

## Dr. Williams Named Special Assistant, Minority Affairs



Dr. Clarence G. Williams

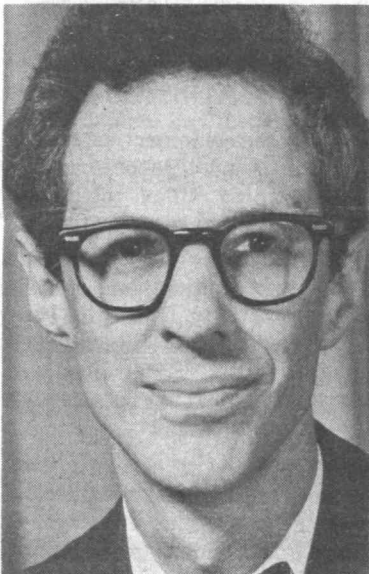
Dr. Clarence G. Williams, assistant dean of the Graduate School, has been appointed Special Assistant to the President and the Chancellor for Minority Affairs, Chancellor Paul E. Gray has announced.

Dr. Williams will work in a staff capacity assisting the Institute's senior officers on all matters relating to minorities, including recruitment of minority faculty, students, staff and employees and advocacy of the interests of minority members of the community.

He will be the MIT representative and spokesman to minority communities outside MIT. Within the Institute, he will be a point of

(Continued on page 12)

## Corbato, Penfield Appointed EE Dept. Associate Heads



Professor Corbato

Professor Fernando J. Corbato and Professor Paul Penfield Jr. have been appointed associate heads of the MIT Department of Electrical Engineering—the Institute's largest department—effective Feb. 1.

Professor Corbato, a computer specialist who has received wide recognition for pioneering work on the design and development of multiple-access computer systems, will become associate head for computer science and engineering.

Professor Penfield, who will be associate head for electrical science and engineering, is well known for his work in the application of solid state devices to microwaves, conservation theorems for physical systems, electrodynamics of continuous media, noise theory and thermodynamics of nonlinear systems, and computer-aided network analysis and design.

Announcement of the appointments was made by Dr. Alfred H. Keil, Dean of the School of Engineering, and by Professor Wilbur B. Davenport, Jr., who will become head of the Department of Electrical Engineering Feb. 1.

Professor Corbato will replace Professor Robert M. Fano, Ford Professor of Engineering and Professor of Electrical Communications, who will return to teaching and research after 11 years in administrative work. Professor Fano organized MIT's Project MAC, a center for advanced computer re-

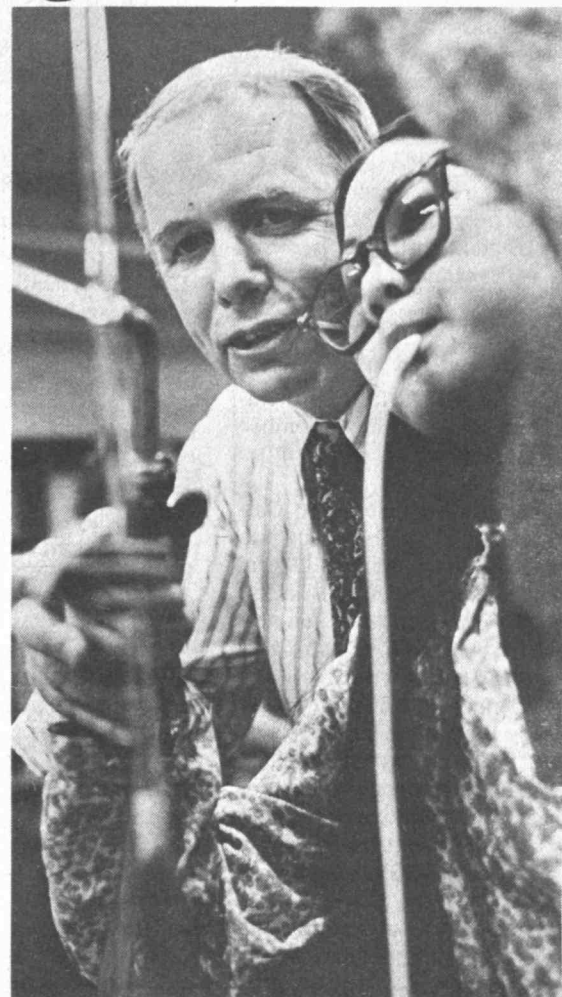
(Continued on page 12)



Professor Penfield



RECORDER PLAYING and glass blowing are among the smorgasbord of activities spread out for students during the Independent Activities Period, which began Monday and continues through Jan. 30. In the recorder group, from the left, are Stephen C. Nuding (partly shown) of Princeton Junction, N.J., and Jeffrey M. King of Allston, both seniors, and Dana L. Roberts of Norwalk, Conn., a 1973 graduate who is a staff member with the Experimental Studies Group. The activity, which brings together recorder players of all levels, was arranged by David D. Dreyfuss, a sophomore from Akron, O. In the glass blowing class, Christine A. Wang, a freshman from



North Scituate, R.I., is assisted by instructor Lawrence W. Ryan, Jr., a research staff member with the Department of Physics. The IAP Guide this year has 508 listings (not counting cross references), an 11 percent increase over a year ago. Some of the activities are offered through departments, centers and laboratories, while others are arranged independently. Dormitory and dining service counts in previous years indicate that about three-quarters of the students are on campus for IAP and that close to 90 percent of the scheduled activities take place, along with a few that have not been arranged beforehand.

—Photos by Margo Foote

## Athans Appointed Director Of Electronic Systems Lab

Professor Michael Athans, a leading authority in optimal control theory, has been named director of the Electronic Systems Laboratory (ESL) of the MIT Department of Electrical Engineering.

Professor Athans succeeds Professor J. Francis Reintjes, director since 1953, who will continue his work on large-scale information systems.

The appointment, effective Jan. 1, was announced jointly by Professor Louis D. Smullin, present head of the Department of Elec-

trical Engineering, and by Professor Wilbur B. Davenport, who will succeed Professor Smullin as department head on Feb. 1.

Professor Athans is the third director in the 35-year history of the laboratory, which has been a world leader in development of control theory, control systems, and information systems.

Born in Drama, Greece, in 1937, Professor Athans received a bachelor's degree in electrical engineering in 1958, and MS and PhD degrees in 1959 and 1961, all

(Continued on page 12)



Professor Athans

## Fuel Saved is Fuel Earned

# Novel Foundation Grant Made to Help MIT Plan Energy Savings

The Union Pacific Foundation has made an unusual grant to MIT's Department of Physical Plant—on the theory that money saved through energy conservation is money earned.

Most of the grant will be used to pay the salary of a full-time environmental engineer—a post soon to be filled for the first time—who will direct the Institute's energy conservation program.

in that its purpose is to help MIT—and other universities—protect and add to their financial resources by finding ways of limiting steeply rising expenditures for energy.

Thomas E. Shepherd, Jr., MIT superintendent of utilities, explained the theory behind the grant this way:

"If we can hire an engineer who brings about a savings of \$800,000, then that's the same thing, in a

sense, as giving MIT \$800,000, adding to its endowment by that much."

"This is definitely something new and innovative," he said. "We intend to document what is accomplished at MIT and make it available to the wider community—to other colleges, universities, and interested institutions or industries."

Mr. Shepherd was among MIT officials who discussed the plan

with Arthur Z. Gray, president of the foundation, which has its headquarters in New York. Others involved in the negotiations included William R. Dickson, head of the Department of Physical Plant, and Philip A. Stoddard, vice president for operations.

Mr. Shepherd said that department officials are "zeroing in" on an environmental engineer and are now reading applications.

Officials in the department

believe that energy savings of 20 percent or more are possible through conservation measures that concentrate in such areas as lighting, temperature and fan systems.

Those projections, and the success of a pilot program last summer, led MIT to launch a search for a full-time environmental engineer to organize and direct an energy conservation

(Continued on page 8)



## Noted Pianist To Give Lecture

Pianist David Barnett will give an illustrated lecture, "Communication through Musical Performance—Illusion or Reality?," at 3pm, Monday, Jan. 14 at the MIT Music Library (Rm. 14E-109).

He has performed as a soloist with major orchestras, including the Boston Symphony Orchestra, the New York Philharmonic, and the orchestras of Cincinnati, St. Louis and Paris. He has taught at Wellesley, Harvard, the New England Conservatory of Music, as well as the University of Bridgeport where he is presently professor of music.

His book, *The Performance of Music*, published in 1972 seeks a synthesis between aspects of musical structure and their implications for performance.

The lecture, sponsored by the Music Section of the MIT Department of Humanities, is free and open to the public.

## Scientific American Includes MIT Authors

Articles by MIT faculty members are featured in December and January issues of *Scientific American*.

"Violent Tides Between Galaxies," in the December issue was written by Alar Toomre, MIT professor of applied mathematics, and his brother Juri Toomre, associate professor of astro-geophysics at the University of Colorado, formerly at MIT.

Also in the December issue was "Laser Spectroscopy" by Michael S. Feld, MIT associate professor of physics and V.S. Letokhov, vice director of the Institute of Spectroscopy of the USSR Academy of Sciences.

The January issue contains an article on "Energy Policy in the U.S." by David J. Rose, MIT professor of nuclear engineering.

## Fulmer Elected

Vincent A. Fulmer, secretary of the Institute, has been elected to the board of directors of the Carroll Rehabilitation Center for the Visually Impaired, a non-sectarian agency formerly known as the Catholic Guild for the Blind.

# Six Head for Africa With Drought Project



MODEL OF PRIMITIVE Dogon granary, constructed by students on MIT-owned land off Memorial Drive, is dwarfed by an example of modern architecture, the 24-story Tang Residence Hall.

Students from MIT will go to Mali in drought-stricken West Africa next week to demonstrate a water-storage technique worked out in a seminar and on an MIT back lot.

Key to the plan is modification of a traditional structure used by the Dogon—one of many tribes that make up the West African nation—to store grain. A granary—made of mud or clay—is traditionally eight feet around and 10 feet high.

The students, with their instructor, have devised a way to convert the Dogon granaries into water collection and storage tanks by installing ferro-cement liners along the sides and soil-cement bowls at the bottom. The liner is actually a thin layer of cement with chicken wire embedded in it.

The project was undertaken as part of a seminar on African architecture taught by Dr. Hans Guggenheim, an anthropologist, former MIT faculty member, and now a research affiliate in the Department of Architecture.

The class not only drew up plans for the modifications, but put their theories to the test by building a model of a Dogon granary on MIT-owned property behind Joyce Chen's restaurant on Memorial Dr. and installing a lining.

The students plan to build at least two similar models in Dogon villages to demonstrate the technique.

### No Visual Pollution

But Dr. Guggenheim said the trip to Mali by five students in his class, including a Harvard student, involves more than teaching the people to convert granaries:

"We also want the students to gain experience," he said, "in how to introduce a new technology under such circumstances, how to work with the people and how to learn from them."

Dr. Guggenheim also stressed the project was "not just a dry technical accomplishment."

"What we're trying to do," he said, "is introduce an invisible technology that does not do violence to the environment, keeping in mind that Dogon archi-

ture is world famous. We are simply modifying the inside of structures without creating any visual pollution."

### Channel From Roofs

"There is also an emotional aspect to this," he said. "Traditional Dogon belief holds that the granaries were brought to man by Nommo, the water spirit. In my discussions with Dogon elders on a recent trip, it was brought out that they do not fear the modification plan as a violation of their belief because it is related to water."

The water collection and storage system worked out in the class involves not only converting the granaries, but also collecting water on the clay rooftops of village buildings.

"The rooftops are flat and are used as work areas," Dr. Guggenheim said, "so they are equipped with a number of water spouts in order to have rain water run off quickly. Our plan is to close off most of these drains, collect the water and then channel it from the roofs into the converted granaries, which would be close by."

Dr. Guggenheim and the students plan to leave for Mali Thursday for three weeks. "Mali seminar will continue when they return, drawing on their experiences."

### Potential Benefits

The trip is being financed by a number of sources, including the Wunderman Foundation; MIT's Undergraduate Research Opportunities Program, and Dr. Guggenheim. Individual students have received grants from the Graham Scholars' Fund of the Department of Architecture. Lester Wunderman is a noted African art collector whose collection of Dogon art has been exhibited at

# Three Forums to Discuss Role of the Arts at MIT

A series of three open IAP forums on the arts, aimed at eliciting community viewpoints on the role of the arts in the curriculum and at MIT generally, will begin today at 2pm in the Music Library, Room 14E-109.

The forums are being sponsored by the Council for the Arts at MIT and will last approximately two hours. The second and third are also scheduled for Wednesday, January 16 and January 23, at 2pm in the Music Library.

The deans of the two schools in which most of MIT's art activities occur and the President's Special Assistant for the Arts will lead the discussion periods.

Professor Roy Lamson will moderate today's forum, while Dean William Porter of the School of Architecture and Planning will moderate the second, and Dean Harold Hanham of the School of Humanities and Social Science will lead the third.

## Faculty Club Being Renovated

The main dining room and the lounge outside the main dining room at the MIT Faculty Club are being renovated and refurnished during January.

Club manager John Cowden said work is scheduled to be completed by the first week in February. Meantime, he said, meals will be served in the small dining rooms. The bar will remain open and its operation will not be affected by the work.

Architect for the renovation is Joan Goody, of Marvin E. Goody, John M. Clancy and Associates, Inc. "The emphasis," she said, "is to create a variety of spaces that will provide intimacy."

During renovation, she said, a pathway from the elevator to the bar will be kept open so members may see what is happening.

The lounge floor will be carpeted in a copper colored rug. The area nearest the river will be raised so

that the window sills can become window seats, and window wells will be beveled outward to enhance the importance of the view to the room. Furniture will be upholstered club chairs and sofas.

The main dining room will have rust-colored carpeting, Ms. Goody said, with oak-top tables and chrome and naugahide chairs. A folding panel wall will close off one-third of the dining room when necessary and several free standing panels will be used to give a feeling of intimacy when the room is being used by private diners.

Lighting the dining room posed a challenge, Ms. Goody said. Oak horizontals in the ceiling will house downlighting for large gatherings, but there will be pendant and wall mounted lights for private dining.

The windows of the dining room will have wooden shutters, Ms. Goody said.

## GA's Quick Copy Center Expands

Graphic Arts Quick Copy Center in the basement of Bldg. 3 Rm. 3-003 is being expanded, according to James W. Coleman, director of Graphic Arts Service.

Major improvement will be installation of a new duplicating system with a 200-bin collator permitting 24-hour turn-around service on up to 200 copies, he said.

The updated equipment, he said, is expected to increase the volume in 3-003 from 9.7 million copies in 1973 to approximately 15 million copies in 1974.

Coleman said the new equipment should be in operation in early February when second term begins.

The new system, he said, will still be limited to black ink, one-side printing. "There are now machines that print on two sides," Coleman said, "but their reliability is not adequate for our needs. We expect, however, that reliable machines with on-line collating should be available before the end of 1974."

The rate schedule will remain the same.

## Mary Rowe to Speak

Dr. Mary Potter Rowe, Special Assistant to the MIT President and Chancellor for Women and Work, will speak at the Cambridge Business and Professional Women's Club meeting Wednesday, Jan. 9, at 6:30pm at the MIT Faculty Club.

Boston's Museum of Fine Arts.

Students accompanying Dr. Guggenheim are Denise Johnson Wagner, Jamaica, W.I., Simon R. Wiltz, Dorchester, and Robert L. Powell, Jr., Boston, all graduate students in architecture; Ronald J. Frere, Fort Pierce, Fla., an undergraduate in mechanical engineering, and Harvey Wiedeman, a Harvard student studying the history of science.

Dr. Guggenheim said a number of other students had worked hard on the project, and that he hoped they could go to Mali another time.

"The students were extremely hard-working," he said. "They gave of their time much more than they might in an ordinary seminar because of the potential practical benefits of what they were doing."

## New From MIT Press

# Hogarthian' Photographic Portfolio 'Must Be Seen'

(This review of a book just published by the MIT Press appeared in the *San Francisco Chronicle* of Monday, Nov. 19.)

By WILLIAM HOGAN

A portfolio of photographs titled "Is Anyone Taking Any Notice?" is an astonishing publication. In spite of its size and elegant format, it is hardly a "gift book" in the accepted sense. It might, in fact, make you ill to look at it. But once into it one cannot avert one's eyes. It is the opposite side of the coin from "The Family of Man," the

eloquent exhibit produced some years ago by Edward Steichen. In its own dark way this is equally effective.

It is the work of David McCullin, a concerned 38-year-old British photojournalist, who says this is not a book about war, but "about the human condition and our responsibility." In geographical segments he documents this condition in England, Biafra (and the Biafra aftermath), Cyprus, the Congo, India, Bangladesh, Londonderry and Vietnam.

The result is Hogarthian and un-

believable. For example, the old and wretched of Calcutta who are about to die, usually on the streets, are taken to a House of the Dying near the holy temple by a Roman Catholic nun, one Sister Theresa. McCullin allows his camera's eye to wander—and how Sister Theresa stands it is something for beatification authorities in the Vatican to consider.

Pictures of Biafran children, close to starvation, are as grisly as any since those made during the liberation of the Nazi concentration camps. These are the naked and the dead—moments of truth

and vulnerability shared by people worlds apart. Is anyone (the photographer asks) taking any notice? This is a relentless, indelible book, a collection of nightmarish phantasmagories by a craftsman in the tradition of David Douglas Duncan, Alfred Eisenstaedt and Gordon Parks.

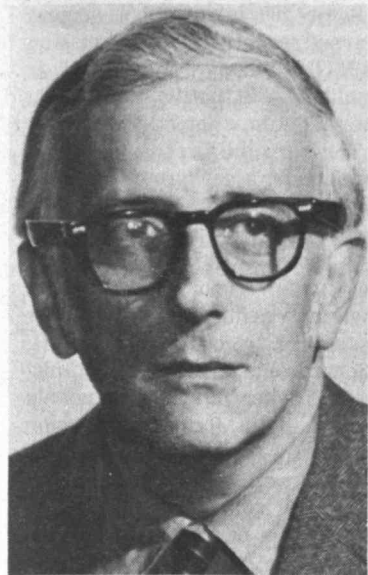
The minimal text is a counterpoint between the photographer's comments (via taped interviews) and phrases drawn from Alexander Solzhenitsyn's Nobel Prize speech ("lunatic asylums for the sane, all this is common and accepted..."). The Solzhenitsyn lines

add little emphasis to McCullin's own straightforward words ("When you've been away and you've seen and spoken with so many dead men, you've had a journey through the darkest chapters of life...").

This remarkable photographer, his publishers tell us, is a former London rebel street kid rejected by four sets of foster parents before he joined the RAF at 17 where he was introduced to photography. He is a humanist and artist whose work, difficult as it may be to do so, must be seen (M.I.T. Press).



# Four Are Appointed to Newly Named Chairs In Harvard-MIT Program in Health Sciences



Dr. Harvey Goldman



Dr. David W. Hamilton



Dr. Roger G. Mark



Dr. H. Eugene Stanley

Four new associate professorships—two at Harvard Medical School and two at MIT—have been established in the Harvard-MIT Program in Health Sciences and Technology, and the first appointees to the positions have been selected.

