Massachusetts Institute of Technology

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January 8, 1975 Volume 19 Number 26

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Services Are
Held in Va.



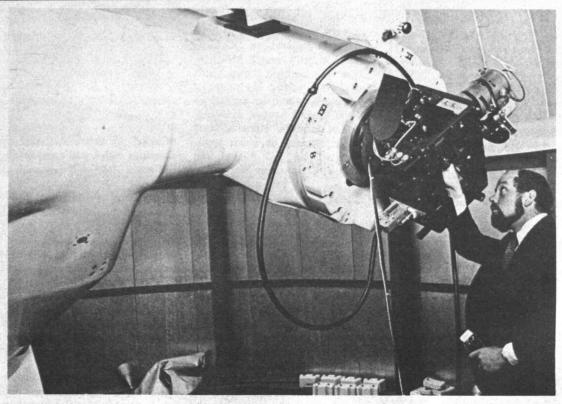
General McCormack

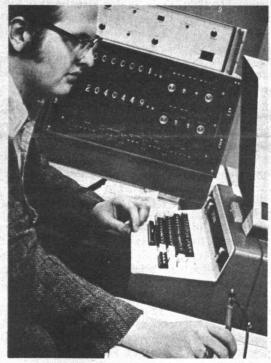
Funeral services were held Tuesday at Memorial Chapel, Fort Myer, Va., for Maj. Gen. James McCormack (USAF, Ret.), 64, a member of the MIT Class of 1937 and an MIT vice president from 1957 to 1965 who died Friday at his winter home at Hilton Head, N.C. Burial was in Arlington National Cemetery.

General McCormack was Director of Research and Development in US Air Force Headquarters in Washington, D.C., when he retired from military service in 1955 and joined the staff of MIT as special adviser to the president.

He was appointed Vice President for Industrial and Governmental Relations at MIT in 1957 succeeding the late Admiral Edward L. Cochrane when Admiral Cochrane retired.

At MIT, General McCormack
(Continued on page 4)





Automated Telescope

THE ASTRONOMER is usually thought of as someone gazing skyward through a telescope. But all that has been changed at MIT's new George R. Wallace Jr. Astrophysical Observatory at Westford, Mass., which has the most automated optical telescope yet developed for general use. At left, James Gettys of Louisville, Ky., a junior in the Department of Earth and Planetary Sciences, works at the computer control system console, using an electronic pointer to direct the telescope a floor above him to a star. Above, Professor Thomas B. McCord, observatory director, adjusts the optics in a two-beam photoelectric filter photometer attached to the 24-inch telescope. The photometer, one of several instruments used to measure light from celestial objects, also is under computer control. Dr. McCord is seeking additional students and faculty to serve as observers as well as to help continue the development of the facility.

Ethiopia Studies Started A group of faculty and

A group of faculty and students in the MIT civil engineering department are engaged in a research program to help four East African nations decide what kinds of roads they should build, and where they should build them, by evaluating the relative benefits and costs of different alternatives.

The work is being done under a three-year, \$400,000 contract recently received from the US Agency for International Development. It will focus initially on highway transportation problems in Ethiopia, where it has been estimated unofficially that 70 percent of the people live more than 100 kilometers from a road.

The MIT group will also work with local government officials and officials from AID and the World Bank to plan transportation programs in the other East African countries of Kenya, Tanzania and Malawi.

The new MIT project is based on a Highway Cost Model developed for the International Bank for Reconstruction and Development by Dr. Fred Moavenzadeh, MIT professor of civil engineering, who has been involved in research on road transportation in developing countries for the last five years. Rural Roads

Members of the project team include Professor Moavenzadeh, Professor Paul O. Roberts, director of the MIT Center for

(Continued on page 9)

Spelling Bee

Registration for the first Spelling Bee closes today, Wednesday (Jan. 8) at 5pm. Fifty finalists will be selected in a preliminary written competition on Monday (Jan. 13) at 7:30pm in Rm. 50-340 (Walker Gym). The Spelling Bee, an IAP activity, will be held in Kresge Auditorium Tuesday, Jan. 21, at 6:30pm.

Faculty Approves Interdisciplinary SM

The faculty has approved the establishment of master's degree programs in interdisciplinary science on a three-year trial basis.

The vote was taken at the faculty meeting Wednesday, Dec. 18, on a proposal presented by Dean Robert A. Alberty of the School of Science

The programs were supported by, among others, Dean Irwin W. Sizer of the Graduate School and Dean Alfred A.H. Keil of the School of Engineering. They will be administered by the Course 25 Committee, a faculty group that has supervised the undergraduate interdisciplinary activities.

Some faculty members questioned whether the committee should be given the authority to conduct master's degree programs, which involve admitting students to the programs and awarding degrees, instead of a department or several depart-

Copies of the Large version of The Report of the President and the Chancellor for 1973-74 are available in the Information Center (Rm. 7-111). ments.

Proponents replied that the faculty already has had some experience with the procedures of the Course 25 committee for undergraduates, and that the dean of the Graduate School will be monitoring the new programs.

They also said the programs will provide opportunities for experimentation on the graduate level, benefit students whose interests do not fit into departmental offerings and be a step toward greater cooperation among departments and schools.

Dean Alberty said the proposal was based partly on the belief that government and industry have jobs for advanced degree candidates oriented toward applied science, whose training has been in areas having a strong scientifie basis but not directed toward research.

The faculty also continued its discussion of the recommendations of the MIT Special Committee on Grading, concentrating on the pass-no credit grading of freshmen.

Some faculty argued that the pass-no credit grading of fresh-

men led to inadequate preparation in basic subjects, such as mathematics, and had become "the most inflationary factor in the grading system."

'The role of the grading system (Continued on page 9)

Wald to Speak

Nobel Laureate George Wald, Higgins Professor of Biology at Harvard University, will speak on "Mechanisms of Human Vision" Friday (Jan. 10) at 4:30pm in Rm. 26-1000. The talk is sponsored by the MIT Department of Psy-



TORRENTS OF RAIN greeted MIT people as they arrived for classes and work Tuesday as a moment in

time at the 77 Mass. Ave. walk light shows. Later, it turned to snow. Photo by Calvin Campbell

Erdelys Open Rehearsals To Questions for IAP

Open rehearsals have been a common practice of many music organizations for a long time.

But seldom, if ever, does the audience have a chance to ask questions or discuss the music with the musicians.

One new activity for IAP 1975 is intended to make just such an interaction possible.

Called Rehearsal and Concert, it is being conducted by MIT violinist Stephen Erdely and his wife, pianist Beatrice Erdely. Professor Erdely is a member of the faculty of the MIT Music Section. Mrs. Erdely is a member of the faculty of the New England Conservatory of Music and also teaches at Brandeis University. Before coming to MIT, Professor Erdely had been a member of the Cleveland Orchestra for 15 years under the late George Szell.

As the Erdelys rehearse, students may tape-record the music and talk with the musicians about musical structure and interpreta-

For the recital, the Erdelys have chosen a program of sonatas that includes the first Boston performance of Recitative and Rondo, Op. 21, by Gunther Schuller, president of the New England Conservatory

Other works will be Sonatina in A Minor, Op. 137, No. 2, by Franz Schubert, Sonata in A Major, Op. 100, by Brahms, and Sonate, by Maurice Ravel.

Remaining rehearsals, which started Jan. 6, will be today, Wednesday, Jan. 8, from 9am to noon and Thursday, Jan. 9, from 2 to 4pm in Kresge Auditorium. The formal recital will be at 8pm Friday, Jan. 10, in Kresge Auditorium and will be free and open to the public.

-William T. Struble



Stephen and Beatrice Erdely

Abstract Art **Exhibit Planned**

A major exhibition of 80 drawings by five leaders of the Abstract Expressionist movement-Arshile Gorky, Willem de Kooning, Jackson Pollack, Franz Kline and Philip Guston-will be on view from Feb. 21 through March 26 at the MIT Hayden Gallery.

The exhibition, sponsored by the MIT Committee on the Visual Arts, has been selected from museums, private collectors, and galleries throughout the United States. Although the five artists have been prolific draughtsmen, their drawings-which have rarely been exhibited together-show the diversity of their accomplishments and their common aims.

Vision, Art And Science Seminar

An all-day seminar on "Vision, Art, and Science," sponsored by the MIT Department of Psychology, will be held beginning at 10am Monday (Jan. 13) in Rm.

Morning speakers will include Professor Anne Coffin Hanson, chairman of the history of art department at Yale University, speaking on "The Human Eye: A Dimension of Cubism," and art historian Marianne Teuber, wife of Professor Hans-Lukas Teuber, head of the MIT Department of Psychology, who wil speak on "Origins of Optical Art."

The afternoon program starting at 2:30pm will include a husbandand-wife team of psychologists, Professor Dorothea J. Hurvich of Columbia University and Professor Leo M. Hurvich of the University of Pennsylvania, speaking on "Color Vision and 19th Century Art," and Dr. Arthur L. Loeb, lecturer and honorary associate on visual and environmental studies at Harvard University, and curator of the teaching collections at Harvard's Carpenter Center for the Visual Arts, speaking on "Crystallographic Rules in the Graphic Works of M.C. Escher.'

Chairman is Dr. Richard M. Held, MIT professor of experimental psychology. The seminars are part of MIT's January Independent Activities Period. The general public is welcome.

Exhibit Features Two Photographers

Photographers Baldwin Lee, MIT '72, and Meridel Rubenstein will give a joint exhibition of their recent works at the MIT Creative Photography Laboratory Jan. 10-

The exhibition will have an informal opening from 5pm to 7pm, Wednesday, Jan. 10.

The gallery at 120 Massachusetts Avenue, Cambridge, is situated on the third floor of MIT's duPont Gymnasium and is open

Baldwin Lee is a graduate of the MIT Department of Architecture and is presently studying photography at Yale with Walker

Meridel Rubenstein was a special student at the Creative Photography Laboratory and is now studying at the University of New Mexico with photographers Beaumont Newhall, Van Deren Coke and Tom Barrow.

Day Care Offered

MIT people who desire day care for children are reminded that the MIT Day Care Program provides care in licensed supervised homes in Arlington, Belmont, Cambridge, Lexington, Watertown and Wellesley for children six weeks to six years of age. For information, contact the MIT Child Care Office, Rm 4-144 at 3-3953 or 3-1592.

Theater Planned

Experimental video workshops in dance, theater and music will be conducted Jan. 13-Feb. 8 in Hayden Gallery.

The schedule for the workshops, sponsored by the MIT Committee on the Visual Arts, will also include viewings of prepared video tapes made by several Boston area artists.

Entitled, "Video: Art in Process," the workshops will be held under the supervision of filmmaker Richard Leacock, MIT professor of cinema, and Ann McIntosh, visting lecturer in video, both of the Film Section of the MIT Department of Architecture, and James B. Roberts, staff member working on video applications in the MIT Center for Advanced Engineering Study

Seating will be provided in Hayden Gallery for public viewing of rehearsals, performance and the completed video tapes. Rehearsals will take place during regular gallery hours 10am to 4pm. Final video performances of dance, drama and music will be at 8pm Jan. 29, 30, 31 and Feb. 1. The remainig period of the exhibition will be devoted to playing the completed tapes.

The workshops have been scheduled for the 1975 Independent Activities Period to give students interested in learning the medium the opportunity to work directly with the equipment and to assist in videotape projects.

In notes for the workshops, the directors said: "The intention is not merely to record the events but to create an interaction between the medium of live videotape and the performance. The camera will not function as a neutral observer but will be used to transform the event to take advantage of the unique characteristics of the video medium.

"The workshops will emphasize the use of live, closed-circuit video as an independent aspect of theater and the exploration of its potential for reaching larger audiences than is possible in the theater or concert hall.'

Among workshop theater events will be a performance of sections of Aristophanes' The Birds.

Artists whose completed tapes will be replayed include Jeffrey Hudson, Elizabeth Clark, Robert Goldman, Benjamin Bergery, Dick Straud, Mark Allen and Ernest Caramelle, who is affiliated with the MIT Center for Advanced Visual Studies.

Directors of individual workshop projects are: Writing for Video-Neal C. Vitale, a senior from Reading, Mass., of the Student Writing Section, MIT Humanities Department; Video/ Drama-Professor Leacock, Ann McIntosh and David Covert, of the Live Video Workshop; Improvisational Video/Music-Mark Allen, of the Live Video Workshop; Video/Dance-Allan Kessler, Valerie Vaughan, John Vaughan; and Individual Projects-Professor Leacock, Ann McIntosh, and Edwin Diamond, lecturer in the MIT Department of Political Science and advisor to MITV, student television news organization.

Richard Leacock, well-known as a pioneering filmmaker, joined the MIT faculty in 1969. While at MIT, he has developed the Super 8mm synchronous sound system. In addition, he has worked with the Boston Opera Company on integrating film with performance. Recently he has become increasingly interested in portable video equipment that would increase the availability of video as an artistic medium.

-WTS

Video Workshops Hayden Corridor Show In Dance, Music, Features Nan Arghyros



"Garlic" by artist Nan Arghyros is included in an exhibition of her drawings which will open Friday, Jan. 10 at the MIT Hayden Corridor

Drawings by the young Boston artist, Nan Arghyros, will be exhibited in MIT's Hayden Corridor Gallery Jan. 10-Feb. 8 under sponsorship of the MIT Committee on the Visual Arts.

Ms. Arghyros was an instructor in the history of art at MIT from 1968 through 1974 and presently is pursuing graduate studies in the doctoral program in art history at Harvard University as a teaching

Her drawings were included in a group exhibition of works on paper at the Boston Visual Artists Union Gallery (1974) and in The De-Cordova Open: A New England Drawing Competition at the De-Cordova Museum (1974). She has also exhibited works in the South Station Area Art Studio Show, Boston (1972), at Milton Academy, Milton, Mass. (1974), and the Ward-Nasse Gallery, Boston

Although her academic training in art history is considerable, and she has held several other teaching positions, she has drawn and painted most of her life and she is largely-self taught.

In the last several years she has been working on a group of drawings which may be called "portraits" of vegetables. Done in pencil in an immaculately refined technique, the vegetables-ranging from egg plants, sweet potatoes to asparagus-evoke biomorphic associations suggestive of forms full of the possibilities of transformation into other shapes. Rich pencil hatchings define their ambiguities of shape and fullness of form. She treats the vegetables as still life, lighting them so that frequently intricate shadows add another dimension to the sense of growth and change that pervades the images.

Ms. Arghyros' most recent work has included sculpture in cloth panels which convey the obsessive feeling for the minutae of form that animates her drawings.

Steinem Tickets Are Given Out

Tickets were distributed Tuesday to members of the MIT community and the press planning to attend a lecture by Gloria Steinem at 5:30pm Jan. 13 in Kresge Auditorium.

Remaining tickets will be available at Kresge the evening of the lecture, according to the MIT Women's Forum, sponsor of the event.

Ms. Steinem, editor and publisher of MS. magazine, is expected to meet with other campus women's groups prior to the

India Program

India's use of satellites for mass education will be discussed by Normal Dahl, former MIT professor and former Ford Foundation deputy director in India, at Boston's Museum of Science at 9pm Friday as part of an Indian program arranged with help from Sangam, MIT Indian student organization. Also included will be classical dancing by Lakshkmi Vullimiri, an MIT graduate stu-

Novak Works Shown

An exhibition of work by the Israeli sculptor, Gyora Novak is on display in the Lecture Exhibition Room at the Center for Advanced Visual Study through Jan.

Mr. Novak, an internationally known sculptor and painter in many media, has had numerous one-man shows in Israel, France and the US. His works are also in several private and museum collections. His MIT exhibit includes a modular notebook of his ideas and work.

lecture. Later in the day she will be a guest of honor at a dinner at the President's House, 100 Memorial Drive.

Visiting Professor Named IEEE VP

Thomas F. Jones, visiting professor of engineering and education in the Division for Study and Research in Education at MIT has been elected vice president-educational activities of the Institute of Electrical and Electronics Engineers for 1975.

He will be responsible for continuing development of a major IEEE campaign to develop a series of short self-study courses and lectures aimed at mid-career education for IEEE members. Professor Jones was president of the University of South Carolina from 1962 to 1974 and will return there next year as a Distinguished Professor of the University.

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MIT Press Issues Luria's '36 Lectures in Biology"



PRESIDENT JEROME B. WIESNER holds a copy of 36 Lectures in Biology with author Salvador E. Luria and his wife, Zella, at a recent MIT Press publication party.

The MIT Press has just pubished Dr. Salvador E. Luria's latest book 36 Lectures in Biology.

The book offers the substance of taped lectures given by Dr. Luria, Institute Professor and director of the Center for Cancer Research, in a General Biology course at MIT during the spring of 1973 and 1974.

Dr. Luria, a pioneer in molecular biology, won the Nobel prize for medicine and physiology in 1969. Last year he received the National Book Award for his book, Life: The Unfinished Experiment.

In the preface, Dr. Luria says that the new book focuses on "the essentials of the life phenomena: the chemistry of the cell, the organization and function of the genetic systems, the genetic significance of life cycles and the functioning of cells in differentiated organizations."

The book's publication was celebrated at a party given by the Press in December. Among guests were Dr. Luria and Mrs. Luria and President Wiesner and Mrs. Wies-

Med Schools Rate MIT High

According to a Boston Globe survey published recently, pre-medical students at MIT have the highest rate of acceptance to medical schools among Boston area colleges and universities.

The article compares the high ratio of undergraduate applicants to the small number of first year openings at medical schools.

"In the Boston area, acceptances have ranged from 86 percent of all those applying at MIT to 65 percent at Clark University in Worcester to 40 percent at Boston College," according to the Globe.

MIT, Wellesley, Boston College

and Brandeis had the highest percentages (10 to 13 percent) of last year's graduating classes applying to medical schools.

The article centered on the competitiveness students face in getting into medical schools. Said MIT senior Matthew E. Farber of Baldwin, N.Y.:

" 'There's pressure to do well, regardless. MIT has always had the image of a diligent, hard working student long before that image was applied to the pre-med, yet at MIT you're pushed to learn the material rather than to beat the other guy out.'

Students Go Before City Panel

The results of a study of pedestrian-involved accidents, prepared by Joel Weissman, a senior in the MIT Department of Urban Planning, will be presented at an open meeting of the Cambridge Transportation Forum, 7:30pm, Thursday, (Jan. 9) at Cambridge city hall.

Also at Thursday's meeting, Stan Kenney, a junior in urban planning, will explain some of the agencies that deal with transportation planning from a citizen participation point of view.

The Forum—a citizen group financed by and working for the Cambridge City Council-was started in the summer of 1973, through the efforts of students in MIT's urban planning depart-

Richards Article

An account of Ellen Swallow Richards' pioneer achievements as "America's First Lady of Science" and her work as one of America's first environmental activists are the subject of an article appearing in the November issue of The Massachusetts Teacher. Mrs. Richards was MIT's first woman graduate in 1873.



