

## Faculty Policies Redefined

Changes have been announced in published MIT policies dealing with certain faculty appointments, with the rules of tenure, with leaves of absence and with the definition of years of service.

President Jerome B. Wiesner announced the changes in a letter to the faculty last week. The changes, he said, were initiated by the Staff-Administration Committee and were approved by the Faculty Committee on Educational Policy and by the Academic Council.

Some of the changes are to bring official policy statements into line with previous decisions on equal employment opportunity.

One change limits to seven years the period that an Assistant Professor may be continued in that rank without promotion. Under previous policy no one could remain at or be appointed to the rank of Assistant Professor beyond the age of 37—a policy that could be interpreted as being discriminatory on the basis of age. The old policy was rescinded by Presidential letter some time ago.

(Continued on page 6)

## No Tech Talk Next Week

In observance of Independence Day, the Institute will be closed on Monday, July 3, as well as on Tuesday, July 4. Classes are cancelled for both days and only those employees needed for essential operations will be required to work.

Tech Talk is also taking a vacation. There will be no paper on Wednesday, July 5. The weekly publication schedule will resume on Wednesday, July 12.

Have a good holiday.



SOMETHING'S MISSING—Two explanations offer themselves for this isolated wheel chained to a bicycle rack near the MIT west campus. Either the owner forgot the combination to the lock, or the thief forgot his chain cutters.

—Photo by Margo Foote

## Education Bill May Benefit Institute

MIT could receive up to \$1.5 million in general aid under the omnibus higher education bill signed by President Nixon last Friday, June 23.

Institute undergraduates could receive up to \$25,000 annually in direct aid. The bill continues present federal scholarships, direct loans and work-study stipends for three years and it also creates a broad new program of scholarships (Basic Educational Opportunity Grants). MIT undergraduates annually need nearly \$6

million in financial assistance.

Chancellor Paul E. Gray said he was "relieved and gratified" by the bill's approval. He admitted it is impossible to determine just how large actual appropriations will be.

Uncertainty over the implications of the education bill arise because the actual appropriation for the bill will not come for some time. The measure President Nixon signed last Friday sets only maximum authorization levels and not appropriations, which still must be dealt with under separate legislation.

The legislation makes it national policy that every college student who cannot afford the cost of his education would get some financial assistance away from any graduate school or public under-

The legislation makes it national policy that every college student who cannot afford the cost of his education would get some financial help from the government. The bill in addition, will take federal financial assistance away from any graduate school or public undergraduate college that discriminates against women in its admission policies.

Under the provisions of the bill, the nation's colleges and universities could receive a maximum institutional aid of \$1 billion a year in grants to be used at the schools' discretion. Forty-five percent of the money would be apportioned among schools on the basis of the number of students attending each school who receive Basic Educational Opportunity Grants. Another 45 percent would be allocated on the basis of the aggregate amount of Educational Opportunity Grants, Work-Study and National Defense Educational Loans paid to students at each

(Continued on page 6)

## MIT Asked to Study Oil Drilling

Two government agencies, one concerned with the New England economy and the other with its environment, have asked MIT researchers to study the environmental and economic consequences of drilling for oil 100 miles off the New England coast.

No one knows for certain that there is oil in the almost two mile thick sedimentary deposits in the offshore area known as the Georges Bank. But the potential looks good enough so that oil companies would be willing to drill exploratory wells into the Bank. Before any such exploration begins, however, a host of prelim-

(Continued on page 7)

## Bodman Elected to Foundation Board

Dr. Samuel W. Bodman III of Wellesley has been elected a director of the MIT Development Foundation, Inc.

He was elected to the board of the Foundation by the executive committee of the Corporation which recently established the Foundation as a private Massachusetts charitable corporation for the purpose of furthering understanding of technology transfer through research, teaching and

active participation in the formation of new enterprises.

Dr. Bodman, an MIT alumnus, is vice president for corporate development of Fidelity Management and Research Co., Boston, and vice president and director of FMR Development Corp. He is a past technical director of American Research and Development Corporation.

He also serves as a director of several other corporations.

The MIT Development Foundation, Inc., is supported by an initial grant from MIT and through gifts from individuals and organizations who are interested in advancing the useful application of technology. President of the Foundation is Richard S. Morse, senior lecturer in the MIT Sloan School of Management. Foundation offices are maintained at 50 Memorial Drive, Cambridge, on the main campus.

## Group to Plumb Forces that Shape Oceans

Albert Einstein, no mean scientific intellect, was reputed once to have enjoined his fellow scientists to bore holes in the plank of nature where it was thinnest.

He meant, it was widely assumed, that science progresses by answering the easy questions before tackling the knottier ones. Now, with the support of the National Science Foundation and the Office of Naval Research, oceanographers from some 15 different institutions are planning a major experiment in a part of the world that is five kilometers thick—the mid-ocean.

The experiment is not only audacious but canny. MODE, which stands for Mid-Ocean Dynamics Experiment, has another aim besides beginning to clarify the still largely mysterious forces

that shape the oceans' overall behavior. In a time when big science is running up increasingly bigger bills, the MODE experimenters are trying to see if a series of experiments—all of which can stand on their own and are worth doing separately—will add up to more than the sum of their parts when done together in a planned and comprehensive manner. This notion is plausible but by no means self-evident. If it is right, however, it is likely not only to advance our knowledge of the mechanisms which control the fluid that covers three-fourths of the globe, but also to change significantly the practice of oceanography itself.

The problems that face physical oceanographers are nearly as vast as the seas themselves. By and

large only surface currents have been charted. What little is known about the flow patterns of the deep ocean rests on the results of single experiments, generally using only one type of instrument. Water is opaque to all sensing techniques but sound, and in any case experimenters are hampered in many ways by being at the top rather than the bottom of the system they wish to study, the reverse of the meteorologist's situation. A pressure gauge, for example, that is both sensitive enough to measure pressure changes of one centimeter and rugged enough to do it under the crushing pressure of five thousand meters of water has only recently been developed.

To attempt a significant increase in our knowledge of mid-ocean dynamics in the Inter-

national Decade of Ocean Exploration which opened in 1970, a group of scientists formed the MODE Scientific Council, which now includes members from all the participating universities and oceanographic institutions, and which has assumed the overall direction and coordination of the project while leaving the individual research teams relatively free to pursue the objects of their interest in their own way in much the same manner as the large-scale national physics laboratories. Co-chairmen of MODE are Allan Robinson of Harvard University and Henry Stommel of MIT. In practice, MODE's loose and informal headquarters are at MIT, where Dennis Moore, a participating oceanographer from Nova University, is spending two

years as the Council's first Executive Officer.

The Council is organized into a number of committees and subgroups on the various experimental elements of the overall project (the Density Committee, for example, and the subgroup on Floats) and there is in addition a theoretical panel working closely with the experimentalists on the design of MODE so as to extract the maximum possible data. This summer the theorists will meet in Boulder, Colorado, where the colossal computer of the National Center for Atmospheric Research (NCAR) will help them plan for the complexities the ocean offers, while the experimentalists will meet at Woods Hole, Massachusetts, to coordinate the field work.

(Continued from page 6)

## Three Books

Nude swimming was what we happened to be mulling over the other day as we stood at one end of the large living room of MIT's Endicott House waiting with 30 to 40 others for Paul Samuelson to arrive at a small and pleasant bash being laid on by the MIT Press to celebrate the publication of Volume 3 of The Collected Scientific Papers of Paul A. Samuelson. Our neighbor had just remarked that she'd heard MIT people had been allowed to use the Endicott swimming pool of a summer, until several episodes of

students. The current volume, Professor Merton told us, contains 77 papers and brings Professor Samuelson's works up to October of 1971. The two earlier volumes collected 129 papers, representing the work of the years up to mid-1964. We asked Professor Merton how it went to edit the thought of a great man. "It was a labor of love," he said, "in all senses of the phrase."

President Jerome Wiesner joined Professor Samuelson to give him a warm handshake and ask what he had up his sleeve for

impresses me about Professor Samuelson's work, and above all that is the willingness to come to terms with the general human experience. I would have said that he gives the lie to the prevalent view among humanists that every other discipline is narrow. I would have mentioned Professor Samuelson's remarkable and heartening insistence that optimism is scientific. It is in fact a book that is a delight for a publisher to encounter—a serious book, but also deeply humane, and one might say, common-sensical about life.



Displaying copies of Professor Samuelson's new book, are (left to right) Robert C. Merton, assistant professor of finance and editor of the book; President Jerome B. Wiesner; Professor Samuelson; and Howard Webber, director of the MIT Press.

—Photo by Bob Lyon

midnight skinny put a stop to such resource allocation, and while we were gazing speculatively at the pool, handsomely set against the surrounding verdure, what we were really pondering was why the subject of nude swimming invariably surfaces at literary cocktail parties. We decided that that's just the way literary cocktail parties are, and pass it along strictly in the interests of accurate reporting.

There was a stir behind us and we turned to see Professor Samuelson enter the room briskly and shake hands with Howard Webber, director of the MIT Press and our genial host. "Nice of you to have me at your party," Professor Samuelson said, and Mr. Webber steered him to the bar. We asked Anne Sayre, the Press's promotion manager, what the order of events was to be. "We generally like to present a just-published book to the author, and I suppose Mr. Webber will say a few words of appreciation," she said. "The reason we're having the party at Endicott House this time is that the Academic Council was meeting here all day, and a number of the people Professor Samuelson wanted to invite were already out here. It makes a good setting for the occasion in any case."