The associate professorships—named for two distinguished scientists—were established earlier this year under a \$1 million gift from Becton, Dickinson and Co., a leading manufacturer of health care products. The award of the associate professorships is designed to support promising faculty members in the Harvard-MIT Program during a non-tenure period in their academic careers.

Announcement of the names for the chairs and the appointees to occupy them was made by Robert H. Ebert, MD, dean of the Harvard Medical School, MIT Provost Walter A. Rosenblith, and Irving M. London, MD, director of the Harvard-MIT Program in Health Sciences and Technology.

The two chairs at the Harvard Medical School have been named in honor of the late Lawrence J. Henderson, MD, a distinguished biochemist who taught at Harvard from 1904 until his death in 1942. A graduate of Harvard College and the Harvard Medical School, Dr. Henderson was Abbott and James Lawrence Professor of Chemistry at the time of his death.

"Dr. Henderson, whose agile mind breached the gap between such seemingly disparate disciplines as Physiological Chemistry and Sociology, continually stressed the need for young minds to be free of restraints that would tend to limit their development during the formative years of their possessors. His early studies under Hofmeister at Strassburg provided him with such an experience. This freedom is implicit in the support provided by the Becton-Dickinson gift," Dr. Ebert said.

The two chairs at MIT have been named in honor of Hermann Ludwig Ferdinand von Helmholtz, the 19th century German physician-physicist, whose illustrious career encompassed work in areas such as vision, hearing, conservation of energy and electricity.

"In all these areas he made major contributions," Professor Rosenblith said, "and we at MIT feel it is particularly appropriate to honor the Helmholtz example."

"These new professorships are vital elements in the development of the Harvard-MIT Program in Health Sciences and Technology," Dr. London said. "The Program is concerned with interdisciplinary approaches that bring to bear skills and talents from diverse fields of medicine, science and engineering on problems of human health and disease. The continued success and future growth of the

Program depend in no small way on our ability to provide outstanding scientists, engineers and physicians with the encouragement and incentive they need to pursue new directions in teaching and research."

At Harvard, Harvey Goldman, MD, a member of the Harvard medical faculty and pathologist at Beth Israel Hospital, has been named Lawrence J. Henderson Associate Professor of Health Sciences and Technology in addition to his present appointment as associate professor of pathology. David W. Hamilton, PhD, an associate professor of anatomy at Harvard, has been given the additional appointment as Lawrence J. Henderson Associate Professor of Health Sciences and Technology.

At MIT, Roger G. Mark, MD, PhD, a member of the MIT electrical engineering faculty and the medical faculty at Harvard and chief of the Thorndike Memorial Laboratory's biomedical engineering division at Boston City Hospital, has been appointed Hermann von Helmholtz Associate Professor of Health Sciences while continuing as professor of electrical engineering. H. Eugene Stanley, PhD, a member of the MIT physics faculty, has been appointed Herman von Helmholtz Associate Professor of Health Sciences and Technology in addition to his appointment as associate professor of physics.

Dr. Goldman, 41, who received his AB in 1953 and his MD in 1957, both from Temple University, has been associate professor of pathology at Harvard Medical School since 1971. He is a member of Alpha Omega Alpha, the American Association of Pathologists and Bacteriologists, the International Academy of Pathologists, the American Association for the Advancement of Science, the New England Society of Pathologists, the Massachusetts Society of Pathologists, the American Gastroenterological Association and the New York Academy of Sci-

ences. His activities with the Health Sciences and Technology Program include principal responsibility for the course in *Human Pathology*, membership on the Medical School's Admission Committee, the Curriculum Committee and its Basic Sciences Subcommittee, the Course Evaluation Committee and the Promotion Board.

Dr. Hamilton, 38, received his AB from Harvard in 1957, his MA from the University of Kansas in 1960 and his Dr.Phil. from Cambridge University, Cambridge, England, in 1963. He became an instructor in anatomy at Harvard Medical School in 1965 and associate professor in 1971. In 1970, he was in charge of *Topics in Reproductive Biology*, a course at Cambridge University, England. With the Health Sciences and Technology Program he is head of the course on the *Functional Anatomy of Man* and is chairman of the MD Curriculum Committee and the Basic Medical Sciences Subcommittee.

Dr. Mark, 34, received his SB in electrical engineering from MIT in 1960, his MD from Harvard Medical School in 1965 and his PhD in electrical engineering from MIT in 1966. He was appointed an assistant professor of electrical engineering at MIT in 1969, and associate professor in 1972. He was appointed an instructor in medicine at Harvard in 1969 and an assistant professor of medicine there in 1972. Dr. Mark is a member of the Massachusetts Medical Society, the Association for the Advancement of Medical Instrumentation and the New York Academy of Science. Within the Harvard-MIT Program, he participates in teaching of the course, *Cardiovascular Pathophysiology*, and serves on the task force to develop collaborative cardiovascular research programs. He is a member of the Program's Admissions Committee and Biomedical Engineering Committee.

Dr. Stanley, 32, received his BA degree in physics and mathe-

matics from Wesleyan University in 1962 and his PhD in physics from Harvard in 1967. He was a staff member at MIT's Lincoln Laboratory in 1967 and 1968 and a consultant from 1969-1971. From 1968-1969 he was a Miller Fellow at the University of California's Physics Department. He was assistant professor of physics at MIT in 1969 and associate professor in 1971. Dr. Stanley, a member of the American Physical Society and the American Academy of Arts and Sciences, has participated in the development and teaching of three courses: *The Functional Anatomy of Man*, *Gastroenterology and Science and Engineering of Membranes and Structural Tissues*. He also has participated in the Interdisciplinary Program in Biomaterials Science and is a member of its steering committee.

## Drama Group Mixes TV and Live Acting

"Me and My Shadow," short plays and skits that combine live and videotaped theater, will be presented at MIT's Kresge Little Theatre at 8:30pm Thursday, Jan. 17, by the Live TV Workshop, a new experimental drama group based in Cambridge.

The MIT performance, directed by playwright Vincent Canzoneri of Boston and sponsored by the MIT Student Art Association, will feature actors interacting with their own videotaped images.

The program will include "Eh Joe," a TV play by Samuel Beckett, three short works—"Stop-Time Everyman," "Venus De Milo" and "If I Were President"—written by Mr. Canzoneri for the new group, and several other works and TV tapes. The audience will be invited to participate in a discussion with the actors following the performance.

Tickets are \$1 and are available at TCA and at the Student Art Association, Rm. 429.

## Vending Machine Thefts Lead to Removal

Those vending machines at MIT that are repeatedly subject to damage and theft will be removed under a new policy announced this week by Robert J. Radocchia, Walker Memorial dining service manager and MIT's liaison with Servend, Inc., the vendor.

Damage to and thefts from sandwich machines alone have amounted to \$50,000 over the past 13 months alone, Radocchia said. The high cost of repairing machines after they are broken into is

included in the figure, he said, and is one of the reasons for the new policy.

"In areas where machines are repeatedly vandalized or stolen from in the future," he said, "the machines will be removed, regardless of how much business they are doing."

He also requested that persons witnessing vandalism to machines report it immediately to Campus Patrol, Ext. 3-2997.

In another change, aimed at providing better service,

Servend will begin moving perishable foods—such as sandwiches—from remote locations to central vending areas in the late afternoon. This will improve the selection available at a few locations and at the same time prevent customers from having to search at several locations.

Locations of the central vending machines will be posted in all vending areas when they are decided upon, Radocchia said.

## Job Survey Meeting Tomorrow

A meeting to discuss the new classification and compensation program which MIT is developing for members of the Administrative and Academic Administrative Staffs will be held Thursday, Jan. 10, at 12:30pm in Bldg. 54-100.

Kerry B. Wilson, wage and salary administrator, who announced the meeting, said attendance at a series of pre-Christmas sessions was encouraging as was the high degree of individual interest evidenced by the questions posed.

"However," he said, "this program is a major undertaking and one that will be of considerable significance both to MIT and to the individuals involved. It is highly desirable that all concerned know as much as possible about the program. For this reason the additional meeting has been scheduled."

Wilson urged all Administrative and Academic Administrative Staff members who were unable to participate in the earlier sessions to attend the upcoming meeting.

## United Drive Hits \$98,075

Members of the MIT community have contributed \$98,075 to the 1973-74 United Way/United Black Appeal Campaign.

The campaign received contributions from 2,853 people at MIT. Both the number of givers and the amount contributed fell below comparable figures for 1972 when 3,328 people gave \$111,318.

Professor John Ross, Frederick George Keyes Professor of Chemistry, who headed the 1973-74 campaign, told chief solicitors in a letter:

"The task proved to be particularly hard this year and the overall results may seem discouraging. I want to remind you that every dollar you helped to raise at MIT was and is needed. . . that without your efforts the same amount would not have been raised. . . and that the MIT administration, no less than I, genuinely appreciates the contribution of extra time and energy you have made."

The final report on contributions shows that 2686 gave to United Way and 1005 gave to the United Black Appeal.

Contributions to United Way totaled \$82,071, an average of \$30.52 per gift. United Black Appeal contributions totaled \$16,003, an average of \$15.97 per gift.

## Employees Invited

MIT employees and supervisors were reminded this week that they are invited to participate in activities of the 1974 Independent Activities Period (IAP).

Professor Michael Feld, chairman of the IAP Policy Committee, said, "I know that the requirements of the job take priority, but I hope that many employees will enjoy participating in some of these programs to the extent that their own or the IAP schedules allow."

## Grades Out Soon

Transcripts with first term grades will be available the week of Jan. 22 and transcripts with January period grades the week of Feb. 25, the Registrar has announced.

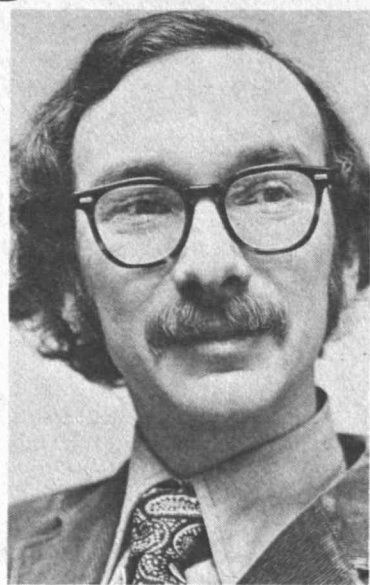


# Johnson, Schroeder, Williams Are Appointed 'Chances Are' Notices Sent

## As First Edgerton Assistant Professors



Timothy L. Johnson



Michael D. Schroeder



James H. Williams

The names of the first MIT faculty members to be appointed Esther and Harold E. Edgerton Assistant Professor have been announced by Provost Walter A. Rosenblith.

Those named are:

—Michael D. Schroeder, assistant professor of electrical engineering.  
—Timothy L. Johnson, assistant professor of electrical engineering.

—James H. Williams, Jr., assistant professor of mechanical engineering.

The appointments are for two years.

The Edgerton professorship was established by the Corporation in February to honor Institute Professor Emeritus Edgerton and his wife, who have been associated with the MIT community nearly 50 years.

Corporation Chairman Howard W. Johnson and President Jerome B. Wiesner said in February that the fund named for the Edgertons will be used to provide new horizons in research and career development for younger faculty. Concurrently, it will also provide funds needed by the faculty members to involve undergraduate students directly in their research.

"There is no more fitting way for us to honor this man and this woman for the devotion, affection and warm friendship, they have given freely to young people at this university over a period of nearly half a century," Mr. Johnson and President Wiesner said.

### Information Systems

Professor Schroeder, 28, was a teaching assistant in the Department of Electrical Engineering for two years and instructor for

another two years before becoming an assistant professor in September, 1972. He received his BA in mathematics from Washington State University in 1967, his SM in electrical engineering and his EE degree from MIT in 1969 and his PhD in computer science in 1972 from MIT.

Professor Schroeder has not only gained an excellent reputation as a teacher, but has also made significant contributions to the development of the Computer Science and Engineering core curriculum. Most of the educational effort and contributions have been directed to the subject on Information Systems. His students regard him as among the very best young teachers in the department.

His contributions to MIT's educational program are paralleled by equally significant contributions to the research program of the Computer Systems Research Division of Project MAC. In addition to his master's and doctoral research, he participated in the development of the MULTICS operating system, in the evaluation of its performance, and in the design of the new central processor which is now in service. In particular, he was the primary designer of the hardware protection mechanisms.

Professor Johnson, 27, joined the

faculty in September, 1972, after completing doctoral work in the Decision and Control Sciences area of Electrical Engineering. He received an SB in economics, an SB in electrical engineering and an SM in electrical engineering from MIT in 1969. He received the PhD from MIT in September, 1972.

Professor Johnson became interested in control systems as an MIT co-op (Course VI-A) student at Honeywell, Inc., and continues to be active in VI-A education as an adviser to MIT students at Digital Equipment Corp. His research is generally concerned with distributed-parameter systems with emphasis on applications in the bio-medical area. Examples of some of the problems he and his students are presently studying include dynamic models for biological membranes and electrodes, basic theory of viscoelastic systems, attitude stabilization and control of flexible aircraft, diffusion of probability in stochastic stability problems, and the human motor control system.

He is also a consultant to the Boston Veterans Administration Hospital in the area of clinical neuro-physiology and to the Charles Stark Draper Laboratories in the area of electrocardiography. Professor Johnson also serves as editor of the Institute of Electrical and Electronics Engineers Control Systems Society Newsletter.

Professor Williams, 32, received his SB and SM in mechanical

engineering from MIT in 1967 and 1968, respectively, and his PhD from Trinity College, Cambridge, England, in 1970. After completing high school, he worked for the Newport News Shipbuilding and Dry Dock Co. as an apprentice machinist, working his way to apprentice designer and senior design engineer. Thus, even before receiving his degrees from MIT he had accumulated considerable engineering and shop experience as well as experience as a shop designer.

Professor Williams is recognized as a superb undergraduate teacher and has acquired an extraordinary reputation in this respect. He received the Everett Moore Baker Award for Outstanding Undergraduate Teaching last May.

As one of few black faculty members in the School of Engineering, he has effectively helped black students to be successful at MIT. In doing this, Professor Williams has given freely of his time to tutor and counsel all students.

His research is based within the areas of applied mechanics and the mechanical behavior of materials. In collaboration with Professor S.H. Crandall, he has been studying the dynamics of isolated structures under seismic excitation. During the past year, he has completed a number of theoretical studies relating to the stiffening of structures by graphite filamentary composites. Recently he has proposed a concept for monitoring elastic stress states by acoustic emissions. This concept, when developed, can have a significant impact in the area of non-destructive testing.

Through his associations as a consultant, Professor Williams has worked on many problems in the areas of stress analysis, fracture and fatigue analysis, random vibration and shock analysis, and the non-destructive testing of structures for integrity assessment. He is considered, by virtue of his extensive work in the field, to be the nation's leading expert on stresses in rotary paper dryers.

Professor Williams was du Pont Assistant Professor of Mechanical Engineering in 1972-73.

Some 200 high school seniors learned recently if their admission to MIT is "likely," "possible," or "unlikely" in notifications from the MIT Admissions Office.

They are the first to be so advised under a new program called Early Evaluation adopted last year by the Ivy League and MIT.

Purpose of the program is to permit high school students to plan their future education with greater assurance, according to Peter H. Richardson, director of admissions. Earlier, he said, all students waited until formal admission letters were mailed in early April.

Early evaluations are made by individual admissions officers as soon as the prospective student's application is complete—except for CEEB scores and senior year grades.

Richardson said he estimates that 85-95% of those receiving "likely" cards will be admitted, 40% of the "possibles," and very few of the "unlikelys."

## More Alumni In News Careers

Recent interest in newspaper careers among MIT graduates (*Tech Talk*, Sept. 12) is not unprecedented.

Here, courtesy of alumni sources, are other MIT graduates not included in the earlier article:

James H. Winfield, '40, president and publisher, *New York Daily News*; Valfrid E. Palmer, '54, business manager, *New York Daily News*; Alan M. Kriegsman, '48, music critic, *Washington Post*; Maj. Gen. Thomas A. Lane, '32, syndicated columnist specializing in public affairs and national policy and editor in chief of "Strategic Review," a quarterly publication of the US Strategic Institute.

Paul J. Dennehy, '44, photographer, the *Los Angeles Times*; Edward J. Amrien Jr., '59, director of professional services, Follett Publishing Co., Chicago, former science editor of *World Book Encyclopedia*; Todd Fandell, '60, special writer for the *Wall Street Journal*, and Edward M. Pakenham, '54, associate editor, *Philadelphia Inquirer*.

The late R. Gordon Shand, '17, was executive editor of the *New York Daily News*.

# MIT's Fisher Receives Clark Award from Economics Assn.

(The following article is reprinted from the Monday, Jan. 7, issue of *The New York Times*. Copyright 1974 by The New York Times.)

By SOMA GOLDEN

Last month, Franklin M. Fisher—heavy-set, gray-haired and brilliant—received the economics profession's loudest applause.

The 39-year-old professor from the Massachusetts Institute of Technology went home from the New York meeting of the American Economic Association with the John Bates Clark Award tucked proudly under his arm. The five-inch bronze medal is given every other year to an economist under the age of 40 who has made "a significant contribution to economic thought and knowledge."

Professor Fisher's triumph probably marks the end of an era when the brightest analysts spent their talent and their youth trying to sharpen the tools of econometrics, a statistical art form that is now the vogue.

Four of the last five Clark award winners have been econometric methodologists. They have helped transform modern economic analysis from a matter of rough

judgment into a refined statistical exercise involving high-speed computers, mountains of data, elaborate equations and sophisticated techniques of statistical inference.

The other winners, like Professor Fisher, are relatively unknown outside their profession and their journal. *Econometrica* (which Professor Fisher has edited since 1968). The superstars are Zvi Griliches of Harvard, who won the award in 1965 for his work in technological change and "distributed lags;" Marc Nerlove of the University of Chicago, who received the award in 1969, another lag expert, and Dale Jorgenson of Harvard, who was honored in 1971 for his work on investment theory and the handling of simultaneous equations.

Professor Fisher's work ranges up and down the scale of esoterica from "the identification problem" to "aggregation of production functions." He has also made courtroom appearances in recent years as a consultant on behalf of the International Business Machines Corporation in its defense against antitrust charges.

### Copper Outlook

Professor Fisher has dabbled, too, in more routine applied econometric problems, like the outlook for copper prices ("We're about on target for a terrific rise in the mid-seventies," he says) and the economic cost of Detroit's auto model changes ("In 1960 or so that was running about \$5-billion; I'm not sure where it is now").

"I run in swings with my work," he said. "Almost everything I do is some form of micro-economics [the study of an industry or company]. But after I finish a big empirical study I don't want to see numbers anymore."

### Does It Make Sense?

Professor Griliches added: "People are out there running around processing data, publishing equations, prescribing policy. Fisher sits back and asks, 'Does it make any sense?'"