MIT HEALTH SCIENCES FELLOWS with Uncas A. Whitaker, (fourth from left) trustee of the Health Sciences Fund, attended a recent luncheon at the MIT President's House. The newly established Fund administers the Health Sciences Fellowships. Mr. Whitaker is the chairman of the board of AMP, Inc., Harrisburg, Pa. and a Life Member of the MIT Corporation. The fellows are left to right Stephen C. Jones of Beverly Farms, Jay J. Schnitzer of Meredith, N.H., Dusan G. Lysy of Cambridge, Chester H. Conrad of Kew Gardens, N.Y. and David W. Levine of Somer-

13 Assistant Professors Listed

Thirteen new assistant professors in the Schools of Science, Architecture and Planning, Management, and Humanities and Social Science at MIT have been listed.

They are:

Raymond M. Baker, Department of Biology and Center for Cancer Research. Graduated from Yale in biophysics in 1962, Professor Baker received the PhD from the University of California, Berkeley, and joined the Ontario Cancer Institute of the University of Toronto as a post-doctoral fellow in 1969. He was appointed assistant professor in the Department of Medical Biophysics at Toronto in 1973. In the past year he has served as staff scientist in The Hospital for Sick Children, Toronto. Professor Baker lives in Bel-

Arnold I. Barnett, promotion from instructor of mathematics to assistant professor, Sloan School of Management. An instructor since 1973, Professor Barnett received the BA degree from Columbia in 1969 and the PhD from MIT last year. His widely publicized 1974 study of murder rates in the nation's 50 largest cities utilized mathematical models to show that homicide statistics, while accurate in listing the occurrence of murder, are "misleading and un-satisfactory" as indicators of risk of murder. Professor Barnett lives in Cambridge.

John R. Bennett, Department of Earth and Planetary Sciences. Professor Bennett holds the BS, MS and PhD degrees in meteorology from the University of Wisconsin. Since December, 1972, he has been general physical scientist for Project Lake Ontario-"International Field Year for the Great Lakes"-sponsored by the National Oceanographic and Atmospheric Administration (NOAA). He lives in Winchester.

George W. Brandenburg, Department of Physics. Coming to MIT from the Stanford Linear Accelerator Center, where he was research associate from 1971-74, Professor Brandenburg will first participate in an MIT experiment at the Fermi National Accelerator Laboratory, Chicago, with a group of scholars from MIT's Laboratory for Nuclear Science. He received the AB, '65, and PhD, '69, from Harvard. From 1969-71 he was a post-doctoral fellow at the Max Planck Institut fur Physik in Munich. He lives in Lexington.

Leonard G. Buckle, promotion from instructor to assistant professor, Department of Urban Studies and Planning. A 1974-75 Lilly Teaching Fellow, Professor Buckle holds the SB degree from MIT in electrical engineering and industrial management, '64, and the PhD degree, '74, in urban studies and planning. He is co-reporter with his wife, Suzann, professor of urban studies and planning, to the American Bar Association for the "Juveline Justice Standards Proj-

Suzann T. Buckle, promotion from instructor to assistant professor of urban studies and planning. She received the BA in English literature and Biblical studies

NOW Leader at MIT

Wilma Scott Heide, immediate past president of the National Organization for Women (NOW), will speak on "Sexism as a Disease, Feminism as a Cure" Tuesday, Jan. 21, from 5-7pm in the Mezzanine Lounge of the MIT Student Center.

Ms. Heide is a guest in residence at Wellesley College and a distinguished visiting scholar at the University of Massachusetts at Amherst. Persons wishing to have dinner with Ms. Heide after her lecture should call Jean Gerlach at 3-4861.



Baker







Bennett Brandenburg



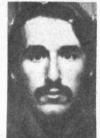
Canizares



Graham



Greenwood



Jaffe



Joannopoulos



Mahapatra



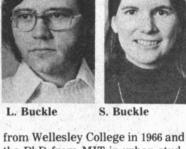
Slattery

Professor Jaffe is a resident of Watertown.

John D. Joannopoulos, Department of Physics. Professor Joannopoulos holds the BA and PhD degrees from the University of California at Berkeley, and the MA from the University of California at Davis. A Regents Fellow in 1969-70, he is now conducting research on the theory of disordered systems and the properties of surfaces. Professor Joannopoulos lives in Belmont.

Sitikantha Mahapatra, Sloan School of Management. For the past year Professor Mahapatra has been assistant professor of quantitative analysis and control at Bowling Green State University. He received the BA in 1967 from Regional Engineering College, the MBA in 1969 from the Indian Institute of Management, and the PhD in 1974 from Case Western Reserve.

Robert J. Slattery, promotion from instructor to assistant professor, Department of Architecture. Principal and director of Arrowstreet, Inc., architects, planners and environmental designers, Professor Slattery holds the BS in engineering science from the University of Notre Dame and the BArch from MIT, '70. He is codirector of the 1974-75 project to renovate and modernize the MBTA Park Street subway station at a cost of \$4.2 million. He was senior designer for the humanities and arts building and the House V living/dining facilities at Hampshire College. Professor Slattery lives in Cambridge.



S. Buckle

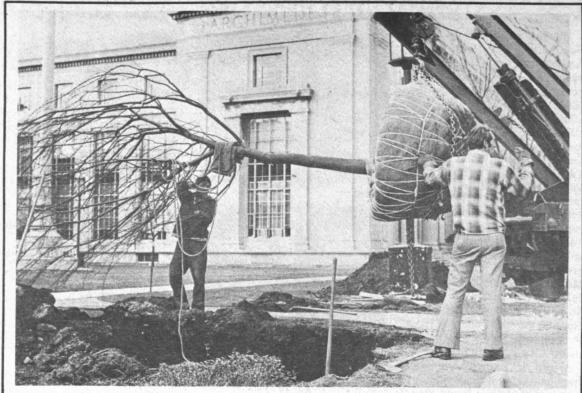
the PhD from MIT in urban studies and planning last year. She is a 1974-75 Lilly Teaching Fellow, an associate director of MIT's Undergraduate Program and cocoordinator with her husband Leonard of UROP law-related and urban studies. The Buckles make their home in Boston. Claude R. Canizares, promotion

from DSR staff to assistant professor of physics. Professor Canizares received the BA, MA and PhD degrees in physics between 1967 and 1972 from Harvard, where he was an instructor in 1970-71. Since 1971 he has carried out research on Xray astronomy data from MIT satellites, the design of a prototype Bragg crystal spectrometer, and high speed photometry. In research completed at the Cambridge Electron Accelerator, Professor Canizares assisted in setting up, running, and analyzing data for electron scattering experiments. He lives in Arlington.

Edward M. Graham, Sloan School of Management. Professor Graham holds the SB degree from MIT and the MBA and DBA degrees from Harvard Business School. From 1970-72 he was instructor in business administration for the Central American Institute of Business Administration (INCAE) in Managua, Nicaragua, and from 1968-70, research associate at Harvard Business School. He has been a lecturer in business administration at Northeastern University and Babson College. His current research involves the strategy of the multinational enterprise. Professor Graham lives in Cambridge.

Ted R.I. Greenwood, promotion from postdoctoral fellow to assistant professor of political science. He holds the BSc, '67, from the University of Toronto, where he was a teaching assistant in mathematics. In 1970 he received the SM degree from MIT in physics, and in 1973, the PhD in political science. In the summer of 1970 while serving as an MIT research associate on a study in arms control sponsored by the Carnegie Endowment for International Peace, he was rapporteur for the 10th Pugwash Symposium on "The Impact of New Technologies on the Arms Race." For the past academic year he has been a research fellow in the Program for Science and International Affairs at Harvard's Center for International Affairs, and a postdoctoral fellow at MIT's Center for International Studies. Professor Greenwood lives in Bel-

Robert L. Jaffe, promotion from DSR staff to assistant professor of physics. Professor Jaffe received the AB degree in physics from Princeton and the MS from Stanford, where he was research associate at the Stanford Linear Accelerator Center in 1972. For the past two years he has been a postdoctoral research fellow at MIT.



ington, plant one of four Japanese Zelkova trees in Killian Court. The trees replace several blighted American elms removed in past summers. Be-

WORKMEN WITH Frost & Higgins, Inc. of Burl- lieved to be blight-resistant, the Zelkovas closely resemble the small-leaved American elms in the Court.

Photo by Calvin Campbell

Services Held for Gen. McCormack

(Continued from page 1) was primarily responsible for the general supervision and management of the MIT Lincoln Laboratory at Lexington and what was formerly the MIT Instrumentation Laboratory in Cambridge. He left MIT in November, 1965, to become chairman of the board of directors and chief executive officer of the Communications Satellite Corp. in Washington, D.C. During his tenure as MIT vice president, General McCormack also served as a member of the MIT Corpora-

News of General McCormack's death was received with sadness by MIT officials.

President Jerome B. Wiesner said "the nation and MIT have lost a gifted leader, organizer and manager."

"For those of us here at the university who worked with him, the loss is especially keen," he said. "He was a wise colleague and a devoted and trusted friend.'

Howard W. Johnson, Chairman of the MIT Corporation and a former MIT president, said:

"His creative impulse in the cause of national defense, in the whole domain of science and public policy, in university governance, in industry, and in institution building enriched and enlivened our national life. Above all, his civilizing influence shaped a legacy of mind and spirit which will always be exemplary of the personal qualities we hold high at MIT.

Dr. Julius A. Stratton, MIT President Emeritus, (1959-66), said General McCormack's life "was one of devoted serviceservice to his country, to MIT and to many another institution."

"He was endowed with a brilliant mind, overflowing with innovative ideas, tempered with good common sense, and marked by a keen sense of humor and a flair for the apt and telling phrase," Dr. Stratton said. "The range of his knowledge was tremendous, encompassing a profound understanding of education, of business and industry, and the structure and operations of government. He was capable of the most penetrating insights, striking to the very heart of a problem with clear judgments of action to be followed. In discussion, he was diplomatic, tactful, but firm, and with all a delightful companion. Those of us who were privileged to work closely with him through many years know how much he

gave to MIT. We shall never forget

Dr. James R. Killian, Jr., Honorary Chairman of the Corporation and MIT president when General McCormack returned to join the staff in 1955, said :

"He served with distinction in a variety of posts crucial to our national guidance in a period of rapid change in science and technology. We remember him for his exceptional poise, his attractive personality and for the articulateness with which he applied his qualities of leadership. It was with regret that we bade farewell when he left to lead Comsat, but it was with pride that a friend and associate had been chosen for this important role in a key technological enterprise of the 20th century. I shall always cherish the rewarding experience of working with him in various settings and organizations.

General McCormack was a native of Chatham, La., and was graduated from the US Military Academy at West Point, N.Y., in 1932. He was a Rhodes Scholar at Oxford University, England, where he received the degree of bachelor of arts in 1935. He received the degree of master of science in civil engineering from MIT in 1937.

General McCormack served as an engineering officer in successive grades until the outbreak of World War II when he became a staff officer with the War Department and later served with the 12th Army Group in Europe.

In 1947, at the age of 36, he was promoted to brigadier general and assigned by the Army to the US Atomic Energy Commission director of military applications. When the Air Force was formed as a separate service, he transferred to that service and rose to the rank of major general before retiring in

A specialist in political-military affairs with long experience in research administration, General McCormack continued in service to the nation after coming to MIT. In 1955, in response to a request from the Secretary of Defense, he helped establish the Institute for Defense Analyses, an organized effort by 10 universities to support the Defense Department's Weapons Evaluaton Group, and served as the IDA president until 1958.

Also, while an MIT vice president, General McCormack was twice called upon for service in the Greater Boston area.

He was for several years an officer of the Greater Boston Chamber of Commerce and from

1963 to 1964 he served as president of that organization.

In August, 1964, at the request of then-Governor Endicott Peabody, General McCormack became the first chairman of the Massachusetts Bay Transportation Authority which had been organized out of the former Metropolitan Transit Authority.

General McCormack left MIT and the MBTA in November, 1965, to become COMSAT's board chairman and chief executive officer. He remained in that position until 1970, but continued as a Comsat board member until

Also, in 1970, when MIT began a two-step program for the orderly divestment of the Charles S. Draper Laboratory (former Instrumentation Laboratory), General McCormack was invited to serve on the laboratory's newlyconstituted board of directors to help guide the organization to independent status. He continued to serve on the laboratory's board until his death.

During his career, General McCormack helped organize several national service organizations, including the Aerospace Corp., the Mitre Corp. and Educational Services, Inc. He served on the boards of these organizations for several years and at the time of his death he was chairman of the board of Aerospace Corp. He was a frequent consultant to numerous federal agencies, including the White House, the Department of State, the National Aeronautics and Space Administration, the US Civil Service Commission, and the Departments of Defense, Navy and Air Force. He also participated in several major national studies: the Rockefeller Special Study on Prospects for America, the Gaither Panel on National Security, and the Draper Committee on Foreign Military Assistance

His military decorations included the US Distinguished Service Medal, the US Legion of Merit, the US Bronze Star, the French Legion of Honor and the Order of the British Empire.

While at MIT, General McCormack made his home on West Cedar St. on Boston's Beacon Hill. After moving to the Washington area, he made his home in Arlington, Va.

Survivors include his widow, the former Eleanor Morrow; a son, Major James R. McCormack of Fort Ruker, Ala.; and a daughter, Anne M. Stanton of Fort Campbell,

Professor Sheila Widnall Takes High Post with DOT

Dr. Sheila E. Widnall, professor of aeronautics and astronautics at MIT, has been officially appointed the first director of the Office of University Research for the US Department of Transportation.

Under DOT's Program of University Research, begun in October, 1972, Professor Widnall will assist universities in their contacts with DOT agencies in three major ways: 1) as principal advisor to the Secretary on university research activities, 2) as liaison at the secretarial level with the academic community, and 3) as chief administrator of the Program of University Research.

The program promotes interaction among universities, government and the transportation industry through research projects. DOT expects to award \$5 million for research contracts in transportation science and technology this fiscal year.

Professor Widnall, who was appointed to the MIT faculty as assistant professor in 1964, holds the Lawrence Sperry Award from the American Institute of Aeronautics and Astronautics "for notable contributions made by a young man or woman to the advancement of aeronautics." She was appointed full professor this year.

As a result of her studies of aerodynamic noise for the Army Research Office, she conceived and



Professor Widnall

managed the development of MIT's new anechoic wind tunnel facility and participated in wind tunnel studies of unsteady aerodynamic pressures on Boston's John Hancock Building.

Professor Widnall is married to William S. Widnall, who is serving on the staff committee of the House Committee on Science and Astronautics through a Congressional fellowship from the AIAA. Their permanent home is in Lex-

Changes Coming in Tax-Sheltered Annuity Plan

MIT's tax-sheltered annuity program, availabled to faculty and staff, will have new limits beginning January, 1976.

The program, which became effective January, 1974, enables individuals to set up plans where members take a reduction in salary and the amount is invested in special accounts in their names. These accounts are exempt from federal taxes on both principal and interest until withdrawn or received in the form of annuity pay-

The plan varies in value depending upon an individual's tax bracket. For those staff and faculty members who expect to be in lower tax brackets after retirement, deferral of current income could result in overall reduction of

The new limitations of these accounts are explained in the following release from the MIT Benefits

"Beginning in 1976, the Employee Retirement Income Security Act of 1974 (ERISA) places new limits on the size of contributions that may be made on behalf of any individual under a funded plan of deferred compensation. Under the new limits, annual contributions to a Tax-Deferred annuity for any individual may not exceed the lesser of (i) the normal exclusion allowance limit that has heretofore applied under section 403 (b) or (ii) the lesser of 25% of annual compensation or \$25,000 (adjusted for future cost of living increases in the same manner as are primary social security benefits). This 25%

Obituary

Antonio Soave

Antonio Soave, 68, of Brighton, who retired in 1973 as a porter in Food Services, died Saturday, Dec. 21.

An employee at the Institute for 18 years, Mr. Soave leaves his wife, Arcangela, and three children, Frank and Fortunata Soave, and Mrs. Antonio Cutone.

or \$25,000 calculation must include the Institute's contributions to the pension fund.

"However, the law permits employees of educational institutions to elect one of three alternative formulas that may result in higher contribution limits. The election is to be made in the time and manner to be prescribed in regulations and, once made, the election is to be irrevocable.

The alternative formulas for limiting contributions to a Tax-Deferred Annuity are:

"Contributions that do not exceed 20% of includible compensation times service up to 10 years, minus employer contributions already made for annuities and pension contributions for the 10-year period ending on the date of separation from service. These contributions may be made only once, in the year in which the participant separates from service, and cannot exceed \$25,000. Includible compensation is net salary from the Institute after your TDA contribution

"Contributions that do not exceed the smallest of (a) 25% of includible compensation plus \$4,000 (b) the normal exclusion allowance for the year, or (c)

"Contributions that do not exceed the 25% or \$25,000 limit including pension contribution described in item (ii) of the preceding paragraph without regard to the normal exclusion allowance limit under section 403 (b).

"No regulations implementing these provisions of the law have yet been issued, so this discussion should be considered a fairly tentative explanation of the provision of the law as now written. Regulations or future interpretation based on further study may change this explanation. However, this information may be useful to you as a guideline for potential changes in your situation for

All faculty and staff will be receiving a statement on the program from the Benefits Office

New Subjects

The MIT Committee on Curricula has announced Jan. 31, 1975 as the new deadline for submission to the Registrar of proposals for new subjects, unit changes, major description changes and other revisions affecting curricula.

Professor Leonard A. Gould of the Department of Electrical Engineering and chairman of the committee said all proposals would be acted on as soon as possible in order to meet printing schedules for the 1975-76 MIT catalog.

Gordon H. Pettengill, chairman of the subcommittee on graduate subjects, said the Jan. 31 deadline also applies to the submission of graduate subject descriptions. All revisions should be submitted to Ruth S. Goodwin, assistant to the registrar, in E19-344.

WMO Award

Bijoy M. Misra of India, a graduate student in the MIT Department of Meteorology, has received the 1974 research award from the World Meteorological Organization. The WMO award of \$500 was initiated in 1970 to encourage young scientists from developing countries working in the field of meteorology.



President Jerome B. Wiesner offers hors d'oeuvres to, from left, Loretta Mannix, administrative assistant to President Emeritus Julius A. Stratton, Catherine Ahearn, a retired member of the Patent Office, Jo Semple, a retired member of Graphic Arts and

Edna Pacht of the Comptroller's Accounts Office at the Quarter Century Club's holiday party held Monday, Dec. 16, in the Sale de Puerto Rico. Dr. and Mrs. Wiesner were host and hostess for the event.

Photo by Calvin Campbell

UROP Praised by Change Magazine

(In a recent editorial discussing new programs in undergraduate education, CHANGE Magazine cited MIT's Undergraduate Research Opportunities Program. The editorial by CHANGE editorin-chief George W. Bonham appeared in the Winter 1974-75 issue under the title, "Revitalizing Undergraduate Learning," and is reprinted here in part.)

