

Uncas A. Whitaker, MIT Benefactor, Dies

A memorial service was held in Harrisburg, Pa., Saturday (Sept. 20) for Uncas A. Whitaker, MIT alumnus, Life Member Emeritus of the MIT Corporation, and founder and Chairman of the Board of AMP Incorporated, an international leader in the design and manufacture of electrical components.

Mr. Whitaker died Sept. 16 at Swans Island, Me., at the age of 75.

During the 14 years Mr. Whitaker served as a member of the Corporation, he was a guiding force in the development of the life sciences, biomedical engineering and advanced education in the field of medicine at MIT.

Born in Lincoln, Kan., on Mar. 22, 1900, Mr. Whitaker received his SB degree in mechanical engineering in the MIT Class of 1923. His professional education included a degree in law as well as degrees in engineering. At the height of his career in industry, he was elected a member of the Corporation in 1961 and be-

came a Life Member in 1966.

Howard W. Johnson, chairman of the Corporation, said at the memorial service for Mr. Whitaker that he was a guiding force in MIT's expansion of basic research and education in biology and the health sciences, and the application of engineering to problems in living systems.

"He was one of those rare and unusual leaders who created and sustained his own company and made it an economic force of great quality and distinction for the benefit of others," Mr. Johnson said. "He was deeply committed to the cause of improved education in medicine and related health professions through a greater emphasis of the basic biological sciences and advanced technology in the training of medical doctors."

MIT President Jerome B. Wiesner said that not only at the Institute but elsewhere Mr. Whitaker had seen "the linkages between science and



Mr. Whitaker

engineering on the one hand and medicine on the other, and sought zealously to encourage them."

Mr. Whitaker vigorously encouraged these concepts during the establishment of the Health Sciences and Technology Division at MIT and later, in funding the Health Sciences Fund, Inc., which is headquartered at MIT and of whose board he was a member. This fund is dedicated to the support of research in the health sciences at MIT and at Harvard Medical School and its affiliated hospitals.

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Working Group Study Completed

A study of the 1975 Biweekly Salary Review was recently completed by the Working Group on Office-Clerical Issues.

The first objective of the Working Group following its formation in January, 1975, was to recommend improvements in policy and/or procedures for the 1975 Biweekly Salary Review process. Recommendations were made to John M. Wynne, Vice President, Administration and Per-

sonnel (see Tech Talk Supplement, March 5, 1975) and implemented last April.

Over all, the majority of the 1175 biweekly employees and supervisors who responded to the questionnaire, thought that this year's review was more effective than last year's. According to the questionnaire data, this improvement was most likely the result of better information to all participants, a greater occurrence of

review discussions (consequently better two-way communication between supervisors and supervisees), and also the higher percentage increase given this year than in recent years.

Sixty-one percent of the questionnaire respondents indicated satisfaction with the review this year, while 13 percent reported dissatisfaction. In general, the degree of satisfaction reported by biweekly employees corresponded to the percentage increase they received.

An encouraging result of the study was that 93 percent of the respondents took part in a review discussion this year and that their discussions were reportedly characterized, for the most part, by open communication.

A factor that contributed to promoting open communication was publication of the percentage increase. While fifty-nine percent of the respondents felt that publishing the percentage increase was either somewhat or definitely helpful in promoting open communication, proportionately more employees than supervisors (63 percent to 52 percent) held this opinion.

A third of the respondents indicated that a positive change in their

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Research and Teaching Assistants:

In the event your tuition and fee payment was not deducted from your September payroll check as planned, you are expected to make your payment at the Cashier's Office, Rm 10-180, upon receipt of your check.

appointment of women to faculty and staff positions," Chancellor Paul E. Gray said in a letter of transmittal to OCR in Boston.

"Further, we judge our progress to be good in the recruitment of minorities into our office clerical and service occupations.

"On the other hand," Dr. Gray said in the letter, "we are disappointed that we are unable to approach more closely our goals for black faculty and staff despite what we believe are serious efforts in good faith to search for candidates for faculty and staff positions.

"Our recruitment efforts, especially in the fields of science and engineering, are all too often unsuccessful in yielding black candidates for faculty positions," Dr. Gray said.

"I participate each week in reviewing the search evidence presented by the Departments. The documentation of efforts to broaden the pool...is all there, but the candi-

(Continued on page 7)

Affirmative Action Results Are Mixed

MIT is doing well on the employment of women, close to its goal on total minority employment, but still has a way to go on black employment, according to figures submitted to the Office for Civil Rights of the US Department of Health, Education and Welfare recently.

In response, OCR noted MIT's long and continuing commitment to affirmative action and commented with favor on the amount and quality of the documentation provided.

Submission of the report marked the end of a two year period during which MIT set affirmative action goals and tried to achieve them.

In its transmittal, MIT said overall employment of women rose seven percent as of July, 1975, over the period ending December, 1973. During the same period, total minority employment increased 11 percent and employment of blacks increased nine percent.

"We have effectively met our overall goals for July, 1975, for the

Coal Exploitation Would Require New Technology

If oil supplies dwindle and the promise of nuclear power proves illusory, can the US meet its energy needs with coal by the beginning of the 21st century?

Coal resources are ample, but their rapid exploitation would depend on a number of profound changes in national energy policy and, thereafter, on massive capital investment in new technology.

That is the conclusion of Dennis L. Meadows, professor of engineering at Dartmouth College, who was co-author of the best-selling and con-

troversial book, "The Limits to Growth," and two colleagues working at Dartmouth.

The massive controversy over nuclear power and uncertainties in oil supplies led the Dartmouth group to study an alternative energy strategy in which coal might satisfy much of US energy demand by the next century. Now the first publication of their computer-based analysis appears in the October-November issue of Technology Review, the national journal of new developments in technology and their impli-

cations edited at MIT.

The authors, in addition to Professor Meadows, are Professor Roger F. Naill, director of the Project on the Dynamics of Long-Term Resource Availability at Dartmouth, and John Stanley-Miller, formerly research associate at Dartmouth who is now assistant professor of environmental engineering at the University of Southern California. Professor Meadows directs the Program on Technology and Public Policy in the Thayer School of Engineering at Dartmouth. All three

Modular Education Program Funded

The National Science Foundation has made a grant of \$772,000 to MIT to develop, in collaboration with other universities, industry and professional societies, a new approach to advanced engineering education based on the "modular" system instead of the "course" as the unit of instruction.

The project, to be conducted over a two-and-a-half year period, will be co-directed by Professor Lawrence B. Evans of the MIT Department of Chemical Engineering and Professor Myron Tribus, director of the MIT Center for Advanced Engineering Study.

A National Steering Committee of experts from chemical engineering and engineering education has been named to help guide the program. Committee members are:

Harold Abramson, American Institute of Chemical Engineers; Professor Stuart W. Churchill, Univ. of Penn.; Dean Fred Landis, Univ. of Wisconsin-Milwaukee; Professor William K. Linvill, Stanford; Dr. Harold S. Mickley, Stauffer Chemical; Dr. Jack F. O'Donnell, Arthur D. Little; Dr. Moses Passer, American Chemical Society, and Professor Warren E. Stewart, Univ. of Wisconsin.

CAES has been involved in developing courses for practicing engineers since 1962.

The new program will aim at restructuring the teaching of engineering by minimizing the differences among undergraduate study, graduate study and continuing education.

"This program is a national effort," said Professor Evans, "and will not be limited to the talent at MIT. We intend to find the best person in the country to prepare a module in each area of expertise. We will go anywhere in the world to get the best talent."

Professors Evans and Tribus said the program represents an effort to meet these needs:

—A need to allow practicing engineers to move rapidly from one area of specialization to another as national priorities change.

—A need for new approaches to continuing education in order to conserve national engineering talent.

—A personal need among engineers for a way to learn new material without leaving their jobs.

"With scientific knowledge doubling each decade," Professor Evans said, "the technical knowledge of the

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Ms. Garrison and Dr. Sizer

—Photo by Calvin Campbell

United Way Drive Opens

The 1975 MIT United Way Drive will be formally launched Thursday Sept. 25, with a meeting of some 70 chief solicitors at the Faculty Club.

Presiding at the meeting will be Dr. Irwin W. Sizer, dean emeritus of the Graduate School, chairperson of the 1975 campaign, and Patricia A. Garrison, assistant to the equal employment opportunity officer and co-chairperson. Chief speaker will be Chancellor Paul E. Gray. A United Way representative will also speak and answer questions.

Pledge cards this year will be distributed along with paychecks, beginning with the Sept. 30 payroll, and covering the hourly payroll on Oct. 3, the bi-weekly payroll Oct. 8, and the exempt payroll Oct. 15. Solicitors will be responsible for visiting their departments to collect pledge cards and answer any questions donors may have.

The MIT Quarter Century Club has assumed administrative support of

(Continued on page 11)

past and the ultimate energy sources of thermonuclear fusion and solar power there could be "several decades of high imports, rising prices, increasing government intervention, supply interruptions and stagnation or decline in the material standard of living."

However, said the Dartmouth scientists, long-term planning could help avoid these problems, and coal could carry a major burden during this period.

According to their results, the fol-

(Continued on page 3)

Art Song Subject Draws Young Musicians

Several MIT students who are serious young singers and pianists are enrolled this fall in a subject that is probably unusual outside the curriculum of a conservatory.

With Rufus Hallmark, tenor soloist and assistant professor of music at MIT, they are exploring the creation of the art song—beginning with an examination separately of the lyric poems and the music of some of the great songs of the standard literature, then going on to combine them in performance. To heighten their appreciation of the creative process in this special genre, they will also have an opportunity to compose and perform their own songs.

In the process they will be able to share the musicianship of Professor Hallmark, whose research in the art song is currently represented in a display, "Schumann at Work on a Song," now on view in the Music Library.

In 1970, Professor Hallmark spent several months in Europe examining and photographing the song manuscripts of Robert Schumann, including Schumann's sketches for his famous song cycle, *Dichterliebe*, which are kept in the Schumann Museum in Zwickau, East Germany, the composer's home town. Professor Hallmark's research, which was done for his PhD thesis (he received his degree from Princeton last spring), concentrated on the *Dichterliebe* (*A Poet's Love*), written in May, 1840, and based on the "Lyrisches Intermezzo" section of Heinrich Heine's *Buch der Lieder*.

"The changes Schumann made in different manuscript stages reveal his attitude toward a poem and in many cases suggest criteria for performances of the songs," Professor Hallmark said. In fact, the study indicates that a famous singer interprets one passage quite incorrectly.

Professor Hallmark plans to return later to his photographic collection of all the extant Schumann song

manuscripts and write a book about the composer's *Lieder* as a whole.

Professor Hallmark is active as a singer, as soloist with the Boston Camerata, a group that specializes in medieval and renaissance music, and with *I Fiori Musicali*, an ensemble that performs baroque music. He also sings *Lieder* and in December will give a recital at the Goethe Institute, Boston, of poems by Eichendorff set to music by Schumann, Brahms, Wolf, Mendelssohn, Franz and Pfitzner.

Of a Boston Camerata concert last spring, Richard Buell wrote in the *Boston Globe*: "Rufus Hallmark showed, as before, an elegant light tenor."

Piper Coming

The skirl of the Scottish highland bagpipe will fill the Building 7 Lobby starting at noon Wednesday, Sept. 24.

The piper will be Barry Roderick, who will also explain the construction and history of the great highland war pipe he'll play at one of the several noon-time programs arranged by Suzanne Weinberg, coordinator of the Lobby 7 Committee.

Personnel Promotes Two

Carolyn A. Scheer and Kenneth L. Hewitt have been appointed personnel officers in MIT's Office of Personnel Services, effective Sept. 1.

Both Ms. Scheer and Mr. Hewitt joined the Office of Personnel Services in 1973 as personnel assistants, where they were responsible for interviewing and placing applicants in all non-academic areas of employment and other special projects. As personnel officers, Ms. Scheer will be responsible for personnel assistance for the organizational units reporting to the Provost and Mr. Hewitt will have personnel responsibility for the laboratories and centers reporting to the Vice President for Research.

Ms. Scheer received the BA degree in history, cum laude, from Jackson College, Tufts University, in 1970 and an EdM degree in counseling from Boston University in 1974. She came to MIT in 1970, joining the secretarial staff in the Office of the Dean for Student Affairs. In 1972 Ms. Scheer was appointed to the sponsored research staff at the Education Research Center. She has been active at MIT as an undesignated sophomore adviser and as a member of the Steering Committee of the Women's Forum. She may be contacted at x3-1595.

Mr. Hewitt, who expects to receive the BS degree in business administration from Northeastern University in January, 1976, attended Newton Junior College following graduation from Rindge Technical High School in Cambridge. He joined the staff of the Graphic Arts department in 1964 and assisted in all phases of the service during his nine-year association there. As a member of the Research Development and Technical Employees Union, Mr. Hewitt served as union steward for six years and as an Executive Board member for two years.

Mr. Hewitt is active in Cambridge City School programs and has assisted in programs for the summer and part-time employment of Cambridge High School students at MIT. He is also head coach of the MIT junior varsity basketball team. Mr. Hewitt may be contacted at x3-4267.



Chamber Players List Concerts

The first of four concerts to be presented by the MIT Chamber Players during the 1975-76 season will be heard at 8pm Saturday, Oct. 4, in Kresge Auditorium. The concert will be free and open to the public.

The Players, now in their second year, will perform Concerto for Piano and Woodwind Quintet, Op. 54, by Wallingford Riegger, *L'Histoire du Soldat*, by Stravinsky, and Piano Quartet in A Minor, "The Trout," Op. 114, by Schubert.

Violist Marcus Thompson, assistant professor of music and founder and director of the Chamber Players, will conduct the Stravinsky work and join the ensemble for the Schubert quintet.

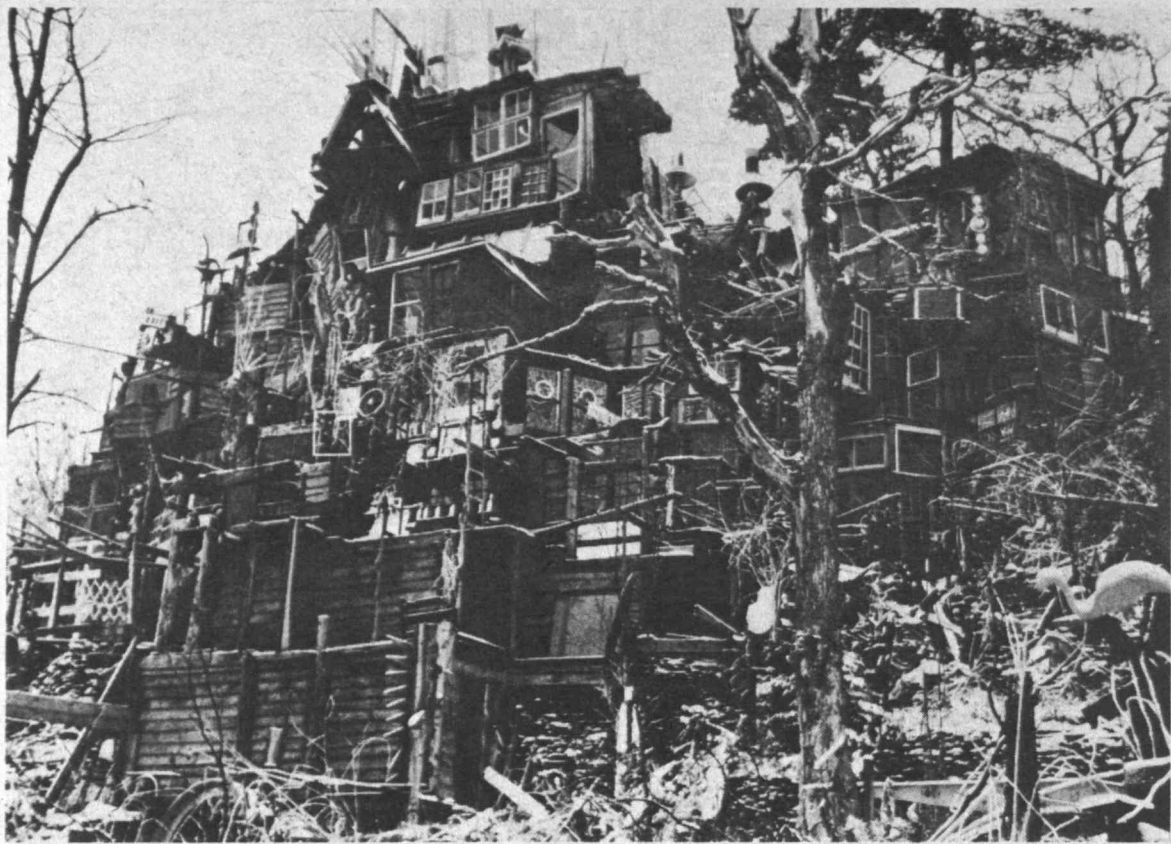
Pianist for the Riegger concerto will be Seth Carlin, a professional musician who performs with Professor Thompson on the recital stage. Gordon Smith, an MIT undergraduate student, will be pianist for the Schubert.

During the summer just past, Professor Thompson participated in the Santa Fe Chamber Music Festival. His concerts during the coming year will include an appearance in February in Carnegie Hall, playing Walter Piston's viola concerto.

ASCAP Award

David Epstein, composer and conductor of the MIT Symphony Orchestra, is a recipient of a 1975-76 award of the American Society of Composers, Authors and Publishers (ASCAP).

The ASCAP awards are granted by an independent panel and "are based upon the unique prestige value of each writer's catalogue" and the performances of his compositions not reflected in the ASCAP survey of performances, according to an ASCAP letter.



Full view of "House of Mirrors" constructed by Clarence Schmidt near Woodstock, N.Y., is seen in this photograph taken in 1967 by Gregg Blasdel. The house burned to the ground in 1968 in what the Woodstock plan-

ning board called "a glorious conflagration." The photograph is included in the exhibition of works by Schmidt opening in Hayden Gallery Friday, Sept. 26, 8-10pm.

Johnson Appointed Museum President

Howard W. Johnson, chairman of the MIT Corporation and MIT's representative on the board of trustees of the Boston Museum of Fine Arts, has been appointed president of the museum board.

Mr. Johnson succeeds John Coolidge, who announced that he would not be available for re-appointment as president. Mr. Coolidge leaves the office after serving a two-year term.

Mr. Johnson has been an MFA trustee since 1971. James R. Killian, Jr., honorary chairman of the Corporation, also is a museum trustee, originally joining the board in 1966 as one of MIT's representatives.

Throughout its 105 years, the MFA has had on its board of trustees principal officers of Harvard University, MIT and the Boston Athenaeum, the three institutions which participated heavily in the original founding of the MFA. William Barton Rogers, MIT's founder and first president, for example, was one of the organ-

izing founders of the MFA and served on its board of trustees for many years.

Besides Mr. Johnson and Mr. Killian, MIT officers who have served on the MFA board of trustees in recent years include the late Samuel Stratton, president of MIT in the 1920s; the late Karl T. Compton, president from 1930 to 1949; the late Dean of Architecture William Emerson; the late Walter Humphreys, who was Secretary of the MIT Corporation; former President Julius A. Stratton; Professor Emeritus Pietro Belluschi and Professor Emeritus Lawrence B. Anderson, both former deans of the School of Architecture and Planning; William A. Coolidge, a member of the MIT Corporation; and Professor Emeritus John E. Burchard, former dean of the School of Humanities and Social Science.

Dramashop to Salute Off-Broadway Theater

The MIT Dramashop will begin a season-long salute to New York's Off-Broadway theater with performances of Edward Albee's *American Dream* and Lanford Wilson's *The Madness of Lady Bright*, Friday and Saturday (Sept. 26 and 27) at 8pm in MIT's Kresge Little Theatre. Performances are free and open to the public.