If economists could run controlled laboratory experiments, Professor Fisher would be out of business—or at least in a different line of work. But, for the most part, the cost of human guinea pigs and the urgency of policy decisions have precluded econo-

mists from testing their ideas about such things as the effect of income taxes on spending or the impact of the investment tax credit on business outlays.

"So the poor old economist," Prof. Robert Solow of MIT said, "has to find out how X affects Y by looking at one run of history. It's very hard to isolate the impact of changes of one thing or another." Professor Solow, the 1961 Clark winner, heads the awards committee of the American Economic Association.

Professor Fisher and other economists have invented methods to squeeze the most out of data and to put numbers on theory. Although the techniques may sound foreign to those outside the profession, within the nation's graduate schools the econometric methods developed by these pioneers are the hallmarks of serious empirical work.

For most academics, Mr. Fisher's award seemed preordained. "It was only a question of whether all four of these geniuses could get the medal before they turned 40," said one young economist at last week's convention.

Now the profession is pondering who will get the laurel in 1975, when the AEA next gives away the award named for a leading American economist of the late 19th century. One thing seems clear, however; the award won't go to yet another econometrics whizkid.

### A Stage Dove

"This stage is probably done," Professor Solow said. Advances in econometrics now, he suggested, depend on improvements in available data, not on brilliant methodological breakthroughs.

Many of the brightest young economists today, say their seniors, are chipping away at policy problems focusing on the city, labor, poverty, natural resources and the environment. Although some of the younger generation scoff at the fascination of recent Clark award winners with pure methodology, few of them seem to scoff at the award itself.

Prof. Paul Samuelson of MIT, a Nobel Prize winner and the first recipient of the Clark award, in 1947, explained why: "Economists work for the only coin worth having—the applause of their peers."



## New Program Helps Working Civil Engineers

A special "residency" program developed by the MIT civil engineering faculty is providing students an opportunity to gain both a masters degree and "real world" professional experience during the same two-year period.

The program was developed to provide students an alternate way of financing graduate education. Other methods are using one's own funds or working as a research assistant.

Of the seven students currently in the program, five are employed by Stone & Webster Engineering, Inc., Boston, and two are with Simpson, Gumpertz & Heger, Inc., Cambridge. Both firms have international reputations.

Combining work and graduate study gives students exposure to a "real" problem-solving environment which will lead to a better understanding of what additional technical and managerial education is required.

The participating engineering firms give student residents important assignments. Practicing professionals monitor their performance. Students benefit from exposure to challenging design problems and from meeting and working with professionals.

Professor Peter S. Eagleson, head of the Department of Civil Engineering, said the success of the program "depends on the interaction of the university faculty and practicing engineers."

"The faculty at MIT has always valued such interaction and its individual members have participated in such joint efforts."

Frank J. Heger, a principal in Simpson, Gumpertz & Heger, said the residency program, from the firm's point of view, "is an opportunity for us to establish a relationship with promising young people interested in structural design."

The two students currently with the firm under the MIT residency program worked at Simpson, Gumpertz & Heger previously as Northeastern University cooperative education students.

Dr. Heger, who formerly taught at the Institute—as did the other principals in the firm—praised the program as a means of emphasizing the practice of engineering to students.

"We need to give them an opportunity to see what it's all about, to give them a chance to see

# Nine Top Police Professionals Join MIT Study

By ROBERT C. DIORIO  
Staff Writer

Nine of the nation's leading police professionals have joined researchers at MIT who are studying the planning and resource allocation functions of urban public safety systems.

They will serve as a Police Advisory Panel to a multi-disciplinary MIT research team headed by Dr. Richard C. Larson, associate professor of electrical engineering and urban studies.

Panel members—who have accumulated collectively more than 200 years of experience in US police departments—also will assist in communicating the products of the research program to police personnel.

Panel members are:

—**Capt. Daniel Cawley**, Management Information Systems Division, New York City Police Dept.

—**Sydney Cooper**, New York City-Rand Institute, former chief of inspectional services, New York City Police Dept.

—**Mark Furstenberg**, director of planning and research, Boston

Police Dept.

—**Inspector Herbert F. Miller Jr.**, director, Operations Planning and Data Processing Division, Metropolitan Police Dept., Washington, D.C.

—**Chief Joseph McNamara**, Kansas City Police Dept.

—**Patrick V. Murphy**, president, Police Foundation, Washington, D.C., former New York City police commissioner.

—**Lt. Glenn Pauly**, commander, planning and development, St. Louis Police Dept.

—**Thomas Reppetto**, associate professor, John Jay College of Criminal Justice, New York City.

—**Capt. Palmer Stinson**, research and development, Management Services Division, Oakland Police Department.

The MIT research program, "Innovative Resource Planning in Urban Public Safety Systems," is a two-year effort funded by the National Science Foundation through its Division of Social Systems and Human Resources' RANN (Research Applied to National Needs) program.

## IAP Career Programs Working Well

Offers of careers to sample were running slightly ahead of undergraduates who signed up for career sampling during IAP, according to Robert K. Weatherall, director of career planning and placement.

The program gives undergraduates an opportunity to observe day-to-day working life in various

what the real world is like," he said.

The two-year resident program begins each June with three months as a full-time resident at an engineering firm. This is followed by three-and-a-half months of full-time study at the Institute. In mid-December the student returns to the engineering firm and combines work with part-time study for one year. The following December he returns to the Institute for full-time study until May, completing his thesis and degree requirements.

MIT students participating in the program are: Bruce I. Goldman, Brooklyn, N.Y.; Joseph P. Morray Jr., Watertown, Mass.; Edward R. White, Revere, Mass.; Farid Elsabee, Bethpage, N.Y.; Kenneth N. Long, West Roxbury, Mass.; Stephen J. Cudren, Canton, Mass.; and Timothy McGrath, Quincy, Mass.

professions. "I was very pleased at the number of alumni who responded and the variety of careers they offered to share with undergraduates," Weatherall said.

Nearby offerings include assisting with newly established public management and administration programs; developing new techniques for making printed circuit boards; computer programming; visiting a stock broker's office; applying operations research techniques to manufacturing systems; and observing warehouse and sales distribution in a small business.

Invitations from further away include project engineering, machine design and drafting in Virginia; exposure to an active law practice in New Haven; introduction to patent law in Illinois; following a practicing surgeon in St. Louis; and monitoring overall return on non-US stock market investments of the Ford Foundation in New York.

For further information, visit the Career Planning and Placement Office, Rm. 10-140.

## MIT's Erdely Duo Will Give Concert at Kresge Jan. 25

Violinist Stephen Erdely, who recently joined the MIT music faculty, will give a concert with his wife, noted pianist Beatrice Erdely, at 8pm Friday, Jan. 25, in Kresge Auditorium.

In the concert, their first in Boston, the Erdelys will present a program of classical and contemporary sonatas. Featured works will be the Boston premiere of Istvan Anhalt's Sonata 1954, Beethoven's Sonata in A Major, Op. 30, No. 1, Mozart's Sonata in B Flat, K. 454 and Bartok's Second Sonata. The concert, sponsored by the MIT Music Section, will be open to the public free of charge.

Stephen Erdely, who was a violinist with the Cleveland Orchestra under the late George Szell for 16 years, joined the MIT faculty this fall as assistant professor of music. A native of Hungary, he received his training in Europe as a pupil of Ede Zathureczky, Leo Weiner, Denes Bartha and Zoltan Kodaly at the National Franz Liszt Music Academy in Budapest.

Before joining the Cleveland Orchestra in 1950, Professor Erdely toured widely in recitals in western Europe where he was a recognized recording artist. He left the Cleveland Orchestra in

The project is designed to bring some of the products of MIT's mathematical and sociological research to administrators concerned with planning and resource allocation in police and emergency medical services.

Research will include an analysis of how to evaluate the operational effectiveness of urban emergency systems; the development of models for planning, research and management tools for use with such systems; and an evaluation of the impact of new technology and new forms of operation on these services.

**Patrol Sectors**

The panel met with the MIT researchers in mid-December to discuss the impact of computers on police departments. Also discussed were the responses of police employe organizations to proposed innovations in police operations.

The members of the panel are recognized nationally for their concern with law enforcement problems and for their work in searching out innovative solutions.

Capt. Cawley already is heading an effort in the New York City Department to implement some of the resource allocation tools developed recently at MIT and modified for New York by the New York City-Rand Institute.

These tools will be used to estimate the required number of radio-dispatched patrol cars for each precinct by time of day and day of week. They also will be used to improve dispatching procedures and the design of precinct patrol sectors.

**Clerical Duties**

Mr. Cooper had a distinguished career with the New York City Police Department, obtaining the rank of chief of personnel and chief of inspectional services. Retired from the department, he now is a consultant on police research to the New York City-Rand Institute.

Mr. Furstenberg coordinates federal Law Enforcement Assistance Act-funded improvement programs for the Boston Police Department.

A current program focusing on improved patrol allocation—developed in cooperation with Pro-

fessor Larson—has so far resulted in implementation of the "maximum response and patrol plan" announced by Boston Police Commissioner Robert di Grazia in September.

Boston increased the number of patrol cars on the street from a daily average of 179 to an average of 261 by reassigning to patrol duty policemen who had been performing clerical duties.

**At Its Highest**

Inspector Miller coordinates a patrol allocation study sponsored by LEAA's National Institute on Law Enforcement and Criminal Justice.

The study, being conducted jointly with Mathematics, Inc., a Princeton-based "think tank," is to modify and adapt Professor Larson's simulation model of patrol forces to the needs of the Metropolitan Police Department in Washington, D.C.

The department wants to reallocate its 130 cars so that the supply of patrol forces is greatest when demand for police service is at its highest.

**Effect on Crime**

Chief McNamara served for 17 years with the New York City Police Department before going to Kansas City in November 1973. For three years he was a fellow at the Harvard Law School Center for Criminal Justice and Kennedy School of Government. He received his PhD in January 1973.

Mr. Murphy, as president of the Police Foundation, is responsible for supporting major innovations in police departments around the United States.

One such study, now being conducted in Kansas City, Mo., directed policemen not to perform "crime preventive patrol" in certain areas, but to answer calls for police assistance as usual.

The study's goal is to determine the effect on crime reduction of police patrol procedures.

**"Pauly Blocks"**

Preliminary results suggest that there is little, if any, measurable difference in crime rates between the experimental areas and those that were patrolled as usual.

Mr. Murphy, who was appointed by President Johnson to be the first administrator of LEAA in 1968, was police commissioner of New York City from 1970-1973.

Lt. Pauly has played a key role in the implementation of modern computer techniques in the St. Louis Police Department.

His proposed method of collecting police call-for-service data by geographical sub-unit has resulted in the naming and wide use in other police departments of "Pauly blocks," a name given to the sub-unit.

Currently he is directing the trial implementation of an automatic police car locator system, the first of its kind.

**John Jay College**

The system uses inertial guidance techniques made popular in the space program. It will allow the St. Louis police dispatcher to know within 50 feet the location of any of 25 cars.

The project is scheduled to get under way May 1.

Professor Reppetto served on the Chicago police force for 15 years, achieving the rank of detective commander.

He has served as a consultant for various firms, including the Boston Redevelopment Authority. Author of several police-related publications, Professor Reppetto was a member of the Massachusetts Governor's Technical Advisory Committee on Police. He began teaching at John Jay College in 1971.

Capt. Stinson is a veteran of 24 years on the Oakland Police Department.



Stephen and Beatrice Erdely



# THE INSTITUTE CALENDAR

January 9  
through  
January 18

## Events of Special Interest

**The Bermuda Triangle – Limbo of the Lost\*** – John Wallace Spencer, author of "Limbo of the Lost". LSC Lecture. Wed, Jan 9, 8:15pm, Rm 26-100. Free.

**The Steel Industry in Developing Nations – Status and Prospects\*** – John F. Elliott, metallurgy. Technology Adaptation Program Seminar Series. Thurs, Jan 10, 4:30pm, Rm 9-150.

**Winter Con II** – Second annual winter war gaming convention, sponsored by MIT Strategic Games Society & American Wargaming Association. Sat, Jan 12, 9am (all day), 4th fl Stu Ctr.

## Seminars and Lectures

### Wednesday, January 9

**A New Look at Rocks with the Electron Microscope** – William F. Brace, earth & planetary sciences. Earth and Planetary Sciences Lecture (74). 11am, Rm 54-425.

**Chemical Constitution and Reactions of Coal\*** – Prof. Jack B. Howard, chemical engineering. Chemical Engineering Seminar. 1pm, Rm 12-102.

**Illustrated Lecture: Bubble Raft Study of Fracture Nucleation** – Frank A. McClintock, mechanical engineering. Metallurgy & Materials Science Seminar. 2pm, Rm 13-5101.

**Earthquake Prediction** – Frank Press, Robert R. Shrock Professor of Geophysics. Earth & Planetary Sciences Lecture (74). 3pm, Rm 54-425.

**Looking at the Sun From Skylab, With Emphasis on Observations Using an X-Ray Telescope** – Dr. Bruno B. Rossi, Institute Professor Emeritus, Professor Emeritus of Physics. Physics Potpourri (25a). 3:30pm, Rm 37-212.

**Future Transmission Technology\*** – Prof. Robert S. Kennedy, electrical engineering; Dr. John Fulenwider, GTE Labs, Waltham; John E. Ward, deputy director, ESL. Telecommunications Planning and Research Seminar Series. 4-6pm, Rm 9-451. Coffee.

**Introduction to Thesis Requirements and Procedures** – Research Opportunities in Electrical Engineering Seminar. 4:30pm, Rm 10-105. Refreshments, 4.

**Village Life in Iran** – Hamid, a social anthropological perspective. Program on the Third World: Seminar on Foreign Students and Participation in Development (345). 7pm, Walker Memorial International Student Lge.

### Thursday, January 10

**Biochemical and Behavioral Effects of Amphetamines** – Loy D. Lytle, nutrition & food science. Nutrition & Food Science Seminar (222). 9am-12n, Rm 16-310.

**The Contemporary Ethical Situation** – Rev. Arnold Hogan, S.J., Adult Education Center, will discuss "Humanity Comes of Age". Ethics: Sources and Applications Lecture (343a). 10:30am-12n, Rm 1-134.

**Prospective Thesis Topics in Structural Geology** – William F. Brace, earth & planetary sciences. Earth & Planetary Sciences Lecture (74). 11am, Rm 54-425.

**What is Ethics?** – Judith Thomson, philosophy. Philosophy Lecture (241). 2pm, Rm 4-231.

**Information Theoretic Results From Multiple Sources** – Prof. J.K. Wolfe, University of Massachusetts. Communication Theory, Electrical Engineering & RLE Seminar. 3-4pm, Rm 26-217.

**Foreign Direct Investment in Canada: What's Good for GM of Canada is Not Necessarily Good for GM** – Tom Horst, Harvard Center for West European Studies; Allan Detsky G. Political Science Seminar (261g). 3-5pm, Rm 1-190.

**Pattern Recognition Applied to Prediction of Earthquake Epicenters** – Frank Press, Robert R. Shrock Professor of Geophysics. Earth & Planetary Sciences Lecture (74). 3pm, Rm 54-425.

**Immunology and Cancer** – Herman N. Eisen, M.D., immunology, Center for Cancer Research. Health Careers and Currents in Medicine Seminar (124). 3-4:30pm, Kresge Auditorium.

**The Sun and the Earth – Solar Wind, the Magnetosphere, and the Aurora** – George Siscoe, visiting professor of physics; V. M. Vasyliunas, physics. Physics Potpourri (259). 3:30pm, Rm 37-212.

**Electromagnetics and Dynamics** – Research Opportunities in Electrical Engineering Seminar. 4:30pm, Rm 10-105. Refreshments, 4pm.

### Friday, January 11

**Ethics of Behavior Control** – Stephan Chorover, psychology, will speak on psychosurgery and other methods of behavioral control. The film "Should Man Play God" may be shown. Innovations in Medicine (266). 10am-12n, Rm 16-134.

**Radiometric Age – Dating in Planetology** – Patrick M. Hurley, earth & planetary sciences. Earth & Planetary Sciences Lecture (74). 11am, Rm 54-425.

**Monte Carlo and Clathrate Compounds\*** – Prof. Jefferson Tester, chemical engineering. Chemical Engineering Seminar. 1pm, Rm 12-102.

**Evolution of the Moon and the Terrestrial Planets** – Nafi M. Toksoz, earth & planetary sciences. Earth & Planetary Sciences Lecture (74). 3pm, Rm 54-425.

**The Sun and the Earth – Solar Wind, the Magnetosphere, and the Aurora** – George Siscoe, visiting professor of physics; V.M. Vasyliunas, physics. Physics Potpourri (259). 3:30pm, Rm 37-212.

**Materials and Devices** – Research Opportunities in Electrical Engineering Seminar. 4:30pm, Rm 10-1-5. Refreshments, 4pm.

### Monday, January 14

**Laser Fusion, Compression of DT Pellets** – Benjamin Lax, physics. Physics Seminar. 10-11:30am, Rm NW14-2209.

**How to Start Worrying and Love Your Environment, OR the Geigers'll Get You if You Don't Watch Out!** – Frank Aldrich, M.D., medical. The film "The Noise Boom" will be shown. Innovations in Medicine (266). 10am-12n, Rm 16-134.

**The Question of Pangeaic Orogenic Belts** – Patrick M. Hurley, earth & planetary sciences. Earth & Planetary Sciences Lecture (74). 11am, Rm 54-425.

**What Have Been the Effects of Our Devaluations?** – Anne Krueger, economics. Economics Lecture (77). 2pm, Rm E52-394.

**Prospective Thesis Topics in Mantle Dynamics** – Nafi M. Toksoz, earth & planetary sciences. Earth & Planetary Sciences Lecture (74). 3pm, Rm 54-425.

**Communication Through Musical Performance – Illusion or Reality?\*** – David Barnett, noted pianist, will give an illustrated lecture, 2pm, Music Library. Free.

**High Polymers and Low Polymers\*** – Edward W. Merrill, Carbon P. Dubbs Professor of Chemical Engineering. Chemical Engineering Special Polymer Lecture Series. 3pm, Rm 12-102.

**Science in Industry in France** – Pierre Aigrain, Henry R. Luce Professor in Environment and Public Policy. Science in Industry Seminar (258). 3:30pm, Rm 9-150.

**X-Ray Astronomy – What Does It Take?** – Walter Lewin, physics. Physics Potpourri (259). 3:30pm, Rm 37-212.

**Recent Theoretical Studies of TCNO and Related Compounds\*** – Dr. Frank Herman, IBM Research Labs, San Jose, California. Metallurgy & Materials Science Seminar. 4pm, Rm 13-5002.

**Bioelectrical Engineering** – Research Opportunities in Electrical Engineering Seminar. 4:30pm, Rm 10-105. Refreshments, 4pm.

**Objectivity and Decision: Philosophical Problems in Purposive Action\*** – Ronald S. Laura, Ph.D., candidate in philosophy, Oxford University, Brasenose College. Respondents: Prof. Judith T. Thomson, philosophy, Frank T. Keefe, director, City Development Authority, Lowell Mass. Urban Studies and Planning Technology and Culture Seminar. 5:15pm, Rm 1-190. 6:45pm buffet, Stu Ctr, West Lge. 7:30-9pm, open discussion.