We drifted across the room to where Professor Samuelson was chatting with Robert C. Merton, who is assistant professor of Finance in the Sloan School and who was the editor of the third volume of the Collected Scientific Papers. This, we learned, was a continuation of the tradition begun by Joseph E. Stiglitz, who edited the first two volumes, published by the MIT Press in 1966, and who was also one of Samuelson's

the fourth volume. It turned out that Professor Samuelson had written seven major papers since the deadline for Volume 3 had passed. This seemed to us a considerable leg up on the next number of the series, but the author was making no predictions when, or even if, on the subject of another volume. "All inflexible rules are bad," he said. "That sounds like a fundamental principle," President Wiesner remarked.

At this point, Mr. Webber intervened to say that the photographers were importuning for a picture and shepherded Professors Samuelson and Merton and President Wiesner out onto the terrace. We took the opportunity to chat for a moment with Katherine Parker, a senior editor at the MIT Press, who had herded the book through manuscript to production. "It wasn't really a difficult job," she told us, "because in this instance all the papers had been previously published and Professor Samuelson left them as they were in real life, so to speak." We inspected one of the books that had been set about the room. The papers had been reproduced by offset from the pages of the journals in which they had originally appeared, and the effect of differing type styles and sizes as one moved from paper to paper was diverse and pleasing.

As it happened the formal presentation never got made and Professor Samuelson was soon busy autographing copies of the books, which began to disappear like hot-cakes. We asked Mr. Webber what he would have said in the even that he had Made A Few Remarks. He replied: "I would have said what it is that so

And I would have cited examples of Professor Samuelson's really extraordinary grace and style. Here I'll show you."

Mr. Webber grabbed up a copy of Volume 3 from a rapidly dwindling pile and began leafing through the pages, dog-earring those on which exemplary passages appeared. "The first example I would have cited," Mr. Webber explained, "is here in the Nobel lecture, where despite the injunction to be entirely serious, he tells an anecdote that turns out to be an anecdote within an anecdote. And here is perhaps the most graceful admission of error I've ever come across." We peered at the page Mr. Webber was marking and caught the article's title: "The Nonswitching Theorem Is False." "And here," Mr. Webber continued, "is my favorite piece of down-to-earth, common-sense advice." He showed us another page and we read: "Never, never make a joke. My remarks about Samuelson's Razor, and my experience that only the simple theories that can be explained so as to make sense to an intelligent outsider (one's wife) turn out to hold up in economics, was intended as a humorous *obiter dictum*..."

We congratulated Mr. Webber and asked him if he expected the book to sell well. "Quite well," he replied. How well was that, we wanted to know. "At least as well as the earlier two volumes," Mr. Webber said. "While I'd really much rather publish the scholarly works, I sometimes wish—from the sales viewpoint alone—that we had the textbook also. *That* sells not only well, but seemingly forever. Just one such book, I sometimes think, would support a university press in perpetuity."

## Waste Disposal Study May Lead to Recycling

Two students are conducting a study of the paper waste disposal system on the MIT campus this summer which may lead to a comprehensive recycling program.

Fred P. Gross, a junior from Brooklyn, New York, and Douglas W. Brogan, a freshman from Springfield, Pennsylvania, are analyzing the types and amounts of wastes collected from MIT offices. They are working in conjunction with Donald Whiston of Physical Plant.

The two students, both members of MIT Ecology Action, hope to provide a precise plan for changing the present waste disposal system into a recycling system.

"Right now we're interested in interviewing secretaries," Gross explained. "We want to get a good idea of how many trash receptacles are in each office, what goes in to them, and when they are emptied."

The idea behind the study, Gross said, is to see if an Institute-wide recycling program can be started and maintained with little or no disruption in present activities of Physical Plant workers.

"The only real difference between disposal and recycling

would be that paper and other materials would go in separate containers. Then the non-paper materials would be disposed of in the present way, while the paper wastes would be sent to a recycling plant."

## ME Group Seeks Amputees

The biomedical engineering group of the Department of Mechanical Engineering is seeking above the elbow amputees for experimental work with the "Boston Arm."

The commitment will include a fitting period of two to three weeks with only one or two sessions of one hour, followed by two weeks of experiments for one to two hours per day. Times will be at the convenience of the volunteer, and arrangements can be made with the group for payments. For more information, call Nevil Hogan on Ext. 2334.

## Nine Named to Faculty

The following academic appointments have been announced:

James H. Porter of Cambridge to associate professor from visiting associate professor in the Department of Chemical Engineering;

John T. Day of Oak Ridge, Tennessee, to assistant professor in the Department of Chemical Engineering from instructor;

Ian F. Davenport of Berkeley, California, to assistant professor in the Department of Chemical Engineering;

Arnoldo C. Max of Santiago, Chile, to associate professor in the Sloan School of Management;

Stuart E. Madnick of Pebody to assistant professor in the Sloan School of Management;

John W. Morgan of Princeton, New Jersey, to assistant professor in the Department of Mathematics;

Charles M. Oman of Watertown to assistant professor in the Department of Aeronautics and Astronautics;

Mary Lou Pardue of Edinburgh, Scotland, to associate professor in the Department of Biology;

John Van Maanen of Newport Beach, California, to assistant professor in the Sloan School of Management.



LUNCHTIME IN THE GREAT COURT—One of the inhabitants of the Great Court pauses on a pillar for a bite to eat.

—Photo by Margo Foote

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

# Students to Study Democratic Convention

Three students from the Massachusetts Institute of Technology will make this year's Democratic National Convention the subject of an undergraduate research project.

The three—a junior and two sophomores supported by MIT's Undergraduate Research Opportunities Program—will fly to Miami Beach July 8 to see how—and if—participatory democracy works at what has been called “the largest, youngest, blackest, femalest, most-unpredictable convention ever.”

The purpose of the study will be to see how the stringent reforms established by the Democrats' Commission on Party Structure and Delegate Selection, which became known as the McGovern Commission when the South Dakota Senator was named its chairman, stand up under the actual test of presidential politics in the give and take of a national convention. The MIT students, who have gained access to the convention hall and floor, will talk to delegates and party officials to assess the effect of the new rules on the convention process.

The three undergraduates are: Norman D. Sandler of (503 Fairway Place) Fairfield, Iowa, a sophomore; David M. Tenenbaum of (470 West End Ave.) New York City, a junior; and David H. Green of (150 W. Fourth St.) Mt. Carmel, Pennsylvania, a sophomore. Faculty adviser to the convention study project is Dr. Louis Menand, III, lecturer in political science and assistant to the

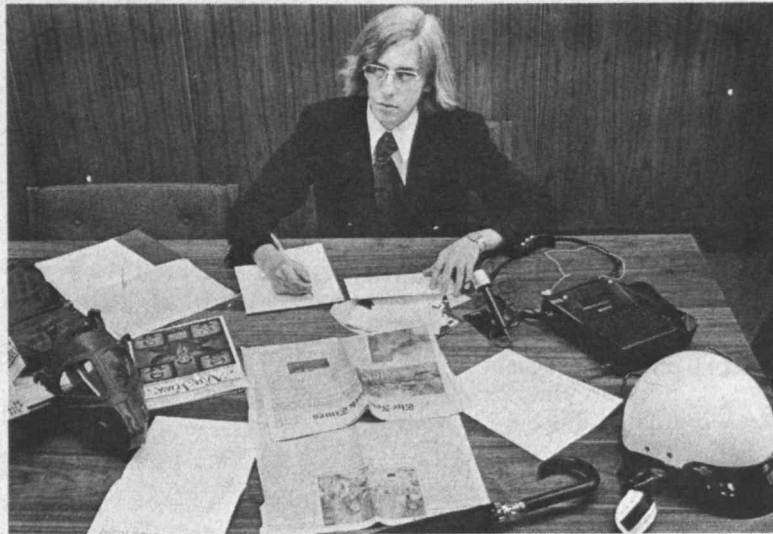
provost at MIT. The Undergraduate Research Opportunities Program is an Institute-wide program through which MIT undergraduates in a variety of disciplines can undertake original research projects.

According to Norman Sandler, leader of the project, the new rules for selecting convention delegates are putting the entire political system on trial. “The McGovern Commission guidelines specified that state delegations should have a ‘reasonable’ proportion of representation for women, minority groups, and young people,” he points out. “This has meant that 79 per cent of the delegates overall are attending their first convention.

“For example, 90 per cent of the California and Massachusetts delegations have never been to a convention before. In my home state of Iowa, 80 per cent of the delegation is made up of students, farmers, housewives, and other people who never before thought they could participate in the national political scene.”

Mr. Sandler, who is majoring in political science and management, used breaks in his study schedule at MIT to take active part in both his district and state Democratic conventions and was nominated to be a delegate to the national convention. He withdrew his name, however, to be free to conduct his study of the new party rules.

“The new rules also mean that there will be an unprecedented



Norman B. Sandler displays some of the paraphernalia he plans to take to the Democratic National Convention, including a hard hat, gas mask and tape recorder.

