small group involved with the Undergraduate Research Opportunities Program (UROP). Excellent typing, dictaphone and organizational skills required. Ability to deal with students, academic and research staff important. 73-1265-R (12/5).

Secretary III - IV to the Manager of Self Study Subject Development (Center for Advanced Engineering Study) will handle general secretarial tasks; perform scheduling for video taping, filming sessions, viewings; perform some accounting functions; type technical material; act as liaison between the office and individuals it deals with. Maturity; ability to handle detail; excellent typing essential. 73-1245-R (11/28).

Secretary III - IV to three professors in Chemical Engineering will type correspondence, course material, technical manuscripts; handle general office duties; assist in maintenance of student records. Excellent typing skills required (technical typing preferred); ability to work with students and for several people important. 73-1246-R (11/28).

Secretary III - IV will handle secretarial duties in the Child Care Office and assist with duties in the Personnel Development, Special Services Office. Type and edit for grammar and format material from both areas; maintain Child Care accounts; process tuition

assistance applications; assist with orientation programs. Excellent secretarial skills; competence in basic arithmetic, spelling, grammar required. Maturity, good judgment and ability to set priorities important. 73-1260-R.

Secretary III-IV for a group of faculty members in Mathematics. Handle all general secretarial duties, maintain postdoctoral job opportunity files. Excellent typing skills needed for correspondence and mathematical papers. Previous technical typing experience helpful. Ability to work with minimal supervision important. 73-1254-R (12/5).

Secretary III (part-time) in the Dean for Student Affairs Office will assist with general secretarial and administrative duties necessary for the operation of Talbot House, Student Center/Kresge. Good secretarial skills; and the ability to quickly important. 12 hour work week. 73-1198 (11/21).

Secretary III in Biology Headquarters will handle correspondence, memorandums, typing of class notes and quizzes for the Undergraduate Officer; assist with the registration process; maintain files. Accurate typing required; ability to deal with students, faculty and staff important. 73-1212-R (11/21).

Secretary III in Physical Plant will handle applications for use of the Student Center, Kresge and Chapel; maintain files of records; type Student Center Committee correspondence; handle billing of LSC movies, events, weddings. Good business skills required. Ability to deal effectively with students, visitors, and others who use the facilities. 73-1237-R (11/28).

Secretary III in the General Purchasing Office will handle general secretarial duties; prepare purchase orders; maintain log sheets and record data. Accurate typing skills required. Ability to work with details important. 73-1270-R (12/5).

Secretary III to the Vice President for Administration and Personnel and to the Administrative Assistant in that Office will handle heavy load of typing, transcribe from dictating equipment, maintain active calendar, serve as office receptionist, maintain files and answer phones. Good language skills, ability to take accurate messages are essential. Knowledge of Institute policy and resources is desirable to provide assistance to a large number of callers and visitors. Will use IBM Executive typewriter. 73-1271-R (12/5).

Secretary III will be receptionist for Urban Studies and Planning Department. Receive visitors; supply information regarding class schedules and locations of faculty and staff members; answer call director; screen phone calls; assist with typing; maintain address file of departmental personnel. Good typing skills; previous experience; desire to work with a variety of people important. 73-1258-R (12/5).

Senior Clerk IV (Documentation) in the Center for Policy Alternatives will organize and maintain an extensive document collection of English and foreign language publications for a research group involved in the area of science, technology and public policy. Search current literature, order publications pertinent to the center; document and catalogue material; handle correspondence. Accurate typing required; knowledge of French and German or Russian desirable. Familiarity with MIT's library system preferred. 73-1248-R (11/28).

Jr. Programmer V in the Arteriosclerosis Center will assist in design, development, and evaluation of a Medical Data Management System. Candidate must have a sincere interest in working in a medical environment and have the ability to collaborate with medical personnel. Previous data management experience, knowledge of PL/1 and familiarity with 360/370 OS desirable. 73-1182-A (11/14).

