

Nicholas Fici, a night custodian, in his basement workshop with the model of a rigged cargo clipper ship which he recently completed.

Photo by Calvin Campbell

By SALLY M. HAMILTON
Staff Writer

"Once you are a fisherman, you don't know how to rest."

That's Nicholas Fici, an evening custodian in MIT's Bldg. 37, talking. For 30 years he was a fishing boat captain. Now that he's left the fishing fleet, he finds himself spending free time designing and expertly building exquisite models of cargo clipper ships fit for a

nautical museum.

"Rigged cargo clipper ships, plying trade, usually lumber, sugar or grain, haven't been seen in the oceans for at least forty years," Mr. Fici said.

Mr. Fici, who has hand-built more than 20 clippers, is always at work on a model and in recent years has made at least two a year. His ships are usually three to six foot models. His tools are all miniatures of the equipment used by boat builders.

Off work last year for six months following an operation, he designed and built a seven-foot long model which now sits in his two-story basement workshop.

"This boat was built like the old clipper ships, the same way, by hand," he said. "It could go into the water tomorrow."

Everything in the boat is according to specifications except

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King Day

A noon march in silence from the lobby of Bldg. 7 to Kresge Auditorium followed

by a one-hour program of recordings, singing and speaking at Kresge will mark the anniversary of the birth of the late civil rights leader, Dr. Martin Luther King, today (Wednesday, Jan. 15) at MIT.

All members of the MIT community are invited to attend and participate. Keynote speaker will be Hubert Jones, visiting associate professor of urban studies and planning and a leader of the Boston area Black community.

The MIT program has been planned by the Office of the

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You All Come

President Jerome B. Wiesner and Chancellor Paul E. Gray have invited all members of the MIT community to drop into an IAP party during the hour of 3 to 4pm Monday (Jan. 20) in the lobby of the Vannevar Bush Bldg. (13). Music, refreshments, and impromptu mingling will be the order of the afternoon.

Inflation, Minorities Conference Today

More than 100 minority business people were expected for a day-long seminar at MIT today (Wednesday, Jan. 15) on "Inflation and Minority Business."

The conference is sponsored by MIT, through the office of Dr. Clarence G. Williams, special assistant to the president and the chancellor on minority affairs, and the State Office of Minority Business Assistance (SOMBA), headed by David Harris, Jr.

It was to begin at 9:45am in Kresge Little Theater.

Conference participants include minority men and women who own and operate manufacturing, retail and service businesses. The conference focuses on what Dr. Williams and Kermit Allen, education coordinator for SOMBA, called the "urgent and difficult sets of unique problems facing this particular group in the state's economy, particularly during this inflationary period."

Small businesses, particularly minority ones, tend to be among the most vulnerable in an economic situation marked by drastic declines of real output, softening of demands in major markets, raw material shortages and an escalating layoff and unemployment rate, Dr. Williams and Mr. Allen said.

The conference has these objectives:

—To expand the understanding that minority entrepreneurs have of inflation and what it means to their business community.

—To aid the minority entrepreneur in identifying those resources in and around his community which are useful in helping the business withstand potentially severe market trends.

—To introduce the minority entrepreneur to flexible and innovative management techniques which can be used to minimize the impact that inflation is having on the business.

MIT faculty members are par-

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Mortgage Conference This Week

Can the nation's sagging home-building and home-financing industries be helped by a radical change in the traditional concept of a fixed interest, level-payment mortgage?

A team of financial experts and economists at MIT—studying alternative mortgage instruments for six months—is expected to recommend such a change when it reports its findings at a two-day conference Thursday and Friday (Jan. 16-17) at MIT. The conference is sponsored by the MIT Sloan School of Management and the Federal Reserve Bank of Boston.

Franco Modigliani, Institute Professor and professor of finance and economics, and Donald R. Lessard, assistant professor of finance and international management, coordinated the pilot study project for the Department of Housing and Urban Development and the Federal Home Loan Bank Board. Both Dr. Modigliani and Dr. Lessard are Sloan School faculty members.

More than 100 members of the mortgage lending and housing industries, government agencies and the academic community are expected to attend and participate

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At 87, She's Still Campaigner

Florence Luscomb, '09, Battles for Communes

By ELLEN HOFFMAN
Staff Writer

An 87 year-old MIT alumna, Florence Luscomb, has had difficulty finding a commune to join in recent years.

"After our last commune broke up last year, I tried to find another, but some had no openings and others would not take anyone over 35," she explains.

Small wonder, then, that Ms. Luscomb—SB, Architecture, 1909, and long a fighter for public causes—is co-sponsoring legislation to help "legitimize" communal living in Massachusetts. The bill she is sponsoring, introduced in the Massachusetts legislature by State Senator William Owens of Boston, proposes that communes be considered "family units" instead of

"lodging houses" for zoning purposes and thus legal in residential zones.

Ms. Luscomb, who still maintains a vigorous speaking schedule, will be at MIT this Friday (Jan. 17), in Rm 3-415, speaking on "Women Architects and Their Work" for the Sexual Politics and Design lecture series offered by the School of Architecture.

Ms. Luscomb now rents the partially-heated top floor of an old house in Brookline, but she has lived in various co-operative groups for more than 25 years. She has always been the oldest member of the groups, usually comprised of graduate students, but this has never bothered Florence, who is young at heart.

For Ms. Luscomb, who has

no living relations, communal living offered a satisfying lifestyle for many years.

"I tried living by myself," she recalls, "but it was inhuman. I'd come home to a dark house and there'd be no one to share ideas with when I was home."

In this battle—at age 87—Florence Luscomb has miraculously managed to preserve the same interest in social and political reform that she had when she stood on soap boxes and spoke out for women's right to vote more than 60 years ago.

When Florence came to MIT in 1905, there were only 12 women students at the Institute. The women's suffrage movement was gaining

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Ms. Luscomb voting in 1922



Ms. Luscomb today

Ithiel Pool Named Arthur And Ruth Sloan Professor

Dean Harold J. Hanham of the MIT School of Humanities and Social Science has announced the selection of MIT Professor Ithiel de Sola Pool, international authority on political communications and behavior, as the Arthur and Ruth Sloan Professor of Political Science.

The chair was established in 1961 by Dr. Arthur W. Sloan, a noted chemist and former chairman of the board and executive vice president of the Atlantic Research Corp., and his wife, Dr. Ruth C. Sloan, a distinguished historian and an authority on African affairs. Professor Pool is the first to hold the chair. Heretofore, portions of income from the Sloan gift have been used for career development among younger members of the faculty whose research interests are in African Affairs.

Professor Pool came to MIT in 1952 as professor of political science and director of the International Communications Program of the Center for International Studies. He worked closely with the late Max F. Millikan in attracting to MIT the nucleus of scholars who founded graduate instruction in political science at MIT. He was head of the political science section in the Department of Economics and Social



Professor Pool

Science when the graduate program was designed and initiated; he served as first chairman when political science became an independent department; and under his leadership the department was designated by a national panel of deans and department heads as providing "the best instruction in political science" in America.

Professor Pool is the author of numerous books and articles, including *American Business and Public Policy* (with R.A. Bauer and L.A. Dexter) which won the

Old Views of MIT On Exhibit in Bldg. 4

Photographs, showing the original 19th century MIT buildings in downtown Boston and step-by-step views of construction in Cambridge, are on display in the Bldg. 4 corridor.

Included is one photo of the first aerial photos ever taken. Made from a balloon, it shows the Mercantile Bldg. on Summer St. where MIT's first classes were held in 1865. The exhibit mounted by the MIT Historical Collections includes photos from the Cambridge Historical Commission and the Boston Athenaeum.

Woodrow Wilson Award as the best book in political science published in 1963. Professor Pool has been a pioneer in the use of quantitative methods and computer technology in political science. His interests as a political scientist are unusually broad. They have led him at an earlier stage of his career into the domain of political sociology, where he executed a now classic study of the comparative social characteristics of political elites. More recently he has been at the forefront of the study of the social and political impacts of communications technology. He is a national authority on communications policy and his views have been sought by lawmakers on the problems of privacy and data banks, the effects of televisions on children, the potentials of cable televisions, and the ways in which technology can facilitate greater citizen communications and participation. He has served on numerous governmental and professional advisory boards and selection panels.

Professor Pool did his graduate work just prior to World War II at the University of Chicago, which was then the intellectual center of American political science. Working with such leading figures as Charles Merriam, Harold D. Lasswell, Quincy Wright, and Leonard White, he made a substantial contribution to normative political philosophy by applying systematic analysis to the question of equity in public policy. During World War II Professor Pool analyzed Axis propaganda, and in the process he advanced the mathematics employed in the techniques of content analysis. At the time he also taught at Hobart College, where he designed a novel undergraduate curriculum in political science. In 1949 he was invited to the Hoover Institute of Stanford University as associate director of the RADIR project, where he directed research on worldwide changes in elites and political symbols, until coming to MIT.

Professor Pool has held responsible posts in the American Political Science Association and The American Association for Public Opinion Research. In 1957-58 he was selected a fellow of the Center for Advanced Study in the Behavioral Sciences, and he has been elected to the American Academy of Arts and Sciences.

OPD Moves to E-18

The following members of the MIT Office of Personnel Development have moved their offices from Bldg. E19-220 to Bldg. E18-320—Drs. F. Adam and Maureen M. Yagodka, co-directors; Karen Powell, secretary and employee instructor; John A. Carley, personnel development officer; Priscilla E. Mead, personnel development officer; Joan Rice, orientation and Ellen Oglesby, tuition assistance. All telephone extensions remain the same.



KAREN C. DILLON, MIT first year student from Camden, N.Y., exchanges autographs with Gloria Steinem after her lecture in Kresge Auditorium.

Gloria Steinem At MIT

By PATRICIA M. MARONI
Staff Writer

Gloria Steinem strode into a packed Kresge Auditorium at 5:40pm Monday with a promise that the future of the women's movement will depend not on technology alone, but on autonomous organization—of women's reproductive lives, their work lives, and their political lives.

She made a special plea to the students to mobilize all academic disciplines that might contribute to a changed national consciousness. "Women have been brought up to believe that they are dependent on technology for their freedom in the sense that technology removes the need for physical strength and provides contraceptive-freedom," she said. "But to believe this way is to politically condemn all wom-

en in pre-technological societies to a perpetually anti-feminist, inferior state until they gain technology—which doesn't make human sense. Women's veto power in the bearing of children may be their cartel, their nationalism, their power."

On unionization among women, she said a crucial concern is "to keep from lapsing into terminal gratitude." Clerical workers will always be a vanguard of organizing among women, she said.

Ms. Steinem's speech was sponsored by the MIT Women's Forum.

After a series of meetings with representatives from other MIT women's groups, Ms. Steinem said she was encouraged by changes in campus attitudes since her last formal visit to MIT—"in 1955, as someone's date."