### Tuesday, January 15

**Laser Heating of Magnetically Confined Plasmas for Controlled Fusion** – Dr. Daniel Cohn, National Magnet Lab. Physics Seminar. 10-11:30am, Rm NW14-2209.

**Ethics and Systematic Theology** – Dr. Gabriel Fackre, Andover Newton Theological School, will discuss "Christian Faith and Bio-Medical Questions". Ethics: Sources and Applications Lecture (343a). 10:30am-12n, Rm 1-134.

**Prospective Thesis Topics in High Temperature Rock Mechanics** – Christopher Goetze, earth & planetary sciences. Earth & Planetary Sciences Lecture (74). 11am, Rm 54-425.

**Acupuncture** – Dr. Smith, Beth Israel Hospital. The film "Acupuncture Anesthesia" will be shown. Innovations in Medicine (266). 1-3pm, Rm 16-1310.

**Open Session on Writing (126)** – Tillie Olsen, writer-in-residence, will read from her work and answer questions about the writing of it. Humanities Lecture, 1-3pm, Rm 6-120.

**What is Logic?** – George Boolos, philosophy. Philosophy Lecture (241). 2pm, Rm 4-231.

**Poor Mr. Nixon** – Evsey D. Domar, Ford Professor of Economics. Economics Lecture (77). 2pm, Rm E52-394.

**Canadian-American Conflicts: Who Wins, Who Loses** – Joseph Nye Harvard Center for International Affairs. Political Science Sememinar (261g). 3-5pm, Rm 1-190.

**System Approaches to Health Care Delivery** – Edward B. Roberts, Alfred P. Sloan School of Management. Health Careers and Currents in Medicine Seminar (124). 3-4:30pm, Rm 9-150.

**X-Ray Astronomy – What's it All About?** – Walter Lewin, physics. Physics Potpourri (259). 3:30pm, Rm 37-212.

**Studying, Teaching, Living in a Foreign Country: Isreal** – Panel and discussion. Foreign Study Office (122). 4pm Rm 10-280. Refreshments.

**Recent Advances in Electrolyte Theory\*** – Prof. John W. Perram, Australian National University. Applied Mathematics Colloquium, 4pm, Rm 2-338. Coffee, 3:30pm Rm 2-349.

**Computer Science** – Research Opportunities in Electrical Engineering Seminar. 4:30pm, Rm 10-105. Refreshments, 4pm.

**Representation: Reflections, Refractions, and Distortions\*** – Prof. Marx Wartofsky, chairman, philosophy, Boston University. Respondents: Stanford Anderson, architecture, Richard M. Held, psychology, Philosophy, Architecture, Physics and Technology and Culture Seminar. 5:15pm, Rm 1-190. 6:45pm, buffet, Stu Ctr Mezzanine Lge. 7:30-9pm, open discussion.

### Wednesday, January 16

**Use of Lasers and Optics for Measurements of Properties of Thermonuclear Plasmas** – Dr. Ward Halverson, National Magnet Lab. Physics Seminar. 10-11:30am, Rm NW14-2209.

**Biochemical Individuality (Discussion Group)** – Maria Linder, nutrition & food science. Nutrition & Food Science Seminar (223). 10am, Rm 16-134.

**Nature of the Interior of the Moon** – Sean C. Solomon, earth & planetary sciences. Earth & Planetary Sciences Lecture (74) 11am, Rm 54-425.

**Are There Jobs in Economics?** – E. Cary Brown, Head of Department of Economics. Economics Lecture (77). 2pm, Rm E52-394.

**"Silly Putty" and Foolish Fluids\*** – Edward W. Merrill, Carbon P. Dubbs Professor of Chemical Engineering. Chemical Engineering Special Polymer Lecture Series. 3pm, Rm 12-102.

**Light Emitting Diode Research at GE** – Jack Kingsley, General Electric Corp. Science in Industry Seminar (258). 3:30pm, Rm 9-150.

**The Contribution of Progressive Myopia to the Rise of Impressionism: Visual Problems in the History of Art\*** – Cary Lu, WGBH. Joint Biology and Psychology Seminar. 3:30pm, Rm 26-100.

**Everything You Always Wanted to Know About Cosmology in Two Painless Lectures** – Kenneth Brecher, physics. Physics Potpourri (259). 3:30pm, Rm 27-212.

**Systems Science and Control Engineering** – Research Opportunities in Electrical Engineering Seminar. 4:30pm, Rm 10-105. Refreshments, 4pm.

**Physical Planning in Kuwait** – SPURS Fellows Program on the Third World: Seminar on Foreign Students and Participation in Development (345). 7pm, Walker Memorial International Student Lge.

### Thursday, January 17

**Solar Energy** – Dr. John Goodenough, Lincoln Lab. Physics Seminar. 10-11:30am, Rm NW14-2209.

**Technology Applied to Medicine: New Careers for Engineers** – Laurence R. Young, aero/astro, chairman of Harvard-MIT Committee on Biomedical Engineering. Health Careers and Currents in Medicine Seminar (124). 3-4:30pm, Rm 9-150.

**The Bible as a Source of Ethical Teaching** – Guest speaker, to be announced, will discuss "The Moral Teachings of Christ". Ethics: Sources and Applications Lecture (343a). 10:30am-12n, Rm 1-134.

**What is the Philosophy of Religion?** – Boruch Brody, philosophy. Philosophy Lecture (241). 2pm, Rm 4-231.

**The Energy Crisis and the State of the Economy** – Paul A. Samuelson, Insitute Professor of Economics, Lester C. Thurow, economics, and Paul W. MacAvoy, Alfred P. Sloan School of Management. Economics Lecture (77). 2pm, Rm E52-394.

**Canadian Electoral Politics: Impeach the Prime Minister** – Walter Dean Burnham, political science. Political Science Seminar (261g). 3-5pm, Rm 1-190.

**What Price Health?** – Thomas H. Ballantine M.D., director, Commonwealth Institute of Medicine. Film and lecture. Innovations in Medicine (266). 10am-12n, Rm 16-134.

**Prospective Thesis Topics in Solid Earth Geophysics** – Sean C. Solomon, earth & planetary sciences. Earth & Planetary Sciences Lecture (74). 3pm, Rm 54-425.

**Everything You Always Wanted to Know About Cosmology in Two Painless Lectures** – Kenneth Brecher, physics. Physics Potpourri (259). 3:30pm, Rm 37-212.

**Communication and Probabilistic Systems** – Research Opportunities in Electrical Engineering Seminar. 4:30pm, Rm 10-105. Refreshments, 4pm.

### Friday, January 18

**Photovoltaic Solar Cells** – Dr. Ivars Melnaglis, Lincoln Lab. **Materials & Techniques for Solar Energy Conversion** – Dr. Harry Gatos, electrical engineering, associate director, Center for Materials Science and Engineering. Physics Seminar. 10-11:30am, Rm NW14-2209.

**Ocean Dynamics Experiments** – Carl I. Wunsch, earth & planetary sciences. Earth & Planetary Sciences Lecture (74). 11am, Rm 54-425.

**New England Geology and Continental Drift** – Richard S. Naylor, earth & planetary sciences. Earth & Planetary Sciences Lecture (74). 3pm, Rm 54-425.

**Where Surface Tension Reigns\*** – Edward W. Merrill, Carbon P. Dubbs Professor of Chemical Engineering. Chemical Engineering Special Polymer Lecture Series. 3pm, Rm 12-1102.

**The Challenge of Semiconductor Electronics** – Dennis Buss, Texas Instruments. Science in Industry Seminar (258). 3:30pm, Rm 9-150.

**Eclipsing Binary Stars** – Hale Bradt, physics. Physics Potpourri (259). 3:30pm, Rm 37-212.

**Electronics, Computers and Systems** – Research Opportunities in Electrical Engineering Seminar. 4:30pm, Rm 10-105. Refreshments, 4pm.

**Laboratory Synthesis of Genetic Material** – Har G. Khorana, Alfred P. Sloan Professor of Chemistry. Chemistry Seminar (48). 4:30pm, Rm 18-290.

## Community Meetings

**Open Forum on the Role of the Arts at MIT (348)** – Roy Lamson, chairman, Special Assistant to the President for the Arts. 2-4pm, Wed, Jan 9, 2-4pm, Rm 14E-109.



**Course Evaluation** — (238c) — Sponsored by SCEP & TCA. Briefing meeting Wed, Jan 9, 7pm, Stu Ctr Rm 450; then daily after 10am.

**Grievance Committee (322c)** — Sun, Jan 13, 6pm, Stu Ctr Rm 401.

**Women's Forum\*** — Meeting Mon, Jan 14, 12n, Rm 10-105.

**Men & Women: A Discussion of Some Life Styles** — Alice Ilchman, dean, Wellesley College, Warren Ilchman, Harvard University. Association for Women Students. Mon, Jan 14, 3-5pm, Stu Ctr Mezzanine Lge.

**Open Forum on the Role of the Arts at MIT (348)** — William Porter, chairman, Dean of the School of Architecture and Planning. Wed, Jan 16, 2-4pm, Rm E14-109.

**Student Committee on Educational Policy (325)** — Wed, 7:30pm, Stu Ctr Rm 353. **Education Lectures Project Meeting** Mon, Jan 14, 7pm, Stu Ctr Rm 401.

**Hillel Social Service Project\*** — Training sessions for social service project for the elderly will be held Thurs, Jan 10 & Jan 24. Social programs will be held at Georgetown Community Center on Thurs, Jan 17 & at Mattapan Community Center Sun, Jan 20. Contact Hillel, x3-2982, for further information.

**MIT Community Players\*\*** — Monthly meeting, featuring a series of improvisations. Come participate or observe. Mon, Jan 14, 7:30pm, Stu Ctr Mezzanine Lge. Refreshments.

**PDP-II Users Meeting\*** — Discussion with DEC software support. Tues, Jan 15, 2:30pm, Rm 13-5002. Coffee, 2pm.

## 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; all Stu Ctr Rm 407. Jeff, x3-5285 or 864-5571.

**Constitutions Service (342a)** — Discussion on "Design Features of Organizations". Wed, Jan 9, 2:30-5pm, Stu Ctr Rm 401.

**Mathematics Club (169a)** — Thurs, Jan 10, 3pm — Phonological Rules, Prof. Morris Halle, foreign literature & linguistics. Mon, Jan 14, 3pm — Prof. Daniel Kleitman, mathematics. Thurs, Jan 17, 7pm, — planning meeting for spring term.

**MIT/DL Bridge\*\*** — Tues, 6pm, Stu Ctr Rm 491.

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

**White Water Club\*\*** — Pool Session. Tues, Jan 15, 8-10pm, Alumni Pool.

## Movies

**Relation of Mathematics to Physics** — Feynman Film Series, Physics (243a). Wed, Jan 9, 1pm, Rm 26-100.

**Challenge in the Classroom** — Math Films (163). Wed, Jan 9, 4pm, Rm 2-190.

**The Grand Illusion** — World War I: Film and History Series (143). Wed, Jan 9, 7-10pm, Rm 10-250.

**Great Conservation Principles** — Feynman Film Series, Physics (243a). Thurs, Jan 10, 1pm, Rm 26-100.

**Geyser Valley and Heartbeat of a Volcano** — Earth Sciences Theatre (63a). Thurs, Jan 10, 4pm, 8pm, Rm 54-100.

**Energy: A Social Problem** — Film Series on the Energy Crisis (153). Thurs, Jan 10, 5pm, Rm 10-400.

**Energy: A Social Problem** — Film Series on the Energy Crisis (153). Fri, Jan 11, 12n, Rm 10-400.

**Symmetry and Physical Law** — Feynman Film Series, Physics (243a). Fri, Jan 11, 1pm, Rm 26-100.

**Kids in Cities (285)** — Urban Studies and Planning Film Series. Mon, Jan 14, 2pm, Bldg E21.

**Surtsey Volcano and Earthquakes: Lessons of a Disaster** — Earth Sciences Theatre (63a). Fri, Jan 11, 4pm, 8pm, Rm 54-100.

**Ipress File** — LSC. With Lone Ranger Serial. Fri, Jan 11, 7:30pm, 10pm, Rm 10-250. Admission 50 cents, ID required.

**Distinction of Past and Future** — Feynman Film Series, Physics (243a). Mon, Jan 14, 1pm, Rm 26-100.

**Challenging Conjectures** — Math Films (163). Mon, Jan 14, 4pm, Rm 2-190.

**The Not So Solid Earth and Exploring the Restless Earth** — Earth Sciences Theatre (63a). Mon, Jan 14, 4pm, 8pm, Rm 54-100.

**Energy vs. Ecology** — Film Series on the Energy Crisis (153). Mon, Jan 14, 5pm, Rm 10-400.

**Energy vs. Ecology** — Film Series on the Energy Crisis (153). Tues, Jan 15, 12n, Rm 10-400.

**Probability and Uncertainty in the Quantum Mechanical View of Nature** — Feynman Film Series, Physics (243a). Tues, Jan 15, 1pm, Rm 26-100.

**Kids in Cities (285)** — Urban Studies and Planning Film Series. Tues, Jan 15, 2pm, Bldg E21.

**San Francisco: The City That Waits to Die, An Approach to the Prediction of Earthquakes and San Andreas Fault** — Earth Sciences Theatre (63a). Tues, Jan 15, 4pm, 8pm, Rm 54-100.

**Mark Twain — Background for his Works and Mark Twain's America** — Humanities Film Festival. Wed, Jan 16, 12:10pm, Rm 14-1615. Coffee. Bring lunch.

**Seeking New Laws** — Feynman Film Series, Physics (243a). Wed, Jan 16, 1pm, Rm 26-100.

**Kids in Cities (285)** — Urban Studies and Planning Film Series. Wed, Jan 16, 2pm, Bldg E21.

**Films for a New Age: The Ultimate Mystery** — IAP 153a Film. Wed, Jan 16, 2pm, Rm 6-120.

**Fixed Points** — Math Films (163). Wed, Jan 16, 4pm, Rm 2-190.

**All Quiet on the Western Front** — World War I: Film and History Series (143). Wed, Jan 16, 7-10pm, Rm 10-250.

**Kids in Cities (285)** — Urban Studies and Planning Film Series. Thurs, Jan 17, 2pm, Bldg E21.

**Andros Reef and Carbonate Sedimentation** — Earth Sciences Theatre (63a). Thurs, Jan 17, 4pm, 8pm, Rm 54-100.

**Hydroelectric: Clean Power?** — Film Series on the Energy Crisis (153). Thurs, Jan 17, 5pm, Rm 10-400.

**Hydroelectric: Clean Power?** — Film Series on the Energy Crisis (153). Fri, Jan 18, 12n, Rm 10-400.

**Kids in Cities (285)** — Urban Studies and Planning Film Series. Fri, Jan 18, 2pm, Bldg E21.

**Controversy over the Moon, Solar Prominences, The Solar System and The Depths of Space** — Earth Sciences Theatre (63a). Fri, Jan 18, 4pm, 8pm, Rm 54-100.

**Great Bank Robbery** — LSC. With Lone Ranger Serial. Fri, Jan 18, 7:30pm, 10pm, Rm 10-250. Admission 50 cents, ID required.

## Theatre

**Works-in-Progress\*** — Boston playwright Vince Canzoneri will present a form of drama involving video-camera, video-production and live cameras. The actors will be televising themselves while acting so that the audience will see both live and televised action. Followed by a discussion. Thurs, Jan 17, 8:30pm, Kresge Little Theatre. Admission \$1.

## Exhibitions

**The Stars, The Moon\*** — Black and white photography exhibition sponsored by the Committee on the Visual Arts. Comprised of photographs taken at the California Institute of Technology's Mount Palomar Observatory and by NASA's five lunar orbital satellites in 1966-67. Fri, Dec 14, Sat, Jan 12, Hayden Corridor Gallery.

**Recent Paintings by Don Robertson\*** — Sponsored by Committee on the Visual Arts. Exhibit Sat, Dec 15-Sat, Jan 12, Hayden Gallery. Hours: 10am-4pm Mon-Sat, closed Sun.

**Photography Exhibition\*** — "8x10 Contact Prints" by Ron Rosenstock. Thru Tues, Jan 15, 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

**Saturday, January 12** — V Basketball. RPI, 8:15pm, Rockwell Cage. JV/F Basketball. Browne & Nichols School, 6:15pm, Rockwell Cage.

**Monday, January 14** — Var B Basketball. Emerson, 7:30pm, Rockwell Cage.

**Tuesday, January 15** — F, V Basketball. Tufts, 6:15pm, 8:15pm, Rockwell Cage.

**Friday, January 18** — V Basketball. Norwich, 8:15pm, Rockwell Cage.

## Religious Services and Activities

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

**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.

**Hillel\*: Services** — Mon-Fri, 8am, Rm 7-102; Fri, Traditional 4:15pm, K 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 K kosher Kitchen, must order by Tues each week. Beginning Jan 7, \$2.25/each, Mon-Fri. Info and to order, Herbie Levine, x8403 Dorm. **Workshop in Creative Services** — call Hillel for info.

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

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

## Announcements

**February Degree Recipients** — Post cards must be returned to E19-335 no later than Fri, Jan 25, 1974 to indicate whether diploma is to be mailed, picked up or if June attendance is planned.

## Dining

**Wednesday, January 9** — Lunch: chicken paprikash. Dinner: green pepper steak over rice. **Thursday, January 10** — Lunch: chili chop steak on bun. Dinner: Canadian bacon. **Friday, January 11** — Lunch: hot turkey sandwich. Dinner: fish baked in mornay sauce.

## New IAP Listings

**Desert Island Physics** — Quantum mechanics derived from first principles, with applications to particle, nuclear, atomic and solid state physics. Prof. B.T. Feld. Jan 25, 29 & 30, 2-5pm, Rm 26-414.

**MOO** — Prof. Joel Spencer. We shall analyze & play the game of MOO, the object of which is to guess a four digit number in the minimum of guesses. Meetings Jan 14, 17, 21, 11am-12n, Rm 2-151.

**Key Telephone Systems** — Kevin Koch, Draper employee, Julian West, student. Course on hardware and creating service, not stealing it. Meetings: Mon, Jan 14, introduction & sets; Thurs, Jan 17, key service units & key telephone units; Mon, Jan 21, esoterica. All meetings 8pm, Rm 1-146.

## Additional IAP Information

The following are changes, corrections and additions to the information which appeared in the Final Guide to IAP. The bold numbers correspond to the numerical listings in the Guide.

**Brief Introduction to Law (264)** — Topics for seminar are: Mon, Jan 14, Introduction to Anglo-American Law; Tues, Jan 15, Watergate (Part I); Wed, Jan 16, Your Income Tax; Thurs, Jan 17, Constitutional Law; Fri, Jan 18, Watergate (Part II). Further information, see IAP Guide.