There are also notable new efforts to invigorate the entire undergraduate experience. One such major effort has been under way for the past five years at the Massachusetts Institute of Technology, and it is worth reporting here for a number of reasons. Technically oriented institutions, like liberal arts colleges, have with good reason sought new approaches to enliven their undergraduate offerings. Recently, this magazine reported on one such effort at the Worcester Polytechnic Institutea program for developing "technological humanists" (June 1974) -and it is worthy of emulation to whatever degree is possible.

MIT, a larger and more prestigious university, has since its inception in 1871 been committed to preparing the young "in the fundamental principles of positive science, with their leading applications to the industrial arts." Despite the eminence of many of MIT's faculty, this tradition of attending to their undergraduates has pervaded the staff of the institute throughout its history. Nonetheless, the comparatively rigid curriculum of science and technological fields imposed restraints on many of the institute's students and caused resentments that called for new and more flexible approaches. A number of experimental ventures have been tried at MIT over the years, most of them dying on the vine, and there have been indications that some of its most creative students were turned off by what the institute had to offer. Many freshmen came to MIT with a formidable high school preparation that resulted in boredom rather than excitement.

Though the sixties provoked more visible student dissatisfaction at MIT, the institute's moves to reconsider its undergraduate offerings long preceded that period.

The move for reform came into renewed focus after a major lecture in 1957 by Edwin H. Land, a remarkably gifted inventor and president of the Polaroid Corporation. In an address entitled "Generation of Greatness: The Idea of a University in an Age of Science," Land outlined a major revamping of the undergraduate experience that would allow the formation of small clusters of "research families" by undergraduate students and senior faculty. These families would remain through most of the undergraduate years and hopefully advance the students' original thinking and research sophistication.

Land's notions continued to percolate through the institute and provided further impetus to a series of ad hoc and continuing undergraduate education committees designed to enrich the seminar-research experience. These committees carried the firm support of high administrative circles. Out of these efforts emerged, among other projects, a new Freshman Seminar Program and an impressive new Undergraduate Research Opportunities Program (UROP), which in a span of half a decade has materially affected undergraduate performance and which has tangentially given the institute's faculty a monitoring mechanism to gauge the educative process in the university as a

Despite its comprehensive influence, MIT's Undergraduate Research Opportunities Program must surely stand as the anthithesis of the bureaucratic academy. It doubles as a learning facilitating support office and an institutionally-based grantmaking foundation for innovation, and its only claim to turf and academic clout is that it is and remains a faculty support function, intersecting but not threatening all disciplines and academic territories.

UROP began modestly in the fall of 1969, supported by an annual appropriation of \$100,000 initially provided by Edwin Land. It has since grown to include an annual budget of \$300,000-400,000 that comes largely out of MIT's operational budget. Used often as seed money, UROP research funds ex-

tended to faculty-student collaborators have pulled additional funds from outside sources. And participation in this vibrant undergraduate program is impressive: of MIT's 3,600 undergraduates, 1,800 are actively involved in UROP projects. All are facultysupervised and involve 500 of the institute's 950 full-time teaching faculty. UROP now collaborates with all of the institute's 24 departments, with faculty participation ranging from 83 percent in nutrition and food sciences to 6 percent in foreign literature and linguistics. (The reason for this disparity is largely the degree to which laboratory work is adaptable to a disciplinary field.) While the hundreds of UROP undergraduate projects have enormous subject variety, students may typically be expected to receive grants of up to \$350 for laboratory and field expenses, or be paid an hourly rate. UROP projects are either taken for academic credit (on a passfail basis) or for payment made to the student researcher. Only in exceptional cases is both available. The entire UROP program is

brilliantly headed by a young physicist, Margaret L.A. Mac-Vicar, and a small, dedicated group of UROP "facilitators." none of whom has ever had extensive educational experience. But their perceptions and unfailing ingenuity seem just right. Dr. MacVicar, who also carries a full teaching load while serving as liaison between countless constituencies, and her informal staff are not products of schools of academic administration; but their program all comes together, and it works. Twice a year, UROP distributes 10,000 copies of a 134-page directory of research opportunities and supplements its listings with weekly updating in Tech Talk, a university publication. Tech Talk makes fascinating reading, particularly since it is written in refreshingly simple English.

"We are still receiving proposals and making financial awards to UROPers," said one recent *Tech Talk* column. "Past experience tells us that some of you are procrastinating. Please submit your proposals now. By

mid-November we are usually insolvent. (On the other hand, if you don't submit proposals, we won't

One sees in UROP team leader MacVicar (who could probably run the Defense Department with equal facility) and her entrepreneurial group a rare enthusiasm that seems now to have pervaded much of the institute. A recent talk with some of UROP's undergraduates reminded this observer of shop talk with advanced graduate students. They described their immersion in their research projects with the sort of enthusiasm that can only be generated by making one's own discoveries, and their projects are judged by the institute's faculty as acceptable and occasionally "brilliant" and "remarkable." One biology major, who considered dropping out in his first year, now talks engagingly about his research with a leading Boston hospital medical researcher, while others described devices and materials which they helped develop, some of which may have important commercial applica-

MIT's faculty and administrators largely confirm these enthusiasms. Jerome Wiesner, MIT's president, admits that UROP "exceeds my fondest hopes in terms of its pervasiveness in the institution." And Chancellor Paul Gray emphasizes the "irreplaceable accountability" that comes out of research collaboration, in which UROP undergraduates participate regularly.

Faculty see the UROP experience as beneficial to student and teacher alike. UROP programs allow students to "begin thinking with their hands," says Jerome Lettvin, professor of biology and electrical engineering. He regrets the grim-faced professionalism of today's students which for many makes temporary failure an unacceptable prospect. "They are permanently scared shitless,' says Lettvin, and he thinks UROP makes prospects of research failure less intimidating. Jerrold Zacharias, who helped get UROP under way, considers it an institutewide success, providing "a mechanism for the faculty to do

Just Society Series to Hear Dr. Wallace

Phyllis A. Wallace, a visiting professor at the Sloan School of Management since 1973 and former chief of technical studies in the Office of Research for the US Equal Employment Opportunities Commission, will deliver a lecture on "Some Dilemmas of Marginality" from 4-6pm, Thursday (Jan. 9) in Room 9-150.

The lecture is the fifth in a series sponsored by MIT's Technology and Culture Seminar on the theme of "Merit and Equality in a Just Society." Professor Wallace's respondent will be William J. Spring, director of the Regional Institute on Employment Training and Labor Market Policy at Boston University.

Professor Wallace, senior economist for the US government from 1957-65, is former Vice-president of the Metropolitan Applied Research Center in New York, where she worked with Dr. Kenneth B. Clark before coming to MIT.

A major figure in equal opportunity research and procedures, Professor Wallace is a member of the National Manpower Policy Task Force, the Committee on the Status of Women of the American Economic Association, and the advisory committee to the US Bureau of the Census.

Her most recent book, published last June, is *Pathways to Work*. Part of her current research, to be published by the MIT Press, is on "Equal Employment Opportunity and the AT&T Case."

Mr. Spring, a former reporter for the *Milwaukee Journal* and staff member of the US Senate Sub-Committee on Employment, Poverty and Migratory Labor was a Fellow at Harvard's Institute of Politics from 1973-74.

Teuber to Lecture For Nursery School

Visual illusions will be the subject of a slide lecture presentation of interest to children and adults to be given by Dr. Hans Lukas Teuber, head of the Department of Psychology, at 3pm, Sunday, Jan. 19, in the Compton Lecture Hall, Rm 26-100.

The lecture, which will benefit the MIT Cooperative Nursery School and the MIT Day Care Center, is entitled "Now You See It, Now You Don't, Or Why Do Things Look The Way They Do?"

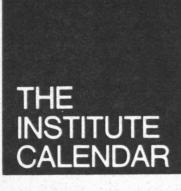
Tickets are \$1 per person and will be sold at the door.

Tech Talk Copies Cut

Due to increased newsprint costs, *Tech Talk* distribution to dormitories and offices has been cut from 20,500 to 17,500, effective this issue. The Information Center will continue to receive the same number of copies. Members of the community are asked to pass on copies in those areas where circulation has been cut back.

whatever it wants to do."

More important, perhaps, UROP's open approach offers MIT's faculty a fundamental challenge to review its total undergraduate experience, and through UROP pose some fundamental questions that any faculty worth its salt must ask almost continually. In the final analysis, one of UROP's lasting functions may be to provide an ongoing monitoring mechanism on the quality of undergraduate education at MIT. It is no small accomplishment for such a complex institution.



January 8 through January 19

Events of Special Interest

Molecular Biology: A Survey for the Non-Scientist (35) – Robert A. Weinberg, biology, will speak about his areas of interest. Designed for non-scientists. Thurs, Jan 9, 1pm, Rm 56-520.

Survey of Views on Unions and Unionization (378a) — Sponsored by Women's Forum. Thurs. Jan 9: members of AWARE will discuss their decision to affiliate with a union, and District 65 specifically. Fri, Jan 10: women members of "white collar" unions will discuss their feelings about unionization. 12n, Rm 10-105.

Women's Forum – Gloria Steinem, well-known founder of the National Women's Political Caucus and the Women's Action Alliance, will speak, Mon, Jan 13, 5:30pm, Kresge, Tickets: Beginning Tues, Jan 7, Bldg 10 Lobby, 8-9am, 12n-1pm, 5-6pm.

What's Physics All About, Anyway? (272) – Talks for non-academic employees. Tues, Jan 14: What Do Physicists Do? – Anthony P. French, physics. Thurs, Jan 16: What are Black Holes? – Kenneth Brecher, physics. 12n, Rm 6-120.

Molecular Biology: A Survey for the Non-Scientist (35) – Gene M. Brown, associate head of biology, will speak about his areas of interest. Designed for non-scientists. Thurs, Jan 16, 1pm, Rm 56-520.

Nutrition of the Pepsi Generation: The Nutritional Quality of the Foods You Like to Eat! (235) — Howard Appledorf, University of Florida. Nutrition & Food Science Seminar. Thurs, Jan 16, 4pm, Rm 54-100. Designed for the entire MIT Community.

Now You See It. Now You Don't. Or Why Do Things Look the Way They Do? — Hans-Lucas Teuber, psychology, department head. Technology Children's Center, Inc., lecture to benefit the MIT nursery School and Day Care Center. Sun, Jan 19, 3pm, Rm 26-100. Tickets \$1, available at door. Designed for children and adults, with visual demonstrations.

Seminars and Lectures

Wednesday, January 8

Psychosurgery: Therapy or Threat (296) – Stephan Chorover, psychology. Psychology Seminar. 10am, Rm E10-013.

Numerical Modeling of Climate – E. Lorenz, meteorology. Climate Seminar (222). 10am, Rm 54-811.

Phase Equilibria and Elasticity of Spinel Disproportionation: Effects of Cation Disorder and Implications for the Mantle – Dr. Robert C. Liebermann, Research School of Earth Sciences, Australian National University. Earth & Planetary Sciences Seminar. 11am, Rm 54425.

Brain Science and Education (295a) – David Singer, Harry Potter, G. Psychology Seminar, 12:30pm, Rm E10-013.

Can a 5 Megawatt Research Reactor Find Fulfillment in Medicine?

– B.W. Murray, nuclear engineering; D.J. Hnatowich, G. Nuclear Engineering Seminar (227e). 1:30pm, Rm NW12-222.

Magnetic Levitation – C. Haldeman, aero/astro. Highlights in Aeronautics and Astronautics Seminar (6a). 2pm, Rm 33-206.

Modern Lifestyles – Guests include Elaine Noble, lesbian feminist and recently elected to State Legislature (tentative); Mary Rowe and Robert Fein, Office for Women & Work; representative from psychiatric staff, and others. Changing Lifestyles and Modern Times (352c). 3pm, Rm 14E-304.

Do Electrons Really Run Away? – Ernest Moniz, physics, Lectures in Physics (265), 3:30pm, Rm 4-231.

Black Political Activities in Boston – Melvin King, urban studies, director of Community Fellows Program; Floyd Barbour, humanities, will read from a play "Daywork." Dean for Student Affairs Black Perspective Seminar. 7pm, Rm 10-280. Reception follows.

What's News in Physics (381a) — Gloria Lubkin, senior editor, *Physics Today*; Niemann Fellow at Harvard, Association for Women Students Seminar, 8pm, location to be announced.

Thursday, January 9

International Oil (312) — World Oil Group. Politics, economics and prices will be discussed. Sloan School of Management Seminar. 9:30am, Rm E52-451. May last all day.

Numerical Modeling of Climate – E. Lorenz, meteorology. Climate Seminar (222), 10am, Rm 54-811.

Desalination of Water (64a) — Graduate students at the Water Resources Lab. Civil Engineering Seminar. 10am-4pm, Rm 48-308.

Surf Conditions in Outer Space – John Belcher, physics. The Physics of Space Seminar (267). 10:30am, Rm 37-696.

Applications of Electron Microscopy in Biology – Jon King, biology, Instruments and Techniques in Biology Seminar (33), 12n, Rm 16-310.

The Anatomy of Blocking Patterns – F. Sanders, meteorology. Climate Seminar (222). 1pm, Rm 54-811. (Note change in time from IAP Guide).

Interface Equilibria Within Stressed Solids – John W. Cahn, metallurgy. IAP Seminar on Thermoelastic Martensite (S9). 12:30pm, Rm 13-1401. Coffee 12n.

Language Development from Birth to 6** – Paula Menyuk, education, co-director of applied psycho-linguistics program, Boston University. "Out of the Mouth of Babes", a film, will be shown, Technology Wives Organization Child Development Seminar (364a) 2pm, Stu Ctr West Lge (babysitting available Stu Ctr Rm 473).

Is Cancer Reversible? (231) – Maria C. Linder, nutrition & food science, Nutrition & Food Science Seminar. 2pm, Rm 16-134.

The Effects of Sonic Booms on Your Future – Wesley L. Harris, aero/astro & ocean engineering. Highlights in Aero/Astro Seminar (6a). 2pm, Rm 33-206.

Operations Research Center Seminar (181) – Dr. Randall Robinson, president, Robinson Information Systems, 2:30pm, Rm 24-121.

Heavy-Ion Nuclear Reactions and Super-Heavy Nuclei – Eric Cosman, physics. Lectures on Physics (265). 3:30pm, Rm 4-231.

Opportunities in Mathematics – J. Munkres, mathematics; Robert K. Weatherall, director of career planning & placement office, assistant dean of the Graduate School. Mathematics Club Lecture (199f). 4pm, Rm 2-190.

Some Dilemmas of Marginality* – Phyllis A. Wallace, visiting professor of management. Respondent: William J. Spring, director, Regional Institute on Employment Training and Labor Market Policy, Boston University. Technology and Culture Seminar: Merit and Equality in a Just Society. 4pm, Rm 9-150.

Shedding Light on the Color of Minerals – Roger G. Burns, earth & planetary sciences. Earth & Planetary Sciences Lecture (83). 4pm, Rm 54-425.

Uses and Abuses of Consultants – Fred Temple, former consultant, Nairobi City Council, Kenya; George Metcalfe, Technoserve. Professionals in Development Seminar (372b). 8pm, Rm E14-304.

Friday, January 10

The Slender Crescent: Viewing the Newest Moon (253) — Philip Morrison, Institute Professor, physics. Illustrated lecture and discussion. Physics Seminar. 10am, Rm 6-120.

Can Man's Pollution Precipitate Another Ice Age? – Hurd Willett, meteorology, emeritus, Climate Seminar (222). 10am, Rm 54-811.

Conway's Theory of Games (199a) – Richard Stanley, mathematics. Mathematics Seminar. 11am, Rm 2-190.

Current Policy Issues in Education – Gregory Anrig, Commission of Education, Commonwealth of Massachusetts. IAP Special Event sponsored by DUSP. 12n, Rm 3-415.

Nature of Thermoelastic Transformations – Walter S. Owen, materials science and engineering, department head. IAP Seminar on Thermoelastic Martensite (S9). 12:30pm, Rm 13-1401. Coffee 12n.

Effect of Dynamical Fluxes on Climate Change – P. Stone, meteorology, Climate Seminar (222). 1pm, Rm 54-811.

Structures to Tame Violent Loads – Emmett A. Wittmer, aero/astro. Highlights in Aero/Astro Seminar (6a). 2pm, Rm 33-206.

Modern Lifestyles – Guests include Elaine Noble, lesbian feminist and recently elected to State Legislature (tenatative); Mary Rowe and Robert Fein, Office for Women Work; representative from psychiatric staff, and others. Changing Lifestyles and Modern Times (352c). 3pm, Rm 14E-304. (Repeat of Wed, Jan 8 seminar).

Probing Nuclei with Electrons – Jochen Heisenberg, physics. Lectures on Physics (265), 3:30pm, Rm 4-231.

Mechanisms of Human Vision (298) – George Wald, Higgins Professor of Biology, Harvard University. Psychology Seminar, 4:30pm, Rm 26-100.

Monday, January 13

The Human Eye: A Dimension of Cubism — Anne C. Hanson, Yale University, 10am; Origins of Optical Art — Marianne Teuber, Cambridge, Mass, 11am; Color Vision and 19th Century Art — Dorothea J. Hurvich, Columbia University and Leo M. Hurvich, University of Pennsylvania, 2:30pm; Crystallographic Rules in the Graphic Works of M. C. Escher — Arthur Loeb, Carpenter Center for the Visual Arts, Harvard, 3:30pm. Vision, Art and Science Psychology Seminar (300). Rm E10-013 (alternate Rm 35-225).

Genetic Counseling – Dr. Allen Crocker, Children's Medical Center. Genetics and Society Seminar (287a). 10am, Rm 4-231.

Energy, Health, and Transportation-Related Applications of Magnetic Fields (226) – Guided tour and explanation of Alcator, MIT's high magnetic field toroidal plasma fusion machine. National Magnet Lab Seminar. 10am, Rm NW 14-2209.

The World Hunger Crisis and its Ethical Implications* – Jean Mayer, nutrition, Harvard University; delegate, World Food Conference in Rome. Hillel and Chaplaincy Lecture. 12n, Stu Ctr Mezzanine Lge. Bring lunch.

Indium-Thallium and Copper-Zinc Systems — John B. Vander Sande, metallurgy. IAP Seminar on Thermoelastic Martensite (S9). 12:30pm, Rm 13-4101. Coffee 12n.

Biochemical and Behavioral Effects of Amphetamines (230) – L.D. Lytle, nutrition & food science. Nutrition & Food Science Seminar. 1pm, Rm 26-204.

Long Term Trends in Atlantic Sea Surface Temperature – Dr. Michele Fieux, meteorology. Climate Seminar (222). 1pm, Rm 54-811.

Recursion Theory: What a Machine Cannot Do - H. Rogers, Jr, mathematics. Annual IAP Logic Week (176b). 2pm, Rm 2-190.

Wind Effects Created by the MIT Greene Building – Frank Durgin, aero, DSR, Highlights of Aero/Astro Seminar (6a). 2pm, Rm 33-206.

