

\$6 Million Funding

MIT to Establish Major Center for Cancer Research

Plans were announced Monday, December 4, for establishment of a major Center for Cancer Research at MIT headed by Nobel Prize winning biologist, Dr. Salvador E. Luria.

The National Cancer Institute announced the award to MIT of two grants for the Center: \$2,362,500 for alterations and renovations of facilities for the Center, and \$136,376 for operating costs of the Center for the first preparatory year. A commitment also has been made by NCI for an additional three years of operating support for a total of \$1,891,000, subject to the availability of funds.

At the same time, President Jerome B. Wiesner and Howard W. Johnson, Chairman of the MIT Corporation, announced that the



Dr. Luria.

—Photo by Marc PoKempner

Institute will add \$1.8 million toward the construction costs of the new Center and that Dr. Luria, an Institute Professor and Sedgwick Professor of Biology, will be the Center's director. Dr. Luria was a 1969 recipient of the Nobel Prize in Medicine or Physiology for his research in virology.

By the time the Center, which will report to Provost Walter A. Rosenblith, is in full operation in the fall of 1975 it will have 12 researchers of faculty rank, of which one or two will be persons already affiliated with MIT, Dr. Luria said. Faculty members will receive dual appointments to the Center and to the MIT department of their specialty.

The Center eventually will have about 60 professional staff mem-

bers and technical assistants and a total work force of about 150 persons. In keeping with the Center's program to train new cancer researchers, funds for personnel include provisions for about 10 graduate students.

The Center will be housed in the Horace Sayforth Ford Building (Building E18). Work on the renovation and reconstruction of four floors of the building will begin January 1, 1973. Occupancy of two floors is planned for October, 1973, and of the other two floors for May, 1974. The completed Center will contain 35,000 square feet of research and office space.

The new Center is "committed to a long-term program," Professor Luria said.

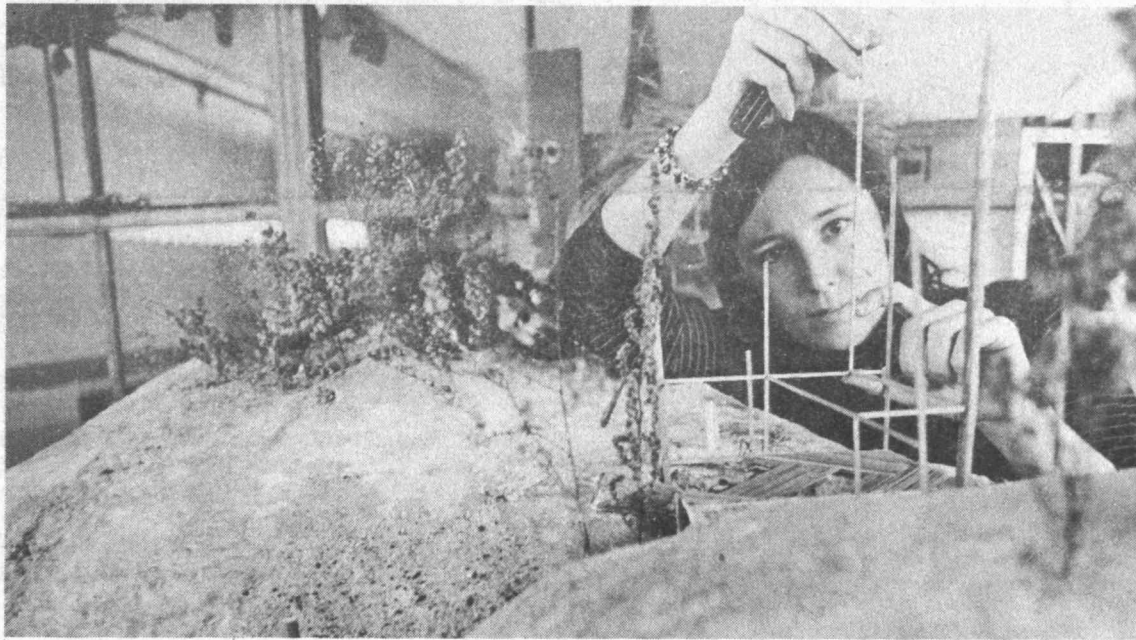
"Despite the concepts and re-

search tools that 25 years of cancer research have developed, cancer research is not ready for a crash-program approach," he said. "Along with research, therefore, the Center will devote a great deal of effort to training young people—physicians, Ph.D.s, and graduate students—in the field of cancer research."

Professor Luria said the Center will broaden MIT's already deep commitment to biomedical research.

"That ongoing commitment has provided the base upon which to build the Center—strong research groups in biology, chemistry and biochemistry, close ties with clinical centers working with cancer patients, and a reputation

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Cynthia Howard, a graduate student in architecture from Norwell, working on a model.

—Photo by Margo Foote

Women Making 'Important Contributions' to Science

The following article, written by Katherine Bryn, originally appeared in the November 1972 issue of Science Digest and is reprinted here with permission.

Every boy who dreams of being a scientist doesn't become an Albert Einstein. The same is true for girls; not all become Madame Curies. But today some 30,000 women work as scientists and many make important scientific contributions and lead rewarding lives.

Actually, some were doing it back in Madame Curie's day, due in part to the women's suffrage movement which called for the opening of the professions as well as the vote to women. Some women began to attend college and became teachers. Later the Civil War turned many women into doctors, nurses and volun-

teers. The first woman astronomer, Maria Mitchell, was trained by her father. Among other things she was the discoverer of a comet in 1847. She taught at Vassar when it

opened in 1865, and 25 of her students were distinguished by listings in *Who's Who in America* and other honors.

Early female scientists of the 19th century often entered their professions in odd ways. In the 1880s Edward Pickering of the Harvard Observatory encouraged women volunteers to study the stars. More than 40 who had some background in mathematics did computing and tabulating. Pickering is supposed to have become disgusted with a male assistant and to have sworn that he could train his maid to do the job. He kept his promise, and Williamina Paton Stevens Fleming, a Scottish immigrant, became a member of the staff in 1881 as head of the

(Continued on page 4)

Cover Subject

Irving M. London, M.D., director of the Harvard-MIT Program in Health Sciences and Technology, is the subject of the cover story in the November 27 issue of *Modern Medicine* magazine.

High School Girls Explore Career Choices

More than 100 junior and senior women from local high schools will attend an afternoon conference on Professions for Women at MIT on Friday, December 8.

Sponsored by the Association of Women Students with the Office of Admissions, the program will focus on the many professional areas available to women, including such areas as science, mathematics, engineering, medicine, law, social science, urban studies and architecture.

The conference will begin at 1pm in Kresge Little Theatre with opening remarks by Barbara S. Nelson, assistant to the President and Chancellor, followed by a welcoming address by Peter H. Richardson, director of admissions. At 1:25pm Robert K. Weatherall, director of placement and assistant dean of the Graduate School, will discuss "Placement of Women."

Highlight of the afternoon program will be a panel discussion,

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Geophysical Theory Opens New Vistas

The continental drift theory—the idea that the earth's continents were once a single land-mass from which they have drifted apart—is alive and well again after several decades of being rejected by scientists, an MIT geophysicist says.

Writing in the current issue of *Technology Review*, MIT's monthly magazine of science and technology, M. Nafi Toksoz, professor of geophysics in MIT's Department of Earth and Planetary Sciences, says that the theory has opened new vistas for earthquake prediction and for petroleum and mineral exploration.

"From the reconstruction of continents as they were in past geologic times," he writes, "it may be possible to find an originally neighboring deposit which is now a part of a different continent. Such reconstruction can point to promising regions that are yet unexplored."

The idea of a single proto-continent arose from the shapes of the continents today—Africa and South America, for example, look as if they once fitted together edge to edge—and became popular around 1910, according to Professor Toksoz, when Wegener proposed that the continents were floating on dense by relatively fluid material beneath them, like sheets of ice floating on water. Later it was discovered, however, that this material, now called the mantle, was not fluid but generally rigid, and since there existed no scientific explanation of how continents could move under such circumstances, the drift theory was more or less abandoned.

But in recent years evidence indicating that the continents have moved during their history has been piling up. Some clues have come from paleoclimatology, Professor Toksoz says. Geologists have found in cold latitudes deposits characteristic of warmer climates, and frequent geological similarities have been noted in places separated now by large bodies of water.

More clues are provided by paleomagnetic studies. "The earth

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Chinese Scientists Pay Visit

Photo page 12

A delegation of scientists from the People's Republic of China, currently making a four-week tour of universities and scientific institutions throughout the United States, spent yesterday, Tuesday, December 5, visiting laboratories and centers at MIT.

The delegation, which includes seven scientists, a science administrator, two members of the Chinese United Nations Mission and two interpreters, was greeted by President Jerome B. Wiesner, Chancellor Paul E. Gray, and Provost Walter A. Rosenblith in the seminar room of the Center for Theoretical Physics.

The Chinese scientists, the second such professional delegation to visit the US recently, are the guests of the National Academy of Sciences. The visit was arranged through the Committee on Scholarly Communication with the People's Republic of China. Professor Victor Weisskopf, a member of this committee, was designated area host for the delegation's visit to the Boston area, which has also included a day of sight-seeing, a reception at 111 Memorial Drive, the President's House, Sunday evening jointly sponsored by MIT, Harvard, and the American Academy of Arts

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Speak Softly

We were much taken the other day by a headline in the *Globe* that read "English Teachers to oppose 'doublespeak' (public lying)", followed by a brief article to the effect that the National Council of the Teachers of English had established a Committee on Public Doublespeak. High time was our immediate reaction and we hied ourself off to talk about it with Professor of Literature Wayne O'Neil—mistitled, we thought, by the *Globe* article as Rabbi Wayne O'Neil—who was listed as one of the committee's members.

"The committee is one of a number of NCTE bodies," Professor O'Neil told us, waving us into a comfortable and battered easy chair in his office. "I'm not actually a member of the NCTE itself, but I've written for their journals. It's a vast organization and they have journals for elementary teachers, high-school teachers, and so forth. The doublespeak committee was the idea of Walker Gibson. He's an English professor at U-Mass down in Amherst and is the new president of the NCTE. One example of public lying he uses to get the idea of the sort of verbal confusion we are concerned about is the use of 'protective reaction strike' to characterize what in plain language is, after all, just another bombing raid."

We remarked that in our experience teachers of English had not been noticeably in the vanguard of those concerned with the general erosion of the language. "All too true," Professor O'Neil agreed with a companionable laugh. "But there does seem to be a growing interest in what you might call professional awareness of social responsibility. The medical profession, for example, is beginning to tackle issues like community medicine. Political scientists and historians in the past few years, some of them at any rate, have been calling their professions to task for not speaking out, at least within their disciplines, against social injustice at home and the war abroad. And I think that the doublespeak committee is probably part of that trend. Certainly it is true that if English teachers are to come to grips professionally with some of our large-scale social problems then the language we use to describe them is a good place to begin."

"The doublespeak committee is still just getting underway. It will I hope perform a sort of watchdog service, call it what you want. I suppose I was asked to be on it because I've done some work in that general direction. I wrote an article for the NCTE journal *College English* called 'The Politics of Bidialectalism' in which I was interested in trying to sort out the reasons why dialects have not been acceptable in schools in this country but have always been put down in favor of a preferred, standard speech. And I presented a paper to a special conference at last year's meeting of the American Political Science Association. It was called 'The Language of the Pentagon Papers' and subtitled 'Or, Did They Lie to Each Other, Too?' At that time, remember, we had only *The New York Times* version of the papers, but even then it was clear that there was something of a gap, to say the least, between the public and internal governmental statements on the war, and, if you examine the rhetoric of the papers closely enough you can see evidence for a good deal of internal lying as well."

We asked Professor O'Neil for some recent examples of double-speak. "Well," he said, "a recent goodie, of course, is 'peace is at hand.' We're still not certain what that means. And the other day, you may have noticed that the *Globe* printed a big zero on the first page to indicate the number of Americans killed that week in Vietnam. But there was at least one plane damaged over Vietnam that week. It just happened to crash over the border in Thailand, so the men who were killed weren't counted."

"Another example: I happened to visit Northern Ireland in the summer of 1971. I went to see some friends in Belfast. I'd read that one of the things the British troops had been using to keep order were rubber bullets. That had a comfortable, almost paternalistic let's-not-really-hurt-anyone ring to it. You know you think of rubber as fairly soft and bullets as small. Then I saw some of them, and in fact those 'bullets' are about six to seven inches long and an inch thick. And they're rubber in the same way a hockey puck is rubber."

Richard Douglas, head of the Humanities Department, came in just then with a handful of papers, which he deposited with a flourish on Professor O'Neil's desk. "I see you've become a Rabbi according to the *Globe*," he remarked, pausing by the door. Professor O'Neil laughed. "Let me tell you how that happened," he said. "It's a good illustrative. When the NCTE asked me to be on the doublespeak committee, they sent along a form to fill out, and one entry on it asked 'How do you prefer to be addressed'. There were a number of titles underneath that you could check off. I thought this an admirable opportunity. One isn't offered the choice as a rule. I passed up 'Sister.' I checked 'Rabbi.' Now all my mail is addressed that way, and the press releases put out by the NCTE refer to me that way. It's an example of the way a word persists once it gets used. Rabbi means 'teacher,' of course."

"'Brother' is always good too," Professor Douglas said as he departed.

We asked Professor O'Neil what the doublespeak committee would be doing next. "Having a meeting," he replied with a laugh. "Some of the members are interested in untwisting the language that's used in advertising. My own interests lead in other directions, particularly the concealed racism that's embedded in so much of the English that's taught in the schools. There's been some awareness of this problem recently, but it's also produced some amusing results. I recall a reader I once saw that was prepared for black kids in ghetto schools, and some care had obviously been taken to make the pictures and the words correspond to the children's real lives. The title was the funny part. It was 'Goldilocks.'"

"I'm not sure, finally," Professor O'Neil continued, "whether it is possible for any group to change the way we tend to teach the language. I think that Christopher Jencks's book on the schools is probably right; that they aren't really suited to bring about social change. I'm not cynical, but then I'm not really hopeful either. The schools seem to me a function of the larger society and it would follow from that that we can't do much to change the schools until we can change some of the aims of our social institutions. Orwell's essay 'The Language of Politics' is still the last word on that subject."



Joel Spencer and his son David enjoy a chilly romp on the sculpture near Alumni Pool.

—Photos by Marc PoKempner

Revisiting Childhood in 'The Magic Years'

"The Magic Years," an imaginative new offering for this year's Independent Activities Period

(IAP), will seek to introduce undergraduates to the joys of childhood.

The course was organized by Joel Spencer, assistant professor of mathematics. "Few fathers seem to be able to relate to small children," he said, "possibly because of certain atavistic notions of masculinity. My activity is not a course in child care, but designed to give students a chance to try to enjoy little children."

More than half a dozen students signed up for the activity following publication of the first Guide to IAP in November, Professor Spencer reported. Now he is seeking young children, from 6 months to three years, to participate in the program.

"What we hope for is a one-to-one relationship," he said. "During the first week the student will meet with the child and the child's parent in the home. Thereafter the student will take the child outside the home. In addition, there may be some field trips, such as to a zoo or restaurant."

Meetings with the children are planned for three afternoons each week. Each encounter will last approximately two hours.

Professor Spencer emphasized that any parent who felt uncomfortable about permitting the student to take the child could terminate the relationship at the end of the first week.