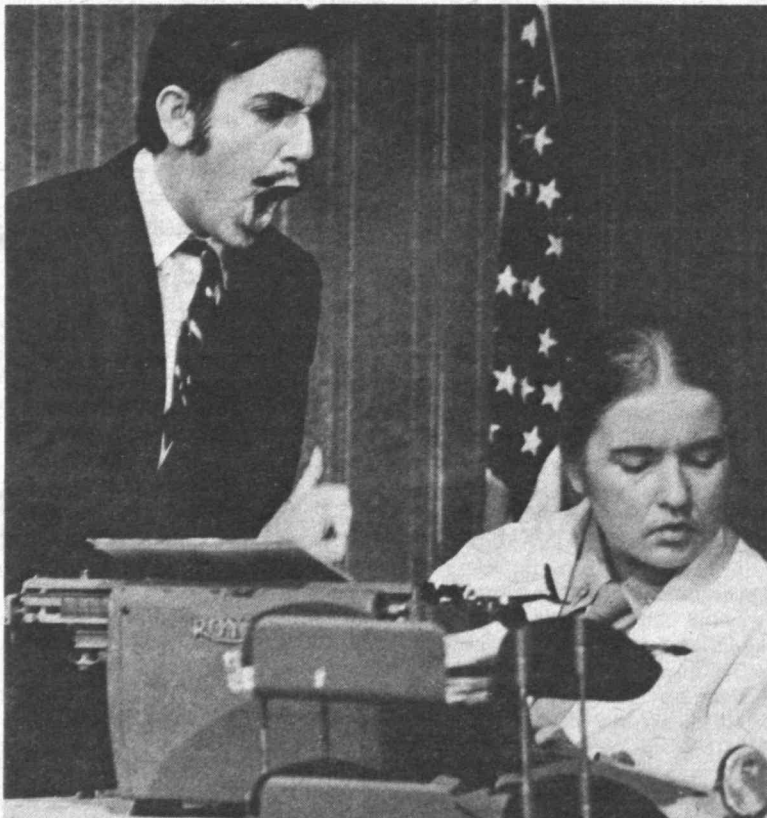
The group's entire 1975-76 season will be devoted to eight one act plays by American authors in recognition of both Dramashop's 20th anniversary and the US Bicentennial.

Works by playwrights including Terrence McNally, Tom Egan, Ronald Tavel and black playwrights Ed Bullins and Le Roi Jones will also be performed. Floyd Barbour, assistant professor of humanities and teacher of MIT's course in black

drama, has been invited to direct one of these plays.

The format of Dramashop will remain the same as in previous years. The program will include four evenings of one act plays, followed by a critique and a coffee hour. The plays are entirely directed, designed, acted and staged by students under the supervision of Joseph D. Everingham, professor of humanities and director of drama, and three professionals.

This year two new professionals, Cecilia Eller, costume designer, and William Fregosi, set designer, have joined Edward Darna to comprise the professional staff. Both Ms. Eller and Mr. Fregosi have worked at WGBH-TV, the Boston University Theater Department, the Boston Conservatory and the Boston Ballet and Opera Companies.



Gary Cote, '78 and Rosanne Wyleczud, '78, performing in MIT Dramashop's production of Terrence McNally's *Next*, Sept., 1974 in Kresge Little Theatre. Terrence McNally is one member of New York's off-Broadway movement being saluted this year by Dramashop—celebrating its 20th anniversary season.

Echoes

50 Years Ago

Professor J.F. Norton predicted the release of atomic energy in the near future.

Tech returned to the two term system which had been replaced by three terms during World War I.

40 Years Ago

Incoming students numbered over 600.

Using the laboratory method so successful in science and engineering, the Department of Architecture offered new course for entering students in designing and supervising construction of a house.

25 Years Ago

Thirteen co-eds were registered at Tech.

Kresge Foundation gave \$1.5 million for construction of an auditorium.

Soaring wholesale food prices forced a general five cent boost in meal costs at Walker Memorial.

—Prepared by Ethel Newell of MIT Historical Collections, x3-4444.

TECH TALK

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Mountcastle to Present F.O. Schmitt Lecture

Dr. Vernon B. Mountcastle, professor of physiology and director of the Department of Physiology, The Johns Hopkins University School of Medicine, will receive the 1975 F.O. Schmitt Lectureship Award of MIT's Neurosciences Research Program on Tuesday, Oct. 7.

Dr. Mountcastle will present his lecture, "The World Around Us: Neural Command Functions for Selective Attention," at 4:30pm in Kresge Auditorium. The program, which will be opened by MIT Provost Walter A. Rosenblith, is open to the public.

The F.O. Schmitt Lectureship and Award was established in 1973 in honor of Dr. Francis O. Schmitt, who helped establish the field of biophysics in the 1950s and who founded the Neurosciences Research Program in 1962. Dr. Schmitt is Institute Professor Emeritus and Professor of Biology Emeritus at MIT.

Dr. Mountcastle is a noted researcher in the physiology of the central nervous system, in particular the neural mechanisms in sensation and perception. He is widely recognized for his determinations of the quantitative parameters of neuronal activity, and for defining the role of particular brain cells that interrelate motivation, motor behavior, and external events.

He is the fourth neuroscientist to receive the Schmitt Award. A medal will be presented to him by President Jerome B. Wiesner at a reception following the public lecture.

Dr. Mountcastle received the Doctor of Medicine degree from The Johns Hopkins University School of Medicine in 1942. After serving in the medical corps of the US Naval Amphibious Forces from 1943 to 1946, he

became a resident fellow in physiology at Johns Hopkins. He joined the faculty in 1948, becoming full professor in 1959 and director of the Department of Physiology in 1964.

Since 1966 he has been an Associate of the Neurosciences Research Program, and a member of the Visiting Committee in Psychology at MIT.

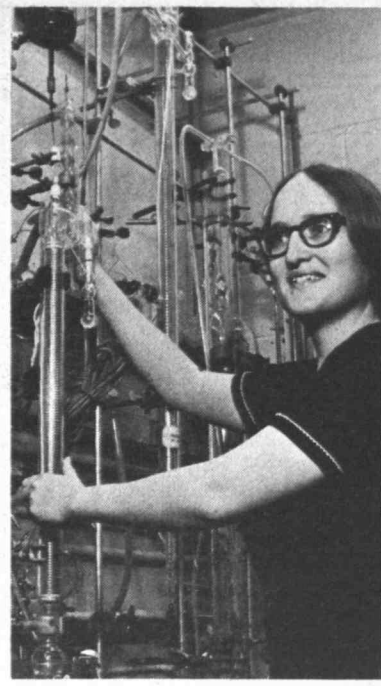
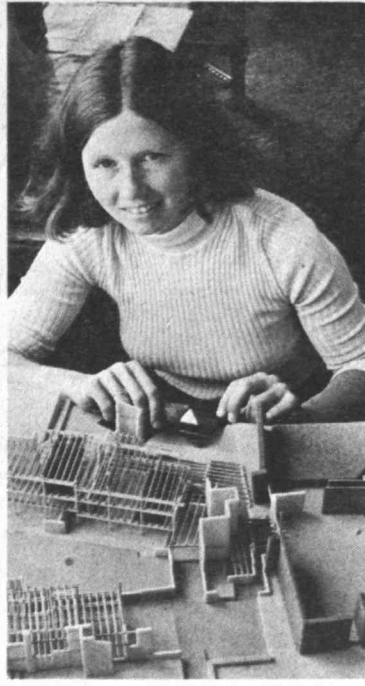
The Neurosciences Research Program serves as a world-wide communications center for neuroscience research. Sponsored by MIT and funded by federal agencies, the NRP's 30-odd Associates are drawn from such fields as medicine, psychiatry, physics, biochemistry, biology, neurology, and psychology. The current Associates include three Nobel Laureates.

Dr. Schmitt, who headed the program for 12 years, and now serves as NRP Foundation Scientist, received his PhD degree in physiology from

Washington University in 1927.

After postdoctoral work abroad, he returned to Washington University, where he became one of the first to apply x-ray diffraction and polarization optics to biology. His group had the first university electron microscope in the US.

Dr. Schmitt became professor of biology at MIT in 1941 and was department head from 1941 to 1955. His research on the fibrous proteins of the giant nerve axons of squid led to understanding the chemical and physical composition of myelin, the material that sheathes nerve fibers. During World War II, Dr. Schmitt developed the technique for making collagen sutures. He was made Institute Professor in 1955.



Three graduate students have been awarded fellowships supporting their thesis work from the American Association of University Women. Left to right they are: Najwa Makhoul of Galilee, Israel, in urban studies and

planning; Margo Jones of Somerville, in architecture, and Dabney White of Rochester, N.Y., in chemistry. Altogether the AAUW awards 70 domestic and 50 international fellowships annually. —Photos by Calvin Campbell

Lessard Named to Ford Professorship

Dr. Donald R. Lessard, assistant professor of management at MIT and co-coordinator of the forthcoming MIT Mortgage Study, has been awarded a Ford International Career Development Professorship for research in international investment and financial management.

The award, made possible by a 1966 Ford International Grant to MIT

under the aegis of Provost Walter A. Rosenblith, was announced by Dean William F. Pounds of the Sloan School of Management. It is intended for untenured faculty members with research interests in the international aspects of political science, economics, management or urban planning.

Dr. Lessard, 32, of Cambridge,

was co-editor with Institute Profes-

or Franco Modigliani of the final volume of the MIT Mortgage Study and co-author of the accompanying introductory paper to be published later next month by the Federal Reserve Bank of Boston. In addition, he has written major research papers on the benefits of international diversification, the financial strategies of developing Latin American countries, and direct investment in the US by OPEC nations.

Professor Lessard received all his degrees from Stanford—the BA in Hispanic-American studies in 1965, the MBA in 1969 and the PhD in 1970. He came to MIT as a visiting assistant professor in 1973 after teaching at Dartmouth and was named assistant professor in 1974.



CAES, DSRE Schedule Four Schwartz Seminars

The schedule for a series of seminars by MIT Visiting Professor Bertrand Schwartz, a leader in the reform of French engineering education, has been announced.

The first, "The Reform of the School of Mining of the University of Nancy" will be held Thursday (Sept. 25) from 12:30-2:30 in Room 9-150.

The second, "On the Reform of the Primary School—Thoughts Drawn from the French and American Experience," will be held Oct. 9 from 2-4pm in Room 9-150.

The third seminar in the series will be "On the Inclusion of the Constituency in the Design of an Education Program—An Example Drawn from an Experiment in Eastern France," scheduled for Oct. 16, from 2-4pm in Room 20C-117.

The final seminar Oct. 23 will focus on "Education in the Year 2000—On the Need for Fundamental Rethinking of the Issues," and will be held from 2-4pm in Room 20C-117.

Co-sponsors of the series are MIT's Center for Advanced Engineering Study and the Division for Study and Research in Education.



Professor Schwartz

Dr. Schwartz is credited with the development of France's national continuing education plan. He is principal consultant to the French minister of education for adult and continuing educational programs, and a professor at the University of Paris. He will be at MIT until Oct. 25.

Coal Technology Needed

(Continued from page 1) lowing policies could help coal play a role in "bridging the energy gap" between supply and demand:

- diverting a large fraction of oil and gas investment to developing coal-derived synthetic fuels;

- installing pollution devices on smokestacks to reduce sulfur dioxide emissions, thus encouraging coal use;

- enacting legislation to allow strip mining under strict environmental regulation;

- increasing coal miners' wages and reducing the accident rate in mines.

However, said the researchers, the computer model shows that even with such policies there will still be a short-term energy gap in the 1980s because coal production will not be able to start up fast enough to meet demand. To alleviate this startup problem, the researchers proposed the following additional policies:

- reducing delays in synthetic fuel research by an intensive research

program or a federally guaranteed price for synthetic fuels;

- relaxing the sulfur dioxide emission standards for five years, while initiating a forced compliance program that will have all coal-fired electric plants fitted with pollution devices by 1980, and concurrently banning oil and gas-fired plant construction from 1975 onward;

- enacting federal guarantees for coal prices, subsidizing excess coal-mining capacity and allowing accelerated export of coal.

"With these additional short-term policies, coal production keeps pace with the smoothly rising demand and long-term energy shortages are avoided," said the scientists. Yet they recognize that coal is not the final, long-term solution. Coal resources are depletable, too, and "their use only buys time until the energy transition is truly completed with a shift to such ultimate sources as solar, fusion and geothermal power."

Ultrasound Technique May Aid Tumor Therapy

MIT researchers are developing an ultrasonic system they hope will destroy or shrink inoperable tumors, by heating the rapidly-dividing cancer cells.

Tumors would be irradiated with ultrasound—sound too high to be heard by human ears—to heat them to about 42 degrees Centigrade (about 108 degrees Fahrenheit). There is considerable evidence that such heating causes some tumors to regress, or even disappear, and increases their sensitivity to X rays and drugs.

A major advantage of the treatment would be that tissues surrounding the tumor would not be harmed, as they are by x-rays and drugs.

"With ultrasound, if it doesn't work, at least it has done no harm," said Padmakar P. Lele, MD, PhD, professor of experimental medicine in the MIT Department of Mechanical Engineering.

This is because ultrasound can be focused on the tumor. Moreover, healthy cells are less sensitive to heat than rapidly-dividing cancer cells, and are not damaged by limited exposure to temperatures of 42 degrees.

Professor Lele is working on the ultra-

sonic system with graduate student Ronald J. Frere and senior Fred S. Tsuchiya, all in the Department of Mechanical Engineering. The work is sponsored in part by the US Public Health Service.

Dr. Lele said that the system should be ready for clinical use in about a year, if it is possible to use a probe to monitor internal temperatures. If not, many more measurements will have to be made, so that physicians treating patients will be able to estimate the heating produced by a certain intensity of ultrasound administered for a certain period of time.

Not all tumors are expected to respond to the treatment, but for some, just 15 to 30 minutes of heating, followed by X-ray treatment, "might do the job," Dr. Lele said.

"The beauty of it is that even if it doesn't destroy all the tumor, but perhaps only half, that itself can cause the regression of the tumor," he said.

Since the MIT researchers began their work in May, 1974, they have measured the different rates at which ultrasound is absorbed, depending on the tissue that is irradiated, and whether the ultrasound is

directed along or across the tissue.

They have also designed and built a computer-controlled system that moves a beam of ultrasound about a tumor, to heat it evenly. They have succeeded, Dr. Lele said, in keeping the temperature constant to within one-tenth of a degree.

They are now doing further work to determine the optimum speed at which the beam should travel, and the optimum path it should follow.

The idea of heating tumors is not new. "It has been known for about 60 or 70 years that hyperthermia of tumors can cause them to stop growing or to regress, and can increase their sensitivity to chemotherapy and X rays," Dr. Lele said.

One method of heating that has been tried is the use of microwaves—the radiation that cooks food in microwave ovens. But since microwaves cannot be focused, Dr. Lele said, they pose a hazard to the eyeballs and the testes, which are particularly sensitive to heat.

Other heroic attempts have been made, Dr. Lele said—including putting the patient into a bath of molten wax. But because of the body's system of heat regulation, it is extremely difficult to

raise internal temperatures by applying heat externally; inevitably the skin is burned first. Drugs that induce fevers also have undesirable side effects.

Ultrasound, which has none of these disadvantages, has many medical uses. Dr. Lele is also working on a system that uses ultrasound to measure the damage done by heart attacks, to aid physicians in prescribing treatment.

Ultrasound is also used increasingly in obstetrics—for example, to estimate the delivery date, and to determine whether the delivery will be normal.

It can also be used, Dr. Lele said, to detect tumors, except lung tumors and brain tumors. At the present time, the quality of the diagnosis depends largely on the skill of the person making it; unfortunately, Dr. Lele says, relatively few persons in the US are skilled in the use of ultrasound.

But ultimately, it may be a major tool both for detecting cancer, and for destroying it.

Sign Language Classes Offered

Classes in sign language are being offered again this year by the Artificial Intelligence Laboratory.

Two-hour classes meet two nights a week, for a total of 40 hours. There is a \$25 fee for the course. Both adults and children are welcome in the program. For further information, call Paul Goldenberg, x3-3471.

Earthquake Prediction Necessary

Without earthquake prediction, ancient communities in developing countries will continue to experience heavy loss of life from even mild earth shocks, according to an MIT professor who was in Turkey when the recent earthquake there took 2,500 lives.

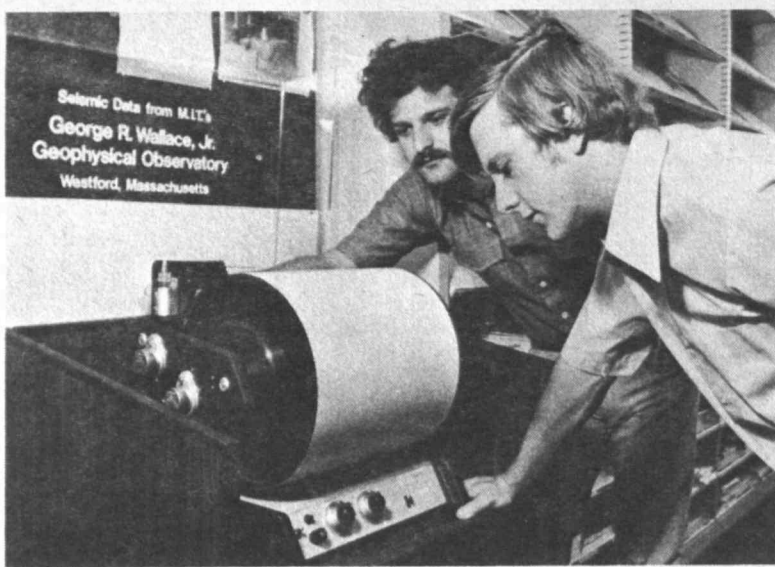
Professor M. Nafi Toksoz, director of MIT's George R. Wallace, Jr. Geophysical Observatory, was visiting friends in his native country when the Sept. 6 quake, which measured 6.7 on the Richter Scale, hit in the area of Lice, Turkey.

"Earthquake-resistant construction is nonexistent in developing countries, except for a few modern structures, and the results of quakes can be devastating," said Professor Toksoz, a member of the MIT Department of Earth and Planetary Sciences.

He compared the 1964 Alaska quake, which hit 8.4 on the Richter Scale but took only 125 lives with the recent quake in Turkey and with a quake in Peru in 1970 that measured 7.0, but which took 70,000 lives.

He also cited the 1971 quake in San Fernando, Calif., a suburb of Los Angeles, which at 6.4 was nearly as big as the one in Lice, Turkey, but which killed only 58 people.

"Earthquake prediction is without doubt very important in developing



GROUND TALK—What the sensitive seismometers at MIT's recently dedicated George R. Wallace Jr. Geophysical Observatory in Westford, Mass., are picking up can be seen on this seismograph at the Lindgren Library on the second floor of Building 54. Checking the chart are Jason Metaxas, left, a senior clerk in the Department of Earth and Planetary Sciences, and Richard Hodges, a special graduate student in the department from Holderness, N.H. Metaxas, a native of Athens, Greece, now lives in Boston.

countries located in earthquake belts," he said.

The world's leading technological nations could collaborate in developing an earthquake prediction network, perhaps coordinating their efforts through the United Nations, Professor Toksoz said.

"Meaningful prediction would mean averaging better than 50 percent accurate," he said.

"That is well within reach in well instrumented areas within the next 10 years," he said.

Observer Issued

The September issue of MIT Observer, a reproduction of newspaper clippings about MIT, its programs and its people, has been published and copies are available at the Information Center, Rogers Bldg. Lobby (Bldg. 7).

The latest issue appears in a tabloid newspaper format, a change from the former magazine format. The new style was adopted to achieve lower printing costs.

New UROP Listings

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

New England Aquarium Boston, Ma. The New England Aquarium is interested in involving undergraduates in the following research projects being conducted at the Aquarium:

- 1) Time stability of nutrients in phytoplankton culture medium;
- 2) Trace metal uptake and transport by fresh water algae;
- 3) Transitional metal trace analysis by gas chromatography;
- 4) Separation and characterization of polar organic material from sea water and phytoplankton culture media;
- 5) Measurement of metal complexing capacity in real water systems and its effect on phytoplankton productivity;
- 6) Determination of heavy metal associations in fresh water and marine sediments;
- 7) Gas chromatography of inorganic oxygen containing anions. Credit or College Work Study funding available.