—Photo by Marc PoKempner

number of challenges to elected state delegations,” Sandler says. “The McGovern Commission deliberately left the wording of its guidelines vague, and numerous challenges are now underway to test the meaning of ‘reasonable’ representation.

“The Florida delegation, for example, was challenged by the Women's Caucus and the result was a realignment in which some of the women were moved from being alternates to the main delegation. I expect there will be a fight in the Credentials Committee over the seating of the Illinois delegation, which is now predominantly white, male, and well over 30.”

The three MIT students will arrive in Miami Beach two days before the Convention opens. They will use tape-recorders to record conversations with the convention participants, and David Tenenbaum will also record events by camera. The team became

interested in doing this sort of on-the-spot research into the political process—and convinced of its effectiveness—when doing a series of political investigative reports and photo-essays for *The Tech*, the MIT undergraduate newspaper. The students hope to have their report in hand—and hope to publish it—sometime in September, well before the 1972 election.

“What the new rules do, in effect, is ask if truly participatory democracy can work in practice,” Sandler notes. “There's a good chance it may not work, and some of the people we've been talking to in preparation for going to Miami say there's a fifty-fifty chance for the convention to result in political havoc. Others think this is the chance to make the party responsive to a wider socio-economic spectrum of the population as a whole. In either case, we'll be there to get the story.”

# Sheehan Appointed ILO Head

Charles J. Sheehan of Burlington, has been appointed director of the MIT Industrial Liaison Office.

Announcement of the appointment was made by Vincent A. Fulmer, Vice President and Secretary of the Institute. Mr. Sheehan succeeds Jack W. Christensen, who has just been elected Secretary of MIT Development Foundation, Inc., a recently formed non-profit corporation to promote useful applications of technology.

The Industrial Liaison Office (ILO) administers MIT's program of scientific and research relationships with industry through the Industrial Liaison Program. The program is now in its 22nd year and provides an organized means by which a select group of major research-based corporations keep in close touch



Mr. Sheehan, with MIT's basic research in science, engineering and industrial management.

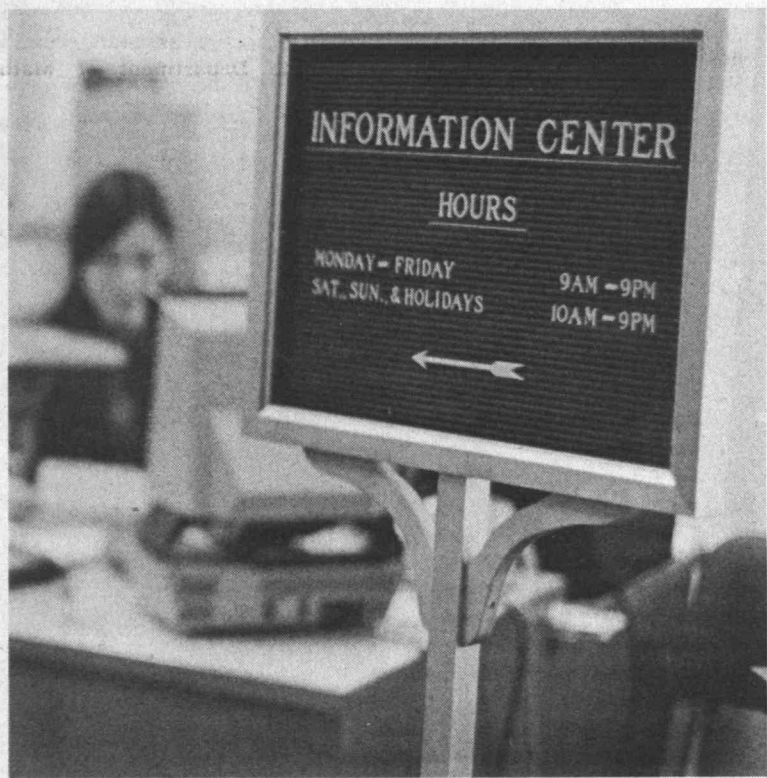
The 95 participating companies are located geographically throughout the country and represent a host of industrial fields, including the electronics, aerospace, chemical, automotive, petroleum, rubber, metals, insurance, and food industries. Company representatives participate in private symposia, usually held on the MIT campus, that are sponsored by the program on a number of diverse policy or research topics. Some twelve to fifteen symposia are scheduled for member companies each year. In addition, companies in the program receive a monthly list of publications, indexing research papers by MIT faculty members, and an annual directory of current research, prepared by the ILO, that contains brief descriptions of all research being conducted at MIT.

Mr. Sheehan has been an Industrial Liaison Officer in the ILO since coming to MIT two and a half years ago. Before that he was a project engineer, performing technical and economic evaluations of new processes and products, at the Esso Research and Engineering Company in New Jersey. He received his B.S. in chemical engineering at Northeastern University in 1956 and his Master's degree from MIT in 1967.

Mr. Sheehan said that one of his main concerns in his new post would be to attract representative companies in new industries, such as transportation, to participate in the Industrial Liaison Program. “Information transfer, which is after all the principal reason for the ILO's existence, is particularly important in those technologies aimed at problems of wide public concern,” Mr. Sheehan said.

“I would also like to extend a warm welcome to members of the MIT community who would like more information about the Industrial Liaison Program or about any of the participating companies,” he added.

Mr. Sheehan, a native of Boston, is married to the former Mildred Gray, of Needham, and has three children.



Beginning Saturday, July 1, the Information Center (Room 7-111) will expand its service and schedule. The Center will be open from 9am to 9pm on weekdays and from 10am to 9pm on weekends and holidays. The desk in the main lobby will close, and the previous information extension, 4741, will be reserved for requesting Physical Plant emergency assistance. The new general information extension will be 4795.

## Athletic Card Fees Raised for Staff, Faculty, Students

The annual athletic fee for faculty and staff will go up to \$35 starting July 1, an increase of \$10 over this year's fee.

Ross Smith, director of athletics, said the increase was made necessary because funds for the Department of Athletics have been cut considerably for the 1972-73 fiscal year.

“Nevertheless,” he said, “our fees still are well below those charged for faculty and staff at

neighboring institutions.”

The \$35 fee is more than double what the faculty and staff fee was three years ago. However, Professor Smith said, the department will make every effort to avoid still more increases over the next few years.

Student athletic cards also will go up this next academic year—from \$3 to \$5. Alumni will continue to be charged \$60 for their athletic cards, Professor Smith said.

## Traveling Exhibition to 3 Museums Funded

The National Endowment for the Arts has awarded three science museums a matching grant of \$45,000 to sponsor a travelling exhibition of art works designed and constructed by 15 present and former fellows at the Institute's Center for Advanced Visual Studies.

The exhibition is scheduled to open at the Museum of Science and Industry in Chicago on November 15 and will be composed of art works that are scientific or technical in nature, using flame, programmed light, electronic and sonic devices.

The grant from the federal agency was awarded jointly to Chicago's Museum of Science and Industry, the Franklin Institute Science Museum in Philadelphia and the Palace of Arts and Science in San Francisco. “The grant represents a major breakthrough for science museums,” said Daniel M. MacMaster, president of the Museum of Science and Industry. “It is the first major grant to science museums by the National Endowment for the Arts. It also represents the first cooperative exhibit program among the nation's principal science museums.”

The exhibition will be interdisciplinary in nature, combining artistic creativity and technical knowledge. Such collaborative projects, which bring together the work of artists, scientists and engineers, are representative of the Center for Advanced Visual

Studies, headed by Institute Professor Gyorgy Kepes.

The present and former fellows whose work will be represented in the exhibition are: Navarro Baldeweg, Mauricio Bueno, Lowry Burgess, Paul Earls, John Goodyear, Michio Ihara, Gyorgy Kepes, Ted Kraynik, Alejandro Otero, Otto Piene, Alan Sonfist, Wen-Ying Tsai, Stan VanDerBeek, Takis, and Friedrich St. Florian, who is the project's coordinator.

The exhibition is currently scheduled to be displayed at five museums over a period of 17 months. The schedule is: Museum of Science and Industry, Chicago, Illinois, November 15, 1972 - January 15, 1973; The Palace of Arts and Sciences, San Francisco, California, February 1, 1973 - March 31, 1973; Cincinnati Contemporary Arts Center, Cincinnati, Ohio, April 15, 1973 - July 1, 1973; The Franklin Institute, Philadelphia, Pennsylvania, November 1, 1973 - December 31, 1973; and the Museum of Fine Arts, St. Petersburg, Florida, January 28, 1974 - March 17, 1974.

### Music Library Has New Hours

The Music Library will be open an extra five hours every Monday this summer beginning Monday, June 19. The new Monday hours will be 9am to 10pm.

# THE INSTITUTE CALENDAR

June 28  
through  
July 14

Please notify the Calendar Editor, X3279, Rm 5-111, of any activities which have been suspended for the summer. Thank you.

## Women's Forum

**Women's Forum\*\***  
Every Monday, 12n, Rm 10-105.

## MIT Club Notes

**Classical Guitar Society\*\***  
Concert guitarist Hugh Geoghegan is available for private instruction for intermediate and advanced students. Call Vo Ta Han, 661-0297.