Parents interested in participating in this IAP program may call Professor Spencer at Ext. 3-7905 or at 492-0972 in the evenings.



The Spencers watch the launch of one of the daily weather balloons.

Author John Barth to Read Selections of Recent Prose

John Barth, the noted fiction writer and a visiting professor of English at Boston University, will read a collection of his recent prose on December 11 in the Mezzanine Lounge of the Student Center, starting at 8pm.

The program is the first of a series of poetry and prose readings which will be sponsored this year by the Council for the Arts at MIT.

Barth is the author of a trilogy, composed of *End of the Road*, *The Floating Opera* and *The Sot-Weed Factor*, which is the same story told from tragic, comic and farcical view points. Next he wrote *Giles Goat-Boy*, a science fiction

vision of the world as a gigantic university, and *Lost in the Funhouse*, a collection of short stories. His most recent work, *Chimera*, is a collection of three linked novellas which retell classic stories.

Barth is a very commanding reader according to MIT poet Barry Spacks. "The last time I heard John Barth read was a year ago at Wellesley College and he received a standing ovation—a well deserved one. The literary pyrotechnics of his prose are more than matched by the energy and brio of his delivery," Spacks continued.

The reading is open to the public free of charge.

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Please address all news and comment to the editorial office, Room 5-111, Ext. 3-3277.



The Reverend Parvey discussing her new assignment as chaplain for the Harvard, Radcliffe and MIT Lutheran communities.—Photo by Margo Foote

Constance Parvey Becomes Lutheran Chaplain at MIT

MIT's new Lutheran Chaplain was ordained in a historic ceremony Sunday in Harvard University's Memorial Church.

Constance Fern Parvey, who will serve as associate pastor at the University Lutheran Church and as Lutheran Chaplain at the Institute and Harvard, was the first person to be ordained in the university's 158 year old church. She is only the fifth woman to be ordained in the Lutheran Church.

The Service of Installation will take place in the MIT Chapel next Sunday at 3pm. The Reverend John Crocker of the Episcopal Church and the Reverend Stanley F. MacNevin of the Roman Catholic Church will participate in the service and there will be a reception in McCormick Hall afterward.

Miss Parvey will divide her time 40-40-20 percent among the Institute, Harvard and the University Church in Cambridge. MIT has been without a Lutheran Chaplain since the departure of the Reverend Don Lee a year ago.

"I think there is little need for sectarian thinking," Miss Parvey said in an interview last week, "but I do represent the Lutheran Church and its tradition. Whereas MIT is generally future oriented, I believe I serve as a presence that is a bridge between the past and the future.

"I would like in my work to serve the aesthetic, the spiritual and the ethical dimensions of the community," she explained, "as a balance to the rational and ana-

lytic side which is the work of the Institute. A pastor's job is to serve the priesthood of all believers. To me this means the development of responsible leadership, engaging the full human potential."

Miss Parvey served in the university ministry to students from 1953 to 1966 at Duke University in Durham, N.C., the Lutheran Ministry in Greater Boston, the University of California, Los Angeles and the University of Wisconsin, Madison.

"The university community is on the nerve's edge of psychic changes in society," Miss Parvey continued, "and is therefore a critical point for the kind of Christian presence that can raise proper questions of values."

Since 1967, Miss Parvey has been doing research and writing. In addition to publishing several articles, she has been executive producer of the Town Meeting television series in Minneapolis-St. Paul, editor of the Harvard Divinity Bulletin, on the staff of the McCarthy for President campaign and a member of the Department of the Church of the Harvard Divinity School working on the role of voluntarism in Third World Development.

Miss Parvey emphasizes that the Lutheran Community on campus is not limited to students but includes faculty and staff as well. She estimates that about 250 people are involved with the Lutheran Church at the Institute.

Miss Parvey's office will be at 312 Memorial Drive.

C. K. Colton Receives Dreyfus 1972 Teacher-Scholar Award

Dr. Clark K. Colton, assistant professor of chemical engineering, has been selected to receive a 1972 Teacher-Scholar grant from the Camille and Henry Dreyfus Foundation.

One of 17 young faculty members chosen from throughout the nation, Professor Colton will receive \$25,000 to support special projects in teaching and research.

The Dreyfus Teacher-Scholar grants originated in 1970 as a means of promoting the careers of outstanding young teacher-scientists in the fields of chemistry, biochemistry and chemical engineering. Recipients of the award are selected on the basis of achievement and potential.

Professor Colton was one of only two chemical engineers selected this year from a total of 102 nominees. Previous Dreyfus Award winners at MIT are Professors Daniel S. Kemp and Robert J. Silbey of chemistry.

Professor Colton's research has been primarily in the application of chemical engineering to prob-



Professor Colton.

lems of medical and biological interest, particularly mass transfer in medical and physiological

systems.

He has published extensively on the design and performance of artificial internal organs and is a consultant to the Artificial Kidney Program of the National Institutes of Health.

In addition Professor Colton is now engaged in research on enzyme technology.

A graduate of Cornell University, he received the Ph.D. from MIT in 1969 when he was appointed assistant professor of chemical engineering. At MIT he serves as a member of the Clinical Research Center Policy Committee and the Committee on Biomedical Engineering.

Professor Colton is a member of the American Institute of Chemical Engineers, the American Chemical Society and the American Society for Artificial Internal Organs and the American Association for the Advancement of Science.

Professor Colton and his wife have two children and reside in Brookline.

Alumnus Gives 19th Century Paintings to MIT Collection

Four major 19th century American paintings have been donated to MIT by I. Austin Kelly III, a member of the Class of 1926.

The works are: Albert Bierstadt's "White Mountains through the Clouds," Thomas Doughty's "Romantic Landscape," 1835, Winslow Homer's "Farm Boy" and George Inness' "Medford Massachusetts" (1867).

"These fine acquisitions represent the beginning of a collection of 19th century painting to join our

already established collection of 20th century art," said Professor Wayne Andersen, Chairman of the Committee on the Visual Arts and Director of Exhibitions.

Mr. Kelly has been a patron of the arts and libraries at MIT for several years. A year ago, he contributed funds to the Committee on Historical Collections for the restoration and exhibition of portraits and busts of the Institute's founders, and this summer he donated a collection of 30 rare books, containing a perfect page from the Gutenberg Bible, a book from George Washington's library and a first edition of Tom Paine's *Common Sense*, to the libraries. He has also served as a member of the visiting committees for the Department of Humanities and the Library, and of the Corporation Development Committee.

A resident of New York City, Mr. Kelly is the founder of one of the first pension consulting firms in the United States, the National Employee Relations Institute in New York. He is a member of the English Speaking Union, the Newcomen Society, the Grolier Club, the Citizen's Advisory Committee of the New York Public Library and the Bibliographic Society.

Holiday Crafts Sale Thursday

The Building 10 Lobby will be transformed into a bustling marketplace tomorrow, Thursday, December 7, as the Technology Wives hold their annual Holiday Arts and Crafts Sale.

The student wives will display their handcrafted Christmas gifts—pottery, paintings, toys, candles, knitting, jewelry, decorations, macrame, greeting cards, etc.—under the dome beginning at 8am. Closing time for the sale has been extended to 7pm this year to allow working wives and others a chance to visit the sale.

An ever popular event, the sale features unique Christmas gifts at reasonable prices. For the best selection and to avoid last minute crowds, shop early.

PM Club Offers Beer & Pretzels

"Music, conversation, and all the cold draft beer you can drink" is the inviting advertisement for "Romantic Landscape," (1835), e Friday Afternoon Club.

Run by a committee of graduate students and Institute secretaries, the Friday Afternoon Club lives up to its advertising. The Club offers taped music, lots of draft Budweiser, and most importantly, a comfortable setting for people to get together. There are plenty of chips, cheeses and other snacks to satisfy a beer-drinker's appetite. A limited selection of white and red wines is also available.

Jim Tang, a graduate student in aeronautics and astronautics from Taiwan, is manager of the Friday Afternoon Club. He says, "I think the Club answers a basic need for students at MIT—the need to meet with other people on a social rather than academic level.

"Some students find it difficult to get out and meet people in a city like Boston," he continues. "The Friday Afternoon Club provides an informal gathering place on campus where students are apt to feel more comfortable."

Located in the Ashdown House "Thirsty Ear," the Friday Afternoon Club is open every Friday from 6pm until the beer is gone—usually around 10:30pm. All members of the MIT community aged 21 and over are invited. Admission is \$1 for men and 50 cents for women and will buy all the beer a person can drink.

Erratum

The Center for Sensory Aids Evaluation and Development was inadvertently omitted from the list of supporters of the tactual map in last week's Tech Talk. Tech Talk regrets the omission.

Obituaries

J. MacAllister

Joseph MacAllister, 85, who had been associated with MIT for nearly 40 years, died Saturday, December 2, after a brief illness.

Mr. MacAllister came to the Institute in 1933 as a sign painter and became manager of the Hobby Shop when it was formed in 1938. He retired from the Hobby Shop in 1952 but continued to work part time for the Institute, again as a sign painter.

Except for a brief period in his mid-70s when he decided to spend full time pursuing his own interests, Mr. MacAllister continued to work for the Institute until September of this year.

Mr. MacAllister was a gifted craftsman, particularly in wood-working. He created delicate pictures and seals in inlaid wood, many of which were given to friends at MIT. One of his last major projects was building a grandfather clock for his home. It was so admired by his daughter-in-law that he constructed a second clock for her.

He was also a skilled gardener and often brought flowers from his garden to friends at the Institute.

Mr. MacAllister is survived by his wife, a son, Charles T. Copeland MacAllister of Framingham, a 1935 graduate of MIT, a daughter, Constance Curley of York Village, Maine, five grandchildren and four great-grandchildren.

K. A. Sponholtz

Karl A. Sponholtz, 61, a Lincoln Laboratory employee, died on November 23.

Mr. Sponholtz was a custodian at Lincoln. He joined the Institute in 1957.

He is survived by his wife Frances and several children.

Outlook for Women Is Improving

(Continued from page 1)

women assistants. In 1898 the Harvard Corporation finally recognized her contribution, and she became the first woman to be officially appointed curator.

There were women in other scientific professions, too. Ellen Swallow taught school until she had enough money to enter Vassar at age 25. Her professors made her feel she could do something "for science." Then she applied and was accepted by M.I.T. as a special student—the first woman student at M.I.T. It wasn't until later that she learned she had been admitted without charge so the president could say she was not a student. She became a sanitary chemist, setting up her own laboratory in 1884. Her work in water analysis was the basis for the sanitary regulations in most American communities today.

And of course there were many others. Mrs. Erminnie Platt Smith was an ethnologist in the 1800s and the first woman elected to the New York Academy of Sciences. Elsie Clews Parsons, a mother of six, was a sociologist at Barnard at the turn of the century.

More than a few women were interested in becoming doctors to improve the health care of their sex and of their children. One such woman, Elizabeth Blackwell, worked as a governess in the homes of doctors and read their medical books. "She wanted to prove that a woman could be as good a doctor as a man," says Barbara Miller Solomon, Ph.D., of Harvard, "and to this end she forced herself to overcome her feeling of repugnance for the human body. Liberal Quaker-Philadelphia doctors helped her to apply to respectable schools such as Cornell and Harvard but they all rejected her. She finally entered an inferior school, Geneva College, in 1847. She later studied abroad, and returned to the United States to start the Woman's College of the New York Infirmary in 1868."

Adequate medical training was a problem. In 1860 the schools approved by the American Medical Association would not admit women. The A.M.A., however, would not approve the 19 so-called medical colleges for women started by their sex. So it was a milestone when in the 1870s the University of Michigan accepted female students.

Despite pioneering efforts of the past generations of women in science, there are still many "firsts" to be achieved. (Even today there are only two women with Ph.D.s in meteorology.) Today women represent almost 40 percent of the total work force in the U.S., but they account for only 10 percent of the nation's more than 300,000 scientists. They make up 27 percent of our chemists, 21 percent of our biologists, 19 percent of our psychologists and 10 percent of our mathematicians.

According to Felice N. Schwartz, president of Catalyst, an organization to promote part-time employment for women, there are 5,500,000 women college graduates and eight million women with some college training in America today. Still, she contends, "our society is crippled and the economy suffers when this vast reserve of energy and brain power is insufficiently tapped."

Many organizations and businesses are trying to remedy this situation, in part to comply with

new laws barring sex discrimination by employers. Dow Chemical, for instance, has a nationwide Job Opportunities For Women Program, and General Motors emphasizes its "priority attention to increasing opportunities for employment and advancement of women."

The outlook is improving. Women are receiving more science scholarships and finding the doors to graduate school opening more easily than their grandmothers did. At M.I.T., the enrollment of women has doubled in the last five years. And the acceptance rate for

of New York. The problem is even more severe at the doctoral level, and the National Academy of Sciences has only nine women among more than 800 members.

In the field women often are delegated to second-rate jobs, do not advance as fast as men and sometimes are forced to leave if they become pregnant. One female physicist said her employer "seemed to think pregnancy was damaging to the brain."

Nepotism rules, which allow only one person in a family to be a paid faculty member, are still in effect at many universities, and it

fields. The supply of mathematicians, life scientists and elementary and secondary school teachers is expected to be significantly above requirements. But in a number of occupations, including some scientific areas—chemistry, physics, engineering, geology and geophysics—projected requirements are in excess of the estimated supply.

As more women go to work—in all fields, not just science—many of the myths that were used to withhold jobs are being dispelled.

According to studies on working women reported by Lotte Bailyn,

at two.

The effect of a working mother on her children has long been an argument against women having a career. Lois Wladis Hoffman, Ph.D. of the University of Michigan, reports on a study she concluded:

"The daughters of working mothers are more likely to choose their mothers as models and as the person they most admire." She also found that "for girls of all ages, having a working mother contributes to a concept of the female role which includes less restriction and a wider range of activities. They usually approve of maternal employment, plan to work themselves when they grow up and become mothers, and, if they are old enough, they are more often employed themselves." The high-achieving woman, Hoffman concludes, has a high-achieving daughter.

Isabelle Karle, for instance, is a crystallographer with a Ph.D. from the University of Michigan. Her two daughters have doctorate degrees in chemistry. Ernesta Ballard, who went to college to be a horticulturist only after she was married and had a family, has three daughters. One is a hematologist, one is a graduate of Harvard Business School and one is a graduate of Harvard Law School.

Not all science careers require doctorates, though, and if a particular field is of interest, a woman should find out about the specific job and the kind of training needed. In medicine, for example, there are many jobs besides doctors and nurses, some combining other sciences such as physics, chemistry and engineering.

Science Digest, hoping to encourage its female readers to fulfill their desires for a career in science, asked some of today's women scientists what advice they would offer an aspiring female scientist. Here are some of their comments, both discouraging and encouraging.

Gretchen Minnhaar, a Michigan architect: "There are no more frustrations for a woman than there are for a man. In fact, being a woman is sometimes an asset because it opens doors a man couldn't get in."

Betsy Ancker-Johnson, a physicist at Boeing Scientific Research Laboratory, University of Washington: "A woman needs to be twice as determined to succeed with the same amount of competence as a man. It's a tough road, and my only advice is to work hard."

Joanne Simpson, Director, Experimental Meteorology Laboratory, National Oceanic and Atmospheric Administration: "The ability to seize opportunities is the best talent a young girl can develop."

Ruth Weiner, Chairman, Department of Chemistry, Florida International University: "It's hard to maintain your humanity when you're constantly under a microscope for being a woman in an unusual field."