Student Lobbying for Federal Financial Assistance — A small group of undergraduates who attended a conference on student lobbying will present and discuss what they learned and possible action to be taken. UROP Seminar, 3pm, Rm E53-482, Refreshments.

The Nature of Police Professionalism in Los Angeles* – Joseph Woods, history, Queens University, Ontario. Innovative Resource Planning Project/Operations Research Center Seminar. 3pm, Rm 3-133.

New Perspectives on Solar Energy – John Goodenough, Lincoln Lab. Optics and Energy Sources Seminar (227). 3pm, NW14-2209 Refreshments 2:45.

A Physicist Looks at Heart Attacks — H. Eugene Stanley, physics, Hermann von Helmholtz Associate Professor of Health Sciences and Technology. Lectures on Physics (265). 3:30pm, Rm 4-231.

The Evolution and Internal Structure of the Terrestrial Planets – Earth, Moon, Mars, Venus, Mercury – M. Nafi Toksoz, earth & planetary sciences. Earth & Planetary Sciences Lecture (83). $4p_{m_{\rm i}}$ Rm 54-425.

Self-Diffusion of Rigid Particles in a Shear Flow, With Application to Blood Flow* – Eugene C. Eckstein, research fellow, Peter Bent Brigham Hospital; Ascher H. Shapiro, Ford Professor of Engineering, Harvard-MIT HST Interdisciplinary Program in Biomaterials Science Seminar. 4:30pm, Rm 37-212. Coffee 4pm.

Adventures in Mind Control – Gerald Seavey will describe the highly acclaimed Silva Mind Control Course. Independent Offerings (328a). 5pm, Rm 4-159.

Tuesday, January 14

Some Genetic Conditions – Dr. Harry Shwachman, pediatrics, Children's Medical Center. Genetics and Society Seminar (287a), 10am, Rm 4-231.

Piano Mathematics and Electronics; The Effect of Inharmonicity on the Mathematics of Piano Tuning, and the Use of Electronics for Tuning* — Albert Sanderson, applied physics, Harvard University. Electrical Engineering and Music Seminar. 10am, Rm 4-160.

Energy, Health, and Transportation-Related Applications of Magnetic Fields (226) — Will describe two uses of newly developed lasers for energy-related plasma physics research. National Magnet Lab Seminar. 10am, Rm NW14-2209.

Jupiter: The First True Pulsar? - Y. M. Vasyliunas, physics. The Physics of Space Seminar (267). 10:30am, Rm 37-696.

Zonal, Continuous Flow and Elutriation Centrifugation — Mitch Griffith, Beckman Instruments. Instruments and Techniques in Biology Seminar (33). 12n, Rm 16-310.

Gold-Cadmium and Iron-Platinum Systems — Martin L. Green, G. IAP Seminar on Thermoelastic Martensite (S9). 12:30pm, Rm 13-4101. Coffee 12n.

The Future of Set Theory – E. Kleinberg, mathematics. Annual IAP Logic Week (197b). 2pm, Rm 2-190.

Masculinity and Feminity Re-Visited** – Carol Gilligan, Center for Moral Education, Harvard Graduate School of Education. Technology Wives Organization Child Development Seminar (369a). 2pm, Stu Ctr West Lge (babysitting Stu Ctr Rm 473).

Worldwide Navigation for Light Aircraft – Walter M. Hollister, aero/astro. Highlights of Aero/Astro Seminar (6a). 2pm, Rm 33-206.

Partially Observable Markov Processes — Alvin Drake, electrical engineering, associate director of Operations Research Center; An Overview of the Innovative Resources Planning Project — Richard Larson, electrical engineering & urban studies. Operations Research Center Seminar (181). 2:30pm, Rm 24-121.

Photo Chemical Applications of Lasers – Aram Mooradian, Lincoln Lab. Optics and Energy Sources Seminar (227). 3pm, Rm NW14-2209. Refreshments 2:45.

The Erotic in Russian Literature – Katherine O'Connor, foreign literature & linguistics, MIT & BU. Lectures on Russian Literature and Culture (132). 3pm, Rm 14N-225.

Chemical Bonding in Solids – Marc Kastner, phycis. Lectures of Physics (265). 3:30pm, Rm 4-231.

Design and Utilization of Cytokinin Antagonists (50) - Sidney Hecht, chemistry, Chemistry Seminar. 4pm, Rm 18-491.

Studying, Teaching, Living in a Foreign Country: Israel (376) - Students and faculty will discuss their experiences. Independent Offering. 4pm, Rm 10-280.

The Control of the Water Cycle – Jose P. Peixoto, Geophysical Institute, University of Lisbon. Meteorology Seminar. 8-10pm, Rm 54-100 Info, x3-2285.

Wednesday January 15

Does Molecular Biology Become More of a Hazard than a Promise e — David Baltimore, American Cancer Society Professor of all Microbiology. Genetics and Society Seminar (287a). 10am, Rm a 4-231.

Energy, Health, and Transportation-Related Applications of Magnetic Fields (226) — Basic physics of superconductivity and demonstrations. National Magnet Lab Seminar. 10am, Rm NW14-2209.

Nickel-Titanium and Copper-Aluminum Systems – R. J. Salzbrenner, metallurgy. IAP Seminar on Thermoelastic Martensil Frida (S9). 12:30pm, Rm 13-4101. Coffee 12n.

Resonance Raman Spectroscopy: A New Probe for Biological Structures – Thomas G. Spiro, chemistry, Princeton University Prospects for Short Wavelength Lasers – Terry Cool, applied physical and electrical engineering, Cornell University. Spectroscopy Laboratory Symposium (318a). 1-5pm, Rm 6-120.

Hilbert's Tenth Problem: A Question That Has No Answer – A Leggett, mathematics. Annual IAP Logic Week (197b). 2pm, Rⁿ 2-190.

New Frontiers in Biology (35a) – Salvador E. Luria, Institute Professor, biology, director of Center for Cancer Research. Biology Seminar 2pm, Rm E17-615.

How to Design Reliable Systems with Unreliable Components W.E. Vander Velde, aero/astro. Highlights of Aero/Astro Semins (6a). 2pm, Rm 33-206.

You Want to Start a Business (315) - Arnold E. Amstutz, anagement. Sloan School of Management Seminar. 3pm, Rm 52461.

Discussion of Homosexuality in Media and Film - Stuart Byron, ne Real Paper (tentative) and a representative from Gay Media ction. Changing Lifestyles and Modern Times (352c). 3pm, Rm

aser and Optical Diagnostics for Fusion - Daniel Cohn, DSR Staff, agnet Lab. Optics and Energy Sources Seminar (227). 3pm, Rm W14-2209. Refreshments 2:45.

thods of Knowing and the Unity of the World (189) - Patrick lburn, program director for Center for Integrative Education; sociate editor, Main Currents of Modern Thought. Libraries minar. 3pm, Rm 14S-100.

duid Crystals - J. D. Litster, physics. Lectures on Physics (265). 30pm, Rm 4-231.

Manganese Nodule Project: Understanding the Resource tential of Deep-Sea Polymetallic Nodules - Roger S. Burns, earth planetary sciences. Earth & Planetary Sciences Lectures (83). m, Rm 54-425.

dvantages of Sam's Simple Sensible System c of Measurements his system would add a note of excitement to our everyday cabulary. Independent Offerings (328). 4:45pm, Rm 4-159.

frican Affairs and the Economic Development of American Black ommunities - Willard Johnson, political science. Dean for Student fairs Black Perspective Seminar. 7pm, Rm 10-280. Reception

ravels in Scotland-Slides and Commentary - Ellen J. Henderson, emistry. Independent Offerings (340d). 7:30pm, Rm 18-290.

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Biologist Looks at Medical Genetics - Maurice Fox, biology netics and Society Seminar (287a). 10am, Rm 4-231.

vironmental Engineering Education (67a) - Graduate students at Water Resources Lab. Civil Engineering Seminar. 10am-4pm, The gm 48-308.

itch tagnetic Fields (226) Critical Applications of agnetic Fields (226) - Guided tour and explanation of s in Lagneplane. National Magnet Lab Seminar. 10am, Rm NW14-2209.

Solar-Terrestrial Phenomena: Stone Age to Present – George L. Siscoe, visiting professor, physics. The Physics of Space Seminar 276). 10:30am, Rm 37-696.

IAP Managin Instruments - Fred Kalfon, armacia. Instruments and Techniques in Biology Seminar (33). In. Rm 16-310.

Thermodynamic Factors - Dr. L. Kaufman, Manlabs, Inc. IAP Seminar on Thermoelastic Martensite (S9). 12:30pm, Rm 13-4101. 59a). Poffee 12n.

of Theory: Is Analysis consistent? - P. Lavori, mathematics ister, Annual IAP Logic Week (197b). 2pm, Rm 2-190.

chological Effects of Day Care ** - Philip Zelazo, Infant velopment Services, Tufts New England Medical Center, Tufts trical iversity Medical School. Technology Wives Organization Child velopment Seminar (369a). 2pm, Stu Ctr West Lge (babysitting Ctr Rm 473).

Aircraft Engines of the Future-Oil Conservation, Nox and Noise ack L. Kerrebrock, aero/astro. Highlights of Aero/Astro Seminar (6a). 2pm, Rm 33-206.

Derations Research Center Seminar (181) - Murray Geisler, ting professor of management; RAND Corporation. 2:30pm, Rm reign 14-121.

aser Pellet Fusion - Benjamin Lax, physics, director of Magnet ab. Optics and Energy Sources Seminar (227). 3pm, Rm 14-2209. Refreshments 2:45.

esthetics of the Opera (245) - Irving Singer, philosophy. A idney conard Bernstein film, "What Makes Opera Grand?" will be shown. il osophy Seminar. 3pm, Rm 26-100.

rants for Graduate Study Abroad (360) – The Churchill, DAAD, and all bright, Luce, Marshall and Rhodes scholarships will be ussed. Independent Offerings. 3:30pm, Rm 36-261.

ysical uperfluid ³He Below 3 Milli-Kelvin — Thomas Greytak, physics. 1, Rm ectures on Physics (265). 3:30pm, Rm 4-231.

Topic in Mathematical Statistics - Herman Chernoff,

hematics. Mathematics Club Lecture (199f). 3:30pm, Rm 2-190. omise etermining the Age of a Rock – Patrick M. Hurley, earth & or of lanetary sciences. Earth & Planetary Sciences Lecture (83). 4pm, 1, Rm m 54-425.

Ima Lewis School of Music - Speaker from the school, in Boston, as of be announced. Dean for Student Affairs Black Perspective

y and eminar. 7pm, Stu Ctr Mezzanine Lge. Reception follows.

Tanzanian Model of Professional Training in Development rofessionals in Development Seminar (372b). 8pm, Rm E14-304.

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logical Southard, earth & planetary sciences. Climate Seminar (222). 10am, tersity km 54-811.

lagnetic Fields (226) - Guided tour of the low-magnetic field acility. National Magnet Lab Seminar. 10am, Rm NW14-2209.

m, Reducleation and Growth Mechanisms - G.B. Olson, metallurgy. IAP inar on Thermoelastic Martensite (S9). 12:30pm, Rm 13-4101. offee 12n.

Biolog hat are Phenomenology and Existentialism? – Izchak Miller, hillosophy. What is Philosophy? (251). 2pm, Rm 4-231.

ents Made Artificial Genes – Har Gobind Khorana, Alfred P. Sloan emining essor of Biology and Chemistry. Genetics and Society Seminar

Nonstandard Analysis: Are There Non-Real Points on the Number Line? - David F. Pincus, visiting scholar, mathematics. Annual IAP Logic Week (197b). 2pm, Rm 2-190.

Aerodynamics of Road Vehicles and Race Cars - Elmer E. Larrabee, aero/astro. Highlights of Aero/Astro Seminar (6a). 2pm, Rm 33-206.

CO₂ Laser Solenoid Fusion - Ward Halverson, DSR staff, Magnet Lab. Optics and Energy Sources Seminar (227), 3pm, Rm NW14-2209. Refreshments 2:45.

A Discussion of Sex in Films - George Manseur, Esquire Cinemas; Kay Larson, The Real Paper (tentative). Changing Lifestyles and Modern Times (352c). 3pm, Rm 14E-304.

Theory of Disordered Systems - John Joannopoulos, physics. Lectures on Physics (265). 3:30pm, Rm 4-231.

Community Meetings

Acting Workshop in Theatre Games and Improvisation** - Joel Polinsky, Theatre Two. Sponsored by MIT Community Players. An excellent opportunity for beginners with interest in the theatre. Wed, thru Mar 12, 7:30pm, Rm 1-132. Fee: \$30. Info, Dianne Banda, x3-4621.

Social Events

Strat's Rat - Dance to WTBS music and drink light or dark beer, 16 oz for 25 cents. Sat, Jan 10, 8:30pm, Sala. Free, college ID required.

Ad-Hoc Over 30's Singles Chowder and Marching Society Lunchtime meeting in Stu Ctr East Lge (small dining room off Lobdell), Fri, 12:30-1:30pm. New members always invited. Look for the table with the red balloon. Suzanne, x 3-3131 or Marty x8-1206 Draper.

Movies

Heartbeat of a Volcano; Volcanos: Exploring the Restless Earth; Caverns & Geysers - Earth & Planetary Sciences Theatre. Wed, Jan 8, 2pm, Rm 54-100.

Rivers of Sand: Human Theme and Tribal Portrait - Robert Gardner, film maker, will discuss his work. The Anthropologist as Film Maker (139). Wed, Jan 8, 3:30pm, Rm 9-150.

Unsolved Problems - Mathematical Films (199e). Wed, Jan 8, 4pm,

Ivan the Terrible, Part I - Humanities Film Festival (186). Thurs, Jan 9, 12n-1:30pm, Rm 9-150.

Earthquakes: Lesson in Disaster; San Andreas Fault - Earth & Planetary Sciences Theatre (75). Thurs, Jan 9, 2pm, Rm 54-100.

Radium and Radioactivity - Serendipity or Science? Barker Engineering Library Film Series (190). Thurs, Jan 9, 5pm, Rm

Radium and Radioactivity - Serendipity or Science? Barker Engineering Library Film Series (190). Fri, Jan 10, 12n, Rm 10-500.

Volcano Surtsey; Kilauea Eruption, 1955; Kilauea Eruption, 1959 -Earth & Planetary Sciences Theatre (75). Fri, Jan 10, 2pm, Rm 54-100.

Pits, Peaks and Passes - Mathematical Films (199e). Fri, Jan 10, 4pm, Rm 2-190.

And Now for Something Completely Different** - LSC. Fri, Jan 10, 7 & 9:30pm, Rm 10-250. Admission \$.50.

Wait Until Dark** - LSC. Sat, Jan 11, 7 & 9:30pm, Rm 10-250. Admission \$.50.

The Time Machine** - LSC. Sun, Jan 12, 7 & 9:30pm, Rm 10-250. Admission \$.50.

Afternoon of Bio-Flicks (28) - Developmental Biology films. Mon, Jan 13, 1pm, Rm 16-310.

An Approach to the Prediction of Earthquakes; Continents Adrift; Yellowstone: Our First National Park - Earth & Planetary Sciences Theatre (75). Mon, Jan 13, 2pm, Rm 54-100.

Mark Twain's America - Humanities Film Festival (186). Tues, Jan 14, 12n-1pm, Rm 4-270.

Homosexuality in Film and Television - The Boys in the Band (tentative), A Very Natural Thing, and a segment of channel 44's Bostonia program will be shown. Changing Lifestyles and Modern Times (352c). Tues, Jan 14, 3pm, Stu Ctr Rm 473.

Bizarre, Bizarre - French Film Series (119). Tues, Jan 14, 7pm, Stu Ctr Rm 407. Followed by informal discussion in French with nati speakers.

Translation of Culture: In Depth View of Yanomamo Indian Society - Timothy Asch, film maker, will discuss his work. The Anthropologist as Film Maker (139). Wed, Jan 15, 3:30pm, Rm 9-150.

Can You Hear the Shape of a Drum? - Mathematical Films (199e). Wed, Jan 15, 4pm, Rm 2-190.

Ivan the Terrible, Part II - Humanities Film Festival (186). Thurs, Jan 16, 12n-1:30pm, Rm 9-150.

Aerial Photo Interpretation: Introduction; Aerial Photo Interpretation of Hydrological Resources; Aerial Photo Interpretation of Geological Resources – Earth and Planetary Sciences Theatre (75). Thurs, Jan 16, 2pm, Rm 54-100.

Sex in Films - Films from the Multi-Media Resource Center of the Institute for Sex Research (Indiana University-the Kinsey Institute) and films of pornography will be shown. Changing Litestyles and Modern Times (352c). Thurs, Jan 16, 3pm, Stu Ctr Rm 473.

Kitty Hawk to the Moon - Serendipity or Science? Barker Engineering Library Film Series (190). Thurs, Jan 16, 5pm, Rm

Kitty Hawk to the Moon - Serendipity or Science? Barker Engineering Library Film Series (190). Fri, Jan 17, 12n, Rm 10-500.

Airborne Magnetometer; Tellurometer; John Wesley Powell: Canyon

Geologist; Geology of the Grand Canyon Country; Erosion - Earth & Planetary Sciences Theatre (75). Fri, Jan 17, 2pm, Rm 54-100.

The Twelve Chairs ** - LSC. Fri, Jan 17, 7 & 9:30pm, Rm 26-100. Admission \$.50.

The Passion of Joan of Arc (Dreyer) - Film Society. Fri, Jan 17, 7:30 & 9:30pm, Rm 6-120. Admission \$1.

The Magnificent Seven** - LSC. Sat, Jan 18, 7 & 9:30pm, Rm 10-250, Admission \$.50.

Forbidden Planet** - LSC. Sun, Jan 19, 7 & 9:30pm, Rm 10-250. Admission \$.50

Music

Beatrice and Stephen Erdely - Piano and violin concert. Program includes sonatas by Schubert, Brahms, Schuller and Ravel. Fri, Jan 10, 8pm, Kresge. Free.

An Evening with the Dulcimer - Lecture/demonstration by Virgil Hughes on Appalachian dulcimers and other folk instruments. Sun, Jan 12, 8pm, Music library (Bldg 14E).

Dulcimer Playing and Singing - Music program with Robert Harman, followed by discussion of the history of the Appalachian dulcimer and folk tunes led by Stephen Erdely. Wed, Jan 15, 8pm, music library (Bldg 14E).

Theatre

The White House Transcripts: A Documentary Drama (276) -Screening of a unique videotaped "docu-drama" featuring professional actors. Political scientists, journalists and psycho-historians will discuss presidential power. Wed, Jan 15, 2-5pm, Call x3-3371 for monitor locations.

Dance

Serbian Dancing* - Bob Liebman will teach Serbian dancing Sat, Jan 11, 10am-1pm & 2-5pm, Sala. Sponsored by MIT Folk Dance Club. Admission: \$1.50/session, \$1/session with ID.