Administrative Assistant V in the Summer Session Office will assist with the office administrative functions. Handle and supervise the processing of applications and notifications of admission; maintain records of communications; arrange publication of publicity material for programs; coordinate mailing lists; ability to assume responsibility, to compose and type correspon-

Senior Library Assistant IV in the Barker Engineering Library will be assistant in the Processing Office for Monographs and Catalog Maintenance. Verify catalog records; process incoming monographs; supervise various card catalog processes. Previous library experience in cataloguing/processing department, some library science courses in bibliography, experience is a necessity. Accurate typing required. 9-5 or 10-6. 73-1231-R (11/21).

Senior Clerk III or IV in the Registrar's Office will work with Undergraduate student records. Transcribe grades, check computer input/output, update

permanent records. Excellent typing required. Previous office experience helpful. Interest and ability in working with details essential. 73-1257-R (12/5).

Accounting Clerk III-IV in the Center for Space Research will be responsible for various payroll records; monitor travel expense vouchers; reconcile the monthly accounting statements; perform other general clerical duties. Familiarity with the Institute payroll procedures; accurate typing skills are desirable. 40 hour work week. 73-1255-R (12/5).

Technical Typist III in the Chemical Engineering Department will type large volumes of reports, manuscripts, proposals from rough drafts using a magnetic tape typewriter. Excellent skills; ability to handle typing of equations and chemical symbols; good skills in punctuation and paragraphing required. Ability to work independently important. 73-1238-R (11/28).

Senior Clerk III in the Personnel Benefits Office will answer general questions about employee benefits; maintain various files; type correspondence and benefit forms. Experience and skill in working with people, setting priorities important. Interest in insurance, pensions or medical plans helpful. 73-1264-R (12/5).

Technical Typist III in the Research Lab of Electronics will type manuscripts and reports from rough data. Responsible for punctuation and paragraphing, may involve some editing for preparation for publishing. Excellent skills, minimum of one year experience. 73-1266-R (12/5).

Clerk-Typist II in Nutrition and Food Science will assist the secretary to the Administrative Officer with general office duties. Type proposals and reports, handle billing of xerox changes. Ability to work with figures a must. 73-1235-R (11/28).

General Cook at the Faculty Club must be able to read, understand and follow recipes for all types of food preparation. Make sauces, cook meats, vegetables, prepare salad ingredients. Prepare menu items for luncheons and some items for dinner. General knowledge of all types of food preparation; good experience in first class club or restaurant required. Ability to read and understand English important; will generally prepare American-type food. 6am-2pm. 73-1228-R (11/21).

2nd Class Engineer must have a Mass second class Engineer's license or higher. Individual must be willing to work on any shift. 73-182-R (4/73).

Electrician for Physical Plant will install and maintain all types of electrical equipment and systems. Ability to work from blueprints, verbal instructions or sketches as necessary. Some electronic experience desirable. Must be able to work all shifts and on irregular schedule. Minimum of five years experience and Mass State license required. 73-1107-R (10/17).

Technician A (E and M) in the Radioactivity Center will maintain electronic equipment associated with controlled low background facility, breath radon and thoron equipment; troubleshoot nuclear pulse instrumentation; do construction and wiring. Individual must have a strong background in pulse and digital circuits; experience in use of oscilloscopes and other test instruments; ability to use shop machinery. Experience in repair of electronic instrumentation helpful. 73-1186-R (11/28).

Electronic Technician B (temporary) at Earth and Planetary Sciences will operate testing equipment such as the oscilloscope and assemble and check out circuits. Duties also include wiring, connecting boards, documentation, drawing and processing of acquired data. Knowledge of electronic circuitry; some familiarity of processing of computer data required. (Job guaranteed to 1/31/74 with possibility of extension to 6/30/74). 73-1229-A (12/5).

Technician B in the Environmental Medical Service will perform general radiation protection technician duties at the MIT reactor. Repair and calibrate instruments conduct radiation surveys, sample preparation, decontamination and lab clean-up. Package radioactive waste and assist in construction of shields. Training and experience in electronics and radiation protection required. Afternoon shift. 40 hour work week. 73-1227-A (12/5).

Painter in Physical Plant must have minimum of 5 years experience in all phases of painting, including interior and exterior work, preparation and mixing paint materials and matching colors, thorough knowledge of the various materials, tools, equipment and rigging used in the trade. Must have a Painter Rigger's License and be able to work effectively on staging and ladders. 40 hour work week. M-F. 73-1240-R (11/24).