

'But It Was No Science Fiction Convention'

By Philip Morrison
Department of Physics

It is a rare landscape which boasts a massive snow capped peak rising almost three miles above a flat plain. A couple of weeks ago I spent a week in just such a surrounding, every day wondering again at the beauty and bulk of the mountain in all lights.

That mountain is Mount Ararat, still more famous than the view would justify, for it is held by legend to be the very mountain where old Noah beached the Ark as the flood waters receded.

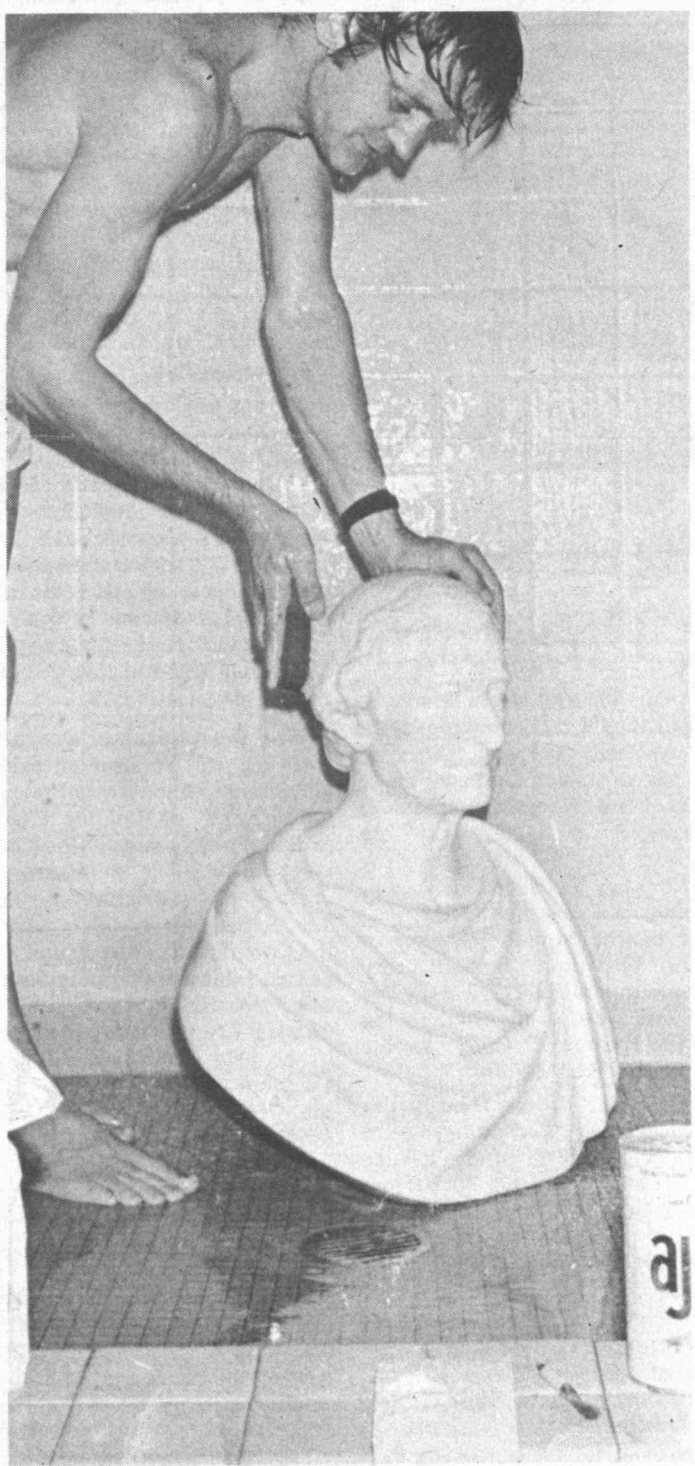
There were about 35 scientists meeting in view of Ararat. We were all guests of Professor V. A. Ambartsumian, distinguished astronomer of the Armenian Aca-

demy of Science, whose observatory at Byurakan, Soviet Armenia, looks 60 kilometers from its low mountain altitude south to Ararat.

We were a mixed bag, all but three or four of us from either American or Soviet universities or research institutes. And we were widely spread in special interests,

(Continued on page 3)

MIT Probe Aboard OSO-H to Measure X-Ray Sources



--Photo by Bob Lyon

Famed Founder Found

The group putting together the exhibit of the first 50 years of MIT history discovered that somewhere there was a bronze bust of the founder, William Barton Rogers. The trouble was no one knew where, and the last record of it dated back about 30 years. While rummaging in an Institute warehouse, however, the committee found not only the bronze bust but this fine, though very grubby, marble one as well. Three hours in the shower restored its original beauty, and it will hold a place of honor in the exhibit which opens in the Hayden Lobby next Monday.

An X-ray telescope designed and built by MIT scientists will measure and map many hundreds of X-ray sources in the heavens from onboard the Orbiting Solar Observatory-H (OSO-H) which the National Aeronautics and Space Administration will launch tomorrow.

The scientists expect to use the data from OSO-H to clarify the nature of X-ray sources and their relationship to the evolutionary processes of stars, and to the dynamics of the universe as a whole.

Among the sources of X-rays the scientists hope to study in a detail never before possible are:

-Remnants of exploded stars, such as the Crab Nebula and the Cygnus Loop,

-Peculiar galaxies, like M-87 whose nucleus appears to have thrown out a jet of bright objects, each one of which may be a spinning mini-galaxy,

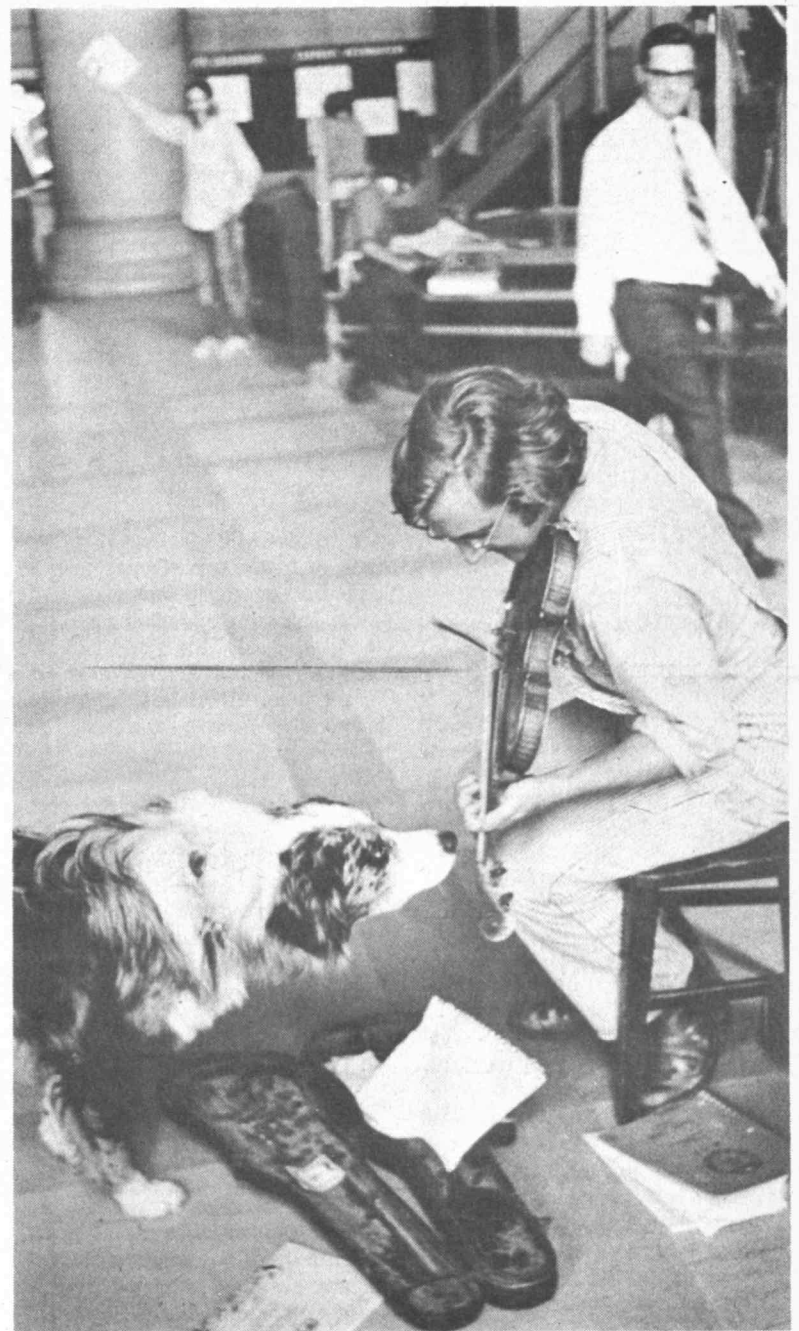
-Objects of uncertain structure, like Sco X-1 in the constellation Scorpio. This curious source, the first to be discovered, is the brightest X-ray source in the heavens, with the exception of the sun and occasional X-ray novae. Its total radiant power is a thousand times that of our sun and 99.9 percent of its luminosity is in the form of X-rays. The object fluctuates between the 12th and 13th magnitudes in the visual range of the spectrum, and its luminosity continuously jitters as though numerous flares were being given off.

Sco X-1 may be a collapsed star, and some authorities have speculated that it is one which underwent complete gravitational collapse to below the radius at which gravitation becomes so strong that light cannot escape.

It is thought that stars which undergo total collapse become 'black holes,' which are singularities in space possessing intense gravitational and magnetic fields. Sco X-1 may be such a 'black hole' which is part of a binary star system, and is sucking away the atmosphere of its companion. As these gases are pulled into the 'black hole,' a huge reaction occurs, generating powerful X-rays.

As well as cataloging and measuring the various discrete sources, the MIT instruments on OSO-H will provide data which may determine whether the extragalactic X-ray background is created

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Paul Zavattero, '72, has taken up an independent form of Student Aid. Not only does he make a little extra money while entertaining passersby in the Lobby of Building 7, but, he says, "It's a great way to practice." The dog doesn't look too sure about that.

--Photo by Alfred Anderson, '71

Arts & Science Share Inauguration Spotlight

Plans are booming for activities celebrating the inauguration of Dr. Jerome B. Wiesner as President and the installation of Dr. Paul E. Gray as Chancellor of the Institute. A full schedule of these events will be published later this week in the Calendar of Inaugural Events.

"We are very pleased at the response of the community," said Professor Peter Elias, Chairman of the Inaugural Events Committee. "We had hoped that groups from throughout the Institute would

want to sponsor activities in which the whole community could participate. We are gratified at the wide and imaginative variety of events which have been scheduled."

The inaugural period will extend from next Monday, September 27, through the inauguration itself on Thursday afternoon, October 7.

A number of panel discussions, colloquia and seminars are planned, both by Departments
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MIT-Designed Telescope Measures X-Ray Sources

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throughout intergalactic space—in which case it should be evenly distributed over the sky—or is the produce of many distant galaxies—in which case it may be resolved into many small, discrete sources.

X-ray astronomy, possible only with instruments lofted to near the top or beyond the Earth's atmosphere, is still a young, largely unexplored field.