**Micrographics (157a)** — Meetings will be Tues, Jan 15-29, 2-3:30pm, Rm 14-0551, Microreproduction Lab.

**Workshop on Secretary/Supervisor Relations (336)** — All panels will be held 12n-2pm, Sala. Tues, Jan 22: discussion of secretarial role. Thurs, Jan 24: supervisory role. Thurs, Jan 29: brainstorming session, not a formal panel.

**NASIC Demonstrations (158)** — CHEMCON, chemistry data base, will be demonstrated Thurs, Jan 17, 1pm, Barker Engineering Library, 5th floor. By appointment only. Call Phillip Piper, x3-7746.

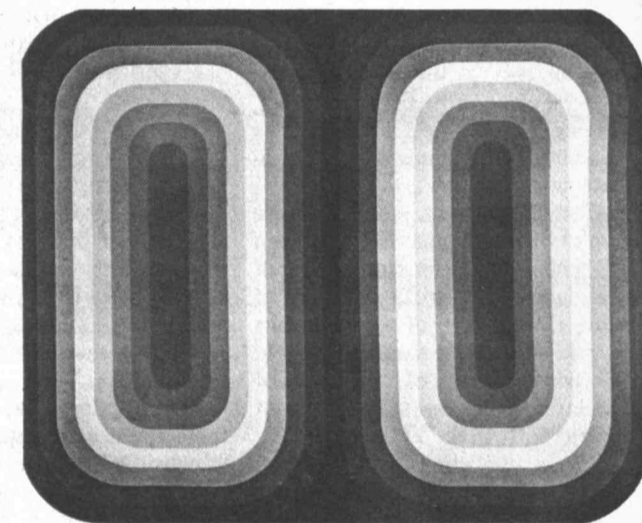
**How to Find Out in Engineering (157)** — INFORM, business/management oriented data base, will be demonstrated as part of seminar on NASIC. Wed, Jan 23, 3pm, Barker Engineering Library Orientation Rm, 5th floor. By appointment only. Call Phillip Piper, x3-7746.

**Ragtime, Old-Time Jazz Jam Sessions (313a)** — All musicians and music lovers invited. Three Fri evening sessions, 8pm-12m, Stu Ctr; Jan 11, Sala; Jan 18, Rm 407; Jan 25, Rm 491. Bring instruments, beverages, no food allowed, Information, Sam Benichasa, x8-3686 Draper, 547-2520, evgs.

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

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

Send notices for January 16 through January 25 to the Calendar Editor, Room 5-111, Ext. 3-3279, before noon Friday, Jan 11.



Summer Palace Series, Double Oval No. 1, one of the acrylics on shaped canvases, comprising a one-man show of paintings by Don Robertson now on display at Hayden Gallery and remaining on view through Jan. 12.

## Technology and Culture Seminar

The MIT Technology and Culture Seminar is co-sponsoring two lecture series during IAP—one by Professor Marx Wartofsky, philosophy chairman at Boston University, the other by Ronald S. Laura, Oxford University.

The Wartofsky lectures—the first of four was given Tuesday afternoon—are entitled "Picturing, Modeling and Representing: Science and Art as Modes of Cognitive Praxis and Objectivity"—and are co-sponsored with the MIT Departments of Philosophy, Architecture and Physics. The remaining Wartofsky lectures will be presented Tuesday, Jan. 15, 22 and 29, starting at 5:15pm in Rm. 1-190. Professors Stanford Anderson, Richard M. Held, Jerome Y. Lettvin and Barbara Herman are among respondents who will discuss individual lectures at buffet dinners (\$1) in the Mezzanine Lounge, Student Center, following each lecture.

Professor Wartofsky is known for his work in the philosophy of science. His lectures examine the ways in which science and art see and represent the world and the ways these perspectives interact.

The second lecture series—"Objectivity and Decision: Philosophical Problems in Purposive Action"—will also start at 5:15pm in Rm. 1-190, co-sponsored with the Department of Urban Studies and Planning. Mr. Laura, a PhD candidate at Oxford's Brasenose College whose particular interest is with ethical issues in problems of planning, will discuss in his lectures the problem of objectively determining "truth" when normative decisions must be made. A similar buffet supper (\$1, Mezzanine Lounge, 6:45pm) will follow where respondents will be Professor Judith J. Thomson, Department of Philosophy, and Frank T. Keefe, director of the City Development Authority of Lowell, Mass.



# Placement Office Annual Report Highlights Brighter Employment Prospect for MIT Grads

By CHARLES H. BALL  
Staff Writer

A master's degree in management from MIT's Alfred P. Sloan School of Management can add \$5,000 to an engineering graduate's starting salary, according to the report of the Career Planning and Placement Office for the academic year 1972-1973.

Robert K. Weatherall, director of placement and assistant dean of the Graduate School, said that salaries paid to last June's recipients of master's degrees in management rose a "remarkable" ten percent over what they had been a year before.

Offers in the range of \$16,500 to \$17,000 were "typical" for master's degree holders from the Sloan School, Mr. Weatherall said. "A senior in engineering who is interested in business can raise his starting salary by \$5,000 if he goes to Sloan. A senior in the humanities or social sciences, whose undergraduate qualifications have little direct application in business, enjoys an even larger return on his investment in a Sloan degree."

Other highlights of the report, to be distributed Jan. 9:

MIT students graduating last year found in general "a gratifying market for their talents."

During the past four years, engineering graduates "have not been the hardest, but the easiest, to place." Furthermore, because of a decline in engineering enrollments at other schools and an increasing demand for engineers, an engineering degree "will continue to be a precious commodity."

The numbers of seniors going into medicine and law continued to increase. A total of 96 seniors—11 percent of the June graduating class—gained admission to medical school and 37 seniors—four percent of the class—entered law school.

Women graduates did "extremely well" in obtaining jobs and in gaining admission to graduate schools.

Mr. Weatherall said salaries paid to graduates to the Sloan school and other leading schools of management "are a measure of the complexity of the modern world, in which a single corporate decision can cost millions of dollars and affect thousands of workers."

"It is important that such decisions be approached systematically," he said. "The sophisticated methods of analysis employed by industry have created a demand for people with specific training and the candidate who has mastered the analytical techniques in business school is valuable beyond his years."

## Planning Positions

While the outlook was good for most of MIT's master's and PhD graduates, an exception was in architecture and planning, Mr. Weatherall said.

Out of 51 students graduating with master's degrees in architecture and planning who reported on their employment situation at graduation, 15 (more than a quarter) said they were uncertain of what they would be doing, he reported.

"Architects' offices have been short of work and reductions in federal aid to the cities have cut the number of available planning positions," the report commented.

## Find Jobs

Mr. Weatherall said doctor's degree recipients "did surprisingly well." In spite of tight academic budgets, the number of PhD's finding university teaching jobs jumped seven percentage points and the number finding jobs in industry rose three points, he said.

As for seniors graduating last June, the number taking jobs in business and industry, which reached a low of 12% in 1971-1972,

rose to 14%. The number going on to graduate school rose four percentage points to 67%.

"These upswings," Mr. Weatherall said, "left a reduced number of students reporting such occupations as disc jockey, playing the trombone or 'traveling.'" Fourteen percent of the seniors—and in this there was no change from the previous year—said at graduation that their plans were unsettled or that they had been unable to find jobs, he said.

## Less Than Half

Mr. Weatherall said that seniors admitted to medical and law schools were "some of the best and the brightest in the class." The national competition for admission to these schools had developed "to the point that a student generally needs to have an excellent record to gain acceptance," he said.

"Half of our successful applicants in 1972-73 came from the top quarter of the class. It is from the top quarter that every graduate school, and every employer, would most like to draw recruits—and out of this select cadre at MIT last year, the medical schools won virtually one in five," he said.

Mr. Weatherall said the 11% of seniors going to medical school compared with less than five% as recently as 1968, and that the percentage going to law school in 1968 probably was less than half of last year's four%.

## Power and Grace

Because the overall percentage of seniors going to graduate school has not been rising, "the increased numbers headed for medical and law school point to a significant reduction in the number continuing their education in science and engineering."

Mr. Weatherall made this added observation:

"The students headed for medicine and law are representative of a considerable number of students who major in a science or engineering discipline at the Institute not because they have chosen the field for their profession but because they are interested in the subject and they know that the educational experience will be valuable whatever field they enter. They bring to the profession which they ultimately choose the cultivated intellect which Cardinal Newman praised as the hallmark of a liberal education in which, 'a good in itself, brings with it a power and a grace to every work and occupation.'"

## Staying Home

On the subject of women degree recipients last year, Mr. Weatherall said that a larger proportion of women seniors than of men went on to graduate school. "Of 15 women seniors and graduate students who applied to medical school, all but one were accepted," the report said. "At the doctoral level," it added, "women were proportionately more successful than men in obtaining faculty appointments."

## Good Health

He added: "Husbands and wives are planning their lives so that both can have a satisfying career. We see as many husbands as wives who say that they are limited to a certain area in their search for a job or a graduate school because their spouse is going to school there. Couples are taking turns in making the lead decision if the

plans of one must wait on the plans of the other. To a much greater extent than in the past, men and women are obtaining their education together, and they want to share the joys of productive work."

Mr. Weatherall said the recovery of the economy during the year, bringing with it increased demand for engineers, coincided with news that freshmen enrollments in engineering across the country in 1972 were the lowest in 20 years.

But he said that engineering enrollment at MIT this fall continued to show "good health."

## Previous Year

"A number of companies who look to the Institute for engineering talent expressed concern about their future supply," he said. "We were glad to be able to assure them that engineering enrollments at MIT had held up well."

Mr. Weatherall said a "disproportionate emphasis" had been placed on unemployment in engineering over the past few years. He said the profession had been "hard hit" by the recession, but that other professions and occupations also had been seriously set back.

The report also commented on educational debt carried by students at graduation. In 1972-73, it said, 56% of graduating seniors reported owing money for their education as compared with 53% the previous year.

## Less Inclined

The median of indebtedness for those in debt, the report said, was in the range \$3,251-\$3,500 for bachelor's degree holders, \$2,251-\$2,500 for master's degree recipients and \$1,751-\$2,000 for PhD's.

Mr. Weatherall said it was interesting that doctor's degree recipients, after eight years or more of expensive education, are so much less often in debt and carry so much less debt than graduating seniors.

He added: "Is it because scholarship aid was more readily available, and tuition was lower, when today's PhD's were undergraduates, or is it because seniors owing money on their undergraduate education are less inclined to go on to graduate school than those who do not?"

Mr. Weatherall said that study of the plans of last year's seniors suggests that students who are in debt at graduation are "less likely to go on to graduate school as their next step than those who owe nothing."

## Starting Salaries

The report cautioned, however, that "we do not know whether it is

a student's indebtedness which inhibits his going to graduate school, or whether the inhibition is rather a function of his lack of means so that even if he had not had to borrow to meet his undergraduate expenses he would still be hesitant about embarking on graduate study."

"Clearly," the report said, "indebtedness does not inhibit all students. Many seniors going on to graduate school owe \$5,000 and more."

The report added that while more undergraduates than in the past are borrowing to pay their tuition, tuition increases "have not outstripped students' earning power. Despite the ravages of inflation, the cost of tuition has remained almost constant in relation to bachelors' starting salaries."

## Three Are Named Asst. Comptrollers

Three members of the MIT comptroller staff have been promoted to Assistant Comptrollers.

They are John P. Leonard of Duxbury, Mass.; Richard A. May of Westville, N.H.; and John C. Sears of Hanover, Mass. Announcement of the appointments was made by MIT Comptroller Philip J. Keohan.

Mr. Leonard, a graduate of Boston College, came to MIT as a staff accountant in the Research Fiscal Office in 1956. From 1964 to 1972 he was manager of the Fiscal Office at MIT's Charles S. Draper Laboratory. Since November, 1972, he has been senior accounting officer in the Comptroller's Accounting Office responsible for personnel activities, including payroll and employee benefits.

Mr. May, who received his degree in business administration from Northeastern University, came to MIT in 1954 as a clerk in the Payroll Office. From 1961-1969 he was coordinator of payroll and accounting computerization. Since July, 1969, he has been assistant accounting officer responsible for design and implementation of computer systems in the Comptroller's Accounting Office.

Mr. Sears received the certificate from the Bentley School of Accounting and Finance in 1962. He came to MIT in 1957 as assistant payroll supervisor. From 1964-1972 he was an accounting officer in the Comptroller's Accounting Office. In February, 1972, he became senior accounting officer responsible for a wide variety of accounts payable and receivable.

## Where Are Cylinders?

A new shortage threatens MIT.

Gas cylinders.

According to Robert E. Durland of the Purchasing Office, suppliers of compressed gases are running short of cylinders and may have to curtail deliveries. There is no immediate threat, but if the shortage persists and becomes more severe, curtailments can be expected, he said.

Major users of compressed gases—like MIT—can alleviate the shortage. Durland estimates that there are between 3,500 and 4,000 cylinders at MIT. Many, he said, are rarely used and some haven't been used for years.

"Steady users of com-

pressed gases are not a problem," Durland said. "They have a regular turnaround of cylinders."

"The people we want to reach are occasional users who may use half a tank, then leave the rest standing in the corner."

Seldom used cylinders, Durland said, also offer an opportunity for MIT to save some money. Demurrage charges of five cents per day are assessed on cylinders after a 30-day free period. "In many cases," he said, "the demurrage charges are more expensive than the gases remaining in the cylinders."

Persons with cylinders to return may call x3-4761 for pick-up service.

## Arts Council Makes Grants

Grants totaling \$5,525 have been made by the MIT Council for the Arts to six MIT activities in the arts and related fields.

The grants were announced by Professor Roy Lamson, special assistant to the president for the arts. They are:

—\$2,000 to MITV, an undergraduate television news group, for purchase of a video camera;

—\$1,500 to Professor William L. Porter, dean of the School of Architecture and Planning, and Gyorgy Kepes, Institute Professor emeritus and director of the Center for Advanced Visual Studies, in support of a symposium scheduled to be held at MIT in February.

—\$1,000 to Judith Wechsler, assistant professor of art history, for outside lectures in her subject, "Topics in Art, Science, and Technology;"

—\$500 for purchase of tickets, at 25 to 50 cents each, for underprivileged Cambridge-area children to attend performances of the New York Theatre Festival, a non-profit touring company that will present 32 productions for elementary and high school students in Kresge Auditorium in the spring of 1974;

—\$300 for a stipend to Maria Magosciova, a professional choreographer, to organize, coach and supervise an MIT Slavic Dance Workshop;

—\$225 to the student newspaper *Thursday* to pay authors of the paper's "RSVP" column at \$15 each for 15 pieces to be published during spring 1974.

The Council for the Arts at MIT, formed in 1971, is composed of 65 distinguished men and women from various parts of the country who give advice and support to the arts at MIT.

## Opera Cast Sought

John Cook, director of the MIT Opera Workshop, is recruiting a chorus for the production of "Orpheus and Euridice," this year's Workshop production.

The opera, composed by Christoph W. Gluck in 1762, calls for a chorus of 30 as well as a full production crew and set and costume designers. To revise the English version of the opera, Mr. Cook also is looking for someone proficient in Italian to work on the original Italian libretto. Interested participants call John Cook, x3-6961 or leave a message at x3-3210.

## Novel Grant For Fuel Study

(Continued from page 1)

program at the Institute. The responsibility of the new engineer will be to try to determine where economies can be made and then implement procedures to bring them about.

Mr. Shepherd estimated recently that energy savings measures already in effect at MIT, prompted by the energy squeeze and the rising cost of fuel, could save the Institute as much as \$600,000 this year.

He said he expected the estimated savings to be about evenly divided between electric consumption and boiler fuels, both oil and gas.

MIT's original energy budget for the fiscal year ending June 30 was \$3.2 million, but increases in the price of fuel could have pushed actual costs to as high as \$5 million, Mr. Shepherd said.

However, he said, energy conservation measures have cut into these projected increases—and could reduce them by about \$600,000.



# MIT Pair Suggest Methanol As Alternative to Gasoline

Methyl alcohol may offer an attractive alternative to gasoline in reducing automobile pollution and in alleviating the oil shortage, say two MIT scientists.

In an article in the 21 December issue of *Science*, Thomas B. Reed and Robert M. Lerner, staff members at MIT's Lincoln Laboratories, described an independent study they carried out on methanol as an automobile fuel. Methanol, commonly known as wood alcohol is presently used extensively in the chemical industry as a base compound.

The scientists said methanol, with an energy per volume second only to gasoline, and at a slightly higher cost, gave significantly better mileage, in terms of energy consumed and at the same time greatly reduced emissions.

A 1970 American Motors Gremlin converted to methanol use in a government study cited by Reed and Lerner essentially met the proposed 1976 emission standards and had five times lower emission than the same car operated with gasoline.

"From these results, it becomes clear that if gasoline becomes scarce or too expensive, we can design cars that will operate on pure methanol with low pollution," the researchers said.

"Specific fuel consumption will probably be higher on a weight or volume basis, necessitating a larger fuel tank; but specific energy consumption (energy/

distance) will certainly be lower due to the ability to use higher compression ratios and simpler pollution controls."

The principal drawback to methanol's use as a fuel, the scientists said, is that not enough is now being manufactured. However, they have found that methanol could now be used to stretch present gasoline supplies.

In a series of tests the scientists ran unmodified cars on mixtures of up to 30% methanol in gasoline. They found that fuel economy increased up to 13%, carbon monoxide emissions decreased up to 72% and acceleration increased by 7%.

"It is indeed astounding that small additions of methanol can so disproportionately affect the octane and other properties of gasoline. We believe during the compression stroke in an internal combustion engine the methanol absorbs a large amount of heat, cooling the fuel and quenching premature combustion. The dissociation products of methanol, hydrogen gas and carbon monoxide, increase the flame velocity

**Pedestrians in the West Campus area are urged to use a recently built sidewalk in back of Baker House along Amherst Alley during snowy weather. The regular walkway is frequently blocked with snow cleared from the alley and is unsafe.**

and give more complete and efficient combustion," they said. This is because 10% methanol by weight in gasoline, when dissociated, yields a fuel mixture which is 40% hydrogen gas by volume.

The scientists also pointed out that methanol could be used for home heating and to generate electricity once it is manufactured on a large scale and, thus, becomes sufficiently cheap.

They contended that, unlike hydrogen suggested as a fuel by many experts, methanol presents no special problems in storage or shipment, because it can be kept in conventional fuel tanks and shipped in tank cars, tank trucks, and tankers, and transported in oil and chemical pipelines.

"Methanol can continue to serve man's energy needs as we run out of fossil fuel because it can be made from so many sources," contended Reed and Lerner. Among the sources they suggested were, the methane gas flared off from oil wells, coal, wood, municipal refuse, and the decomposition of natural wastes such as manure and sewage.

## Obituaries

### R.L. Wille, 62

Dr. Ing. Rudolf L. Wille, 62, professor of fluid mechanics at Technical University of Berlin and frequent visiting lecturer at MIT, died on Thursday, Dec. 27.

Professor Wille came to MIT as administrator for the MIT-TUB Faculty Exchange Program and was an exchange professor at MIT in the Department of Aeronautics and Astronautics in 1967-68.