Mary S. Calderone, Executive Director, Sex Information and Education Council of the U.S., Inc.: "You make your dream with what you've got—at least that's what I did."

And perhaps the most encouraging comment of all, from Esther Peterson, a consumer specialist and former Assistant Secretary of Labor: "I hope you have as good a time as I've had."

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Shown above is Paula Elster, a junior in chemistry from Palo Alto, California, measuring mutual diffusion coefficients of helium and oxygen in a chemistry laboratory in Building 4.

—Photo by Margo Foote

women applicants is higher than for men, says Dr. Mildred Dresselhaus, associate head of the electrical engineering department, because "they know pretty definitely" that this is the career they want before applying to such a specialized school.

Changes in both technology and attitudes are responsible for the increasing number of women in science. Aware of the population problem, families are smaller and children spaced close together, so that a woman devotes fewer years to raising children.

There are still barriers to overcome, however. Although more girls graduate from high school than boys, only 50 percent go on to college, compared with 80 percent of the boys, says Alan Pifer, president of the Carnegie Corporation

is the wife who is expected to settle for an unpaid position or unemployment.

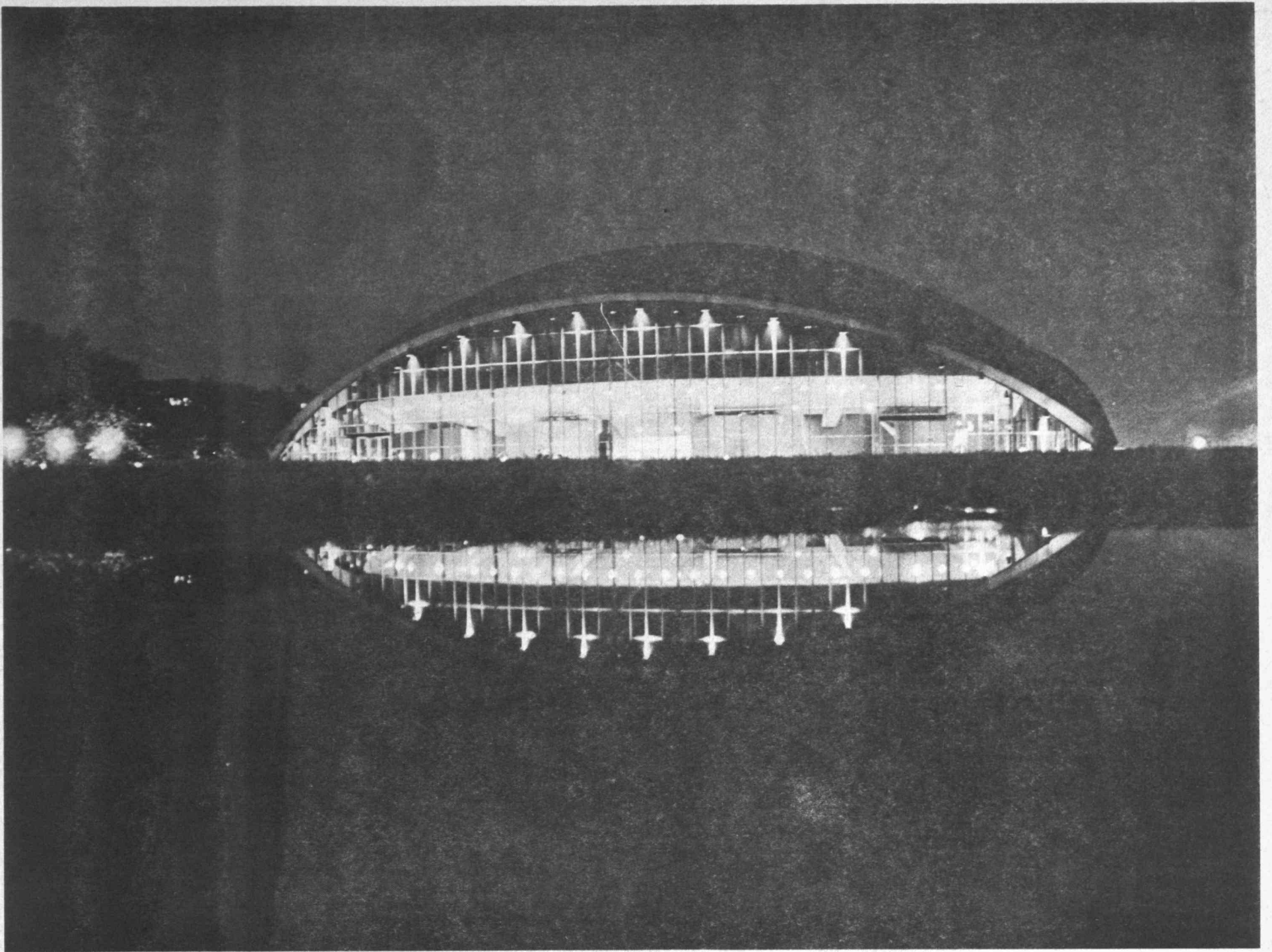
Also, as in most professions, women often are paid less than men. According to the latest census data, the median income of women with graduate school training is about the same as the income of men with a high school diploma. However, in many areas the gap is closing.

What is the job outlook for the future? A recent study by the Department of Labor analyzed occupational employment in 1968 and has projected an employment outlook for college graduates in 1980. The study concludes that while there will be an overall balance in the supply and demand for college graduates, some imbalances will occur in particular

Ph.D. of M.I.T., "the higher the professional qualification of a woman, the more likely she is to be working—a finding that belies the contention that professional training is wasted on women because they don't use it."

Other studies show that women actually leave jobs less often than men. Helen Astin found that 91 percent of the women who received doctorates in 1957-58 were employed seven years later. She also found that time off for child-bearing was months, not years.

Some people believe that there are certain skills at which men are better than women, or vice versa. But of 22 aptitudes tested on the Johnson O'Conner Human Engineering Aptitude Test, men and women do equally well on 14, women excel at six and men excel



After the Rain: Photographer Margo Foote was on her way home from an evening assignment in Kresge when

she saw the auditorium mirrored in water standing on the lawn in front of the building. Virtually kneeling in icy

water, she took the picture with a half-second exposure at about $f/5.6$ on Tri-X film. Her camera is a Nikkormat.

Apollo Schedule

Apollo 17 is scheduled to blastoff toward the Taurus-Littrow region of the moon tonight, December 6.

Carrying Dr. Harrison H. Schmitt, lunar module pilot, Captain Eugene A. Cernan, mission commander, and Commander Ronald E. Evans, command module pilot, Apollo 17 is the last scheduled manned mission to the moon. This flight will end the historic 12-year-old Apollo lunar exploration project.

For those who wish to follow the moon mission, the following are times and dates of principal events (all times are Eastern Standard Time.):

Blastoff: Wednesday, December 6, 9:54pm.*

Lunar surface contact: Monday, December 11, 2:54pm.*

First Extra Vehicular Activity (EVA): Monday, December 11, 6:33pm.*

Second EVA: Tuesday, December 12, 5:03pm.*

Third EVA: Wednesday, December 13, 4:33pm.*

Lunar module lift-off from moon: Thursday, December 14, 5:56pm.*

Lunar module docks with command module: Thursday, December 14, 7:53pm.*

Command module enters Earth's atmosphere: Tuesday, December 19, 2:11pm.*

Splashdown: Tuesday, December 19, 2:24pm.*

*Television coverage.

Support Team at Cape Ready for Apollo Launch

A team of Draper Laboratory engineers were poised in readiness today at Cape Kennedy, Florida, to provide support for tonight's launch of Apollo 17.

Assembled in the "back room" of launch control center, where they will monitor the Apollo guidance, navigation and control systems, were Phil Felleman, Steve Copps, Malcolm Johnson, Robert O'Donnell, Margaret Hamilton, Ken Kido, Joseph Mori, and Peter Weissman, all from Cambridge.

Also on hand for the launch were George Silver, director of the MIT office in Houston, Texas, and

Romilly Gilbert, the engineer in charge of the Cape Kennedy office of MIT.

The MIT support group includes Don Millard, Phyllis Rye, and Donald Eyles, from the Draper Laboratory in Cambridge, who help NASA and the astronauts run checks on lunar module guidance programs in the Cape Kennedy Lunar Module Simulator.

Heading a group of laboratory and university dignitaries at Cape Kennedy for the launch were Dr. Charles Stark Draper and Dr. Rene Miller, head of the MIT department of Aeronautics and Astronautics.

In Civil Engineering

Lectureship Honors S. J. Mathis

A memorial lectureship fund honoring the late Sam J. Mathis of the Standard Oil Co. of New Jersey, a widely known civil engineer and construction authority, has been started at MIT.

Under terms of the lectureship, started with a gift by Mr. Mathis' widow, Mrs. Kathryn Mathis of Pinehurst, N.C., income from the Mathis Fund will be used to provide for a periodic lecturer in the Department of Civil Engineering at MIT.

A native of Blackville, S.C., Mr. Mathis was a 1933 graduate of The Citadel, Charleston, S.C., where he also received the Civil Engineer degree in 1941. Before World War II, he was employed by the US Coast and Geodetic Survey and the South Carolina State Highway Department.

During the war, he served as an engineering and construction officer with the US Navy and took part in numerous major construction projects under extraordinarily difficult conditions in southeast Asia.

Following the war, he worked briefly with Raymond Concrete Pile Co., now Raymond International, Inc., and then joined Creole

Petroleum, Inc., a subsidiary of Standard Oil of New Jersey in 1946, directing and supervising major construction projects. From 1962 to 1965, he was a chief engineer with another Standard Oil of New Jersey subsidiary, ESSO Libya, where he directed large-scale construction projects in Libya, including the construction of a liquid natural gas plant and an entire new city, Marsa

Brega.

From 1965 until his death in 1971, Mr. Mathis was world-wide consultant working out of the Standard Oil of New Jersey corporate offices in New York City. During much of his career, Mr. Mathis worked closely with several MIT professors in civil engineering, particularly Professor T. William Lambe, an authority in soil engineering.

Physicist Laura Roth Appointed Mauzé Professor

Dr. Laura M. Roth, a distinguished research physicist from the General Electric Research and Development Center in Schenectady, New York, has been appointed Abby Rockefeller Mauzé Visiting Professor in the Department of Physics.

Announcement of the appointment was made by Provost Walter A. Rosenblith. The Mauzé Professorship was established to bring distinguished women scholars to MIT to inspire women students in addition to enriching their professional education.

Dr. Roth's recent research interests have centered on solid state theory, electronic properties of semiconductors, magnetism, and disordered systems. She is conducting a series of seminars at MIT on "Electron States in Disordered Systems."

Dr. Roth received the B.A. degree in physics from Swarthmore College in 1952. Her graduate study in physics was completed at

Radcliffe College where she received the A.M. degree in 1952 and the Ph.D. degree in 1957.

From 1956 to 1963 Dr. Roth was a staff physicist at MIT's Lincoln Laboratory. In 1963 she was appointed associate professor of physics at Tufts University and was promoted to full professor in 1965. She left Tufts in 1967 to join the Semiconductor Physics Branch of the GE Research and Development Center.

A Fellow of the American Physical Society, Dr. Roth is also a member of Phi Beta Kappa and Sigma Xi. In 1962 she received the Radcliffe Graduate Society Medal. Dr. Roth was a Sloan Fellow at Tufts University from 1963 to 1965.

Dr. Roth served as a summer lecturer at Harvard University in 1959 and at the University of Colorado's Institute for Theoretical Physics in 1969.

Dr. Roth commutes to MIT from Schenectady, New York, where her husband and two children reside.

MIT-Wellesley

Information and application forms for the Wellesley-MIT Exchange for the spring term are available in the Exchange Office, Room 7-101. Applications are due Thursday, December 21.

Events of Special Interest

Technology Wives Art and Craft Sale

Annual sale features Christmas decorations, pottery, toys, paintings, jewelry, knitted and crocheted articles, etc. Thursday, December 7, Bldg 10 Lobby. Get there early!

Corporation Joint Advisory Committee*

Continued informal discussion of growth in the MIT administration. Thursday, December 7, 7:30pm, Rm 10-105.

Poetry Reading*

John Barth, Boston University, will read a collection of his recent fictional prose. Monday, December 11, 8pm, Student Center Mezzanine Lounge.

Candy Cane Day

Class of 1974's third annual candy cane sale. Wednesday, December 13, all day, Bldg 10 Lobby. Price: 15 cents each.

Pottery Sale*

Student Art Association. Wednesday-Friday, December 13-15, 10am to 6pm, Student Center West Lounge.

Seminars and Lectures

Wednesday, December 6

Specialization of the Human Brain for Language*

Dr. Norman Geschwind, Dept of Neurology, Harvard Medical School. MIT Education Division Colloquium. 12n, Rm 9-150.

Adaptation of Technology by Developing Countries

Prof. Nathan Cook, mechanical engineering. Special Technology, Power and Values Seminar. 1:30pm, Rm 35-225.

Endocrine Response to Trauma**

Prof. N. Thomas Ryan, Boston University School of Medicine. Oral Science Seminar. 3-5pm, Rm E18-301.

Laser Driven Fusion*

Dr. Keith Bruechner, KMS Fusion. Nuclear Engineering and ANS Student Branch Seminar. 3:30pm, Rm 9-150. Coffee, doughnuts, 3pm.

Some Numerical Problems in Optimal Control of Distributed Parameter Systems Connected with Variational Inequalities and Optimization of a Domain*

Prof. R. Glowinski, Institut de Recherche d'Informatique et d'Automatique, Numerical Analysis Dept, University of Paris. Decision and Control Science Group Seminar. 4pm, Rm 33-206.

Introducing: The Automated Electron Microprobe Analysis Facility

Prof. John S. Dickey, earth and planetary science. Departmental Colloquium. 4pm, Rm 54-100.

Time Dependent Crack Growth in Rate Dependent Materials: Applications to Stress Corrosion Cracking, Polymer Fracture, Etc.*

Prof. A. S. Argon, mechanical engineering. Colloquia on Fracture. 4pm, Rm 1-379.

Unitarization of a Multiperipheral Model*

Prof. J. Young, physics. Joint Theoretical Seminar. 4pm, Rm 6-120. Coffee, 3:30pm, CTP Seminar Rm.

Relativistic Phenomena in Semiconductors*

Dr. W. Zawadzki, Institute of Physics, Polish Academy of Sciences. National Magnet Lab Seminar. 4:15pm, NML 2nd Floor Conference Rm. Tea, coffee, 4pm.

Ethics and Man's Evolution*

Prof. Ernst Mayr, Alexander Aggasaz Professor of Zoology, Harvard University. Technology and Culture "Images of Man" Seminar Series. 5:15pm, Rm 9-150. Respondents: Prof. John Graves, philosophy; Robert Trivers, Harvard. Buffet dinner, \$1.

Alternatives to the Synagogue*

Rabbi Everett Gendler, congregation in Lowell, originator of Yesh Bera (Is there an alternative?). Hillel Seminar. 7:30pm, Student Center West Lounge.

Polarization of the Feminine: Mary Cassatt and Edward Munch*

Whitney Chadwick, visiting lecturer of art history. Toulouse-Lautrec Festival Seminar. 8pm, Rm 9-150.

The Situation of Jewish Communities in Arab Countries since 1967*

Shuel Gabay, an Israeli born in Iraq. Israeli Club Seminar. 8:30pm, Student Center Rm 400. Coffee and doughnuts.