At the Institute this new field of astronomy has been vigorously explored in experiments conducted with rockets and high altitude balloons. Recognizing that long term observations of X-ray sources from satellites offer great advantages over balloon and rocket studies, the X-Ray Astronomy Group initiated the OSO-H project four years ago.

Now, as their instrument is undergoing its final testing and

calibration before launch, a harvest of new data on the positions, spectra and time variations of X-ray sources is anticipated by the scientists, including Drs. George Clark, Hale Bradt, Walter Lewin, Herbert Schnopper and George Sprott.

According to Dr. Clark, professor of physics and principal investigator, the instrument is expected to operate for at least one year after launch, and it should detect sources which are ten thousand times fainter than Sco X-1.

The MIT instrument for the OSO-H will be located in a wedge-shaped section in the rotating wheel of the satellite. The rotation axis will be aligned in a direction perpendicular to the sun, and the rotary motion will cause the X-ray detectors to scan around the sky.

The instrument has two multi-chambered detectors oriented above and below the wheel plane. The upper one, with a 1° field of view, is aimed 15° above the wheel plane. Each detector consists of four proportional counter chambers arranged one behind the other, plus a single-chamber counter at the side, for a total of five chambers per detector.

By careful choice of filling gases and window materials, the five chambers have each been made selectively sensitive to a limited range of the X-ray spectrum. All together, the detectors will prove '5 color' X-ray spectral data from 1 to 60 keV, akin to the broad band multicolor photometry data obtained in conventional ground-based optical astronomy measurements. Coin silver honeycomb collimators define the fields of view.

The counters will be calibrated periodically in flight by exposure to on-board radioactive sources emitting X-rays at several discrete energies.

The one degree per day precession of the spin axis of the satellite—required to keep the axis aligned perpendicular to the direction of the sun—assures that nearly the entire sky will be scanned by the MIT instrument in the course of a year.

The X-ray telescope for the OSO-H was constructed in the Laboratory for Space Experiments of the Institute's Center for Space Research under the direction of Mr. Robert Rasche and Mr. Richard Taylor.

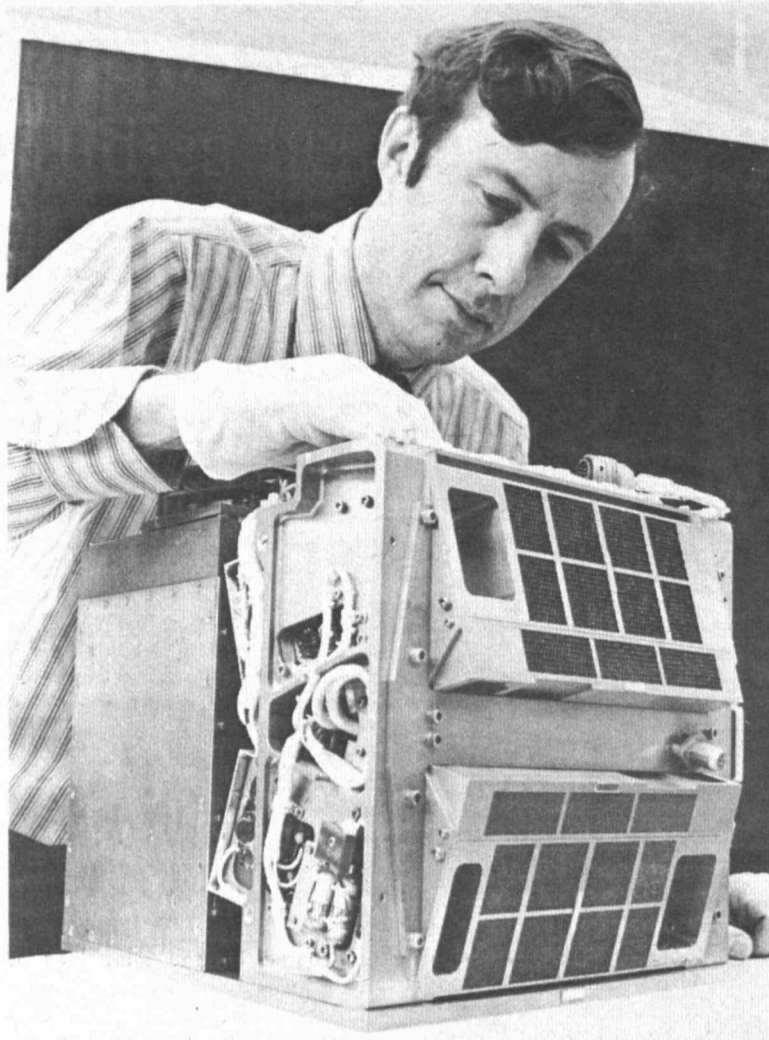
They Track Mysterious Interferers

Often sensitive electronic equipment around the Institute behaves erratically for no apparent reason. The equipment has no observable technical problem, but responds to radio signals from unknown sources, causing faulty performance. In such cases the Radio Frequency Interference Laboratory can be consulted.

The RFI Lab first traces the path of the spurious signal. The signals are most commonly carried on control or power wires connected simultaneously to other equipment. Parts of instruments also may form a 'parasite' antenna and pick up signals radiated from other equipment. A third path is electrostatic or magnetic induction and is common to high sensitivity pick-ups and probes. Once the path and source of the problematic signals are known, a variety of solutions is available. The source of the signal or the effected equipment may be modified or shielded. Filters may be installed to reduce the noise level, or the equipment may simply be relocated.

The RFI Lab has solved many exotic problems in its seven years of existence. An electron microscope that mysteriously unfocused at odd times was saved from the scrap heap when Lab workers discovered the presence of a magnetic field produced by arcwelding equipment two floors below. Erroneous outputs given at regular times by a thermocouple measurement device were traced to radio station pickups which heated the thermocouple.

The services of the RFI Lab are available to everyone at the Institute. Director Ralph Burgess and his staff will be happy to identify the presence of suspected interference and either recommend or provide a solution on request. The Lab is located in 20B-031 on Extension 2415.



Professor George Clark of physics checks out the delicate X-ray telescope that is to be launched tomorrow aboard NASA's OSO-H. —Photo by Margo Foote

25 Students Begin Study in Joint Health Program

A new kind of medical training began last week. Twenty-five students registered as the first class in the joint Harvard-MIT Program in Health Sciences and Technology.

The joint Program is a major collaborative effort of the two universities designed to focus science and technology on human health needs. The Program will have three parts: (1) curricula which qualify the student to enter the clinical years of medical or dental school; (2) curricula at the interfaces of human biology and engineering, the physical sciences, and mathematics; and (3) curricula in human biology which qualify the student to pursue graduate study in the life sciences. The Program will provide a framework for scientists and engineers to work on clinical problems and for physicians to work with scientists and engineers.

The 25 members of the initial

class—all selected from Harvard, Radcliffe and MIT—are enrolled in an especially prepared series of courses in human biology. These courses are designed to achieve progressive penetration of the physical sciences and engineering into biology and medicine, and to develop an informed social analysis of the human meaning of health activities. On satisfactory completion of this curriculum, the students will be admitted to the clinical years of study at the Harvard Medical School.

The joint Program in Health Sciences and Technology grew from a long-term study headed by President Jerome B. Wiesner and Robert H. Ebert, Dean of the Faculty of Medicine at Harvard.

Irving M. London, M.D., is the director of the joint Program on behalf of MIT and Harvard. He was formerly Professor and Chairman of the Department of Medicine at the Albert Einstein College of Medicine.

General guidance for the Program is provided by an Administrative Committee including Dr. Ebert; Walter A. Rosenblith, MIT Provost; Harvey Brooks, Dean of the Division of Engineering and Applied Physics, Harvard; William F. Pounds, Dean of the Sloan School of Management, MIT; Henry C. Meadow, Associate Dean, Harvard Medical School; and Dr. London. Present staff includes Dr. Walter L. Koltun, assistant director for resources, and Dr. Frederick Bowman, administrative officer.

Inaugural: Broad View of Institute

(Continued from page 1)

and Centers and by the Inaugural Events Committee.

Panels, sponsored by the Committee include such topics as "Political and Social Control of Technology" next Monday at 3pm in Room 9-150, "Education, Values and the Qualities of Life" on Monday, October 4, at 8pm, also in Room 9-150, and "MIT and the Future: A Black Perspective" on Tuesday, October 5, at 2pm in Room 26-100.

A two part colloquium on "New Directions in Electrical Engineering Research" will be offered by that Department on Thursday, September 30 and Friday, October 1, at 3pm in Room 4-370. The Department of Physics will offer "What the Cicada Sang," a discussion on the teaching of physics, at 4:30pm on Thursday, September 30 in Room 26-100. Many other Departments and Centers have organized activities which are included in the inaugural calendar.

A concert featuring the MIT Symphony Orchestra, Choral Society and Glee Club with guest artists will highlight the program the night before the inauguration, Wednesday, October 6. Other groups will perform chamber music and folk songs and blues in the Hayden Library and a brass ensemble will present a noontime concert in the Building 7 Lobby on Tuesday, October 5.

The Department of Ocean Engineering will sponsor an exhibit of "Summer Laboratory Projects" in the Lobby of Building 5. Other exhibits will include "Contemporary Views of Man" which will open in Hayden Gallery on Tuesday, September 28, sponsored by the Committee on the Visual Arts, and an exhibit and visual presentation, "Artistic Potential of the Charles River," a day-long event to be held Friday, Monday and Tuesday, October 1, 4 and 5, by the Center for Advanced Visual Studies.

One highlight of the ten-day period will be a community reception at which everyone will have an opportunity to meet Dr. and Mrs. Wiesner and Dr. and Mrs. Gray. The reception is scheduled for 5pm October 1, in the Great Court. It will be held in duPont Athletic Center in case of rain.

On inauguration day, Thursday, October 7, Professor Walter A. Rosenblith, Provost, will lead a panel discussion on "Directions in Research at MIT in the 1970s" at 10am in Kresge. A parallel discussion on "Directions in Education at MIT in the 1970s" will be chaired by Chancellor Gray at 2pm, also in Kresge.

The inauguration itself will take place at 4:30pm in Rockwell Cage, with Chairman Howard W. Johnson presiding. Dr. James R. Killian, Jr., Honorary Chairman of the Corporation, will offer remarks and Dr. Wiesner will present the inaugural address.

Unemployment Law Signed, Offers Extended Benefits

Last Thursday Lieutenant Governor Donald Dwight signed into law a bill increasing the authorized period of extended unemployment benefits by 13 weeks. The law took effect on September 19.

Extended benefits will now be available for a period equal to the earned benefit period provided that the earned and extended pe-

riods combined do not exceed 52 weeks. This extension will continue in effect until March 3, 1973 during periods when the level of unemployment in the state exceeds 4.5 percent, as is presently the case.

Legislation which will provide unemployment benefits for employees of non-profit organizations is still pending.



Dr. Marvin Minsky.



Dr. Bernard Burke.

CETI Meeting Like Seeking Noah's Dove

(Continued from page 1)

ranging from archaeologists to radio astronomers. Three men were from MIT: Marvin Minsky, pioneer in computer science and artificial intelligence; Bernard Burke, radio astronomer who dropped in from Leyden, where he is now spending a term or two of leave from MIT; and me, a theoretical physicist. (My wife was there, too, working as recording technician in English, and Dr. and Mrs. Charles Townes, not so long ago familiar MITers.)