DSRE Announces Lectureships

MIT's Division for Study and Research in Education has announced the availability of two special postdoctoral lectureships next fall.

The appointments involve a mixture of teaching and research and preference will be given to recent recipients of a doctorate

who have a strong interest in the relation of their work to education.

The appointments are for one academic year and are renewable for an additional year. The salary will be \$12,500 for the nine-month academic year.

Inquiries or requests for application forms should be addressed to D.S.R.E., Rm. 20C-124.

D.S.R.E., a new academic structure at MIT, cooperates in an interdisciplinary doctoral program for students in various MIT departments who wish to pursue their disciplines in directions related to education.

LVW President Here

"Citizen Participation in Government" will be the topic of a lecture by Mrs. Florence Rubin, president of the Massachusetts League of Women Voters, at a meeting of the Technology Wives Organization Wednesday, Jan. 15 at 8pm in the Emma Rogers Room (10-340). All members of the MIT community are invited. Refreshments will be served.

Kiparsky Chapter

Professor Rene P.V. Kiparsky of the Department of Foreign Literatures and Linguistics at MIT is the author of the chapter, "The Role of Linguistics in a Theory of Poetry" in the forthcoming book, *Language As A Human Problem*, edited by Einar Haugen and Morton Bloomfield and scheduled for publication Jan. 27 by W.W. Norton and Co.

European Piano Duo To Appear in Concert



Alfons and Aloys Kontarsky

A contemporary music concert by Europe's foremost duo-pianists, Aloys and Alfons Kontarsky, will be given Monday, Jan. 27, at 8pm in Kresge Auditorium.

The concert, sponsored by the MIT Music Section, will be open to the public without charge.

The program will include Stravinsky's Concerto for Duo-Piano Forti Soli, Bizet's *Jeux D'Enfants*, Opus 22, Ravel's *Les Sites auriculaires* and Reger's *Opus 96*.

Long associated with modern music, the Kontarsky brothers received early musical training at Darmstadt, Germany, a center of avant-garde music after World War II. They also studied piano,

independently of each other at the State University of Music in Cologne.

In 1955 they were awarded first prize for duo-pianists at the fourth international music competition in Munich. They completed their studies as pupils of Eduard Erdmann in Hamburg in 1957.

The Kontarskys' repertoire includes the entire important classical and modern works available for two pianos and for one piano, four hands.

In addition to concertizing throughout Europe the brothers have made tours in the Near East, Japan, South America and two concert tours in the US.

Both brothers currently serve as professors at the State Academy of Music in Cologne.

—Sally Hamilton

TECH TALK

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"HOW'S THAT AGAIN?" Some of the entrants in the preliminary round of the Great MIT Spelling Bee seem to express various shades of disbelief as they hear one of the words they were required to spell in the test to win their way into the finals.

Photo by Calvin Campbell

50 Are Picked for Finals In Spelling Bee

Fifty finalists have been chosen—from a field of 260 hopefuls—for the IAP spelling bee next Tuesday night (Jan. 21) in Kresge Auditorium.

The finalists, who will be competing for a variety of prizes, were selected Monday night, Jan. 13, in a written elimination competition held in the Walker gymnasium.

Each of the finalists will receive a copy of *The American Heritage Dictionary of the English Language: New College Edition*, a donation of the Houghton Mifflin Company of Boston.

The spelling bee will start at 6:30pm and its organizers hope to have a large audience. Admission

NLRB Dismisses Unfair Labor Practice Charges Against MIT

The regional director of the National Labor Relations Board recently dismissed two unfair labor practice charges brought against the Institute by the Service Employees International Union, AFL-CIO.

The union had alleged in one case that the Institute had not bargained in good faith during the negotiations which preceded the strike last fall, and in the other that the Institute was responsible for alleged interference by the

is free.

Among the top prizes are a calculator donated by Texas Instruments, Inc., \$100 worth of computer time contributed by Information Processing Services, a \$100 cash award from the Alfred P. Sloan School of Management and a \$75 prize contributed by the Cambridge Trust Company.

The spelling bee is patterned after the National Spelling Bee, which is sponsored by Scripps-Howard newspapers in 14 cities and 62 other newspapers.

There will be five judges for the MIT event, including two former winners of the National Spelling Bee.

The chief judge will be Dr.

Hartley Rogers, Jr., MIT associate provost.

"We hear criticisms of the literacy and spelling ability of today's college students," Dr. Rogers said, "but the unusual interest in the spelling bee shows that many students continue to take pride in this basic skill." Dr. Rogers brings interesting credentials to the post of chief judge. He is a mathematician who has a bachelor's degree in English from Yale University.

The former spelling bee winners serving as judges are Henry Feldman, a doctoral candidate in applied mathematics at Harvard, and Robert A. Wake, an MIT 1974 graduate who is now a graduate student at Brown University. Feldman was the National Spelling Bee champion in 1960, representing the Knoxville, Tenn., News-Sentinel, and Wake in 1966, representing the Houston, Tex., Chronicle.

The other judges are Barbara J. Trombley, national consultant for the Houghton Mifflin Company's *American Heritage Dictionary of the English Language*, and Dr. Mary Potter Rowe, Special Assistant to the President and Chancellor for Women and Work at MIT.

Pronouncers will be Dean Robert Holden, Dean Peter Buttner, and Harvey Elentuck.

Dr. Rowe, asked about her thoughts on spelling bees, said, "I like them because they're fun. I do believe people should spell better. I got a letter just this week asking me for all the salary 'rages' for men and women."

Aid in Search

Two members of the MIT meteorology department—Robert C. Beardsley, associate professor of oceanography, and Frederick Sanders, professor of meteorology—are among a group of New England scientists who have assisted the Coast Guard in the search for possible survivors of the research vessel Gulf Stream, missing since Jan. 6 in the Gulf of Maine.

Lexington police with the union's right to picket on federal property on Hanscom Field. In both cases, appeals were denied by the board's general counsel.

In another case brought by the Institute and charging the union with mass picketing, threats of violence and other illegal activities during the strike, the board found cause to issue a complaint against the union and has scheduled a hearing before an administrative law judge on Jan. 15.

G. A. Znamensky, Retired Professor

Professor George A. Znamensky, 84, of Arlington, assistant professor of Russian, emeritus, in the Department of Foreign Literatures and Linguistics, died Monday, Jan. 6.

Professor Znamensky was born in Russia where he received most of his education and served as president of a classical junior college from 1917-21.

He received the MA in education from Harvard University in 1932. He came to MIT as a part-time instructor in what was then the MIT Department of Foreign Languages in 1942 and became assistant professor in 1946. In 1955 Professor Znamensky retired, but continued to teach as senior lecturer until 1960.

He leaves his wife Olga.

Employee Views Sought on IAP

Adam and Maureen Yagodka of the Office of Personnel Development and coordinators of employee participation in MIT's Independent Activities Period are seeking comments from instructors and employees on success of various IAP sessions.

They are interested in learning

the names of specific offerings that attracted employee participation and the number of employees in attendance at each session. Written and telephone replies should be directed to Ms. Priscilla E. Mead in the Office of Personnel Development, E18-320, at x3-4277.

Lowell Institute School Issues Enrollment Invitation to MIT Community

Bruce C. Wedlock, director of the Lowell Institute School, issued a campus-wide invitation this week to all members of the MIT community to participate in the evening courses being offered during the school's spring term.

The evening courses—designed primarily for technical-level stu-

dents—will begin the week of Feb. 10. Deadline for application is Wednesday Jan. 29.

New offerings this term include *Scientific Glassblowing*, *Reporting Technical Information*, *Safety and Management in the Chemical Field*, and *Engineering Drawing-II*.

In addition, 11 other subjects—including *Machine Tool Fundamentals*, *Digital Electronics*, *Op-Amp Applications*, *Creative Photography*, *High-Speed Strobe Photography*, *Dimensioning and Tolerancing for Engineering Drawings*, *Color TV*, *TV Signal Processing and Measurement*, and *Wave*

Two Appointed to Staff Of MIT Associates Program

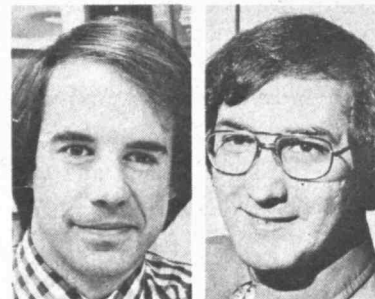
David W. Dove, former staff engineer at the Charles S. Draper Laboratory, and Thomas R. Henneberry, engineer for the Polaroid Corp., have been appointed to the staff of the MIT Associates Program.

The appointments were announced by Program Director Jerome J. Schaufeld, who said the appointments represent "a significant turning point" in the expansion of the 14-year-old Associates Program. A major goal, he said, in addition to expanding the base of service to the 39 industrial firms presently in the Program, is to increase the number of participating firms by 50 percent within the next year.

Historically, most of the firms in the program were New England-based, but Schaufeld reports that an increasingly important objective is representation in the Midwest and an expanding National scope.

Participating in the two-way flow of knowledge between the MIT faculty and the industrial community are such companies as State Street Bank and Trust Co., American Science and Engineering, Inc., Microwave Associates, Inc., Cambion-Cambridge Thermionic Corp. and the National Shawmut Bank of Boston.

Mr. Dove, who worked on the computer modelling and simulation of advanced inertial guidance systems at Draper Lab, received the BS degree from North Carolina State University in 1969, the SM degree from MIT in 1971 and the MBA from Boston University, where he is a part-time faculty member. He and his wife Nina live in Winchester.



Dove

Henneberry

Mr. Henneberry, active in the engineering development of the SX-70 camera project at Polaroid and the manufacturing areas of the company, received the BS degree from the U.S. Military Academy at West Point and has completed study toward an MBA from Northeastern University. He is now attending the New England School of Law for a J.D. degree. He lives in Revere with his wife Karen and their three children.

\$1,250 in Prizes Offered To Student Innovators

Two checks for \$500 and 10 honorable mention awards at \$25 each will be prizes in the second annual Student Innovation Contest, sponsored by the MIT Innovation Center.

Professor Y.T. Li, director of the Center, said a total of 14 students have registered in the graduate and undergraduate divisions of the competition thus far. To encourage greater competition, the deadline for registration in the contest has been extended to Jan. 29. Entries must be submitted by Feb. 19.

A panel of judges composed of the 13-member Innovation Education Council will rank the student inventions on originality, technical feasibility and marketability. Faculty members serving on the Innovation Education Council are drawn from six departments in the School of Engineering and the Sloan School of Management.

Past student entries have ranged from a personal text editor and a rotary rolling conduit to an automated tape and record accessing machine.

Last year's first place winners

were Carl N. Bielenberg from Garrison, N.Y. whose "automated programmable tape and record accessing machine" activated any selected song from a stack of records and Rinaldo Spinella, from Glendale, Ariz., who submitted a digital torquemeter. Bielenberg is still at work on his project in an attempt to gain acceptance by the federal Patent Office.