He was director of the Hermann

Foettinger Institute of Fluid Mechanics at TUB and was a member of various governing councils of German aerodynamic associations and research councils of the German government. In 1972-73 he was a fellow of Churchill College and visiting professor in the engineering department of the University of Cambridge, England.

### M. Chamberlain, 80

Marguerite Chamberlain, 80, science librarian emerita at MIT died Dec. 13, in Toledo, Ohio.

Miss Chamberlain came to MIT as Eastman Librarian in 1932. When the Science Library was organized in 1952, combining Eastman and Lingren Libraries, she became Science Librarian. She retired in 1959.

Survivors include a sister, Mrs. Joseph Jordan, Toledo, and several nieces and nephews. A memorial service will be held this spring in Waterville, Me.

### Elenora Whaley, 60

Elenora N. Whaley, 60, of Cambridge, wife of Leonard W. Whaley, the manager of East Campus, died on Saturday, Dec. 1.

Mrs. Whaley, who resided in East Campus with her husband from 1967-1969, is survived by her husband and a daughter, Mrs. Jacqueline Fairley of New York.

### Agnes Driscoll, 85

Agnes E. Driscoll, 85, of Arlington, who retired in 1958 as stock clerk in laboratory supplies, died Dec. 2. Mrs. Driscoll began work at the Institute in 1919. She is survived by a daughter, Marie J. McGrath of Arlington.

## 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.

### Sloan School of Management

Synchronization of traffic signals. A project is underway in which the underlying problem would be to set traffic signals in a street network or along an artery so as to minimize driver inconveniences. Several means have been proposed for this, such as (1) a model of traffic, (2) a measure of performance, and (3) an optimization technique. The Operations Research Center has a project underway concerned with developing signal-setting methods. The UROP project would be focused on the application of two or more methods to a street in Waltham (Main Street). These will be evaluated through theoretical traffic models and, if possible, field measurements. Feedback from the process will be used to modify the methods. As many as five students could participate for academic credit. Contact Prof. John D.C. Little, 24-215, x3-3601.

**Cabot Corporation** **Billerica**  
The Billerica Research Center of the Cabot Corporation has suggested two project areas for UROP students:

(1) Cabot Corporation has under development an *in vitro* blood gas analyzer using mass spectrometry as the basis for quantitative gas measurement. Such an instrument system would supplement the present electrode based blood gas analyzer which tends to be operator-sensitive and less reliable than the mass spectrometer system has the potential for being. An area of concern here is the possible depletion of gas at the inlet membrane-blood interface. Several alternatives are being considered that would lead to the reduction of these gas depletion problems, such as the use of secondary flow to decrease the boundary layer or the use of degasification procedures so that the liquid phase may be eliminated. Some experience in liquid and gas flow phenomena is desired to carry out an investigation of alternative techniques for the solution of gas inlet problems and subsequently to make experimental or theoretical investigation of the technique chosen to determine its applicability to the mass spectrometer blood gas analyzer. Credit.

(2) The Applied Physics Group of the Cabot Technical Center at Billerica has suggested an appropriate project to commence during the January IAP period. The project is an extension of work on the surface photo-voltage effects in CdS crystals previously reported in *Surface Science* 29 (1972) by Lagowski, Balestra and Gatos, of the Department of Metallurgy and Materials Science. The student would assist in devising and preparing experiments, obtaining and analyzing data, preparing samples, and modifying the test equipment to improve the test results as required. The student should be pursuing studies in materials science or physics with emphasis on semiconductor materials and devices and be familiar with theoretical and laboratory aspects of preparing, testing and analyzing experimental results for the high band gap semiconductor materials such as FaAs and CdS.

**Massachusetts General Hospital** **Boston**  
A laboratory at MGH is utilizing recent advances in the knowledge of biomembrane

structure to elucidate the mechanism of action of pain controlling drugs. An opportunity exists for an undergraduate to participate in one of the following areas: (1) Experimentation on the uptake of anesthetics into prepared lipid membranes to define the composition of the membrane; (2) Study of the perturbations of membrane structure by anesthetic agents using dilatometric and electron spin resonance techniques; and (3) Study of the effects of nerve blocking compounds (local anesthetics) on ion permeability at physiologically active doses.

### Boston State Hospital

A major aspect of research at the Sleep and Dream Laboratory at Boston State Hospital is the continuous polygraphic recording of sleeping laboratory animals and humans under various conditions (drugs, neural or physical disorders, emotional disorders, etc.). Presently polygraph recordings are scored visually by a human record keeper according to a standardized procedure. The laboratory would like to work with a student who would develop a machine to mimic visual scoring, thus relieving the human record keepers of dull work and increasing reliability. The student would have access to an PDP-8.

### Appalachian Mountain Club (AMC)

AMC, the largest association of hikers and outdoors people in New England, has suggested two project areas for MIT undergraduates: (1) Energy—The AMC operates a system of eight remote huts in the White Mountains of New Hampshire and an opportunity is available for a student to study alternative methods for providing energy needed by stove, refrigerators and lights for the huts. The project would involve analyzing costs, both economic and environmental, of both the present and alternative energy production methods which might involve wind, solar or hydrogen energy production; and (2) Waste Disposal—In addition to the hut system the AMC has 17 shelter-camp sites in the White Mountains and Maine. Sewage disposal is a problem at most sites and the project would involve developing on-site disposal methods and a study of alternative methods.

### Nutrition and Food Science

*In Vitro* metabolism of the chemical carcinogen, aflatoxin: Aflatoxin B1 is a very potent carcinogen for certain rodents and is suspected of being a carcinogen for man. The metabolism of aflatoxin by the rat, mouse, duck, monkey and human liver is under investigation. Projected or ongoing projects are the isolation of unstable intermediates of B1 metabolism, unknown B1 metabolite identification, metabolism of aflatoxins by animals altered by malnutrition or drugs, and a survey of aflatoxin metabolism by diseased humans. Laboratory tools and methods involve use of radioactive isotopes, column and thin layer chromatography, surgical techniques, and computer data analysis. Contact Dr. G.N. Wogan or Bill Roebuck, 56-215, x3-6781.

### Education Development Center (EDC)

EDC is interested in involving students in their Computer and Laboratory Calculus Project which would entail the design of laboratory experiments demonstrating the principles and applications of calculus. Possible projects include: (1) shirt pocket timer to aid data collection in the field; (2) LED light pulse generator for low light level perception experiments; (3) calibration of bicycle ergometer. Experience in electronics is necessary as both design and construction will be done by the student. IAP or spring term to start.

## Graduate Studies

The following brief description of selected graduate fellowships have been received recently by the Graduate School Office. More complete descriptions are available in the Office, Room 3-136.

### New York City Urban Fellowship Program

The New York City Urban Fellowship Program has 20 positions available for 1974-75. Fellows will be placed as interns in city agencies and attend weekly seminars. They will receive academic credit plus \$4,500 in stipend. All undergraduate and graduate students in degree programs who have completed their junior year by September, 1974, are eligible. More information and applications are available in your department headquarters. Deadline: January 14, 1974.

### Woodrow Wilson Doctoral Dissertation Fellowships in Women's Studies

The Woodrow Wilson National Fellowship Foundation is offering 20 doctoral dissertation fellowships for 1974-75 for men and women writing dissertations in women's studies. The fellowships are for a period of up to 12 months and may not be renewed. They cover the cost of tuition and required fees and provide a stipend of \$250 plus a dependency allowance for children. To be eligible, students must be in doctoral programs at graduate schools in the United States and must have fulfilled all pre-dissertation requirements by September, 1974. Students must be nominated by the graduate dean. Deadline: February 1, 1974.

### National Institutes of Health Postdoctoral Individual Research Fellowship Program

The National Institutes of Health (NIH) supports postdoctoral academic and research training in specified health and health-related areas. Proposed study must result in (biomedical) research training in specified shortage areas. Applicants must be citizens or non-citizen nationals of the US, or have been lawfully admitted to the United States for permanent residence at time of application. Applications and a list of the research areas in which fellowship applications will be accepted are available in the Graduate School Office. Deadline: January 15, 1974.

## Foreign Studies

### Summer Study

**German Academic Exchange Service (DAAD)**—announces the availability of 20 scholarships for intensive study of German at the Goethe Institutes in the Federal Republic of Germany in the summer of 1974. Courses will last eight weeks. These scholarships are available to US pre-doctoral students in all fields except German.

An applicant must not be younger than 19, nor older than 32 years at the beginning of the scholarship. He or she must have a knowledge of German (at least one year of college level German), and must have attended a college or a university for at least two years before the beginning of the scholarship.

The scholarship rate for an eight week course will be DM 2,300 (approximately \$900). This amount will cover tuition, board and room plus some additional living costs. Travel costs are not covered. DAAD will also pay the premium for health and accident insurance.

Application deadline is Feb. 25, 1974, at the German Academic Exchange Service (DAAD), New York Office, 1 Fifth Ave., Suite 11D, New York, N.Y. 10003. Further information and application forms may be obtained at the Foreign Study Office, Rm 10-303, x3-5243.

## Credit Union Audit

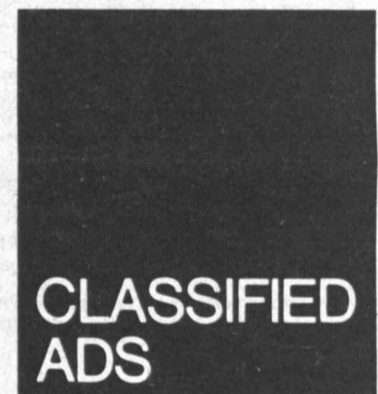
The Supervisory Audit Committee of the MIT Employees Credit Union is now confirming balances of members' accounts. Statements will be mailed this week. Members are asked to check their statements carefully. An instruction card and return envelope will be enclosed to facilitate reporting any errors found on the statements.

## Pistol Course

A five week course in basic pistol marksmanship will be offered by the MIT Pistol and Rifle Club beginning Thursday, Jan. 17. Those interested call George Sechen, x3-2398.

## WBZ Names Dyett

E. Lovell Dyett, a research associate with the Department of Political Science at MIT since January 1972, has resigned to become operations manager for public affairs at WBZ-TV, Ch. 4.



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, January 11.

## For Sale, Etc.

Sgl bed w/hdbrd, \$25. x8495 Dorm.

Oriental rug, 12x9, w/pad, \$40; rugs w/pads: 12x12, \$35; 12x9, \$12; 14,500 BTU Chrysler AirTemp AC, 5 mos, \$135; infant auto safety seat, GM, to 20 lb, \$10; or best. Call, 494-8118.

Pr stud Dunlop snows, mtd VW, \$40. Chip, x3-1558.

Wdn Tempest skis, 185 cm, w/boots, gloves, used 6x, \$75 or best. x0650 Dorm, evgs.

Refrig, \$10. x8-1177 Draper.

TV, Wstghse, b&w, 18" port, "instant on" type, exc cond, \$90. Doug, x3-4170.

VW stud snows, gd cond, 560x15, 2 for \$15. Leo, x3-4314.

Snows, 3 steel stud, 78-14, 3/8" tread, 2 whls, 5 hole, fit Falcon 68-73, Fairlane 68-74 (not GT), \$40; pr andirons, 19" hi, 15" deep, blk iron, brass knobs, nw, \$15. x3-5618.

Snowblower, 2 stage self prop, gd cond, '75 or best. Armand, x3-4200.

Bl desk & chr, \$15; bl chest drwr, \$20; 2 wicker bskt chrs, \$5/pr. Sue, x3-2575.

Necchi sew mach w/out cab, best; Gould oil burner w/controls, 275 gal

tank, \$125. Audrey, x3-4837.

Snows, 2, Frstn T&C, J78-15, ww, mtd, balanced, exc cond, \$35/pr. x7287 Linc.

Elec calculators, 20% off: Melcor 1000, \$48; TI-2500 Datamath, \$64; Bowmar Mx40, \$66; Melcor 380, \$80; nw, yr wrnty, limited supply. Phil, 354-1638, evgs.

AR3 spkrs, exc cond, 2 for price of 1, \$225. Tom, x8-1510 Draper.

Mtl desks, \$ 35/ea, desk calculators, as is. x3-2921.

Stud snows, 2, mtd, 700x13. Jeff, x3-4838.

M plastic Kastinger ski boots, sz 8 m, used 1 seas, \$25. Ed, x8-4459 Draper.

Pr snows, 7.35x15, half worn, free. Jim, x3-1926.

Very old comic books. Jim, x8-1518 Draper.

National tape recdr & match spkrs, exc cond, \$100; flash attach, bulbs, batt, \$11; flash attach shoe for Nikkormat, \$11. Steve, x3-7950.

Chest of drawers, ask \$15. Mike Lutter, x8-4429 Draper.

Free b&w TV w/stand. x3-1878.

Sgl bed; couch; elec organ; b&w 19" TV; carpets; spot lamp; best. Hossein, x3-7795.

TEAC 3300-10 tape desk, b nw, orig packing 10 1/2" reels, all solenoid operation, Advent mics, Sony head demag, Scotch 207 unused tape, best. David, x3-4157.

Hcky skates, sz 12, gd cond, ask \$15. Maslov, x3-3681.

Skis, Kneissl Wh Star, 210 cm, w/step-in-bndgs, gd cond, \$60. Don, 492-6210.

Sofabed, \$30; couch, \$30; standing lamps, \$7; 9x12 rug, \$25; desk & chr, \$60; nego. Henry, 354-1638.

Wheels, 2, 14x7, Chevelle, 5 bolt, \$4; 2, 13x4, Maverick, 4 bolt, \$2. Bill, x8-1303 Draper.

Radial snows, 165x13 SP, 2, less 2 K, fit Fiat 124, \$30. Herman, x3-5483.

Sm desks, 2 w/lamp & chr, \$9.50/ea. Henriette, 494-9106.

Wdn skis, 6', w/54" poles, free; f ski boots, sz 8, cheap. Stu, x3-1418.

Wd hanging storm wndws (2) 34x58; (4) 31x42, (2) 28x58, Sully, x8-4093 Draper, aft 4.

Salon hr dryer, \$11; elec curlers, \$8; Polaroid camera, \$7; hot comb, \$5; car



8-trk, \$18; true lite mirror, \$8. Call, 494-9142.

Solid rock mpl desk, bureau & dresser, \$100. Linda, 262-4127.

Plywd sailing pram, 8', w/sail, Butler, \$75. Paul, x8-1367 Draper.

Sgl bed, little used, w/fr, matt, bx spr, \$75, nego. x3-7350.

Yamaha FG 150 guitar, 6 str, w/case, 2 yrs, ask \$100; Bundy flute, sterling, reg 40832, 5 yrs, orig case, ask \$85. Tony, x5780 Linc.

Abarth muff for '68 BMW 2002, \$25; want motorcycle, 350 cc or so, inexp. Call, 603-898-9146, NH.

Firewood: \$70/cord, \$40/1/2 cord delivered, \$10/2 rows to top (sta wgn), \$8/lg trunk, \$5/sm trunk, both closed. Don or Ed, 655-5125, evgs.

Tires, 2, 78-13, 1 nw, 1 gd cond, \$18/both. Joel, 491-4755.

Sofa bed, \$40; wd bunkbed, \$20; baby stroller, \$10. Call, 776-3794.

Firewood, seas, hrdwd, \$90/cord delivered, \$85/cord pcik up. Darlene, x3-6171.

Headphones: Koss ESP, \$45; Koss Pro 600, \$35. Duncan, x3-2539.

Stud snows, 6.50x13, exc cond, \$40/pr. Call, 492-3837, evgs.

Lg wdn dining tbl, 4-6, gd cond, Arvind, x3-1558.

Austrian ski boots, Keflach, sz 11 m, \$40. Merton J. Kahne, x3-2916.

Radios: '74 Vega am, \$35; '69 BMW amfm, \$75. Eric, 277-7878.

Camera gadget bag, soft blk case, outside pckt & tripod straps, \$6; filters, Canon fl.8, fl.5, sun hood & adapter ring, \$/ea. x3-7787.

Radio direction finder, Apelo ADF-200, 2 yrs, was \$1,275, ask \$600. John Cahill, x8-4573 Draper.

Hseplants, various types, cheap while they last. Marni, Rm 2-272.

Wildcat weekend/holiday lift tkts, 4, '73-'74, \$8/ea. Doug, x3-7220.

Pr snows, G70-14, sl used, mtd, \$20 ea. Pat, x3-6738.

Lenses, b nw, boxed: Pentax 85 mm fl.9, \$100; 105mm f2.8, \$100; Nikon 35mm f2.8, \$75. x7611 Linc.

Lg snorkel parka w/woolf collar, cost \$55, nvr worn, \$40. Bob, x3-7305.

Wedding gown, sz 10, June '73, modified V neck, dbl faced satin, \$60. Schwartz, x7461 Linc.

## Vehicles

'64 Volvo 544, rebt eng, 4 radials, body nds wk, \$200 or best. Jim, x3-2276.

'64 Saab 96, working, \$150. Joh, x8-2570 Draper.

'65 Pontiac, 2 dr, grn, gd transp, dependable, nds muff, \$175. Vince, x8-4459 Draper.

'68 Ford LTD wgn, 302 eng, 15 mpg, no rust or dents, snows, best, Tom, x8-3987 Draper.

'68 Ford Cortina, 4 dr, 60 K, exc cond, \$300. Wu, x3-1910.

'68 Pontiac Le Mans, p st & br, auto, r, ac, nw snows, gd body, \$525. Tom, x8-1276 Draper.

'68 Chevy sta wgn, \$200. Jim, x3-4523.

'68 Cutlass wgn, ac, gd cond, lo miles, \$875. x5721 Linc.

'69 Linc Cont, sed, vinyl top, leath sts, all power, v cln, lo miles, best. Dr. Panet, x3-5128.

'70 Olds Cutlass Sup, 2 dr, conv, sm 8 cyl, auto, r, stud snows, \$1,895, exc mlg. x3-4257.

'70 Dodge Coronet, 4 dr, 318 V8, p st, auto, 45K, \$1,200 or best. Mark, x8-1387 Draper.

'71 Ford Gal 500, hdt, 2 dr, exc cond, nw br, auto, sacrifice \$1,600. Tasos, x8-4980 Draper.

'71 Merc Monterey, exc cond, 2 dr hdt, auto, p st & br, radials/snows, \$1,500 or small car trade. John, x327 Linc.

'72 Chevy Nova, 2 dr, 6 cyl, auto p st, 27K, \$1,750 or best. Carol, x666 Linc.

'73 Ford Torino wgn, p st, auto, 6.2K, \$2,300. G. Smith, x3-4849.

## Housing

Acton, BR apt, unfurn, sub Feb-July, \$210 cinl h. x7347 Linc.

Arl, Northgate, sub until Aug w/opt,

BR, LR, K, \$200 incl h. Carrie, x3-4905.

Back Bay apts, 2 BR w/K avail 2/1; BR w/Kette avail 1/1 Mitch, 266-6576.

Brkline, off Comm Ave, rm to rent, \$22/wk. Call, 566-1276, aft 11 am.