Our business was CETI: Communication with Extraterrestrial Intelligence, and we all wore the little metal badges with the letters CETI cast into them—just as sure a sign of a conference in the USSR as those plastic name tags are here in the US.

But it was no science fiction convention.

CETI as an objective for science is about ten years old. It is not based on the mere idea of other worlds with other beings more or less like ourselves: such ideas are older than modern science itself.

Where CETI differs somewhat from the imaginative work of writers and seers over much of human history is that for about the last ten years, but not ever before that, we have ourselves possessed the means of signalling across the spaces between the stars. Since Galileo's day we have known that all the stars are suns. Whether those other suns have their planets, the planets life, the life evolved to a complex state, and that complexity found some means to make itself known across the light years—that is what CETI is about.

The issue is really two-fold.

The first issue is the most uncertain: ETI is certainly possible, as far as our knowledge goes. We are here, and there is no obvious arrow in the sky marking the only one of a hundred thousand million stars in our Galaxy fit for communication. How many others are there? That is the first issue.

On its answer—and we cannot really do much better than a thoughtful guess—hangs the problem of how far we look across the whole Galaxy, or even out over the intergalactic ocean of empty space. We and They might

(Professor Philip S. Morrison of the Department of Physics took part in an international conference to consider communications with intelligent life on other worlds held two weeks ago at Byurakan, USSR, near the Turkish border, sponsored by the Soviet and American Academies of Science. In this article written for Tech Talk, Professor Morrison, one of the organizers, gives his impressions of what transpired there.)



Dr. Philip Morrison.

not able to afford the big dishes and high power.

Three great uncertainties dominated the three or four days of lively discussions on these matters.

Stars we can see and count.

Planets seem—we cannot be sure—pretty likely to be found.

Steady sunshine and earth-like planets mean we can expect the chemical building blocks of life to form in some quantity. But does life begin to form out of those molecules with high probability?

We don't know. The biologist Francis Crick, witty and learned discoverer of the double helix, felt we cannot yet do more than guess at its likelihood. But he felt that if life formed, it was likely to evolve. Once something like mammals formed, he felt that species who might make radio dishes were all but inevitable.

The archaeologists were less sure of that. They felt that given intelligent social species with clever hands, all that was needed was the invention of language. Once they could symbolize and model their thought, they were bound to develop big, powerful social groups, and sooner or later, make these big dishes.

So it went. The messages were envisioned, the code-breaking imagined. There was a well-known Soviet military cryptanalyst present who felt that this kind of message would not be hard to decipher. It was meant to be read, not hidden.

The second issue was the kind of signal. How to look?

We have to think of a long patient search, a search through four dimensions. Two of these fix the sky direction, how high above the horizon, say, and at what bearing? (Of course, the source will move with the whole sky as the earth turns.) Then there is the search for the right waveband. Microwaves are favored by most, though the deep infrared might be very useful.

These matters are probably easier to settle, for they are determined by the physics of space, which neither We nor They can change.

But last of all, there is a search in time. For the very deepest years of human history are a mere moment in the age of life on

earth. We cannot expect that They have been mysteriously synchronized with us.

They are either far behind our history, or far ahead. Since We are only barely able to signal, the ones behind our pace are still mute. The ones ahead we must count on, patiently waiting, sending steadily some inquiring signal out, for one more group—ourselves—to join their big network.

But that is the problem: does civilization, or at least its communicative phase, last long enough to give us some overlap with Them across the eons of geological time? Anyway, we need to listen to find out. No use to send, at least not yet, for unless we are really early birds, many others have sent before us.

These arguments are not new. They were all surveyed and criticized at Byurakan by the international group. There was wide agreement that the chances were high enough that we should begin two modest programs of search.

One is to look in the microwave bands at a few hundred selected stars nearby, as ten years ago Project Ozma looked at only two stars, and three years ago a group at Gorki in the USSR looked at ten more. We need to raise the ante a little above that.

The second is to look, still by microwave, right at the nebula in Andromeda, our nearest bright neighbor galaxy. We can point to all the stars there at once. No more search in direction is needed; only slow tuning over the frequency band, and the faith that maybe just one of the billion suns out there has a race of beings willing to declare themselves present over a radio channel which takes two million years—a thousand times the length of the Christian Era—to reach any receiver at all.

The dove brought the news to Noah that life was possible out there in the flood waters. Maybe our CETI talks, seeking the answer not after forty days but after as many years or more, to life in the silent depths of space, will have as happy an outcome. We can only get to work to see.

It is perhaps a good omen that men began international discussions to this end while facing Mount Ararat.

New Coaches Named for Fencing, Rifle Teams

Tech's varsity fencing and rifle teams will be headed by new coaches this year. Eric Sollee of Newton succeeds Edwin H. Richards as fencing coach, and James B. Enos, Jr., of Andover will take over the rifle coaching duties from Master Sergeant Alan Hannon.

Mr. Sollee, a graduate of Harvard and a former All American fencer, has long been active in amateur fencing circles. In 1955, he organized the Philippine Amateur Fencing Association and served as chairman of that country's Athletic

Federation. Since 1963, he has served as chairman of the New England division of the Amateur Fencers League of America (AFLA). Mr. Sollee also teaches foil fencing to trainees at St. Paul's Rehabilitation Center for the Blind.

Mr. Enos has been an active member of the MIT Rifle Club for the past four years and competed intercollegiately during his undergraduate days at the University of Massachusetts. He is a staff accountant in MIT's accounting office.

In addition, three former MIT athletes have been named to coaching positions. James Shields, '71, of Norridge, Illinois, will be assistant freshman basketball coach. He was a key backcourt player during the past two varsity hoop seasons. He is now a graduate student in the Department of Electrical Engineering.

Alan Levin, '71, of Wynnewood, Pennsylvania, and Valentin Livada, '71, of Long Island City, New York, both will be assistant soccer coaches. Mr. Levin co-captained the MIT soccer team last fall and was a standout defensive star at full-back. He was named the most valuable player on the team in 1970 and was also selected to Greater Boston All Star honors. Mr. Livada co-captained the 1969 soccer team and is now doing graduate work at the Institute.

Humanities Offers Seminar on History of Technology

The Department of Humanities will present a continuing faculty seminar on the History of Technology, beginning today at 4pm in Room 14N-313.

Dr. Booke Hindle, Visiting Killian Professor of the History of Technology, will direct the seminar, which will focus on the factors that have influenced the character and development of technology. After the first few meet-

ings, members will submit papers examining influences brought to bear on a specific technological field at some point in its history. In this way participants from a variety of fields will gain insight into their own fields as they relate to the overall structure of technology.

The seminar will be held weekly, except for the third Wednesday of each month. Students are welcome to attend.

TECH TALK

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

THE INSTITUTE CALENDAR

September 22
through
October 1, 1971

Send notices for September 29 through October 8 to the Calendar Editor, Room 5-111, Ext. 3279, by noon Friday, September 24.

Events of Special Interest

Foreign Graduate Student Banquet

Welcoming banquet for incoming foreign graduate students and their spouses. Featured speaker: **Dr. Jerome B. Wiesner**, President. Sponsored by the Graduate Student Council and the Foreign Student Office. Wednesday, September 22. Sherry hour, 6pm, Student Center, Mezzanine Lounge. Dinner, 7pm, Student Center, Sala de Puerto Rico. Please RSVP to Foreign Student Office, Ext. 3795.

English Conversation Classes for Foreign Wives **

Registration will be held on Thursday, September 23, 10am-12noon, Emma Rogers Room (room 10-340). Classes available at all levels of ability. Sponsored by Technology Matrons, classes will meet regularly on Tuesday and Thursday mornings. No academic credit offered. Fee is \$15 for 18 sessions. Child care provided for pre-school children. For more information, call Mrs. J. Francis Reintjes, 484-3595, or Mrs. Herman Meissner, 729-5323.

Corporation Joint Advisory Committee (CJAC)

First meeting of the 1971 fall term. Agenda will be discussed. Thursday, September 23, 7:30pm. Bush Room (Room 10-105). This is an open meeting—everyone is welcome to come.

The Future of the International Payments System *

Round table discussion sponsored by the Sloan School of Management and the Economics Department. Guest speaker is **Dr. Guido Carli**, Governor, Bank of Italy. Panel includes **Professor Franco Modigliani**, chairman, **Professor Paul Samuelson**, and **Professor James Tobin**, Sterling Professor of Economics, Yale University. Friday, September 24, 2:30-4:30pm. McDermott Hall, Green Building (Room 54-100).

Seminars and Lectures

Wednesday, September 22

Working in the Ocean *

One day symposium on recent ocean engineering developments and problems. 8:30am-5:30pm, Kresge Auditorium. Luncheon reserved tickets, \$5. Advance registration required, no fee. Registration forms available in the Sea Grant Office, Room 3-282, Ext. 7041.

First Order Heat Flow and Atom Segregation Models to Delineate Stability in Plane-Front Solidification

Professor R. L. Coble, MIT. Department of Metallurgy and Materials Science Ceramics Seminar. 11am. Bush Room (Room 10-105).

Faculty Seminar in the History of Technology *

Dr. Brooke Hindle, visiting professor, Department of Humanities. Seminar will meet through the term to examine cases illustrative of the effect of cultural factors in the inner history of technology. Initial meeting at 4:00pm, Room 14N-313.

New Developments in the School of Architecture and Planning **

Dr. William Porter, Dean of the School of Architecture and Planning. 5pm in the Bush Room (Room 10-105). Refreshments will be served.

Thursday, September 23

Pressure Fields; Flow Visualization **

Fluid Mechanics Film. 4-5pm, Room 3-270.

Tracking the Moon by Laser *

Professor Carroll O. Alley, Jr. Department of Physics and Astronomy, University of Maryland. 4:30pm in Room 26-100. Tea served at 4:00pm in Room 26-110.

Friday, September 24

A Simulation of the Separation of a Binary Particulate Suspension in a Bounded Control Volume under the Influence of a Centrifugal Force Field *

J. Porter, graduate student, Department of Chemical Engineering. 2pm, Room 24-121.

Measurement of Flamability and Burn Injury Potential of Fabrics *

F. Wong, graduate student, Department of Chemical Engineering. 3pm, Room 24-121.

Monday, September 27

Auto-Inhibitors and Their Biological Role **

Dr. B. T. Lingappa, Biology Department, Holy Cross College. General and Applied Microbiology Seminar. 2pm, Room 16-134.

Harmonic Generation in Shallow Water Waves *

Dr. C. C. Mei, Department of Civil Engineering. Water Resources and Hydrodynamics Seminar. 4-5pm, Room 48-316. Coffee served at 3:30pm in Room 48-410.

Pressure Fields; Flow Visualization **

Fluid Mechanics Film. 4-5pm, Room 3-270.

The Compensated Kalman Filter *

Professor Michael Athans, Department of Electrical Engineering. Decision and Control Sciences Group Seminar. 4:00pm in Room 39-500.

Experimental Writing Class without a Teacher *

Sponsored by **Professor Peter Elbow**, Department of Humanities. 5:30pm, Room 14N-226. For more information, call Mirian Sitrin, Ext. 7601 or 7602.