Folkdancing - International: Sun, 7:30-11pm, Sala. Balkan: Tues, 7:30-11pm, Stu Ctr Rm 491. Israeli: Thurs, 7:30-11pm, Sala. Noon dancing: Fri, 12n-1:30pm, Kresge Oval in good weather, otherwise Bldg 7 Lobby. Learn & practice more difficult dances Fri, 1:30-3 or 4pm, Stu Ctr 491.

Exhibitions

Sculptures by Michios Ihara* - Including sculptures and photographs of works by the sculptor, a fellow at the Center for Advanced Visual Studies. Thru Sat, Jan 11, CAVS.

Collages* - By Livia Campanelli St. Florian. Thru Sat, Jan 11, weekdays 9am-5pm, CAVS (Bldg W11). Free.

Gyora Novak, Sculptor* - Modular notebook of his ideas and work on display. Sponsored by the Center for Advanced Visual Studies. Thru Tues, Jan 28, weekdays 9am-5pm, CAVS (Bldg W11). Free.

Creative Photography Gallery* - Exhibition of photographs by Baldwin Lee and Meridel Rubenstein. Sat, Jan 11-Tues, Jan 28, 10am-6pm, 3rd floor Bldg W31. Free.

Exhibition at Faculty Club* - Rugs, wall hangings, and weavings done by Claudia Ogilvie. Thru Fri, Jan 31, Mon-Fri 9am-11pm, 6th floor faculty club, Bldg E52.

Nan Arghyros: Drawings* - Sponsored by the Committee on the Visual Arts. Fri, Jan 10-Sat, Feb 8, Hayden Corridor Gallery. Free.

Video: Art in Process* - Interaction between live video and actors, dancers, writers and musicians. Mon, Jan 13-Sat, Feb 8, daily 10am-4pm and Tues 6-9pm, Hayden Gallery. Free.

The Look of Music in the Middle Ages* - Facsimiles of manuscripts and transcriptions into modern notation; pictures of life in the Middle Ages. Open daily, music library, Bldg 14E.

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.

MIT Historical Collection* - Permanent exhibition, open Mon-Fri, 9am-5pm, Bldg N52, 2nd floor.

Athletics

Home Schedule - Saturday, January 11 - JV/F, V Basketball. Springfield, 2pm, 3:30pm, duPont Wrestling Room. Monday, January 13 – JV/F, V Basketball. Lowell Tech, 6:15pm, Rockwell Cage. Tuesday, January 14 – V Hockey. Fitchburg State, 7pm, ice rink. Wednesday, January 15 – F "B" Basketball. Chauncy Hall, 5:30pm, Rockwell Cage. V "B" Basketball. Emerson, 7:30pm, Rockwell Cage, Saturday, January 18 - Track, Williams, Tufts, 1pm, Rockwell Cage. V Fencing. SMU, Norwich, 2pm, duPont Fencing Room. V Hockey, Maine (Portland-Gorham), 7pm, ice rink.

Women's Athletic Council* - WAC is formed of representatives from all the women's teams and works to promote women's athletics at MIT. Meetings 1st & 3rd Tues of each month, 7:30pm, duPont Conference Rm. Info: Mary Lou Sayles, director x3-4910.

Editor's Note: Anyone connected with MIT - students, employees and faculty - are encouraged to participate in IAP activities. Some courses, in fact, are particularly designed for "lay-people." The number in parentheses in many Calendar entries refers to the IAP course number, in case additional information is needed.

Freshmen are encouraged to attend departmental lectures and seminars. Even when these are highly technical they provide 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 15 through January 26 to the Calendar Editor, Room 5-111, Ext. 3-3279, before noon Friday, January 10.



Announcements

Activities Day-Sat, Jan 25-Sponsored by the Dean for Student Affairs. Activities include competition basketball and volleyball (2-4pm, duPont) and tournaments in cards and games (4pm, Stu Ctr Rm 407). Undergraduates can compete with graduates, faculty and staff. Sign up by Wed, Jan 22, with Toni Wilson, Rm 5-104. Winners will be announced at a party in McCormick Country Kitchen, 7:30pm, and will receive token awards. Sign up for party by Fri, Jan 17. Also contact Toni if you can help man these activities.

Family Day Care Program-We have licensed, loving and supervised homes in Arlington, Belmont, Cambridge, Lexington, Watertown and Wellesley, caring for babies from 6 weeks to 6 years. If your child needs care or you can care for others, call or come to the Child Care office, Rm 4-144, x3-3953 or x3-1592.

R/O Coordinator-Applications are now being accepted in the FAC office. Any student interested in this paid position should come to the office, Rm 7-103, see Bonnie Kellermann, and get a job description. Proposals will be due no later than Jan 10, 1975. Questions, x3-6771.

Discount Tickets-Tickets for the Associate Artist Opera Company's production of Rossini's Cinderella (Fri, Jan 31 & Sat, Feb 2), are on sale now for \$2.25 at the TCA office, St Ctr Rm 450, x3-4885

BSO-Discount tickets for the Wed, Jan 22 BSO open rehearsal are available now at the TCA office, Stu Ctr Rm 450, x3-4885.

Technology Children's Centre Nursery School*-As some of our pupils will be leaving, we will be happy to welcome new applicants in Jan for both Eastgate and Westgate. Info and appointment to visit the school, Fran Olson, x3-5907.

Hillel Classes*-All classes have resumed (as of Mon, Jan 6).

Basic Pistol Marksmanship Course*-Thurs, 5 consecutive weeks beginning Jan 9, 6:30pm, duPont Pistol Range. Fee: \$15, covers costs. Register: Tom McLennan, x3-3296 or Andy Platais, x8-1417 Draper. Open to adults only. For info on basic rifle course contact Andy Platais.

February Degree Recipients-Post cards must be returned to Rm E19-335 no later than Fri, Jan 24, to indicate whether diplomas are to be mailed, called for in person or if June attendance is planned.

Constitutions Service (355)—Robert Sacks, G, will provide advice and assistance on constitutions, by-laws and procedures, as well as training in administrative and parliamentary procedures. Sat, Jan 11, 9am,

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 3-3849 unless otherwise specified in the listing. Undergraduates are also urged to check with the UROP bulletin board in the main corridor

West Roxbury VA Hospital Boston, Ma The Spinal Cord Injury Service at the VA Hospital has offered the following projects: 1. Investigation of the necessary architectural and equipment requirements for a bioengineering unit to be incorporated in a new building, for example, the environmental control requirements. 2. Examinations of the urinary tract using transducer equipment with measurement of bladder pressure and rectal pressure togéther with EMG's of sphincter muscles. 3. Development of some type of transducer tip catheter of a very small diameter which would allow measurement of pressure within the bladder or urethra or both. 4. A method for monitoring an infusion apparatus used for bringing fluid into the kidney in such a way that the in-flow rate could be set up in a precise way under certain pressure. 5. Development of a language keyed control unit for patients who have control only of their mouth muscles.

Massachusetts General Hospital

Boston, Ma 1. Microprocessor Applications in Medical Instrumentation-The further development of a microcomputer system using PROM's to perform input/output, sequencing, basic arithmetic, and display operations. The system will serve as a multipurpose monitor for acutely ill pa-

2. Emergency Cardiac Monitor-A subminiature (pocket-size) electrocardiographic audio monitor. The frequency of audio output will be linearly dependent on instantaneous values of EKG voltage detected by special touch-on chest elec-

3. Operating Room Environmental Pollution Analysis-The traces of anaesthetic agents in the OR will be analyzed using sampling gas chromatography technique.

Department of Architecture

The program in the Industrialization of the Housing Sector is a multi-disciplinary organization dedicated to improving the socio-economic performance of the housing industry. Undergraduates are encouraged to initiate and complete substantive research in several areas. The research projects are of special interest to students in architecture, economics, management, political science, and urban studies, but such a background is not a prerequisite.

Prof. Arthur D. Bernhardt, Rm E40-216, x3-4547 or x3-3747.

Department of Nutrition and Food Science

Oxygen Transport in Frozen Materials-The project involves the determination of the oxygen permeability of a number of materials in the frozen state. The effectiveness of these materials to reduce oxygen transport and thus to reduce oxidative deterioration of frozen fish blocks will be evaluated. Laboratory experience in the chemical or engineering fields is desirable. Project could be developed into a thesis topic. Pay or credit.

Prof. James M. Flink, Rm 56-109, x3-6735.

The Foxboro Company The following two projects are available for undergraduate research. The first project can take place at MIT while the second requires Foxboro facilities. Automatic Patching of Analog Computers/Programming-This study has the objective of conceiving, developing and debugging digital computer programs and routines in Hybrid Fortran, that will enable an experimental automatic patching system for an analog computer model EAI 680 to be controlled and commanded from a teletype terminal of a digital computer model EAI 640. Automatic Patching of Analog Computers/Performance Evaluation-The aim of this research effort is to evaluate an experimental automatic patching system for an analog computer model EAI 680, from the point of view of simulation performance, electronic signal integrities, sufficiency in patching (interconnectivity), and user acceptance.

Graduate Studies

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

National Research Service Awards

The Alcohol, Drug Abuse, and Mental Health Administration will provide National Research Service Awards to individuals for predoctoral and postdoctoral training in specified areas of biomedical and behavioral research. Applicants must be citizens or non-citizen nationals of the US, or have been lawfully admitted to the US for permanent residence. A predoctoral applicant must have completed or more years of graduate work as of the proposed activation date of the award and have a doctoral prospectus. Applicants must apply in one of the ADAMHA priority areas specified. Upon completion of the program, recipients of NRS awards are expected to engage in biomedical or behavioral research or teaching for a period equal to the period of support.

Deadlines: Applications received by January 15th, results announced in June; applications received by May 1st, results announced in January.

Faculty Fellowships NSF Faculty Fellowships in Science Applied to Societal Problems

NSF will award approximately 80 Faculty Fellowships in Science on April 11, 1975. Awards will be offered primarily to those proposing activities which promise to broaden the perspectives of college science teachers and thereby to improve their effectiveness in teaching and research directed toward the understanding and amelioration of societal problems. Tenures of three to nine months are available. Stipends are based on the average monthly income received from regular and continuing salaried academic work in

the year in which the application was submitted. Applicants must a) be citizens or nationals of the US; b) hold a baccalaureate or its equivalent; c) have had five or more years' experience in teaching sci ence, mathematics or engineering at the collegiate level as of February 7, 1975; d) show clearly that their proposed activities will increase their competence as teachers of science applied to societal problems; and e) intend to continue teaching. Application materials may be obtained from the Faculty Fellowships in Science Program, HES, National Science Foundation, Washington, D.C. 20550. Information: Graduate School Office, Rm 3-136. Deadline: February 7, 1975.

MIT Club Notes

MIT/DL Bridge Club**-ACBL Duplicate Bridge. Tues, 6pm, Stu Ctr Rm 473.

Bridge Club*-ACBL Duplicate Bridge. Open Matchpoint pairs Tues, 6-9pm and Thurs, 7-10:30pm; separate non-masters section Thurs, 7-10pm; all Stu Ctr Rm 473. Jeff. 864-5571.

MIT Club of Boston-Robert Woolf, Esq, will speak on the world of sports and law at the monthly luncheon meeting. Thurs, Jan 9, 12:15-1:30pm, Aquarium Restaurant, 100 Atlantic Ave, Boston. Cost: \$4, payable at door. Tickets: Ms. Kiirats, x3-3878.

Strategic Games Society-Offers opponents and discounts on merchandise to members plus gaming and periodical library, Sat during IAP (except Jan 18), 1pm-1am, Walker Rm 318. Info, Kevin Slimak, 491-8568 or Robert Sacks, 494-8889.

Strategic Games Society-Third Annual Winter Wargaming Convention in New England-Sat & Sun, Jan 18 & 19, Sala. Registration: \$2.50/day, \$4/2 days. Preregistration discount \$.50. Info, Robert Sacks, 494-8889.

Student Homophile League*-Meetings Sun during IAP, 4pm, Rm 1-132. Info, talk, help in coming out, call Jim at the Hotline, x3-5440. Come out, come out, wherever you are! Party Fri, Jan 17, 5pm. Check bulletin board for location (bulletin board is being moved to Bldg 3).

TCA General Meeting**-Topics: course evaluation, another TCA dinner, project reports, fixing up office. Mon, Jan 13, 7:30pm, Stu Ctr Rm 450. New & old members welcome, refreshments served.

Tech Model Aircrafters*-Flying in du-Pont Gym Sat, Jan 11, 6-10pm.

MIT Wheelmen*-Meetings Tues, 7:30pm,

White Water Club**-Pool sessions. Tues, Jan 14, 8-10pm, Alumni Pool.

Religious Activities

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

Baha'i Discussion Group*-Discussion about the Baha'i faith. Thurs, 7pm, Rm 4-155. Refreshments.

Christian Science Organization*-Weekly meetings, including testimonies of healing. Tues, 7:15pm, Rm 8-314.

Hillel Services*-Fri: Traditional 4pm, Rm 16-139; non-Traditional 8:30pm, Chapel. Sat: Traditional 9am, Chapel. Mon-Fri, Minyan 7:30am, Rm 7-102.

Humanist Counseling Hour-Tues, 2-3pm by appointment or spontaneously, religious counseling center, Memorial Drive, Thomas Ferrick, Humanist Chaplain

Prayer Time**-Lunch hour prayer and Bible class lead by Miriam R. Eccles. Fri, 1-2pm, Rm 20E-225

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

United Christian Worship Service*-Sun, 10:45am, Chapel.

United Christian Fellowship*-Sunday school and nursery for infants and children during United Christian Worship Service. Sun, 10:45-12n, Stu Ctr Mezzanine Lge.

IAP Notices

The Collection of Attitudinal Data-Intended to acquaint those interested with the major difficulties encountered and the approaches taken by social scientists in gathering attitudinal data. Concentration on questionnaire design and problems likely to be encountered in the field (we will not deal with questions of sampling procedure). Seminar-format discussion followed by field experience in data collection. Political Science. First meeting Wed, Jan 8, Rm E53-336. Mike D'Amato, x0433 Dorm; Susan Burk, 494-8294; or Chris Arterton, x3-3145.

Special Computer Group Aids Resource Development

A special computer group, Resource/Alumni Data Systems (R/ADS), has been established at MIT to take responsibility for existing and new computer systems in Resource Development, the Alumni Association, and the Alumni Fund in conjunction with the urgent support needs of major funding efforts now being planned by the Institute.

R/ADS is organized under General James B. Lampert, Vice President, Resource Development, and reports to Nelson C. Lees, Director of Resource Planning. The management of the group is closely coordinated with Richard A. Knight, Secretary of the Alumni Association, and Frederick G. Lehmann, Financial Vice President and Treasurer of the Alumni Association and Director of the Alumni Fund. R/ADS interacts technically on a structured basis with the Office of Administrative Information Systems. R/ADS adheres to MIT system development methodology and programming standards as established by OAIS, and consults on a regular basis with Kenneth T. Finney, Jr., Manager of Systems Development for OAIS.

Much of the work now in R/ADS was transferred from OAIS where the assignment of staff time to it had to be balanced against competing ongoing and priority efforts. The pressing need to assign special priority to accelerating systems development and other computer work to prepare for a major funding effort and to support it while it is carried on, led to the difficult and unusual decision to establish R/ADS as a separate group for the duration of the effort.

The manager of the new R/ADS group is Victor M. Maslov. Mr. Maslov received the BA degree from Columbia and an MBA from Harvard Business School. He has been a member of the MIT Staff



Left to right, Ms. Peterson, Mr. Maslov, and Mr. Matson.

since 1969, most recently as Project Manager in OAIS.

Mr. Robert F. Matson is the systems analyst in the new group. He received the BA degree from Stonehill College and has been an MIT staff member since 1969, most recently as an Area Coordinator in OAIS.

The third member of the new group is Ms. Merry C. Peterson, programmer/analyst. Ms. Peterson holds the BA degree from Case Western Reserve University and comes to MIT from Transaction Technology, Inc. in Cambridge.

The data processing needs of upcoming concentrated funding efforts by the Institute will require new systems and the expansion and strengthening of several existing ones operated by Resource Planning to support the overall Resource Development effort, including the solicitation activities of Institute officers and Resource Development staff, satellite funding programs, and approved faculty funding projects.

Dr. Killian's Leadership At CPB Draws Tribute

(Dr. James R. Killian, Jr., Honorary Chairman of the MIT Corporation and former MIT President, in mid-December relinguished the position of chairman of the board of the Corporation for Public Broadcasting. He will continue as a board member until a successor is approved and seated, but on the occasion of his resignation as chairman, The New York Times in its Dec. 20 issue published the following editorial tribute under the title "Pioneering Public TV.")

"The resignation of Dr. James R. Killian Jr. as chairman of the Corporation for Public Broadcasting's board, effective today, ends an era in a pioneering effort to give American television viewers -children and adults- a chance to see what mature broadcasting can provide without commercials, ratings or talking down to the American people.

"With good reason, Dr. Killian is considered the father of public broadcasting. As head of the Car-

Experimental Medicine Laboratory-An

opportunity to work with ongoing projects

involving research on biological effects of

ultrasonic radiation; medical applications

of ultrasonic radiation: ultrasound-tissue

interactions and untrasound technology.

Sponsored by HST. Padmakar P. Lele, Rm

Women in Science (382)-Meetings will be

as follows: Wed, Jan 8 & 22, 12n-2pm, Rm

10-105; Wed, Jan 15, 12n-2pm, Rm 33-252.

Power for Abundant Living (348)-Will

meet Mon, Tues, Thurs, Fri, Jan 6-28, Rm

13-3101 from 7-10pm, not from 2-5pm.

26-007, x3-5235.

negie Commission on Educational Television, he formulated the 1967 report that built the framework for Government support of a network of stations in communities all over the country. The most solid tribute to his efforts would be for Congress to provide the long-range funding necessary for public broadcasting to flourish as a noncommercial alternative on the dial, enabling the nation's 250 public TV stations to produce more original programs and interconnect more news, public affairs, drama and entertainment shows from here and abroad.

"The fundamental idea behind public broadcasting was set forth in a letter from essayist E.B. White to the Carnegie Commission: 'Noncommercial television should address itself to the ideal of excellence, not the idea of acceptability.... It should restate and clarify the social dilemma and the political pickle. Once in a while it does.' It still can."

Editor to Speak

"What's News In Physics?" will be the topic of a lecture by Gloria Lubkin, senior editor of the magazine Physics Today, Wednesday, Jan. 8, from 8-10pm in the Mezzanine Lounge of the MIT Student Center.

Ms. Lubkin is on leave from the magazine as a Niemann Fellow at Harvard. Persons wishing to have dinner with her should call Professor Vera Kistiakow-.sky at 3-4853...

Page 8, Tech Talk, January 8, 1975

Pension Bylaws Changed

Four changes in the MIT Pension Association's Bylaws, which will affect staff members at retirement, have been adopted by the Pension Association.