Dr. Li said entries should consist of a detailed description of an original idea or invention, a description of the existing need the invention will fill, and an evaluation of the potential market. Both individual and team efforts are permitted.

Professor Li said he hoped the marketing factor would not dissuade students from entering the competition.

"A technical idea is a fragile thing and should be developed. The transfer of knowledge from the developmental stage of an idea to the decision making processes concerning materials, manufacturing and marketing strategy is a fairly natural one," he said.

Newspaper People Due for Seminar

Video-display terminals for newspaper composition and makeup will be the subject of the second MIT Newspaper Technology Seminar at 4pm Tuesday (Jan. 21) in Rm. 9-150.

Speaker will be Jay G. Levinthal, consulting engineer for Raytheon Co. He will trace evolution of composition and makeup terminals, describe typical design approaches and applications, consider costs and benefits for different approaches to automated

composition and makeup and project future developments in both technology and applications. The seminar is open to the public.

The series is part of a three-year educational program undertaken by MIT under a grant from the Frank E. Gannett Newspaper Foundation, Inc., to develop technologists in the newspaper business. Director is Professor J. Francis Reintjes of the MIT Electronics Systems Laboratory.

Optics will be offered.

Wedlock reported that the School's most popular course—*Metals Joining*—is already over-subscribed for spring. He added that MIT employees are usually eligible for tuition assistance and generous scholarship aid.

All courses, which emphasize practical exercises and shop and

laboratory work, meet weekly from 6:30-9:30pm.

For additional information and registration material, applicants may visit the Lowell Institute School Office, in Room 5-118, or call x3-4895.

Chemistry of Maturation, Biologic Rhythms Studied

A major advance towards understanding the chemical basis of sexual maturation as well as the biologic rhythms in ovulation and sleep has been made at MIT.

MIT researchers have developed the first workable technique for measuring the secretion of melatonin, a substance thought to regulate sleep and sexual maturation.

Using that technique, they have shown that the human pineal, a pea-sized gland buried in the center of the brain, secretes more melatonin at night than during the day.

Dr. Richard J. Wurtman, professor of endocrinology and metabolism, and Dr. Harry J. Lynch, research associate in nutrition and food science, reported in the current (Jan. 17) issue of *Science* magazine that much more melatonin is found in human urine samples taken from 11pm to 7am than from 7am to 3pm or from 3pm to 11pm.

The samples were taken from six healthy adults. Total amounts of melatonin excreted varied considerably from individual to individual, but in all cases, more melatonin was excreted—and therefore probably secreted by the pineal—at night than during the day.

The discovery was made possible by a new technique, developed chiefly by Dr. Lynch, for measuring the minute traces of melatonin found in urine samples collected over periods shorter than a day.

Up to now, it was impossible to measure melatonin secretion in humans. Its secretion in experimental animals could be studied only by looking in their pineals for melatonin itself, or for the enzyme catalysts that make it.

The importance of the pineal in regulating sexual maturation was first suspected about a hundred years ago, when a German doctor described the case of a 4-year-old male child who died of a tumor destroying the pineal. The child had the sexual organs of an adult.

"For about a hundred years doctors and scientists have speculated that the human pineal might be a gland and that it might secrete a hormone that has something to do with sexual maturity and with biologic rhythms in gonad (sexual organ) function, sleep and behavior," Dr. Wurtman said.

Recent work by scientists had revealed that synthetic melatonin makes people sleepy, suppresses the secretion of sexual hormones, and modifies locomotor activity rhythms and the pattern of electrical activity generated by the brain (i.e. the electroencephalogram).

Research on rats had shown that the rate at which melatonin is synthesized by the pineal was greater when the animal was left in darkness and less when the animal was in light. Removing the pineal induces precocious puberty in rats, while injecting rats with pineal extract containing melatonin delayed maturity and interfered with ovulation.

It had also been found that annual rhythms in melatonin are important in some species. For example, the pineal hormone turns the coat of the weasel white in winter, and makes its sexual organs atrophy.

But until the development of a sensitive technique for measuring

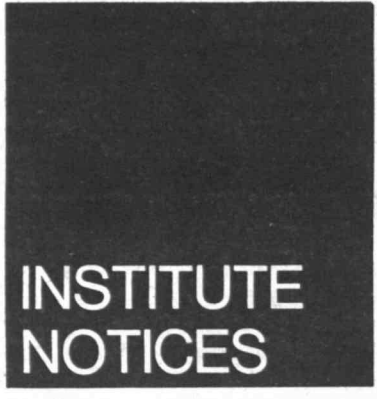
melatonin in human urine, there was no way to determine whether it was actually the hormone secreted by the human pineal, or whether its secretion rate also depended on the time of day, or age, or lighting.

Dr. Wurtman and Dr. Lynch now plan to do further studies to determine whether the increase in melatonin excretion at night is caused by darkness, sleep, food or the assumption of a reclining position.

They also will examine mela-

A new Xerox copy machine that produces high-quality copies on coated paper at 10 cents apiece has been added to the SCM copiers in the Hayden Library lobby. Last year more than a million copies were made on MIT libraries' rapid copy machines, and thousands more were produced through orders to the Microreproduction Lab.

tonin secretion in large numbers of children and adults of both sexes and all ages, to determine, for example, whether a fall in melatonin secretion actually may be a factor in causing puberty.



Announcements

Wellesley Course on Women—Will be offered at MIT (Extrdepartmental 210, Contemporary Women: An Interdisciplinary Perspective). Classes will meet Tues & Thurs, 11am-12:30pm. Call or stop by the exchange office, Rm 5-108, x3-1668 for information. Open to all students.

Wellesley-MIT Exchange—MIT Students may still sign up for subjects at Wellesley for the spring 1975 term. Check with the Exchange office, Rm 5-108, x3-1668.

MIT Community Players—If you have a proposal for the spring mini-production, please contact Steve Ivester, 864-6400, x2839 (days) or 242-4783 (evgs).

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

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

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

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

MIT Employee's Federal Credit Union—Effective Nov 28, 1974, each member's share account is insured for up to \$40,000, the new maximum share-holding allowed by law.

6.163 Strobe Project Lab—Upperclassmen interested in taking 6.163 in the spring semester may sign up on the list posted by Rm 4-405. Attendance may be limited.

New UROP Listings

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

Massachusetts Research Center Boston, Ma. The Research Center conducts research in areas of the public interest. Projects are offered in the areas of budget analysis, desegregation, state financing of schools, corrections, and gun control. Tim Bird, Rm. 4-209, x3-1368.

Mechanical Engineering Dept. A project involving experiments with an electronic feedback system at Polaroid Corporation is available. The system is used in management training programs to determine individual preferences and to help develop consensus. Prof. Sheridan, Rm. 1-108, x3-2228.

Undergraduate Summer Research at Yale The Department of Engineering and Applied Science of Yale University is offering a limited number of special grants to college juniors who would like to gain experience in advanced research next summer. Available projects include work involving environmental studies, acoustics, biochemistry, biomechanics, surface chemistry and catalysis, solid state physics, magnetism, atomic physics, fluid dynamics, pattern recognition. Stipends will be about \$110 per week and will be awarded for an eleven-week period from June 2 through August 15, 1975. Applications available at UROP. They are due February 15.

Evaluations are Due! UROP participants are reminded that their letters of evaluation for fall term are anxiously awaited. It is our informal policy to hold up on requests for financial awards if the proposers' evaluations are not in. (And we are known for our long memory.)

Undergraduate Research Conference The 29th Annual Eastern Colleges Science Conference will be held at Widener College during the period April 3-5, 1975. The ECSC has provided a forum for the presentation of undergraduate research papers since 1947, and many institutions have served as host since that time. Undergraduates from all colleges in the eastern United States are eligible to participate, and faculty members are encouraged to accompany students to the Conference, as well as to participate in all Conference activities. It should be noted that presentation of a paper is not a prerequisite for attendance. Jack Powers, Box 1184, Widener College, Chester, Penn. (215) 876-5551, x387.

Foreign Studies

Gonville and Caius College, University of Cambridge, Research Studentships 1975-76—Open to candidates who are not already registered research students of the University of Cambridge. Two types of awards available are A) **Gonville Research Studentships** and B) **Tapp Research Studentships in Law**. Candidates must be male, under the age of 30 on October 1, 1975, and graduates of the University of Cambridge or any other university in the UK, or elsewhere, or be about to graduate not later than August 1975. They must be prospective candidates for a research degree in the University of Cambridge, and tenure of a Studentship is conditional upon the student selected being accepted by the Board of Graduate Studies. (Application to the Board is made through the Cambridge Intercollegiate Graduate Application Scheme, (CIGAS). Forms may be obtained from the Secretary, Board of Graduate Studies, Cambridge. Application forms for the Studentships may be obtained from the Senior Tutor, Gonville and Caius College, Cambridge, CB21TA. Applications should reach the Senior Tutor no later than April 1, 1975. In awarding Studentships, first consideration will be given to candidates who nominate Gonville and Caius College as their College of first preference under the CIGAS. The value of the Studentship will be determined after considering successful candidates' income from other sources. Successful candidates will receive up to approximately US \$2,000 if they are from outside the UK. Foreign Study Office, Rm. 5-108, x3-5243.

Peterhouse College, Cambridge University, Research Studentships 1975-76—Open to candidates who are not already members of the College. Candidates must be men under 25 years of age on December 1, 1975. In certain circumstances allowances may be made for time already spent in research or other approved activities. Candidates must be graduates of a University in the United Kingdom or elsewhere; if not graduate they should have graduated by August 1975. They must intend to be candidates for the degree of PhD in the

Daily Seminars Spotlighting Laser

Lasers and spectroscopy are the subjects of a series of daily seminars being conducted during IAP.

The seminars meet in Rm 6-120 at 10:30am Mondays through Fridays. This week they deal with the "resolution revolution" in laser spectroscopy; today, "Two Photon Spectroscopy," by Professor David Pritchard; Thursday (Jan. 16) "Laser Spectroscopy in Molecular Beams," by Professor Shaoul Ezekiel; and Friday (Jan. 17) "Future Applications," by Professors Rainer Weiss, Daniel

Kleppner and Robert Field. Seminars next week deal with applications of lasers: Monday (Jan. 20) "Holography and Applications," by Professor Ezekiel; Tuesday (Jan. 21) "Picosecond Pulses," by Dr. Seppo Sari; Wednesday (Jan. 22) "Monitoring Pollution with Lasers," by Professor C. Forbes Dewey, Jr. and Michael M. Burns; Thursday (Jan. 23) "Biological Physics with Lasers" by Drs. Toyochi Tanaka and K. Rothschild; and Friday (Jan. 24) "Integrated Optics and Fiber Communication," by Professor Chenming Hu.