Thursday, December 7

Infrared Spectral Studies of Ionic Oxide Glasses*

Prof. W. M. Risen, Jr., Dept of Chemistry, Brown University. Dept of Metallurgy Special Seminar. 2pm, Rm 13-5101.

Marine Pollution from Solid Waste Disposal

Dr. R. A. Horne, consultant. Analytical Chemistry Seminar. 4pm, Rm 4-161.

Metallurgy Is a Human Occupation*

Institute Professor Emeritus Cyril S. Smith, metallurgy, history of science and technology. Graduate Metallurgy Committee Seminar Series. 4pm, Rm 6-120. Refreshments.

The Meaning of Astrology*

Gerald A. Ouellette, Draper Lab. Special lecture and discussion for Seminar DL-1 "Man in the Universe." 4pm, Rm 37-252.

Nitric Oxide Formation in Burners

Prof. John B. Heywood, mechanical engineering. Thermodynamics Seminar. 4pm, Rm 3-343. Coffee served.

Some Physical Properties of Proteins Related to Engineering of Synthetic Food*

Dr. ChoKhyun Rha, Dept of Agricultural and Food Engineering, University of Massachusetts. Nutrition and Food Science Departmental Seminar. 4:15pm, Rm 54-100. Coffee, 4pm.

Peculiar Phase Transitions, Especially Metal-Insulator*

Dr. P. W. Anderson, Bell Telephone and Cavendish Labs. Physics Colloquium. 4:30pm, Rm 26-100. Tea, 4pm, Rm 26-110.

Friday, December 8

Yugoslavia: Fall of the Croats to the Cleaning of the Serbs*

Dr. Robin A. Remington, Center for International Studies. CIS Luncheon Seminar. 12:30-2pm, Rm E53-368. Bring your own brown-bag lunch.

Chemical Engineering 10.991 Seminars

D. Lam, "Glow Discharge Polymerization," 2pm; D. Aldrich, "Pyrolysis of Solid Waste," 3pm. Rm 10-105.

A Variant of Special Relativity of Greater Symmetry*

Prof. Irving Segal, mathematics. Seminar on Mathematical Cosmology, Field and Particle Theory. 3pm, Rm 8-205.

Nuclear Reactor Safety

Prof. Henry W. Kendall, physics. Mechanical Engineering Seminar. 3pm, Rm 3-270. Coffee, 4pm, Rm 1-114.

Optical Mixing*

Prof. Yuen-Ron Shen, Dept of Physics, University of California at Berkeley. Materials Science Colloquium. 4pm, Rm 9-150. Refreshments, 3:30pm.

Numerical Studies of Anomalous Skin Penetration in Collisionless Plasmas*

Prof. N. A. Krall, University of Maryland. Plasma Dynamics Seminar. 4pm, Rm 26-214.

Green's Function Estimates and Stochastic Integrals; Behavior at and on the Boundary of a Strictly Pseudoconvex Domain*

Prof. Paul Mallivin, University of Paris. Special Seminar. 4:30pm, Rm 2-190.

Sublimations of Erotic Imagery*

Prof. Wayne V. Anderson, art history. Toulouse-Lautrec Festival Seminar. 8pm, Rm 10-105.

Monday, December 11

Balance Sheet and Summary

Prof. Roy Lamson, humanities, and Prof. Leon Trilling, aeronautics and astronautics. Technology, Power and Values Seminar. 2-5pm, Rm 37-252.

Nuclear Engineering Doctoral Seminars*

G. Braun, "MHD Effects on Heat Transfer in Fusion Reactor Lithium Systems" and P. Hendrick, "Predicting the Reliability of an LMFBR Fuel Pin." 3-5pm, Rm NW12-222.

The Korteweg De Vries Equation

Prof. Robert Muira, Mathematics Dept, Vanderbilt University. Applied Mathematics Colloquium. 4pm, Rm 2-338. Tea, 3:30pm, Rm 2-349.

Modelling Phytoplankton Dynamics

Dr. Herbert Rice, New England Aquarium, Research Dept. Hydrodynamics and Water Resources Seminar. 4-5pm, Rm 48-316. Coffee, 3:30pm, Rm 48-424.

Freezing Injury in Micro Circulation

Prof. Ernest G. Cravalho, mechanical engineering. Harvard-MIT Program in Health Sciences and Technology/Interdisciplinary Program in Biomaterials Sciences. 4pm, Burn's Institute Auditorium, Mass General Hospital.

Reversible Magnetic Energy Transfer Systems for Theta Pinch Reactors*

Prof. K. I. Thomassen, electrical engineering. Research Lab of Electronics and Electrical Engineering Seminar. 4-5pm, Rm 26-217.

Tuesday, December 12

A New Approach to Optical Space Communication**

Dr. R. M. Lerner, Lincoln Laboratory. Lincoln Lecture Series. 3:30pm, Lincoln Lab Cafeteria.

Why Concorde Is a Conventional Aircraft for the Pilot*

Prof. Marc Pelegrin, ONERA, Toulouse, France. Aeronautics and Astronautics Departmental Seminar. 4pm, Rm 35-225. Coffee and tea, 3:30pm, Rm 33-411.

Algorithmical Contour Recognition*

Prof. Oleh Tretiak, RLE. CIPG Seminar. 4-5pm, Rm 20E-210. Coffee, 3:30pm.

New Innovations and results in Two-Dimension Vidicon Imaging

Prof. T. B. McCord, earth and planetary sciences. Astrophysics Colloquium. 4:15pm, Rm 37-252. Coffee, tea, 4pm.

The Role of Organic Phosphates in Mediating Hemoglobin Function

Dr. H. Franklin Bunn, Division of Hematology Research, Children's Hospital Medical Center. Biology Colloquium. 4:30pm, Rm 6-120. Refreshments, 4pm, Rm 56-520.

TAW International Inc., A Black-Owned Corporation with Major Focus on Sub-Sahara Africa

Thomas A. Wood, president, TAW International Leasing, Inc. Community Fellows Program Seminar. 5-6:30pm, Rm E40-169.

Modes of Thinking in Physics*

Institute Professor Victor Weisskopf, head, Dept of Physics. Topics in Arts, Science and Technology Seminar. 7-10pm, Rm 3-133.

An Anthropologist Looks at the Bible*

Rabbi Maurice Zigmond, anthropologist and former director of New England Regional Hillel. 7:30pm, Rm 1-273.

Wednesday, December 13

Chemical Reactors as Dynamical Systems*

Prof. Rutherford Aris, chemical engineering, University of Minnesota. Chemical Engineering Seminar. 10am, Lewis Conference Rm, Bldg 12.

Cross-Cultural Perspective on Intellectual Development*

Dr. Jerome Kagan, Dept of Psychology and Social Relations, Harvard University. MIT Education Division Colloquium. 12n, Rm 9-150.

The Prospects of Technological Society**

Prof. Jay W. Forrester, management, and Prof. Arthur Kantrowitz, mechanical engineering. Special Technology, Power and Values Seminar. 1:30pm, Rm 35-225.

The Flavor of SALT: Prospects for Arms Control*

Prof. Jack Ruina, electrical engineering. Concourse Forum. 3pm, Rm 10-105. Coffee, 4pm.

Vitamin A Teratogenesis and Cleft Palate**

Dr. Devendra M. Kochhar, Dept of Anatomy, University of Virginia. Oral Science Seminar. 3-5pm, Rm E18-301.

Subcritical Crack Growth in Simple Uniaxial Composites: Applications to Fracture in Drawn Polymers, Etc.*

Prof. A. S. Argon, mechanical engineering. Colloquia on Fracture. 4pm, Rm 1-379.

Internal Tides and Oceanic Tidal Dissipation

Prof. Carl Wunsch, earth and planetary science. Departmental Colloquium. 4pm, Rm 54-100.

Dispatching Fire Engines in New York City*

Prof. Edward Ignall, operations research, Columbia University. Operations Research Center Seminar. 4pm, Rm 24-307. Refreshments following.

Thursday, December 14

The Operations of American Airlines*

George Warde, president, American Airlines. Flight Transportation Laboratory Seminar. 4pm, Rm 35-225. Coffee, 3:30pm, Rm 33-411.

Some Practical Roles for Microbial Genetics in Antibiotic Fermentation Research

Dr. Richard P. Elander, Smith Kline and French Laboratories. Microbiology and Biochemical Engineering Seminar. 4pm, Rm 4-159.

Soot Oxidation Kinetics in Combustion

Prof. John P. Appleton, mechanical engineering. Thermodynamics Seminar. 4pm, Rm 3-343. Coffee served.

Superconductivity of Ternary Compounds*

Prof. Bernd T. Matthias, University of California at LaJolla. Materials Science Colloquium. 4pm, Rm 9-150. Refreshments 3:30pm.

Friday, December 15

Chemical Engineering 10.991 Seminars*

M. Sefton, "Hydroxylated Styrene-Butadiene-Styrene Block Copolymers as Potential Bio-materials," 2pm; H. Banijamali, "Drag Reduction," 3pm; Rm 10-105.

Morphological Stability of Composite Structures

Dr. Harvey Cline, General Electric Research and Development Center. Special Seminar. 3pm, Rm 8-105.

Community Meetings

Concerts, dance performances, theatrical presentations and scientific demonstrations are scheduled to take place in the Bldg. 7 Lobby almost every day from noon to 2pm, so drop by and see what is happening.

RDTEU Children's Christmas Party***

Sponsored by Research Development and Technical Employees Union. Sunday, December 10, 1:30-6:30pm, Sala de Puerto Rico.

Women's Forum*

First presentation and discussion of bi-weekly committee proposal. Monday, December 11, 12n, Rm 10-105.

Technology Wives Organization

Monthly meeting featuring guest speaker Barbara Ackerman, mayor of Cambridge. Tuesday, December 12, 8pm, Student Center Mezzanine Lounge.

Ring the Lobby*

Series of short concerts of live/electronic/recorded music, arranged by Paul Earls. Sponsored by Lobby 7 Committee. Weekdays through Friday, December 15, 12n, 2pm, 4pm, 5pm, Bldg 7 Lobby.

MIT Club Notes and Meetings

Alpha Phi Omega

Chapter meeting. Wednesday, December 6, 7:30pm, Student Center Rm 407.

Association of Women Students

Guest speaker will be Alice S. Wong, assistant professor of microbiology and molecular genetics at Harvard Medical School, former postdoctoral fellow and biology research assistant at MIT. Monday, December 11, 4-6pm, Cheney Rm 3-310.

Bridge Club*

Duplicate bridge. Every Thursday, 6:45pm, Student Center Rm 473.

Chess Club**

Every Saturday and Sunday, 1:30-5:30pm, Student Center Rm 473 (unless otherwise noted).

Classical Guitar Society**

Classical guitar lessons, group and private. Wednesdays and Thursdays, 5-8pm, Rms 1-132, 1-134, 1-136. Call Vo Ta Han, 494-8353.

Glee Club**

Rehearsals. Every Tuesday, Wednesday and Thursday, 5pm, Kresge. For more information call John Chandler at 494-8550.

Hobby Shop**

Open weekdays, 10am-4:30pm, duPont Gym basement. Fees: students \$6/term, community \$10/term. Call X3-4343.

Judo Club**

Every Monday, Wednesday, Friday, 5pm; every Saturday, 1pm, duPont Gym Exercise Rm. Beginners welcome.

Logarithms

Meetings and rehearsals every Wednesday, 7:30pm, and every Sunday, 4pm, Student Center 4th floor. Call dorm X9628 for information.

MIT Club of Boston

Institute Professor Emeritus Gyorgy Kepes will discuss "Interactions of Art and Technology." Thursday, December 14, 12n, Aquarium Restaurant, 100 Atlantic Ave, Boston. Luncheon, \$3.60 at door. For reservations, call Mrs. Crossley, X3-3878.

MIT/DL Duplicate Bridge Club**

Every Tuesday, 6pm, Student Center Rm 407. No game December 19, 26 or January 2.

Outing Club*

Meeting on winter safety. Wednesday, December 13, 8pm, Student Center Rm 473. Regular meetings: Monday, Thursday, 5pm, Student Center Rm 473.

Rugby Club

Rugby practice. Every Tuesday and Thursday, 5pm, Briggs Field.

Russian Table**

Conversational Russian during lunch. Every Thursday, 1pm, Walker Dining Hall.

Science Fiction Society*

Every Friday, 5pm, Rm 1-236.

Scuba Club

Compressor hours: Tuesday, 9-11am, Friday, 3-5pm, Alumni Pool. Special program: Members of VIPER (Virgin Islands Project for Environmental Research) under NSF program will present their summer work, Wednesday, December 6, 8pm, Rm 20E-017.

Soaring Association*

Meeting on third Tuesday of each month, 7:30pm, Student Center West Lounge.

Strategic Games Society*

Saturdays 1pm, Walker Rm 318. Club offers opponents and discounts on merchandise to members plus gaming periodicals library. Kevin Slimak, dorm X0389.

Student Committee on Educational Policy (SCEP)**

Meeting on Experimental Programs-ESG, Concourse, etc. Wednesday, December 6, 7:30pm, Student Center Rm 450.

Student Homophile League*

Meeting and mixer. Every Thursday, 8pm, St. John's Church, 33 Bowdoin St, Boston. For gay help (anonymous) at MIT, call the student gay tutor, 492-7871, anytime.

Student Information Processing Board Meeting*

Every Monday, 7:30pm, Rm 39-200.

Tech Engineering News**

Stop by to work or learn. Every Sunday, 5pm, Student Center Rm 453. For more information, call Dorm X8376.

Tech Model Railroad Club Open House*

Saturday, December 9, 2-5pm and 8-10pm, Rm 20E-214. Meetings every Saturday, 4pm, Rm 20E-214.

Technique

Staff meetings. Every Saturday, 11am, Student Center Rm 451.

Technology Community Association

General meeting. Tuesday, December 12, 7:30pm, Student Center Rm 450.

Tiddlywinks Association*

Every Wednesday, 8pm, Student Center Rm 491.

Undergraduate Association*

General meeting. Thursday, December 7, 7:30-11pm, Sala de Puerto Rico.

Unicycle Club*

Meetings every Sunday, beginner's session at 1pm, other activities at 2pm, Walker Gym.

Social Events

Muddy Charles Pub**

Join your friends at the Muddy Charles Pub, 110 Walker, daily 11:30am-2pm, 4:30pm and on. Note: The Pub is being redecorated. Artists and others interested are welcome to submit ideas and original work for display. Call GSC, X3-2195.

Friday Afternoon Club**

Music, conversation and all the cold draft Budweiser you can drink. Every Friday, 6pm, the Thirsty Ear in Ashdown basement. Admission: men \$1, women 50 cents. Must be over 21.

SCC Pot Luck Coffeehouse*

Live entertainment every Friday and Saturday, 8:30pm to 12m. Student Center Mezzanine Lounge. Free coffee, cider, doughnuts. Sponsored by Student Center Committee. Volunteers to perform or otherwise help out, call Paul Mailman, dorm X9626, or Doug Fried, dorm X8767.

Movies

Sacco and Vanzetti

Humanities 21.017 Movie. Wednesday, December 6, 7pm, Rm 26-100. Free and open to those interested.

La Dolce Vita

Humanities 21.490 Movie. Wednesday, December 6, 8pm, Rm 10-250. Free and open to those interested.