The changes were approved at the Dec. 16 Pension Association meeting. At the meeting, Association members elected Abraham Siegel, associate dean of the Sloan School and professor of economics and management, to succeed Charles Kindleberger, professor of economics, as the Association's president and one of the trustees.

The changes are:

A spouse no longer has to be financially dependent on the staff member in order to receive the surviving spouse's benefit.

As of the day a member retires, the member can elect to have his/her account in the Variable Fund (which fluctuates with the stock market) transferred to a fixed-dollar annuity in the Dollar Fund. This is a one-time change and can not be reversed.

Not more than 50 percent of a member's retirement benefits can be paid to someone other than the member of his/her spouse. This change was instituted to comply with an Internal Revenue Service requirement.

Members receiving long-term disability benefits will now have the premiums and contributions that are required for group life insurance, for Institute-sponsored health care programs and for the Pension Association paid by the Institute instead of by the Trus-



CHILDREN FROM GREATER BOSTON grade schools line up outside MIT's Kresge Auditorium waiting to see a children's play presented by the New York Theater Festival. The festival, sponsored by the Performing Arts Repertory Theater and the National Theater Company, performed "Freedom

Trail" and adaptations of "A Connecticut Yankee in King Arthur's Court" and "Oliver Twist" at MIT last month. The company will return Jan. 20-21 with "The Miracle Worker." Attendance is arranged through

Photo by Calvin Campbell

tees. According to Allen Urquhart, Benefits Officer, this change was made "to provide better net benefits than under the old plan."

These changes will not affect those already in retirement.

Members of the Pension Association also voted to authorize the trustees to make such technical changes in the Association's Bylaws as are required to comply with the 1974 Employee Retirement Income Security Act. These changes will not reduce benefits and will be reported to the members when effected

Faculty Gives Approval To Interdisciplinary SM

(Continued from page 1) is not to take the pressure off the student," one said. "If there is too much content in a subject, then the content should be reduced."

Some suggested that pass-no credit be limited to the first term in the freshman year.

Other faculty argued, however, that two terms were needed for the system to serve its purpose of easing the adjustment problems of freshmen.

"Many freshmen sail through the fall term," one said, "because of good preparation in high school, but they are more likely to run into trouble in the spring term." He also reported that most freshmen strongly supported at least one full year of pass-no credit grading.

Another faculty member said those worried about what a freshman gets out of a subject should also consider the shortened semesters and in some cases the elimination of finals. "These may be at least as important factors as pass-no credit," he said.

Robert G. Gallagher, associate chairman of the faculty, introduced a proposal by the Committee on Educational Policy which would require that students complete their registration by the end of the fifth week of each term and which would allow each student to delete up to six subjects from the final transcript of his/her undergraduate years. He said a subject could be eliminated at any time during the semester, even after the student had received a grade. The plan, he said, would allow students "to make six mistakes."

The proposal was criticized by some faculty as having an undersirable feature of direct manipulation of the transcript.

President Jerome B. Weisner, presiding at the meeting, asked the Special Committee on Grading to consider the proposal as part of its overall study. He said that the discussion on grading will be continued at the February faculty meeting (there is no meeting in January).

Hydrodynamics Benefactor Ralph M. Parsons Dies

Ralph M. Parsons, friend of MIT and founder of the Ralph M. Parsons Co., a world-renowned engineering-construction firm, died Dec. 20 in San Marino, Calif. He

In a statement on Mr. Parsons' death, James R. Killian, Jr., honorary chairman of the MIT Corporation, said:

"We regret the loss of an MIT benefactor, Mr. Ralph M. Parsons, skillful engineer and business man for whom our Laboratory for Water Resources and Hydrodynamics is named and the present form of which he made possible. Though not an MIT alumnus, he made important contributions to the Institute as a member of our Civil Engineering Visiting Committee, and to those of us who had the privilege of knowing him, he was a great and good friend."

With support from Mr. Parsons, the former Hydrodynamics Laboratory of the Department of Civil Engineering was doubled in size and in 1970 was renamed the Ralph M. Parsons Laboratory for Water Resources and Hydrodynamics. Mr. Parsons served from 1964 until his death as a member of the Visiting Committee of the department

In a letter of sympathy to Mrs. Parsons, Professor Donald R.F. Harleman, director of the laboratory, said:

"The expansion of this laboratory, which came about through your husband's generosity, came at a most opportune time. Since the building was completed...there has been a large increase in the need for education and research in the fields of water resources and environmental engineering both in this country and abroad. Because of our excellent facilities, we are able to respond to this need and to contribute to the development of an exciting and challenging field. This building will stand as a permanent memorial to Ralph M. Parsons."

Mr. Parsons graduated from the Pratt Institute in 1916, then served with the US Navy for eight years as an aeronautical engineer. He later went into business for himself and in 1944 formed the current company, of which he has been board chairman and chief executive officer and, since April, 1974, founder chairman.

Mr. Parsons' work in recent years included construction of many of the world's largest and most modern petroleum refineries, chemical plants, and mining and metallurgical plants. He was also a pioneer in the construction of missile and space launch facilities and nuclear plants.

Aliens Must File

All resident aliens must file address reports with the Immigration and Naturalization Service during January.

Address forms are available to MIT faculty, staff and students in the Registry of Guests, Rm. 7-121 and the Foreign Student Office, Rm. 3-111. Completed forms may be returned to either office or mailed directly to the Immigration and Naturalization Service.

IAP Seminars Will Cover MIT Itself

Daily seminars on "MIT—The Institution" by principal administrators and faculty will be offered in Room 3-133 from 9:30am to noon for two weeks starting Monday (Jan. 13) as part of IAP.

The first next Monday by Howard W. Johnson, chairman of the Corporation, James R. Killian, Jr., honorary chairman, and Kimball Valentine, Jr., assistant to the treasurer, will be on "The MIT Charter and Corporation."

"The Faculty" with Professor Elias P. Gyftopoulos, faculty chairman, and others as speakers, will be given Tuesday (Jan. 14). The third—on Wednesday (Jan. 15)—will be "History, Tasks, Directions," led by Chancellor Paul E. Gray, Provost Walter A. Rosenblith, and Elting E. Morison, the Elizabeth and James Killian Professor of the Class of 1926.

Later speakers will include President Emeritus Julius A. Stratton; Associate Provost Hartley Rogers, Jr.; Vice Presidents Albert G. Hill, John M. Wynne, James B. Lampert, and Philip A. Stoddard; Deans Robert A. Alberty, Alfred H. Keil, William L. Porter, Carola Eisenberg and Irwin W. Sizer; Associate Deans Thomas M. Hill and Donald L.M. Blackmer; and many others. Coordinators are Peter J. Mancuso, senior from Plainview, N.Y., and Robert J. Holden, associate dean for student affairs.

State Education Head to Speak

Dr. Gregory R. Anrig, Massachusetts commissioner of education, will speak at MIT at noon Friday, Jan. 10, at the conclusion of a special Independent Activities Period course in Rm. 3-415. He will discuss current policy and issues in education. The Institute community is invited.

The IAP course—being given by Dr. Janet Weinman, director of the Division of Research and Evaluation for the state Department of Education—deals with the application of research tools to policy making.

MIT Collections Draws Visitors

The women's auxiliary of the Massachusetts Dental Society will become the first group not affiliated with MIT to tour the MIT Historical Collections when 30 of its members visit the campus Jan.

The visit will highlight the group's annual meeting and will include a luncheon and an address on "Women's Roles in Industry" by Miss Susan Schur, MIT '60, vice president of the MIT Alumnae Association.

Civil Engineering Group Begins Road Studies in Four African Nations

(Continued from page 1)
Transportation Studies, Robert D.
Wyatt, staff member of the MIT
Department of Civil Engineering
and project manager, Robert D.
Logcher, associate professor of
civil engineering, and several
graduate research assistants.

Mr. Wyatt and Fredric S. Berger, a graduate earch assistant from East Orange, N.J., are presently in Ethiopia planning the collaborative effort with representatives of the Ethiopian government, AID, and other international agencies.

Ethiopia has already instituted a large-scale program for major highway arteries, Mr. Wyatt said, but with the onset of famine in the northern provinces the government found itself unable to distribute relief supplies and is now placing emphasis on the development of rural roads.

Relates Costs

Although analysis of highway construction costs can be and is done by conventional means, the MIT approach integrates a whole host of detailed engineering factors and enables planners quickly to review a wide range of alternative construction plans and relate them to available resources of capital and labor and to environmental factors.

After the model is given a numerical description of the terrain a proposed highway would cross, a section of the computer program estimates construction costs of earthmoving and drainage for the "best" road (few curves and hills but more earthwork) and poorer but acceptable roads, all the while relating hills and curves to operating costs of cars and trucks. Estimate Separately

A maintenance section of the model tells how a road's surface will deteriorate, taking into account rainfall, volume of traffic, the way the road was built, a specified maintenance schedule and the cost of the maintenance.

In addition, the model predicts operating costs of vehicles using various types of roads. For example, gravel roads may be cheaper to build but they increase vehicle operating costs and reduce speeds. In addition, the model shows how different levels (and costs) of maintenance affect the cost of running autos and trucks.

The prime advantage of the MIT model is that it can do "more faster" and integrate many factors that would otherwise have to be estimated separately, Mr. Wyatt said.

Coming to MIT

The model is also an eminently practical instrument, Mr. Wyatt said. Highways are largely what is termed "social overhead" and are means to an end and not productive resources in themselves, he said. Developing countries also

have great needs for health and educational services and must carefully weigh the allocation of limited resources, particularly capital.

"The whole idea (of the MIT model) is to give as rational a basis as possible for the development of highways," Mr. Wyatt said.

The collaborative program with the Ethiopian government will also include bringing some Ethiopian highway officials to MIT for supplemental training in MIT's Center for Advanced Engineering Study.

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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

For Sale, Etc.

Stanton 500EE stereo crtrdg, nvr used, \$10. John, x3-1827.

Cast iron stoves, old, some fancy, exc for heating house w/wood or coal. Call, 925-5582, mostly evgs.

Pr citizen band Midland walkie-talkies, 1 W power, 2 chnl, nw, nvr used, 20% off list, \$75/pr. Brock, x3-3502.

plyr w/spkrs, 8 trk, \$35. x3-6034.

Quadro 12 spkrs, 3 way, 5 yr wrnty, yr old, nw \$240, ask \$160; '70 Maverick, 2 dr, radio, snows, gas saver, auto, exc cond, \$1,200 or best. Call, 492-2032.

Sherwood S7500 stereo rcvr, 40 W + 40 W, fm 1.8 uV, wrnty cards, \$220 or best. Call, 782-1328, lve msg.

Keystone md1 K808 8 mm zoom movie camera; Bell & Howell proj; both perf cond, \$100/pr. Call, 267-1158, aft

Exc pr Pirelli stud radial snows, 165x15, \$45. Call, 491-2126.

Mod DR thl w/smoke glass top, 4 chrome, tweed & rattan chrs, ctr of tbl under glass also chrome & twee approx 4'x6', \$350. Marge, x3-2974.

Full sz bed, Slumberland matt w/bkcse hdbrd, Vic, x7661 Linc.

Regina 3 spd elec broom, \$15; Danish mod chr, org pillows, can be changed to another color, \$15; Sears sun lamp/ std, nw, \$10. Liz, x3-5831.

Misc 52 mm fltrs; caps & case for Nikon 35 or 50 mm lens; zoom lens for Kodak Carousel proj. x5545 Linc.

F sz 8 3 pc skating outfit, prpl w/fur trim, \$12. x3-3656, 11-11:30am.

Snows, 7.75x14 Gdyr Suburban, nylon 22, \$25/prl Helen, x8-3501 Draper.

Snows, (2) 6.00x13, fair cond, \$15; 24" boy 3 spd bike, almost nw, \$45. Jeff, 244-4059, evgs.

Lafayette solid state 8 trk crtrdg rcrdr/player/tape deck, deluxe, nw, \$150 less mics, \$65. Don, x8-3333

Hewlett Packard HP-65, 3 mos, w/security cradle, hard leath case, all std access, wrnty, mint cond, list \$870, \$750 nego. Neil, 965-0967, evgs.

Rear deck ski rack, holds 2 prs skis & poles, locks, fit most cars, used 1 yr.

exc cond, \$15 or best. Lenn, x3-3770. Tech Aero Club membership, 180 club,

\$80. Mark, x7856 Linc.

Cast iron & canvas loung chrs, 2, perf cond, \$23/ea; asst books, rcrds, etc; (2) 5 hole rims, older VW, fit 5.60x15 \$5/ea. Rich or Francine, 661-3164.

Rieker m sz 11 ski boots, lk nw, \$20. Mark, x3-4549.

Bell & Howell autoload super 8 focus-tronic fl.8, 5:1 zoom, nw, nvr used, make offer. x3-5221.

Snows, pr 7.50x15, 6 ply truck tires, mtd Interntnl whls, 500 mi, \$50. Dennis, x3-7232.

K2-five competition skis, any size, nw, \$160. Call, 628-3021, evgs.

Volkyl skis, 185 cm, \$40; m Lange Swinger ski boots, sz 8M, \$40; m Henke ski boots sz 8, \$30. George,

Solid mahog Duncan Phyffe dining rm DR set w/6 chrs, 5 lves, pads china cab, credenza, \$800. Dick, x3-6186.

Head mtl skis, 195 cm, Solomon bndgs. \$50; La Dolmite m ski boots sz 9. \$20. Call. 862-7712.

Bean's lg "backpacker" down slp bag, used 4x, sells for \$88, now \$50. Call, 492-5036.

Bomar MX100 calc, 3 wks, can send in wrnty cards yourself, \$100 or best. x0431 Dorm.

GE solid state b&w TV, 17", yr old, exc cond, \$80. Dr. Archer, x3-6793.

Gdyr ww stud snows, 2, 4 ply nylon cord, 6.95x14, \$10/pr; child carrier for bike, \$3.50. Norm, x3-5333.

Pr belted F74x14 (7.75x14) snows 3K, \$35; pr bckl leath ski boots sz 2, \$10; boy & girl 20" coaster brake bikes, \$10/ea. E. Nesman, x181-56-141 Havstack.

Japanese 12 str guitar, \$40, x3-3273.

Stereo equip, lowest prices in Bos. Marshall, 734-9291, aft 6pm.

Manhattan X175 acoustic & elec guitar Danelectro bass amp, both \$300; Univox Rhymemaster, \$75. x3-4765.

B&W 14" TV, exc cond, yr old, \$80 or best; TV tb1, \$10. Dmitri, 492-2826.

Sears dwell-tachometer, nw, \$15. Bob, x3-3990.

Baby sled, push-type w/whls, nw, \$13; 2 mtl wardrobes, left & rt, 20" deep, 21" w, 66" hi, \$15/ea; Dr Atkins hrdcvr, nw, \$3. Dennis, x8-3333 Draper.

Heathkit AJ12 stereo (tube) tuner: Heathkit AA100 stereo (tube) amp, 25 W.RMS/ch, both exc cond, best ea or both; wanted: cheap TV. Richard, 494-9217, evgs.

Moving to Eur. Garrard 40B trntbl std amp w/wd finish, 2 wd cab spkrs, 4 yrs, exc cond, \$100. x3-4495.

Stud snows, 2, D78x14, Sears Dynaglass, mtd, fit Maverick or others. Ihab,

HP 45 calc, 4 mos, \$280, x3-4824.

Polaroid 104 camera w/flash attach, 2 packs color film, \$35. John, x3-7571.

DeJur 8 mm movie proj, std & super, \$50; Frigidaire auto washer, nds some repair, free, x3-2576.

Red oriental rug, \$40; work tbl, \$5. Patil, 494-0390.

Necchi sew mach, free arm, lk nw, \$75. x3-5547.

TI SR-10pckt calc, purchased on MIT account & pref to sell to prsn or program on same, \$149.95. Undergrad Seminar Office, x3-3621.

Kodak pckt instamatic 40, \$25; Cosmic aquarium pwr fltr, \$20; Simplex Criterium fr & rear bike derailleurs, chn, \$15; wanted: Stopper bike lock. x8984 Dorm.

Hi-Fi "electrofonic" stereo, trntbl, amp, 2 spkrs, \$45; sm GE amfm radio, \$8; Westclox elec K clock, \$5; GE alarm clock, \$4. Call, 494-8182.

Turkish suede carcoat, hrdly worn, sz 40, \$125 orbest. Steve, x 3-6607.

Fir mdl mahog 21" b&w Zenith TV, exc cond; refrig, exc working cond, frst-free; 14" rims, fit many Ply, Dodge, Chrysler cars. Call, 395-7265, 2:30-6:30pm.

Panasonic cassette rcrdr, mdI RQ413S, almost nw, nw \$65, \$50; pr Rieker ski boots. 9½M, \$30. Bill Beebee, x8-3624. Draper.

Vehicles

'64 VW sed, has sticker, wl run, ok mech, \$120. Joe Huber, x8-3472

'64 Ford Gal 500, p st & br, 4 dr, roomy, mucho trunk space, runs beaut, lk-nw tires incl snows, 85 K, \$300. Call, 237-2309, bef 9pm, lve msg.

'65 VW bug, runs well, current inspection sticker, \$350. Mark,

'67 Ford Third, 55 K, best, Bill, x7559 Linc.

'67 Camaro RS, nds batt & muff. Andy, 661-3929.

'67 Mustang, recent reconditioned eng, nw clutch & br, 2 snows, exc run cond, no rust, \$600. James, x3-2489.

'68 Dodge Dart, 4 dr sed, std, 74 K,

\$550. Bob, x3-6948.

'68 Volvo 142S, std, radials, radial snows, wht, gd cond, 8 trk crtrdg/am radio, 91K, \$1,200; '73 Volvo 145 auto wgn, red, exc cond, radial snows, amfm, 22K, \$4,200. Call, 861-0865.

'69 Fiat 850 cpe, std, only 36 K gd gas miles, exc eng, radials, snows, am radio, sky blu, exc cond except restored damaged body, best. Patrick, 864-9518, evgs, lve msg.

'70 AMC Hornet, 6 cyl, 4 dr, 68 K snows, v gd cond, \$900, x3-5547,

'72 Dodge Colt, auto, 14K, exc cond, \$1,695. Ed, x3-2380.

'72 Porsche 914, appearance grp, 5 spd, mag whis & snows, amfm stereo, 30 mpg, 28K. Call, 933-0755.

'73 Porsche 914, 2.0 appearance grp. amfm, 20K, exc cond, \$4,900. Peter, x3-6323.

Housing

Arl, 2 BR apt, dw, ac, balcony, blk to H Sq bus, \$230 incl pkg, ht, gas. Call, 643-3600.9-5.

BkIne condo, walk to T, 26' LR, panel DR, 3 BR, 2 B, hi ceil, ac, \$42,000. Nancy, x3-3012.

Camb, unusually attractive, freshly mod, tasteful 4 rm apt, 2 fam hse, qt nice nbrhd, nr Porter Sq & T, ww, pkg, easy to heat, ideal cpl or sgl adult, avail now, \$275, Call, 864-4298.