**Baker House SPAZ Jogging Club\*\***  
Daily, 10:45pm, Baker 2nd Floor West.

**Hobby Shop\*\***  
Open weekdays, 10am-4:30pm, duPont Gym basement. Fees: students \$6/term, community \$10/term. Call X4343.

**Tiddlywinks Association\***  
Every Monday, 8-11:15pm, Student Center Rm 491.

**Soaring Association\*\***  
First and third Mondays every month. 7:30pm, Student Center Rm 473.

**Classical Guitar Society\*\***  
Special summer lessons for beginners, group and private. Mondays and Tuesdays. Call Vo Ta Han, 661-0297.

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

**Outing Club\***  
Every Monday, Thursday, 5pm, Student Center Rm 473.

**MIT/DL Duplicate Bridge Club\*\***  
Every Tuesday, 6pm, Student Center Rm 491.

**Fencing Club\*\***  
Every Tuesday, 6-9pm, duPont Fencing Rm.

**Beginning Mandarin Classes\*\***  
Chinese Students Club. Lectures on Tuesdays, 7:30-9pm; recitations on Thursdays, 7:30-8:30pm; through August 17. Rm 3-442. Admission \$5.

**Glee Club\*\***  
Every Tuesday, Wednesday, Thursday, 5-6:30pm, Kresge. New members, especially tenors, welcome. Call Cyril Draffin, 247-8691.

**Rugby Club**  
Summer rugby. Every Tuesday and Thursday, 5pm, Briggs Field.

**Urban Vehicle Design Competition**  
Volunteer meetings. Every Wednesday, 3pm, Rm E40-250.

**Nautical Association\*\***  
Basic Sailing Shore School, repeated every Wednesday throughout the summer, 5:15pm, Sailing Pavilion. Non-members welcome.

**Table Tennis Club\*\*\***  
Practice session, every Wednesday, 7:30-10:30pm. T-Club Lounge, duPont.

**Science Fiction Society\***  
Every Friday, 5pm, Student Center Rm 421.

**Student Homophile League\***  
Meeting and mixer meets Fridays, 7:30pm, Mission Church, 33 Bowdoin St, Boston. For gay help (anonymous) at MIT, call the student gay tutor, 492-7871 anytime.

**Chess Club\*\***  
Every Saturday and Sunday, 1:30-5:30pm, Student Center Rm 491.

## Social Events

**Party**  
Free beer, crackers & pretzels, barmaids, music and people. Muddy Charles Pub, Friday, June 30, 4:30-6:30pm.

**Muddy Charles Pub\*\***  
Join your friends at the Muddy Charles Pub, 110 Walker, daily 11:30am-7:30pm. Call X2158.

**Friday Afternoon Club\*\***  
Music, conversation and all the cold draft Budweiser you can drink. Every Friday, 5:30pm, Ashdown basement Games Rm. Admission: men \$1, women 50 cents. Must be over 21.

# Morrison Reflects on Grade-School Science

*(The following is an excerpt from "Reflections on a Decade of Grade-School Science," an article written by Philip Morrison and Joe Griffith which appeared in the June, 1972, issue of Physics Today. Dr. Morrison is professor of physics at the Institute and Mr. Griffith is principal of the Thoreau School in Concord.)*

To involve a child with science, to maintain his fascination with mechanical or natural phenomena, proper guidance is apparently as necessary as proper tools.

Even if physicists never teach elementary school science in a classroom, they do—inadvertently perhaps—affect the way children learn about science.

We propose that physicists should more consciously influence the way science is presented to children. This influence can be exerted as parents, as members of a community informally advising their school boards, or as official curriculum consultants. High school and college faculty should realize that they may determine the outlook of future elementary school science teachers.

## EES

For the past ten years or so, we have been helping to create the Elementary Science Study (ESS) curriculum, a project of the Educational Development Center. This new approach to grade school science, supported primarily by the National Science Foundation, involved the work of over a hundred scientists and educators. ESS equipment, films and printed materials are now used in about ten percent of the classrooms in the US. Based on our experience with ESS, what general guide can we offer to physicists in their varied elementary science advisory roles?

Start with a firm conviction: physics—science—belongs squarely in the grades, more importantly each year, more genuinely the better the schools can become. What is indispensable is the true presence of laboratory natural science in the hands and minds of grade school children: laboratory natural science with experiments, measurements, successes and failures.

We as physicists are not mainly practitioners. We want science to be in the classroom not to give the pupils some hold on its practical consequences. No, it is really theory we want to bring there. Others can outline the water cycle and the causes of air pollution; they are important questions, but for us the deeper questions are those of how we know what we claim to know, of evidence, of attitude towards facts, of feeling a little more at home in an atmosphere of cause and

effect, of seeing the world in terms of size and shape and motion, of the effects of scale and of instruments, of the role of chance, of the nature of uncertain and partial knowledge, or all the rest of the network men call science.

These abstractions, for so they are, are for us the most relevant, because they open wider and are more powerful than any single result, any single application. They represent anchors in a world of change.

## A Warning

Now we enter an earnest warning: those succinct, productive, even beautiful, concepts are the end point of introductory science, not its beginning. Those concepts of science gain reality for the learner, become "rooted in the subsoil of the mind" as John Dewey wrote 40 years ago, only if they spring from an enduring, varied and personal basis of experience and attitude, from action and vision, not mere precept, from interest and curiosity, not mere duty and memorization, however palatably induced.

Simple sentences are not hard for many people to learn: Light travels in straight lines; action and reaction are equal and opposite; the planets are nine; the spectral colors seven, the geologic epochs more, energy is conserved...That is not to say that these efficient stereotypes are valueless. Who would be able to recall them if they had no truth? But the significant point is not the learning of the formula; the significant point is the productive internal use of the idea.

It would be far better to doubt that light goes in straight lines, on the basis of experience (for, of course, that is approximate) than to know the simple truths of Kepler's optics but remain innocent of any use of hand lens or microscope, or of the sunbeam cast by a mirror. Experience first is the right end up; inverted science is older in the schools than one likes to believe. More of it upsidedown may not be valueless, but it is not a sensible goal for a scientist in the schools. Other media can be counted upon to take their share of such inversions.

It is that belief in the concept not as root but as flower, once ripened, to become a root in its turn, perhaps many years later, that widens science in the schoolroom. The use of tools, the modification of materials—paper from blended pulp, music from struck pot lids, the nurture of an aquarium, the dyeing of cloth—these craftsmanlike and artistic tasks no longer remain clearly separate from science. Science can inform them, and they can for their part lead science for the young student, as once they did for all

mankind. The tip that the history of technology provides is often a most valuable clue to the path through which some material or technique can be brought to schoolroom level.

How is all this accomplished? There is one clear scheme with which we have worked for a long time. It is to provide by a good deal of honest and expert work, carefully linked by trial and error testing with real school children, a "kitted" approach. The ESS materials, experiments and guides, carefully packaged and provided with alternatives and pathways, are prepared for sale to schools and teachers. (For information on ESS materials, contact Webster Division, McGraw-Hill, the publisher or a local representative.)

These attractive and varied cartons of hardware and software come into the school for children and teachers to handle and mishandle. True to the style we have become immersed in, these packages are based on no strong structure of concepts; rather, they are cunningly aimed at being workable, attractive and varied, direct experiences that can lie at the base of concept formation. They are opportunities, rather than precepts. Other projects have taken a much more organized view of what science is: They tend to produce much more symbolic materials, aimed at making clear such fundamental points of view as varying reference frames or the idea of systems, their boundaries and their interactions.

The major task of the designer of materials and the teacher—who will in the best circumstances often be one and the same person—is to be sure that a mere formula, whether a verbal one or even a formally mathematical one, does not replace for most children the deep roots of concept formation.

## The British Experience

The British innovative schools have generally taken quite a different line of action. They disbelieve in packages, kits and central suppliers as a whole. They rely upon the improviser, the active and interested teacher, who scrounges, begs, borrows, collects.

We recognize a real and productive tension between these points of approach. At least since Archimedes, we would imagine, every lab in the world bought something from outside. It is evidently not practical to rediscover all of human history, yet it is just as fundamental that no real lab can exist if it buys not only all its instruments but also all its experimental designs from some kit-builder. The minimum research lab must modify and improvise, shift its interests, note discrepancies, work for itself.

## Movies

**Little of Algiers**  
Modern Fiction Film Series. Thursday, June 29, 7:30pm, Rm 10-250. Tickets 50 cents. Must show ID.

**At the Devil\*\***  
C. Saturday, July 1, 7pm and 9:30pm, Rm 10-250. Tickets 50 cents. Must show ID.

**Quel Killer and 4 Leaf Clover\***  
Chinese movies w/English subtitles. Saturday, July 1, 8:30pm, Kresge. Tickets: adults \$2, children \$1. Call Peter [unclear], dorm X9750.

**Bucket of Blood and Tales of Terror\*\***  
C. Saturday, July 8, 7pm and 10pm, Rm 10-250. Tickets 50 cents. Must show ID.

**Live in Fear (Record of a Living Being)\*\***  
C. Kurosawa Retrospective. Sunday, July 9, 8pm, Rm 10-250. Tickets 50 cents. Must show ID.