The President's Analyst

Humanities 21.922 Movie. Wednesday, December 6, 9pm, Rm 26-100. Free and open to those interested.

Waves in Fluids and Generation and Propagation of Sound

Fluid Mechanics Films. Thursday, December 7, 4-5pm, Rm 3-270.

Baccanale**

LSC. Friday, December 8, 7pm and 9:30pm, Rm 26-100. Tickets 50 cents. Must show ID.

The Love of Jean Ney*

Film Society. Friday, December 8, 7:30pm and 9:30pm, Student Center Rm 407. Tickets \$1.

SCC: Whatever Happened to Baby Jane?***

Student Center Committee Midnight Movie Series. Friday, December 8, 12m, Sala de Puerto Rico. Free. Must show ID.

The Conformist**

LSC. Saturday, December 9, 7pm and 9:30pm, Rm 26-100. Tickets: 50 cents. Must show ID.

Go West and At the Circus*

LSC. Sunday, December 10, 8pm, Rm 10-250. Tickets: 50 cents. No ID required.

Putney Swope

Humanities 21.284 Movie. Monday, December 11, 7pm, Rm 10-250. Free and open to those interested.

Magneto hydrodynamics and Rarefied Gas Dynamics

Fluid Mechanics Films. Monday, December 11, and Thursday, December 14, 4-5pm, Rm 3-270.

Fluid Dynamics of Drag, Parts 3 and 4

Fluid Mechanics Film. Tuesday, December 12, 4-5pm, Rm 3-270.

Il Grido

Humanities 21.105 Movie. Tuesday, December 12, 7pm, Rm 10-250. Free and open to those interested.

Alphaville

Humanities 21.03 Movie. Tuesday, December 12, 9pm, Rm 10-250. Free and open to those interested.

All Quiet on the Western Front

Film Society. Friday, December 15, 7:30pm and 9:30pm, Student Center Rm 407. Tickets: \$1.

SCC: Phantom of the Opera**

Student Center Committee Midnight Movie Series. Friday, December 15, 12m, Sala de Puerto Rico. Free. Must show ID.

Music

Concert Band Fall Concert*

Directed by John Corley, performance will include works by Giannini, London, Nelhybel, Kazdin and Mozart. Friday, December 8, 8:30pm, Kresge. Free.

Ma Si-Hon and Tung Kwong-Kwong Violin/Piano Concert*

Performances of classical music sponsored by Chinese Students' Club. Saturday, December 9, 8pm, Kresge. Tickets: \$2, \$3, \$5, \$10; discount for advanced purchase. Call John Ning, dorm X8-323.

Classical Guitar Society Concert*

Recital by Hugh and Thomas Geoghegan, students of Leonid Bolotine and Julian Bream. Program includes classical music for solo and duet, works by Sor, Ponce, Garnados, Torroba and Geoghegan. Sunday, December 10, 3:15pm, Kresge. Tickets: \$1.25 students, \$2 general public.

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 December 13 through December 22 to the Calendar Editor, Room 5-111, Ext. 3-3279, by noon Friday, December 8.

(Continued on page 8)

Theater and Shows

Arthur Miller's "After the Fall"*

Community Players. Thursday-Saturday, December 7-9, and Wednesday-Saturday, December 13-18, 8pm, Little Theatre. Tickets: \$2.50 for general public; student discount on advanced sales only, \$2 with ID, Bldg 10 Lobby; reservations, X3-4720.

Four O'Clock Theater*

Scenes by MIT playwrights in staged readings. Monday, December 11, 4pm, Little Theatre. Free.

Community Players*

Meeting with films on mime. Monday, December 11, 7:30pm, Student Center West Lounge. New members invited.

Dance

Balkan Folk Dancing*

Intermediate and advanced. Every Tuesday, 7:30-11pm, Student Center Rm 491.

Folk Dance Club*

International folk dancing. Every Sunday, 7:30-11pm, Sala de Puerto Rico (exceptions to be posted).

Friday Afternoon Dance Break*

International folk dancing on the Kresge Oval, every Friday (weather permitting), 12:30-1:30pm.

Israeli Folk Dancing*

Folk Dance Club. Every Thursday, 7pm for beginners, 7:30pm for Israeli dancing, duPont Gym T-Club Lounge.

Tech Squares*

Western style square dancing. Every Tuesday, 8-11pm, Sala de Puerto Rico. Admission: \$1; first time free.

Turkish Students Association*

Folkdancing. Every Sunday, 4-7pm, Student Center Rm 491.

Exhibitions

Images of the Feminine in the Belle Epoque*

Exhibition of 150 prints of women by Toulouse-Lautrec and other 19th century artists including Gauguin, Munch, Cassatt and Whistler. Hayden Gallery, through January 6. Open Monday-Saturday, 10am-4pm.

Hayden Corridor Gallery*

Exhibition of working drawings and prints of the 19th century steam engines, including locomotives, mining machinery and marine engines. Sponsored by Committee on Visual Arts, through January 3.

Photographs by Terry Lindquist*

Creative Photography Gallery, 120 Mass Ave. On display December 11 through January 31. Free, open daily, 10am to 6pm.

The Aborigines of Australia*

Exhibit sponsored by MIT Anthropology Program. Humanities Library, through January 3.

Graphic Notation in Contemporary Music*

Exhibition presented in the Music Library, Rm 14E-109.

Hart Nautical Museum*

Exhibits include "Ocean Engineering Summer Laboratory Projects 1971 and 1972," and "Tugs and Towing." Bldg 5, first floor.

Athletics

Varsity Swimming*

Tufts. Wednesday, December 6, 6:30pm, Alumni Pool.

Women's Swimming*

Wellesley. Wednesday, December 6, 7pm, at Wellesley.

Varsity Hockey*

Tufts. Wednesday, December 6, 7pm, Skating Rink.

V & F Squash*

Trinity. Wednesday, December 6, 7pm, duPont Squash Courts.

Women's Athletic Council

Open meeting. Thursday, December 7, 5:30pm, Rm 32-137.

Varsity Squash*

Navy. Friday, December 8, 7pm, duPont Squash Courts.

Indoor Track*

WPI and Brandeis. Saturday, December 9, 12:30pm, Rockwell Cage.

JV/F Fencing*

Concord High School. Saturday, December 9, 2pm, duPont Fencing Rm.

JV/F Hockey*

Brooks School. Saturday, December 9, 2pm, Skating Rink.

Women's Fencing*

Concord High School. Saturday, December 9, 2pm, duPont Fencing Rm.

Varsity and Freshman Squash*

Wesleyan. Saturday, December 9, 2pm, duPont Squash Courts.

JV/F and Varsity Wrestling*

Wesleyan. Saturday, December 9, 2pm, duPont Gym.

Freshman and Varsity Basketball*

Bowdoin. Monday, December 11, 6:15pm and 8:15pm, Rockwell Cage.

Varsity Squash*

Army. Friday, December 15, 7pm, duPont Squash Courts.

Religious Services and Activities

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

Christmas Celebration Dinner

Open to all who want to celebrate the birth of the Lord. Saturday, December 9, 1pm. Call Ann Gauger, dorm X8-643 or 494-8327, if interested in attending.

Ananda Marga Yoga Society*

Yoga classes, every Thursday, 4pm, Student Center West Lounge. For information call 491-3691.

Campus Crusade for Christ/College Life*

Every Friday: 7pm family time; 8pm Open Book teachings. Rm 1-132.

Chinese Christians Fellowship*

Bible study, hymn singing, praying, sharing. Every Friday, 8-11pm, Student Center Rm 491.

Christian Bible Discussion Group*

Every Thursday, 1pm, Rm 20B-031. Call Prof. Schimmel, X3-6739, or Ralph Burgess, X3-2415.

Christian Science Organization**

Every Tuesday, 7:15pm, Rm 8-314.

Divine Light Mission*

Discourses on the direct experience of Truth given by Guru Maharaj Ji. Every Monday, Wednesday, Friday, 7:30pm, Rm 8-105. Call 369-1603 (Concord).

Hillel Activities*

Services: Monday-Friday, 8am, Rm 7-108; Friday, 8:15am, Chapel; Saturday, 9am, Chapel.

Hebrew table: Monday, 5:30pm, Kosher Kitchen. Talmud, in cooperation with Yavneh, Burton Seminar Rm: beginners, Tuesday, 8pm; advanced, Wednesday 8pm and Sunday 12n. Prayer class: every other Shabbat, 2pm. Jewish philosophy from Middle Ages to present, Monday, 7pm, Rm 5-231.

Rabbi Lawrence Kushner of Sudbury Temple Beth El on "Innovative Ways of Making Shabbat," Friday, December 8, 8pm, Chapel.

Meeting for all students interested in Hillel Hebrew classes during IAP, Wednesday, December 13, 3:30pm, Rm 1-203.

Rabbi Samuel Korff, Associated Synagogues of Massachusetts, will discuss "Birth Control and Abortion: A Halachic Interpretation," Sunday, December 10, 8:30am, 858 Walnut St, Newton. If interested in attending, call Hillel Office, X3-2982.

Hillel Office, 312 Memorial Drive, Ext. 3-2982.

Islamic Society*

Prayers, every Friday, 12:15pm, Kresge Rehearsal Rm B. Discussions on the Qur'anic interpretations of various aspects of life, every Saturday, 4pm, ISC Lounge, Walker 2nd floor, coffee served.

Latter Day Saints Student Association*

Religious seminars, every Tuesday, 8-9:30am, Student Center West Lounge.

Protestant Worship Service*

Every Sunday, 11am, Chapel.

Roman Catholic Masses*

Weekly masses in the Chapel: Sunday, 9:15am, 12:15pm, 5:15pm; Wednesday, 5:05pm; Friday, 12:05pm.

United Christian Fellowship*

Christians for Dinner. Food and fellowship. Every Wednesday, 5pm, Walker (at the sign of the fish). Followed by singing, praying, sharing meeting, 6pm, Rm 14E-303.

Vedanta Society*

Services, every Friday, 5:15pm, Chapel, followed by discussion hour, 6pm, Ashdown Dining Room.

Westgate I and II Bible Study**

Every Wednesday, 8pm, Westgate I low-rise Apt G-1. Call 494-8405.

Zen Society*

Meditation meetings. Monday through Friday, 8-9am, Chapel. Call 492-4945.

Announcements

Career Planning and Placement Meeting

For students interested in master's degree in business administration at Boston College. Peter Oliveri of the Admissions Committee will speak. Thursday, December 7, 2:30-3:30pm, Rm E19-455.

Premedical Students

Friday, December 8: Dr. William Fleeson, associate dean, University of Connecticut Medical School, 12n, Rm 7-100. Tuesday, December 12: Dr. David Scotch, New York University School of Medicine, 11am, Rm 4-159.

Creative Photography 4.051 Lottery

Lottery for enrollment in the class. To enter, sign up before Friday, December 15, in W31-310. Drawing will be held on December 15.

New UROP Listings

For more detailed information on UROP opportunities listed, MIT undergraduates should call or visit the Undergraduate Research Opportunities Program Office, Room 20C-231, Ext. 3-5049 or 3-4849. Undergraduates are also urged to check with the UROP bulletin board in the main corridor of the Institute.

APPLICON, INC.

Burlington

This new and growing company would like to meet students and faculty co-advisors interested in software for computer graphics. Their Design Assistant 700 TM uses PDP-11 with 1 or 2 scopes, hardcopy output devices, and a digitizing table. The inhouse software development group has a number of projects currently underway, and would like to meet students interested in the same topic.

WASHINGTON SUMMER INTERNSHIP PROGRAM

Students interested in the Washington Summer Internship Program should contact Prof. Christopher Schaefer, E53-367, x3-5264 or the Political Science Departmental headquarters, E53-450, x3-5262 before Wednesday, December 20th. Opportunities are varied depending on student interest. Past interns have worked in Congress with a variety of governmental agencies and law firms as well as public interest groups.

NOTE: UROP has moved and is now located in 20B-141. The telephone numbers are still Ext. 3-5049 and Ext. 3-4849.

Placement Interviews

Representatives of the following companies and institutions are scheduled to conduct recruiting interviews on campus this week. Students who wish to arrange an interview should sign up in person at the Placement Office, Room E19-455, Monday through Friday, from 9am to 4pm.

Wednesday, December 6: Action (Vista Peace Corps); 3M Company; Uniroyal Incorporated; Naval Research Laboratory.

Thursday, December 7: Action (Vista Peace Corps); 3M Company; Boston College School of Business Administration.

Friday, December 8: Firestone Tire and Rubber Company; National Security Agency.

NOTE: The above are the last recruiting interviews scheduled by the Placement Bureau until February.

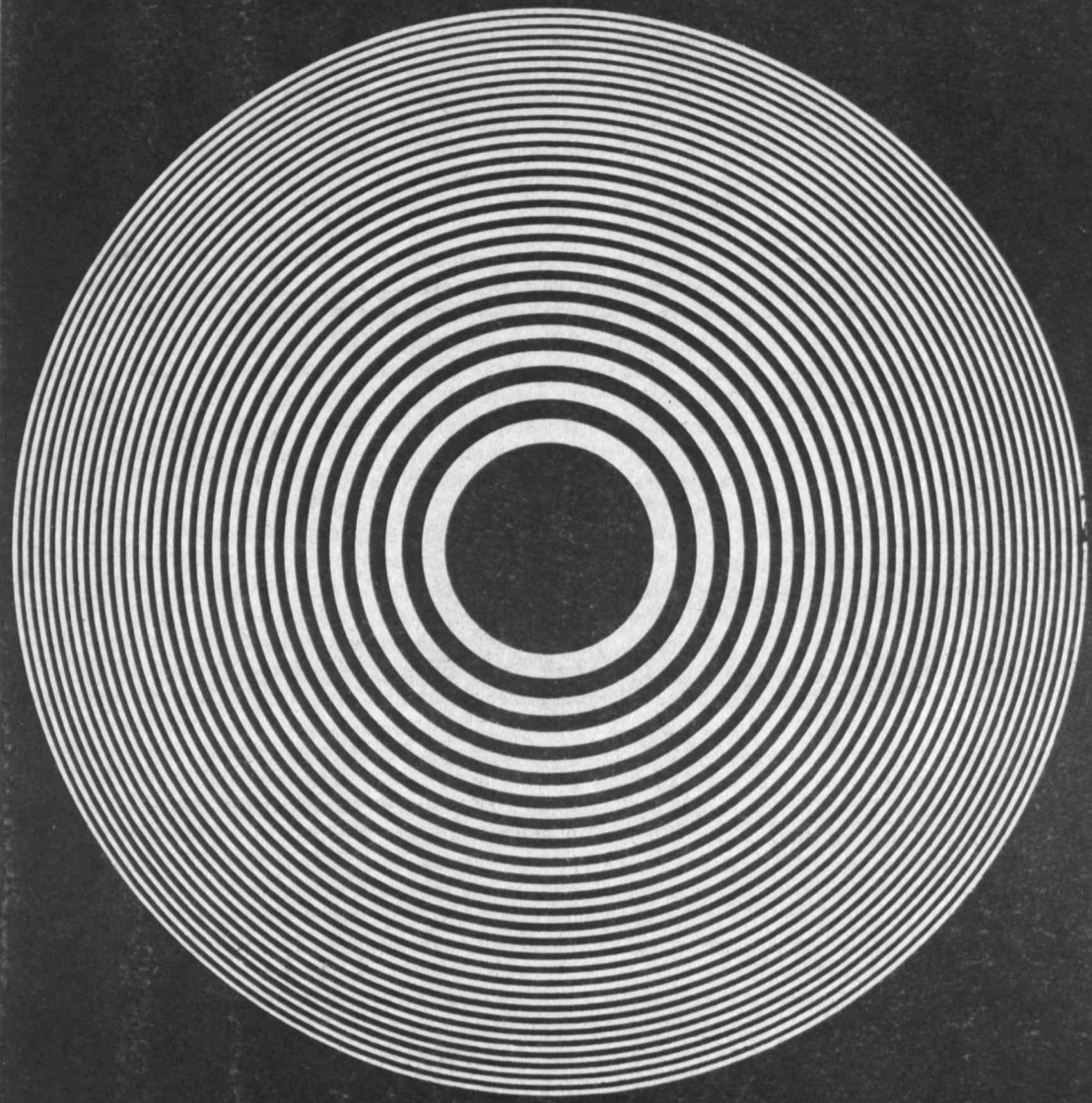
Student Employment

On Campus: Mechanical drawing work for Ocean Engineering; lab assistant in Mechanical Engineering; clerk in the Purchasing Office; weekend animal caretaker in Nutrition.