MIT Club Notes

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

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

MIT/DL Duplicate Bridge—If you're interested in a friendly game of duplicate bridge, attend meeting Tues, Jan 21, 6pm, Stu Ctr Rm 491. We can have a beginners program if there is sufficient interest. If interested and can't attend, call Sam Smith, x8-3666 Draper or Arthur Boyce, x8-1414 Draper.

MIT Employee's Federal Credit Union***—Annual business meeting. Thurs, Jan 23, 5:30pm, Rm 10-105.

MIT Outing Club*—Mon & Thurs, 5-6pm, Stu Ctr Rm 461.

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

Strategic Games Society—Third annual Winter Wargaming Convention in New England—Sat & Sun, Jan 18 & 19, Sala. Registration: \$2.50/day, \$4/2 days. Pre-registration discount \$5.00. Info, Robert Sacks, 494-8889.

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

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

MIT Women's Chorale**—Wives and working members are encouraged to join. Thurs, 8pm, Rm 10-340.

Religious Activities

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

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

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

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

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

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

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

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

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

IAP Notices

IAP #227b The Advisory Committees on Reactor Safeguards—Has been cancelled.

IAP #38 Chemical Engineering in Medicine, has been cancelled. If you would be interested in a similar course, look at #153.

Terminals Improve Cataloging

Two new computer terminals installed last month in the Catalog Department of the MIT Libraries are enabling library personnel to catalogue books approximately three times faster than ordinarily achieved by hand.

Director of Libraries, Miss Natalie N. Nicholson, reports that MIT catalogues approximately 25,000 titles each year.

As a user of the Ohio College Library Center (OCLC) cataloging system, MIT joins 276 other educational institutions and federal libraries in the sharing of more than one million catalogue records. MIT became a user of the system through NELINET, the New England Library Information Network—a multi-state consortium of academic, research, public and other libraries—sponsored by the New England Board of Higher Education. NELINET provides OCLC services to more than 70 educational institutions.

According to library assistant Ms. Pamela Reekes, MIT '70, who has been responsible for teaching the system to other staff members, a complete catalogue record is "called up" on a 14-inch screen from either Library of Congress records or the contributed cataloging of member libraries.

The system is expected to speed the transmission of books from catalog department to shelf and cut down on the percentage of original cataloging. MIT now catalogues 38 percent of its own material and depends on Library of Congress records for the remainder of books received.

Library systems designer Patricia Sheehan said the OCLC terminal, one of four purchased by MIT, will also encourage regional inter-library lending since all in-



Robert Q. Barr of the Climax Molybdenum Co. presents limited issue commemorative medal of MIT alumnus William S. Coolidge to Miss Natalie Nicholson, director of libraries. Photo by Calvin Campbell

A limited series of Wedgewood medallions honoring 101-year-old MIT alumnus William Coolidge, '96, has been issued by the Climax Molybdenum Company of Greenwich, Conn., and one has been presented to the MIT Libraries.

The medallions are in appreciation of Dr. Coolidge's contributions to the molybdenum industry. One was represented to MIT Friday (Jan. 10) in a ceremony in the Archives Library. A second was given to Harvard, where Dr. Coolidge was also once a student.

Making the presentation was Robert Q. Barr, director of technical information for Climax Molybdenum, a division of Amax, Inc. Accepting for MIT were Miss

Natalie N. Nicholson, Director of Libraries, and E. Neal Hartley, Institute Archivist.

Dr. Coolidge, who lives in Schenectady, N.Y., holds the Nobel Prize for his development of ductile tungsten, which found its first application as filament material for the incandescent lamp.

He also invented the cathode X-ray tube (or Coolidge tube) and the C-tube, a listening device for submarine detection and underwater signalling.

Dr. Coolidge, a retired vice president of General Electric and director of research, is a former MIT Corporation member and staff member in the Departments of Physics and Chemistry.

stitutions in possession of a specific book are automatically listed on the terminal operator's screen.

Mrs. Frances R.L. Needleman, head of the catalog department, sees an inherent value in the science and engineering-related input her department will provide as a contributing member to the automated data base.

"MIT research is so far in advance of hard-cover publications, that we often write to the Library of Congress about newly developing fields in an attempt to gain assistance with cataloging terminology," she said.

Under the OCLC system, 58 percent of the available catalog information is entered by member institutions.

MIT United Fund Tops Last Year Despite Pinch

Despite severe economic conditions final results for the 1974-75 United Way Campaign at MIT show a total contribution of \$100,716, just \$168 under last year.

"We are particularly grateful," said Dean Peter P. Gil, associate dean for teaching programs at the Sloan School, the 1974-75 chairman for the campaign, "that 2,815 people made contributions, a number that is only 89 fewer than last year when the entire economic picture was much brighter."

Both the number of contributors and the amount contributed came close to equalling last year's figures despite a delayed start by the United Black Appeal.

Contributions by academic departments, administrative departments and laboratories and centers follow.

Academic Departments
Aeronautics and Astronautics—46 gifts, \$2,676; Aerospace Studies—5, \$39; Architecture—13, \$713; Biology—23, \$2028;

Chemical Engineering—25, \$1,033; Chemistry—63, \$2,123; Civil Engineering—57, \$1,804; Earth and Planetary Sciences—18, \$850; Economics—16, \$2,180; Electrical Engineering—108, \$4,646; Foreign Literatures and Linguistics—19, \$667; Humanities—20, \$1,064; Mathematics—22, \$1,385; Mechanical Engineering—61, \$2,865; Metallurgy—26, \$1,232; Meteorology—26, \$1,243; Military Science—10, \$165; Nuclear Engineering—26, \$1,648; Nutrition—65, \$1,344; Ocean Engineering—17, \$766; Philosophy—6, \$726; Physics—94, \$5,012; Political Science—30, \$1,097; Psychology—11, \$369; Sloan School—72, \$4,616; Urban Studies and Planning—18, \$848.

Administrative Departments
Admissions—18, \$975; Alumni—29, \$559; Athletics—11, \$350; Audit Division—6, \$136; Campus Patrol—27, \$393; Career Planning and Placement—8, \$168; Comptroller Accounting—86, \$943; Credit Union—4, \$65; Dean Graduate School—6, \$305; Housing and Food Service—108, \$940; Graphic Arts—26, \$417; Industrial Liaison—11, \$439; Institute Information Service—20, \$419; Libraries—105, \$1,887; Lincoln Fiscal—7, \$171; Lincoln Lab—557, \$20,658; Medical—95, \$4,245; MIT Press—9, \$269; Office of Administrative Information—42, \$818; Office of Sponsored Programs—45,

\$780; Personnel—25, \$820; Physical Plant—103, \$2,234; Planning—4, \$75; President's Office—27, \$3,749; Program Development Office—16, \$935; Purchasing—23, \$196; Registrar—13, \$188; Safety Office—8, \$114; Secretary of the Institute—7, \$175; Student Affairs—12, \$398; Student Financial Aid—4, \$93; Summer Session—3, \$94; Resource Development—29, \$595; Treasurer's Office—15, \$768; Vice President for Resources—11, \$437.

Laboratories & Centers
Arteriosclerosis Center—2, \$84; Cancer Research Center—9, \$317; Center for Advanced Engineering—8, \$87; Center for Materials Science—8, \$138; Center for Policy Alternatives—11, \$678; Center for Space Research—36, \$917; Electronics Systems Laboratory—31, \$1,156; Energy Laboratory—24, \$650; Harvard-MIT Health Sciences Program—2, \$115; Information Processing Center—46, \$802; Joint Center Urban Studies—4, \$111; Laboratory for Nuclear Science—89, \$1,713; Neuroscience Research Center—13, \$530; Project MAC—13, \$247; Research Laboratory of Electronics—55, \$1,219; Division for Study and Research in Education—4, \$71; Urban Systems Laboratory—3, \$120; National Magnet Laboratory—78, 2,483.

MIT Steel Researchers Take Tip from Ice Cream Makers

Scientists at MIT have taken a tip from the old-fashioned ice cream maker to devise a cheaper way to shape steel into precision parts.

Instead of pouring liquid steel into a mold—expensive because the liquid is so hot that the mold can be used only once—they first turn it into a semi-solid, semi-liquid glop by agitating the liquid as it cools, just as ice cream is stirred as it freezes.

Since half the mixture is solid when it is poured into a mold, it is cooler than liquid steel, and the same mold, or die, can be used over and over.

The MIT researchers, who recently succeeded in making liquid steel into a red

hot, semi-solid "ice cream," are now working on die-casting it. (They have applied the process to other metals, but steel is the most challenging, because of its high melting point.)

The process is formally called "Rheocasting" ("flow" casting). Around the laboratory, the scientists sometimes refer to it as "ice cream casting."

The work is part of an MIT-industry research project coordinated by Dr. Merton C. Flemings, ABEX Professor of Metallurgy at MIT, and funded by the federal Defense Advanced Research Projects Agency. Industry participants are Abex Corporation, Mahwah, N.J., and the Hitchiner Manufacturing Corp., Mil-

ford, N.H.

Rheocasting was discovered several years ago by former MIT graduate student David Spencer, working with Professor Flemings and Professor Robert Mehrabian.

Professors Flemings and Mehrabian gradually applied the process to metals with higher and higher melting points, starting with a tin-lead alloy and working their way up to steel and other high-temperature alloys like cobalt and nickel base superalloys.

The technique has a number of advantages besides the critical one of reducing the temperature of the material to be die cast.

The metal shrinks less as it solidifies,

since the only metal that can contract is the liquid half; the liquid shrinks very little since it is already partially cooled down.

It is possible to cast composite materials by the process, to achieve such qualities as improved resistance to abrasion, or to dilute expensive metals with inexpensive materials such as sand, mica, and recycled glass.

The researchers also plan to work on other methods of forming the semi-solid alloys, including one (extrusion) where the metal is squeezed through a die like toothpaste, to form long, simple shapes.

—Barbara A. Burke

Fuel Price Watch



Following are comparative prices of various fuels over the past four years. The prices are supplied by Office of Environmental Engineer, MIT Department of Physical Plant, and are published regularly in *Tech Talk* so MIT people will have a frequent guide to how prices have been climbing and to why energy conservation is important at home and at the Institute.

Date	Industrial Oil (#6)	Steam Per klb	Electricity Per kWh	Home Oil Per gal
Jan. 1975	\$ 13.975	\$ 4.85	\$.0300	\$.3665
Jan. 1974	10.90	2.35	.0248	.307
Jan. 1973	4.66	1.87	.0173	.142
Jan. 1970	1.86	1.04	.0114	.059*

* The \$.059 per gallon figure in 1970 was the cost of No. 4 heating oil used at several buildings on the campus not served by the central heating plant. In compliance with the Metropolitan Boston Air Pollution Control District standards, these boilers have been switched over to the more highly refined No. 2 fuel oil since 1970. The 1973 and 1974 figures are for the more expensive No. 2 fuel oil, which, in 1970 was \$.13 per gallon.