**The Childhood of Maxim Gorki\***  
Film Society. Monday, July 10, 8:30pm, Rm 10-250. Tickets \$1.

## Music

**Festival of Summertime Music\***  
Program of works by Brahms, Debussy and Webern performed by cellist Luis Leguia and pianist Robert [unclear]. Tuesday, July 11, 8pm, Kresge. Free.

## Dance

**Folk Dance Club\***  
International folk dancing. Every Sunday, 7:30-11pm, Sala Puerto Rico (exceptions to be posted).

**Summer Dance Classes\***  
Dance Workshop. Beginning modern, Tuesday and Thursday, 12n-1:30pm; beginning ballet, Tuesday and Thursday, 3:30-5pm; intermediate/advanced modern, Monday and Wednesday, 7-8:30pm. McCormick Gym. Admission \$1.75/class. Hannah, 547-0398.

**Folk Dance Club\***  
Balkan folk dancing. Every Tuesday, 7:30-11pm, Student Center Rm 407.

**Folk Dance Club\***  
Israeli folk dancing. Every Thursday, 7:30-11pm, Student Center Rm 407.

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

## Exhibitions

**Graphics\***  
Exhibition of graphics by Boston artists. Hayden Corridor Gallery, June 26-July 21.

**Autographed Music Scores**  
Exhibition of autographed musical scores in honor of Klaus Liepmann and the Choral Society. Music Library (Rm 14E-109) through the summer.

**Hart Nautical Museum\***  
Exhibits include "Naval Undersea Research and Development Center," and "The Art of Rigging." Bldg 5, first floor.

## Religious Services and Activities

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

**Roman Catholic Mass\***  
Every Sunday, 10:30am, Chapel.

**Hillel Religious Services\***  
Monday-Friday, 8am, Rm 7-102; Fridays, 7:30pm, Chapel; Saturdays, 9:30am, Chapel.

**Divine Light Mission\***  
Discourses on the direct experience of Truth given by Guru Maharaj Ji. Every Monday, Wednesday, Friday, 7:30pm, Rm 4-145. Call 369-1603 (Concord).

**Ananda Marga Yoga Society\***  
Group meditations. Every Tuesday, 5pm, Rm 14E-303. For information, call X3664.

**Latter Day Saints Student Association\*\***  
Religious seminars. Every Tuesday, 8am, Student Center Rm 473.

**Christian Bible Discussion Groups\***  
Every Thursday, 1pm, Rm 20B-031. Call Prof. Schimmel, X6739, or Ralph Burgess, X2415.

**Islamic Society Prayers\***  
Every Friday, 12n, Student Center Rm 402.

**Free Draft Counselling\***  
Hillel, 312 Memorial Drive, X2982. Call or visit 10am-5pm.

\*Open to the Public  
\*\*Open to the MIT Community Only  
\*\*\*Open to Members Only  
†Freshmen encouraged to attend

Send notices for July 12 through July 21 to the Calendar Editor, Room 5-111, Ext. 3279, by noon Friday, July 7.



### Tech Nursery

### School Begins

### Summer Session

Summer session for toddlers began this week at the Technology Nursery School.

Opening day was attended by about 25 youngsters, all children of Institute students, faculty or staff. After juice, crackers and a story, the children were let loose on the play area behind Eastgate.

Technology Nursery School runs a six week summer session in addition to its regular September to May session, following the MIT calendar of vacations. The school has a professional staff of six teachers and a director.



photographs by Margo Foote



# Faculty Policies Altered

(Continued from page 1)

and the new statement—placing the limit at seven years—is the substitute for it.

Another change is to assert as Institute policy that appointments to the academic staff are made without prejudice to current or potential child-rearing responsibilities which may require periods of part-time service or leaves of absence. To assure that appointment and tenure policy is consistent with the above change, provision is made for part-time appointments. Although a professorial appointment, including a tenure appointment, normally obligates a faculty member to render full time service to the Institute, in those special instances where full time service is not in the best interest of both parties, an appointment may be made with a specified part-time obligation. This change also establishes the principle that each change in status,—for example, from full time to part time—must be explicitly approved through normal academic appointment processes.

The basic tenure rule is unchanged, i.e., that tenure must be granted an Associate Professor with a total of seven or more years of service, if he is continued after age 35.

In order to reflect the potential for part-time service on the faculty, the definition of years of service, as used in tenure policies, has been changed to provide for

## Education

(Continued from page 1)

school. The remaining ten percent would be based on the number of graduate students at each school.

The legislation also provides grants of \$300 a year for each veteran enrolled and additional grants of \$150 for each veteran in a special remedial program. The additional income to MIT would be negligible under this provision of the bill.

Under the Basic Educational Opportunity Grants program created by the bill, every college student in the country could receive an annual grant of \$1,400, less the amount he and his family could be expected to contribute toward his education. If a student and his family were able, by standards set by the Office of Education, to pay his entire education, he would receive no federal grant. Only about ten percent of MIT students will be eligible for such aid.

## Goldberg to Lead Eclipse Expedition

Graduate student Alan Goldberg will lead an MIT Planetary Astronomy Laboratory group to Gaspé Peninsula, Canada, July 10 to observe a solar eclipse.

The eclipse itself will not be unusual, but it will serve Goldberg's group as a warm-up for an eclipse that will be seen from Africa next year and which will be the longest for the next century.

Gaspé will offer one of the best views of the July 10 eclipse, which will last 2½ minutes. Also, Gaspé offers the best chance for clear weather.

Goldberg will be taking the Laboratory's new vidicon photometer. It makes digital magnetic tape recordings of stellar images through the telescope and is expected ultimately to replace photographic plates in astronomy. The photometer was developed by the Laboratory director, Dr. Thomas B. McCord, associate professor of planetary physics.

"equivalent" full time service which allows the addition of fractions of years representing part-time service. For example, an individual with half-time appointment for one academic year is considered to have one half year of service.

A distinction is made between recognized professional leaves and personal leaves of absence. Recognized professional leave in excess of one year and personal leaves of any length are not ordinarily counted as years of service.

Finally, MIT's sabbatical leave program—which was formally adopted and published last August—was explicitly incorporated in "Policies and Procedures" with the circulation of the Presidential letter.

The rules were last published in 1966 in booklet form under the title "Policies and Procedures: A Guide for Staff Members". The President's letter amends specific sections of that booklet.

## MODE to Analyze Oceanic Forces

(Continued from page 1)

A later meeting of both groups will complete the final design of the experiment.

So much for the apparatus of MODE. The experiment itself will take four months and begin next spring in the Sargasso Sea in a 120 mile square approximately 500 miles from Bermuda. Four research vessels, three American and one British, will move about the area making measurements, while an array of current meters, temperature recording instruments and pressure gauges will be moored in 16 different fixed positions, and a battery of floats and airborne sensors of various sorts will complete the experimental hardware. The dozens of scientists involved will keep in touch with each other and with the experiment's progress by round-the-clock radio broadcasts from MODE's ground headquarters on Bermuda.

What the MODE experimenters hope to obtain is a comprehensive and concrete grasp, solidly backed by a wide range of data, on the low-frequency, medium scale motions of the sea. Why such mesoscale motions are important can be indicated by analogy with the weather, and though the analogy is far from exact it does offer a direction along which theory and experiment may travel, which is important when dealing with an entity whose mechanisms are as unknown as those of the ocean.

Prior to about 1940, it was generally thought that the mean circulation of the atmosphere was driven in a simple manner by heat transfer: Air rose at the equator and sank at the poles, creating a large, slow machine for circulating the atmosphere. In this view, the energetic eddies of air in storms and tornadoes were seen as peripheral to the main atmospheric model. Today it is known that atmospheric eddies, far from being mere byproducts of the larger system, are in fact the mainspring that drives the atmosphere's mean circulation and causes most of our climatic conditions.

Most models of ocean circulation today postulate a slow stable mean flow, but what little data exist seem to indicate irregular eddy motions that are at least ten times more energetic than the models would suggest. In



Wine tasting was the order of the day at a "tasting of the grape" party sponsored by the Physical Plant

examines one of the five ordinary and two extraordinary vintages offered at the event.

—Photo by Margo Foote

a preliminary report, the MODE scientists write: "The evolution of the understanding of the atmospheric circulation provides valuable guidance in the present study...The space and time scales



Professor Stommel.

of the oceanic mesoscale are expected to be respectively shorter and longer than the corresponding atmospheric scales. The strength of the physical analogy between the two circulations will depend on the energy source(s) of the oceanic eddies. The energy source is presently moot.

"Direct observational evidence for the importance of the mesoscale eddy motions, although scanty and non-definitive, provides some indication of the important scales and strong motivation for further study. The tracking of neutrally buoyant floats off Bermuda in 1959-60 from the R/V Aries first indicated the existence of irregular mesoscale motions in the deep water an order of magnitude more energetic (5-10 cm/sec, 200km, 40 days) than the anticipated value for the mean flow."

Considerable ingenuity has gone into the design of the instruments to be deployed. Advances in the technology of deep-sea moorings and reliable current meters now allow exposure periods of several months with high recovery probability. About 50 current meters will be deployed on the 16 moorings. Free-floating instruments will include 20 widely dispersed large neutrally-buoyant floats, which will be situated at a depth of 1200 meters in the "sound channel" and tracked remotely by

SOFAR stations already installed on islands. A small cluster of some 50 floats will be tracked by a movable hydrophone array, and there will be two types of bottom pressure gauges as well as inverted echo sounders, and electric field recorders.