Off Campus: File clerk at New England Medical Center; warehouse and clerical work at United Parcel Service; data coding in Newton; busboys, doormen, porters for the Parker House in Boston.

Off Campus Work-Study Positions (open only to students receiving financial aid from MIT): Clerk typist in Cardiac EKG Lab at Massachusetts General Hospital; students in all majors at Hanscom Field; child care assistants at Technology Nursery School.

For details on these and other available jobs and how to apply, come in and see Kathi Mahoney, Student Employment Office, Room 5-119.



Ring the Lobby

An electronic celebration of the resonances of the MIT Building 7 Lobby and notable historical events of the Halcyon Advent Season by Paul Earls, Composer, Fellow of the Center for Advanced Visual Studies, with Charles E. Miller, Stroboscopist — An evolving multi-channelled recorded/live/electronic/environmental/participatory musical system operating weekdays at noon, 2, and 4 pm, with special performances at 5 pm, from December 4 through 15, 1972 — Special thanks to Bose Corporation, Tech HiFi, Pat Lee, Jim Kates, Steve Ringle, Bart Johnson, Roy Harvey — Presented by the Lobby 7 Committee

This poster was designed by Ralph Coburn of the Office of Design Services.

Earls Mini Concerts Reverberate in Bldg. 7

The lobby of building 7 has been reverberating with musical sounds, and will continue to do so through Friday, December 15.

Every weekday, for the next two weeks, there will be short 10-minute programs at 12noon, 2pm and 4pm, and a longer concert at 5pm.

The entire program, entitled "Ring the Lobby," has been arranged by composer Paul Earls, a fellow at MIT's Center for Advanced Visual Studies, and is being sponsored by the Lobby 7 Committee.

Historic events from past Decembers will be celebrated in the performances. For instance, Stra-

vinsky's "Symphony of Psalms," which was premiered in December, 1930 will be presented, the birthdays of the late Walt Disney on December 5, and composer Hector Berlioz on December 11, will be acknowledged, the abdication speech the United Kingdom's King Edward gave one December will be aired, and of course Christmas songs will be played.

The lobby is 100 feet high and has a reverberation time of over 7 seconds, which Earls plans to take advantage of with the use of a feedback system as well as music. In addition, there will be an electronic piano, films, strobe lights,

participatory systems and a kinesthetic sculpture.

Earls was born in Springfield, Mo., in 1934. He received the B.M. degree from the Eastman School of Music and the M.M. and Ph.D. degree from the University of Rochester. Before coming to MIT in 1969, he was a member of Duke University's music faculty.

Earls has composed electronic and conventional concert works, environmental sound works, films, theater music, exploratory multi-sensory systems and music encoding techniques.

All events are open to the public free of charge.

Where (Not) to Park In Snow Emergency

The MIT Committee on Parking has issued the following statement regarding parking during snow emergencies.

The City of Cambridge has increased the number of streets designated as "Tow Areas" during a declared snow emergency and violations carry a \$15 fine, a \$25 towing charge, and a \$2 per day storage charge. These regulations will undoubtedly affect the MIT Community.

The Monroe Street Parking Lot will be open to members of the MIT Community who do not have parking permits and usually park on the Cambridge streets. Students and staff who take advantage of this lot will not be required to remove their cars by 8am.

MIT may, at its option, declare a snow emergency before the City of Cambridge declares its emergency.

In the event of an MIT snow emergency, so that plowing can be accomplished, ALL OPEN PARKING LOTS WILL BE CLOSED FROM 5 PM - 7 AM. This includes East Open, Kresge, Sloan, Main, Annex (except for Medical), Ford Building, Building 48 and Briggs Field. Persons having permits for these areas may park overnight in the East, Albany and West Garages. Persons not having permits for the garages, however, must remove their cars by 8 AM.

All cars with Hayward stickers should park in the Hayward Street Garage.

There can be no parking at any time on Amherst Alley, from Danforth Street to Westgate.

A snow emergency will be announced on 253-SNOW.

The Committee on Parking urgently requests the cooperation of the MIT Community during a declared snow emergency. Our parking regulations will be strictly enforced and, in the event that compliance is not obtained, it may be necessary to increase our fine and tow schedules.

City to Try Sticker Plan

The City of Cambridge is initiating a trial program of parking stickers for residents of the area of Cambridgeport near the river.

Parking stickers will be issued to anyone whose motor vehicle is registered in Massachusetts upon presentation of the registration displaying an address in that section of the city. There is a \$1 fee for the sticker. Stickers are available from the Department of Traffic and Parking at 57 Inman Street.

According to Cambridge Traffic Director George Teso that area of Cambridgeport has been a problem for many years because of drivers from across the river who leave their cars all day.

Concert Band Plays Dec. 8

The MIT Concert Band will present its annual fall concert on Friday, December 8 at 8:30pm in Kresge Auditorium.

The Concert Band, directed by John Corley, has traditionally specialized in the performance of original contemporary works, many of which are commissioned specially for it. Works on the program which have been dedicated to John Corley and the Concert Band, by the composers, are: *Prelude and Happy Dance* by Andrew Kazdin and *Three Symphonic Movements* by Edwin London. The band will also present *Praeludium and Allegro* by Vittorio Giannini and *Trittico* by Vaclav Nelhybel. *Serenade Number 12* by Mozart will be performed by the band's wind ensemble under the direction of Felix Visuciglia, the assistant director of the band.

Pre-legal Institute Scheduled

Boston College Law School has announced its 16th annual Pre-legal Institute to be held at the Law School in Brighton, Saturday, December 9 from 9:15am to 1:15pm.

The Pre-legal Institute is designed to give college upperclassmen information about the Law School Admission Test (LSAT). It also provides students with a brief preview of the study of law and a glimpse at the life of a law student.

A panel of law professors and authorities on the LSAT will give students the opportunity for a discussion of selected aspects of the test. Techniques for taking the test, proper procedures for interpreting the scores and the overall meaning of individual scores will be discussed.

The discussion of the LSAT will be preceded by a sample class on torts conducted by Professor James W. Smith of the Boston College Law School.

Another panel will focus on the many changes in law school curricula and student activities. Finally, professors at the Law School will discuss opportunities for law school graduates in the legal profession.

All college upperclassmen are invited and no reservations are necessary. The Preprofessional Advising and Education Office, Room 10-186, will provide further details to interested students.

Personnel Offers Chance to Learn Technical Typing

The Training Section of Personnel will offer a new brief introduction to technical typing beginning next week.

The program is geared for new employees who have not had any training in this area but will be doing technical typing in their jobs. The two one-hour sessions will cover equation spacing and the use of the Greek alphabet.

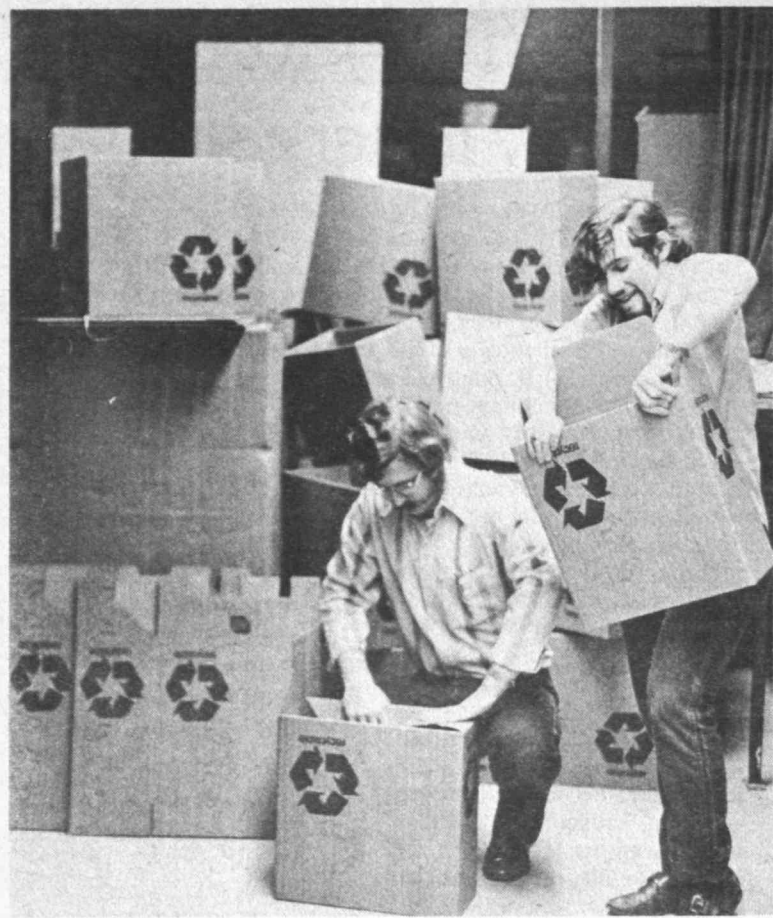
Initially, the course will be given every other week on Tuesday and Thursday from 4 to 5pm. The first class will be held Tuesday, December 12.

"We hope this program will facilitate the transition from business or academic work to technical work and will minimize the guesswork which goes into beginning technical typing," Bernard Morris, coordinator of skills training said.

Although the course is intended for new employees, anyone in the community who would benefit from it is invited to attend. Those interested may call Ext. 3-1912 to reserve a place.

Registrar's Reminder

Second term registration material for all regular students will be available in the Lobby of Building 10 on Monday, December 11, and Tuesday, December 12.



Volunteers were hard at work last week assembling and distributing the 5,000 cardboard waste baskets which will be used in the Institute-wide recycling program, to begin in a few weeks. Here, George Munroe, a sophomore from Newton and Fred Gross, a senior from Brooklyn, N.Y., find themselves surrounded by the fruits of their labor in the Ecology Action Office. Gross, chairman of Ecology Action and one of the instigators of the recycling effort, said that volunteers are still needed to help distribute the rest of the waste baskets. The program will begin after all the waste baskets have been distributed, sometime before the end of the year.

—Photo by Margo Foote

Arnold Air Society Conducts Wilkes College Book Drive

The Zeamer Squadron and MIT Angel Flight, organizations made up chiefly of Air Force ROTC students, are sponsoring a book drive this week in the Lobby of Building 10 to benefit the Wilkes College library in Wilkes Barre, Pennsylvania.

The Wilkes College Library was partially destroyed in last summer's Hurricane Agnes and books are badly needed to replace those lost.

The Zeamer Squadron and MIT Angel Flight are part of the Arnold Air Society which is conducting a nationwide drive to collect books for Wilkes College.

The booth in Building 10 will be open daily from 9am to 5pm. The students plan also to establish a book drop near Air Force ROTC headquarters in Building 20E which will receive books after hours and after the official drive closes.

Luria to Direct Major Cancer Laboratory Announced for MIT

(Continued from page 1)
for excellence in research that will attract brilliant young researchers eager to search for solutions to the problem of cancer."

The overall plan of attack of the

Sherwood Wins Warren K. Lewis ChemE Award

Thomas K. Sherwood, professor emeritus of chemical engineering at MIT, was the recipient of the Warren K. Lewis Award from the American Institute of Chemical Engineers at their annual meeting held in New York on November 27.

The Lewis Award, which carries a prize of \$2,000, is given in recognition of distinguished contributions to chemical engineering education. Established in 1963, the award honors MIT Professor Emeritus Warren K. Lewis who is recognized as the father of modern chemical engineering.

Professor Sherwood has taught at the Institute since 1924, serving as Dean of Engineering from 1946 to 1952. He is a graduate of McGill University and he received the S.M. in 1924 and the Sc.D. in 1929 from MIT. After his retirement from MIT in 1969 he became professor of chemical engineering at the University of California at Berkeley.

He is a founding member of the National Academy of Engineering and in recent years has been instrumental in bringing the Academy's advisory functions to bear on technical problems involved in air pollution control.

Professor Sherwood is widely recognized for his pioneering work in the understanding and development of mass transfer—the movement of solids, liquids, gases and mixtures under smooth and turbulent flow conditions. His book, "Absorption and Extraction," published in 1937, was the first comprehensive text in this area.

new Center will be to approach a number of research problems at the molecular biology level. This approach has been taken only at a few major institutions and at the National Institutes of Health. The research will be divided into four major areas—virus research, cell biology, immunology and cell development.

Certain kinds of viruses are known to cause cancer in animals and are thought to cause at least some forms of human cancer. Those viruses, and the cells upon which they act, provide a rich opportunity to try and determine exactly what biochemical processes lead to the production of cancer from normal cells.

Cell biology, in its broadest sense, will cover most of the research that will be conducted at the Center. Specific research on cell biology, however, will focus on the cell membrane. When normal growing cells come in contact with one another, communication across the membranes causes the cells to stop their growth. Research at the Center will be aimed first at determining why this communication does not work in cancer cells, and why the cancer cells keep growing even when they are in contact with surrounding cells.

Immunology studies will concentrate on specific chemical substances, called antigens, that are found on all cells but are changed when normal cells become cancer cells. Some of these cancer antigens can make their cells susceptible to killing by antibodies which are defense substances produced by the body. The immunology research in part will attempt to understand what biochemical mechanisms cause special antigens to appear in cancer and devise ways of enhancing the antigen-antibody reactions that may allow the body to destroy certain tumor cells.

Research on cell development will be carried out at the most basic level. The process that

allows a single cell to differentiate and develop into the various kinds of cells found in the body is still one of the profound mysteries of biology. Cancer often appears to involve a derangement of the normal process. Cell development research at the Center will concentrate on the differentiation and development of various kinds of blood cells, both normal ones and those that become leukemic.

No clinical studies are being planned at the Center for at least the first three to five years of operation. However, a clinical advisory committee will keep the researchers informed of recent clinical developments and possible clinical uses for the results of their basic research.

Dr. Luria was one of the pioneers of molecular biology and was the first to discover mutations in viruses which permit them to overcome immunological barriers. In 1969 he was awarded the Nobel Prize for Medicine or Physiology, shared with Dr. Max Delbrück of California Institute of Technology and Dr. Alfred D. Hershey of the Carnegie Institution of Washington, for basic research on viruses regarded as primarily responsible for modern advances in the control of viral diseases as well as advances in molecular biology.