Massachusetts General Hospital Boston, Ma. An opportunity exists for an undergraduate interested in participating in a research project involving human hemoglobin in solution, intact red cells and the processes that influence its relationship with oxygen. Advanced level of related laboratory experience is desirable.

Boston Biomedical Research Institute The Department of Muscle Research at the BBRI is carrying out an investigation to elucidate the mechanisms of muscle contraction and the cause of several diseases (hypertrophy, myotonia and muscular dystrophy) in which muscle tissue is defective. Suggested projects include enzymatic studies on muscle proteins and membrane systems of the muscle cell, electron microscopy of protein aggregates and mechanical measurement of single muscle fibers.

Tufts Medical School Multiple antibiotic resistance in bacteria is a major health problem. This laboratory is studying this plasmid-mediated infectious resistance which can be transferred easily among various bacterial species. The approach is to isolate the piece of extrachromosomal DNA (R factor) away from the bacterial cell and to study control of its replication and transfer. Other work concentrates on the regulation of expression of certain antibiotic resistance genes, most notably that to tetracycline. Students interested in joining an ongoing basic science project with clear medical-health relevance are invited to participate.

Moleculon Research Corporation Moleculon has developed a material called "poroplastic" which is an ultramicroscopic homogenous membrane which can be impregnated with many liquids or solutions. The firm would like to involve undergraduates in the following research applications for this material: 1) Enzyme immobilization; 2) Polymer morphology; 3) Pore size distribution; 4) Photochemical reactions; and 5) Study of phase boundary mobility within poroplastic film. Students interested physical chemistry, chemical engineering, physics, metallurgy, and mechanical engineering are encouraged to join in this research.

Sloan School of Management Center for Information Systems Research Research opportunities exist for students with strong interest in computer-based infor-

mation systems to participate in a project centered around the development and evaluation of an experimental relational system for managing large data bases. A hierarchical approach is planned, with focus on the following levels: a relational file system, relational operators, an access control level, and a relational DML processor. Contributions ranging from conception and design to implementation and performance evaluation are sought in areas such as: storage and index structures, search algorithms, privacy, concurrent access control, and compound query strategies. Performance simulation and analysis are also relevant.

Dr. Murray Edelberg, Rm E40-365, x3-7655.

MITRE Corporation Bedford, Ma. Experimental Computer Science: System Penetration

MITRE is currently engaged in the design of computer systems that are not penetrable, i.e., no unauthorized access to information is possible. One such system, built on a DEC PDP-11/45, has been completed, and designs for other systems are proceeding. This task is the examination of the PDP-11/45 based system for design or implementation flaws and the exploitation of these flaws to produce penetration, i.e., to gain access to information in an unauthorized fashion. Car needed for transportation to Bedford. Pay or credit available.

Law Related

Patent Law A Patent Lawyer connected with a large Boston patent law firm would like to interest a student in a study of the teaching value of patents and patent literature in technological fields. Three studies are proposed: 1) Studies of litigated cases and comparison of patents held by the court to scientific and technical literature. 2) Historical review of patent development in a given field of technology, and 3) Survey of current use of patent literature.

Urban Settlement Design Program This research project involves the development of simple computer programs dealing with the inter-relationships of physical planning variables. The variables would include population/community components, lengths of infrastructure to areas served, density tables, etc. Fortran skills and basic competence in computer programming are required. Reinhard Goethert, Rm E21-306, x3-4404.

A Social Assistance Information File An undergraduate is encouraged to work with MIT faculty and staff of the Cambridge Public Library to develop a Public Information System that will help citizens of Cambridge public and private assistance centers. A data bank of available services will be gathered in areas such as child care, health, legal services, education, employment, housing, recreation, nutrition, etc. It is intended that the system be located in public places such as libraries, the YMCA, etc. A unique, graphic, non-keyboard console is under design for this purpose. In some cases the system may be designed to be bilingual. Students interested in social applications of computer, data processing, organization and retrieval will find the project challenging. Dr. M.M. Kessler or Prof. Roy Kaplow.

Public Use of Computers The project will address itself to the use of computers in solving the daily problems of the average citizen. The focus will be on the family and individual problem areas that require decision making. Examples of this are: tax calculations, consumer strategy such as buying on time versus credit, renting versus buying a house, choice of education, etc. We may also explore self training and learning programs. It is intended that the computer

This Week in Sports Women Sailors Shine In New England Meet

MIT was the scene of the annual New England Intercollegiate Women's Single-handed Sailing Championships. The host sailors gave evidence that MIT was out to regain the top rung of the women's national intercollegiate sailing ladder.

Thirty-six skippers from New England colleges vied for the top prize in competition Saturday and Sunday on the Charles River. After the first day's competition, MIT had qualified five: junior captain Barbara Belt (Severna Park, Md.), sophomores Alanna Connors (Greenwich, Conn.), Sarah Husted (Camarillo, Cal.), freshmen Audrey Greenhill (East Hills, N.Y.) and Debra Meyerson (Southfield, Mich.) for the eighteen skipper final on Sunday.

But the big story for Tech during the weekend regatta was the sailing of sophomore Alanna Connors. After seven races, Alanna held a fifteen point lead over the field that included last year's national low-point skipper, Diana Baxter of Tufts. Unable to keep up the awesome pace, in her last two races, Alanna dropped to second place, finishing second, two points out of first. Alanna's 49 points put her three up on the defending national champ, Baxter, and fourteen points ahead of MIT's Barbara Belt, who finished fifth.

MIT's cross country team opens its 1975 season this Saturday in hopes of regaining the Engineers' Cup. The MIT Engineers lost the annual

trophy to Worcester Polytechnic Institute last fall, after winning the cup in 1973. The Engineer harriers are spearheaded by junior Frank Richardson (Sac City, Iowa), an outdoor three-mile All American. Richardson, winner of five regular 1974 outings, is expected to be one of New England's top individual harriers this season. The Tech runners are pre-season ranked in the top fifteen teams in New England.

MIT's soccer team polished off its third straight pre-season exhibition foe Boston State, 6-3, and appears to be ready for its first regular season decision on Wednesday afternoon versus Harvard. Perennially one of the top teams in the nation, MIT hopes to pull off one of the early season collegiate soccer upsets of the year. The Crimson booters are ranked fifth in the pre-season New England polls. Forwards Rich Okine (Aflao, Ghana) and Shin Yoshida (Hitachi City, Japan) have given the Engineer booters the added offense lacking on the 1974 varsity.

Lincoln Blood Drive

Lincoln Laboratory's Fall blood drive, conducted by the Lexington Red Cross, will be held Monday, Sept. 29, and Tuesday, Sept. 30.

INSTITUTE NOTICES

Announcements

Sophomores—Please return your freshman job survey questionnaire to Dean for Student Affairs office, Rm 5-104, if you have not already done so. We appreciate your help.

Preprofessional Meetings—The Medical School Interview: Mon, Sept 29, 4pm, Rm 37-252. University of Michigan Law School Interviews: Make appointment in Preprofessional Office for Tues, Sept 30, 9am-12n, Rm 10-186.

University of Pennsylvania Law School: Group meeting with representatives Thurs, Oct 2, 5:15pm, Rm 3-133. Sponsored by Preprofessional Advising & Education Office.

Graduate Student Council Meeting—First official meeting. Wed, Sept 24, 5:30pm, Walker Blue Rm. Leave your name with cashier & bring meal up to Blue Rm. Info: GSC office, x3-2195.

Course Time Change—Course 21.523, Cultures & Societies of South America, will meet Tues, 3-5:30pm, Rm 14N-312. No pre-requisite.

Freshmen—Those interested in having the picture used in the Freshman Picturebook returned should come to TCA, Stu Ctr Rm 450, weekdays between 11am & 3pm.

Graduate Students—Applications for advanced degrees in Feb, 1976 must be returned to Registrar's Office, Rm E19-335, by Fri, Sept 26, 1975.

MITHelp—Sessions available for students with weak backgrounds in algebra, trig, analytic geometry and logs & exponentials. Info: inquire daytime, FAC office, Rm 7-103, x3-6771; Mon thru Thurs evgs, 7-8pm, Rm 4-155.

MIT Family Day Care Program—Warm, loving homes needed, especially on campus, to care for infants and toddlers. Immediate openings. Info and applications: Child Care Office, x3-3953.

Student Furniture Exchange—Open Tues & Thurs, 10am-2pm. Buy and sell to students, tax-free donations gratefully accepted, 25 Windsor St, x3-4293.

EE Student-Faculty Committee—The Committee will hold its annual membership meeting Mon, Sept 29, 4pm, Rm 10-105. Refreshments. Hope to see you there!

Graduate Studies

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

Wellesley College Graduate Fellowships A number of fellowships for graduate study in 1976-77 at institutions other than Wellesley College are available to graduating seniors and alumnae of Wellesley College and to women graduates of any American institution. Deadline: January 15, 1976.

Graphic Arts Industry Fellowship Program Awards will be made for research and study in one or more fields of study such as mathematics, chemistry, physics, engineering and business technology provided the area of study has potential application in the printing, publishing, and packaging industries. Fellowship awards range from \$1,000 to \$3,000. Applications are available in the Graduate School Office. Deadline: February 1, 1976.

New Course Listings

Undergraduate Seminar 06-S09—Design of Digital Communications Equipment—Participants should be very familiar with digital and analog circuit design. Limited construction of selected circuit modules will begin after a reasonable feasible design has been completed. This phase will continue under UROP. For info on joining, credits, etc, please call C.D. Paton, Rm 9-370, x3-7411.

SRE 221 The Philosophical Foundations of Cognitive Studies—An examination of philosophical problems in recent studies of psychology, linguistics, artificial intelligence and neural physiology with emphasis on language and thought, memory, computers, and the information processing approach. Information on times and instructors: Elaine B. Medverd, administrative officer for DSRE, x3-6047.

SRE 225 Comparative Development in Human and Nonhuman Primates—A new subject that will observe human and nonhuman behavior both in natural and experimental settings, paying special attention to the roles of play, imitation, and sex roles in social development as well as the roles of motivation and environment in cognitive development. Information on times and instructors: Elaine B. Medverd, administrative officer for DSRE, x3-6047.

MIT Club Notes

MIT Baha'i Association—Will gather Mon, 5pm, Rm 8-105.

MIT Ballroom Dancing Club—The club will be very active this term with frequent workshops & dances. New members welcome at all functions. Info & times: Carl Sharon or Doug King, 536-1300.

Bridge Club—ACBL Duplicate Bridge. Open pairs Tues & Thurs, 7pm, Stu Ctr Rm 473.

MIT/DI Bridge Club—ACBL Duplicate Bridge. Tues, 6pm, Walker Memorial Blue Rm.

MIT Concert Band—Percussionists and oboes needed. Exciting music & many activities planned. Come to a rehearsal, Mon, 7:30pm & Wed, 8pm, Kresge.

MIT Ecology Action—Meeting to discuss continuing projects & new ideas. Wed, Sept 24, 7pm, Stu Ctr Rm 002.

Hellenic Students Association—General meeting Sun, Sept 28, 3pm, Stu Ctr Mezzanine Lge. Refreshments.

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

Psi Club—For all graduates of Silva Mind Control. Meeting Wed, Sept 24, 5pm, Rm 4-159.

MIT Radio Society W1MX—Meeting Tues, Sept 30, 8pm, Rm 4-270.

MIT Scuba Club—Go down with us! Meeting Tues, Sept 30, 6:30pm, Rm 20E-017. Dive New England slide show. Open water dives planned this fall: ocean, quarry, night, ice. At 8pm explore depths of MIT pool, where you can win free air for a year (pool equipment provided). Compressor hours: Tues & Thurs, 1-3pm, pool.

Shotokan Karate Club—Rigorous training for intercollegiate competition & self-defense, given by 6th degree black belt. Mon & Wed, 8pm, duPont wrestling rm; Sat, 1pm, duPont 2nd fl dance rm.

MIT Soaring Association—Meeting Thurs, Sept 25, 7:30pm, Stu Ctr Rm 491. Coffee & donuts. Films, slides.

Strategic Games Society—Sat, 1pm-1am, Walker Rm 309 & 318. Offers opponents and discounts on merchandise to members plus gaming & periodical library. Info: Paul Bean, 266-6108.

MIT Table-Tennis Club—Team practice Thurs, 7-10pm, T-Club Lge.

Technique—MIT yearbook needs photographers, writers & workers. Sat, 11am, Stu Ctr Rm 451, x3-2980.

Tech Squares—Club trip to Shindiggers SDC Sat, Sept 27, 7pm, meet 1st fl Stu Ctr. Info: Mike Tersoff, 266-8266. Anyone who knows how to square dance is welcome.

Tiddlywinks Association—Wed, 8pm, Stu Ctr Rm 473.

MIT Wheelmen—Meetings Tues, 7:30pm, Rm 1-203.

Religious Activities

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

Campus Crusade for Christ—Family Time Fri, 7:45pm, Rm 37-252.

Celebration of Holy Communion—MIT Lutheran & Episcopal Ministry, Wed, 5:05pm, Chapel. Supper following, 312 Memorial Dr.

Christian Worship Service—Sun, 10:45am, Chapel. Refreshments following service.

Hillel Services—Sh'min Atzereth & Simchath Torah—Fri, Sept 26, 7pm; Sat, Sept 27, 9:30am. Mincha-Maariv 7pm; Sun, Sept 28, 9:30am; all Chapel.

Islamic Society—Prayers Fri, 1pm, Kresge rehearsal Rm B.

Prayer Time—Lunch hour Bible classes led by Miriam R. Eccles, Fri, 1-2pm, Rm 20E-226. All are welcome.

Roman Catholic Mass—Sunday 9:15am, 12:15 & 5:15pm; Tues & Thurs, 5:05pm; Fri, 12:05pm; all Chapel. Weddings, baptisms, confessions, call Fr. Moran, x3-2981.

ART TRANSITION

October 15-20, 1975
Massachusetts Institute of Technology

(The following program is a working schedule and is subject to change)

Wednesday, October 15

4:00 Room 54-100
Jurgen Claus, Presentation
Aldo Tambellini, Presentation

8-9:15 Lobby 7
Registration

9:30 Kresge Little Theatre
Jasia Reichardt, Director, Whitechapel Art Gallery, London
Presentation

11:00 Sonia Landy Sheridan, Head, Generative Systems Department
Art Institute of Chicago School
Presentation

Saturday, October 18

12:00 Lobby 7
Paul Earls, present Fellow, Center for Advanced Visual Studies, "U.S. Air Weave: A Swatch of Our National Musical Warp and Woof, for Columbus Day"

2:00 Kresge Little Theatre
NEW ART/SCIENCE/TECHNOLOGY
Panel: John Nolan, President, Massachusetts College of Art, Boston
Jasia Reichardt, director, Whitechapel Art Gallery, London
James Seawright, director, Visual Arts Program, Princeton University
Sonia Landy Sheridan, head, Generative Systems Department, Art Institute of Chicago School
Harriet Casdin Silver, artist

4:00 CAVS
Reception, Center for Advanced Visual Studies

6:00 CAVS
Charlotte Moorman, T.V. CELLO, by Nam June Paik
(open to registrants only)

8:00 CAVS
Charlotte Moorman, T.V. CELLO, By Nam June Paik
(continuation of program, open to the public. Tickets available at box office)

9:30 Room 26-100, Compton Laboratories
T.M. Stephens, Co-ordinator, Art Research Center, Kansas City
Presentation

10:15 Room 26-100, Compton Laboratories
Karin Bacon, Arts Festival Producer
Presentation

11:00 Room 54-100
EXPANSION OF THE ARTS
Panel: Karen Bacon, Arts Festival Producer
Elma Lewis, Director, Elma Lewis School of Fine Arts
Sonia Landy Sheridan, Head, Generative Systems Department Art Institute of Chicago School
T.M. Stephens, Co-ordinator, Art Research Center, Kansas City

2:30 Room 54-100
ART SUPPORT SYSTEMS
Panel: Wayne Andersen, Professor of History of Art, MIT
Renee Levine, Managing Director, Center for the Performing Arts, SUNY at Buffalo
Matko Mestrovic, Professor, University of Zagreb, Yugoslavia
Jasia Reichardt, Director, Whitechapel Art Gallery, London
Manfred Schneckeburger, Director, Kassel Dokumenta 6
Jan Van Der Marck, Director, Hopkins Center Art Galleries, Dartmouth College
Howard Wise, President, Electronic Art Intermix

Thursday, October 16

9:30 Mezzanine Lounge
Gerald O'Grady
Presentation

10:30 Sala de Puerto Rico
NEW EDUCATION/EDUCATION TOWARDS THE NEW ART
Panel: James Ackerman, Professor of Art History, Harvard University
Gyorgy Kepes, founder, Center for Advanced Visual Studies
Roy Lamson, Special Assistant to the President, M.I.T.
Elma Lewis, Director, Elma Lewis School of Fine Arts
John Nolan, President, Massachusetts College of Art, Boston
Gerald O'Grady, Director, Center for Media Studies, SUNY at Buffalo
Manfred Schneckeburger, Director, Kassel Dokumenta 6
Jerome Wiesner, President, M.I.T.

12:00 Institute of Contemporary Art, Boston
Reception

2:00 Institute of Contemporary Art
Video presentations and informal conversation with the artists
Douglas Davis, Juan Downey, David Cort, Aldo Tambellini

4:00 Briggs Field
Large outdoor environmental works, continuing all evening, Otto Piene, Rockne Krebs, Paul Earls, Joan Brigham

4:00 Room 54-100
Jeffrey Shaw, Eventstructure Research Group, Holland Presentation: WATER WALK TUBE

5:00 Room 54-100
Nancy Holt, artist
Presentation: Premier: Pine Barrens, film

8:00 Room 10-250
Yvonne Rainer, dancer/artist, FILM ABOUT A WOMAN WHO...

8:00 Massachusetts College of Art
EVENINGS FOR NEW MUSIC, Center of the Creative and Performing Arts, SUNY at Buffalo

Sunday, October 19

10:00 Outdoors, Kresge Plaza
Gary Rieveschl
LIVE FORMS, outdoor event

12:30 Kresge Little Theatre
ARTIST AS EDUCATOR
Panel: Allan Kaprow, artist
Margaret Mahoney, Vice President, Robert Wood Johnson Foundation
Otto Piene, Director, Center for Advanced Visual Studies
James Seawright, Director, Visual Arts Department, Princeton University
Virginia Gunter, Director of Exhibitions and Programs, Massachusetts College of Art, Boston

3:30 Kresge Little Theatre
FILM/THE AESTHETIC OF THE TECHNOLOGICAL IMAGE
Panel: Peter Feinstein, Director, University Film Study Center
Hollis Frampton, filmmaker
Richard Leacock, Head, MIT Film Section
Ed Pincus, filmmaker
Deac Rossell, critic
Michael Snow, filmmaker
Robert Gardner, Carpenter Center, Harvard University

6:00 Kresge Little Theatre
Hollis Frampton, filmmaker
Presentation
Ed Pincus, filmmaker, M.I.T.
Presentation

List of Participants

Chloe Aaron
James Ackerman
Maryanne Amacher
Wayne Andersen
Billy Apple
Karin Bacon
Fred Barzyk
Joan Brigham
Lowry Burgess
Jurgen Claus
Christo
Muriel Cooper
David Cort
Douglas Davis
Juan Downey
Paul Earls
Scott Fisher
Hollis Frampton
Luis Frangella
Peter Feinstein
Virginia Gunter
Ron Hays
Nancy Holt
Michio Ihara
Allan Kaprow
Gyorgy Kepes
Rockne Krebs
Roy Lamson
Richard Leacock
Renee Levine
Les Levine
Elma Lewis
Margaret Mahoney
Center of the Creative and Performing Arts, SUNY, Buffalo

Ann McIntosh
Matko Mestrovic
Charlotte Moorman
Carl Nesjar
John Nolan
Gerald O'Grady
Nam June Paik
Otto Piene
Ed Pincus
Robert Preusser
Keiko Prince
Yvonne Rainer
Jasia Reichardt
Gary Rieveschl
Deac Rossell
Pat Rohm
Robert Rohm
Jon Rubin
Friedrich St. Florian
Manfred Schneckeburger
Sonia Landy Sheridan
James Seawright
Jeffrey Shaw
Harriet Casdin Silver
Alejandro Sina
Michael Snow
Alan Sonfist
Athena Tacha Spear
Thomas M. Stephens
Takis
Aldo Tambellini
Wen-Ying Tsai
Stan Van Der Beek
Jan Van Der Marck
Howard Wise

Friday, October 17

9:30 Kresge Little Theatre
Christo's Valley Curtain, film
Presentation by Christo

10:30 Kresge Little Theatre
ENVIRONMENTAL/LARGE SCALE ART
Panel: Christo, artist
Nancy Holt, artist
Rockne Krebs, artist
Otto Piene, Director, Center for Advanced Visual Studies
Jeffrey Shaw, Eventstructure Research Group, Holland
Jan Van Der Marck, Director, Hopkins Center Art Galleries
Dartmouth College

1:30 MESTROVIC

2:00 Kresge Little Theatre
NEW MEDIA/VIDEO/COMMUNICATION
Panel: David Cort, video artist
Douglas Davis, artist
Les Levine, artist
Matko Mestrovic, Professor, Zagreb University, Yugoslavia
Gerald O'Grady, Director, Center for Media Studies, SUNY at Buffalo
Aldo Tambellini, artist
Howard Wise, President, Electronic Art Intermix

Art Leaders To Hold Event Here

Leaders of the art world will come to MIT next month to participate in ART TRANSITION, an intensive five-day examination of the status and development of the visual arts in contemporary society.