One of the important variables in the dynamics of water transport is density, and thus temperature measurements, from which density can be calculated, will form a significant background against which to weigh other data. Oddly, no adequate temperature gauges existed when the experiment was being planned. Carl Wunsch, associate professor of oceanography at MIT, who is heading the moored thermal array project of MODE, set about designing a new temperature gauge with John Dahlen of MIT's Charles Stark Draper Laboratory. The new gauges are simple spheres containing thermistors and small cartridge recorders for taking data. Two types, one for point readings of temperature and one that measures temperature gradients, are being fabricated by the Draper Lab, and Professor Wunsch hopes to have better than 60 of them made by the time MODE begins next March.

Another ingenious device, an airborne probe for determining the average velocity profile of 5000 meters of water, has been made by W. S. Richardson of Nova University. It consists of a plastic expendable torpedo which is dropped from a plane and whose contents, three small torpedoes filled with flourascene dye, are tracked from the air. When the torpedo is released into the water, the first inner torpedo pops out, spreading dye on the surface. The large torpedo then sinks to the bottom where a timer releases first the second and then, after a known interval, the third torpedo. These rise successively to the surface to release their dye. Since the rate of descent and ascent, the time interval, and the bottom depth are all known the relative distances between the surface dye marks will indicate both the surface current and the average velocity profile of underwater mean flow.

MODE has at least three important implications for science. The first lies in the experiment's substance. As the MODE scientists write: "In general terms we

are aware that both ocean and atmosphere act together as a coupled engine to produce weather and climate...but so little is known about the physics of the oceanic circulation that important environmental events cannot be related meaningfully to causes, and hence remain as the folk-lore rather than the working-stuff of science." The MODE team is under no illusions that the experiment will answer some of the larger questions, but it should produce for the first time enough solid data to see if the questions are the right ones. And it should also prove whether joint experimentation and simultaneous theoretical application of data to dynamical models is a promising route for future oceanographic studies.

The second implication depends in large part on the outcome of the first. If MODE works well, it will likely lead to an even larger experiment on an international level in the mid-70's. So far, the major mid-ocean studies have been conducted by Russian scientists, and several Russian observers will participate in the MODE field program next spring. It does not seem improbable that an international collaboration would be one outcome of a successful venture. The MODE researchers point out: "Short-range prediction for the atmosphere has been achieved through the hard-won understanding obtained from world weather-observing networks and the development of physical-numerical models that can be run on modern computers." It may be that MODE will lead to something of the sort for oceanographic research.

Finally, a successful MODE will probably alter significantly the character of oceanographic research itself. Professor Wunsch, reflecting on the experiment's professional implications, said recently, "For some time the field of oceanography has been something of a last outpost for the rugged individual researcher. But we may be fast approaching the time when you see oceanographic research papers with 30 authors, as is so common in physics these days. In that case, ocean research may be a little less fun to do, but we may turn out knowing more about it."

MODE is costing the NSF and the Office of Naval Research a little better than \$10 million. Big money for big projects would seem to be the wave of the future.

# Answers to Frequent Questions on Centrex



The following are frequently asked questions and answers compiled from Centrex counselor training sessions which were completed June 16. The conversion to Centrex will take place August 12 at MIT and Draper Laboratory.

**Q. What will be the general telephone number after August 12? A.** The main Institute number will be 253-1000. The main Draper Lab number will be 258-1000.

**Q. Will calls to 864-6900 be intercepted? A.** Yes, until late this year callers will be redirected to the correct number.

**Q. Can calls received directly from an outside party be transferred? A.** Yes, depressing your telephone hook once will call the MIT operator who can transfer the call. Calls cannot be transferred from MIT to Draper or vice-versa.

**Q. How do you call from one MIT extension to another? A.** Dial 3 plus four digits.

**Q. How do you call from one MIT extension to a Draper Lab extension and vice versa? A.** From MIT dial 182-8 plus four digits. From Draper dial 182-3 plus four digits.

**Q. Can I make a long distance call from MIT and bill it to my home telephone number? A.** Yes, by dialing 190 and advising the operator where to bill the call.

**Q. What number do I dial for emergency calls? A.** 100

**Q. Can I dial 190 and bill a long distance call to a 253 or 258 number? A.** No.

**Q. If my Centrex extension line is equipped with Call Forwarding, how can I reroute calls to another extension? A.** Dial 72 plus the extension to which you want the calls rerouted. To deactivate the Call Forwarding, dial 73.

**Q. Will we retain the direct inward dialed lines from the FTS (Federal Telecommunications System) network? A.** Yes, the exchange codes will be 253 for MIT and 258 for Draper.

**Q. Can I arrange for conference calls? A.** Yes, by dialing 109. The operator can arrange a conference of five Centrex stations or one outside party and four Centrex stations.

**Q. Can I arrange a conference call with a call received from the outside? A.** Yes, by depressing the switchhook once to summon the operator.

**Q. Will there be a new Centrex directory? A.** Yes, it will be issued on or about August 4. Home information will not be included in this directory.

**Q. Where can I obtain announcement (postal) cards to advise callers of my new Centrex number? A.** Call Ext. 3651 on campus or Ext. 821-216 at Draper.

**Q. Can I place a long distance call from an MIT phone and charge it to an MIT or Draper account? A.** No. Most telephones will require going through a telephone company operator and need a telephone credit card



Centrex counselor training sessions were completed June 16 for department and laboratory representatives from MIT and Draper Laboratory. Bell Telephone Customer Service Representative Miss Ruth Ann Hazel explains the new system to counselors who will answer questions from their departments.

—Photo by Margo Foote

## Who's New in the News

President Jerome B. Wiesner was awarded an honorary Doctor of Engineering degree by Rensselaer Polytechnic Institute at commencement ceremonies last Friday, June 9.

O. Robert Simha, Massasoit Community College director of planning, gave the charge of the college at commencement exercises on June 3.

Professor Eugene Skolnikoff of political science is one of nine scholars the State Department has invited to study its "external research" program which evaluates world trends for the Secretary of State.

Dr. Paul Samuelson, professor of economics and Nobel Prize winning economist, received an honorary doctor of laws degree at Harvard's commencement June 15.

Professor John F. Rockart of Management received the 1971-72 Western Electric Fund Award for Educational Innovation in Higher Education for Business Administration.

Professor Edwin Kuh and Professor Lester Thurow, both of the Department of Economics and the Sloan School of Management,

## Games Area Offers Summer Bowling Specials

Bowlers will have a chance to bowl as many games as they can for one dollar at the Student Center Games Area between opening hour and 7pm this summer.

The "Stretch a Dollar Special" went into effect June 21. The "Red Pin Special" allows bowlers to win a free game certificate if a strike is thrown when the head pin is red between 7pm and closing hours.

Bowling hours are Wednesday through Saturday, 11:30am to 11:30pm; Tuesdays, 4pm to 8pm; Sundays, 4pm to 10pm. The summer specials are open to all members of the community.

were among those listed by Newsweek June 19 as members of Senator George McGovern's brain trust.

Dr. P.L. Thibaut Brian, professor of chemical engineering, has completed a new book, *Staged Cascades in Chemical Processes*, which was published by Prentice-Hall, Inc. earlier this month.

Special honors were conferred on Institute Professor Gyorgy Kepes, Director of the Center for Advanced Visual Studies, during commencement ceremonies at the Massachusetts College of Art last month.

Prof. Barry Spacks of the humanities department has written a new novel entitled *Orphans* which was published recently by Harper's Magazine Press.

## Barlow Appointed Manager for Institute Dining Services

Stephen Barlow of Stouffer Management Food Systems has been appointed Stouffer's dining services manager for the Institute's dining facilities.

He succeeds David Cantley who has been promoted to New England district manager for Stouffer's. Announcement of the appointment was made by H.E. Brammer, MIT's director of housing and food services.

The Institute has contracted with Stouffer's for all on-campus dining facilities for the past 15 years. The dining manager is responsible for operation and planning of residence hall dining rooms as well as the facilities in the Student Center, Walker Memorial and Ashdown House.

Mr. Barlow received the B.S. degree in sociology from Yale University in 1964 and the B.S. degree in hotel and restaurant management from Cornell University in 1966. He has been associated with the dining services at Illinois Bell Telephone Company and Service Systems Corporation in New York. He, his wife and their three children plan to live in Winchester.

Mr. Cantley, who also received the B.S. degree from Yale, has been on the Stouffer's staff for the past eight years, serving as dining manager at the Institute in 1967 and again from 1969 to the present. As Stouffer's district manager in New England, his involvement with MIT will continue.



Graffiti removal has cost the Institute \$22,647 between May, 1970 and May of this year. The sand blasting and washing necessary to remove paint from buildings sometimes leaves a discolored finish and there is a danger of actually exposing the

reinforcing rods in the future. Although Physical Plant continues to test new coatings which would make graffiti removal easier, less expensive and less damaging, they have not yet found a satisfactory product.

—Photo by Margo Foote

number which would be billed back to the department. Departments will need to acquire credit cards.

## MIT to Study Consequences of Coastal Oil

(Continued from page 1)

inary questions about the economic and environmental effects of possible oil recovery must be answered.