Camb, mod 2 BR apt, ww, ac, pkg on premises, blk off Mass Ave ½ btwn MIT & Harv, \$265 incl util. Lucien, x3-6436.

Chelsea-Everett-Rev line: 3 rm, \$150 + ht & util; 4 rm, \$195 + elec (util & ht incl), no pets. Tony, x5713 Linc. Dorchester, 2nd fl, 4 rm & sunporch,

red line T at Fields Crnr, \$175 htd. Debby or Bruce, 876-0435, days.

Dorchester, nr Everett Sq, 6 beaut sunny rms, oil heat & hot wtr. Call, 282-6668, aft 5pm. Framingham, BR grdn apt, ac, 25 min Camb, rt 9 trnpk, avail 2/1, v reas,

\$195. x3-4772. Newton Crnr, BR apt w/resident super, Indry, pkg, eat-in-K, conv loc on T,

Gunstock, NH, 3 BR ski chalet, \$200/wk. x8-4415 Draper.

yard, \$185 incl ht, gas, x3-5158.

Seas membership avail, exceptionally nice ski lodge in Sugarbush area, \$175. Ken Smith, x8-4230 Draper.

Ski hse for rent, Canadian brdr, 6 BR, central ht, 2 frpl, ski eastern twnshps. Christine, x3-2742.

Animals

Adorable, affectionate fluffy 7 wk pup, G shep & husky, f, free, loves people, nds home. Jessie, x 3-3141.

Birman blu & seal point kittens, 4 mos, make offer. x3-7260.

expressive respon hsebrkn, nds nw home, wht w/brn & blk spots, 20 wks. x3-4985.

Intelligent, sensitive sled-dogs, 2 yg, beaut, malamute f, lk for owners who jog, hike, climb or x-cntry ski to share others also considered. Call, 389-4802, wknds or 7-9:30am,

Beaut long hr Peruvian guinea pigs.

Lost and Found

Lost: set car keys w/blu tag, btwn West garage & Bldg 1, 12/24. x3-2255.

Found: watch, bsmnt Albany garage. Susan, x3-4606.

Found: pr blk gloves w/leath palms, at entrance to E18, 9am, 12/26. Betty, x3-6240.

Found: crnr Ames & Amherst, 12/6, pr glasses. Claim at E. Campus desk.

Lost: Yng blk female dog, 12/13 in Charlestown. If you've taken in a "stray" dog, please call 242-1646 evgs. (Answers to "Nichol".)

Wanted

WI give free rm & brd in exch for evg babysitting, psbly sm salary depending on hrs avail, Winchester. Bonnie, x3-3567.

Nd carpentry work, putting up shelves, interested in making some xtra money? Mrs. Garber, x 3-1627.

Tenor sax, gd cond. Jay, x 3-6404.

Analytical balance for Jan, capacity 30 GM, resolution .1 MG (.0001 GM), wl borrow, rent or buy if reas. Harry or Mike, x3-3356.

Help! Every sort of warm clothing for our new ward arriving from sub-tropic area next week, she's 5'7", 34-27-35, sz 9?, 8B shoe. Rm 33-303, x3-2271.

Sm vac clnr for gen dusting & carpet clning. Charles, x3-5069, lve msg.

Someone to translate books, papers, pamphlets on bldg & construction from Dutch to Eng, salary nego. Ann or David, x3-1350.

Sub Feb-end May or June, spac 1-2 BR apt or hse, gd area of Camb, furn, pkg, for research assoc & wife. Audrey, x3-3122.

File cab, 2 drwr. Dave, x268 Linc.

Teenage son desires car, run cond, to learn auto mechanics, hope for under \$50. F. Perkins, x3-3282.

IBM Selec typwrtr, gd cond; also for sale: mtl sew mach std, \$10; working spinning whl, best. Audrey, x3-3984.

Rider to share exp & driving to Miami, lv Fri, 1/10, aft, arrive 1/12 (stop overnite in DC). Dena or Barbara, x3-4401.

Roommates

Rmmate for 3m, f, pref, f, 5 BR MIT owned apt, K, B, LR, porch, qt street nr Cent Sq. Ken, 547-0265.

M seeks rmmate to seek out & share Beac Hill apt. Michael, 494-9820.

Rmmate, pref f, wonderful Back Bay apt, top 2 flrs 4 story twnhse, Comm Ave, ½ blk Mass Ave, d & d, washer & dryer, skylite, frpl, 2-B, own rm, \$125 & ht & util. Call, 262-2222.

Camb, mod apt avail 2/1, 10 min MIT, K, B, \$75 incl everything. Call, 876-8520.

Considerate, mature, responsible rmmate, 23+, share homey 4 BR apt w/2f, m, cats, 5 min Cent Sq, pleasant nbrhd, avail now, \$102.50. Call, 491-5144.

Carpools

Ride nded, W Nwtn to MIT & back, 3/3, Mon-Fri, 9-5. Valerie, x3-4415.

Attn Bklne residents: I nd ride to MIT from Cldg Crnr area, wI share exp, my hrs 9-5, pls call, Catherine, x3-5831.

WI take riders from Arl-N Camb-W Som to Draper or MIT, hrs 7:30-4:30. Bill, x8-3546 Draper.

Miscellaneous

accurate, Rita, x3-3408.

WI type theses, term papers, manu, etc. Phyllis, x3-4237.

Fr lessons by Fr tchr, any level. Call, 494-8423, 6-7pm.

WI type theses, manu, etc. Carol, x3-4153. Typing on IBM exec, theses, manu, etc,

Singing & piano lessons by exper qualified tchr/performer, all lvls instru, free intro lesson, all-inquiries welcome. Call, 729-7591.

Weaving lessons on individual floor looms, beg & intermed, Newton Ctr. Call, 965-6217.

Enroll your child 3 yrs & up in unique Zuzuki method of piano playing. Call, 267-2264.

POSITIONS AVAILABL

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, 10-211, 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 Person-

Persons who are not MIT employees should call the Personnel Office on extension 3-4251.

Employees at the Institute should continue to contact their Personnel Officers to apply for positions for which they feel they qualify.

3-4266

3-4267

Virginia Bishop Mike Parr Philip Knight (secretary - Joy Dukowitz) Sally Hansen Jack Newcomb Evelyn Perez (secretary - Mary Ann Foti)

3-4275

3-4278

3-1594

3-1595

Dick Higham Pat Williams Claudia Liebesny (secretary - Dixie Chin)

DSR Staff or Exempt, Programmer in the Artificial Intelligence Lab will design, maintain and document new computational environments for children for computer-oriented education research project. Such environments include computer simulation of physical and biological phenomena, computer graphics, music, art. Familiarity with LISP, LOGO, PDP-10, PDP-11 assembly language, experience in designing similar environments and in

teaching desirable, 74-1495-A (1/8).

DSR Staff in National Magnet Lab Alcator Group will assist in planning, designing, building assembling, operating and interpreting data from various experimental systems for plasma diagnostics in the Alcator Thermonuclean fusion experiment. BS in EE or Physics, specialized training and/or experience with tokamak thermonuclear research or other experimental plasma machines helpful. 74-1513-A (1/8).

DSR Staff, Systems Analyst, in Center for Information Systems Research (Sloan School) will develop and implement communication system between a PRIME 300 mini computer and the IPC IBM S/370/168. Extensive knowledge of S/370 operating system and PRIME 300 internals required. Position is for period 2/1/75-6/30/75 only. 74-1499-R (1/8).

Academic Staff Technical Assistant in Biology will do research involving nucleic acid isolation, enzymology, bjochemical assays, growth and maintenance of bacteriological and bacteriophage stocks, Small amount of laboratory management. Sophisticated knowledge of nucleic acid chemistry and biochemistry techniques required. Prior experience as technical assistant and/or graduate level laboratory experience preferred. 74-1494-R (1/8).

Administrative Staff, Sr. Consultant Trainer, in Office of Personnel Development will have responsibility for planning, design and follow-up services related to training workshops, organization development; perform professional, management and support tasks as a participating team member. Must be knowledgeable and experienced in organization development, career development, adult education, processoriented group work with adults, and applied social science survey research. Applicants will present 1-2 hour training activity, including written proposal and report, for staff evaluation. Report, proposal and process documentation writing skill, Masters degree in behavioral science plus minimum of 50 hours small group facilitation experience required. Knowledge of MIT/academic institutions helpful. A75-1 (1/8).

Administrative Staff, Supervisor, ministrative Applications in the Information Processing Center, will supervise development, maintenance, documentation and execution of computer programs; participate in report design, accounting system, data bases; provide related services for Institute and external users; establish and enforce programming and documentation standards. Knowledge of PL/1, IBM 370, ICL and TSP, experience in development of reporting systems which support administrative functions, written and verbal communication skills required. 74-1496-R (1/8).

DSR Staff in Joint Center for Urban Studies will be principal researcher on development of computer-based manpower information system for construction industry, labor unions. MBA, 2 years experience in industrial labor relations, working knowledge of construction industry, and ability supervise program development and operational system required. 74-1484-R (1/8).

DSR Staff, part-time, temporary in Artificial Intelligence Lab, will develop computer programs for graphic dis-plays of biology curriculum pictures. Background in Biology and graphic arts, particularly in art drawing required. Position is for approximately 4 months. 74-1486-A (1/8).

DSR Staff in Center for Cancer Research will perform original research on the formation of the DNA genome of leukemia virus; work on the extraction of nucleic acids, radioactive assays of nucleic acid by hybridization, virus production, tissue culture, preparation of sub-cellular fractions. BS degree, preferably in Biology, and strong chemistry background required. 74-1461-A (12/18).

DSR Staff-Computer Systems Manager, in Center for Transportation Studies will design, develop and implement real-time computer system to be used in routing and scheduling of public transportation for testing Dial-A-Ride concept, a federally sponsored demonstration project in urban transporta-tion. Strong computer background, experience in supervising program development, knowledge of communications interfacing and structured programming required. MBA in Management or Computer Science necessary. 74-1482-A (12/18).

Admin. Staff, Asst. Director of Financial Aid will assist students and their families in describing and resolving financial problems related to study at MIT: perform need analysis of aid applications, correspond with students, parents, donors; participate in various activities relating to donor reporting, fund accounting, federal programs administration; provide editorial assis tance in development of policy and procedure statements; perform related duties as required. Bachelor's degree or equivalent education and experience required. Ability to articulate orally in writing, and interest and skill in dealing with young people also necessary. 74-1441-R (12/11).

DSR Staff in Energy Lab will be involved in developmental work with coal gassification projects. Prior exper-ience in development and related technological processes of coal gassification: computer simulation, construction of pilot equipment with minimal technical assistance and financial re sources, data gathering, work with students inexperienced in research activities, and ability to meet project deadlines required. Advanced degree in Chem. Eng. is also necessary. 74-1428-A (12/11).

DSR Staff Resident Operations Manamajor Dial-A-Ride system Demonstration Project conducted through Center for Transportation Person will oversee daily operation of system, and have responsibility for driver and control room staff training, vehicle and control room operations, development and imple-mentation of project strategies and policies. Two and one-half year commitment and residence in NY State demonstration area required. Experience in operation of demand-responsive transit systems and advanced degree in transportation engineering or planning are necessary. 74-1416-A (12/4).

DSR Staff Computer Programmer/Data Analyst in Joint Center for Urban Studies will assist in data collection related to study of economic success and social consumption; will have full responsibility for programming of data and assist in its analysis. Masters degree in Sociology, or equivalent, programming experience required. Temporary through June, 1975. 74-1421-R (12/4).

Subcontract Administrator, Assistant Director in Office of Sponsored Programs will work with project personnel in negotiating complex subcontracts; prepare Requests for Bids; review quotations; arrange for preaudit of proposed costs and negotiation of terms and conditions; will also monitor active awards. Bachelors degree in Business Administration or equivalent combination of education and experience, subcontracting experience in government agency or university environment, knowledge of procurement regulations of government agencies required. 74-1403-R (11/27).

Administrative Staff-Director of the MIT Press: Full responsibility for publishing program and operations of large university press. Direction of Acquisitions, editorial, design, production, marketing and business activities. Program includes over a hundred books and several journals, Annual sales, about \$2.5 million. Substantial and varied experience in the overall management of a publishing house required, preference for experience in scientific and technological publications. 74-1397-R (11/20).

Administrative Staff, EDP Internal Auditor, will perform EDP auditing, reviews of system, post audit of computer system; develop audit programs, questionnaires; write and pre-sent reports. Bachelor's degree in business administration, accounting major, or equivalent combination of education and experience, graduate work in computer science and experience in computer systems analysis and programming required. 74-1366-R

DSR Staff in Artificial Intelligence Lab will be responsible for maintenance and repair of PDP 11/45 computer and its peripheral equipment, debug software problems, recognize and correct hardware faults. Programming experience on PDP 11/45 computer and time sharing systems required. Some circuit design experience desirable. 74-1306-A (10/23).

DSR Optical Physicist will conceive, design and execute experiments in nonlinear optics. Candidates should have several years' experience in innovative, experimental research including work in high-power, solid-state lasers from near ultraviolet to near infrared, and knowledge of nonlinear, materials. Ph.D. required. 74-1318-R (10/23).

DSR Staff Experimental Optical Physicist, in Research Laboratory of Electronics will identify, formulate and implement key experiments on communications in low visibility atmospheres, develop general experimental capability in and formulate new directions for optical communications research. Ph.D. in Engineering or physics required. 74-1301-A (10/23).

Admin, Staff, Journals Manager at the MIT Press will be responsible for overall direction of Journals operation: budget, fiscal control, departmental workflow, staff supervision, production and subscription aspects, editor contact, assessment, acquisition and development of new journals. (Division currently publishes 4 quarterly and one monthly journal). Experience with business/financial aspects of publishing and/or scholarly journals publishing. 74-1273-R (10/9).

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

DSR Staff, Programmer in the Laboratory for Nuclear Science will maintain and develop computer-based acquisition system comprised of large minicomputer (PDP-11/45). Comac instrumentation and in-house electronics. EE or Physics degree, or equivalent required. Experience in systems development on mini computer preferred. Work sites include MIT, BNL, Fermi Nat'l Lab. 74-1183-R (9/25).

DSR Staff-Temporary for the Joint Center for Urban Studies will supervise the work of graduate research assistants working on topics related to public sector relations in Boston: Ph.D. or work toward advanced degrees required. Experience with research on municipal employee labor relations, and as a supervisor important. Job duration, approximately 6 months. 74-1126-A (9/11).

DSR Staff at the National Magnet Laboratory will work on the Alcator thermonuclear experiment. Conceive, design, and carry out plasma diagnostic experiments using neutron, optical, electrical, magnetic and microanalysis and assessment of data. Ph.D. in plasma physics or related area required; familiarity with tokamak devices desirable. 74-1136-A (9/11), 74-1512-A (1/8).

DSR Staff-Physical Chemist in the Research Laboratory of Electronics must be experienced in molecular beam techniques and surface science to conduct experiments on semiconductors and related materials. Ph.D. in Physical Chemistry required. 74-1110-A

DSR Staff-Scientific Programmer in Earth and Planetary Sciences will work on analysis of celestial mechanics data from Mariner 9, MVM, Viking, Pioneer

Venus Probes and other space related projects. Design, write, modify and run Fortran data-analysis program, Ada-vanced knowledge of Fortran and minimum of 1 year professional programming experience required. Background in math, physics, engineering; knowledge of IBM/360/JCL and assembler useful. Submit resume. 74-1267-A (10/9).

DSR Staff in Energy Laboratory will design, build, and operate large scale heat transfer apparatus. Graduate degree in heat transfer; extensive experience in designing, instrumenting, and conducting laboratory tests in heat transfer experiments with a minimum of supervision required. 74-858-A (7/31).

DSR Staff Economic Advisor at the Joint Center for Urban Studies will Presidents of MIT and the Harvard on the state of the economy and labor force of Cambridge, and prospects for future economic development; evaluate proposals in fields of health, education, housing, transportation, and community development in view of their impact on the advisory committee of faculty and administration members from both institutions. Doctoral degree or equivalent experience in urban economics, manpower, community development required. Ability to work effectively with local government and university officials Ability to plan and conduct research. 74-753-A (7/17).

DSR Staff in the Energy Lab must have minimum of 5 yrs experience in defining, securing, organizing and supervising research in heat transfer related to energy production and utilization. Familiarity with MIT; experience in supervising student theses research and staff; Ph.D. in Mechanical Engineering required, 74-359-A (5/1).

Engineering Assistant-Exempt, in Mechanical Engineering Laboratory and Energy Laboratory will provide technical support to research in basic combustion problems and internal combustion engines: carry out detailed engineering design of new experimental set-ups and modifications of existing equipment; coordinate daily operation lab; maintain inventory; train graduate students in experimental techniques. 5 years of relevant engineering laboratory experience, including mechanical engineering design and laboratory management required. 74-1439-A (12/11).

Admin. Asst. exempt in Community Housing Service will have responsibility for counseling and referral of MIT persons to housing resources; maintenance of listings and of information base on relevant legislation, and other responsibilities related to overall operation of the Service. Associates degree and/or 5 years experience in public service area, supervisory ability re-quired. MIT experience desirable. 74-1480-R (12/18).

Engineering Assistant-Exempt in the National Magnet Laboratory will set up experiments and take measurements of magnetic fields produced by humans and animals. Will work with hospital medical groups. Experience in biomedical research; strong experience in low frequency electronics; knowledge of magnetics and cryogenics required. Flexible schedule necessary for occasional evening or weekend work. 74-1033-R (8/28).

Area Food Supervisor Exempt in Food Service will be responsible for the unit serving areas; flow of food and utensils during meal periods; portion controls, sanitation. Will train and supervise pantry employees. Technical knowledge of food production; ability to work under pressure, irregular hours and weekends required. 74-835-A, 74-836-A (7/24).

Secretary V-VA to Executive Vice President of Alumni Association will perform duties relating to Assn. activities; compose and type correspondence, transcribe materials for Alumni officers; arrange conferences, meeting, itineraries, and assemble relevant materials independently; carry out library and other research projects. Excellent typing, shorthand and dictaphone skill required. Ability to work independentand to exercise judgment and discretion necessary. 74-1477-R (12/18).

Secretary IV to faculty and student research group in Ocean Engineering will type correspondence, class materials, technical reports; monitor accounts, arrange appointments and travel. Excellent typing skill with experience in technical typing required. Previous secretarial experience and ability to work independently necessary. MIT experience preferred. 74-1489-R (1/8).

Secretary IV in Mechnical Engineering will perform secretarial duties for several faculty members: handle correspondence, appointments, travel and coffee seminars, some accounting. High school graduate or equivalent, secretarial school training or relevant experience required. Shorthand or ability to use dictation equipment is necessary, 74-1485-R (1/8).

Secretary III, part-time, in Libraries will perform standard secretarial duties: type correspondence, reports and manuals; assist in compilation of statistics and flow charts. Good typing skill required. Temporary position through 6/30/75; 20 hrs/wk., flexible schedule, 74-1510-R (1/8).