Tuesday, September 28

Notes on Propulsion Hydrodynamics, Especially in Rough Seas*

Professor S. Powell, Department of Ocean Engineering. 4pm, Room 5-234. Coffee session at 3:30pm in Room 5-314.

Wednesday, September 29

Kinetics Models for Solidification

Professor D. R. Uhlmann, MIT. Department of Metallurgy and Materials Science Ceramic Seminar. 11am, Bush Room (Room 10-105).

A Proposed Method of Determining the Pressure-Temperature History of Rocks from Laboratory Measurements *

Dr. Hartmut Stetzler, Sandia Corporation. Earth and Planetary Sciences Colloquium. 4pm, Room 54-100.

Thursday, September 30

A Review of the MIT-NASA Waterville Valley Workshop on Short-Haul Air Transportation *

Joseph Vittek, deputy director, Flight Transportation Laboratory. 4pm, Room 35-225. Coffee session at 3:30pm in Room 33-411.

Fundamentals of Boundary Layers: Boundary Layer Control **

Fluid Mechanics Film. 4-5pm, Room 3-270.

Friday, October 1

Soap Films: Fluctuations as a Cause of Light Scattering and Rupture *

A. Vrij, graduate student, Department of Chemical Engineering. 2pm, Room 24-121.

Pyrolysis of Cellulose *

D. Aldrich, graduate student, Department of Chemical Engineering. 3pm, Room 24-121.

Localized Electronic States in Disordered Systems and Their Contribution to Transport Properties *

Dr. B. Halperin, Bell Telephone Laboratories. Center for Materials Science and Engineering Colloquium. 4:00pm in the Bush Room (Room 10-105). Refreshments served in the Bush Room at 3:30pm.

MIT Club Notes

Alpha Phi Omega *†

Open meeting to introduce APO to people interested in joining. Wednesday, September 22, 7:30pm. Bush Room (Room 10-105). Refreshments.

MIT Flying Club *

Organizational meeting. Wednesday, September 22, 7:30pm. Student Center, Room 491.

Scuba Club Pool Session **

MIT Scuba Club. Wednesday, September 22, 8pm. Alumni Pool. (*Repeated Oct. 6, Oct. 20, Nov. 3, Nov. 17, Dec. 1, Dec. 15)

Students International Meditation Society *

Introductory lecture. Wednesday, September 22, 8-10pm. Student Center, Room 407.

Musical Theatre Guild **

Auditions and organization of technical staff for November production of *Pirates of Penzance*. Wednesday and Thursday, September 22-23, 8-11pm. Kresge Rehearsal Rooms. For more information, call 354-7795 or 876-0613.

MIT Zero Population Growth *

Formative meeting to draw up plans and goals. Thursday, September 23, 7:30pm. Student Center, Room 491.

MIT Soaring Association *

General meeting. Thursday, September 23 7:30pm. Student Center, Room 473. New members invited.

Hellenic Students Association

Reception welcoming new Greek students. Sunday, September 26, 7-9pm. Student Center, West Lounge. Refreshments.

Book of the Week *

Informal discussion of *How to Stay Young* by **Herndon**, Tuesday, September 22, 15:15 (next to the exit). Anyone who has read the book should bring a copy. Snell, Ext. 4922.

Baker House SPAZ Jogging Club *

Jogging around BU and Harvard (Dai second floor west).

MIT/DL Duplicate Bridge Club *

Every Sunday at 7pm and evening sessions. Room 491.

Nautical Association **

Basic Sailing Shore School. Repeated throughout the fall, 5:15pm. MIT Pavilion.

MIT Tiddlywinks Association *

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

Outing Club *

Every Monday and Thursday, 5pm. Student Center, Room 473.

Rugby Club **

Every Tuesday and Thursday, 5pm. For more information call Wayne Book, Ext. 7601.

Urban Action **

Mini-course in urban problems. Wednesday, September 22, 7-9pm. Student Center, Room 473.

Science Fiction Society *

Every Friday, 5pm. Spofford Room.

Indian Folk Dance and Lore ***

Sponsored by the Boston Indian Cultural Center. Student Center, Room 407.

MIT Bridge Club **

Duplicate Bridge. Every Saturday, 10-12pm. Admission is \$2 per term or 75 cents per session.

Judo Club **

Every Saturday, 1:00pm. Exercises and sparring welcome.

MIT Chess Club **

Every Saturday and Sunday, 1:30-4:00pm.

Student Meetings

Technique Staff Meeting

Every Saturday, 11am. Student Center, Room 473.

ERGO Staff Meeting

Every Sunday, 6pm. Student Center, Room 473.

Movies

My Fair Lady **

Lecture Series Committee. Friday, September 24, 7:30pm. Kresge Auditorium. Admission 50 cents.

From Russia with Love **

Lecture Series Committee. Saturday, September 25, 7:30pm. Room 26-100. Admission 50 cents.

International House *

Lecture Series Committee. Sunday, September 26, 7:30pm. Admission 50 cents.

Women in Love **

Lecture Series Committee. Friday, September 24, 7:30pm. Room 26-100. Admission 50 cents.

Dance

MIT Dance Workshop **

Auditions and organization meeting for dance performance. Wednesday, September 22, 8-10pm. Production people as well as dancers welcome.

Dance Solos *

Featuring **Sally Bowden** and **Carol Spang**. Dance Association. Saturday, September 25, 7:30pm. Memorial, Room 50-340. Tickets \$2 for general public.

International Folk Dancing *

MIT Folk Dance Club. Every Sunday, September 27, 7:30pm. Puerto Rico.

Modern Dance Technique Class **

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

Balkan Dancing *

MIT Folk Dance Club. Basic/Intermediate/Advanced. Every Tuesday, 7:30pm. Student Center, Room 407. For more information, call Jane Weiman, 876-5609.

Square Dance Club *

Every Tuesday, 8pm. Student Center, Room 491. For information, call 491-4768.

MIT Dance Workshop **

Modern dance classes. Elementary classes with Joan Blackmer, Tuesdays and Thursdays, 10am and 2pm. Intermediate classes with Joan Blackmer, Tuesdays and Thursdays, 12noon. General classes open to the community, taught by Marsha Davis, Thursdays, 7pm. Admissions: \$2 for the community, free for students. All classes held in McCormick Gym. For more information call Cha-Rie Tang, dormline 0-908.

Israeli Folk Dancing *

MIT Folk Dance Club. Every Thursday, 7:30-11pm. Student Center, Room 407. Basics taught from 7:30-8pm.

Friday Afternoon Dance Break *

MIT Folk Dance Club. International folk dancing on the oval lawn in front of Kresge. Every Friday, 12-1pm.

Mixers

Class of '74 Mixer

Friday, September 24, 8-12pm. Student Center, Sala de Puerto Rico. Admission 75 cents. All students welcome.

Exhibitions

Visual Design Experiments *

An exhibit of photographs of experiments made by students in Visual Design Problems, prepared by Professor Robert Preusser. Presented in connection with the inauguration of President Jerome B. Wiesner. Opening on Monday, September 27. Building 7.

Alfred Leslie, Philip Pearlstein, Wayne Thiebaud: Contemporary Views of Man *

Collection of paintings portraying the human figure in a representational manner. Sponsored by the MIT Committee on the Visual Arts. September 28 through October 31, Hayden Gallery. Gallery hours: Monday-Thursday, 10am-5pm; Friday, 10am-9pm; Saturday, Sunday and holidays, 1pm-5pm.

Eskimo Art and Artifacts *

Sponsored by the Anthropology Program for Course 21.06 in cooperation with the Peabody Museum of Archaeology and Ethnology, Harvard University. Now through October 8. Hayden Library Reading Room, Second Floor.

Summer Laboratory Projects, Ocean Engineering *

Exhibit of photographs and instruments. Hart Nautical Museum. Building 5, First Floor.

Steamboat Design *

Details of Robert Fulton's steamboat *North River* and other early American steamboats. Hart Nautical Museum. Building 5, First Floor.

Main Corridor Exhibitions *

Presented by students and departments. Buildings 7, 3, 4, 8.

Athletics

Marksmanship Course *

MIT Pistol and Rifle Club. Course in basic pistol marksmanship. Five consecutive Thursdays beginning September 23, 6:30-8:30pm. Pistol Range in duPont Gymnasium. \$10 fee covers pistols, ammunition and targets. Limited to the first 20 adult applicants. Call Harold Sulahian, Ext 3989, to sign up.

Varsity Baseball *

Massachusetts Bay Community. Friday, September 24, 3:30pm. Briggs Field.

Varsity Sailing *

Dinghy Invitational. Saturday, September 25, 12:30pm. Lower Charles River Basin.

Women's Varsity Sailing *

Novice Regatta. Sunday, September 26, 9:30am. Lower Charles River Basin.

Varsity Golf *

St. Anselm's. Tuesday, September 28, 12:30pm. Concord Country Club, Concord, Massachusetts.

Varsity Baseball **

Boston University. Tuesday, September 28, 4:00pm. Briggs Field.

Varsity Baseball *

Massachusetts Bay Community. Friday, October 1, 3:30pm. Briggs Field.

Religious Services and Activities

MIT Hillel Yom Kippur Services

Traditional: Tuesday, September 28-4:45pm, Minchah in Kosher Kitchen, and Kol Nidre, 6:15pm, Kresge Auditorium. Wednesday, September 29-8:30am, services in Kresge Auditorium; Yizkor at 11:55am, Minchah at 4:45pm, followed by Ne'elah, all in Kresge Auditorium.

Reform: Tuesday, September 28-8:00pm, Kol Nidre, Sala de Puerto Rico. Wednesday, September 29- 10:45am-2:00pm, Sala de Puerto Rico; Yizkor at 6:00pm and Ne'elah at 6:15pm, Sala de Puerto Rico.

Praying, Singing, Sharing Meeting *

United Christian Fellowship. Tuesday, September 28, 7-8pm. East Campus Lounge.

Tech Catholic Community Discussion Series *

"New Life Styles for the 70's" by the Rev. Robert Baer. Wednesday, September 29, 7:30-9:00pm. East Lounge in McCormick Hall.

Free Draft Counseling *

Sponsored by MIT Hillel, 312 Memorial Drive, Ext. 2982. Call between 10am and 5pm or visit the Hillel Office.

Christians for Dinner *

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

Christian Bible Discussion Group *

Every Thursday, 12:15pm. Room 20B-031. For information, call Professor Schimmel, Ext. 6739.

Islamic Society Prayers *

Every Friday, 12noon. Student Center, Room 473.

Vedanta Service *

Every Friday, 5:15pm. MIT Chapel. Followed with discussion hour, 6pm, Ashdown House Cafeteria.

MIT Hillel Religious Services *

Every Friday at 7:30pm and every Saturday at 9am. MIT Chapel.

Roman Catholic Mass *

Every Sunday, 9:15am, 12:15pm and 5:15pm. MIT Chapel.

Christian Worship Service *

Every Sunday, 11am. MIT Chapel.

Christian Discussion Group *

Bible study and discussion of Christianity today. Every Sunday, 9:30-11:00am. McCormick Seminar Room A. For more information call Ron Gamble, Ext. 6712 or 547-4279.