Professor Luria was born in Italy, graduated from the University of Turin Medical School in 1935 and conducted research at the University of Rome and the Institut Pasteur and Curie Laboratory in Paris. He came to the United States in 1940 and served at Columbia, Indiana and Illinois Universities and Carnegie Institution. He was a lecturer at the University of Colorado and Notre Dame University and, on two Guggenheim Fellowships, did research at Vanderbilt and Princeton Universities. He was appointed professor of microbiology at MIT in 1959. Professor Luria makes his home at 48 Peacock Farm Rd., Lexington.

Cancer Center to Build on Decades of Research

Research on improved means of cancer treatment as well as on the basic causes of cancer has been conducted at MIT for decades.

John G. Trump, professor of electrical engineering and director of the MIT High Voltage Laboratory, has been working on the treatment of cancer for over 30 years. Using the high voltage electrostatic generator method brought to MIT in 1930 by Dr. Robert Van de Graaff, Trump designed one of the first million volt x-ray generators used in cancer therapy.

One of the major problems of treating tumors with high energy x-rays is how to eliminate a tumor deep within the body without seriously affecting surrounding healthy tissues. To overcome this problem, Professor Trump and his associates used carefully shaped beams of penetrating radiation and rotated the patient during treatment. The effect is to localize the dose on the tumor-invaded regions while minimizing the dose to healthy tissues.

Each day, more than 40 patients under the care of physicians from the Lahey Clinic in Boston are treated at MIT, using modern two and three million volt Van de Graaff accelerators.

Another form of treatment is

being developed by Dr. Gordon Brownell, professor of nuclear engineering and head of the physics research laboratory at Massachusetts General Hospital. He is directing a team effort to devise means to use the neutrons emitted by the five-million watt MIT nuclear reactor on a so far incurable form of brain cancer.

The principle of the treatment, called neutron capture therapy and now under experimental investigation in animals, involves the use of boron compounds which can enter tumors but not healthy brain tissue. When an atom of boron captures one neutron, it ejects an alpha particle, which travels only a very short distance and stops after destroying one or two cells of the tumor.

Besides developing means for treatment, major research efforts at MIT are devoted to discovering the basic causes of cancer.

Professor David Baltimore of the biology department has been working to determine how certain viruses cause normal cells to become cancerous. In 1970, Professor Baltimore identified a new enzyme in certain viruses that produce cancers in mice or chickens. This enzyme, which was independently discovered by Dr. Howard Temin of the University of

Wisconsin, was an important step in understanding how cancer-causing viruses work.

The function of the enzyme is to copy the information of the virus's ribonucleic acid, or RNA, to make deoxyribonucleic acid, or DNA, molecules that contain all the biological information of the virus. This DNA, it is believed, can become permanently established in the cells and ultimately produce cancer.

There are many unsolved questions about the virus production of cancer cells being studied in Professor Baltimore's laboratory. For example, although a virus is assumed to produce DNA in the host cell, virus-produced DNA has not yet been identified and its possible location in the chromosomes is under investigation. Another question is whether tumor viruses also hide in human cells. Although tumor viruses have been isolated from cells of non-human species, none has yet been found in human cells.

Phillips W. Robbins, professor of biochemistry in biology is examining the chemical differences between the cell membranes of normal cells and those that have been transformed into cancer cells by viruses.

One of the major differences be-

tween normal and cancerous cells is the way they grow among surrounding cells. Normal cells continue multiplying until they touch other cells. After they make contact, the cells cease multiplying—a phenomenon called contact inhibition. Tumor cells, however, are not inhibited by contact with surrounding cells, and this permits the wild growth characteristic of cancers.

The events that result in this contact inhibition are probably started by chemicals situated on the cell membrane. The first step in determining how these sites work is seeing what chemical differences exist between the membranes of normal and cancer cells.

Alexander Rich, professor of biophysics in biology, has been working for years to unravel the many steps by which genetic information contained in DNA molecules direct the production of proteins in the cell. In one of the steps, molecules called transfer RNAs help position the building blocks of proteins, amino acids, in their proper places in a growing protein chain.

Cancer cells contain transfer RNA molecules that differ from those in normal cells—some are new types, others are modifications of normal transfer RNA

molecules.

Professor Rich is now working on transfer RNA molecules in mammalian cells, using x-ray diffraction analysis to determine their crystalline structure. He will be analyzing the transfer RNA molecules from cancer cells, to determine how the molecules differ from those of normal cells and what role the changed molecules play in producing cancer cells.

Professor George Wolf, of the Department of Nutrition and Food Science, is trying to determine how large doses of vitamin A prevent the appearance of lung tumors in hamsters previously treated with cancer causing compounds. Other researchers have discovered that while a specific cancer-causing compound normally produces lung tumors in hamsters, large doses of vitamin A prevent the tumors from appearing.

Professor Wolf is examining the mucus-producing cells in the lungs and trachea of the hamster to determine the biochemical effect that both the cancer-causing compound and vitamin A have on those cells. He is also trying to find why certain skin tumors that can be induced in rabbits regress when vitamin A acid is applied to them.

CLASSIFIED ADS

For Sale, Etc.

Frieden & Marchant calculators, add, sub, mult & div w/accumulation capability, many other capabilities incl storage, all gd cond, offers over \$20 considered. X3-5156.

Full sz bed, inner spring matt & foundation, frame, \$50; air cond, 14,000 BTU, Chrysler Airtemp, \$150. Rosalind, X3-2153.

Sansui 4000 AM/FM stereo rcvr w/wal case, 6 mo old, \$300. Dave, Dorm X0-255.

Ski bts, woman's 7 1/2 buckle, \$25; 200cm wood skis w/bndgs, \$10. Call 492-2612.

Imported oriental stoneware, coffee sets, tea sets, vases, cups, Tings, etc, low price, ideal Xmas gifts. Call 924-6422 eves.

Oriental rugs: Afghan Bokhara, 5x3.8, \$115; Afghan, 6.7x3.5, \$135; Katchli Bokhara, ivory background, 6.2x4, \$250. Joe, X3-3356.

Garrard 40B trntbl w/Grado FCR cart, free hdphones, exc cond, yr old, \$30. Dominique, X3-4476.

Caravelle lace woman's ski bts w/trees, 8; Koflach man's 11 1/2 buckle; wd skis & 54" poles; Argus C-3 35mm camera; Yashica 44 TLR; Graflex slide proj w/Airequipt magazines. Stu, X3-1418.

Canon TL-QL, 35mm SLR w/f1.8, 50mm lens, sec to 500th shutter, thru the lens mtr, case, asking \$120, Coop price \$180, lk new, used 3 times; Sony 255, 3-head stereo tape deck, exc cond, \$110. Jerry, X3-2422.

Humanic Dynafit ski bts, man's 10 1/2, rarely used, \$15. Gary, X3-3726.

Movie light bar, 4 bulb; assort hand tools; 3 gal vaporizer; 2 buck saws; wicker fruit baskets; ship clock; any reas offer accepted. X7454 Linc.

GE Trimline 500 port stereo, v gd cond, list \$100, asking \$50. Ken, Dorm X9-264.

Gdyr Suburb snows, XG78-14, w/ht wall, used 3 mo, orig cost \$75, w/ sell for \$35. X3-2726.

Bose 901 system; Marantz 1200 integrated amp, 100/100 rms/chan; Marantz 120 tuner; Dual 1229; make offers. Willy, Dorm X8-377.

Advent 100A Dolby, \$175; Sony 355 tape deck, \$125; Advocate 101, \$80; Scotch low noise tape. Call 232-6021.

Firestone Twn & Country snows, 2, dbl striped ww, E78-14, used 1 seas, 1 nds tube, make offer. Sandy, X3-4342.

Pr unpaint corner china cabinets, new, \$25 ea or \$45/both. X3-2164.

LR sofa & chr w/slip covers, \$35; recliner, \$30; If LR wall mirror, \$20. X3-3103.

Six church pew ends for benches, etc, offers. Wilson, X3-5121.

Jensen 12" Flexaire woofer, 8" mid-range horn tweeter, 2 ea, \$40 for all; Bel, 5-rm unfurn apt, 1st fl, nr Cushing Sq, pking nr T, avail 1/1, \$250/mo. X8-4430 Draper.

Guild Jet Star bass, \$125; Ampeg B-15N bass amp, \$150; both perf cond, both \$250. Ken, Dorm X9-632.

Wooden skis, 195cm, br new, \$20. X3-6887.

Polaroid camera mod 350 w/flash, used 3 times, best offer over \$60. Vikki, X3-4563.

Pr studded snows, 8.50-9.00x15, exc cond. Eric, X3-7210.

Hockey skates, 10, new cond; wnted: corner china cupboard. David, X3-5671.

Kent elec guitar w/case; 140w amp w/2 10" Jensen spkrs; Shure PE57 mike w/stand; new Remington rechargeable shaver. Peter, Dorm X8-623.

Ladies genuine rabbit fur coat, w/ht w/brn spots, 10-12, worn twice, furrier will store & service, \$250. X3-7024.

Whitney console piano, Kimball, mahog, 10 yrs old, beaut cond, \$495. Armente, X7374 Linc.

Hotpoint wash mach, exc cond, \$22; kng sz sheets & pillow cases, w/ht Percalé perma-press in orig, sealed pack, \$6 & \$2.75; hi domed elec fry pan, 11"x17", alum, Teflon lined, nv used, orig \$28, now \$20. Jeannie, X8-2577 Draper.

Sunapee Region 5-acre wded lot, 10 min to Rte 89 & Lk Sunapee, walk to King Ridge ski area & state forest, 200' frontage on town rd. Gilbert Brown, X3-4204.

Lv country, various home furn & appliances for sale. Vicki, X3-6615.

Sony 6055 stereo, 30w/chan, \$230; Dual 1218 w/Shure M91E cart, \$130; JBL spkrs, L88's, \$330; all less than 4 mos old. Phil Mandel, X3-3161.

Tasco 7TE-5, 500 pwr telescope, fl, 1000mm, aperture 60mm, lk new, \$100; Minox daylight dev tank, \$10; Grado tone arm, \$10. Bruce, X3-2525.

Seely Slumberland Riviera firm matt, w/box spr & frame, dbl, used 2 mos, \$85. Jim Peers, X3-1423.

Cipher elec guitar, exc cond, \$40. Thad, X3-6221.

Kenwood 4066 3 head tape deck, list \$200, w/ sell at \$120. Dorm X8-658.

Corner china cabs, 2, \$20/ea. Peter, X7284 Linc.

Bolox Macro Zoom 155 super 8 movie camera, 30mm, f1.9 zoom lens, minimum focus 1', elec drive, fully auto, case & access, new \$300, asking \$100. Don X8-3333 Draper.

Man's hand knit sweater, royal & navy blue, nvr worn, pullover, 42-44, \$30. Denise, X633 Linc.

Twn & Cntry studded snows, 2, 7.50x13, \$25. Bernard, X8-1376 Draper.

Frigidaire frost free refrig; BR set; Singer touch & sew mach. X3-6994.

Vehicles

'60 Aston Martin DB-4, gd cond, bronze w/red leath inter, 24K on rebuilt eng, spottl, cover & shop man incl, stored in winter, asking \$3000. Craig, X695 Linc.

'64 VW convert, eng bad, some rust, \$130. Call 262-2536.

'64 Morgan, 1600cc Cortina eng, runs, nds work, \$700. Karen, X3-4711.

'64 Chevy convert, new tires, runs well, nds new crossover pipe, \$100. Phil Konop, X8-4047 Draper.

'66 VW Sqbk, R&H, new br, batt, snows, 3 extra tires, dented side, \$625. David, X8-3677 Draper.

'66 Chevy II, runs well, nds body windshield wiper work, \$100. Dale Jones, X3-5355.

'66 Shelby America, drk grn, classic, \$900. J. MacDonald, X3-7048.

'67 Renault R10, \$399; '71 Honda 100, \$250; Suzuki T500/S, \$550; BAS 250, \$75. Call 1-663-3139 eves.

'67 Mustang V-8, auto, p-disk br & st, AM/FM, snows, buckets, 53K, vinyl rf, \$850 or best. Jane Anne Simpson, X7195 Linc.

'68 Valiant, less than 50K, warr, 225 eng, auto, immac mech cond, perf body, paint, inter, AC, p-st, R, new tires, snows, \$1200. David, 661-9652.

'68 VW Sqbk, R&H, gd cond, \$650. X7861 Linc.

'68 Int'l van, 12' walk-in, exc cond, low mi, \$750 or best. John Leone, X8-3566 Draper.

'69 Dodge Polara wgn, 318 V-8, auto, p st & br, rf rack, new ww, \$1195 or best. X8-1415 Draper.

'69 Datsun pickup truck, 48K, R & H, exc value, \$875. X3-5708.

'69 Renault 16, 4 dr sedan, 32K, radials, new muffs, fuel pump, br, carb, orig owner, \$900. X3-7492.

'69 Ford Country Squire wgn, p-br & st, exc cond in & out. X3-6702 or X3-7808 eves.

'69 Austin America 4-5 psgr, auto, exc cond, \$750 firm. X8-4449 Draper.

'69 Triumph GT6, new tires, exhaust, br, fresh tune up, 4 spd, AM/FM, exc cond, \$1200; '71 Alfa Romeo GTU, 15K orig mi, AM/FM, heat rear window, 5 spd, TOSI traction, fuel inject, Pirellis, \$3500. Marilyn, X3-4112.

'70 Camero, 350 V-8, auto, vinyl top, rear window defrost, 29K, \$2200. Mack, X8-3603 Draper.

'71 Impala convert, V-8, snows, all pwr, 30K, gld, \$2000. X3-5274.

'71 Pinto Runabout, 28K, 2000cc, 4-spd, air cond, mag whs, deluxe int, AM/FM, exc cond, \$1750. Sorensen, X5404 Linc.

'72 Ply Duster, 340 Hurst, 4-spd, 2-dr hrdtp, green w/bl stripes, lg tires, 7.5K, must sell, back to school. Jeff, X8-4093 after 4pm.

Raleigh Sprite 27, 5 spd men's bike, exc cond. Lloyd, Dorm X9-465, lv msg.

'71 CZ motorcycle, gd for road & trail riding, v gd run cond, asking \$395. X3-6842.

'72 K2, 750 Honda, org metal flake, guarr, rack & back rest, exc cond, \$1650. Gy, X8-5597 Draper.

'69 Sea-Doo mod 372, 25hp inbd water-cooled eng, all fiberglass const, turbine-jet drive, v safe, trlr incl, \$595 or best, wd consider trade for snow-mobile. X3-5778.

Housing

Bk Bay, apt sublet for Jan or Feb, beaut & mod, perf for cpl, 1 lg BR & 1 sm BR, frpl & carpeted, furn optional, negotiable for \$330. Call 261-5893.

Bk Bay, Bcn St, 10 min walk to MIT, sublet, avail 1/1, lg stu, exc, quiet bldg, newly painted, w-w carpet, mod K-nette & B, incl all util exc elec, \$150/mo. X3-3737.

Camb, Fairweather St, 5-rm apt, 1st fl, 5 min to Harv Sq, avail now. Frank, X8-4458 Draper.

Camb, 1-BR apt, K&B, w-w carpet, avail immed X3-1805.

Camb, Brattle St, 2 BR, tile B, dish-disp, back yard, \$245/mo, MIT people only. X3-7026.

Chelsea, 4-rm apt, exc loc, all utils, immed occup, \$185/mo. Tony X5713 Linc.

Med, 7 rm snl hse; 4 BR, mod B, conven hillside area, mid 20's. John K., X8-3528 Draper.