Camb, 3 BR, nr H Sq, MIT affil, Tobin School, safe nrhood. \$270. x3-1750.

Camb, sub, BR, 10 min walk MIT, furn, panelled, cln, \$155 incl h & gas. Call, 864-3698.

Camb, 2 BR, sub, 10 min walk MIT & Stop & Shop, avail 2/1, \$240 incl h. Call, 491-8882.

Camb, BR, furn, panelling, cab K, avail 2/1 or soon aft, \$160 incl gas h. Richard, x3-7412.

Camb, Mass Ave, 3 blks MIT, sub, BR, LR, K, B, \$190 incl util. Mr. Espinosa, 494-0485.

Dorchester, Sawyer Ave, rms or apt. Bialocki, 696-5318.

Lex, beaut Scandinavian style apt, renovated barn, BR, lg eat-in-K, LR, den, gar, open porch, lg garden borders farmland, bus H Sq from door, walk Linc Lab, gd childless cpl, no pets, avail 2/1, \$285 incl util, Gerd, x3-6737.

Som, 1 1/2 BR, ww, n H Sq, on bus, \$190 incl h. Steve Duggan, x8-3617 Draper.

Vt, Weston, ski hse avail wkly rental from \$30/day, 3 BR, all elec, frpl, ski Bromley, Magic, Okemo, Stratton. x477 Linc.

Canadian border ski hse, slps 15, 2 frpl, central h, ski eastern townships, v reas. Christine, x3-2742.

## Animals

Samantha has 6 beaut Rhodesian ridge black pups, pedigree. x3-5853.

Bl-pt siamese kittens, 9 wks, CFA reg, w/shots, \$30. Karen, x3-6748.

AKC german shep, f, 13 mos, spayed, raised w/infant, priced v reas. David, x8-3959 Draper.

Beaut shepherd mix, m, yr old, brn & blk, moving, free, Bob, x8-4610 Draper.

Rodney, beagle-mix, needs home, master just died, will be put to sleep. Give lonesome 6 yr old dog a home. Anne, 891-6583, aft 6.

## Lost and Found

Found: contact lenses, Hyden Lib, Rm 14S-100. x3-5671.

Lost: star-shaped earring, grn & wh enamel, Ames St, 12/16. Jackie, x3-3870, lve msg.

Found: 35mm negatives of man & son playing, nr Hayden Gallery, 12/19. x3-4680.

Found: brn tiger f cat, 12/26, 3rd fl Bldg 56. Maureen, x3-5801.

## Wanted

F, share Mattapan apt w/2 f, nr T, \$57 + util. Li Liang. x3-7193.

Refrig, LR furn. Marilyn, x3-7271.

To borrow piano, must play to maintain sanity, wl move & tune. Ausrin, x3-7225.

Rmmate, f, share spac 2nd fl Bri hse, w/2 f, own rm, lg bk yard, porch, free parking, nr T, \$83 + util. Ronda, x3-7271.

People, 2-3, 20-30 yrs, share 4 BR hse w/garden, 35 wooded acres, 40 mi west Bos, 1 1/2 hrs Camb each way, nr bus & train, avail Feb. Call, 1-425-4555, late evgs.

Carpool to Holbrook, 5 days/wk. John, x3-7739.

Rmmate, Central Sq, own rm, \$100 incl h. x3-3854.

Merck Index, 8th ed. Mark, 868-4890.

Rmmate, 25+, pref not stu, share 2 fl hse nr H Sq, on bus, nr shops, congenial, sm garden, cats, avail now. x3-6251.

Grad cpl or stu, live beaut lg hse Wayland, 25 min drive MIT, rent proportional to time spent w/indep young boys, as much or little as want, own stu apt in hse, avail now. Prof. Bamberger, x3-6211.

Responsible people to take care of preschool chldm in Camb, Som, suburbs. x3-1592.

Inexpensive but accurate balance scale. Frank, x7184 Linc.

Ride from Saxonville (Fram) to MIT daily, wl pay. Elaine, x3-1590.

Rider or carpool daily, Medford-MIT. Dan, x3-3190.

Twin bed frame &/or box spr. Joe, x3-7141.

Used elapsed time meters, in hours, 60 cycles, 115 v, nd up to 3. Tony, x3-5783.

Responsible babysitter 2 morn/wk in Jan, 5 morn/wk Feb-June, charming infant. Call, 876-7945.

Carpool, Lex-Waltham border, Concord Ave, to MIT; also tape rcrdr, sew mach. Call, 861-9027.

Rmmate, 1 or 2, 3 BR apt, MIT-owned, Camb, furn, parking, 5 min Sloan or Bldg 7, \$93. Philip, 354-1638.

Carpool, Brockton-Braintree to MIT, 5 days/wk. Chuck, x3-6275.

Rmmate, share Bos apt w/3 MIT grad stu, across Charles, lg LR, K, B, own semi-furn BR, \$115 w/h, nego. Bill, 536-8540.

P-t babysitter for 15 mo old. Alice, x3-3676.

Foreign m stu nds place to live, pref w/MIT stus, call if nd rmmate or want to look for apt. Bijan, x3-4396.

Ride or carpool from Billerica. x3-4278.

Rmmate for 6 mos, 2 man hse, Newton Ctr. Bill Gosper, x3-6765.

Architecture grad stu wants carriage hse, shack, out bldg, etc to do some projective blding & living. Aron, x3-7791, lve msg.

Bike rack &/or luggage rack for VW. Don, x3-2991.

Kermantle rope, 11mmx165', other used rock climbing equip. John Peters, x8-4098 Draper.

F grad stu or prof, share 5 rm apt, Camb-Som line, own rm, \$50+util. Call, 661-3336.

Handbook of Chem & Physics, 44th ed, (India paper), CRC; Latin rmmate, m, new apt. Jose, x3-5808.

Drummer, mediocre ability, for jazz band being formed east campus over IAP, have own drums. Interested, x0234 Dorm.

Copy of '71 Technique yrbk. A. P. Yao, Mobil Oil Sipore, P.O. Box 3025, Singapore 22.

Oscilloscope w/triggered sweep. Bob, x3-2575.

## Miscellaneous

Wl do Ger-Eng, Eng-Ger translations, not too tech, Ger native 18 yrs USA, reas. Erica, x3-2728.

Exp typist, non-tech, dictaphone, also prof writer, can edit. Chuck, x3-7410.

In a bind? Too many exams, papers? Let Rita do typing. x7328 Linc.

Typing, all types, great rates. Stan, x3-6765, lve msg NE43-915, or drop a line.

French girl wd. like to spend 6 mos w/American family, au pair. Francois, x3-5787.

Exp private party avail to supply variety of baked goods & luncheon foods to teas, colloquia, seminars, parties. Ellen, x3-6805.

Exp university instructor wl teach Mandarin conversation, Chinese lit & lang. Liu, x3-6705.

## 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. 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  
Claudie 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:

Secretary IV  
Jr. Dietary Aide  
Sr. Clk. IV  
Sr. Clk. IV P.T.  
DSR Staff  
DSR Staff  
Acctg. Clerk III-IV  
Tech. Lib.  
Secretary IV

Director of Cell Culture Facility - DSR Staff will have total responsibility for the smooth operation of the new facility and will be in charge of appointing and supervising the technical staff and support personnel. Managerial skills, previous experience in large scale cell and virus production required. Ability to design and enforce safety procedures for the operation of the Center important. 73-1367-A (1/9).

DSR Research Staff at the Center for Cancer Research will work with mouse leukemia viruses, including sterile passaging of cells and general tissue culture techniques, with a variety of biochemical extraction and purification techniques. B.S. in Biology or Chemistry desirable. 73-1344-A (1/9).

DSR Staff - (Temporary to 6/74) at Cambridge Project will conduct experiments in computer graphics as applied to their use. Write programs for same and develop networks of minicomputers. B.S. degree required (preferably in EE); experience in minicomputers and graphics programming needed. 73-1354-R (1/9).

Assistant to the Accounts Payable Supervisor (Exempt) in the Accounts Payable Section of the Comptroller's Accounting Office will process post-doctorate, grad awards and rent accounts; assist in the processing of foreign invoices, stop payments, and change order areas; responsible for past due transactions and correspondence with vendors and departments. Accounting degree is desired; accounting course work plus 2-5 years work experience acceptable. Good accounting and communication skills important. 73-1358-R (1/9).

DSR Staff Researcher in Health Sciences and Technology will carry on a program of membrane research that is supported by the National Heart and Lung Institute of NIH. Candidate must have the ability to creatively propose new experiments using cation-specific antibodies; skill in handling the preparation of materials for Raman spectroscopy; skill in using a dye laser and Raman spectrometer; competency in the interdisciplinary field of biological physics. Recent Ph.D. required. 74-12-A (1/9).

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).

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 resolution and physical constants of thin film, or MS degree required. 73-1127-R (10/24).

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 Pro-

73-1314-R  
73-1317-R  
73-1091-R  
73-1246-R  
73-1303-R  
73-1311-A  
73-1243-R  
73-912-R  
73-1260-R  
73-488-A  
73-1268-R  
73-1324-R  
73-1231-R  
73-1265-R  
73-1275-R  
73-1254-R  
73-1255-R  
73-1257-R  
73-1239-A  
73-1116-A  
73-1256-R  
73-1309-R  
73-1282-R  
73-1279-R  
73-1235-R  
73-1162-R

Sr. Acc't Clerk IV  
Sr. Clerk III  
Secretary IV  
Secretary III-IV  
Secretary IV  
Lib. Gen. Asst. III-PT/T  
DSR Staff CXL  
Admin. Staff CXL  
Secretary IV  
DSR Staff  
Secretary IV  
Secretary III  
Sr. Lib. Asst. IV  
Secretary IV  
Tech. Asst. IV  
Secretary III-IV  
Acctg. Clk. III  
DSR Staff-P.T./Temp.  
Tech. Admin. Asst.  
Admin. Staff  
Sr. Clerk III-IV  
Admin. Staff  
Admin. Stf Nurse/spvrs  
Secretary III-IV  
Clerk II  
Secretary IV P.T.

The following positions are on HOLD pending final decision:

73-1091-R  
73-1277-R  
73-1248-R  
73-1332-A  
73-1218-A  
73-1283-R  
73-1255-R  
73-953-A  
73-1293-R

Secretary IV  
Jr. Dietary Aide  
Sr. Clk. IV  
Sr. Clk. IV P.T.  
DSR Staff  
DSR Staff  
Acctg. Clerk III-IV  
Tech. Lib.  
Secretary IV

Biochemist - DSR Staff member will participate in lipoprotein studies, and will supervise the activities of several technicians in a clinical research setting. Ph.D. or M.D. in Biochemistry required, as well as experience with lipoprotein and supervising. 73-515-R.

Director of Cell Culture Facility - DSR Staff will have total responsibility for the smooth operation of the new facility and will be in charge of appointing and supervising the technical staff and support personnel. Managerial skills, previous experience in large scale cell and virus production required. Ability to design and enforce safety procedures for the operation of the Center important. 73-1367-A (1/9).

DSR Research Staff at the Center for Cancer Research will work with mouse leukemia viruses, including sterile passaging of cells and general tissue culture techniques, with a variety of biochemical extraction and purification techniques. B.S. in Biology or Chemistry desirable. 73-1344-A (1/9).

DSR Staff - (Temporary to 6/74) at Cambridge Project will conduct experiments in computer graphics as applied to their use. Write programs for same and develop networks of minicomputers. B.S. degree required (preferably in EE); experience in minicomputers and graphics programming needed. 73-1354-R (1/9).

Assistant to the Accounts Payable Supervisor (Exempt) in the Accounts Payable Section of the Comptroller's Accounting Office will process post-doctorate, grad awards and rent accounts; assist in the processing of foreign invoices, stop payments, and change order areas; responsible for past due transactions and correspondence with vendors and departments. Accounting degree is desired; accounting course work plus 2-5 years work experience acceptable. Good accounting and communication skills important. 73-1358-R (1/9).

DSR Staff Researcher in Health Sciences and Technology will carry on a program of membrane research that is supported by the National Heart and Lung Institute of NIH. Candidate must have the ability to creatively propose new experiments using cation-specific antibodies; skill in handling the preparation of materials for Raman spectroscopy; skill in using a dye laser and Raman spectrometer; competency in the interdisciplinary field of biological physics. Recent Ph.D. required. 74-12-A (1/9).

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).

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 resolution and physical constants of thin film, or MS degree required. 73-1127-R (10/24).

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 Pro-

gramming experience. Knowledge of teleprocessing, and COBOL or PL/1. 73-265-R (4/73).

Computer Operator IV will operate IBM Model of 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 instruction, midnight to 8:00am shift. 73-1221-R (11/21).

Senior Keypunch Operator III in the Office of Administration Information Systems will operate the IBM 029 keypunch machine. Punch into computer input cards formatted and unformatted documents. Minimum 2 years experience operating IBM 029 or comparable equipment. 73-1286-R (12/12).

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 in the Supervisor of some advanced operating system required. Ability to contribute to research and work with students important. 73-1234-A (10/24).

Project Manager - Administrative Staff in the Office of Administrative Information Systems will develop major systems; perform feasibility studies; prepare budgets; work with clients in the evolution of each new development project. Applicants should have a strong background in the management area of administrative data processing. 73-1327-A (12/19).

Systems Analyst - Administrative Staff in the Office of Administrative Information System will develop, under direct supervision, solutions to business problems; prepare, design, and program specifications for new programs and for modifications to existing systems. Applicants should have business and administrative experience, analytical ability and familiarity with computers. 73-1315-R (12/19).

DSR Staff Programmer in the Laboratory for Nuclear Science will do all the design and programming for the laboratory management information and accounting system and work with the systems group on other special projects on the IBM 360-65. BS degree with background in Math and EE required. Minimum one year assembly language and PL/1 programming experience required. Familiarity with management information systems and MIT account methods preferred. 73-1339-R (1/9).

Applications Programmer Trainee (Exempt) for the Office of Administrative Information Systems will learn the program language, department standards for programming and documentation. Review specifications with trainer; develop program flow-charts; code computer instructions; aid in debugging process. Operational experience is very helpful. 74-2-A (1/9).

Programming Analyst for the MIT Information Processing Center must have experience and thorough knowledge of large-scale, time-sharing computer systems. PL/1 and FORTRAN Language, documentation and communication skills are necessary qualifications. The User Services Group requires an individual who understands and is responsive to the needs of the Center's users.

User Assistance - assisting users by providing programming information and debugging help and tracking down special problems.

User Information - Instructional documentation and conducting seminars, workshops, and short courses. 73-1294-R (12/12).

DSR Staff Programmer in the Research Laboratory of Electronics will be responsible for the implementation of a multi tasking picture processing system, integrating existing software modules into the final system, and for total system documentation. Will also write diagnostic software and assist in the diagnosis of computer failures. Bachelor's degree in EE or Computer Science (Master's Preferred). Two years experience in programming small computers in Assembly Language and Fortran; PDP-11 and to programming and digital hardware experience required. 73-1349-A (1/9).

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** at the Center for Space Research will carry a major responsibility for the analysis of data from the MIT X-ray observatory on the Third Small Astronomy Satellite. The work will include the pre-launch, post-launch organization of operation and data management; development of the data system; analyze and publish results. Ph.D. in Physics required. Extensive experience with computer programming for data and analysis on a systems level. Knowledge of astronomy and astrophysics absolutely essential. 73-1310-R (12/19).

**DSR Staff** in Physics will need experience and skill in performing calculations relating to a contract on "equation of state near the critical point." Candidate must be skilled in the application of the Wilson renormalization group approach to new situations, and in understanding the novel physical phenomena to be expected near the critical point. 73-1368-R (1/9).

**DSR Staff Research** for the Harvard-MIT Program in Health Sciences and Technology will perform research combining principles of physics and a working familiarity with current membrane research. Expertise in the area of the formation of arteriosclerotic plaques required. Ability to design experiments using a resonance Raman spectrometer important. Project funded for one year. 73-1353-R (1/9).

**Infirmiry Nurse - (Exempt Staff)** will do bedside nursing at the Infirmiry. Assist surgeons in the operating room, administer first aid and emergency treatment. Individual must be a Mass. Registered Nurse with minimum one year nursing experience. 40 hour work week; 11pm-7am; weekend rotation. 73-1348-R (1/9).

**Salesperson (Exempt)** for the MIT Press will provide sales coverage for domestic wholesale, retail trade accounts; will attend trade, professional, and academic exhibits; solicit new business. Extensive travel involved. Minimum 5 years book publishing and trade sales experience required. 74-10-R (1/9).

**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 MIT Chairman's Office will organize busy office; handle many office routines and inquiries requiring independent disposition; maintain extensive filing system; monitor office accounts. Excellent typing, shorthand, and dictaphone skills required. Ability to maintain communications and smooth relations with top level offices of the Institute and with the Greater Boston Community essential. Willingness to assume responsibility, to work independently and under pressure important. 37½ hour work week. 73-1335-R (12/19).

**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).

**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** 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 (11/14).

**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** will handle secretarial duties for the associate director and group of associates of the Joint Center for Urban Studies. Transcribe from tapes; handle reception duties; maintain filing system for a study of a national housing allowance. Excellent typing needed for manuscripts and reports (some technical); previous secretarial training or experience preferred. Job will start 1/14/74. 73-1288-R (12/12).

**Secretary IV** for the Undergraduate Association, Dean for Student Affairs Office will type correspondence and minutes of meetings; maintain files and records; schedule booths for the lobby of Building 10; monitor checking account. Good skills and knowledge of office procedures preferred; ability to work with several people and the desire to help students important. This position is for 10 months per year; office not open during July and August. 73-1285 (12/12).

**Secretary IV** to two Biology professors will handle all general office duties; type technical material from dictaphone; process invoices independently perform office functions. Strong typing and dictaphone skills required; some accounting and organizational ability preferred. Previous experience essential. 73-1308-R (12/19).

**Secretary IV** in Aerospace Studies (Air Force ROTC) Department will perform general office duties including file maintenance and correspondence. Will administer and maintain specialized Air Force medical files. Good typing required, ability to meet people and answer telephone inquiries essential. 30-35 hour work week. 73-13-R (12/19).

**Secretary IV** to a professor in Metallurgy will handle general office functions; take dictation for letters; type correspondence, class materials; assist in preparation of reports; assemble statements of expenditures. Excellent typing and shorthand skills required; previous experience preferred. 73-1316-R (12/19).

**Secretary IV** to several professors will handle general office duties; type class material, papers, proposals, correspondence, assist with typing overload. Good typing skills required; technical typing preferred but will train good typist. Flexibility to work for several people important. 73-1306-R (12/19).

**Secretary IV** in the Laboratory for Nuclear Science will handle all general secretarial duties for an active high energy physics group. Excellent typing needed for memos, reports, correspondence, papers (some technical). Shorthand skills desirable but not essential. Ability to work independently; good organizational skills important. 73-1340-R (1/9).

**Secretary IV** in the Summer Sessions Office will handle general secretarial duties; type letters and memos from hand-written material or dictaphone; process office bills and invoices; assist with registration processes. Excellent typing skills; poise and maturity needed in working with and assisting people. 73-1343-R (1/9).