Grievance Procedures Restated by Personnel

(The following was prepared by the Office of Personnel Services to respond to recent inquiries about grievance procedures.)

In the past several weeks there have been a number of questions from members of the MIT Community regarding the present Institute grievance procedure. It, therefore, seems particularly appropriate to restate the current procedure.

"Any person employed* at MIT who believes that the Institute's stated policy of non-discrimination has been violated or that they have been treated unjustly for any reason should have access to a clear means of seeking redress. Such persons should be encouraged to communicate, either in writing or in person, with the Assistant for Minority Affairs or the Special Assistant for Women and Work. Either will initiate an inquiry into all the facts relevant to the complaint and will attempt to resolve the matter to the satisfaction of both the aggrieved individual and the person or organization against which the complaint has been brought, recommending a final decision in each instance to the Chancellor.

"This process will be held confidential to the extent that the aggrieved person wishes it. It is hoped in most instances that any person who feels aggrieved will have sought to resolve his or her complaint with the appropriate persons within the department, including the department head, and, in the case of other than academic staff, with the assistance of the appropriate personnel officer before bringing the complaint to the attention of the Assistant for Minority Affairs or the Special Assistant for Women and Work."

(*This procedure is not intended to apply to employees who are

represented by a labor union. Collective bargaining agreements applying to these employees include grievance and arbitration procedures and equal opportunity provisions. (Page 5 of Institute's Affirmative Action Plan.)

Where complaints cannot be resolved within the department, advice may be sought from the appropriate Personnel Officer, whose areas are defined below:

Virginia Bishop, Ext. 3-1591—Treasurer, V.P. Fiscal Relations, V.P. Financial Operations.

Sally Hansen, Ext. 3-4275—School of Science.

Richard Higham, Ext. 3-4278—Office of the President and Chancellor.

Philip Knight, Ext. 3-4267—V.P. Research area.

Claudia Liesbesny, Ext. 3-1595—Provost area.

Jack Newcomb, Ext. 3-4269—School of Engineering.

Michael Parr, Ext. 3-4266—V.P., Operations area.

Evelyn Perez, Ext. 3-2928—V.P., Administration and Personnel; V.P., Resource Development; V.P. (including Medical, E.M.S., and Registrar's Office), School of Architecture and Planning.

Patricia Williams, Ext. 3-1594—Sloan School of Management, School of Humanities and Social Sciences, Libraries, Center for International Studies.

Any questions regarding this procedure should be referred to the Personnel Officer, or Dr. Mary P. Rowe, Special Assistant for Women and Work (ext. 3-5921), Dr. Clarence G. Williams, Special Assistant for Minority Affairs (ext. 3-5446), or James J. Culliton, Director of Personnel Services (ext. 3-1675).

THE INSTITUTE CALENDAR

January 15
through
January 26

Events of Special Interest

What's Physics All About, Anyway? (272) – Talks for non-academic employees. Thurs, Jan 16: **What are Black Holes?** – Kenneth Brecher, physics. Tues, Jan 21: **What is an Elementary Particle?** – Vera Kistiakowsky, physics. Thurs, Jan 23: **Lasers-The Light Fantastic** – Michael Feld, physics. All 12n, Rm 6-120.

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

Molecular Biology: A Survey for the Non-Scientist (35) – biologists will speak about their areas of interest. Thurs, Jan 16: **Gene M. Brown**, associate head of biology. Thurs, Jan 23: **Jonathan A. King**, biology. 1pm, Rm 56-520.

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

The Institute Spelling Bee (332) – Tues, Jan 21, 6:30pm, Kresge. Admission is free. Doors open at 6pm, but contestants should report between 5:15pm & 5:45pm. Hartley Rogers, mathematics, associate provost, will be the Chief Judge.

Seminars and Lectures

Wednesday, January 15

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

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

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

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

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

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

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

So You Want to Start a Business (315) – Arnold E. Amstutz, management. Sloan School of Management Seminar. 3pm, Rm E52-461.

A Discussion of Homosexuality in Media and Film – Stuart Byron, *The Real Paper* (tentative) and a representative from Gay Media Action. Changing Lifestyles and Modern Times (352c). 3pm, Rm 14E-304.

Laser and Optical Diagnostics for Fusion – Daniel Cohn, DSR staff, Magnet Lab. Optics and Energy Sources Seminar (227). 3pm, Rm NW14-2209. Refreshments 2:45pm.

Methods of Knowing and the Unity of the World (189) – Patrick Milburn, program director for Center for Integrative Education; associate editor, *Main Currents in Modern Thought*. Libraries Seminar. 3pm, Rm 14S-100.

Integrated Optics** – S.R. Chinn, Lincoln Laboratory. Lincoln Lecture Series. 3:30pm, Lincoln Lab cafeteria.

Liquid Crystals – J.D. Litster, physics. Lectures on Physics (265). 3:30pm, Rm 4-231.

The Manganese Nodule Project: Understanding the Resource Potential of Deep-Sea Polymetallic Nodules – Roger S. Burns, earth & planetary sciences. Earth & Planetary Sciences Lecture (83). 4pm, Rm 54-425.

Potential Contribution of Aquaculture to Meeting World Food Needs* – John E. Bardach, director, Institute of Marine Biology, University of Hawaii. Nutrition & Food Science Special Seminar. 4:15pm, Rm 54-100.

Advantages of Sam's Simple Sensible System of Measurements – This system would add a note of excitement to our everyday vocabulary. Independent Offerings (328). 4:45pm, Rm 4-159.

African Affairs and the Economic Development of American Black Communities – Willard Johnson, political science. Dean for Student Affairs Black Perspective Seminar. 7pm, Rm 10-280. Reception follows.

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

Bureaucracy and the Non-Governmental Sector in Development Work* – Curtis Roosevelt, chief, non-governmental organization section, ECOSOC, United Nations. Seminar on International Students and Participation in Development Seminar (373). 8pm, Internat'l Student Lge. 2nd fl Walker. Coffee.

Thursday, January 16

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

Environmental Engineering Education (67a) – Graduate students at the Water Resources Lab. Civil Engineering Seminar. 10am-4pm, Rm 48-308.

Energy, Health, and Transportation-Related Applications of Magnetic Fields (226) – Guided tour and explanation of Magneplane. National Magnet Lab Seminar. 10am, Rm NW14-2209.

Solar-Terrestrial Phenomena: Stone Age to Present – George L. Siscoe, visiting professor, physics. The Physics of Space Seminar (267). 10:30am, Rm 37-696.

Searching Literature by Interactive Computer – Exhibition of Technological Innovations in the MIT Libraries. 11am, Rm 7-102. Info, x3-7746.

Affinity Chromatography; Gel Electrophoresis – Fred Kalfon, Pharmacia. Instruments and Techniques in Biology Seminar (33). 12n, Rm 16-310.

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

Neutron Molecular Spectroscopy (227g) – Charles V. Berney, nuclear engineering. Nuclear Engineering Seminar. 1:30pm, Rm 6-120.

Proof Theory: Is Analysis Consistent? – P. Lavori, mathematics. Annual IAP Logic Week (197b). 2pm, Rm 2-190.

Psychological Effects of Day Care** – Philip Zelazo, Infant Development Services, Tufts New England Medical Center, Tufts University Medical School. Technology Wives Organization Child Development Seminar (369a). 2pm, Stu Ctr West Lge (babysitting Stu Ctr Rm 473).

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

Operations Research Center Seminar (181) – Murray Geisler, visiting professor of management; RAND Corporation. 2:30pm, Rm 24-121.

Laser Pellet Fusion – Benjamin Lax, physics, director of Magnet Lab. Optics and Energy Sources Seminar (227). 3pm, Rm NW14-2209. Refreshments 2:45pm.

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

Superfluid ³He Below 3 Milli-Kelvin – Thomas Greytak, physics. Lectures on Physics (265). 3:30pm, Rm 4-231.

A Topic in Mathematical Statistics – Herman Chernoff, mathematics. Mathematics Club Lecture (199f). 3:30pm, Rm 2-190.

Determining the Age of a Rock – Patrick M. Hurley, earth & planetary sciences. Earth & Planetary Sciences Lecture (83). 4pm, Rm 54-425.

Elma Lewis School of Music – Speaker from the school, in Boston, to be announced. Dean for Student Affairs Black Perspective Seminar. 7pm, Stu Ctr Mezzanine Lge. Refreshments.

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

Friday, January 17

Late Ice Age Climatology from Geological Evidence – John Southard, earth & planetary sciences. Climate Seminar (222). 10am, Rm 54-811.

Energy, Health, and Transportation-Related Applications of Magnetic Fields (226) – Guided tour of the low-magnetic field facility. National Magnet Lab Seminar. 10am, Rm NW14-2209.

Nucleation and Growth Mechanisms – G.B. Olson, metallurgy. IAP Seminar on Thermoelastic Martensite (S9). 12:30pm, Rm 13-4101. Coffee 12n.

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

Man-Made Artificial Genes – Har Gobind Khorana, Alfred P. Sloan Professor of Biology and Chemistry. Genetics and Society Seminar (287a). 2pm, Rm 18-290.

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

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

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

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

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

Monday, January 20

Ethical Uses of Arms and the Survival of People* – Amelia Leiss, Center for International Studies, DSR Staff. Arms, Food, Oil, and the Survival of People Seminar (357c). 12n, Stu Ctr Mezzanine Lge.

General Assessments and Key Questions – Morris Cohen, Ford Professor of Materials Science and Engineering. IAP Seminar on Thermoelastic Martensite (S9). 12:30pm, Rm 13-4101. Coffee 12n.

What is Philosophy of Religion? – Baruch Brody, philosophy. What is Philosophy? Seminar (251). 2pm, Rm 4-231.

Energy in Perspective – Walter R. Eckelmann, president, Exxon Production Research Co. Earth & Planetary Sciences Lectures (83). 2pm, (note change in time), Rm 54-100.

Chemistry and Lasers (49) – Jeffrey Steinfeld, chemistry. Discussion of the uses of modern optical techniques in chemistry. 2pm, Rm 6-233.

Controlled Thermo-Nuclear Fusion: Search for a New Energy Source – D. J. Sigmar, aero/astro, nuclear engineering. Highlights in Aeronautics and Astronautics Seminar (6a). 2pm, Rm 33-206.

Nuclear Power: An Open Discussion of the Issues (227h)* – Pat De Laquil, John Hendricks, Howard Shaffer, all G; **Dr. Carl Hovevar**, Union of Concerned Scientists. Nuclear Engineering Seminar. 2:30pm, Rm NW12-222. Refreshments.

Quantitative Gel Chromatography of Soybean Protein Hydrolyzates – Jens Adler Nissen, Novo Industri A/S, Copenhagen, Denmark. Nutrition & Food Science Special Seminar. 3pm Rm 16-134.