The event from Oct. 15-20 is co-sponsored by the MIT Center for Advanced Visual Studies and the University Film Study Center. MIT President Jerome B. Wiesner is chairman. Co-chairmen are Otto Piene and Peter Feinstein, directors of the two centers.

ART TRANSITION will combine panel discussions, performances, and film and video viewings with exhibitions and outdoor art events to represent a range of advanced forms of art that have become publicly evident during the last decade. The program will function on two levels, with events and exhibitions open to the public and the academic community as well as a specific program for registrants.

Panel subjects will include support systems for the arts, new art and new technology, the concerns of art and education, large-scale environmental art, expansion of the arts and the media of video and film. ART TRANSITION will include several music performance events.

Project director for ART TRANSITION is Virginia Gunter, director of programs and exhibitions at Massachusetts College of Art. The project is supported by the National Endowment for the Humanities and by MIT.

A major catalogue will be published in connection with the event, including visual material by artists and essays and papers on various aspects of projects by the participants.

Shakespeare Performances

The MIT Shakespeare Ensemble will begin its second season with two free outdoor performances at Government Center and Copley Square in Boston, Friday (Sept. 26) and Saturday (Sept. 27).

The performances, including scenes from *The Merchant of Venice*, *Anthony and Cleopatra*, *The Tempest* and *Twelfth Night*, will be performed on a stage next to City Hall at 12:30pm Friday and at Copley Square at 1:00pm Saturday. In case of rain, performances will be postponed until Friday, Oct. 3 and Saturday, Oct. 4.

The repertory company, under the direction of Professor Murray Biggs, will also perform scenes in the lobby of MIT's building 7 at noon, Tuesday, Oct. 7 and Wednesday, Oct. 8.

The company's first full-length production of the season, *The Merchant of Venice*, will be performed in MIT's Sala de Puerto Rico in the Student Center, Wednesday, Oct. 15 through Sunday, Oct. 19. Tickets may be reserved through the company's box office (x3-4420) beginning Wednesday, Oct. 1. Ticket prices are \$2.50 to \$3.00 for weekday evenings and \$3.00 to \$3.50 for weekend performances. All students will receive \$1.00 discounts. Group rates also are available.

Wrong Number

A misprint in Pat Eden's telephone number in the *Matrons' Bulletin* has caused some confusion for those wanting to sign up for her intermediate crewel class—and for the man who owns the misprinted telephone number.

The correct telephone number is 253-2858.

In addition, the date of the beginning class has been changed from Tuesday, Oct. 14, to Tuesday, Oct. 21.

The *Bulletin* also omitted listing the names of the speakers at the first Travel Group discussion. They are Ruth Ippen and Jean Brown, who will speak on their recent trip to Iran. The meeting will be held Thursday, Oct. 23, at 10am at Kay Bolt's home, Tabor Hill Rd., Lincoln.

THE INSTITUTE CALENDAR

September 24
through
October 5

Events of Special Interest

Underwood-Prescott Symposium on Food for the World* – Speakers and their topics are: **Dr. J. George Harrar**, recipient of 1975 Underwood-Prescott Award, president emeritus & life fellow, The Rockefeller Foundation: Prospects for an Adequate World Food Supply. **The Lord Ritchie-Calder**, science writer, member of House of Lords: Conditions for Human Survival. **Nevin Scrimshaw**, head of nutrition and food science: Prospects for Supplementing Traditional Agricultural Sources for Food. Tues, Sept 30, 2pm, Kresge.

Seminars and Lectures

The Potential for Resource Recovery from Demolition Wastes* – **Richard M. Wiesman**, G. Mechanical Engineering Seminar. 12:05pm, Rm 3-465. Bring lunch, coffee & tea provided.

Issues and Opportunities in the Construction Industry* – **Janet Rossow**, research assistant, civil engineering. Civil Engineering Constructed Facilities Division Seminar. 4pm, Rm 3-370.

Thursday, September 25

Pockel's Readout Optical Modulator – A Real Time Image Storage Device* – **Peter Nisenson**, ITEK Corporation. EE & CS Optics Seminar. 2pm, Rm 36-428.

Mechanical Model for Arterial Distress* – **Douglas Kenyon**, mechanical engineering. Mechanical Engineering Thermal-Fluids Seminar. 4pm, Rm 3-343.

The Biblical View of Humanity** – **Nahum Glatzer**, University Professor, Judaic Studies & religion, Boston University. Humanitas: An Evolving Perspective Seminar on Technology & Culture. 4pm, Rm 9-150.

The MIT Electron Ponderator and Nuclear Structure Physics* – **William Turchinets**, physics. Physics Colloquium. 4:15pm, Rm 26-100. Refreshments 3:45pm, Rm 26-110.

Friday, September 26

Trucking: Thoughts on Current Regulatory Proposals* – **Al Pinkerton**, Naval War College, R.I. Center for Transportation Studies Seminar. Buffet 12n, Stu Ctr Mezzanine Lge (\$1), seminar 12:45pm, (free).

Motion Perception and Observation* – **O.H. Gerlach**, Technische Hogeschool, Delft, Holland. Man-Vehicle Laboratory Seminar. 2pm, Rm 37-187.

Reforming of Organic Wastes to High Btu Gas* – **Michael Modell**, chemical engineering. Chemical Engineering Seminar Series. 2pm, Rm 10-105.

Magnetic Order in a p-Electron System* – **Dr. W. Kanzig**, visiting professor. Physics Seminar. 4pm, Rm 9-150. Tea 3:30pm.

Energy Conversion of an Intense Relativistic Electron Beam in a Plasma* – **M.A. Greenspan**, Laboratory of Plasma Studies, Cornell University. Plasma Dynamics Seminar. 4pm, Rm 36-261.

Cognitive Development and Language Acquisition* – **Hermine Scinclair-deZwart**, visiting professor in DSRE, president of Department of Psychology, University of Geneva. Psychology Colloquium. 4:30pm, Rm E10-013.

Monday, September 29

Biological Engineering in Food Production* – **Dr. J. George Harrar**, recipient of 1975 Underwood-Prescott Memorial Award, president emeritus & life fellow, The Rockefeller Foundation. Nutrition and Food Science Seminar. 3pm, Rm 16-134.

Materials for Candu Reactors* – **J.S. L. Robertson**, AECL, Chalk River, Ontario, Canada. Nuclear Engineering Seminar. 3pm, Rm NW12-222.

Applications of Estimation Theory in Oceanography* – **A.B. Baggeroer**, electrical engineering, ocean engineering. Electronic Systems Laboratory Control & Communications Seminar. 4pm, Rm 39-500.

Inertial Convection at Low Prandtl Number* – **Michael Proctor**, mathematics. Applied Mathematics Colloquium. 4pm, Rm 2-338. Coffee 3:30pm. Rm 2-349.

Design of Biological Monitoring Programs* – **Stephen Moore**, civil engineering; **Russell T. Brown & Charles J. Puccia**, G. Parsons Laboratory & Civil Engineering, Water Resources & Hydrodynamics Seminar. 4pm, Rm 48-316. Coffee 3:45pm, Rm 48-140.

Tuesday, September 30

A 150 KV Pulsed Power Supply Design* – **Allan Forbes**, G. Nuclear Engineering Doctoral Seminar. 12n, Rm 38-166.

Stability and Control of the Broadcast Channel* – **Dr. Erol Gelenbe**, IRIA, France. Electronics Systems Laboratory Control & Communications Seminar. 4pm, Rm 39-500.

Global Measurements of the Temperature of the Mesosphere from a Satellite* – **Clive Rodgers**, National Center for Atmospheric Research. Meteorology Seminar. 4pm, Rm 54-100. Refreshments 3:30pm, Rm 54-923.

Clarence Schmidt in the Context of Grass Roots Art* – **Gregg Blasdel**, lecturer & author, co-organizer of the Schmidt exhibit. MIT Committee on the Visual Arts Lecture. 7:30pm, Rm 54-100.

The Impact of MIT Expansion into Cambridge* – **Richar Krushnic**, staff member, Urban Planning Aid. SACC Discussion. 7:30pm, Stu Ctr West Lge.

Wednesday, October 1

You Never Left Home – Strains on the British Political System* – **Dean Burnham**, political science. CIS Seminar. 12n, Rm E53-482.

Force Reduction as A Design Approach with Excavation Devices as Examples* – **Carl R. Peterson**, president, Rapidex, Inc. Mechanical Engineering Seminar. 12:05pm, Rm 3-465. Bring lunch, coffee & tea provided.

Some Arctic Circulation Models* – **John Hart**, oceanography. Oceanography Sack Lunch Seminar. 1pm, Rm 54-611. Bring lunch, coffee available.

The Applicability of Ethical Theory to Biomedical Research* – **Sissela Bok**, Harvard-MIT Program in Health Sciences & Technology. Technology Studies Seminar. 4pm, Rm 20D-205. Coffee 3:30pm.

Thursday, October 2

CW Mode Locking of Dye Lasers* – **H.A. House**, electrical engineering, RLE.EE & CS Optics Seminar. 2pm, Rm 36-428.

Recursive Stochastic Algorithm* – **Dr. Leonard Ljung**, division of automatic control, Lound Institute of Technology. Electronic Systems Laboratory Control & Communications Seminar. 4pm, Rm 39-400.

Stratospheric Ozone vs Freon: Comments by an Interested Observer* – **Daniel Trainor**, principal research scientist, Avco Everett Research Laboratory. Mechanical Engineering Thermal-Fluids Seminar. 4pm, Rm 3-343.

Medieval Images of the Human: Religion, Art, Science* – **Harry Bober**, New York University. Humanitas: An Evolving Perspective Seminar on Technology & Culture. 4pm, Rm 9-150.

When is a Bump Not a Resonance* – **Irwin Pless**, physics. Physics Colloquium. 4:15pm, Rm 26-100. Refreshments 3:45pm, Rm 26-110.

Studies on a New and Novel Beta-Lactam Antibiotic* – **Dr. Hatsuo Aoki**, Fujisawa Pharmaceutical Co., Osaka, Japan. Nutrition & Food Science Seminar. 4:30pm, Rm 16-310. Appointments available, contact A. Demain.

Friday, October 3

Recent Studies on Prostaglandin* – **Dr. Bengt Samuelsson**, chemistry, Karolinska Institutet, Stockholm, Sweden. Nutrition & Food Science Seminar. 12n, Rm 4-370.

Reactivity of CaO with "Nascent" Carbon in a Rotating-Arc Reactor* – **C.S. Kim**, G. Chemical Engineering Doctoral Seminar. 2pm, Rm 10-105.

Two-Phase Flow* – **F. Ozel**, G. Chemical Engineering Doctoral Seminar. 3pm, Rm 10-105.

Community Meetings

Science Library Tours* – Wed, Sept 24, 3:15pm, & Thurs, Sept 25, 10:15am, Rm 14S-100. Will include tour of library & explanation of resources and services.

Barker Engineering Library Tours** – Including overview, description of collection, introduction to catalog searching techniques, unique features. Wed, Sept 24 & Thurs, Oct 2, 5:15pm; Thurs, Sept 25 & Tues, Sept 30, 10:15 am; Wed, Oct 1, 3:15pm; meet Rm 10-500.

Parents Discussion Group** – Sponsored by Medical Department. **Audrey Entin**, PET instructor, will speak on "Parent Effectiveness Training." Wed, Sept 24, 12:30pm, Rm 1-126. Free. Coffee.

Beginning & Intermediate Sign Language Classes – Ameslan style classes offered this fall by AI Lab. 10 weeks, 2 nites/week, 2 hrs/night, 8th floor playroom, 545 Tech Sq. Cost: \$25. Children & adults welcome. Interested: E. Paul Goldenberg, x3-3471 or 332-1491, morns & evgs.

The Wives Discussion Group** – Led by Myra Rodrigues, social worker. Wed, 2:15pm, Stu Ctr West Lge. Coffee. Babysitting in Stu Ctr Rm 473.

MIT Women's Forum** – Meetings Mon, 12n, Rm 10-105 (Tues in case of holiday) Mon, Sept 29: Open discussion of IAP programs.

MIT Diet Workshop** – Thurs, 12n-1pm, Stu Ctr Rm 491.

Wellesley Events

Autumn Spirit** – Sponsored by Wellesley Asian Association. Fri, Sept 26, 9pm-1am, Stone Davis Dining Rm, Wellesley. Admission: Wellesley ID or \$1.50. Food, music & dancing.

Social Events

Strat's Rat – Sat, Sept 27, 8:30pm, Sala. Light & dark beer, \$.25/16 oz glass. Wine available. WTBS announcer & records. Free, college ID required.

24 Hour Coffeehouse* – Enjoy relaxing conversation, piano playing, games, inexpensive food, candy & drinks. Open 24 hours per day, 7 days per week, Stu Ctr 2nd fl lge.

Over 30's Singles Club – Luncheon 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. Erica, x3-2117 or Marty, x8-1206 Draper.

Movies

Eulerian and Lagrangian Descriptions; Deformation in Continuous Media* – Fluid Mechanics Films. Wed, Sept 24, 4pm, Rm 33-419. Free.

The Last of Sheila** – LSC. Fri, Sept 26, 7 & 9:30pm, Rm 26-100. Admission \$.50, ID required.

Shoeshine (DeSica)* – Film Society. Fri, Sept 26, 7:30 & 9:30pm, Rm 26-100. Admission \$1.

Knock on Any Door** – MidNite Movie. Fri, Sept 26, 12m, Sala. Free, bring blanket.

Alice Doesn't Live Here Anymore** – LSC. Sat, Sept 27, 7 & 9:30pm, Kresge. Admission \$.50, ID required.

36 Ghante** – Sangam. Indian movie with English subtitles. Sun, Sept 28, 2:30pm, Kresge. Admission \$1.

The Incredible Shrinking Man** – LSC. Sun, Sept 28, 6:30 & 9pm, Rm 26-100. Admission \$.50, ID required.

Pressure Fields; Flow Visualization; Channel Flow of a Compressible Fluid* – Fluid Mechanics Films. Tues, Sept 30, 4pm, Rm 33-419. Free.

Pressure Fields; Flow Visualaization; Channel Flow of a Compressible Fluid* – Fluid Mechanics Films. Wed, Oct 1, 4pm, Rm 33-419.

Murder on the Orient Express** – LSC. Fri, Oct 3, 7 & 10pm, Kresge. Admission \$.50 ID required.

Les Abysses (Papatakis)* – Film Society. Fri, Oct 3, 7 & 10pm, Rm 6-120. Admission \$1.

They Might be Giants** – MidNite Movie. Fri, Oct 3, 12m, Sala. Free, bring blanket.

Alice in Wonderland** – LSC. Sat, Oct 4, 7 & 9:30pm, Rm 26-100. Admission \$.50, ID required.

Lost Horizons** – LSC. Sun, Oct 5, 6:30 & 9:30pm, Rm 26-100. Admission \$.50, ID required.

Music

Chamber Music Society Concerts* – Wed, 5:15 pm, music library, Bldg 14E.

MIT Chamber Players* – directed by Marcus Thompson. Program of Janacek, Schubert & Stravinsky. Sat, Oct 4, 8pm, Kresge. Free.

Theatre and Shows

An Evening of One-Act Plays* – MIT Dramashop production of "The American Dream," by Edward Albee and "The Madness Of Lady Bright," by Lanford Wilson. Fri, Sept 26 & Sat, Sept 27, 8pm, Kresge Little Theatre. Free.

Dance

MIT-Wellesley Ballroom Dancing Club** – Beginners workshop on the tango Sun, Sept 28, 2-5pm, Stu Ctr Sala. Carl Sharon or Doug King, 536-1300.

Tech Squares* – Learn to square dance Tues, Sept 30, 8-11pm, Stu Ctr Lobdell. All welcome, whether you've danced before or not.

Exhibitions

Faculty Club Art Exhibit* – Works by Cindy Close exhibited during Sept.

Air Force Art Exhibit* – Unique view of Air Force life seen through the eyes of some of America's foremost artists & illustrators. Mon, Sept 29-Sat, Oct 4, 10am-6pm, Stu Ctr Mezzanine Lge.

Creative Photography Gallery Exhibit* – Works by John Benson. Thru Fri, Oct 10, Mon-Fri 10am-6pm & weekends 12n-6pm, Bldg W31. Free.

Student Art Association Exhibit* – Exhibit of summer photography projects. Daily thru Sun, Oct 12, Rotch Library. Free.

Hayden Gallery Exhibit* – Photo-murals, transparencies, films & diagrams supplement works of environmental artist Clarence Schmidt. Thru Wed, Oct 29, 10am-4pm daily & 6-9pm Tues. Free.

Works on Paper* – Exhibit of Marvin Brown. Thru Wed, Oct 29, Hayden Corridor Gallery. Open daily. Free.

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

MIT Historical Collections* – Permanent exhibition Mon-Fri, 9am-5pm, Bldg N52, 2nd floor. **Bicentennial Exhibit:** Katharine Dexter McCormick, '04, exhibit in Bldg 4 corridor.

Schumann at Work on a Song* – Music Library exhibit of manuscript facsimiles & pictures. Daily, Bldg 14E.

Athletics

Home Schedule* – **Saturday, September 17 – W Sailing.** CCT Invitational, Charles River Lower Basin. **V Baseball.** Mass Bay Cmnty, 4pm, Briggs Field. **Tues, Sept 30 – V Soccer.** WPI, 3:30pm, duPont Oval. **Friday, October 3 & Saturday, October 4 – Water Polo.** MIT Tournament; U Mass, U of RI, Williams, S Conn, 6:30pm Fri, 10am Sat, Alumni Poo.. **Saturday, October 4 – W Sailing.**

Learning Regatta, Charles River Lower Basin. **JV/F, V Cross Country.** Coast Guard, Wesleyan, 12:30pm, Franklin Park. **JV/F, V Soccer.** Trinity, 2pm, duPont Oval. **Sunday, October 5 – W Sailing.** Emily Wick Lark Championship, 9:30am, Charles River Lower Basin.

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

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

Send notices for October 1 through October 12 to the Calendar Editor, Room 5-111, Ext. 3-3279, before noon Friday, September 26.