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

Coming Events

Fall Foliage Tour **

Bus tour through New Hampshire White Mountain area. Sponsored by the Technology Matrons. Saturday, October 2. Buses will depart from Building 52 parking lot at 9am and return by 6pm. Tickets available in the lobby of Building 10 through Friday, September 24. \$6 per person. For further information, call Mrs. Richard Briggs, 862-3061.

A Woman's Changing Roles *

Symposium of panelists discussing the normal life crises that occur in a woman's life as her basic roles shift and change. Panelists include Dr. John F. Reichard, Psychiatrist-in-Chief, Faulkner Hospital; Dr. Grete Bibring, Clinical Professor of Psychiatry, Harvard Medical School; Dr. Helen Tartakoff, psychiatrist, Beth Israel Hospital; Dr. Malkah Notman, Associate Psychiatrist, Beth Israel Hospital; Dr. Norman Zinberg, Scholar in Residence, Tufts University. Saturday, October 2, 1pm. Massachusetts Mental Health Center Auditorium, 74 Fenwood Road, Boston.

*Open to the Public

**Open to the MIT Community Only

***Open to Members Only

†Freshmen interested in departmental program encouraged to attend.

Rey to Speak at Symposium

More than 200 food scientists and food industry executives will discuss developments expected this decade in food science at the annual Underwood-Prescott Symposium tomorrow. The symposium will be held at 2pm in Kresge Auditorium, following a luncheon at the Faculty Club.

At the luncheon Chancellor Paul E. Gray will present the 1971 Underwood-Prescott Memorial Prize to Dr. Louis Rey, scientific advisor and head of Corporate Research and Development for Nestle-Alimentana, S.A., Vevey, Switzerland. Dr. Rey will lead the panel discussion at the symposium.

Other members of the panel are: Dr. Arthur E. Humphrey, professor and director of the School of Chemical Engineering, University of Pennsylvania and Mr. Bruce A. Drew, research associate in applied mathematics for The Pillsbury Company, Dr. Marcus Karel, professor of food engineering in MIT's Department of Nutrition and Food Science, will summarize remarks made at the symposium.

Dr. Rey is internationally recognized for his early work in freeze drying and the related use of cryogenics in the food industry. Also, he has been responsible for Nestle's work with the oil industry in research on single cell protein foods. He formerly was a professor at the University of Dijon in France.

Dr. Humphrey is considered one of the industry leaders in developing single cell protein. His remarks at the symposium will center around immobilized enzymes, semi-permeable membranes and continuous microbial culture.

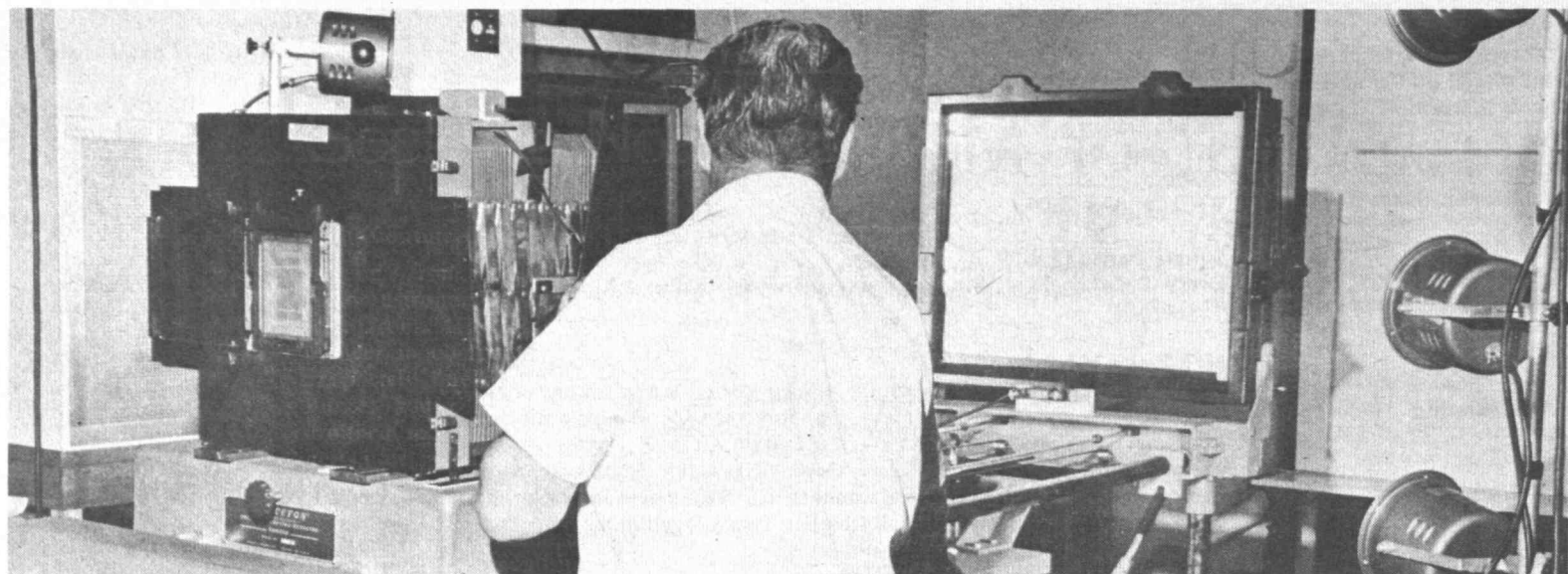
Mr. Drew will speak about optimizing food processing through computer techniques so as to speed up and reduce costs in research in order to have cheaper processed foods and to meet world population nutrition requirements.

This is the ninth year in which outstanding food scientists from the world have delivered lectures in Boston on their work. The lectureship honors the memory of William Lyman Underwood, grandson of William Underwood, founder of the Wm. Underwood Company, the oldest food canner in the U.S., and Dr. Samuel Cate Prescott, the first dean of the School of Science at MIT. Together, in 1895, they were the first to establish that spoilage in canned foods was due to microorganisms.

IPC Installing New Equipment

Beginning tomorrow (September 23), the Information Processing Center (IPC) will be installing an IBM S/370 Model 155. The new computer, with a core memory capacity of 1.5 million bits, will replace the IBM S/360 Models 65 and 40.

Installation is expected to take



Russell Clark checks student ID prints on the color processing machine.

—Photos by Bob Lyon

Tons and Tons of Paper

Graphic Arts Answers Many Needs

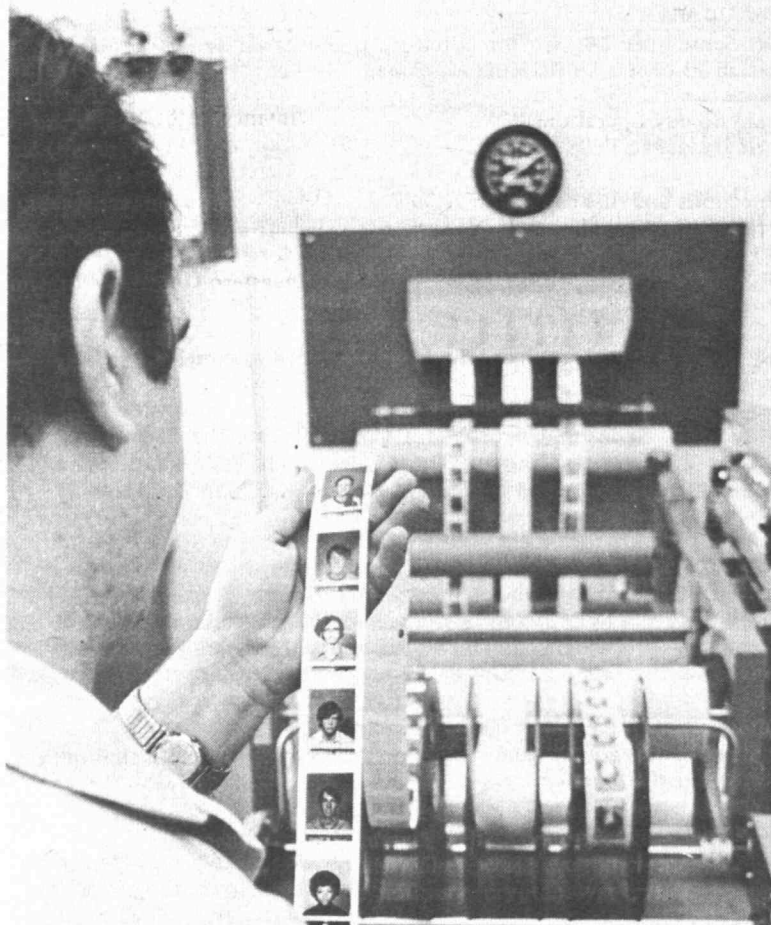
To a passer-by the castle-like building at 211 Massachusetts Avenue looks quiet and serene. If he should venture inside, however, he would hear the whir of machines, the click of camera shutters and the scuffle of busy people. These are the sounds of MIT's Graphic Arts Service in operation.

Founded in 1926, Graphic Arts (GA) provides a number of specialized services for the community. GA's main sections—offset printing, illustration, photography and mailing—handle most of the Institute's graphic arts needs.

The offset printing section, located on the first floor, reproduces Institute brochures, pamphlets, posters, class notes, lab reports and theses. The shop is equipped with three models of printing presses—web, Multilith and Heidelberg.

Two processes, photo direct and offset, are used for most printing orders. Photo direct is faster and less expensive than offset printing because it only involves two steps from the typewriter to the final printed material—the original copy is placed directly in a machine which produces a positive photographic litho plate; the plate is then mounted on a press and actual printing begins.

Offset, on the other hand, is quite involved, but it produces better quality printing than photo direct. It is also more expensive, except when a very large number of prints is desired. First a photographic negative is made from the original copy. Using an arc-lamp vacuum frame, the negative image is then transferred to a thin metallic plate. A chemical developing process is used to bring out a positive image on the plate. Finally,



Joseph Sheff operates the copy camera.

ly, the plate is put on a press and printing gets underway.

In addition to printing, the offset section offers a complete bindery service. Several different types of paperback bookbinding can be done in the shop, including side wire and saddle wire stitching, GBC plastic binding and perfect binding. After a book or journal is printed, the pages are automatically collated and folded, the cover is attached, and ragged edges are chopped off in a giant guillotine.

Photographic work is done in studios and darkrooms on the second floor. Professional photographers are available for location work, on and off campus. The staff also takes passport pictures and formal portraits, in black and white or color. The photography section has equipment for reproducing slides and transparencies

from either an original positive or a negative. Prints, enlargements, photomurals (like the large aerial views of MIT hanging on office and corridor walls), and photographic copies are included among the photographic services. Inanimate objects, such as scale models and architectural or naval designs, are photographed in the illustration studio.

A large task confronts Graphic Arts each fall when the freshman class arrives on campus—each new student must have an ID picture taken. After every freshman's picture has been shot, each picture is reproduced 80 times and kept on file for use with roll cards and student records.

The illustration section is also found on the second floor. Artists and draftsmen use their skills in preparing posters, patent drawings, schematic diagrams, graphs,

charts, book jackets and covers. Besides creative design, they also offer photo-typesetting services, including the use of a Photo-Typositor which can print 2,800 variations of any one type font.