N Camb, furn apt, 2 rms heated, all util, working woman, \$140. X3-6714.

Wakefield, office/stu apt, lg, completely mod, 2 BR, 2 B, frpl, separate K, attached gar, must be seen, ideal for semi-retired professional, adults, no pets, \$500/mo. X3-3104.

Conway, NH vic, new chalet nr 7 ski areas, sleeps 8; also lge hse, sleeps 20, wkend rentals. X8-2476 Draper.

Cuttingsville, Vt, ski hse, 1/2 season membership avail, beau hse, exc cuisine. X3-5915.

NH ski chalet, avail wkly. X8-4415 Draper.

Weston, Vt, nr 4 maj ski areas, new log hse w/frpls, mod fac, sleeps 10, season members, holiday rentals, wkend guests. X477 Linc.

Animals

Pony, 11 hands, v gentle, w/ or w/o tack & 11x10' stained carriage hse-style barn, living country 1/15. Andy, X383 Linc.

AKC bl Great Dane pups, 8 wks, champ & show quality, shots & wormed, m, 2 f, w/papers. A. Jones, 427-2840.

Guinea pig, cuddly, w/ht & brn w/cage, \$5. X3-7195.

Blk mini poodle, 6 wks, AKC papers, best offer. X8-2004 Draper.

Free, 8 wk old kittens, 2 calico, 1 blk/wht, 1 tabby. Anne, X3-7819.

Purebred mini dachshunds, br, paper trained, 7 wks old, parents on premises, \$80. Frederique, X3-2933.

Wanted

Fixtures for 4' fluorescent bulbs. Kornfeld, 661-9698.

Grille for '67 Chevy Impala. Dave Bufford, 267-7287.

IEEE Transactions on circuit theory, '70 & '71. Jonathan, X3-2351.

Gd used 5 string banjo. Kerry, X3-5095.

Car-pool, to start or join, Fram to MIT. John, X3-1825.

Ride from Brkln Vill, Rt 9 & Harv St to MIT daily, w/ share expen. Linda, X8-2471 Draper.

Girl's ice skates, 3-4; w/ do typing on IBM Selec, fast & accur, reas rates. Diane, X3-5123.

Rmmt, gd loc nr NU for approx 3 mo begin Jan, mod apt w/own rm, \$70/mo, w/3 others. John, X8-2876 Draper.

Old, 8x10 view camera. Steve, X3-2926.

Fem rmmt to share 2 flr apt nr Cent Sq, \$58/mo plus util. Fran, X3-1608.

Coffee hostess for Tuesdays, 2-5:30pm. Debbie, X3-4642 or Rm 4-209.

Shop manual for '62 Falcon van, to buy or use; also typist, \$3.00/hr for 60wpm. Ed Weinberger, Box 3340 Baker Hse.

Miscellaneous

Part time management jobs avail, 1 or 2 nights/wk. Ronald, X3-5285.

Wl swap Windsor for Albany pkgng strk. Elaine, X3-2234.

Eastgate wife w/ babysit wkday morns in her own apt. X3-5305.

Cross country skiing, day touring/racing this winter, interested in sharing expen. Jim Miller, X3-5095, rm 3-470.

Wd flrs sanded & refin professionally. Denny, X3-5606.

Grad stu wife, mother of 7 mo old, w/ babysit fulltime in her Westgate apt. B. C. Jain, X3-5348.

Positions Available

Office Biweekly

Secretary IV for two fast-paced research groups, consisting of research staff, graduate and undergraduate students, and technical support personnel. Technical typing experience and shorthand desirable to handle correspondence, typing and proofreading of articles for publication, reports, etc. Secretary will schedule appointments, file, process requisitions. Discretion and initiative important; ability to deal with a number of people; experience important.

Secretary IV will run one-secretary office for three professors, one of whom is a faculty counselor. In addition to duties of correspondence, filing, phones, arranging meetings, manuscript typing (technical and non-technical) secretary will also maintain student records and files, handle registration problems. Secretary needs ability to work with details, to deal with students, to take some shorthand or speedwriting, and to be able to work independently.

Biweekly 3-4251

Hourly

Tech A (EI'c) An individual who assists in laboratory, research, or analytical work under direction or supervision of scientific personnel. Operates highly technical experimental apparatus. Has demonstrated considerable skill and good performance in the particular field of activity. Requires some supervision. To install and assemble fast electronic circuitry and related components. Must be thoroughly familiar with integrated circuits. Must have familiarity and experience with techniques of fast electronics, coincidence circuits, discriminators, and pulse height analyzers. Experience in making and assembly of transmission cables is required.

Hourly Ext. 4268

Lincoln Laboratory

Secretary III for technical office to work for several staff members. Good typing required as well as proficiency in grammar, spelling and punctuation, shorthand unnecessary; secretarial school background or equivalent experience desirable.

Technical Illustrator to prepare drawings of charts, graphs, maps, schematics, etc. from rough sketches or verbal instructions. Minimum of one year's experience required in drafting and ink work, including use of Leroy equipment.

Jane Notaro, Ext. 7305 Lincoln



Professor Jerrold Zacharias, center, demonstrates a science teaching device to Professor Tsien Jen-Yuan, left, and Mr. Li Fu-Sheng, right, two members of the Chinese delegation. —Photo by Marc PoKempner

MIT Plays Host to Chinese Scientists

(Continued from page 1) and Sciences, and a visit to Harvard on Monday.

The visiting delegation is headed by Dr. Pei Shih-chang, Director of the Institute of Biophysics of the Chinese Academy of Sciences, and a member of the Standing Committee of the National People's Congress and of the Presidium of the Scientific and Technological Association of China. Pai Chieh-fu is deputy head of the delegation and a member of the Scientific and

teacher of Nobel Prize winner C.N. Yang; Dr. Ch'ien Jen-yuan, one of China's leading polymer scientists, associated with the Institute of Chemistry; Dr. Ch'ien Wei-ch'ang, a specialist in dynamics and jet propulsion and a professor of mechanics at Tsinghua University; Hu Shih-ch'uan, a member of the Chinese Technical Association Presidium and of the Peking Municipal Bureau of Science and Technology.

Other scientific members of the delegation include: Dr. Chang Wen-yu, a specialist in high-energy physics and the former Academy of Sciences' Institute of Biochemistry; and Li Fu-sheng, deputy head of the External Equipment Laboratory of the Institute of Computing Technology.

After being greeted by President Wiesner, the visiting scientists split into three groups for site visits in the areas of their special interests. The groups were escorted by John Buchanan, professor of biology, Kerson Huang, professor of physics, C.C. Lin, Institute Professor and professor of mathematics, and T.Y. Toong, professor of mechanical engineering.

Among others the scientists talked with during their day at MIT were: Gobind Khorana, Malcolm Geffer, Uttam Rajbhandary, Salvador Luria, David Botstein, David Baltimore, Alexander Rich, George Benedek, Jerrold Zacharias, Philip Morrison, Samuel Ting, Irwin Pless, Robert Hulsizer, George Clark, Bernard Burke, Benjamin Lax, Ronald Probst, Ain Sonin, C. Forbes Dewey, Jr., Arthur Ippen, Sergio Montes and Harvey Greenspan.

Laboratories visited included the National Magnet Laboratory, the Center for Space Research, the Bubble Chamber Group, the Combustion and Propulsion Laboratory, the Fluid Mechanics Laboratory and the Parsons Laboratory for Water Resources and Hydrodynamics.

Charities Drive Shows Growth

Members of the Institute community have donated a total of \$112,010.78 to the 1972/United Fund United Black Appeal campaign to date.

Now in its sixth week, the drive will continue until Friday, December 15. Members of the community are urged to make their donations, either by cash or payroll deduction, as soon as possible.

At the end of the campaign's fifth week, the following totals were recorded: 3,429 gifts to the United Fund totalling \$94,513.42 with an average gift of \$27.56; 904 gifts to the United Black Appeal totalling \$17,497.36 with an average gift of \$19.35.

An additional 21 gifts totalling \$296 have been given directly to the Florence Crittenton Hastings House, a home for unwed mothers, which until this year received United Fund support.

Thefts Reported

An Execuport 300 computer terminal and a Tektronix 454 oscilloscope were taken from the Artificial Intelligence Lab between 3:40pm, November 25 and 4:45pm, November 26. The staff of the laboratory will be grateful for any information helping to locate and reclaim the equipment. Please call Ext. 3-6765 or 3-2996 if you have such information.

ASH Group Studies Effect of Smoke on Non Smokers

Spurred by a report last spring by the Surgeon General suggesting that non-smokers exposed to smoke suffer many adverse effects, a group of administrators, faculty and medical personnel have met to investigate the situation at the Institute.

Members of the group included Professor David Wilson, Dr. Warren Point, Dr. Albert Seeler, Vice Presidents John Wynne and Philip Stoddard and Dean Benson Snyder. Although no new regulations came out of this first meeting, the participants agreed that it is necessary to alert the community, especially smokers, to the offense taken by many non-smokers to the presence of smoke. halls, Professor Wilson said that he has a supply of no-smoking signs, put out by ASH, which are available for a small fee.

Professor Wilson, a former smoker himself, says that many smokers are unaware of the discomfort they cause others. He, Dr. Point and Dr. Joseph Keenan of MIT are members of the New England region Action On Smoking and Health (ASH), a five year old legal action agency representing non-smokers.

ASH is responsible for the Federal Communications Commission decision requiring free broadcast time for antismoking messages. The national group is presently working on a write-in campaign to the Civil Air Board asking that airlines delegate certain sections of their planes as non-smoking areas.

On campus, Professor Wilson has suggested that a vote might be taken before classes at the beginning of the term, before faculty meetings and in offices where several people work together to determine whether smoking will be allowed in the area.

Last spring ASH submitted a petition to the administration requesting no-smoking areas in the Institute's dining halls. No-smoking signs went up in Lobdell, Walker and Ashdown dining halls and Professor Wilson says that the reaction has been good.

"The only problem we've had," he says, "is people stealing the signs. I guess there is a demand for no-smoking signs." Instead of taking the signs out of the dining

Careers Forum Is Scheduled

(Continued from page 1) lead by Lotte Bailyn, associate professor of management, focusing on the panel members' personal aspirations, accomplishments, impressions, and opportunities for women in the professions.

Members of the panel will be: Dr. Carola B. Eisenberg, dean for student affairs; Mary C. Potter, associate professor of social psychology and city planning; Sheila E. Widnall, associate professor of aeronautics and astronautics; Arleen Feng, a senior in architecture; Lissa A. Martinez, a freshman; and Beverly J. Ross, a sophomore in mathematics.

Following the formal program, the visitors will tour the campus and various Schools with MIT undergraduate women. The conference will conclude at an informal get-together in McCormick Hall.

Geophysical Theory Opens New Vistas

(Continued from page 1) has a magnetic memory," Professor Toksoz writes. "If one knows the age of formation of a particular stratum, one can measure the local direction of the earth's magnetic field at that date in the past." This is because as volcanic rock cools in the presence of a magnetic field, there is a certain temperature—about 500 to 800 degrees centigrade—at which its iron content acquires a permanent magnetism, providing a record of the local field's direction at the time the rock was formed. Scientists have known for some years that the earth's magnetic field has reversed itself many times during geologic history.

When paleomagnetic concepts were applied to studies of ocean bottoms, Professor Toksoz said, it was found that the sea-floor was in fact spreading. There is a continuous mid-ocean ridge in the Atlantic, with a central rift valley and with little or no overlying sediment. This lack of sedimentation, given the assumed age of several hundred million years for the Atlantic, was unexpected. Magnetic surveys across the Atlantic, made from the surface, recorded a symmetry in the sea-floor with respect to the mid-Atlantic ridge, and it became clear that as one moved farther from the central ridge, the rock of the ocean floor—not the sediment but the igneous floor itself—got older. "So the sea floor was being continuously created at the ridge, and from there it was pushed outward to make room for new crust—like a pair of diverging conveyor belts," Professor Toksoz writes. "Thus, the Atlantic bottom turns out to be about 200 million years old at the edges and quite new in the middle."

Seismological studies, Professor Toksoz said, have shown that the mid-Atlantic ridge is part of a worldwide pattern of earthquake activity, and study of the foci of such earthquakes have definitely shown that the two halves of the oceanic crust on opposing sides of the ridge are moving away from each other. The spreading velocities have been calculated to be between one and ten centimeters a year, so that any two points on the diverging plates could be moving away from each other by as much as 20 centimeters a year. Professor Toksoz writes: "There has been a very concentrated effort, using both ground-based observations and satellites, to see whether the Atlantic Ocean really is getting wider. Before the end of this decade, some truly convincing data will emerge from these studies."

The question remains, if new crust is being created at mid-ocean ridges, what happens to the old crust that has been pushed to the edges? There is evidence to suggest that at certain places the plates bend downwards and descend back into the mantle. Seismology has in recent years made enormous advances in scope and precision because of sensitive detectors and large seismic arrays that can pinpoint the sources of even extremely small seismic disturbances. "The arrays employ radio telemetry and computers in such a way," Professor Toksoz writes, "as to constitute in effect a kind of acoustical telescope, constantly watching the interior of the planet."

The ocean ridges are characterized by shallow earthquakes, less than 100 kilometers deep, while the

deep trenches, where the plates bend down into the earth, are the sites of both shallow and deep quakes that extend down to a depth of some 700 kilometers. Given the size of the huge crustal plates slowly being thrust deep into the earth, the question arises why these deep quakes invariably stop at a depth of 700 kilometers.

"The most probable answer," Professor Toksoz writes, "is that as the material descends into a progressively warmer medium, it gradually heats up and loses its identity and becomes assimilated into the mantle. The quakes are symptoms of stress concentrations in rigid materials and thus will occur only where the descending lithosphere is cool and rigid."

This sea-floor spreading and the creation of large plates in motion, Professor Toksoz says, control most of the world's earthquake activity. "With about eight such plates, one can explain about 90 percent of the observed earthquakes."

He adds: "The understanding of the lithospheric plate motions has many visible and practical consequences, in addition to its scientific significance. The northeasterly motion of the Arabian Plate is responsible for the opening of the Red Sea and for the numerous destructive earthquakes of southeastern Turkey and southern Iran. The well-known San Andreas Fault and the associated California earthquakes are related to the northerly movement of the Pacific Plate. Our understanding of seismicity and ability to predict earthquake risk in a given region can be enhanced greatly by our ability to calculate stresses due to plate movements. Such calculations are becoming feasible today."

Athletic Activity up 16 Percent, Keeps Growing

Athletics is a booming activity at MIT and there are signs it is continuing to stretch.

Last year, a total of 5,712 players on 611 teams took part in the 19 sports in the intramural program, according to statistics from Ross H. Smith, athletic director. This winter, the number of intramural basketball teams rose from 91 to 102 and hockey teams increased from 51 to 53.

Altogether, 4,905 persons enrolled in 48 physical education courses last year, a 16 percent increase over registrations of the previous year. Registrations for athletic activities in last year's Independent Activities Period were up 22 percent.

Professor Smith reported that 25 percent of male undergraduates and 25 percent of MIT women students take part in intercollegiate sports.

The hustle and bustle in athletics is reflected in demands on physical facilities. Equipment manager John H. Murphy and his staff hand out about 1,200 towels every day. And last fall, more than five miles of football lime lines were put down each week by physical plant crews under the direction of Allen F. Bianco, assistant foreman of physical plant and top man responsible for athletic facilities.