Superman's View of the Universe: The Sky as Seen Through X-Ray Sensitive Eyes – Claude Canizares, physics. Lectures on Physics (265). 3:30pm, Rm 4-231.

Academic Diversity and the Philosophy Department – Frank Peseckis, U. Student Committee on Educational Policy Seminar (372a). 7:30pm, Stu Ctr Rm 400.

Tuesday, January 21

Activated Carbon – Michael Modell, chemical engineering. Innovations in Advanced Wastewater Treatment Technology Seminar (70). 9am, Rm 48-423.

Student's Guide to Career Opportunities in Nutrition & Food Science (236) – James M. Flink, nutrition & food science. Nutrition & Food Science Seminar. 10am, Rm 16-134.

Literature Searching by Interactive Computer – Exhibition of Technological Innovations in the MIT Libraries. 2pm, Rm 7-102. Info, x3-7746.

Scintillation Counting – Willis Cash, Beckman Instruments. Instruments and Techniques in Biology Seminar (33). 12n, Rm 16-310.

Bidding for Shale Oil Rights: An Exercise in Decision Analysis for Capital Investments (308a) – Arnoldo Hax, Sloan School, Sloan School of Management Seminar. 1pm, Rm E52-461.

Do Children Think Differently From Adults?*** – Susan Carey, psychology. Technology Wives Organization Child Development Seminar (369a). 2pm, Stu Ctr West Lge (babysitting Stu Ctr Rm 473).

Small Finite Sets (249) – Fred Katz, G. Philosophy Seminar. 2pm, Rm 4-145.

Man vs. Machine – R.E. Curry, aero/astro. Highlights in Aeronautics and Astronautics Seminar (6a). 2pm, Rm 33-206.

Model Relativism: A Situational Approach to Model Building – Gary Lilien, management; **Under the Guided Dome: Modernizing the State Budgeting Process** – John Little, management, director of Operations Research Center. Operations Research Center Seminar Series (181). 2:30pm, Rm 24-121.

Mathematical Economics – Hal Varien, economics. Mathematics Club Lectures (199f). 3pm, Rm 2-190.

The Marriage of X-Ray and Optical Astronomy – Jeffrey McClintock, Center for Space Research, DSR staff. Lectures in Physics (265). 3:30pm, Rm 4-231.

Video-Display Terminals for Newspaper Composition and Makeup* – Jay G. Levinthal, consulting engineer, Raytheon Company. Electrical Engineering Seminar. 4pm, Rm 9-150.

Steady State Solution of a Simple Climate Model and Their Stability – Michael Ghil, Courant Institute of Mathematical Sciences, New York, New York. Applied Mathematics Seminar. 4pm, Rm 2-338. Coffee 3:30pm, Rm 2-349.

Studying, Teaching, Living in a Foreign Country-United Kingdom (376) – Students and faculty who have studied or taught in the United Kingdom will discuss their experiences. Independent Offerings. 4pm, Rm 10-280.

Earthquakes and the San Andreas Fault – Peter Molnar, earth & planetary sciences. Earth & Planetary Sciences Lectures (83). 4pm, Rm 54-425.

Ribonuclease III and the Processing of mRNA and rRNA in E. Coli – Joan Steitz, Yale University. Biology Colloquium. 4:30pm, Rm 6-120. Coffee 4pm, 5th fl vestibule, Bldg 56.

Sexism as a Disease, Feminism as a Cure (373b)** – Wilma Scott Heide, immediate past president of NOW; guest in residence at Wellesley College; distinguished visiting scholar at U Mass Amherst. Association for Women Students Seminar. 5pm, Stu Ctr Mezzanine Lge.

Wednesday, January 22

High Electron Irradiation of Municipal Wastewater and Sludge – John G. Trump, electrical engineering, emeritus; **Kenneth Wright**, electrical engineering, DSR staff. Innovations in Advanced Wastewater Treatment Technology Seminar (70). 9am, Rm 48-423.

What is Metaphysics? – David Karp, G. What is Philosophy? Seminar (251). 2pm, Rm 4-231.

Is Cancer Reversible? (231) – Maria C. Linder, nutrition & food

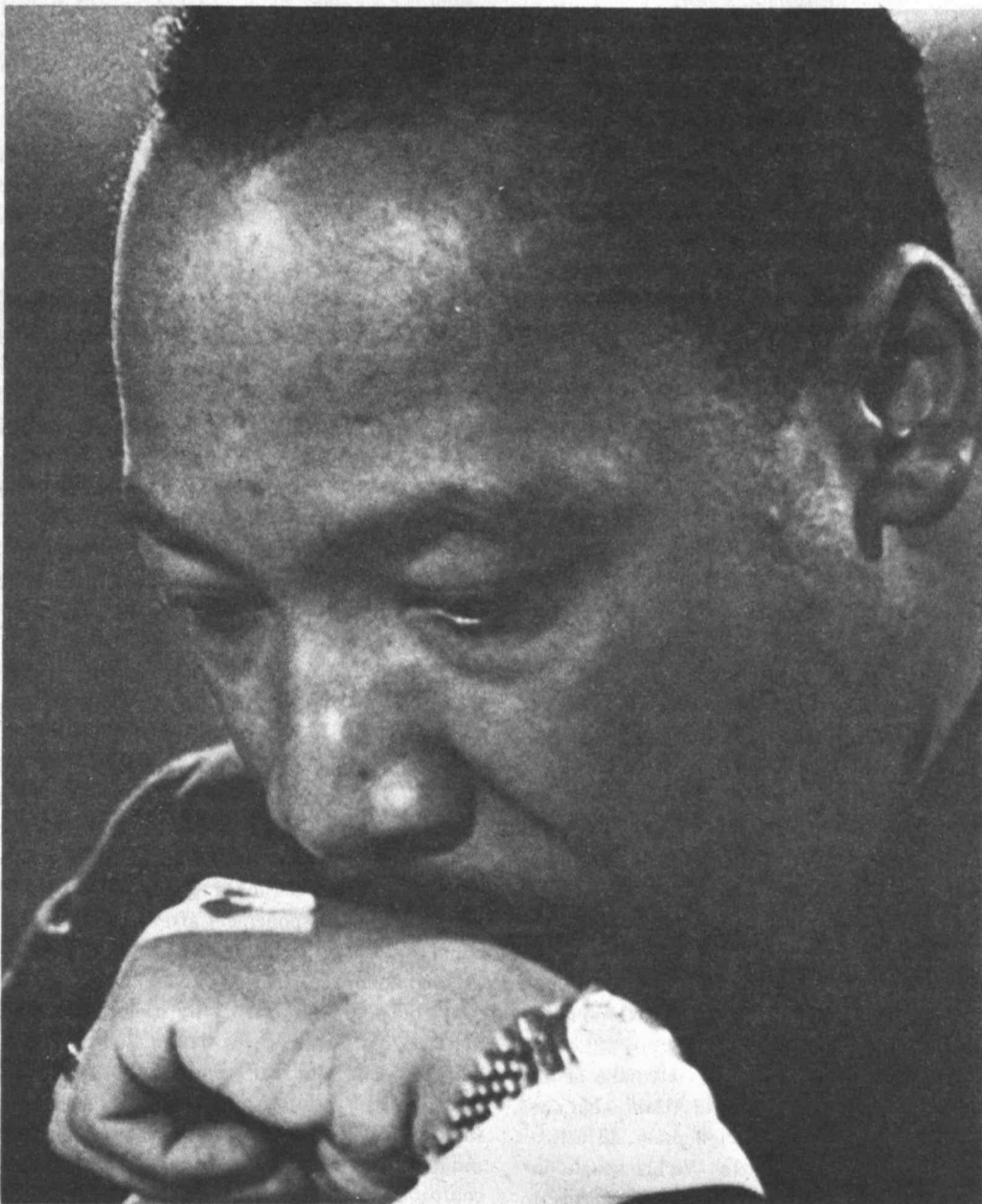
Martin Luther King, Jr.

(1929-1968)

What He Means

A Memorial Program at M.I.T.

January 15, 1975



Program

Noon

Meet and MARCH IN SILENCE
from the Lobby of Bldg. 7 to

Kresge Auditorium

Recordings:

“I Have a Dream” (Lincoln Memorial,
Washington, D.C., Aug. 28, 1963)

“I Have Been to the Mountain Top”
(Memphis, Tenn., April 3, 1968)

Black National Anthem

Invocation:

Reverend Eddie McBride, MIT Community
Fellows Program, and

Reverend John Bryant, St. Paul’s Church,
Cambridge

MIT Gospel Choir, Ricardo Hall directing

Speakers:

Professor Hubert Jones

Representative, MIT Black students

Those in audience who wish to speak in response
to “What He Means to Me”

Closing:

“We Shall Overcome”

All are welcome to participate

“I have a dream,” he said. “It is a dream deeply rooted in the American Dream. I have a dream that one day this nation will rise up and live out the true meaning of its creed; ‘We hold these truths to be self-evident, that all men are created equal.’”

Martin Luther King, Jr.

From a Speech in Memphis 24 hours before his slaying, April 3, 1968

"If I was standing at the beginning of time with the possibility of taking a kind of general panoramic view of the whole of human history up to now and the Almighty said to me, Martin Luther King, which age would you like to live in, strangely enough, I would turn to the Almighty and say: If you allow me to live just a few more years in the second half of the 20th century, I will be happy. Now that's a strange statement because the world is all messed up...the nation is sick...trouble is in the land...confusion all around...that's a strange statement. Well, I don't know what will happen now. We've got some difficult days ahead. But it doesn't matter with me now. Because I've been to the mountain top, I won't mind. Like anybody, I would like to live a long life. Longevity has its place. But I'm not concerned about that now. I just want to do God's will. And He's allowed me to go up to the mountain. And I've looked over, and I've seen the promised land. I may not get there with you, but I want you to know tonight that we as a people will get to the promised land. So, I am happy tonight. I'm not worried about anything. I'm not fearing any man. Mine eyes have seen the glory of the coming of the Lord."

From *Who's Who in America*

KING, Martin Luther, Jr., clergyman. Born, Atlanta, Ga., Jan. 15, 1929. Son of Martin Luther and Alberta (Williams) King. A.B. Morehouse College, 1948, L.H.D., 1957; B.D. Crozier Theological Seminary, 1951; Ph.D. (J. Louis Crozier Fellow) Boston University, 1955; D.D., 1959; D.D., Chicago Theological Seminary, 1957; LL.D., Howard University, 1957; Morgan State College, 1958; L.H.D., Central State College, 1958; Married Coretta Scott, June 17, 1953; children—Yolanda Denise, Martin Luther III, Dexter and Bernice. Pastor, Dexter Avenue Baptist Church, Montgomery, Ala., 1954-59. Co-pastor, Ebenezer Baptist Church, Atlanta, Ga., 1960-68. President, Southern Christian Leadership Conference from founding to his death. Recipient Plafkner award for scholarship, Crozier Theological Seminary, 1951; selected one of 10 outstanding personalities of 1956, *Time* magazine, 1957; recipient of the Nobel Peace Prize, 1964; also numerous awards for leadership in Montgomery Movement. Author of *Stride Toward Freedom* (1958), *Strength to Love* (1963), *Why We Can't Wait* (1964), *Where Do We Go From Here: Chaos or Community* (1967), *The Measure of a Man* (1968), and *Trumpet of Conscience* (1968).