The basement of the Graphic Arts Building houses the mailing service. In the catacomb-like surroundings, the staff handles tons of mail every week. The shop is equipped for labelling and addressing, sealing and stamping envelopes for deposit at the US Post Office. A special machine can automatically insert pre-folded material into envelopes, but some jobs, such as mailing thousands of MIT Catalogs, require manual stuffing. Bulk mail also maintains mailing lists for several Institute offices, including a list of the complete MIT staff.

Graphic Arts offers other services, too. Operating from the Shipping Room at 211 Massachusetts Avenue, three messengers pickup and deliver material from all around the Institute. Two satellite Quick Copy Centers are maintained for small-quantity Xerox copying, one in Room 3-003 and the other in Room E52-442.

All in all, Graphics Arts is a very busy place. In an average year 22 million sheets of paper are used in the offset section and 900,000 bound units are produced. The photography department turns out 100,000 glossy prints and 50,000 slides per year. The Quick Copy Centers produce a total of 11 million Xerox copies. The three GA delivery trucks annually travel about 15,000 miles and one messenger estimates that he walks 17 miles a day.

Edward West, Graphic Arts representative, stresses, "One of our most important functions is giving advice. People come to us and ask how to do something, where to get it done, and how much it will cost. We try to offer suggestions and help them decide how to handle the job. If we can't fulfill a customer's request, we can usually refer him to a commercial firm in the area." Mr. West is available to discuss graphic arts problems with anyone at the Institute. He encourages members of the community to call him at Ext. 4765.

Eleven Community Fellows Begin Year of MIT Studies

Eleven persons with broad experience in problems faced by inner-city minority groups have begun a year's study here as the Institute's first Community Fellows.

The Community Fellows Program was established last spring as a means of encouraging minority leadership in urban centers. The program is mainly centered around independent study which will prepare each individual to meet technical, social and economic problems he encounters in his own locality.

As part of his or her application, each fellow submitted a project idea he or she proposed to develop during the year at MIT. "These project proposals are the heart of the program," said Dr. Frank S. Jones, Ford Professor of Urban Affairs in Civil Engineering and Director of the program. "The ideas include a diversity of subjects such as housing rehabilitation in an economically mixed community, minority entrepreneurship, the potential for a CATV information service in a minority community, alternative educational models, a community arbitration mechanism and decentralized government."

"The development of these proposals throughout the year will bring the Fellows into close asso-

ciation with faculty members and researchers in those specific areas. In addition, Fellows can attend courses or parts of courses they think will be helpful," Mr. Jones continued. Weekly seminars will examine both the broad field of community development issues and strategies and the progress of the Fellows' individual proposals.

"The Fellows are all activists with long experience in their own communities," Mr. Jones explained. "They bring an intense awareness of specific problems of minority groups which we hope will contribute to a better understanding by the faculty and students here."

"We look upon the program as being a sort of sabbatical year," he said. "The Fellows are all disengaged from their home projects, and this gives them an opportunity to pause and reflect—and to consider underlying issues which may have gotten lost during day-to-day operations."

Six of the Fellows are from the Boston area. Two come from Minneapolis and one each from Atlanta, San Antonio and Newark. Three are women. One other was admitted this year but is unable to come because the local projects in which he is involved is presently at an important turning point.

The 1971-72 Community Fellows are:

Benjamin Brown, Atlanta, State Representative in the Georgia General Assembly.

Mrs. Eva C. Curry, Dorchester, Executive Director of the Tenants Association of Boston.

John E. Doyle, Minneapolis, Director of the Minneapolis Urban League Street Academy.

Mrs. Marcella A. Hubbard, San Antonio, Organizer and consultant to the Concerned Tenants Union.

Oscar Jackson, Boston, Engineer/Producer at radio station WBUR, Boston.

Hubert E. Jones, Newton, Executive Director of the Roxbury Multi-Service Center.

Mrs. Ruth E. McClain, Newark, Community Relations Specialist for the Greater Newark Urban Coalition, Inc.

Byron D. Rushing, Boston, Liaison Officer for Black State Representatives.

William Smith, Minneapolis, Director of the Community Relations Pilot City Health Center.

Charles H. Turner, Boston, Director of the Afro-Institute, Northeastern University.

Alberto Villodas, Jamaica Plain, Assistant Supervisor and Spanish Coordinator, Model Neighborhood Board.

The Community Fellows Program operates within the Department of Urban Studies and Planning, but is interdisciplinary in nature. It was developed by Professor Lloyd Rodwin, head of the department, in response to the initiative of Melvin H. King, former executive director of the New Urban League of Boston. Mr. King is now associate director of the program. Support for the program comes from the Rockefeller Foundation and the Permanent Charity Fund of Boston.

Improved Math Skills Shown by Freshmen

Members of the Class of 1975 are noticeably ahead of their predecessors in mathematical skills.

"More than half the class, or nearly 600, will complete the Institute's math requirement (18.01 and 18.02) during the first term," said Dr. Robert A. Alberty, Dean of the School of Science. "More students qualified for advanced placement in 18.02 and more students elected 18.01C which provides the opportunity to start 18.02 in the seventh week of the term."

Some 260 students enrolled directly in 18.02, while 324 are taking the six-week version of 18.01, before proceeding with 18.02. In addition, 124 freshmen elected 18.001, a calculus subject which emphasizes topics of importance in applied math, science and technology.

In another reflection of the superior math background, enrollment in introductory physics subject 8.012 has jumped from 149 freshmen last year to 256 this year. This subject is offered for freshmen with a good knowledge of calculus.

Two subjects which fulfill the Institute's chemistry requirement attracted oversize classes this fall. "Because of large increases in 5.41 (Introduction to Structure, Bonding and Mechanism) and 7.01 (General Biology)," Dean Alberty said, "the decision was made to

offer them both terms in 1971-72. Although that was done, there was another large increase this fall." Freshman enrollment in 5.41 has grown from 355 last fall to 482 this term, while 7.01 freshman enrollment has almost tripled, from 28 to 78.

Samuelson 'Back' at MIT after Typographical Exodus

An omitted line in last week's *Institute Calendar* led many readers to worry that Professor Paul Samuelson had left MIT to become the Sterling Professor of Economics at Yale.

"I've had many honors in my life, but the Sterling Professorship isn't one of them. Being an Institute Professor and the Sterling Professor simultaneously would be moonlighting with a vengeance," Professor Samuelson said.

Professor James Tobin, who is the Sterling Professor at Yale, will participate with Professors Samuelson and Franco Modigliani and Dr. Guido Carli, Governor of the Bank of Italy, in a panel discussion, 'The Future of the International Payments System,' on Friday, at 2:30pm in Room 54-100.



Dr. Paul Samuelson



Professor Frank Jones, center, talks with Richard Prather, '72, left, and Thomas Welch, G, at a reception introducing the Community Fellows to members of the Department of Urban Studies and Planning.

—Photo by Alfred Anderson, '71

Staff Changes Made in Financial Offices

To meet the present and anticipated future demands in the financial administration areas of the Institute, a realignment of the functions, operations, and staff responsibilities in the areas of financial management systems, accounting, and fiscal planning and budgets has been established.

In announcing the new organizational structures, Mr. Paul V. Cusick, Vice President for Business and Fiscal Relations, and Mr. Stuart H. Cowen, Comptroller, noted that the changes have been initiated to provide better coordination within this area and to establish a more centralized unit with which to interact with the community and to meet its needs for service. In addition, this restructuring will assist the interaction between the financial and business operations and the newly created Office of Administrative Information Systems.

Mr. Philip J. Keohan has been appointed Associate Comptroller. He formerly served as an Assistant Comptroller. Mr. Keohan, in addition to continuing as the Institute's senior accounting officer, will have the operational responsibility for the Office of the Bursar, the Benefits Accounting Office, the Investment Accounting operation, and the functions formerly provided by the Division of Sponsored Research Fiscal Section.

In order to strengthen further this realignment of the financial operations, Mr. William J. Duggan, formerly Manager of the Comptroller's Data Processing Office, has been appointed Assistant Comptroller and will report directly to Mr. Keohan.

Mr. John A. Little, Associate Comptroller, will direct the continuing development of financial management systems and will act as a liaison with both the federal government and with a group of technically oriented colleges and universities in development management systems standards. Mr. Little will, in addition, provide overall direction of the Institute's internal audits, and will provide staff support to the Office of the Vice President and Treasurer in areas of special financial reporting and studies. He will also assist the Vice President for Business and Fiscal Relations in the Institute's involvement with the National Center for Higher Education Management Systems at the Western Interstate Commission on Higher Education (WICHE).

In addition, the fiscal planning operations of the Institute have been consolidated with those of the budget. Mr. Frank R. Stevens has been appointed Director of Fiscal Planning and Budgeting and will head these areas. He formerly served as Deputy Director of the Division of Sponsored Research and Director of Fiscal Planning.

Mr. William E. Kelley, Assistant Comptroller, will coordinate the budget operations of the section and will continue to provide the liaison for budget interaction for accounting operations with the office of the Associate Comptroller.

Mr. Joseph M. Patten, formerly Associate Director of Teaching Programs at the Sloan School of Management, has been appointed Associate Director of Fiscal Planning and will coordinate the fiscal planning operations of the section.

**INAUGURAL
EVENTS**

**MASSACHUSETTS
INSTITUTE
OF TECHNOLOGY**

**SEPTEMBER 27
THROUGH
OCTOBER 7, 1971**

TECH TALK SPECIAL

September 24, 1971

MONDAY, SEPTEMBER 27

9:00am **Inaugural Exhibits**
Committee on the Inaugural Events.

Bldg. 14 Corridor *Retrospect: MIT 1861-1916*

Bldg. 7 Corridor *Visual Design Experiments by Science and Engineering Students*

Bldg. 3 Corridor *Women at MIT*

Exhibits
Department of Ocean Engineering.
Bldg. 5 Lobby *Summer Laboratory Projects*

3:00pm 9-150 **Panel Discussion: Political and Social Control of Technology**
Committee on the Inaugural Events. Chairman: Prof. E. B. Skolnikoff, Political Science. Panelists: Prof. M. S. Baram, Civil Engineering; Hon. Emilio Q. Daddario, Political Science; Dr. J. Herbert Hollomon, Consultant to the Provost and the President; Prof. Paul W. MacAvoy, Sloan School of Management; Prof. G. W. Rathjens, Political Science; Prof. J. P. Ruina, Electrical Engineering; Prof. L. D. Smullin, Electrical Engineering; Prof. W. Wertz, Humanities.

6:15pm MIT Faculty Club **Alumni Advisory Council Dinner ***
MIT Alumni Association. Speaker: Dr. Jerome B. Wiesner.

8:00pm 9-150 **Films on Urban Living, Its Problems, Solutions, Etc. Part I: Views of the Past**
Department of Urban Studies and Planning.

Eugene Atget
A short montage of pictures by the famous photographer of Paris.

City: Heaven and Hell
First film in the Lewis Mumford series, highlights his views on urban history.

Follies of the Town
Satirical view of 18th century London.

TUESDAY, SEPTEMBER 28

10:00am Hayden Gallery **Exhibit: Contemporary Views of Man**
MIT Committee on the Visual Arts.

2:00pm 9-150 **Panel Discussion: Engineering in Medicine**
Committee on the Inaugural Events. Chairman: Prof. L. R. Young, Aeronautics and Astronautics. Panelist: Prof. Roger G. Mark, Electrical Engineering; Prof. E. W. Merrill, Chemical Engineering.