This is what the MIT study is designed to do. It has been commissioned, at a cost of \$105,000, by the New England Regional Commission and the New England River Basins Commission through the MIT Sea Grant Program. The Sea Grant Program was established at MIT in 1968, when MIT received the first grant under the National Sea Grant Program, and its purpose is to coordinate and initiate diverse interdisciplinary research related to marine resources, ocean utilization and coastal zone development.

The study will be under the direction of Morris A. Adelman, Professor of Economics at MIT, Professor James A. Fay, of the Department of Mechanical Engineering, Professor Stephen Moore of the Department of Civil Engineering, and Professor John Devanney of the Department of Ocean Engineering.

In essence, the study will try to anticipate the effects of discovering oil even before the exploration takes place. With the aid of a high-speed computer, the research team will cover 200 possible oil discoveries—including the possibility that no oil is present—and will try to predict the effect on regional income and environmental quality of each possibility.

The MIT group will assess both positive and negative economic consequences of oil recovery and refining. For example, because Georges Bank is a rich fishing area, the researchers will enquire how exploration, recovery operations, and possible oil spills might effect the fisheries in that area. If large oil deposits are found and pipelines are laid on the ocean bottom to carry crude oil to a shore-based refinery, how will this effect trawlers and deepsea lobstermen? More generally, what would be the effect on overall regional income of any new jobs and locally available oil that a shore-based refinery might produce?

Environmental questions include a range of possibilities: For each possible size of oil field, what are the chances of an oil spill? What effect would such a spill have on marine organisms? On the tourist industry? If the economics of an undersea pipeline turned out to be competitive with tankers, which transport method would produce a smaller environmental problem.

The study, which is to be completed by December 31, 1972, will not attempt to identify the best policy to follow for offshore oil drilling. It will present results in the form of "if this is the case, then these are likely economic and environmental effects," and final decisions will be up to the policy makers.

# CLASSIFIED ADS

Ads are limited to one per person per issue and may not be repeated in successive issues. All ads must be accompanied by full name and extension. Only Institute extensions may be listed. Members of the community who have no extensions may submit ads by coming in person to the Tech Talk office, Room 5-111, and presenting Institute identification. Ads may be telephoned to Ext. 3270 or mailed to Room 5-105. The deadline is noon Friday.

## For Sale, Etc.

Desk, wood, 17x44", \$30; 3-sp'd bike, \$10, nds work. X1822.

AR4X spkrs, exc cond, \$70/pr; Fender vobrolux amp, 2 10" spkrs, 35 Watt, gd cond, \$125. John, 661-3197.

Welbuilt 5000 BTU air cond, 115 volt, 1000 Watt, \$55. X4121.

Imported baby carriage, brand new, used 1 mo, brown velvet, orig \$65, now \$40. Mrs. Said, X6276.

Spkr & amp, \$20; washer, \$150 or best; violin, \$35, diamond wed rings, X4481.

Gourmet Cookbook, 2 vols, out of print, \$25; Donon's Classic French Cuisine, cloth \$2.50. Brooke, X5642.

West Mobilair 6,000 BTU air cond, \$75. Freve, X7054.

Takagawa Arita hnd-painted dinnerware, 97 pc, nvr used, \$150. Bob, X232 Draper after 3pm.

Carpet, hi qual nyl pile, olive grn, rubber mat, 11x15, \$65, 9x11, \$50. Ron, X6610.

Wallabee man's shoes, 10 1/2, ankle hght, tan suede, wrn 2 days. David, X5820.

Zenith b/w 19" TV, nds repair, pic tube is gd, best offer. X5734.

Kitchenaid top loading port dish, 3 yrs old. Len, X354 Draper 7.

Royal port typwrtr, w/carry case & lock, v gd cond, asking \$20; met office desk, 6 drwr, walnut w/glass, \$60. X3423.

Sears 8.25x14, 4-ply tubeless mounted & balanced tires on '64 Pont wheel; Sears 48 month battery, size 60; ea on car 3 wks, \$17.50 ea or best. Bob, X7559.

Cycle chain, 3/8", case hardened, rubberized, 5', v gd cond, hardly used, \$10. Josh, X5763.

Symphonic chassie radio, AM/FM, phono, 3 yrs old, \$75. X3526 evgs.

Dishwasher, auto-port, exc cond; Tonneau car cover, '65 MG Midget nvr used; AM/SW Regency WT-4 radio, 4 bands, fine tuning, 500-1600kc, exc cond. X2241.

Bayberry 6R lavatory sink w/wt swirl marble, 30"x22", 1 piece construct w/backsplash, nvr used, \$180 new, best. Frank, X5036 Draper 2.

Triumph woman's 3-sp'd bike, 26", book rack, heavy duty chain & lock, new \$80, asking \$45. Call 492-5645 evgs.

Cougar trailer canvas awning, 9'x12', comp, gold/wh, \$35. X5522 Linc.

Crib-size hnd made patchwrk quilt, all colors, fits stroller, new, w/inner lining, \$35; child's bike carrier for man's bike, \$5. Gay, X6363.

Bike, man's, 10-sp'd, Schwinn Varsity Tourist w/23" frame, \$65; crib, Babyline w/Lantwet Super Stanford matt, \$30; bike infant seat, \$5. Call 547-8306.

Carpet, 9x12, br grn, \$15; carpet & pad, 9x12, bl/grn tweed, \$40; wood playpen w/pad, \$1; curtains for 2 BR Westgate apt. Call 547-1168.

Free: wash machine, leaks, can be fixed, just remove it from my yard. Judy, X2695.

Broil King Continuous Clean no-trn broiler/oven, hts to 500, \$15; makeup mir w/lights & travel case, \$15 or best. Ann, X2168.

Motorola 21" b/w console TV, w/UHF convert, \$75. X4062.

Chevy tire rims, 13", 5 bolt; brick/wood bkcase; desk; chest of dwns. Jim, 354-1803.

Col sofa bed, \$30; match chr, \$5; wh drapes for Westgate low-rise BR, \$10. Call 876-0048.

F1 size maple crib w/matt, \$35; car seat, \$6; Proctor-Silex 4-slice toaster, new; Hamilton Beach 10 spd stainless st mixer & bowls; Corning elec skillet. Shan, X6185.

Elec comb w/brush attach, \$8.50; hi intensity light, \$2.50; 2 handmade lucite trays, \$3 ea. X6680.

Scott compact stereo sys, Garrard trntbl, S14 spkrs, orig \$350, asking \$195; knapsack, sm chest-tbl, steam iron, shower curtains; Lost: man's wedding ring, in Bldg 16, big sentimental value. Call 868-5166.

Chest, 58"x20"x35", 5 drwr, 2 cupbrds, \$30; GE refrig, 10 yrs old, \$40 or free; cinder blks, brds, free. Terry, X7530.

Wden wardrobe, \$20; lg wden bureau w/mirror, \$15; Internat'l Harvester refrig, gd cond, \$15; sm bkcase, \$2. X1453.

Free porcelain sinks, 2, 20"x24" w/sep hot & cold faucets, 1 w/trap, exc cond. Conrod, X4101.

King size water bed, compl, 5 yr guar in effect, best offer. Carl, dorm X9603.

BSR auto changer w/ceramic cart & stand, \$15. X6518.

Garrard SL-55 changer w/cart, \$30. Dave, dorm X8530.

Corfam shoes, 2 pr, man's 5 1/2 D, br oxford, blk monkstrap, nvr used, \$8 ea. Bullowa, X5957.

Gold bracelet, 18 carat, \$100, worth \$250. Buyrn, X4155 or 4244.

GE refrig, 14 cu ft, sep freezer, \$90; dish & washer, nd repair, free. Jim, X2691.

Fedders 8000 BTU air cond, 3 yrs old, poor cond, \$35. Liz, X6162.

## Vehicles

'53 Bentley R type, std steel, 4 spd, mech overhaul in England last yr, \$4500. J. Gerty, X5170.

'53 Chrysler New Yorker, 4 dr sedan, restored or for parts. Schindler, X3852.

'59 Chevy, 4 dr sedan, exc run cond but nds brake reline, \$90. X373 Linc.

'60 Am Motors compact, spring inspection, runs well, everything works, \$175 or best. X5846.

'61 Jeep pick-up w/plow, no rust, \$900 or best. Paul Van Passell, X7148.

'62 Buick Spec, V8, auto, R&H, gd tires, gd run cond, \$100. X401 Linc.

'64 VW sedan, gas htr, snows on rims, gd run cond, \$300 or best. Mike, X7378 Linc.

'65 VW bug, exc mech cond, gd tires & batt, \$325, must sell. Frances, X7836 or dorm X9036.

'67 Mustang V8, auto, R&H, 42K, new tires, nds some eng work, \$250 or best. X5271 or X6662.

'67 Ply Valiant, 41K, pwr st, auto, gd cond, lving country, avail late July. X7759.

'68 Volvo 142S, exc cond, 72K, \$1200. X174 Draper 7.

'69 Chevy Impala, Credit Union repossessed, may be seen at 16 Robbins St, Everett. Call 389-2277.

'69 MG GT, AM/FM, Abarth muff, wire wheels, radials, studded snows, \$1700. B. Behrens, X1559.

'69 Ply Road Runner, 61K, gd cond, R. Louise, X3694.