Working Group Study Completed

(Continued from page 1)

job or working relationship occurred as a result of the review discussion. Although only one-quarter of the respondents felt that the discussion would have been different if salary had not been in question, about two-thirds still felt that the formal performance job discussion should be separated in time from the review discussion.

Participants in the review were also asked to express an opinion on how the review increase money should be distributed. Approximately 80 percent of the respondents favored both a general and a merit component. Supervisors were generally more in favor of an all merit or mostly merit distribution than were biweekly employees.

Two evaluation formats were designed by members of the Working Group for use in this year's review.

Over 75 percent of the biweekly questionnaire respondents indicated that they used one of the two forms provided. Both evaluation forms were perceived to be useful in facilitating discussions of working relationships.

An important goal of the Working Group was to provide adequate information to all participants. Seventy-one percent of the respondents agreed that the information received was adequate to meet their needs for participating in the review. The Tech Talk Supplement was the primary information source for the review, and almost all of the respondents obtained at least some information from it. A detailed breakdown of the use of the Supplement indicated that over a third of the respondents did not read or study it thoroughly. An even higher percentage of the

faculty (62 percent) did not take full advantage of the supplement information.

On the basis of questionnaire responses, the Working Group has made the following recommendations:
Review discussion:

—Further encouragement to discuss a wide range of performance and working relationship issues should be given in the future.

—A performance evaluation discussion should be held two times per year.

Nature of Salary Increase:

The salary increase should have a general and a merit component, with the merit component accounting for more than half of the total amount.

—The role of the administrative officer (or other departmental representative coordinating the review) should be explained more completely to all participants.

—Communication of the final review increase decision between the administrative officer and supervisor and between the supervisor and biweekly employee should be further stressed in the review instructions.

Use of Forms:

—Both evaluation forms should be made available in future reviews and their use encouraged.

Review Information:

—All review participants should have equal access to information through the publication of a Tech Talk Supplement.

—Other means of communication should be developed including the further use of departmental meetings.

—Attention should be given to the development of media that will reach the faculty more effectively.

A copy of the complete Evaluation Report will be mailed to every department headquarters within the next two weeks and will be available for review in the Reference Section of the Humanities Library.

Picheny Wins Kodak Award

The Eastman Kodak Fellowship, recognizing a student's outstanding progress, has been awarded to Michael A. Picheny, a graduate student in the Department of Electrical Engineering and Computer Science at MIT. The \$6,000 Fellowship is for the 1975-76 academic year.

George Eastman, founder of Eastman Kodak Co., the world leader in the production of photographic products, film and services, was one of MIT's great benefactors. His vision and generosity enabled MIT to move from Boston to its present site along the Charles River in 1916.

Mr. Picheny, of the Bronx, N.Y., a graduate of Bronx High School of Science, received his BS in electrical engineering in June from MIT where he was elected to Eta Kappa Nu and Tau Beta Pi.

During the summer of 1975 Mr. Picheny worked with Professor Henryk Eisenberg at the Weizmann Institute in Israel designing an interface between a computer and an ultracentrifuge. His long-term goal is research and teaching electrical and bioengineering at a university.

Uncas A. Whitaker, MIT Benefactor, Dies

(Continued from page 1)

These developments were preceded at the Institute by the opening of the Uncas A. and Helen F. Whitaker Building for the Life Sciences (Building 56) in December 1965. Mr. Whitaker's initiating support for the Joint Harvard-MIT Program in Health Sciences and Technology, and his establishment of the Whitaker Professorship in Biomedical Engineering, currently held by Professor Robert W. Mann of the Department of Mechanical Engineering.

In all of these endeavors, Mr. Whitaker worked in close association with Dr. Irwin W. Sizer, who also played a key role in leading MIT into the health sciences field. Dr. Sizer, professor of biochemistry emeritus, is a former head of the Department of Biology and former Dean of the Graduate School. He is currently President of the Health Sciences Fund.

"Mr. Whitaker was one of the greatest friends MIT has ever had," Professor Sizer said. "He was totally devoted to the Institution and contributed greatly to its development in the last 20 years, particularly in the field of the health sciences."

Following his graduation from MIT, Mr. Whitaker was employed as a special engineer with the Westinghouse Air Brake Company in Pittsburgh from 1923 to 1929. During these years, he also enrolled at the Carnegie Institute of Technology (now Carnegie-Mellon University) and received a BS Degree in Electrical Engineering in 1929. For the next nine years he was director of development and design of the Hoover Company in North Canton, Ohio, a major producer of electric home vacuum cleaners. While em-

ployed there, he studied law at the Cleveland Law School and received his JD Degree in 1935. From 1938 to 1941 he served as director of research and engineering of the American Machine and Foundry Company (AMF) in New York City. Each step in his career brought increased responsibility for the direction of technical effort, but none gave him the freedom he sought to try his own approach to the management of technologically-based industry.

In 1941 he resigned from AMF to found Aircraft-Marine Products, Inc. in Harrisburg, Pennsylvania, a company which rose to international importance under his leadership as the world's leading producer of electromechanical connectors for wires, cables, computer circuits, and coupling devices. The spectacular performance of the company brought Mr. Whitaker to national attention in the war years and in the postwar expansion of large-scale computers and industrial construction. He became Chairman of the Board of AMP Incorporated in 1962 and continued in the active management of the company as chairman until his death.

Mr. Whitaker received many honors for his professional and philanthropic activities. He was awarded the honorary degrees of ScD by Elizabethtown College in 1954, LLD by Gettysburg College in 1967 and the ScD by Carnegie-Mellon University in 1975. He was the recipient of the Eli Whitney Memorial Award of the Society of Manufacturing Engineers in 1970; a Distinguished Fellow of the Cleveland Clinic Foundation since 1972; and recipient of the 1974 Distinguished Achievement Award of the Carnegie-Mellon University Alumni Association.

Mr. and Mrs. Whitaker made their home in Harrisburg and Naples, Florida. He is survived by his widow, Helen Margaret (Fisher); two daughters, Mrs. Ruth Holmes of Shrewsbury, Massachusetts, and Mrs. Portia Shumaker of San Juan Capistrano, California; a sister, Mrs. Portia Burnell of Alliance, Ohio; and four grandchildren.

Those who wish to communicate with the family may do so through Mr. Whitaker's office at AMP Incorporated or through the Office of the Chairman at MIT.

Paul C. Eaton Dies at 69

Funeral services were held Sunday at Kennebunkport, Me., for Paul Conant Eaton, 69, Shakespearian scholar and former assistant professor of English literature at MIT who later served for nearly two decades as dean of students at the California Institute of Technology.

Professor Eaton died Thursday at the Maine Medical Center, Portland, following a brief illness. Burial was in Kennebunkport Monday.

Born in Nashua, N.H., Dec. 19, 1905, he was graduated from Phillips Exeter Academy in 1923 and from MIT in 1927. He studied English literature at Harvard where he received the MA degree in 1930.

He became instructor in English literature at MIT in 1930 and assistant professor in 1937. A member of the US Naval Reserve, he entered active duty in 1942 during World War II and served in the Atlantic and later in the Pacific where he was a senior staff operations officer. He returned to inactive status with the rank of lieutenant commander and resumed teaching at MIT in 1946.

In 1947, he joined Caltech as associate professor of English literature and assistant dean of students in 1947 and became dean of students there in 1952. He retired in 1969 and maintained homes both in Pasadena and Kennebunkport. He retained close associations with many MIT colleagues throughout his years at Caltech and during retirement.

Survivors include his wife, the former Katherine Emery; a son, James E.C. Eaton of Simsbury, Conn.; a daughter, Rebecca Comer Eaton of Cambridge; a sister, Mrs. George M. Tinker of Providence, R.I.; and two grandchildren.

Affirmative Action Results Are Mixed

(Continued from page 1)

dates are far too few.

"We remain hopeful, given the 7-9 year time lapse between matricula-

tion as a freshman and receipt of the PhD, that the substantial increases in black student enrollment in the research universities in the late 60s will soon begin to yield significantly

larger numbers of PhD graduates with faculty potential," the Chancellor said.

Dr. Gray, in his letter, also discussed a number of actions MIT has

undertaken to assure a hospitable environment for affirmative actions. Among them he listed:

—Adoption of a policy treating pregnancy and childbirth under the leave and benefit programs as disabilities and illnesses are now treated;

—Emphasis on affirmative action as an important criterion to be considered in decisions on termination of employees for lack of funds or work;

—Establishment of Martin Luther King's birthday as an Institute-wide holiday;

—The summer employment program for Cambridge youngsters;

—The spirit of MIT's comments on Title IX regulations;

—Creation of a classification and salary administration program for the administrative staff to help assure salary equity within that group;

—A day-long meeting of the Academic Council devoted to reviewing affirmative action progress and issues.

"I hope you will find in these actions evidence of a commitment which goes well beyond minimum compliance to one rooted in conviction," Dr. Gray told the OCR.

In response, John G. Bynoe, director of the Region I OCR, said:

"I am pleased to note the Institute's continuing commitment to increasing the number of graduate minority students in the science and engineering disciplines. We believe that this on-going effort will pay dividends at the faculty level in the not-too-distant future.

"That the Institute is also maintaining a solid recruiting campaign to bring more minority faculty into MIT and provide them the necessary infrastructure of support, as they pursue tenured academic careers, is fully supported by the Office for Civil Rights," he said.

"Clearly MIT understands that these two major commitments must be operated simultaneously and that neither can serve as a substitute for the other," Mr. Bynoe concluded.

MIT is now in the process of extending the affirmative action goals—Institute-wide and departmental—to July 1, 1976 and July 1, 1977 to be submitted to OCR in October. There are plans to republish the Affirmative Action Plan with the updated goals when they have been set.

Summary of Employment Changes in Minority and Women Representation at MIT and Employment Goals for July 1975 (Data includes Campus & Lincoln Lab.)

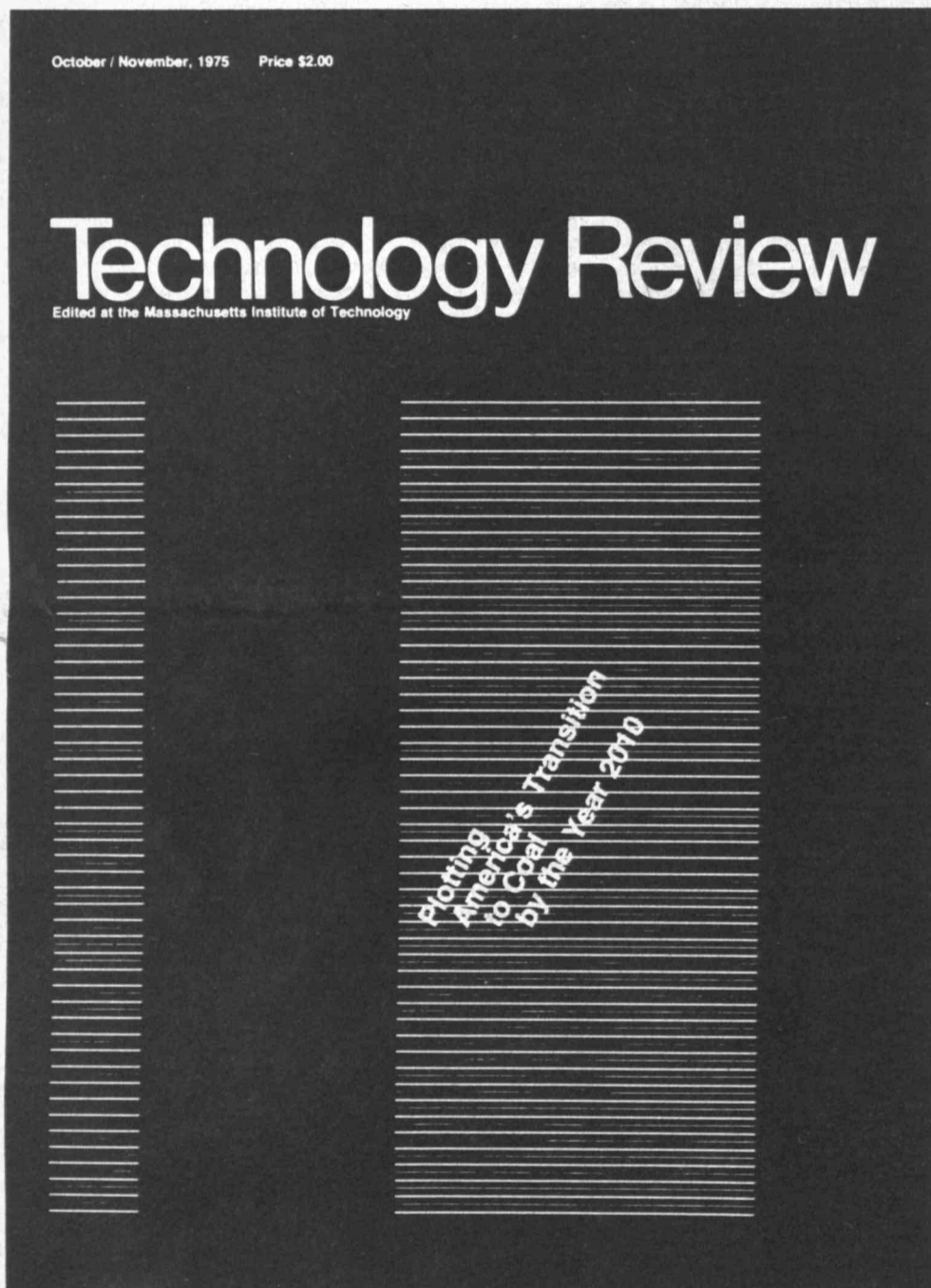
	Actual Employment Data				Goals** July 1975	+ over goals - under goals July 1975
	Nov. 1970	June 1972	Dec. 1973	July 1975		
Faculty Total	947	904	946	970		
Black	8	8	15	18	31	- 13
Total Minority	53	60	62	75	65	+ 10
Women	17	23	45	54	69	- 15
*Other Staff Total	2,592	2,762	2,944	3,255		
Black	38	60	62	69	119	- 50
Total Minority	185	224	248	293	235	+ 58
Women	374	593	528	644	601	+ 43
Exempt Total	581	671	615	683		
Black	18	21	26	25	37	- 12
Total Minority	24	24	33	35	44	- 9
Women	120	153	151	195	156	+ 39
Office/Clerical Tot.	1,899	1,938	1,883	1,847		
Black	83	124	143	152	209	- 57
Total Minority	144	190	212	216	279	- 63
Women	1,241	1,601	1,534	1,552	1,569	- 17
Hourly Total	1,963	1,938	1,823	1,821		
Black	166	169	174	199	202	- 3
Total Minority	204	204	202	243	250	- 7
Women	196	190	192	207	201	+ 6
All Employees Total	7,982	8,213	8,222	8,576		
Black	313	372	421	463	598	-135
Total Minority	610	650	759	862	873	- 11
Women	2,316	2,407	2,455	2,652	2,596	+ 56

* Category includes Research, Academic, Administrative Staff, and Lincoln Staff.

**Goals are aggregations of department goals set in May 1973; total minority goals not directly comparable because of changes in minority definition specified by government agency.

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Making the Transition to Coal
Dennis L. Meadows, Ph.D. '69, et al, Dartmouth College

If our dependence on oil for U.S. energy needs is to lessen, then our use of coal must grow. Here is an analysis of the complex issues in that transition: new mines, new technology, new transport, new synthetic fuels from coal, new pollution controls, and immense new capital investments. What will be the price of coal in 1990?

The Depletion of Stratospheric Ozone
Charles E. Kolb, Jr., '67, Aerodyne Research, Inc.

A layer of ozone shields the earth from harmful solar radiation. Do man-made chemicals and pollutants truly threaten that fragile screen? How shall we protect ourselves, and at what cost?

A Transmediterranean Aqueduct
Joseph G. Debanne, University of Ottawa

At least 40,000 cubic feet of fresh water flow into the Mediterranean each day through the Rhone River, while — less than 500 miles away — a fertile desert awaits only irrigation. Here are the engineering specifications for a giant aqueduct to bring a bonanza to the Sahara.

The Cryopreservation of Living Cells
Ernest G. Cravalho, Department of Mechanical Engineering, M.I.T.

Living tissue can be frozen, thawed, and used. But can man fulfill his vision of the preservation of life itself at extremely low temperatures?

Weather Modification as a Weapon
Gordon J. F. MacDonald, Dartmouth College

The vision of meteorologists who discovered that human interventions could indeed change local weather was agricultural, not military. Now it is clear that rainmaking is a primitive example of an activity with immense military implications.

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CLASSIFIED ADS

Ads are limited to one per person per issue and may not be repeated in successive issues. All ads must be accompanied by full name and Institute extension. Only Institute extensions may be listed. Members of the community who have no extensions may submit ads by coming in person to the Tech Talk office Room 5-111, and presenting Institute identification. Ads may be telephoned to Ext. 3-3270 or mailed to room 5-105. Please submit all ads before noon, Friday, September 26. They will be printed on a first come, first served basis as space permits.

For Sale, Etc.

Phillips 3 spd f bike, almost nw, \$55; bike rack, \$10; Wilson Patty Berg golf clubs, 3 wds, 5 irons, w/cart, \$45; Salzenger Sig tennis rckt, almost nw, \$15. x8-1566 Draper.

Leath briefcase, hrdly used, \$10. Joanne, x3-3134.

M 10 spd bike, 21" frame, Motobecane Nomade, yr old, exc cond, \$90. Bill, 527-0618, 7-9pm.

Bausch & Lomb/Ray-Ban sunglasses w/blk on gold wire frames, cost \$28, \$21. x5-8260 Dorm.

Tiger amps, 4, 90 W/ch, circuit brds assembled, all nw parts, power nvr applied, compl pwr supply capable driving all 4 chnls, nds chassis & intr-brd wiring, \$200. x5-9416 Dorm.

Spkrs, 2 lg Wharfedales, fr cond, \$75 nego. Janet, 354-2250, evgs.

Used elec test equip, RCA WO-88A 5" oscilloscope & RCA WV-98B VTVM, both \$100. JK, x8-3977 Draper.

Nw Schick Flex elec razor w/sideburn trimmer, \$32 nw, ask \$20. Call, 232-6361, aft 5pm.

Stereo cassette tape set, exc cond, \$70. x5-9222 Dorm, evgs.

Book for 8.02, Purcell, Elec & Magnetism, b nw, \$5. x5-9887 Dorm, evgs.

Precision 10 turn potentiometers, 30, most 30 K, 0.25% linear tol, also some 3 turn; best. Jerry, 536-1300.

Lg silkscreen, exc cond, nego. Debra, x3-3764.

Beanbag, 8', \$25; alto rcrdr, \$15; man typwrtr, \$25; VW stud snows, \$30; armchrs w/nw slipcvrs, \$50; mirrored dressing tbl, \$30; sea shells, \$20; GSR meter, \$14. x3-5427.

Mahog tbl w/2 lves & 5 chrs, \$60; fold down couch, \$25; mpl chest drwr, \$25; GE 11" b&w TV, \$45; snows, G70x14, \$30/pr. Call, 899-2095, evgs.

Wstghse HM1313B stereo hi fidelity sound sys, amfm, phono, mpl cab, electronics work but old, cab perf cond, \$100 or best. Fred Berger, x3-5364.

Dark org 9x12 rug, \$35. x3-1549.

Marantz 2270 rcvr, AR-XA trntbl w/Shure Type III crtrdrg, Lyre lift cueing, AR-5 spkrs, Koss Pro 4AA hdphones, looks, works well, \$650 or best. Call, 782-7689.

Lvg for Eur; qn sz matt; desk; 2 homemade couches; tbl; all \$140 or best. Call, 646-5144.

VW unstud snows, 2 used 1 seas, 5.60x15, \$25; Pat, x8-2376 Draper.

Dual 1009 trntbl, 6 yrs, gd cond, best. Phil, x3-7139.

Bike, 3 spd, exc cond, best; waterbed, elev frame, liner, htr, best. Michael, 731-5137.

Imperial Instamatic, used 3X, \$5; sev sum pant suits, sz 11-12, nrly nw, best. Call, 396-5311.