**Secretary IV** for a professor in Earth and Planetary Sciences will handle all secretarial functions; perform some

administrative chores, some library research and editing. Excellent typing (some technical); shorthand preferred. Editorial and organizational skills important. 74-8-R (1/9).

**Secretary IV** to the Head and Associate Head of the Physics Department. Perform general secretarial duties in the headquarters office; answer questions from students and visitors; type a great deal of correspondence. Excellent typing and shorthand required. 74-5-R (1/9).

**Secretary IV** in Biology will handle general secretarial duties for two labs. Type technical manuscripts for publication; maintain student files; monitor office accounts and supplies. Accurate typing required; ability to work independently important; background of high school Biology is helpful. 74-7-R (1/9).

**Secretary IV** to two professors in the Lab for Nuclear Science will handle all general secretarial duties for several small projects. Good shorthand or the ability to take dictation desirable; highly skilled typing required. Initiative and organizational abilities important. 73-1374-R (1/9).

**Secretary IV** to a group of Nuclear Engineering professors will handle all general secretarial duties; type technical reports and journal articles; maintain student records. Good typing and dictaphone skills required; ability to work independently with good judgment important. 73-1364-R (1/9).

**Secretary IV** in the Center for Policy Alternatives will work for the Principle investigator and Project Manager involved in the study of the drought area of Africa. Handle all general office duties; take and transcribe dictation; coordinate office work load. Excellent typing and shorthand; previous secretarial experience essential. MIT experience and knowledge of French helpful. 73-1361-A (1/9).

**Secretary IV** in the Research Laboratory of Electronics will provide secretarial support for a faculty member and research staff. Type technical manuscripts, set up material from rough data and verify footnotes and references; maintain busy calendar; independently handle other procedures. Excellent typing skills required; technical typing experience preferred. 73-1346-R (1/9).

**Secretary III-IV** for the Institute Secretary will handle general office duties organize appointment calendar and itineraries; maintain files. Good typing and dictaphone skills required; light shorthand skills helpful. 73-1326-R (12/19).

**Secretary III-IV** will handle all secretarial duties for the Institute Secretary. Plan travel schedules, make arrangements; assist in gathering and collating information on Corporations. Previous experience; excellent typing and shorthand skills required. Ability to organize and work independently important. 74-1-R (1/9).

**Secretary III-IV Part-time** in Biology will type manuscripts, letters; supervise grant accounts and handle bookkeeping. Previous secretarial experience required; ability to transcribe from tapes desired; shorthand preferred. 9-5 3 days/week. 74-6-R (1/9).

**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 act quickly important. 12 hour work week. 73-1198-R (11/21).

**Secretary III** to the Vice President of Administration and Personnel and 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** to three professors in Ocean Engineering will type correspondence, proposals, reports; maintain files and accounts; make travel arrangements and schedule appointments. Good technical typing skills required; some accounting knowledge helpful; previous experience preferred. 73-1333-R (12/19).

**Secretary III Part-time** in Earth and Planetary Sciences will type manuscripts, correspondence, course material; perform other clerical duties. Excellent typing and proofreading essential; some technical typing skills preferred. 20 hour work week; flexible schedule preferred. 73-1345-A (1/9).

**Secretary III** in the Office of Sponsored Programs will handle general secretarial duties for a contract administrator. Maintain contract and grant records; prepare and route proposals through various processes. Good typing skills required; shorthand helpful ability to organize and work indepen-

dently, previous office experience important. 73-1359-R (1/9).

**Secretary III Part-time** in Mechanical Engineering, Laboratory for Experimental Medicine will type correspondence, manuscripts, proposals, class notes and lectures from tapes. Good typing and dictaphone skills required. Some knowledge of medical, biological or engineering terminology helpful. Previous experience preferred. 21 hour work week. 73-1365-R (1/9).

**Secretary III** in the Development Office will handle all general secretarial duties for the Assistant Director. Excellent typing needed for letters, reports, memos; shorthand helpful; general editorial skills useful. Organizational ability and good judgment important. 73-1351-A (1/9).

**Secretary III** to two staff members in the Alumni Association will type newsletter, general correspondence; assist in the maintenance of Biographic records and general office work. Good typing skills required; ability to establish priorities and good judgment important. 73-1328-R (12/19).

**Secretary IV** will handle general secretarial duties for the Special Assistant to the Dean of Engineering. Set up procedures and files for a new office; type correspondence and reports. Good typing and dictaphone skills; ability to deal effectively with students, faculty, administrators and visitors required. 73-1313-A (12/19).

**Account Representative V** in the Office of Administrative Information Systems will coordinate client schedules, job setup; verify user input and output; maintain operating instructions and job control information; perform liaison functions between the client office and the computer operations facility. Knowledge of computer throughput procedures and job control functions required. Ability to communicate clearly is important. 8:30-5:00. 73-1336-R (12/19).

**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** will assist the department Administrative Officer with fiscal responsibilities, supervision of payrolls. Help train new secretaries, serve as liaison with Institute administrative personnel and people outside MIT. Candidate must have strong organizational skills, a sense of priorities; interest in working with figures and accounts; patience to handle details and to work under pressure. 74-9-R (1/9).

**Library General Assistant III** in the Barker Engineering Library will type the library Bulletin, reference correspondence; handle billing for lost and overdue books; maintain files and assist with filing for card catalog. Strong typing needed; ability to work independently; flexibility and organizational skills important. 73-1329-R (12/19).

**Senior Clerk IV (Documentation)** in Aeronautics and Astronautics will design and implement procedures for documentation of records of the MIT Innovation Center. Prepare and maintain a filing system for patents and innovative ideas; set up and supervise a small reading room for the center; order and file technical literature; assist in preparation of documents for publication including rewriting and editing. Educational background in library science, writing and organization required. 73-1362-A (1/9).

**Accounting Clerk III** in the Comptroller's Accounting Office will be responsible for maintenance of four cycles of accounts receivable billing. File material, prepare new accounts; post on NCR machine. Accurate typing required; ability to work with figures important. 73-1305-R (12/19).

**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 or IV** in the Registrar's Office will need excellent typing skills for work with graduate students' records. Post grades from computer output; update and verify files and records; answer questions from students. Ability to work with details and figures important; previous office experience helpful. 73-1290-R (12/12).

**Senior Clerk III** will take and process orders at Graphics. Price and schedule xerox work, handle requisition details. Knowledge of reproduction processes helpful. 74-3-R (1/9).

**Senior Clerk III** for the Institute Information Center will direct people to various locations throughout the Institute; answer telephone calls for student/faculty addresses and telephone numbers; perform various typing assignments. Candidate must be pleasant, polite, and eager to help people. 73-1366-R (1/9).

**Senior Clerk III** in the Laboratory for Nuclear Science will maintain filing and complicated cataloging system; organize and process materials for a reading room. Accurate typing skills useful; initiative, good judgment and ability to work independently required. 73-1352-R (1/9).

**Technical Statistical Typist III** in Comptroller's Accounting Office will type variety of Institute reports including Financial and Treasurer's reports; Professorship, NIH and Research Grant reports, etc.; as well as other reports and typing that comes in from various departments. Will operate a 24 inch typewriter; work with A.B. Dick Masters; use the adding machine. Excellent typing skills and a minimum of one year statistical typing necessary. 73-1356-R (1/9).

**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 II Part-time/Temporary** in the department of economics will transfer numbers from tables to computer coding sheets to be key-punched for an urban economics research project on housing. Some knowledge of economics and how to use the library required. Accuracy with details and numbers important. 20 hour work week; temp through 6/74. 73-1360-R (1/9).

**Clerk II Part-time** in the Medical Department Dental Clinic will process all dental bills; assist in answering phones and scheduling appointments; occasionally perform other billing projects. Accurate typing skill required; previous office experience preferred. 20 hour work week. 9-1. 73-1342-R (1/9).

**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).

**Machinist A** in the Laboratory for Nuclear Science will set up work; operate machine tools; work from blueprints; specifications, verbal instructions, or sketches. Make tools, dies, and fixtures as may be required. May direct and train machinists of a lower grade. Minimum of five years of applicable machinist experience required. 73-1347-A (1/9).

**Electronic Technician B** in the Center for Space Research will assist with laboratory research; operate technical experimental apparatus. Breadboard and test linear and digital circuit systems for satellite experiments. Graduation from a two-year day technical school or its equivalent; ability to perform flight-quality soldering and cabling required. 40 hour work week. 73-1261-A (12/12).

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

**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).



# Dr. Williams Named Special Assistant, Minority Affairs

(Continued from page 1)  
appeal for formal and informal complaints and concerns.

Dr. Williams will be an ex officio member of MIT's Personnel Policy and Equal Opportunity Committees and of the Faculty and Administrative Councils.

Chancellor Gray said that the Institute was "very fortunate to have Dr. Williams in this critical position, the purpose of which is to provide creative leadership and staff support for all minority matters and concerns at MIT."

"Dr. Williams has the educational background and experience we have been seeking, and a working knowledge of the Institute and of the academic environment," Dr. Gray said. "These are indispensable qualities for the position, which requires great versatility and a flexible and resourceful approach to the complexities of the learning and working environment at MIT."

Dr. Williams said that in his new position he hopes "to expand opportunities for the growing number of minorities at MIT so that the Institute will become a place of 'equal opportunity' in the truest sense of that phrase."

Dr. Williams has been involved in minority affairs since coming to MIT in September, 1972, when he was named to the new post of Assistant Dean of the Graduate School for Minority Affairs. In that capacity he has been involved with the growing numbers of minority students who have come to MIT for graduate study.

Dr. Williams, a native of Goldsboro, N.C., received a bachelor of arts degree from North Carolina Central University in Durham, N.C., in 1961. After studying at Cornell University, he received a master of arts degree in guidance and counselling from Hampton Institute in Hampton, Va., in 1968. He received a PhD in the field of higher education administration and educational psychology at the University of Connecticut in Storrs, Conn., in 1972.

Dr. Williams has had broad professional experience. He served as assistant to the dean of

Hampton Institute and as a counselor in the Counselling and Testing Center in the dean's office at the University of Connecticut.

He has been a leader in black-white training laboratories, and has written numerous articles on the subject of minority students in higher education for several publications. He also has been a high school teacher and basketball coach.

Dr. Williams and his wife, the former Mildred M. Cogdell of St. Paul, N.C., live in Newton. They have two children, Clarence, Jr., 6, and Alton Leroy, 4.

## Professor Athans Is Appointed Director of ESL

(Continued from page 1)  
from the University of California at Berkeley. He began teaching at UC Berkeley. Later, he became a consultant and staff member at the MIT Lincoln Laboratory, and joined the MIT electrical engineering faculty in 1964 as assistant professor, became associate professor in 1966, and professor in 1973.

Professor Athans is the author of a large number of publications in his field and the recipient of numerous awards. In 1964 he received the Donald P. Eckman Award for outstanding contributions in the area of automatic control and, in 1969, the first Frederick Emmons Terman Award presented by the American Society for Engineering Education to the person judged the outstanding young educator in electrical engineering. He was elected a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) in 1964, and currently serves as president of the IEEE Control Society. He resides in Wayland.

ESL, founded in 1939 by Professor Gordon S. Brown and then known as the Servomechanisms Laboratory, achieved internation-

## Moving Begins to Mudd Bldg.



DR. SALVADOR E. LURIA, director of MIT's Center for Cancer Research, left, inspects fifth floor of the Seeley G. Mudd Building with Dr. David Baltimore,

American Cancer Society Professor of Microbiology, and Dr. Nancy H. Hopkins, assistant professor of biology.

—Photo by Margo Foote

The Seeley G. Mudd Building is now in partial use by the MIT Center for Cancer Research and construction is continuing on schedule in the remainder of the structure.

al fame for its contributions to feedback control theory and received numerous awards for its work during World War II in developing control systems for military use.

The laboratory was the original home of the Whirlwind computer project which developed the first high-speed digital computer used at MIT, and is noted also for its development—in the 1950's—of numerical control of machine tools, a manufacturing method now throughout industry. Professor Brown served as director of the laboratory until 1952, when he became head of the MIT Department of Electrical Engineering.

Under Professor Reintjes' leadership, the laboratory continued in its pioneering role. He guided the conception and development of INTREX (which stands for Information Transfer Experiment), a computer-based interactive bibliographic search system that has made ESL a world center in re-

The virology research group, headed by Dr. David Baltimore, American Cancer Society Professor of Microbiology, was moved to the fifth floor of the building last week.

search on large-scale information systems.

Related work on computerization of newspaper layout and editing has contributed to the revolution now taking place in that industry. Under Professor Reintjes' direction, ESL's Decision and Control Sciences Group grew to be a leading theoretical center in optimal control, filtering, and identification and theory of large-scale systems.

Professor Reintjes was born in Troy, N.Y., in 1912 and received the degrees of Electrical Engineer and Master of Electrical Engineering in 1933 and 1934 from Rensselaer Polytechnic Institute. He was a member of the faculty at Manhattan College until 1943, when he joined the MIT staff in the Wartime Radar School. He was appointed Assistant Professor of Electrical Engineering in 1947, Associate Professor in 1953, and Professor in 1961. He lives in Belmont.

Early availability of that floor has also permitted the start-up of two new virology research programs, one headed by Nancy H. Hopkins, the other by Robert A. Weinberg, both assistant professors of biology.

The center—headed by Salvador E. Luria, Institute Professor and Sedgwick Professor of Biology—is scheduled to be completely housed in the Mudd building by late spring.

"Thanks to the exceptionally good work of our Planning Office and of our administrator, Paul H. Quinn," Dr. Luria said, "we have had almost no snags and we're planning on a May 1 date."

"Because of this prompt initial occupancy we shall have the work on cancer viruses under way in the new building early in January and the work on cancer immunology and cancer biology in full swing by June 1."

The building is named for the late Dr. Mudd, the physician, educator and philanthropist who died in 1968.

MIT has received grants of \$3,150,000 from the National Cancer Institute and of \$1,775,000 from the Seeley G. Mudd Fund for construction of the building.

## Corbato and Penfield Are Appointed EE Department Associate Heads

(Continued from page 1)  
search, in 1963 and served as its director until 1968. He was appointed associate head of the electrical engineering department in 1971.

Professor Penfield will succeed Professor Mildred S. Dresselhaus, who was named associate department head in 1972. Professor Dresselhaus, who is the first permanent holder of the Abby Rockefeller Mauze Professorship, will return to her extensive research activities and will increase her efforts on behalf of women at MIT.

"I have many ideas about things to do to make MIT women happier and more productive in their careers," she said.

The MIT Department of Electrical Engineering is the largest and also the best known of the School of Engineering's eight departments. Thirty percent of the School's faculty, 57 percent of its undergraduates, and 30 percent of its graduate students are associated with this department. A 1971 report on graduate education by the American Council on Education, in Washington, D.C., ranked the department first in the nation in quality of faculty, based on a poll of 6,000 US scholars. The Department was tied with Stanford for first with regard to effectiveness of doctoral programs.

The department and the MIT

Research Laboratory of Electronics recently moved into the Institute's new Sherman F. Fairchild Electrical Engineering and Electronics Complex.

Professor Corbato's work on multiple-access computer systems resulted in the first demonstration, in 1961, of an early version of the MIT Compatible Time-Sharing System (CTSS). After further evolution, it began daily operation in 1963 at Project MAC and at the MIT Computation Center, then MIT's principal on-campus computer facility. Experience gained in design, development and operation of CTSS was exploited by Professor Corbato and his colleagues in further development of multiple-access systems, and a new system, called MULTICS (for Multiplexed Information and Computing Service) became available for general use at MIT in 1969. MULTICS service is presently offered on the campus through the Information Processing Center.

Professor Corbato was born in 1926 in Oakland, Calif., and received a BS degree from California Institute of Technology in 1950 and the PhD in physics from MIT in 1956. He was appointed associate professor of electrical engineering in 1962 and promoted to professor in 1965.

He was associated with the MIT Computation Center from its inception in 1956 until he resigned as deputy director in 1966. Within

Project MAC, he was formerly co-head of the Systems Research Division and is currently co-head of the Automatic Programming Division.

Professor Corbato is the author of numerous papers and is co-author of several books, including *The Compatible Time-Sharing System: A Programmer's Guide*. In 1966, the Computer Group of the Institute of Electrical and Electronics Engineers (IEEE) presented him with the W.W. McDowell Award for his work in the development of time-sharing systems.

Professor Corbato has been active in professional societies and was northeastern regional representative of the Association for Computing Machinery (ACM) from 1964 to 1966 and was an ACM national lecturer in 1964. From 1970 to 1973 he served as a member of the Computer Science and Engineering Board of the National Academy of Science. He is a senior member of the Institute of Electrical and Electronics Engineers (IEEE), a member of the American Physical Society, Sigma Xi, and Tau Beta Pi. From 1971 to 1973 he served as a member of the applied mathematics division review committee of Argonne National Laboratory.

Professor Corbato resides in West Newton.

Professor Penfield's wide spectrum of interests include solid

state applications to microwaves, primarily varactors and their applications; conservation theorems for physical systems, including plasmas and electron beams; electrostatics of continuous media, especially the force of electrodynamic origin, and computer-aided network analysis and design. He is the author of the circuit-analysis computer language, MARTHA.

Professor Penfield has been deeply involved in departmental activities and teaching programs. In the construction of the \$17.5 million Sherman Fairchild Electrical Engineering and Electronics Complex, he served as departmental representative, working with the architect on the design of the building, including an inexpensive, built-in shielding system to reduce electromagnetic interference.

In the undergraduate curriculum, he has been instrumental in introducing two innovations in Introductory Network Theory—the first subject encountered by students in the MIT core curriculum in electrical engineering. The first is a self-paced study section in which students work at their own speed instead of following a formal schedule of homework, lectures, and recitations. The second innovative feature is the use by students of a general-purpose, interactive, time-sharing computer language, called APL,

to write and run their own circuit analysis programs as a means of learning analytical techniques.

Professor Penfield was born in Detroit, Mich., in 1933. He received a BA degree in physics from Amherst College in 1955 and the ScD degree in electrical engineering from MIT in 1960.

From 1960 to 1962 he held Ford Foundation Postdoctoral Fellowships, and from 1966 to 1967 a National Science Foundation Senior Postdoctoral Fellowship. During 1966-1967 he was also an academic visitor at Imperial College of Science and Technology, London, England. He was appointed assistant professor of electrical engineering at MIT in 1960, associate professor in 1967, and full professor in 1969.

Professor Penfield is a Fellow of IEEE and was chairman of the Boston section of IEEE in 1971-1972. He is a member of the editorial board of the International Journal of Circuit Theory and Applications, and a member of the American Physical Society and Sigma Xi.

He is the author of numerous professional papers and two books, *Frequency-Power Formulas* and *MARTHA User's Manual*. In addition, he is co-author of three books, *Varactor Applications*, *Electrodynamics of Moving Media*, and *Tellegen's Theorem and Electrical Networks*. Professor Penfield lives in Weston.