Assassinated April 4, 1968, Memphis, Tenn.

A Letter from a Birmingham Jail

The Reverend Martin Luther King, Jr.

April 16, 1963

FOREWORD

"What Martin Luther King stood for and died for can never be killed by a Bullet," said Leontyne Price. His famous "Letter from a Birmingham Jail" was written on April 16th, 1963. Here one gets a glimpse of how this young man in his thirties spoke with prophetic power to the conscience of America.

Dr. King went to Birmingham, Alabama to lead non-violent demonstrations against racial segregation in that city. A group of local clergymen charged him in an open letter of in-

terfering as an outsider and of creating tension and division in the city. The authorities had already arrested him and from the jail he wrote this letter in answer to his critics.

The letter is privately presented by a group of citizens in Andover in order to do honor to his memory and to make available to the people of the community this eloquent and succinct statement of his convictions, his strategy, and purposes.

Martin Luther King, Jr.
Birmingham City Jail
April 16, 1963

Bishop C. C. J. Carpenter
Bishop Joseph A. Durick
Rabbi Milton L. Grafman
Bishop Paul Hardin
Bishop Nolan B. Harmon
The Rev. George M. Murray
The Rev. Edward V. Ramage
The Rev. Earl Stallings

My dear Fellow Clergymen,

While confined here in the Birmingham City Jail, I came across your recent statement calling our present activities "unwise and untimely." Seldom, if ever, do I pause to answer criticism of my work and ideas. If I sought to answer all of the criticisms that cross my desk, my secretaries would be engaged in little else in the course of the day, and I would have no time for constructive work. But since I feel that you are men of genuine goodwill and your criticisms are sincerely set forth, I would like to answer your statements in what I hope will be patient and reasonable terms.

I think I should give the reason for my being in Birmingham, since I have been influenced by the argument of "outsiders coming in." I have the honor of serving as president of the Southern Christian Leadership Conference, an organization operating in every Southern state with headquarters in Atlanta, Georgia. We have some eighty-five affiliate organizations all across the South—one being the Alabama Christian Movement for Human Rights. Whenever necessary and possible we share staff, educational and financial resources with our affiliates. Several months ago our local affiliate here in Birmingham invited us to be on call to engage in a non-violent direct action program if such were deemed necessary. We readily consented and when the hour came we lived up to our promises. So I am here, along with several members of my staff, because we were invited here. I am here because I have basic organization ties here.

Beyond this, I am in Birmingham because injustice is here. Just as the eighth century prophets left their little villages and carried their "thus saith the Lord" far beyond the boundaries of their home towns; and just as the Apostle Paul left his little village of Tarsus and carried the gospel of Jesus Christ to practically every hamlet and city of the Greco-Roman world, I too am compelled to carry the gospel of freedom beyond my particular home town. Like Paul, I must constantly respond to the Macedonian call for aid.

Moreover, I am cognizant of the interrelatedness of all communities and states. I cannot sit idly by in Atlanta and not be concerned about what happens in Birmingham. Injustice anywhere is a threat to justice everywhere. We are caught in an inescapable network of mutuality, tied in a single garment of destiny. Whatever affects one directly affects all indirectly. Never again can we afford to live with the narrow, provincial "outside agitator" idea. Anyone who lives inside the United States can never be considered an outsider anywhere in this country.

You deplore the demonstrations that are presently taking place in Birmingham. But I am sorry that your statement did not express a similar concern for the conditions that brought the demonstrations into being. I am sure that each of you would want to go beyond the superficial social analyst who looks merely at effects, and does not grapple with underlying causes. I would not hesitate to say that it is unfortunate that so-called demonstrations are taking place in Birmingham at this time, but I would say in more emphatic terms that it is even more unfortunate that the white power structure of this city left the Negro community with no other alternative.

In any non-violent campaign there are four basic steps: (1) Collection of the facts to determine whether injustices are

alive. (2) Negotiation. (3) Self-purification and (4) Direct action. We have gone through all these steps in Birmingham. There can be no gainsaying of the fact that racial injustice engulfs this community. Birmingham is probably the most thoroughly segregated city in the United States. Its ugly record of police brutality is known in every section of this country. Its unjust treatment of Negroes in the courts is a notorious reality. There have been more unsolved bombings of Negro homes and churches in Birmingham than any city in this nation. These are the hard, brutal and unbelievable facts. On the basis of these conditions Negro leaders sought to negotiate with the city fathers. But the political leaders consistently refused to engage in good faith negotiation.

Then came the opportunity last September to talk with some of the leaders of the economic community. In these negotiating sessions certain promises were made by the merchants—such as the promise to remove the humiliating racial signs from the stores. On the basis of these promises Rev. Shuttlesworth and the leaders of the Alabama Christian Movement for Human Rights agreed to call a moratorium on any type of demonstrations. As the weeks and months unfolded we realized that we were the victims of a broken promise. The signs remained. Like so many experiences of the past we were confronted with blasted hopes, and the dark shadow of a deep disappointment settled upon us. So we had no alternative except that of preparing for direct action, whereby we present our very bodies as a means of laying our case before the conscience of the local and national community. We were not unmindful of the difficulties involved. So we decided to go through a process of self-purification. We started having workshops on non-violence and repeatedly asked ourselves the questions, "Are you able to accept blows without retaliating?" "Are you able to endure the ordeals of jail?" We decided to set our direct action program around the Easter season, realizing that with the exception of Christmas this was the largest shopping period of the year. Knowing that a strong economic withdrawal program would be the by-product of direct action—we felt that this was the best time to bring pressure on the merchants for the needed changes. Then it occurred to us that the March election was ahead so we speedily decided to postpone action until after election day. When we discovered that Mr. Connor was in the run-off we decided again to postpone action so that the demonstration could not be used to cloud issues. At this we agreed to begin our non-violent witness the day after the run-off.

This reveals that we did not move irresponsibly into direct action. We too wanted to see Mr. Connor defeated: so we went through postponement after postponement to aid in this community need. After this we felt that direct action could be delayed no longer.

You may well ask, "Why direct action?" "Why sit-ins, marches, etc.?" "Isn't negotiation a better path?" You are exactly right in your call for negotiation. Indeed, this the purpose of direct action. Non-violent direct action seeks to create such a crisis and establish such creative tension that a community that has consistently refused to negotiate is forced to confront the issue. It seeks so to dramatize the issue that it can no longer be ignored. I just referred to the creation of tension as a part of the work of the non-violent resister. This may sound rather shocking. But I must confess that I am not afraid of the word tension. I have earnestly worked and preached against violent tension, but there is a type of constructive non-violent tension that is necessary for growth. Just as Socrates felt that it was necessary to create tension in the mind so that individuals could rise from the bondage of myths and half-truths to the unfettered realm of creative analysis and objective appraisal, we must see the need of having non-violent gadflies to create the kind of tension that will help men rise from the dark depths of prejudice and racism to the majestic heights of understanding and brotherhood. So the purpose of direct action is to create a situation so crisis-packed that it will inevitably open the door to negotiation. We, therefore, concur with you in your call for negotiation. Too long has our beloved Southland been bogged in the tragic attempt to live in monologue rather than dialogue.

One of the basic points in your statement is that our acts are untimely. Some have asked, "Why didn't you give the new administration time to act?" The only answer that I can give to this inquiry is that the new administration must be prodded about as much as the outgoing one before it acts. We will be badly mistaken if we feel that the election of Mr. Boutwell will bring the millennium to Birmingham. While Mr. Boutwell is much more articulate and gentle than Mr. Connor, they are both segregationists, dedicated to the task of maintaining the status quo. The hope I see in Mr. Boutwell is that he will be reasonable enough to see the futility of massive resistance to desegregation. But he will not see this without pressure from the devotees of civil rights. My friends, I must say to you that we have not made a single gain in civil rights without determined legal and non-violent pressure. History is the long and tragic story of the fact that privileged groups seldom give up their unjust posture; but as Reinhold Niebuhr has reminded us, groups are more immoral than individuals.

We know through painful experience that freedom is never voluntarily given by the oppressor; it must be demanded by the oppressed. Frankly, I have never yet engaged in a direct action movement that was "well timed," according to the timetable of those who have not suffered unduly from the disease of segregation. For years now I have heard the word "Wait!" It rings in the ear of every Negro with a piercing familiarity. This "Wait" has almost always meant "Never." It has been a tranquilizing thalidomide, relieving the emotional stress for a moment, only to give birth to an ill-formed infant of frustration. We must come to see with the distinguished jurist of yesterday that "justice too long delayed is justice denied." We have waited for more than three hundred and forty years for our constitutional and God-given rights. The nations of Asia and Africa are moving with jet-like speed toward the goal of political independence, and we still creep at horse and buggy pace toward the gaining of a cup of coffee at a lunchcounter. I guess it is easy for those who have never felt the stinging darts of segregation to say, "wait." But when you have seen vicious mobs lynch your mothers and fathers at will and drown your sisters and brothers at whim; when you have seen hate-filled policemen curse, kick, brutalize and even kill your black brothers and sisters with impunity; when you see the vast majority of your twenty million Negro brothers smothering in an air-tight cage of poverty in the midst of an affluent society; when you suddenly find your tongue twisted and your speech stammering as you seek to explain to your six-year old daughter why she can't go to the public amusement park that has just been advertised on television, and see the tears welling up in her little eyes when she is told that Funtown is closed to colored children, and see the depressing clouds of inferiority begin to form in her little mental sky, and see her to begin to distort her little personality by unconsciously developing a bitterness toward white people; when you have to concoct an answer for a five-year-old son asking in agonizing pathos: "Daddy, why do white people treat colored people so mean?"; when you take a cross-country drive and find it necessary to sleep night after night in the uncomfortable corners of your automobile because no motel will accept you; when you are humiliated day in and day out by nagging signs reading "white" men and "colored;" when your first name becomes "nigger" and your middle name becomes "boy" (however old you are) and your last name becomes "John," and when your wife and mother are never given the respected title "Mrs.;" when you are harried by day and haunted by night by the fact that you are a Negro, living constantly at tip-toe stance never quite knowing what to expect next, and plagued with inner fears and outer resentments; when you are forever fighting a degenerating sense of "nobodiness;" — then you will understand why we find it difficult to wait. There comes a time when the cup of endurance runs over, and men are no longer willing to be plunged into an abyss of injustice where they experience the bleakness of corroding despair. I hope, Sirs, you can understand our legitimate and unavoidable impatience.