Nwly retreaded reg tire, G78x14, \$8. Barry, x7772 Linc.

F sgl spd bike w/24" whls, \$18; Messiah: vol I QM, pprbk, \$4.50. Norm, x3-7215.

Uniroyal Cat Paws, 4, F70x14, exc cond, \$75/set. Ray, x7573 Linc.

DR mpl tbl, 6'x3', 2 lves, \$85; 2 cptn chrs, \$10/ea; 4 plain chrs, \$8/ea; hutch cpbrd, \$20; fold-up sgl frame bed, \$20. Per, x3-3920.

Harmony folk guitar, gd cond, easy action, \$30. Ginger, x8-1274 Draper.

Primus DX bike pump for Schraeder valves. x3-7510.

Fisher 100 fm radio, wint case, push bttn tuning, Baxandall bass & treble cntrls, lk nw, retail \$100, \$70. x5-6181 Dorm.

Stamps, all dif, world-wide, Scott listed, mint & used sets & sgls, avail 20% off catalog, in \$2. \$5, \$10 lots. Don, x241 Linc.

Pr rayon t-less blk walls, 7.35x15, frs 6.50x15, exc cond, \$5. John Galis, x182-183-201 Bedford Fl Facil.

Whls, 2 snows & hubcaps, '70 BMW 2002, \$25/ea. Jack Frailey, x3-4974.

Clarinet; nw SML alto sax; nw Fender twin reverb; used baritone sax; best. Larry, x7500 Linc.

Konica 35 mm auto S-2 camera w/case, brkn, as-is, nds shutter, \$35. Dick, x3-6669.

CCM Super Tacks skates, used 1 yr, sz 3, \$45 nego. Gene, x7736 Linc.

Int latex paint, 4 gal red, 6 gal various lite grays, \$8/ea. x3-4680.

Refrig, dorm sz, 20" wide, 2' hi, exc cond, \$30. Claudia, x3-4381.

F 3 spd bike, gd cond, nw gears & hand brakes, baskets, chn, lock, \$40. Tobey, x3-5264.

Shag rug, about 9x12 or bit smaller, off wht, old \$15. x3-7787.

Pr Triumph TR-3 whls, \$8. Matti, x3-4153.

Raleigh Gran Prix 20 spd, yr, exc cond, Sun Tour derailleurs, Clincher tires, \$125 or best; pr Reiker ski boots, must be refoamed, \$25; pr home-bltd solid spkrs, \$25. Jim Corning, 536-2497, evgs.

Pr Gdyr 4 ply poly tires, 8 K, best. Call, 254-8141, aft 5pm.

HP 35 calculator, best. x3-7139.

Stud Dunlop snows, 2 E70x14, w/4 chrome plated whl trim rims, ask \$45. Call, 233-2233, aft 6pm.

Volvo mitten car cover, gold mink, fits P1800, exc cond, \$30; x3-6901.

Hardwick 36" gas stove, pot storage, gd cond, \$50; Whirlpool port dishwasher w/btchr blk top, washes fine, nds minor repair, \$25; 42" wht sink unit. Call, 965-6215.

Full sz matt, 81x104. Call, 494-8803, evgs.

M Gerry down parka, yr old, sz lg, brn, have lost weight, too big, nw \$110, ask \$65. Call, 475-8809, aft 6pm.

Sq grand piano, 107 yrs, beaut piece, nds work, \$70. Mike, 661-9743.

Quaker State deluxe oil, \$15/case, delivered. x3-7508.

Releigh 3 spd bikes, m, f, \$25/ea. Call, 547-7059.

Dining tbl, \$18, yel rug, \$15; red & blu ctrns, Call, 547-7515, aft 5pm.

Naval officer uniforms for NROTC to fit 6'1" 180 lb frame. Matt, 267-8460.

M Schwinn 3 spd bike, barely used, \$65; Victorian mahog wrdrobe, \$20; rollaway bed, \$20; thick blu 5'6"x12' carpet, \$15; K sz quilted bdsprd, \$10; asst unused gift items. Ken, x3-5735.

HP 45 calc, 2, 1 w/cradle, other w/xtra batt pack & applications book, \$125/ea. Adam, x5-8417 Dorm.

Cstm made drapes, 18"W, 90"L, brgndy antique satin, lk nw, used 1 yr, orig \$110, \$60; 4 pc alum food canister set, \$5. x8-2577 Draper.

Moving to tiny apt; couch, gd cond, \$15, U move. Call, 492-1276, aft 6.

Brother elec typwrtr, port, auto rtn, \$100. Barbara, x3-7878.

Wht Water kayak, virtually nw, best over \$200; turn xtra long matt, box spr, \$50. Ed, x8-4432 Draper.

Peugeot PX10 bike, campy front & rear derailleurs, citadel lock, car carrier, \$325; Wstghse chest freezer, 5.3 cu ft, wd grain top, \$110, Yamaha folk guitar, lk nw, \$90. x5-6512 Dorm, evgs.

Red 8x7 1/2' rug, lk nw, \$25; fl polisher/scrubber, \$5; child dbl easel, adj, \$5. Call, 861-8070.

Wool 12x12 carpet, Fr vanilla clr, felt pad, \$120 or best; power variable 15X, 30X, 45X, 60X, refractor telescope w/tripod, \$20; hall tbl, \$5; asst rcrds, books. Andrew 266-5742, aft 6pm.

Solid mahog DR tbl, 6 chrs, made by Payne 50 yrs ago, beaut cond, \$150. Call, 275-1335.

Twn sz box spr & matt, frame, gd cond, cheap. Call, 237-6545, aft 5pm.

DR tbl & 3 chrs, \$25; mtch buffet, \$10; misc furn. x3-7138.

Create-a-Curl Sears instant hairset, compl, \$8. Don, x7328 Linc.

Port dishwasher, \$50; bureau, \$35; swag lamp, \$15; guitar, \$25; tripod, \$25; cassette player/changer, \$75; nitestd, \$15; elec teapot, \$10; etc. Bruce, x3-2297.

HP 55 w/leath blt pouch, other access, \$300. Bill, x5-8464 Dorm.

BSR 4800 AX trntbl w/ceramic crtrdrg, diamond needle, dust cover, \$25 or best. x5-8337 Dorm, evgs.

Bearcat IV police scanner w/8 crystals, mobile attach, b nw w/3 yr wrnty, \$175 or best. Mike x8-2897 Draper.

G ice skates, sz 2, \$9; g tap dance shoes, sz 11 1/2, 12 1/2, 13, \$4/ea; Strollee baby carriage/stroller, \$45. x8-4095 Draper.

Lg dresser, wint, veneer, exc cond, \$65; oval solid wd & formica tbl, 60x30, 4 uphol swivel chrs, exc cond, \$95; 2 dbl pedestal desks, mpl 44x20, exc cond, oak 60x30, gd cond, \$50/ea. x3-2576.

Fbrglas Old Town kayak, Slalom mtl paddle, \$150 or best. Lew, x3-2226.

Brn 9x12 rug; carved mahog armchr; qual DR furn; tbl lamps, guitar; rcrd player; paintings; 35 mm camera; 60 mm telescope; dress form; etc. Call, 876-4328.

Boy hcky skates, exc cond, used 1 seas; Hyde Scholastic, sz 8, leath; Bauer Blk Panther, sz 4, leath; Bauer Blk Panther, sz 7, nylon, Susan, x3-7163.

Exh head, 30" W, 2 spd, wht w/ext vent & lite, nvr connected, nw \$35, \$25. Tony, x8-3051 Draper.

Huntington upright piano, beaut carved wd cab, recently tuned & reconditioned, nice tone, gd action. Jeanne, x3-2850.

Violin, 3/4 Grmn Hauser w/bow & case, bought nw, played 1 yr, exc care, \$125. R Chick, x7241 Linc.

Drapes: 8 panel 6x2', \$20; 7x10', \$15; 4x10', \$7; blu 7x10 rug, \$8; sm mirror, \$2; lg mirror, \$5; rear bike bsks, \$5; sm man typwrtr, \$10; 4 bench seats, blk leathette, \$2/ea. Call, 266-7797.

Wire whls, 5, 6.00x13, fit MG Midget, Sunbeam Alpine, etc, nd some work best. Steve, x8-3754 Draper.

Hand-made copper sculpture, whimsical 7 pc frog band, ea pce about 12" hi, orig \$400, best. Mary, x3-5646.

F sgl spd bike, gd cond, nw tires, bsks, \$30. Dan x3-2422.

Steam travel iron, \$5; port am radio, \$5; unused f swtrs/tops, med, were gifts, \$3-\$5; unused m nylon jacket, med, \$5. Mary Jane, x3-5735.

Pilot 254 stereo rcvr, 65 W/ch rms, yr old, \$325. Joe, x8-1226 Draper.

Fish Tank, 10 gal, \$10. Carol or Don, x3-4675.

M 26" 3 spd bike, exc cond, hrdly used, \$40 nego. Call, 275-9070.

Chrome K set, tbl w/leaf, 4 chrs, v durable, gd cond, \$25 firm. Bob Vronin, x8-4646 Draper.

Sears washer & dryer; fish tank; elec organ; 2 Sansui stereos. Chuck, x8-3360 Draper.

Vehicles

'62 Chevy Nova, exc cond, no trouble, 4 spare tires incl nw snow, \$300 or best; 1 nw lamp, worth \$41, \$25; refrig, \$25. Chintu, 547-1972, 6-8pm.

'62 Rambler Classic, 6, auto, p st, nw exh sys 7 batt, body ok, best. Call, 391-3587.

'64 VW, body gd shape, eng exc cond, nds starter, front end & trans exc cond, \$250 firm. Tom, x8-4137 Draper.

'65 Mustang, V8, 289, auto, eng recently ovhrld, 14-18 mpg, best over \$675. Call, 267-7397, evgs.

'66 Pont conv, eng & trans gd cond. Marvin, 247-9364.

'67 Sunbeam Alpine, 27 mpg, runs, nds work, \$175 or best. Ron, x8-4523 Draper.

'67 VW beetle, runs well, \$400. Phil, x8-4087 Draper.

'67 Ford wgn, sm 8, \$350. Call, 566-2015, evgs.

'68 Cadillac cpe de ville, gold w/blk vinyl roof, 101 K, body & eng gd, incl fair, amfm, p st, br & wndws, nw tires & 2 nw stud snows, \$800 as is. Bill P, x3-2811.

'69 Chevy 1/2 ton van, all wndws, runs gd, \$700. Ed, x3-5565.

'70 Olds Delta Cstm 88, 2 dr, blk vinyl top, 55K, nw tires, snows, tape deck, alarm sys, some dents, v gd run cond, \$1,095. Call, 266-7797.

'70 Triumph Spitfire, red, radials, 52 K, \$1,000 or best. Ken, x8-3309 Draper.

'70 Triumph GT6+ w/'73 eng, about 40 K, ask \$1,500. x3-4814.

'70 Buick Skylark, V8, blu, 4 dr sed, 34 K, p st, exc cond, 4 nw tires + mtd snows, \$1,188 or best. x3-1878.

'71 Saab 99E, 2 dr sed, grn, v gd cond, 25 mpg, Michelin ZX tires, free whling, amfm, \$1,950. Dave, x8-1194 Draper.

'71 Capri, 2,000 cc, v gd cond inside & out, nw paint, amfm, radials, \$1,800. C. O'Neal, x3-4301.

'72 Dodge Swinger, 2 dr, grn, std, 4 nw tires + snows, v gd cond, \$1,600. Dan, x3-4971.

'72 Ford Pinto, auto, \$1,250, Tom Parham, x5-7189 Dorm.

'72 Vega Htchbk, exc cond, nw eng, nw tires, \$1,300 or best. x3-4204.

'73 Pinto runabt, powder blu, exc cond, 29 mpg hiway, auto, radio, 4 xtra nw Uniroyal Tiger Paws, \$2,000. Call, 729-4652, aft 6.

'73 Opel Manta Ralley, 30 K, Michelin XAS radials, exc cond, 4 spd std, fog lites, tach, other gages, amfm, \$2,450. x3-5484.

'73 Chevelle Laguna, p st & br, vinyl roof, bckt seats, etc, perf cond in & out, \$2,500 or best. Call, 682-2739.

'73 Vega, 36K, auto, radio, best. Krishna, 491-4063, evgs.

'74 Grand Prix cpe, auto, 25 K, landau roof, \$3,495 w/snows. Derry, x3-2777.

'74 Pont Firebird, exc cond, 6 cyl, auto, Pioneer amfm 8 trk stereo in dash, Jensen spkrs, lo miles, 2 snows, \$3,300. Melinda, x8-3501 Draper.

'74 MGB, grn, 30 K, gd care, ask \$3,500. Call, 354-2853.

'71 Honda SL 175, 5.5K, exc cond, \$460. Kim Mosley, 247-3835.

'71 Yamaha 350, 7.1 K, well kept, 2 hlmts, \$500. Sue, x5-8231 Dorm.

'74 Yamaha TX500, exc cond, luggage rack, sissy bar, padlock & chn, shop manual, \$1,200 or best. Saturnino, x3-3880.

'74 Honda CL 360, luggage rack, exc cond, 5.7 K, \$900. Rod, x3-5318.

Housing

Back Bay, 2 BR apt avail now, safe, conv, gd nbrs, decent Indlrd, under \$200. Call, 266-4761, kp try.

S Blkne, Baker Sch, 4 BR, lg mod K, overlk woods, frpl, screen porch, safe nbrhd, low 40's. Call, 734-3491.

Camb, 3 BR apts for MIT cmnty only, w/in 5 blks MIT, also 1-3 BR apts. J.J. Vincent, Northgate Cmnty Corp, 876-9442.

Camb, fully furn studio on qt str off Mass Ave, avail 9/21 or 10/1, \$160 all incl. Sunil, 661-9296.

Jam Pl, 6 rms, mod K & B, x3-4965.

Linc, deck hse on 4 acres, 6 BR, 3B, total priv, 2 stall barn & paddock, \$136,000. Call, 259-9441.

Nwntville, 2 BR, DR, LR, sunrm, avail 11/1, \$300 + ht. Dick, x3-6891.

Newton Ctr, 4 BR hse, avail 12/14-2/1, full B 7 2 1/2 B, furn bsmnt, LR, DR, den, incl daily dusting by live-in help, fam only, \$500 + util. Robert, x3-6303.

Som, Union Sq, semi-furn spac 4 rm apt, study, gd cond, nr everything, ideal for grad cpl, lo rent. Dennis, x3-7143.

W Som, avail 11/1, 3 1/2 rms, exc cond, proch, refrig, \$180 incl util & ht. Call, 776-2739, aft 6pm.

Wrtwn Sq area, mod BR apt, nr express bus to Bos, \$240 hts. A. Elison, x7829 Linc.

Animals

Free mutant kittens, 6 toes/paw, 24 digits/kitten. Call 491-2877.

Free gerbils, hsebrkn & frndly. Keith, x3-3242.

Free kittens. x7618 Linc.

Free, 2 v affectionate 6 mos kittens, f, m, must give away, allergic Claire, x3-4771.

Cats, free to gd fam homes: Siamese blupt f, 2 yrs, unspayed; blk 9 mos f, spayed; b&w m, part angora, 2 yrs. Dena, 491-5144.

Lost and Found

Lost: brn coat Sat nite, 9/13, 20 Chimneys, reward. Harold, x5-9662 Dorm.

Lost: reward, \$5 for sm lt blu address book. Christopher Eliot, 266-8724.

Lost: all blk cat, E Campus. Call, 876-3580.

Wanted

Used 8' rack body for pick-up truck, Walter, x3-2458.

TV rabbit ears, Sue, x5-7152 Dorm.

M 3 spd bike; Electronic Principles by Gray & Searle; bridge tbl. L. Kernan, Nw Hse Rm 6-211, x3-6561, lve msg.

Gasoline chain saw, x477 Linc.

Exper fl stripper/sander, carpet layer. Kevin, x3-6580.

Books for 17.07; 14.53; Limits to Growth; The Rise of Meritocracy; KLH 40. x5-6549 Dorm.

Karate or Judo outfit; 1 copy ea of Prob, Randon Var & Sto Proc by Papoulis; Pattern Classification & Scene Anal by Dude & Hart. Alan, x3-4022.

Someone to repair b&w TV. Manu, x3-2929.

Visit prof seeks furn 3-5 BR hse, 1/1-6/31, conv commute distance MIT. R. Osborne, x3-2141.

Camera w/telephoto or zoom lens, pref lite & easy to use. Charlotte, x3-3529.

Place to store intermed sz car under roof, 10/1-7/1/76, w/ pay reas rent. x3-7785.

Ride for 2 sch chldrn, Buckingham Sch-Winchester, 4pm M-Th, 1:30pm Fri, \$10/wk. x3-6242.

Player Piano rolls. Joan, x7002 Linc.

'67 VW bus transaxle assembly. Doug, x3-5330, lve msg.

Set Teflon cookware, plastic plates & bowls, plastic tumblers, Ed, x5-9616 Dorm.

Ride, Plainfield NJ or NY area, any Fri aft 5, share exp. x3-6121.

Inexpensive, sm (min 15") b&w port TV. Sandy, x3-4943.

Intermed squash prtn

POSITIONS AVAILABLE

This list includes all non-academic jobs currently available on the MIT campus. Duplicate lists are posted on the women's kiosk in Building 7, outside the offices of the Special Assistants for Women and Work (10-215), and Minority Affairs (10-211), and in the Personnel Office (E19-239). Personnel interviewers will refer any qualified applicants on all biweekly jobs Grades II-IV as soon as possible after their receipt in Personnel. 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.

Dick Higham 3-4278
Pat Williams 3-1594
Carolyn Scheer 3-1595
(secretary - Dixie Chin)

Virginia Bishop 3-1591
Mike Parr 3-4266
Ken Hewitt 3-4267
(secretary - Joy Dukowitz)

Sally Hansen 3-4275
Jack Newcomb 3-4269
Evelyn Perez 3-2928
(secretary - Susan Bracht)

Spons. Res. Staff Programmer in Center for Space Research to assume major role in reduction and analysis of x-ray astronomy data, from HEAO-A satellite: read, decode, rewrite (in scientific data format) large volume of satellite data tapes. Write, debug, test and run programs on IBM 360. Physics, math or computer science degree, experience with scientific Fortran programming, in large-scale systems programming, especially IBM 360 machine language and in working with I/O systems and graphics required. Initiative, supervisory skill necessary. D75-178 (9/24).

Spons. Res. Staff, in Center for Cancer Research to do work in immunology and leukemogenesis; perform cytotoxicity assays; coordinate mouse breeding; inject and bleed experimental animal subjects; perform varied biochemical and tissue culture procedures. Bachelor's degree required. Two or more years post-graduate immunology or related research experience required. D75-181 (9/24).

Admin. Staff, Accounting Officer in Electrical Engineering and Computer Science to have overall responsibility for supervision and control of budgetary, payroll and accounting affairs of Department: verify and approve all payrolls; manage budgets; forecast expenditures; review cost aspects of grant and contract proposals and accounts; assist in budget preparation; perform other related duties as required. Accounting background and/or familiarity with Institute's payroll and accounting procedures, ability to handle detailed work requiring independent follow-up necessary. A75-52 (9/17).

Admin. Staff, Personnel Officer, Office of Personnel Services will have responsibility for policy interpretation, advice and assistance for all categories of non-academic employees in the School of Engineering. Will also assist with recruitment, interviewing, placement of applicants for all MIT positions. Bachelor's degree, or equivalent combination of education and experience, proven human relations skill, tact and ability to handle sensitive information required. Experience in personnel or counseling, particularly in the placement of scientific/technical personnel, as well as knowledge of union relations helpful. A75-53 (9/17).

Admin Staff, Secretary for Alumni Relations, in the Alumni Assn. Major responsibility involves interfacing with MIT departments, officers and staff of the Association; coordinate and support special off-campus events and major on-campus activities; act as staff coordinator with senior alumni and MIT faculty and administration in programs. MIT degree, and some relevant experience highly desirable. A75-54 (9/17).