'71 Mustang Mach I, 351 4V eng, auto, pwr st & disc br, instru group, stereo tapedeck, mag whls, F60x15 lettered tires, ram air induction, mint cond, 14K, \$3000. Nick, X256 Bedford.

'71 Opel sta wgn, 5 mos old, 6K, perf cond, must sell, \$1800 or best. Call 876-2152.

'67 Honda CB450, very clean, \$500. Gary, X4588.

'69 Yamaha AT1, 125cc, Enduro, \$300 firm. Call 547-1194 evgs.

Wd speed boat, 16 ft, \$125. Call 846-0864.

## Housing

Allston, 6 rm apt nr Comm Ave, in 2 fam house, exc cond, avail mid July-8/1, asking \$225/mo. Tasos, X6980.

Back Bay, lg studio apt, avail 7/1, Marlboro St, nr MIT, furn, tile bath, \$125, sublet w/option. Christine MacDonald, X3494.

Brkln, furn apt for sm fam, no pets, 3rd flr, L, 2 BR, stdy, K, B, pantry, nr MTA & MIT, just painted, \$275/mo, ht, hot water & elec incl. Beverly, X1661.

Brkln, 2 BR apt, K, B, LR, 1st flr, \$160 incl ht, avail now. Marcel, X7472.

Camb, sublet July-Sept, furn, 2 BR duplex, nr Harv & MIT, \$180 incl util. Bonnie, X3724.

Camb-Somerville line, 88 Beacon St, no. 22, 2 BR apt w/balcony, AC, w/w, dish-disp, avail 8/1, 2 mo sublet w/option. Donald Aldridge, X7265 or X2941 1-4pm.

Camb, 1 BR in breezy 4 BR apt nr Cent Sq, \$80/mo. Call Steve, 868-1275.

Camb, walk to MIT, sum sublet w/opt, 2 BR, 2nd flr lg K, partly furn, \$180. Landau, X5323.

Camb, mod 2 BR apt, balc, air cond, w/w carp, dish, covered pking opt, sum sublet w/opt, rent negotiable, avail now. Irvine, X6669.

Camb, Upland Rd, 1/2 block from Mass Ave, 1 BR, LR, gd K, B, ht incl, avail 8/1, \$175. Kristine, X4141.

Camb, 1 BR avail in mod part furn 2 BR apt, nr Design Res, avail now or 7/1-9/1 w/opt, off-st pking, rent negotiable. X5672.

Camb, sublet, 7/1-8/31, sgl rm in Inman Sq apt, \$67 plus util. William, X5797 or X5763.

Camb, 27 West St, nr Cent Sq, sublet w/opt, unfurn, 2 BR, \$270/mo, avail 7/1. Akinori Tagishi, X4207.

No Camb, 6 rm apt, 3 BR, avail 7/1, 16 min to MIT on bike, \$256/mo + util. Louis, X5043.

Westgate efficiency, Aug sublet, \$135. John Miller, X2073.

Andover, cus blt brick col, 4 BR, 1 1/2 B, frpl, family rm, lg LR, DR, eat-in K, laundry, 2 car gar, 2 zone oil ht, on quiet circle, mi to 495 or 93, \$46,900. X2479.

Arl sum sublet, 3 flr house on lake, 4 BR, big yard, patio, comp furn, avail now-9/8, \$300/mo, resp cpl w/ or w/o children. Sandro, X4724.

Maine coast, 7 rm hse slps 6, 1 min to beach, hr to MIT, \$175/wk, avail 7/9-8/31. X3221.

Newburyport, 3 BR hse, split entry ranch, less than 1 hr to MIT, \$28,500. John, X315 Draper 7.

No Conway, NH, White Mtns, new hse, 4 BR, 1 1/2 B, w/w carpet, dish, 2 sundecks, swim, golf, riding, mtn excur, \$150/wk, longer periods avail. X4351.

Waltham-Belmont line, hse for rent, fully furn, w/opt, 4 BR, LR, DR, K, laundry, 1 1/2 B, 2 car gar, finished base, 1/3 acre yard, 9/72-6/73. X2994.

Winch, furn 3 BR hse, nr schools & T, avail 9/1 or earlier for yr. X582 Draper 7.

Buzz Bay, Bourne, sum cott, 2 BR, lg LR, den, nr beaches, avail last 2 wks of July & Aug, fully furn. X7279.

Chilmark, Martha's Vineyard, for rent, July, spacious converted barn, furn, 3 BR, frpl, \$775/mo. Peter Elbow, X4441.

Vt, sum hse for rent, nr Marlboro Music, all conveniences. X7146.

Weston, Vt, 3 BR chalet, 2 frpls, slps 10, nr all recreations, \$100/wk. X477 Linc.

## Animals

F blk kitten, wh patch on chest, big grn eyes, 8 wks old, all shots, free to right person. Stefanie, X1960.

Beagle puppies, blk & wh, 4 wks old, m & f, \$5 ea. Don, X7528.

## Wanted

Fem rmmate for 2 flr apt, Camb nr Cent Sq, \$58/mo. Fran, X2053.

Bedford, beaut lg hse, trees, nd 1-3 people 7/1-8/30, \$70/mo ea or less. Bob, X7526 Linc.

Fem rmmate, Aug or Sept-June '73, own BR, air cond, dish, pking. Joan, X5262.

Rmmate for 1 BR in 4 BR apt, Camb, 5 min from MIT, \$72.50, incl water, w/w carpet, ht, mod appliances. X5763.

Fem rmmate to share 4 BR apt nr Cent Sq, \$70 + util. X6986.

Daily ride Stoneham to MIT & return, 9-5, wl share expen. Barbara, X6241.

Daily ride betwn MIT & Wellesley Hills, Rfe 9 & 16, wl share exp, 8:30-5, flexible. Carlos, X5171.

Resp HS senior, exper, to babysit in Boston area or for vacations. X3706.

Babysitter for 2 yng children, all day Mon & Thurs, start mid July, in West Newton home. Kugel, X2163.

Seek info & opinions from Audi owners. Maslov, X7711.

CRC Handbook of chem & physics. Mark, X6738.

Used copies of Morse & Feshbach, both vol. Norm, X5956.

Used air cond, approx 10,000 BTU, 1/2 price new. Ralph, X7320 Linc.

Upright piano, gd cond, wl move. Pascal, X2824.

Wking refrig, 12 cu ft, or lger, pref less than \$30. John, 868-1391.

Tbl saw, 10" blade. Fortunato, X7713 Linc.

Moderate size reflector telescope w/clock drive & oculars, 6-8", lk RV-6 or better. Harry, X5811 Linc.

Camping or Boy Scout equip for Troop no. 9 in Roxbury. Nobles, X5778.

Inexpen contemp end tbls, port hand mixer, vac clnr, contemp stainless flatware. Call 661-8977.

Bike, boy's 20", gd operat cond; vac cleaner. Bill Gumes, X7213 Linc.

Roof carrier to fit '60 VW. Michael Kearns, X5665.

Ride to Nova Scotia for solar eclipse, 7/10. Kautz, dorm X9828.

Apt, 1 BR, betwn Harv & Cent Sq, begin 9/1, reas rent. Jerry, X4400.

Dodge Dart or Ply Valiant, '66 or newer. Cook, X4192.

Tent trailer that slps 4, no util necessary, cheap. Ethel Vokey, X358 Linc.

Scuba diver to help locate glasses lost at Cohasset in 20 ft of water, wl provide trans, exp, reward. Jim Anglin, X5319.

## Miscellaneous

Wl do any typg, esp tech. Linda, X2054.

MIT wife wl do hsework part time, Brookline, exper, refer. Les Klein, X5831.

Riders wntd to share driving & expenses from Michigan to Boston, 7/2 or 3. Vicky, X4902.

Wl do gen, tech, thesis typing. X2686.

Music major avail for piano accompaniment, exper, flex rates. Katherine Lu, dorm X9642.

Wl animal-sit, babysit, or house-sit. Linda, X4330.

## Positions Available

Administrative Assistant V to work independently in an office coordinating varied and extensive volunteer efforts within the MIT community. Maturity and tact a must; organizational ability, flexibility to work with many different people, extensive knowledge of the Institute, and good office skills are required. Position available after August 1, 1972.

Secretary IV positions are available in several academic departments on campus, working for one to three faculty members. These are good promotional opportunities for Grade III secretaries, and are available immediately. Experience in technical typing, shorthand, knowledge of bookkeeping, familiarity with registration procedures, student contact, etc. are some of the facets of these jobs.

Biweekly, Ext. 4251

Systems Programmer DOS 360-370. The Office of Administrative Information Systems is seeking an individual with a minimum of 2 yrs. experience, who is able to design, implement and test software (operating systems, file handling packages, program products) and service user departments. Knowledge of COBOL and PL/1 required. Sysgen experience. OS 360 experience useful.

Professional Personnel Office  
Ext. 4278

## Graphic Arts Sets Tech Talk Type

This issue of *Tech Talk* is the first to be typeset by MIT's own Graphic Arts, using newly-acquired electronic typesetting equipment. *Tech Talk* type formerly was set off campus. The new typesetting arrangement is intended to ease *Tech Talk* production. Ads and the Institute Calendar continue to be typeset by *The Tech*.