3:00pm 2-190 **Panel Discussion: International Programs at MIT--Part I: Current Programs**
Committee on the Inaugural Events. Chairman: Prof. George W. Rathjens, Political Science. Panelists: Prof. Everett E. Hagen, Economics and Political Science; Prof. Lloyd Rodwin, Urban Studies and Planning; Prof. Frederick McGarry, Civil Engineering; Prof. Thomas J. Allen, Sloan School of Management.

3:00pm 6-120 **MIT in the Flicks--Part I**
Education Research Center.

Fourier Series Demonstration
Prof. William Siebert, Center for Advanced Engineering Studies. 15 minutes.

Introduction to Gaussian Random Processes
Prof. Harry Van Trees, Center for Advanced Engineering Studies. 15 minutes.

(The following produced by EDC-MIT Cooperation)

The Snails are Where the Bubbles Are
An Elementary Science Study Film. 40 minutes.

A Marine Slime Mold, 'Labyrinthula'
David Porter, Developmental Biology Film Program. 8 minutes.

Low Reynolds Number Flows
Sir Geoffrey Taylor, Fluid Mechanics Program, MIT-EDC. 33 minutes.

Peano Curve
Nelson Max, Topology Film Program, EDC.

Relativistic Ride
Dr. Edwin F. Taylor, College Physics Experimental Film Program. 4 minutes.

Forces
Prof. J. R. Zacharias, PSSC. 30 minutes.

4:00pm 3-370 **Colloquium: The TICS System: Writing and Using Computerized Tutorials**
Department of Metallurgy and Materials Science. Prof. Roy Kaplow, Metallurgy and Materials Science. (Demonstration of system will be held 12:00noon-4:00pm in Rooms 13-5118 and 13-5153.)

7:30pm 6-120 **MIT in the Flicks--Part II**
Education Research Center.

Fight for Life (Netsilik Eskimo)
Dr. Asen Balikci, National Film Board of Canada. 51 minutes.

Contemporary Eskimo Life
Dr. Asen Balikci, National Film Board of Canada. 10 minutes.
A question and answer period will be held following the showing of these films.

8:00pm 9-150 **Films on Urban Living, Its Problems, Solutions, Etc. Part II: Views of the Present**
Department of Urban Studies and Planning.

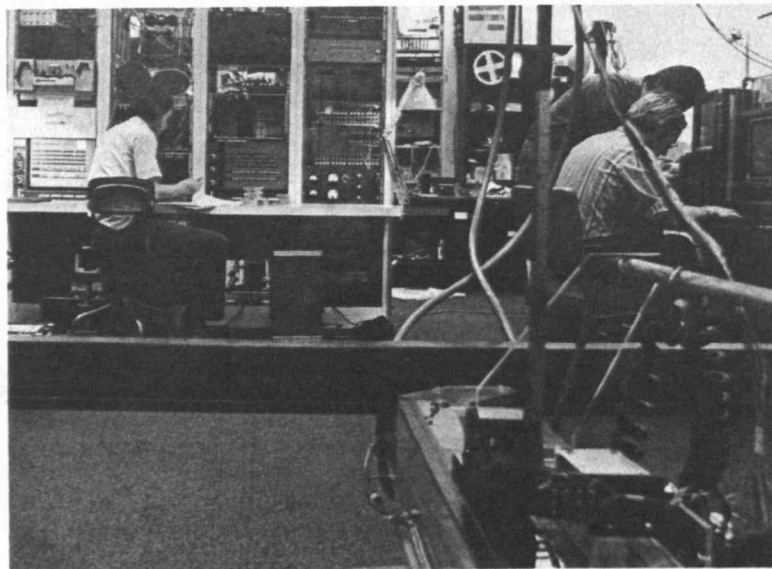
Child's View of the City
Film made by 5-9 year olds.

The Home of Mrs. Graham
Discussion in the living room of a poor black woman.

No Reason to Stay
Two black teenagers discuss why they are quitting school.

The Haight
Depiction of San Francisco district by Edward Pincus

Black Natchez
Edward Pincus film about civil rights work in Mississippi.



Students using the Architecture Machine, a computing facility in the School of Architecture and Planning used for experiments in computer-aided design, artificial intelligence and techniques in man-machine interaction. The students are participating in the Undergraduate Research Opportunities Program (UROP), of the Education Research Center. (See ERC listings on September 28, 29 and 30, and October 4 and 5.)

WEDNESDAY, SEPTEMBER 29

3:00pm 6-120 **MIT in the Flicks--Part III**
Education Research Center.

The Edge of the Earth
John B. H. ...

Queen of the Desert
Prof. R. L. ...

Presentations of the new Sam F. ...
Prof. R. L. ...

The Bose-Davies
Advanced ...
minutes.

Pinola
Prof. E. ...

Campfire
Christie, M. ...

Selecting E. ...
Introductio...

Kynsinger
Linkages ...
Prof. R. Kau...

4:00pm NW12-222 **Colloquium: Political and Social Control of Technology**
Department of Urban Studies and Planning.

8:00pm 9-150 **Films on Urban Living, Its Problems, Solutions, Etc. Part III: Views of the Future**
Department of Urban Studies and Planning.

The City
Shown 193...
help of Eric...

Booms
Animated cities.

Cities of the Future
Late 60s...
TV.

Urbanism
Humor and...
lization.

THURSDAY, SEPTEMBER 30

9:30am Bush Room (10-105) **Discussion: Boondoggle**
Experimental ...
George Ph...
Faculty.

2:00pm 9-150 **Panel Discussion: Co-Existence**
Committee on the Inaugural Events.
Prof. R. L. ...
Panelist: G...
of Man; F...
School an...
Saltzer, ...
Winograd...
H. Wins...ect.

2:00pm Bush Room (10-105) **Colloquium: Boondoggle**
Education Research Center.

3:00pm 6-120 **Colloquium: Man-Machine Interaction**
Department of Urban Studies and Planning.
of the ...
making ...
and p...
Ocean ...

inks--Part III
 Research Center.

MIT Goes to Mexico
 MIT. 35 minutes.

Leacock, MIT. 10 minutes.

the Development of a Synchro-
 Sam Film System
 Leacock, MIT. 30 minutes.

Department
 Making Course, MIT. 10
 minutes.

Encus, MIT. 22 minutes.

stins, MIT. 20 minutes.

Exercises
 Course, MIT. 15 minutes.

Computer Aided Solutions to Complex
 Problems
 Kaufman, MIT. 30 minutes.

Experiences in Providing Tech-
 nomic Inputs to Environmental
 Problems
 Nuclear Engineering. Joseph P.
 Graduate Student, Nuclear Engi-
 neering. 3:00pm in Room NW12-222.

on Living, Its Problems, Solutions,
 Changing Conceptions of Urban
 Planning
 Urban Studies and Planning.

1939 World's Fair, made with the
 of American Institute of Planners.

about development of US

Limits
 60m crisis documentary made for

documentary on modern urban civi-
 lization.

Experimental Education: Boon or
 Hindrance
 Studies Group. Chairman: Prof.
 Physics. Panelists: Students and
 faculty.

Can People and Computers
 Inaugural Events. Chairman:
 R. Fano, Electrical Engineering.
 George A. Gorry, Sloan School
 of Management; Prof. Jerome H.
 Electrical Engineering; Prof. Terry A.
 Electrical Engineering; Prof. Patrick
 Electrical Engineering.

Laboratory Based Mathematics
 Research Center.

Man and the Oceans
 Ocean Engineering. An appraisal
 of the challenges and the challenges for
 the future. Moderator: Prof. Ira Dyer,
 Electrical Engineering.

3:00pm 4-370 **Colloquium: New Directions in Electrical Engineering Research--Part I**
 Department of Electrical Engineering. Chairman: Prof. Louis D. Smullin, Electrical Engineering. Panelists: Prof. F. C. Schweppe, Electrical Engineering; Prof. R. D. Thornton, Electrical Engineering; Prof. G. L. Wilson, Electrical Engineering; Kenneth Sachar, Graduate Student, Electrical Engineering.

3:00pm 4th Floor 545 Tech Sq. **Lecture and Demonstration: Project PEPR**
 Laboratory for Nuclear Science. Prof. Irwin A. Pless, Physics.

4:30pm 26-100 **Colloquium: What the Cicada Sang**
 Department of Physics. A public discussion on the teaching of physics. Prof. Philip Morrison, Physics. Tea, 4:00pm in Room 26-110.

8:00pm 9-150 **Films on Urban Living, Its Problems, Solutions, Etc. Part IV: Urban Renewal**
 Department of Urban Studies and Planning.

Goodnight Socrates
 Destruction by renewal of a Greek neighborhood in Chicago.

The Worcester Film
 Survey of a renewal program, featuring interviews with proponents and critics.

What is the City but the People?
 Made for the New York City Planning Commission to publicize their new Master Plan.

The Case Against Lincoln Center
 Movie by Newsreel criticizing demolition of working class neighborhood to build Lincoln Center.

FRIDAY, OCTOBER 1

9:00am Bldg. E52 Lobby **MIT Press Exhibit**
 Committee on the Inaugural Events.

9:00am-5:00pm Bldg. W11 **Exhibit and Visual Presentation: Artistic Potential for the Charles River Center for Advanced Visual Studies.**

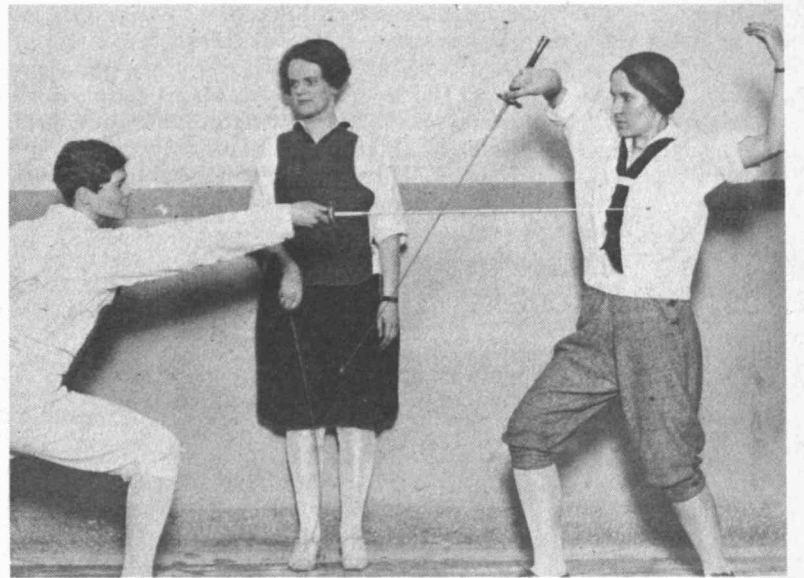
2:00pm 9-150 **Panel Discussion: Future Modes of Transportation**
 Committee on the Inaugural Events. Chairman: Prof. C. L. Miller, Urban Systems Laboratory. Panelists: Prof. Alan A. Altshuler, Political Science, Secretary of Transportation and Construction, Commonwealth of Massachusetts; Prof. Herbert Richardson, Mechanical Engineering, Chief Scientist, US Department of Transportation; Mr. Melvin King, Urban Studies and Planning, Associate Director, MIT Community Fellows Program; Prof. A. Scheffer Lang, Civil Engineering.