Secretary IV in Aeronautics and Astronautics will perform general secretarial duties: type technical reports, proposals and correspondence. Excellent typing skill required. Technical typing ability preferred. 74-1507-R (1/8).

Secretary IV in the Center for International Studies will handle genmembers involved in research projects on nuclear power and urban economics. Schedule meetings, seminars, travel arrangements; type correspondence. papers. Technical-typing ability desired; college background or equivalent experience preferred. Some flexibility in hours is possible. 74-1497-R (1/8).

Secretary IV in Earth and Planetary Sciences will perform secretarial and administrative duties for several oceanography faculty under supervision of administrative assistant: prepare payroll, compose correspondence, arrange travel and appointments. Strong secretarial skills, ability to work independently, and technical typing required. MIT experience helpful. 74-1491-R (1/8).

Secretary IV to the head of Barker Engineering Library and professional staff, Will handle a variety of clerical duties: type correspondence, purchase supplies and equipment, maintain records of book orders, prepare financial statements, act as receptionist, maintain files, administer payrolls. Secretarial and bookkeeping experience required. College or secretarial school training desirable. 74-1382-R (11/20).

Secretary IV in Systems Dynamics Group, Sloan School, will act as receptionist, direct visitors, answer telephone inquiries; maintain library; handle sale and distribution of publications; type and provide other clerical assistance as required. Typing skill and ability to work independently required, 74-1474-R (12/18).

Secretary IV in Office of President/ Chancellor will work with two professors emeriti involved in health sciences projects; act as receptionist, type, file, Ability to work independently, short-hand and typing skill required. Writing skill desirable. 74-1473-A (12/18).

Secretary IV in Metallurgy and Materials Science will perform general secretarial duties for faculty member: type correspondence, technical papers and other materials; maintain subject files; monitor OSP accounts; schedule travel and appointments; do occasional library work. Excellent typing, command of English language and proofreading skills required. Shorthand desirable, 74-1457-R (12/18).

Secretary IV in Energy Lab research staff members and administrative assistant. Will type reports and manuscripts, including technical material, check and verify monthly statements, occasionally assist other secretary. Technical typing ability, ease with figures and ability to establish priorities required. Familiarity with MIT procedures preferred. 74-1384-A (11/20).

Secretary IV will handle standard secretarial duties for a group of Mechanical Engineering professors. Schedule travel, appointments, seminars; type correspondence, monitor accounts; secretarial training or experience, shorthand/dictaphone, technical typing skills required. Ability to communicate and to deal with students and staff important. These positions available for "job-sharing." 74-951-R.

Secretary III-IV in Research Lab of Electronics will perform secretarial duties for faculty and other members of research group; type technical statistical tables and manuscripts, charts; schedule appointments. Shorthand skill is preferred. 74-1454-R (12/18).

Secretary III-IV will work for one professor in Metallurgy and Materials Science. Type from machine or direct dictation, including some technical; maintain files, monitor OSP accounts, schedule travel; conduct moderate library research. Excellent typing, good command of English required. MIT experience, shorthand or speed-writing desirable. 74-1181-R (9/25).

Secretary III in Medical Department will transcribe case histories, routine correspondence, prepare mailings, file, assist with other s secretarial duties in a variety of areas; provide support to other secretaries during vacation, illness and heavy work load. Typing skill, flexibility to work in several areas, ability to transcribe medical terminology (or willingness to learn), previous work experience required. 74-1509-R (1/8).

Secretary III, part-time, in Alumni Association will perform general secretarial duties: type correspondence and reports, assist in research projects, file. Good typing skill required. Familiarity machine dictation helpful. with 74-1476-R (12/18).

Secretary III. part-time, in Meteorology MODE program, an interinstitutional international program in physical oceanography will type, answer phones, perform other standard secretarial duties. Applicants should have typing skill and be willing to learn telecopier use. Work schedule will be irregular, depending on program requirements. 74-1427-R (12/11).

Secretary III in Physical Plant, Super-intendent's Office will provide secretaservices for Support Services Group; type correspondence and reports, answer phones, handle general inquiries. Ability to work with minimum supervision and excellent typing required. Shorthand or speedwriting desirable, 74-1363-R (11/6).

Secretary III to faculty and research group in Research Lab of Electronics will type manuscripts including technical material, make appointments, independently reply to correspondence and compose replies from oral instruction. Shorthand skill and excellent typing ability required. 74-1174-R

Library Assistant/Secretary III in Library will process library Dewey materials, perform secretarial duties for Head Librarian, handle supplies and student payrolls, assist at public desk, answer telephone inquiries. Good typing skill, previous library and/or secretarial experience required. Occasional evening or weekend work may be necessary. Available for interview after 1/20/75, 74-1504-R (1/8).

Library General Assistant III in Office of Administrative Information Systems

will assemble data input and output files for computer processing, review control listings for completeness and accuracy, organize finished outputs, maintain validity of tape library functions. Clerical skill with emphasis on code matching required, 371/2 hr/wk. 74-1483-R (1/8).

Technical Typist III, part-time, at Haystack Observatory, Westford, will type correspondence and reports, including mathematical equations, answer phones, file, perform other clerical functions. Excellent typing skills, including technical typing abili-ty, command of English language, familiarity with dictation equipment required. 20 hrs/wk, normally 10am-2pm. 74-1501-R (1/8).

Technical Typist III will assist in the production of the Neurosciences Research Program Bulletin through use of IBM/MTST composer system. Type manuscripts; adapt format, scientific symbols, tabulations, etc. to style of the Bulletin; proofread copy; check bibliographic format. Good typing bibliographic skills essential; knowledge of publications procedures. Applicant can be trained on MTST, Off-campus location (Brookline); own transportation desirable. 74-985-R (8/28).

Jr. Animal Caretaker, part-time, hourly in Environmental Medical Service will, working alone, perform routine assignments such as cleaning cages and equipment, feed and water animals, etc. in animal quarters care for experimental animals such as rats, dogs, cats, birds, monkeys, etc. May assist experienced animal care personnel in their duties. Graduation from high school or equivalent, required, 16 hrs/wk (Mon.-Tues.), 74-1503-R (1/8).

Jr. Animal Caretaker, Hourly in Environmental Medical Service will, working alone, perform routine assignments such as cleaning cages and equipment, feed and water animals, etc. in animal quarters care for experimental animals such as rats, dogs, cats, birds, monkeys, etc. May assist experienced animal care personnel in their duties. Graduation from high school, or equivalent, required. 74-1490-R (1/8).

Tech A (E-M) for the Radioactivity Center will assist in laboratory, research or analytical work; operate technical experimental apparatus. Maintain electronic equipment associated with controlled low-background facility, breath radon, thoron equipment. Troubleshoot nuclear pulse instrumentation, construct, wire, perform routine tasks, associated with measurement of subjects and administration of laboratory. Strong back-ground in pulse and digital circuits; experience in use of oscilloscopes and test instruments required. 74-922-R (12/18).

2nd Class Engineer must have a Mass. second class Engineer's license or higher. Individual must be willing to work on any shift. 74-182-R (11/24).

3rd Class Engineer at the Power Plant may work any and all shifts and do all kinds of work, consistent with self sufficiency of the Plant. Mass. Third Class Stationary Engineer's license or a license of a higher grade required. Experience on high pressure boilers, oil and gas fired with automatic combustion controls, turbine driven auxiliaries: AC and DC generation, switchboard, and fed water control required. Some experience on turbine-driven equipment is desirable. 74-422-A

The following positions have been FILLED since the last issue of Tech Talk:

Clerk Typist III

Sr. Clerk III 74-1395-R Secretary IV 74-950-R Secretary IV 74-1450-R 74-1426-A Messenger II Acctg. Asst. V 74-1400-R 74-1431-R 74-1378-A Secretary IV Secretary IV Clerk Typist III 74-1211-A Secretary III 74-1443-A Clerk Typist II-III 74-1419-R 74-1302-A DSR Staff 74-1456-R Secretary V Sr. Keypunch Op. III 74-1410-R 74-1362-R Secretary III Secretary IV 74-1452-R 74-1481-R Msgr. Clerk II 74-1289-A DSR Staff 74-1453-R Sr. Lib. Asst. IV

74-1430-R

74-1415-A

74-1470-R

Histology Technician III 74-1458-R Secretary IV 74-1475-R 74-1047-R Acad. Admin. Staff 74-1434-R DSR Staff Secretary V 74-1445-R 74-1391-A Admin. Staff 74-1214-A Clerk Typist III 74-1424-A Secretary III 74-1448-R

The following positions are on HOLD pending final decision: Admin. Staff 74-1398-A

DSR Staff

Payroll Clerk III

DSR Staff 74-1207-A Payroll Clerk III 74-1470-R

Tech Talk, January 8, 1975, Page 11

PEC Oil Will Cost World \$600 Billion by 1984

By ROBERT C. Di IORIO Staff Writer

The \$600 billion that mustunder current oil prices-flow from the treasuries of the oil consuming nations to the coffers of the oil producing nations during the rest of the decade is only the tip of the international oil crisis iceberg.

Transcending price, according to an article in the January issue of Foreign Affairs of which MIT Professor Carroll L. Wilson is a co-author, is the question of whether existing international institutions and payments mechanisms can cope with "the largest single mutation in payments patterns that the modern world economy has ever experienced, short of war '

Dr. Wilson, Mitsui Professor in the Problems of Contemporary Technology at the Sloan School of Management, was the catalyst who brought together the article's four other authors, each an internationally noted banker or economist.

Wilson also briefed President Ford and Vice-Presidentdesignate Rockefeller on the views and proposals of the five authors last week (Dec. 10) in New York City during a meeting of the Commission for Critical Choices for Americans of which Dr. Wilson is a member. Mr. Rockefeller, who organized the commission a year ago when he was governor of New York, had been kept advised by Dr. Wilson of the events that brought the authors together and had asked the MIT professor to make the presentation to President Ford.

New approaches to the payments problem must be explored by the consuming and producing countries together, the authors say, "before the world teeters any closer to the edge of an unnecessary stalemate-locked between the rightful aspirations of the OPEC countries and limited at the first WAES workshop, held capacity of the oil importing countries to meet those aspirations rapidly."

12 Countries

"The astonishing fact...is that so little dialogue about the problems ahead has yet occurred among the countries principally concerned," the authors said. "Confrontation between oil-producing and oil-consuming countries has already produced a gulf of misunderstanding, both as to motives and as to potentialities, on both sides.'

The authors propose two means by which the flow of oil payments can be handled so as to preserve the solvency and growth capacity of consuming countries.

The proposals are the fruit of their own dialogue which began under the umbrella of the Workshop on Alternative Energy Strategies (WAES), which is directed by Dr. Wilson. The dialogue began

in October at the New Seabury Country Club at Mashpee on Cape

WAES is a unique two-year assessment of the energy options available to industrialized countries primarily in the years 1985-2000. More than two dozen leading businessmen, economists, engineers, government officials and scientists from 12 countries, supported by several staff personnel, are involved in the assess-

Separate Action

Three of the five authors of the Foreign Affairs article-Dr. Wilson, Dr. Waburo Okita of Japan, president of the Overseas Economic Cooperation Fund and Chairman of the Japan Economic Research Center, and Dr. Khodadad Farmanfarmaian of Iran, chairman of the Bank Sanaye Iran, are among the principal

participants of WAES. The other authors are Armin Gutowski of West Germany, professor of ecomonics at the University of Frankfurt, and Robert Roosa, former US undersecretary of the Treasury.

They propose, first, a fund in which the OPEC countries could purchase the debt obligations of consuming nations to meet balance of payment deficits; and second a large OPEC mutual investment trust, or family of trusts, that would channel a substantial proportion of the oil proceeds into a wide variety of investments all over the world.

Both plans provide for OPEC countries to work in concert with consuming nations, a sharp contrast to other policy proposals advanced in the US that call for separate action by consuming nations prior to a negotiating session with producing nations.

"The OPEC countries, whose principal product has been for so long underpriced and overused. must be able to convert their exhaustible oil into permanent capital and perpetual earnings, at home and abroad," the authors

"They need, and undoubtedly want, both the enduring goodwill and the continuing economic prosperity of the oil-importing countries. They surely recognize their large stake in the economic prosperity of the world. They undoubtedly want capital markets of their own, and ready access to flourishing capital markets in other countries, to provide an assured base for the economic growth they rightly expect for their descendents," the authors

The payments problem would still be overwhelming, the authors contend, contrary to assertions by high US officials, even if the price of oil were dropped to \$6 a barrel from its present level of more than \$10. If such an unlikely decrease were to occur, they say, it would reduce payments from consumers to producers only from \$600 billion to \$400 billion over the remainder of the decade and still leave problems of such a scale that new institutional means must be provided to meet them.

"In all likelihood, unless further approaches to cooperative action are made within the next few months, some oil-importing countries will have run out of goods to sell, or markets to reach, or capacity to borrow to cover their deficits, and a number may become unable to meet the servicing on the enlarged debts." If this occurs, the authors say, there is little doubt that "...the entire structure of world payments, and of trade and financial relationships would certainly be fractured."

By-product of Energy Strategy Program

"Our first by-product of WAES."

That is how Dr. Carroll L. Wilson, Mitsui Professor in the Problems of Contemporary Technology at MIT, described the proposals he and four others-all internationally noted economists and bankers and all private citizens-have put forward to deal with the staggering payments problem posed by the increase

WAES-Workshop on Alternative Energy Strategies-is a unique two-year assessment of the energy options available to industrialized countries primarily in the years 1985-2000. It is directed by Dr. Wilson who views the Workshop "as an experiment with a new mode of assessment for critical global problems."

"Intergovernmental machinery rarely can afford a time horizon longer than that of governmentsusually less than five years—and is not well designed for the conduct of assessments involving a mixture of political, social, economic and technical factors for a period 10-25 years into the future," Dr. Wilson said.

More than two dozen leading businessmen, economists, engineers, government officials and scientists from 12 countries are involved in WAES. They came together for the first time last October at the New Seabury Country Club in the Cape Cod town

of Mashpee, Mass.

Among issues discussed there was the problem of "the largest single mutation in payments patterns that the modern world economy has ever experienced, short of war...." Dr. Wilson, Dr. Saburo Okita of Japan, President of the Overseas Economic Cooperation Fund and Chairman of the Japan Economic Research Center, and Dr. Khodadad Farmanfarmaian of Iran, Chairman of the Bank Sanaye Iran-all WAES participants-enlisted the assistance of Robert Roosa, former US Undersecretary of the Treasury, and Armin Gutowski of the University of Frankfurt, who was recommended by Helmut Schmidt, chancellor of West Germany.

"What followed was a series of intensive meetings, here, in Iran and elsewhere and much long-distance telephoning, 11th hour traveling in an effort to meet our deadline," Dr. Wilson said, referring to the publication deadline for Foreign Affairs. An article on the proposals leads the January issue.

A significant sidelight is that the proposals first discussed in the October WAES session have, in only two months, been called to the attention of President Ford, Helmut Schmidt and to Prime Minister Miki of Japan, who was briefed by Dr. Okita.

Proposals May Founder

Scientists Urged to Speak Out on White House Office

Proposals to replace the presidential science advisory apparatus dismantled during the Nixon Administration may founder if the nation's science community fails to speak out clearly on the politics, the possibilities and the limitations of a White House science office, an MIT political scientist and a Harvard engineering scientist have warned.

Dr. Eugene B. Skolnikoff, director of the MIT Center for International Studies, and Harvey Brooks, Gordon McKay Professor of Applied Physics and Dean of Engineering and Applied Physics at Harvard, writing in the current (Jan. 10) issue of Science magazine, said they agree with recent proposals for the establishment of a three-member presidential advisory Council for Science and Technology.

They added, however, that "the detailed structure is much less important than the nature of the tasks to be performed and the arguments that justify such a Council in the first place.'

An advisory council at the Executive Branch, they wrote, is preferable to attempting to have the Office of Management and Budget (OMB) or the National Science Foundation's Science and Technology Policy Office perform

these functions.

The OMB, Dr. Skolnikoff and Dr. Brooks wrote, "has never shown a willingness or ability to build the kind of staff able to oversee with substantial technical insight the science and technology activities of the government." The NSF, they said, "simply cannot be expected to perform politically difficult management functions that involve influencing or controlling programs of large rival departments."

Both Dr. Skolnikoff and Dr. Brooks held important posts in the science advisory structure that was born in the Eisenhower Administration, continued under Presidents Kennedy and Johnson and withered during the Nixon Administration.

Dr. Skolnikoff served as an aide to Dr. James R. Killian, then president of MIT, who was the nation's first science adviser, and to his successors; Harvard chemistry professor George B. Kistiakowsky and Dr. Jerome B. Wiesner, now president of MIT.

Dr. Brooks was a member of the President's Science Advisory Committee, which was chaired by the incumbent special assistant to the President for science and technology, for several years.

Both men said that the case for the Council has not been made adequately by any of the contributors to the debate that began when

it became apparent that the Ford Administration was interested in some kind of structural change in the science advisory function.

A study by a select committee of the National Academy of Sciences, chaired by Dr. Killian, "fails to deal with the politics behind the issues or to examine the real and critically important lessons of the rise and fall of the President's Science Advisory Committee (PSAC) and the Office of Science and Technology (OST)," they said.

"It is now essential that we be clearer about the possibilities and limitations of a science office at the White House level if a successful and stable office is to be achieved," they wrote.

"For analytical purposes it is useful to divide the functions that must be performed into two: the science advisory function for the President, and the science policy function for the Executive Branch....

"The science policy function, if justifiable at the Presidential level, can give an institution permanence; the advisory function will always depend on the vagaries of Presidential style and politics."

The primary political lesson to be learned from the past effort to provide presidential advice through the OST "was that it is not possible to legislate an intimate advisory function for the President. In fact, institutions at that level with political power independent of the President almost certainly will be ignored and probably will be destroyed."

The most difficult problem, Dr. Skolnikoff and Dr. Brooks wrote, is in the national security area. "Here the President's need for scientific and technological advice independent of the Defense Department and other security-related agencies is crucial."

Although the President does have other ways of obtaining scientific advice, "the right kind of science office would be a preferable route in our view," Dr. Skolnikoff and Dr. Brooks wrote.

"The importance of such an office being able to present its analyses and recommendations in policy terms useful to other policy-makers cannot be overestimated....

"And finally, such a Council would bring intensive and continuous attention to the international dimension of US science policy which seems to us to be particularly neglected."



APPLICATIONS FOR ADMISSION to MIT were apparently running at an all time high when Mrs. Frances O'Donnell (right) and Janet Hanlon of the MIT Admissions Office began sorting undergraduate applications Jan. 1. According to Peter H. Richardson, director of admissions, exact numbers will be available early next week when computer printouts begin "counting" prospective undergraduate and graduate students. "Judging from the mail we've received," he said, "we expect to exceed the 4,500 final applications received last year." The deadline for submission of graduate school applications is Jan. 15.

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