Admin. Asst., Exempt, will assist Architecture Department Head in overall administration of Department: organize agenda and prepare materials for committee meetings; respond to

surveys; act as liaison with faculty, students; interact with committee chairpersons and Administrative Officer on varied matters. Administrative skills, familiarity with field of architecture, and extensive knowledge of MIT procedures required. Candidates must have excellent writing skills (Writing sample will be required.), and be able to type self-generated material. D75-37 (9/17).

Tech. Asst. IV-V in Research Lab of Electronics to prepare metaphase chromosomes from cultured human leukocytes which have incorporated 5-bromodeoxyuridine; develop a Giemsa staining technique to detect chromosome regions containing BrDU; maintain and harvest cultures; prepare slides for Computer analysis. Research lab experience in biochemistry, cytogenetics, tissue culture required. 40 hr/wk. B75-503 (9/24).

Tech. Asst. IV, temporary, in Research Laboratory of Electronics will work with principal investigator in experiments with infants, using polygraph, modular programmer, pressure transducer, tape recorder; will also schedule appointments with parents and assist in analysis of polygraph data. Some prior experience with above equipment required. Temp. to 12/31/75. B75-515 (9/24).

Secretary IV/Admin. Asst V to Special Assistant to the Provost to handle duties related to facilities use, interdisciplinary environmental education, urban education. Individual will perform general secretarial duties including wide interaction with MIT community members and others. Excellent typing and shorthand skill, ability to organize work and deal well with people required. Non-smoking office. B75-516 (9/24).

Secretary IV to two Material Science and Engineering faculty members: type correspondence, manuscripts, including technical material, from draft and machine dictation; answer routine inquiries independently; arrange appointments, travel; handle conference room scheduling; assist administrative assistant in report and proposal preparation. Technical typing skill preferred. B75-502 (9/24).

Secretary IV to Chairman and faculty of Anthropology and History section, Humanities Department: will handle general secretarial duties including manuscript typing; answer phones; maintain files. Excellent typing required. Shorthand skills, previous secretarial experience preferred. B75-507 (9/24).

Secretary IV, part-time, to Vice President, Administration and Personnel will perform general secretarial duties: type from machine dictation and handwritten draft; answer phones; provide information on a variety of subjects to callers and visitors; arrange meetings; file. Will work with administrative secretary and occasionally act as receptionist. Excellent typing, English grammar skills required. 20 hrs/wk. B75-512 (9/24).

Secretary IV in Humanities Literature Section will take and transcribe shorthand dictation; coordinate Section activities (such as catalogue copy preparation, teaching assignments); type manuscripts and other material for faculty members. Excellent secretarial skills, plus 2 years office experience required. B75-334.

Secretary IV to Center for International Studies faculty member involved in research on nuclear power and urban economics. Will schedule and plan meetings, seminars; type professional papers, correspondence. Excellent secretarial, organization skills required. Secretarial experience preferred. B75-500 (9/24).

Secretary IV in Electrical Engineering and Computer Science will work with two faculty members and graduate student staff. Will type technical and course material; do library research. Writing opportunities exist in this position. (One faculty member is involved in women-related issues and activities.) Position can be converted to part-time to accommodate candidate. B75-517 (9/24).

Secretary IV to two Civil Engineering faculty members: type correspondence, technical reports and theses; maintain files; arrange travel and appointments; handle accounts. Good typing, organization skills required. B75-520 (9/24).

Secretary IV to a District Officer for MIT capital campaign; assist in communications with district alumni volunteers. assemble information on potential donors; type and occasionally edit or compose correspondence and other material; maintain files; handle other duties related to office administration. Excellent typing, communications skills required. B75-513 (9/24).

Secretary IV to two Material Science and Engineering faculty members to type correspondence, papers, manuscripts from handwritten drafts and machine dictation; prepare course work; maintain files; assist administrative assistant in proposal and report preparation. Excellent typing, willingness to work as part of a group and, occasionally, under pressure required. B75-525 (9/24).

Secretary IV to Political Science faculty members to type correspondence, manuscripts from machine dictation and draft; arrange travel, meetings. Excellent typing skill, ability to work with minimal supervision, and at least 2 year's secretarial experience required. College training, shorthand skills helpful. B75-522 (9/24).

Secretary-Receptionist IV in Admissions Foreign Student Office will greet and assist visitors and students; type letters, forms; assist other secretary with special projects; answer phones. Will be trained to answer inquiries concerning immigration. Excellent typing skill, ability to compose correspondence and to operate dictation equipment required. B75-480 (9/17).

Secretary IV to two Civil Engineering faculty members will perform standard secretarial duties; type, answer phones; assist students and visitors; maintain budget accounts. Excellent typing skills, accounting ability required. B75-483 (9/17).

Secretary IV in Nutrition and Food Science will perform standard secretarial duties including technical typing; answer phones; arrange appointments. Good typing required. Secretarial school training or equivalent experience and familiarity with biological/chemical terminology helpful. B75-488 (9/17).

Secretary IV to Director of Alumni Records, Alumni Assn. to type varied material from draft and/or machine dictation; organize and maintain files; research and prepare committee materials; process data for computer file; answer phone inquiries. Ability to set priorities and work independently, secretarial experience and willingness to learn MTST required. B75-487 (9/17).

Secretary IV to Assistant Director, Laboratory of Architecture and Planning: will act as Lab receptionist; type varied material; maintain expense records, and library; manage equipment loan process. Will also do occasional typing for other Lab staff. B75-491 (9/17).

Secretary IV to faculty member and research staff in Research Laboratory of Electronics: type correspondence and technical manuscripts; arrange appointments; handle varied other secretary duties. Excellent typing skill, willingness to learn technical typing required. B75-492 (9/17).

Secretary III-IV to 5 faculty members in Nuclear Engineering will type articles, proposals, class material, correspondence from machine and/or shorthand dictation; arrange travel meetings; maintain files; answer phones. Candidate should be experienced in machine transcription and office procedures and able to organize and complete work with minimal supervision. Technical typing, shorthand skills desirable. B75-508 (9/24).

Secretary III-IV to Executive Officer, Chemistry Department to perform varied duties including some technical typing; assist with administrative procedures (distribution of keys, parking assignments; preparation of appointment forms). Position includes interaction with many Department faculty, staff, students. Selected candidate will occasionally fill in for other headquarters secretaries. Typing skill and good telephone manner required. B75-506 (9/24).

Secretary III-IV in Dean for Student Affairs Office will perform general secretarial duties including much interaction with students in areas of on-campus and fraternity housing. Ability to work in busy office and to deal with people with patience and sensitivity required. Typing skill also necessary. Knowledge of Institute procedures very helpful. B75-521 (9/24).

Secretary III, part-time, to assist secretary to Heat Transfer Group (including faculty and students) in Mechanical Engineering Department: type technical material; file; xerox; perform other office duties as required. Excellent typing skill, command of English language required. Technical typing skill helpful. 20 hrs/wk. B75-591 (9/24).

Secretary III in Materials Science and Engineering will act as headquarters receptionist; perform varied secretarial duties for Department Head and other staff; type forms, memos, correspondence; maintain files, supplies, petty cash fund; process student appointments; assist senior secretary with overflow typing. Candidates must be willing to assist with variety of duties and to work under pressure. Typing skill required. Previous office experience desirable. B75-482 (9/17).

Secretary III to Head of Catalogue Dept. Libraries, will perform general secretarial duties; order and arrange maintenance of equipment; handle administrative matters including student payroll, work schedules, etc. Other clerical duties related to library procedures include filing, card and label typing. Excellent typing skill, ability to handle detailed work accurately and to organize work required. Candidates should be high school graduate or equivalent. B75-485 (9/17).

Lib. Gen. Asst. II-IV in Dewey Library, Industrial Relations section: prepare new material orders; check in and process material; prepare bi-monthly Industrial Relations Accessions Bulletin; type and file catalogue cards. Perform other related clerical duties. May index and abstract journal articles; provide reference assistance to students and others. Ability to become familiar with collection quickly, to handle detailed work, excellent typing skill required. College training in social science desirable. Position includes some prescheduled evening and weekend work. B75-495 (9/24).

Sr. Lib. Asst. IV in Aeronautics and Astronautics Library will handle circulation duties (charge, renew books, reserve material; supervise stacking by student assistants). Arrange student schedules. Process new material including technical reports and microfiche; prepare bindery material. Candidates must be able to handle detailed work, have some knowledge of cataloguing procedures and typing skill. Some experience in circulation procedures desirable. B75-496 (9/24).

Sr. Lib. Asst. IV in the Libraries Acquisitions and Collections section; will have responsibility for acquisition of current serials; record and process serials on visible files; check invoices; circulate sample issues to Division Libraries; prepare forms for monographic series; assist in claims investigations; communicate with vendors. College degree, library experience, communication skill required. Business office experience, knowledge of foreign languages helpful. B75-523 (9/24).

Sr. Library Asst. IV part time in Rotch Library will maintain serials and journals; investigate and process title changes, new titles, etc; prepare serials and journals for binding; maintain display area; provide information to users; supervise student assistants; may be responsible for circulation/reserve desk coverage during acad. year. Typing and organization skill and ability to handle diverse responsibilities required. College training and previous experience in a processing/serials department preferred. 25 hr/wk. B75-479 (9/17).

Sr. Clerk IV, Order Processing at MIT Press, will handle all phases of order process through use of Flexwriter (for computer input), including cash receipts, information updates, mailing list changes, deletions, cancellations, price quotation; assist customers with telephone inquiries and orders; make arrangements for special orders. Good typing skill required. B75-318.

Technical Typist IV in Energy Lab will type complicated mathematical/technical material for reports and proposals; edit, proofread and xerox. Excellent technical typing skill required. B75-499 (9/24).

Sr. Clerk IV in National Magnet Lab to handle varied duties: prepare and approve invoices; reconcile summary sheets; prepare budget reports; prepare payrolls; type correspondence. High school graduate, or equivalent, previous office experience, ability to operate adding machine, typing skill required. B75-518 (9/24).

Sr. Clerk III in Comptroller's Payroll Office to process biweekly payroll; log charges; investigate and clear suspense account entries. Maintain computerized master file. Educational background in bookkeeping or previous bookkeeping working experience, light typing skill, good attendance and communications skill required. B75-489 (9/17).

Sr. Clerk III in Registrar's Office will perform varied duties relating to undergraduate records: transcribe grades; check computer input/output; enter grades, registration data using CRT visual input machine; answer telephone inquiries; interact with academic departments. May assist with other Office duties. Excellent typing, particularly in terms of accuracy, ability to handle detailed work required. Some college training, office experience desirable. B75-510. B75-511 (9/24).

Clerk III in the Information Processing Center will work under direction of senior clerk: handle distribution of publications; maintain and update reference manuals; fill telephone and over-the-counter manual requests; maintain mailing list, using computer for label preparation; prepare new-user packets and supplements; other duties as required. Ability to work well with the public and Center Staff, organization and typing skills required. B75-509 (9/24).

Clerk Typist II, temporary, in Admissions Office to handle varied duties related to admissions process: file and sort applications; type correspondence; handle special statistical projects. Typing skill, accuracy with detail, ability to work under occasional pressure required. Temporary to April, 1976. B75-501 (9/24).

Clerk II, part-time, in Undergraduate Mathematics Office will handle general clerical duties to include answering phones, mailing preparation; maintaining bulletin boards; type; distribute materials throughout department; cover

receptionist desk, as necessary. Typing, organization skill, willingness to work under pressure of peak periods required. 20 hrs/wk, afternoons. Non-smoking office. B75-505 (9/24).

Accounting Clerk III in Alumni Assn. will process and record contributions; verify information; type forms; reconcile receipts; open and sort mail. Typing skill, accuracy with figure required. Ability to use adding machine helpful. Position may require occasional overtime. B75-486 (9/17).

Waitress/Waiter, Set tables, take orders, serve food and beverages on banquet trays. Clear and reset tables. Dust chairs, wipe table clean. Experience is helpful but not necessary. 5pm-9pm, Mon.-Fri. May include some weekend work. H75-122 (9/24).

Campus Patrolman/Patrolwoman, hourly, requires 3-5 years experience in all phases of law enforcement (criminal law, court procedures, criminal investigation, case preparation, complaint investigation; report writing). Will be required to obtain Emergency Medical Technician certification; may be required to complete additional police academy training. Must qualify in use of firearms, have a valid driver's license and an honorable discharge from any earlier police service. Candidates must pass Institute physical exam. 40 hrs/wk., rotating shift. Position includes long hours occasionally. H75-119, H75-120 (9/24).

Sr. Technician (Elec.), hourly, in Laboratory for Nuclear Science will assist in laboratory research/analytical work: will have responsibility for maintenance systems for water temperature, personnel protection, communications systems, heavy electrical switch gear, large motor-generator sets, high-power rectifiers and other related equipment including relay control systems. Two year technical day school graduate, or equivalent, plus a minimum 5 year applicable experience, Journeyman electrician's license plus several years experienced with above equipment. Thorough technical understanding of sophisticated electronic control systems and equipment operation also necessary. 40 hr/wk. Position is at Bates Linear Accelerator, Middleton, Ma. H75-91 ((9/24).

The following positions were still available at *Tech Talk* deadline. The date following each position is the date of the most recent *Tech Talk* issue in which the position was described.

- ADMINISTRATIVE STAFF:**
A75-26, Dist. Officer, Resource Develop. (7/9)
A75-27, Director, Development Off. (6/25)
A76-35, Regional Rep., Alum. Assn. (6/25)
A75-38, Operations Mngr., Medical (7/9)
A75-41, Proj. Mngr., Off. of Adm. Inf. Syst. (8/6)
A75-44, Proj. Planner, Planning Office. (8/20)
A75-48, Director, Tech. Ed. Proj., Off. of Pres. & Chnc. (9/3)
A75-49, Asst. Director, Admissions (9/10)
A75-51, Sr. Staff Acct, Energy Lab (9/10)
BIWEEKLY:
B75-190, Tech. Asst. IV, Arch. (6/25)
B75-195, Comp. Op. IV, Off. of Adm. Inf. Syst. (9/10)
B75-267, Sec. IV, Res. Lab. of Elec. (6/25)
B75-273, Sec. IV, Mt. Sc. & Eng. (7/9)
B75-290, Sec. III-IV, Energy Lab. (7/23)
B75-296, Sec. IV, Civil Eng. (9/10)
B75-306, Sec. IV-V, Physics (7/23)
B75-308, Sec. IV, Tech. & Culture Seminar (8/6)
B75-320, Sec. III-IV, Chem. Eng. (8/6)
B75-339, Sec. IV, Mech. Eng. (8/6)
B75-342, Sec. IV, Jnt. Cntr. Urb. St. (8/20)
B75-358, Sec. V, Resource Dev. (8/20)
B75-366, Sec. IV, Chemistry (8/20)
B75-367, Sec. III, Sloan School (9/10)
B75-380, Sec. IV, Alum. Fund (9/3)
B75-388, Sec. IV, Cntr. for Pol. Alt. (9/3)
B75-409, Sr. Lib. Asst. IV, Energy Lab. (9/10)
B75-420, Sec. IV, Ind. Liaison Off. (9/10)
B75-422, Acctg. Clerk IV, Graphic Arts. (9/10)
B75-427, Comp. Op. IV., Off. of Adm. Inf. Syst. (9/10)
B75-438, Sec. III-IV, Sec. III-IV, Ocean. Eng. (9/10)
B75-447, Sec. IV, Medical (9/10)
B75-451, Sec. IV, Resource Develo. (9/10)
B75-455, Sec. IV, Inst. Sec. for Found. (9/10)
B75-458, Sec./Recept. III, Off. of Pres. & Chnc. (9/10)
B75-465, Sec. IV, Pol. Sc. (9/17)
B75-466, Sec. III, Sloan (9/17)
B75-468, Sec./Sr. Clerk III, Career Pl. & Place. (9/17)
B75-469, SEc. IV-V, Psychology (9/17)
B75-469, Sec. IV-V, Psychology (9/17)
B75-475, Sec. V, Chemistry (9/17)

Chemical Engineering to Try 'Peak Shaving' Subject

Peaks, when you're a graduate student, aren't just for scaling. Sometimes you have to shave a couple.

That bit of educational savvy is the reason why the MIT Department of Chemical Engineering has launched an experiment for learning at the graduate level.

Assistant Professor Richard G. Donnelly has designed a new offering, Subject 10.611 Physics and Chemistry of Surfaces, as a self-paced study course, utilizing, in part, video tapes of lectures and demonstrations produced by the MIT Center for Advanced Engineering Study and the Department of Chemical Engineering.

"What we hope to do is give the students a chance to peak shave," Professor Donnelly said. "All subjects seem to peak about the same time—exams, quizzes, papers all coming up pretty much at once. Often this means students forego taking a subject they really would like to take, just to get some breathing room."

The self-paced aspect of the new subject, it is hoped, will give students a way to get the needed breathing room by allowing them a flexible tape-viewing schedule.

The video tapes, featuring lectures by one of the world's leading authorities on the subject of the physics and chemistry of surfaces, J.Th.G. Overbeek, comprise a portion of one of the 24 subjects offered in the CAES program of continuing education for practicing engineers, according to John T. Fitch, manager of self-study subject development for CAES.

"The tapes were prepared a few years ago when Professor Overbeek, of the University of Utrecht in The Netherlands, was visiting at MIT," Mr. Fitch said. (Professor Overbeek

will be at MIT as visiting professor of chemical engineering for six weeks this term, beginning Sept. 29.)

"The Department of Chemical Engineering helped underwrite the cost of the subject," Mr. Fitch said.

When it is used for continuing education the CAES subject consists of 55 video-taped lectures, each 40 to 50 minutes long, and a set of four study guides—"a step-by-step path through the subject," Mr. Fitch called them—which include a discussion of the lectures with illustrations of blackboard notes, pictures of demonstrations, reading assignments from the text, homework problems and elaborate problem solutions.

The new chemical engineering subject makes use of several of the CAES video tapes and the associated study guides as well as regularly scheduled lectures by Professor Donnelly and additional text material prepared especially for 10.611.

The students—there are 17 registered for the subject—will first review the study guides and other texts, then view the appropriate tapes. The tapes will be shown at scheduled times, but a student looking for "breathing room" can "shave a peak" by skipping the scheduled showing and arranging for a special look at the tapes at a time that is personally less demanding. Students must complete the entire course to obtain credit.

Three or four video-taped lectures and demonstrations by Professor Overbeek make up one unit. The subject is divided into seven units. Professor Donnelly lectures every 10 days.

At the end of each unit students will do a set of problems. The results, to be graded by a teaching assistant who will play an important role

throughout the entire subject, will determine which students are allowed to take a quiz on the unit. Students who pass the quiz go on to the next unit.

Professor Donnelly, whose interest in colloid and surface chemistry stems from his days as a graduate student at MIT, is the co-author of the four study guides used in the CAES video-taped course.

He has taught the physics and chemistry of surfaces for three years in what he calls the "traditional way," using, from time to time, certain of the CAES video tapes in the subject.

The new subject's design combines the accepted principles of self-paced study while maintaining the high level required of a graduate course for credit, Professor Donnelly said.

The preparation for the new subject offering was completed during the 1974-75 academic year as part of Professor Donnelly's activities as one of MIT's first Lilly Post Doctoral Teaching Fellows in a program funded by the Eli Lilly Endowment.



NEW SUBJECT UNDERWAY—10.611, Physics and Chemistry of Surfaces, a self-paced graduate subject in the Department of Chemical Engineering, is making broad use of videotaped lectures and demonstrations produced by the Center for Advanced Engineering Study and the Department of Chemical Engineering. The subject, designed and taught by Assistant Professor Richard G. Donnelly, left, allows students to "peak shave" by taking advantage of a flexible schedule for showing the tapes. Seated are David E. Kleinschmidt of Wausau, Wis., the teaching assistant for the subject, left, and Stephen L. Michaels of Atherton, Calif., a graduate student.