2:30pm 2-190 **Panel Discussion: International Programs at MIT Part II: Future Programs**
 Committee on the Inaugural Events. Chairman: Prof. Everett E. Hagen, Center for International Studies. Panelists: Prof. Peter Eagleson, Civil Engineering; Prof. Ithiel de Sola Pool, Political Science; Dean William F. Pounds, Sloan School of Management.

3:00pm 4-370 **Colloquium: New Directions in Electrical Engineering Research--Part II**
 Department of Electrical Engineering. Chairman: Prof. Wilbur B. Davenport, Electrical Engineering. Panelists: Prof. I. T. Young, Electrical Engineering; Prof. Joel Moses, Electrical Engineering; Prof. S. K. Burns, Electrical Engineering; Prof. D. H. Staelin, Electrical Engineering.

5:00pm-6:30pm Great Court **Community Reception**
 Committee on the Inaugural Events. (DuPont Center in case of rain.)

8:00pm 9-150 **Films on Urban Living, Its Problems, Solutions, Etc. Part V: Community Organization and Protest**
 Department of Urban Studies and Planning.



Coeds, circa 1920, in a fencing class. This picture is included in an exhibit showing the history of women students at MIT in the Building 3 corridor.

Saul Alinsky Goes to War
 Review of Alinsky's work in black ghettos.

Troublemakers
 1965 community organization effort in Newark.

People's Park
 The Berkeley confrontation.

8:30pm Kresge Little Theatre **One Act Plays: All at Sea** by Slawomir Mrozek, and *The Sand Castle* by Lanford Wilson. MIT Dramashop.

SATURDAY, OCTOBER 2

2:00pm Kresge Little Theatre **Concert: Folk Songs--Blues and Original Compositions for Guitar and Voice**
 Department of Humanities. Carolyn and John.

8:30pm Kresge Little Theatre **One Act Plays: All at Sea** by Slawomir Mrozek, and *The Sand Castle* by Lanford Wilson. MIT Dramashop.

MONDAY, OCTOBER 4

9:00am-5:00pm Bldg. W11 **Exhibit and Visual Presentation: Artistic Potential for the Charles River Center for Advanced Visual Studies.**

1:00pm 9-150 **Colloquium: New Frontiers in Urban and Environmental Policy**
 School of Architecture and Planning. Chairman: Dean William L. Porter.

2:00pm-4:00pm Bldg. NW14 **Lecture, Tour and Demonstration**
 Francis Bitter National Magnet Laboratory.

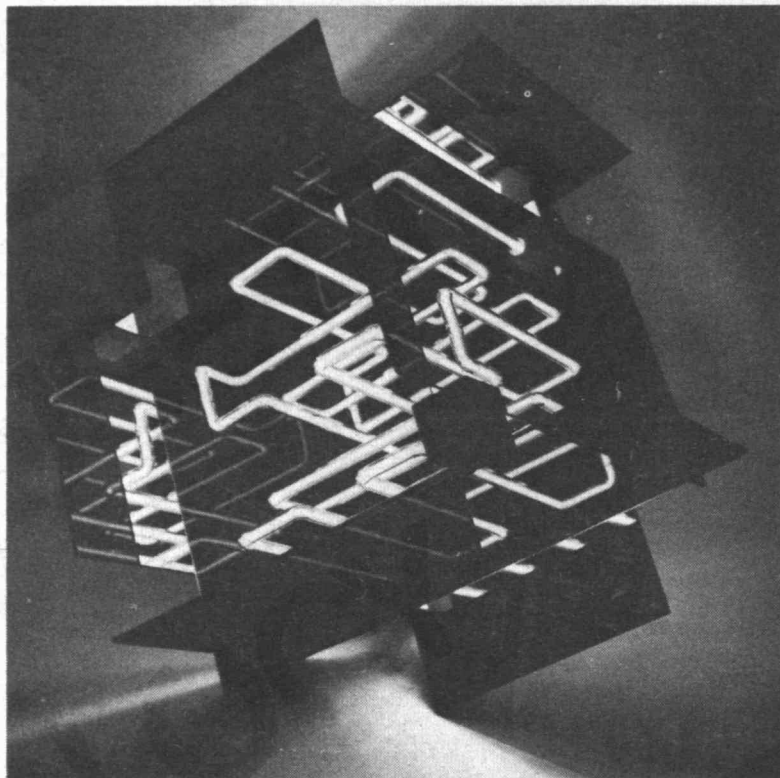
2:30pm Bush Room (10-105) **Colloquium: The Evaluation Problem**
 Education Research Center.

3:00pm 10-250 **Panel Discussion: Manpower**
 Committee on the Inaugural Events. Chairman: Dean R. A. Albery, School of Science. Panelists: Dr. J. Herbert Hollomon, Consultant to the Provost and President; Prof. Charles A. Meyers, Sloan School of Management; others to be announced.

3:00pm 48-316 **Seminar: The Water Environment and Human Needs**
 Department of Civil Engineering. Prof. Arthur T. Ippen, Institute Professor.

5:00pm Music Library **Chamber Concert: Three Sonatas by Paul Hindemith (1895-1962)**
 Department of Humanities. Performers: Sonia Guterman, G, flute; William Moran, '72, bassoon; Robert Hazen, '71, trumpet; Prof. Robert Freeman, Humanities, piano.

8:00pm 9-150 **Panel Discussion: Education, Values and the Qualities of Life: A Look Ahead**
Committee on the Inaugural Events. Chairman: **Prof. Hartley Rogers, Jr.**, Mathematics. Panelists: **Prof. Brooke Hindel**, Humanities; **Prof. Kenneth M. Hoffman**, Mathematics; **Prof. Carl Oglesby**, Humanities; **Prof. Judith Wechsler**, Architecture; others to be announced.



A picture of one of the student design projects featured in the exhibit "Visual Design Experiments by Science and Engineering Students," in the Building 7 Corridor.
--Photo by Nishan Bichajian

TUESDAY, OCTOBER 5

9:00am-5:00pm Bldg. W11 **Exhibit and Visual Presentation: Artistic Potential for the Charles River Center for Advanced Visual Studies.**

12:10pm Bldg. 7 Lobby **Concert: Fanfares, Sonatas, Tunes and Airs by Reiche, Pezel, Purcell, Gabrieli and Brade** by the Cambridge Symphonic Brass Ensemble. Department of Humanities. Performers: **Robert Hazen**, '71, trumpet; **Neil Tornberg**, '69, trumpet; **Barbara Schwarze**, '72, trombone; **David Ludwig**, G, trombone; **Daniel Witschey**, '72, tuba.

1:00pm 9-150 **Colloquium: Undergraduate Research Opportunities Program**
Education Research Center. **Prof. Margaret L. A. MacVicar**, Physics.

2:00pm 26-100 **Panel Discussion: MIT and the Future: A Black Perspective**
Committee on the Inaugural Events. Chairman: **Mr. Gregory Chisholm**, '73. Panelists: **Dr. James J. Bishop**, Office of the Dean for Student Affairs; **Miss Shirley A. Jackson**, graduate student; **Mr. Michael V. Sawyer**, MIT Corporation; **Prof. James H. Williams, Jr.**, Mechanical Engineering; **Prof. James E. Young**, Physics.

2:30pm 10-250 **Panel Discussion: Energy for the Future**
Committee on the Inaugural Events. Chairman: **Prof. Edward A. Mason**, Nuclear Engineering. Panelists: **Prof. Morris A. Adelman**, Economics; **Prof. Jack B. Howard**, Chemical Engineering; **Prof. Lawrence M. Lidsky**, Nuclear Engineering; **Prof. Paul W. MacAvoy**, Sloan School of Management; **Prof. David Marks**, Civil Engineering; **Prof. David C. White**, Electrical Engineering.

5:00pm Music Library **Chamber Concert: Woodwind Concert of Works by Dowland, Mozart and Shostakovich** by No Dogs Allowed
Department of Humanities. Performers: **Raymond Jackendorff**, '68, clarinet; **Steven Umans**, G, clarinet; **Thomas Stephenson**, '71, bassoon.

5:15pm Kresge Little Theatre **Lecture and Demonstration: A New Fundamental Science?**
Technology and Culture Seminar Committee. Chairman: **Dr. J. Herbert Hollomon**, Consultant to the Provost and President. Lecturer: **Dr. Jean Wren-Lewis**, Imperial Chemical House, London. Response: **Prof. Philip Morrison**, Physics; **Prof. Walle J. Nauta**, Psychology.

8:30pm Kresge Auditorium **Performance: The Dance Company of the National Center of Afro-American Artists** **
Committee on the Inaugural Events.

4:00pm NW12-222 **Colloquium: Personal Observations of an American Scientist in the Soviet Controlled Thermo-nuclear Program**
Department of Nuclear Engineering. Speaker: **Prof. R. A. Blanken**, Nuclear Engineering. Coffee served at 3:30pm.

8:30pm Kresge Auditorium **Inaugural Concert ****
Committee on the Inaugural Events. Performers: MIT Symphony Orchestra; MIT Chorale Society; MIT Glee Club; other invited guests.

THURSDAY, OCTOBER 7

10:00am Kresge Auditorium **Panel Discussion: Directions in Research at MIT in the 1970's**
Committee on the Inaugural Events. Chairman: **Dr. Walter A. Rosenblith**, Provost.

2:00pm Kresge Auditorium **Panel Discussion: Directions in Education at MIT in the 1970's**
Committee on the Inaugural Events. Chairman: **Dr. Paul E. Gray**, Chancellor. Panelists: **Prof. Hartley Rogers, Jr.**, Mathematics; **Prof. Margaret L. A. MacVicar**, Physics; **Prof. Travis R. Merritt**, Humanities; **Prof. Franco Modigliani**, Sloan School of Management; **Prof. James E. Young**, Physics.

4:30pm Rockwell Cage **Inaugural Ceremony ****
Committee on the Inaugural Events. Presiding: **Dr. Howard W. Johnson**, Chairman of the MIT Corporation. Remarks: **Dr. James R. Killian, Jr.**, Honorary Chairman of the MIT Corporation. Address: **Dr. Jerome B. Wiesner**, President.

WEDNESDAY, OCTOBER 6

2:00pm 9-150 **Panel Discussion: New Directions in MIT Undergraduate Education: Recommendations of the Special Task Force on Education**
Committee on the Inaugural Events. Chairman: **Prof. William T. Martin**, Mathematics. PANELIS Members of the Task Force and others.

3:00pm 1-390 **Seminar: Problems of the Construction Industry--Career Opportunities**
Department of Civil Engineering. **Prof. William A. Litle**, Civil Engineering.

3:00pm 4-370 **Colloquium: The Ghetto as a System**
The Community Fellows Program.
Dr. Kenneth Clark, Institute Lecturer.

* Tickets (\$4.25/person) must be reserved in advance through the MIT Alumni Association, Room E19-439, Ext. 4875.

** Free tickets to these events will be available to the MIT community beginning on September 30 in the Bldg. 7 Lobby at 10:00am. MIT identification will be required. Maximum for each event will be two tickets per person.