Kaufman Foundation Funds Scholarship

A memorial scholarship fund has been established by the Mitchell B. Kaufman Charitable Foundation at MIT with a contribution of \$100,000.

It will be called the Mitchell B. Kaufman Memorial Scholarship Fund and is in honor of Mr. Kaufman, who was a member of the MIT Class of 1915, and who at the time of his death in 1930 was a well known industrialist and president of the Converse Rubber Co. of Malden, Mass.

This gift was announced by Azel

W. Mack representing the Class of 1915 on the occasion of its 60th reunion. In acknowledgment, President Jerome B. Wiesner said:

"I take deep pleasure from this for two reasons: First, it establishes a fitting permanent memorial here at the Institute for Mr. Kaufman; and secondly, the Kaufman Fund helps to meet one of our most pressing needs, that of scholarship assistance for deserving students."

The first recipient of the scholarship is Sandra G. LeFlore, a member of the 1975-76 Sloan Fellows Program at the Sloan School of Management. She is director of resources and development for the Mayor's Office of Cultural Affairs in Boston.

The terms of the gift, as outlined by Herbert Bremner and Alford P. Rudnick, trustees of the Mitchell B. Kaufman Charitable Foundation, permit the annual award of one or more scholarships, aggregating not more than the cost of tuition, board and room, to students found qualified to pursue undergraduate or graduate study at MIT and who are in need of financial aid. A recipient may receive up to three renewals of the scholarship, either in full or in part, in successive years.

In selecting recipients, preference shall be given to members of minority groups who are disadvantaged in furthering their education by reason

of race, color, creed, sex, foreign nationality, or other social condition. Where the considerations are substantially equal, priority shall be given first to American Indians, and then to Mexican Americans.

Shister Receives Adams Scholarship

Jayne E. Shister, a second year student in MIT's Master of City Planning program in the Department of Urban Studies and Planning, has been awarded this year's Charles Abrams Scholarship.

Ms. Shister's concentration and study is in housing and social policy. She has worked with the citizens group, Massachusetts Tomorrow, and as a research assistant for the Rhode Island development strategy study. She was a teaching assistant for an undergraduate course last year. She was graduated cum laude from the University of Michigan three years ago.

The scholarship is a memorial to the late Charles Abrams established by a group of professional planners who were his former students. The winner is selected from one of the five schools at which Abrams taught—MIT, Harvard, Columbia, New School of Social Research and the University of Pennsylvania.

Marvin Brown Works In Hayden Corridor

An exhibition of recent works on paper by artist Marvin Brown will be on view in Hayden Corridor Gallery Sept. 26-Oct. 29. The exhibition, sponsored by the Committee on the Visual Arts, will run concurrently with the Clarence Schmidt exhibition in Hayden Gallery.

Marvin Brown is among the younger generation of artists who have been working in minimalist directions for a number of years.

His works of the late 1960s included paintings of carefully modulated colors on metal. More recently, he has made constructions of metal,

wood, and vinyls that combine aspects of painting with sculpture. The constructions emphasize the elemental qualities of shape and surface.

In recent works on paper, Brown has experimented with three-dimensional shapes and with cut-outs on graph paper that can be re-assembled to create several different images. In the large works on paper that will be on view, Brown has mixed pigment with beeswax. According to the notes for the exhibition, "subtle nuances of surface are contained by primal, geometric

shapes. The artist's desire to minimize the visual complexity of surface brings to the spectator an intensified awareness of its minute variations. By keeping the shapes basic, Brown forces a confrontation with the potential of surface."

Currently on the faculty of Brown University, Marvin Brown has taught also at the University of Rhode Island, the Philadelphia College of Art, Hunter College, and California State University at Hayward. Grants and fellowships he has received include the Yale-Norfolk, Max Backman, Edward MacDowell and Guggenheim fellowships.

Brown's work was shown in the 31st Annual Mid-Year Show at the Butler Institute of American Art in 1966 and the Whitney Museum of American Art Annuals for 1969, 1970 and 1972. His work was also included in group exhibitions at the Museum of Modern Art, the Newark (N.J.) Museum, the Museum of Fine Arts, Boston, the Finch College Museum of Art, the Katonah and Bykert galleries, New York City, and in other private and university galleries. In the fall of 1974 his paintings and constructions were shown in an exhibition of work by faculty members at Brown University.

A one-man exhibition of Brown's constructions and three-dimensional drawings is currently on view through Sept. 30 at the Tyler School of Art, at Temple University, Philadelphia.

Positions Available

B75-477, Sec. IV, Physics (9/17)
ACADEMIC STAFF:
C75-25, Tech. Asst. Biology (9/17)
SPONS. RES. STAFF:
D75-8, Biophysicist, Nat. Magnet Lab. (6/25)
D75-48, Economist, Energy Lab. (6/25)
D75-70, Electrical Engineer, Lab for Nuc. Sc. (6/25)
D75-106, postdoc res., Lab for Nuc. Sc. (6/25)
D75-107, postdoc. res., Lab for Nuc. Sc. (6/25)
D75-109, Medical Technologist/Technician, Clin. Res. Centr. (9/17)
D75-111, Programmer, Artificial Intelligence Lab (6/25)
D75-112, Engineer, Energy Lab (6/25)
D75-114, Asst. Director, Cntr. for Inf. Systems Res. (7/9)
D75-120, Systems Programmer, Lab for Nuc. Sc. (7/23)
D75-124, Energy conversion, Energy Lab (8/6)
D75-125, energy modeling, Energy Lab (8/6)
D75-126, postdoc. res. Energy Lab (8/6)
D75-127, postdoc res., Energy Lab. (8/6)
D75-129, Proj. Mng., Cntr. for Trans. St. (8/20)
D75-131, independent research, Cntr. for Cancer Res. (8/20)
D75-134, nuclear medicine, Nuc. Eng. (8/20)
D75-138, programmer, Proj. MAC (9/3)
D75-142, Financial asst., Proj. MAC (9/3)
D75-143, plasma physicist, Cent for Space. Res. (9/3)
D75-147, Proj. Engineer, Hlth. Sc. & Tech. (9/3)
D75-148, Proj. Engineer, Hlth. Sc. & Tech. (9/3)
D75-149, Systems Programmer, Hlth Sc. & Tech (9/3)
D75-150, Systems Programmer, Hlth Sc. & Tech. (9/3)
D75-153, Applications Programmer, Lab for Nuc. Sc. (9/10)

D75-161, Economist/Policy Analyst, Energy Lab (9/10)
D75-162, Physicist, Res. Lab of Elec. (9/17)
D75-164, computer graphics, Architecture (9/17)
D75-165, computer graphics, Architecture (9/17)
D75-166, Operations. Branch Mng., Energy Lab (9/17)
D75-167, end-use technology, Energy Lab (9/17)
D75-168, surface physicist, Nat. Magnet Lab (9/17)
HOURLY: H75-55, Tech. B., Lab for Nuc. Sc. (6/25)
H75-65, Tech. A., Lab for Nuc. Sc. (6/25)
H75-112, 113, 114, 115, Waiter/Waitress, Fac. Club (9/10)

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

C75-17	Acad. Staff
B750494	Secretary III
B75-426	Secretary IV
B75-393	Sr. Clerk III
B75-443	Sr. Clerk IV
B75-444	Secretary III-IV
H75-77	Cook's Helper
D75-93	Spons. Res. Staff
B75-439	Secretary III-IV
B75-431	Sr. Clerk IV
B75-476	Sr. Clerk III-IV
D75-133	Spons. Res. Staff (cancel'd.)
B75-404	Acctg. Asst. V
B75-386	Secretary III
B75-385	Secretary III-IV
B75-387	Secretary IV
B75-310	Adm. Asst. V
B75-323	Sec./Lib. Asst. IV
B75-429	Secretary IV
B75-441	Secretary III-IV
B75-407	Sr. Clerk III
B75-460	Secretary IV
H75-35	Exempt
B75-432	Tech. Asst. IV
H75-100,111	Waiter/Waitress
B75-395	Clerk II
B75-384	Secretary IV

The following positions are on HOLD pending final decision:
D75-139 Spons. Res. Staff
B75-450 Secretary III

Modular Education Program Funded

(Continued from page 1) individual engineer becomes obsolete very quickly. Rapidly changing social priorities—for example, the shift from exploring space to developing new sources of energy—require a different mix of professional training by scientists and engineers."

The objective of the program is to develop a set of modules suitable for self-instruction and to organize them so that a practicing engineer can use them to achieve personal goals.

A module is a self-contained package of material on a given skill or concept that includes written notes, videotaped demonstrations, audiotaped presentations or movies, Professors Tribus and Evans said. The module would contain case-study problems, questions and experi-

ments so that the student can verify whether the material has been learned.

"If information can be organized this way," Professor Tribus said, "and students taught to use a knowledge base thus organized in a self-directed way, it will have enormous implications for learning on the job."

"Engineers in industry cannot afford to take time out from the job for two reasons: They're afraid to be away from the competitive environment lest the organization discover that it can indeed get along without them, and they cannot afford to spend a full semester learning material, only a fraction of which is relevant to their work."

The project will develop an "engineering yellow pages" of knowledge and skills. An engineer facing a new

said she hoped the agency might be included again when its reorganization is completed. She also acknowledged the support provided by the United Way to agencies serving the black community. United Way tells us that MIT people who want to support those agencies may so indicate on their pledge cards.

Overall goal of the United Way campaign, which runs through Nov. 20, is \$17 million. As usual, no MIT goal has been set, but Dr. Sizer and Ms. Garrison said they hoped MIT would top last year's total of \$100,716.

'Sow a Little Confusion' MIT Professor Suggests

"For two years, M.A. Adelman, the oil economist, has been urging the government to try to sow a little confusion, perhaps ultimate havoc, in the ranks of the 13-nation oil cartel, the Organization of Petroleum Exporting Countries."

So begins an article on the front page of the Sept. 15 New York Times financial section about the MIT economics professor's belief that Washington can tempt the oil exporters to cheat on their high fixed prices by making cheating easier.

"The way to do it, he argues," says

Colley Named Designer

David Colley, a graphic designer who has received numerous commissions from arts and educational institutions, industry and government, has joined the staff of MIT's Design Services.

The appointment was announced by Jacqueline S. Casey, director of

Design Services. In his new position, Mr. Colley will be responsible for the design of all publications of the MIT Alumni Association, including Technology Review, James A.



Champy, the new executive vice president of the Alumni Association said that Mr. Colley's appointment is part of a reorganization of the Association staff. Mr. Colley will work on the creation of more efficient and effective communications programs for alumni.

Mr. Colley comes to MIT from the University of Illinois at Urbana-Champaign, where he has been associate professor of graphic design in the department of art and design since 1969. A graduate of Murray State University, Kentucky, in 1962, he received a master of arts degree in history of art from Columbia University in 1964, and a master of fine arts degree from Illinois in 1969.

In addition, he studied with photographer Ansel Adams in 1967 and with composer John Cage from 1968-70.

the article, written by Edward Cowan, "is to set up a system of secret, competitive bidding for licenses to import oil into the United States."

The news article says Professor Adelman has circulated privately in recent weeks a paper giving a "full and imaginative outline" of how he believes secret bidding might work.

The Times article also reports that Professor Adelman is critical of US policy, arguing that selling arms to Saudi Arabia and Iran and encouraging the Saudis to expand oil production work against, not for, lower oil prices.

The article reports that Professor Adelman is confident that under a cloak of secrecy bidding would lead to first one member of the cartel, and then another, effectively cutting prices, trying to get a larger share of the US market.

"Sealed bid quotas have been proved to be an effective way to suck in monopoly revenue," the article quotes Professor Adelman, who cites as an example the hundreds of millions of dollars that have been paid for offshore oil leases. Professor Adelman also is quoted as urging the authorization of a volume of oil imports about equal to what the economy would bring in without the bidding procedure, so that no shortage would occur and prices would not be driven up.

What if, in retaliation, the cartel establishes a single agency?

"The sooner they do this, the worse for them and the better for us," Professor Adelman is quoted. "The company buffer would be gone and the governments would have the constant divisive job of haggling over market shares."

Film Premiere

"Women's Work: Engineering," a film produced by the Center for Advanced Engineering Study, will have its premiere public showing at the Women's Forum Monday, Oct. 6, at 12:10pm in the Little Theatre. All members of the community are invited to attend.



HONORED—Dr. Albert G. Hill, former MIT vice president for research, was the guest of honor at a recent reception given by the MIT Black Students Union in appreciation for a prize Dr. Hill has established for the black student who shows the most progress in the sophomore year. James E. Clark, left, and John W. Arnett III, BSU co-chairmen, are shown with Dr. Hill, who recently retired, looking at a plaque he was given by the BSU. Clark and Arnett were mas-

ters of ceremonies at the reception. The speaker was Mary O. Hope, assistant dean for student affairs. Dr. Hill, Chancellor Paul E. Gray, Frank S. Jones, Ford Professor of Urban Affairs and director of the Community Fellows Program, John A. Mims, formerly of the Admissions Office, and Dean Hope each received the BSU appreciation plaques for their support and counsel. The plaques were presented earlier in the year.

—Photo by Calvin Campbell

Instrument Displays Stars

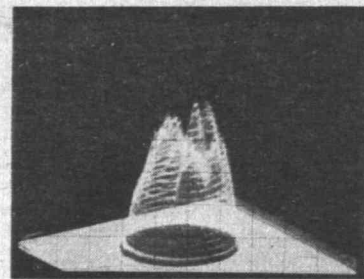
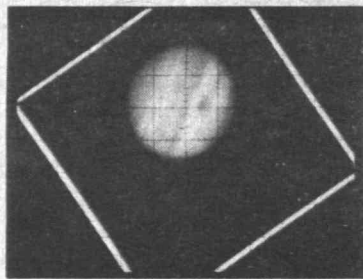
A researcher in the MIT Department of Earth and Planetary Sciences has made an instrument that will display photographs of planets or stars in different forms, to more clearly show variations in brightness.

By turning a knob on the machine, astronomers can instantly convert a photograph of a planet into a semi-transparent relief map with mountains of light and valleys of dark, a contour map, or a graph indicating the intensity of light along a straight line drawn across the planet.

Previously, such displays could be obtained only by programming information into a computer.

The instrument, called a digital solid-state scan-converter, was designed and built by Michael Brookes, a staff researcher in the Earth and Planetary Science center for remote sensing, with funds from the National Science Foundation. He reported the work in a recent issue of Applied Optics.

The scan-converter has been used at several observatories, including the MIT George R. Wallace, Jr., Astrophysical Observatory in Westford, Mass., and the Mt. Wilson Observatory in California. It is also being copied, Brookes said, for use in the NSF Observatory in Chili, the Cerro Tololo Interamerican Observatory.



Photograph of Jupiter (left) is converted into a relief map showing variation in light intensity, by scan-converter designed and built by Michael Brookes.

Personnel Lists 125 Open Jobs

The Personnel Office announced this week that 125 non-academic jobs are available at MIT, as of Friday, Sept. 19.

According to James J. Culliton, director of personnel services, nearly all the jobs represent replacements for persons who have recently left the Institute.

Employment Coordinator Peggy O'Brien of the Office of Personnel Services reported 44 secretarial openings, 34 sponsored research staff positions, and 11 jobs for administrative staff.

The remainder of the list, she said, is composed of 9 part-time temporary, 4 bi-weekly technical, 8 clerical, 5 library, and 9 hourly positions, in addition to one exempt and one academic staff opening.

All positions are now published in Tech Talk for two weeks only under a new space-saving policy. Complete lists, however, are continuously available from the Personnel Office (E19-239), and the offices of the Special Assistants for Women and Work (10-219) and Minority Affairs (10-211). Lists are also posted on the women's kiosk in Building 7.

Superconductors May Change Ship Appearance

Ships of the future may look different on the outside because of what's inside.

That's true, at least, with respect to a ship's propulsion system, and engineers at MIT are at work on new electric drive systems that would allow greater flexibility in the design of a ship's hull.

In particular, the MIT group is concentrating on the application of superconducting electric motors and generators to ship drive systems—with the added potential of reducing both the size and weight of the system.

"The (U.S.) Navy has many new ship concepts, most with a submerged hull and an above-surface platform," according to Philip Thullen, associate professor of mechanical engineering.

But conventional mechanical power systems, such as diesel engine-plus-drive shaft, to a certain extent fix the design of a ship and are not adaptable to the new concepts. The MIT work sponsored by the Office of Naval Research, represents a part of the renewed interest in electric ship drives, which have not been used in surface vessels since World War II, when some were installed in Liberty ships as a war-time expedient.

With an electric drive, the generator and its prime mover can be remote from the motor and the connecting wires in effect replace the drive shaft. Speed-controlled electric drives afford greater flexibility and eliminate the gear reduction that is necessary, for example,

with gas turbines, which have a high rpm with respect to the slow speed of a ship's propeller.

The economies of size made possible by the use of superconducting materials were outlined by Professor Thullen in a paper in the March, 1975, issue of the IEEE (Institute of Electrical and Electronics Engineers) Transactions on Magnetics. In the article, he scaled to size a multipole superconducting synchronous electric motor of 40,000 horsepower turning at 120 revolutions per minute. He then compared it to a conventional electric motor, of equal power and speed, that had been designed for a tanker by a major U.S. builder of marine propulsion units. Whereas the conventional motor had a diameter of 26 feet, the superconducting machine, which was of equal length, was only 15 feet in diameter.

"The advantages of applying superconductivity to electric machinery stem from the ability to create a large magnetic field in a useful volume at reasonable power cost without the use of an iron magnetic circuit," Professor Thullen wrote.

Superconducting machinery produces a high magnetic field because it embodies electromagnets wound from an alloy that offers no resistance to an electric current when the alloy is chilled to about 450 degrees below zero Fahrenheit. Such alloys are "superconductors" of electricity.

In the laboratory, Professor Thullen and his associates have built two unique model machines in the pursuit of their objective

of developing an alternating-current ship drive system. (The Navy also has a program aimed chiefly at developing direct-current homopolar machines, which have excellent speed control and starting torque but which need a rectifier in the standard a.c. power supply. The MIT program seeks to take advantage of the preponderance of a.c. systems and of superconducting materials.)

These model machines contain no superconducting materials and were built to illustrate the viability of two unique alternating current electric machines. Actual machines will use superconductors in the direct current, or field, windings and room temperature copper in the alternating current, or armature, windings.

The first model machine may be considered as an electronically commutated variation of a standard d.c. motor which is capable of operating from an a.c. power supply. The frequency and phase of the armature currents are controlled by thyristors (silicon-controlled rectifiers) to maintain the magnetic field at the maximum torque condition independent of rotor speed or supply frequency.

Thus the motor may be used to drive a propeller over a wide range of speeds while supplied with power by a fixed-frequency generator.

The machine uses two concentric, but mechanically independent rotors, one with a d.c. field winding and one with an armature (a.c.) winding, as well as a stationary armature.

The field winding rotor is free-running

at synchronous speed. Its magnetic field induces current in the rotating armature winding. This winding is coupled to the propeller and produces torque in the same fashion as a conventional polyphase induction motor rotor. This machine concept combines the high d.c. magnetic fields produced by superconducting field windings with the asynchronous operation of conventional induction motors.

Associated with Professor Thullen in the project are Professor Joseph L. Smith, Jr., and Dr. Thomas Keim and Dr. Adrian Bejan, of the Cryogenic Engineering Laboratory of the MIT Department of Mechanical Engineering. Professors John G. Kassakian and James L. Kirtley, Jr., of the MIT Electric Power Systems Engineering Laboratory of the Department of Electrical Engineering and Computer Science.

Their work on ship drive systems is an offshoot of a program started in 1967 to build a superconducting generator for electric utilities. The latter effort realized an initial success in November, 1974, when MIT's three-megawatt superconducting generator was connected with the Cambridge, Mass., power system. It was the first time a superconducting generator that large had been hooked up with a

larger power system and the machine passed the crucial test. The MIT researchers say that superconducting generators will lead to cheaper and more reliable production of electric power and predict that they will be used commercially within 10 years.