You express a great deal anxiety over our willingness to break laws. This is certainly a legitimate concern. Since we so diligently urge people to obey the Supreme Court's decision of 1954 outlawing segregation in the public schools, it is rather strange and paradoxical to find us consciously breaking laws. One may well ask, "How can you advocate breaking some laws and obeying others?" The answer is found in the fact that there are two types of laws: There are *just* laws and there are *unjust* laws. I would agree with Saint Augustine that "An unjust law is no law at all."

Now what is the difference between the two? How does one determine when a law is just or unjust? A just law is a man-made code that squares with the moral law or the law of God. An unjust law is a code that is out of harmony with the moral law. To put it in the terms of Saint Thomas Aquinas, an unjust law is a human law that is not rooted in the eternal and natural law. Any law that uplifts human personality is just. Any law that degrades human personality is unjust. All segregation statutes are unjust because segregation distorts the soul and damages the personality. It gives the segregated a false sense of inferiority. To use the words of Martin Luther King, Jr., segregation substitutes an "I-it" relationship for the "I-thou" relationship, and ends up relegating persons to the status of things. So segregation is not only morally, economically and sociologically unsound, but it is

morally wrong and sinful. Paul Tillich has said that sin is separation. Isn't segregation an existential expression of man's tragic separation, and expression of his awful estrangement, his terrible sinfulness? So I can urge men to obey the 1954 decision of the Supreme Court because it is morally right, and I can urge them to disobey segregation ordinances because they are morally wrong.

Let us turn to a more concrete example of just and unjust laws. An unjust law is a code that a majority inflicts on a minority that is not binding on itself. This is difference made legal. On the other hand, a just law is a code that a majority compels a minority to follow that it is willing to follow itself. This is sameness made legal.

Let me give another explanation. An unjust law is a code inflicted upon a minority which that minority had no part in enacting or creating because they did not have the unhampered right to vote. Who can say that the legislature of Alabama which set up the segregation laws was democratically elected. Throughout the state of Alabama all types of conniving methods are used to prevent Negroes from becoming registered voters and there are some counties without a single Negro registered to vote despite the fact that the Negroes constitute a majority of the population. Can any law set up in such a state be considered democratically structured?

These are just a few examples of unjust and just laws. There are some instances when a law is just on its face and unjust in its application. For instance, I was arrested Friday on a charge of parading without a permit. Now there is nothing wrong with an ordinance which requires a permit for a parade, but when the ordinance is used to preserve segregation and to deny citizens the First Amendment privilege of peaceful assembly and peaceful protest, then it becomes unjust.

I hope you can see the distinction I am trying to point out. In no sense do I advocate evading or defying the law as the rabid segregationist would do. This would lead to anarchy. One who breaks an unjust law must do it *openly, lovingly*, (not hatefully as the white mothers did in New Orleans when they were seen on television screaming "nigger, nigger, nigger") and with a willingness to accept the penalty. I submit that an individual who breaks a law that conscience tells him is unjust, and willingly accepts the penalty by staying in jail to arouse the conscience of the community over its injustice, is in reality expressing the very highest respect for law.

Of course, there is nothing new about this kind of civil disobedience. It was seen sublimely in the refusal of Shadrach, Meshach and Abednego to obey the laws of Nebuchadnezzar because a higher moral law was involved. It was practiced superbly by the early Christians who were willing to face hungry lions and the excruciating pain of chopping blocks, before submitting to certain unjust laws of the Roman Empire. To a degree academic freedom is a reality today because Socrates practiced civil disobedience.

We can never forget that everything Hitler did in Germany was "legal" and everything the Hungarian freedom fighters did in Hungary was "illegal." It was "illegal" to aid and comfort a Jew in Hitler's Germany. But I am sure that if I had lived in Germany during that time, I would have aided and comforted my Jewish brothers even though it was illegal. If I lived in a communist country today where certain principles dear to the Christian faith are suppressed, I believe I would openly advocate disobeying these anti-religious laws.

I must make two honest confessions to you, my Christian and Jewish brothers. First, I must confess that over the last few years I have been gravely disappointed with the white moderate. I have almost reached the regrettable conclusion that the Negro's great stumbling block in the stride toward freedom is not the White Citizen's Council or the Klu Klux Klanner, but the white moderate who is more devoted to "order" than to justice; who prefers a negative peace which is the absence of tension to a positive peace which is the presence of justice; who constantly says "I agree with you in the goal you seek, but I can't agree with your methods of direct action;" who paternalistically feels that he can set the time-table for another man's freedom; who lives by the myth of time and who constantly advises the Negro to wait until a "more convenient season." Shallow understanding from people of goodwill is more frustrating than absolute misunderstanding from people of ill will. Lukewarm acceptance is much more bewildering than outright rejection.

I had hoped that the white moderate would understand that law and order exist for the purpose of establishing justice, and that when they fail to do this they become the dangerously structured dams that block the flow of social progress. I had hoped that the white moderate would understand that the present tension in the South is merely a necessary phase of the transition from an obnoxious negative peace, where the Negro passively accepted his unjust plight, to a substance-filled positive peace, where all men will respect the dignity and worth of human personality. Actually, we who engage in non-violent direct action are not the creators of tension. We merely bring to the surface the hidden tension that is already alive. We bring it out in the open where it can be seen and be dealt with. Like a boil that can never be cured as it is covered up but must be opened with all its pus-flowing ugliness to the natural medicines of air and light, injustice must likewise be exposed, with all the tension its exposing creates, to the light of human conscience and the air of national opinion before it can be cured.

In your statement you asserted that our actions, even though peaceful, must be condemned because they precipitate violence. But can this assertion be logically made? Isn't this like condemning the robbed man because his possession of money precipitated the evil act of robbery? Isn't this like condemning Socrates because his unswerving commitment to truth and his philosophical delvings precipitated the misguided popular mind to make him drink the hemlock? Isn't this like condemning Jesus because His unique God-consciousness and never-ceasing devotion to His will precipitated the evil act of crucifixion? We must come to see, as Federal courts have consistently affirmed, that it is immoral to urge an individual to withdraw his efforts to gain his basic constitutional rights because the quest precipitates violence. Society must protect the robbed and punish the robber.

I had also hoped that the white moderate would reject the myth of time. I received a letter this morning from a white brother in Texas which said: "All Christians know that the colored people will receive equal rights eventually, but is it possible that you are in too great of a religious hurry? It has taken Christianity almost 2000 years to accomplish what is has. The teachings of Christ take time to come to earth." All that is said here grows out of a tragic misconception of time. It is the strangely irrational notion that there is something in the very flow of time that will inevitably cure all ills. Actually time is neutral. It can be used either destructively or constructively. I am coming to feel that the people of ill will have used time much more effectively than the people of goodwill. We will have to repent in this generation not merely for the vitriolic words and actions of the bad people, but for the appalling silence of the good people. We must come to see that human progress never rolls in on wheels of inevitability. It comes through the tireless efforts and persistent work of men willing to be co-workers with God, and without this hard work time itself becomes an ally of the forces of social stagnation. We must use time creatively, and forever realize that the time is always ripe to do right. Now is the time to make real the promise of democracy, and transform our pending national elegy into a creative psalm of brotherhood. Now is the time to lift our national policy from the quicksand of racial injustice to the solid rock of human dignity.

You spoke of our action in Birmingham as extreme. At first I was rather disappointed that fellow clergymen would see my non-violent efforts as those of an extremist. I started thinking about the fact that I stand in the middle of two opposing forces in the Negro community. One is a force of complacency made up of Negroes who, as a result of long years of oppression, have been so completely drained of self-respect and a sense of "somebodiness" that they have adjusted to segregation, and, on the other hand, of a few Negroes in the middle class who, because of a degree of academic and economic security, and because at points they profit by segregation, have unconsciously become insensitive to the problems of the masses. The other force is one of bitterness and hatred and becomes perilously close to advocating violence. It is expressed in the various black nationalist groups that are springing up over the nation, the largest and best known being Elijah Muhammad's Muslim movement. This movement is nourished by the contemporary frustration over the continued existence of racial discrimination. It is made up of people who have lost faith in America, who have absolutely repudiated Christianity, and who have concluded that the white man is an incurable "devil." I have tried to stand between these two forces saying that we need not follow the "do-nothingism" of the complacent or the hatred and despair of the black nationalist. There is a more excellent way of love and non-violent protest. I'm grateful to God that, through the Negro church, the dimension of non-violence entered our struggle. If this philosophy had not emerged I am convinced that by now many streets of the South would be flowing with floods of blood. And I am further convinced that if our white brothers dismiss as "rabble rousers" and "outside agitators" those of us who are working through the channels of non-violent direct action and refuse to support our non-violent efforts, millions of Negroes, out of frustration and despair, will seek solace and security in black nationalist ideologies, a development that will lead inevitably to a frightening racial nightmare.

Oppressed people cannot remain oppressed forever. The urge for freedom will eventually come. This is what has happened to the American Negro. Something within has reminded him of his birthright of freedom; something without has reminded him that he can gain it. Consciously and unconsciously he has been swept in by what the Germans call the *Zeitgeist*, and with his black brothers of Africa, and his brown and yellow brothers of Asia, South America and the Caribbean, he is moving with a sense of cosmic urgency toward the promised land of racial justice. Recognizing this vital urge that has engulfed the Negro community, one should readily understand public demonstrations. The Negro has many pent-up resentments and latent frustrations. He has to get them out. So let him march sometime; let him have his prayer pilgrimages to the city hall; understand why he must have sit-ins and freedom rides. If his repressed emotions do not come out in these non-

violent ways, they will come out in ominous expressions of violence. This is not a threat; it is a fact of history. So I have not said to my people "Get rid of your discontent." But I have tried to say that this normal and healthy discontent can be channelized through the creative outlet of non-violent direct action. Now this approach is being dismissed as extremist. I must admit that I was initially disappointed in being categorized.

But, as I continued to think about the matter, I gradually gained a bit of satisfaction from being considered an extremist. Was not Jesus an extremist in love—"Love your enemies, bless them that curse you, pray for them that despitefully use you." Was not Amos an extremist for justice—"Let justice roll down like waters and righteousness like a mighty stream." Was not Paul an extremist for the gospel of Jesus Christ—"I bear in my body the marks of the Lord Jesus." Was not Martin Luther an extremist—"I will stay in jail to the end of my days before I make a mockery of my conscience." Was not Abraham Lincoln an extremist—"This nation cannot survive half slave and half free." Was not Thomas Jefferson an extremist—"We hold these truths to be self evident that all men are created equal." So the question is not whether we will be extremist, but what kind of extremist will we be. Will we be extremists for hate or will we be extremists of love? Will we be extremists for the preservation of injustice, or will we be extremists for the cause of justice? In that dramatic scene on Calvary's hill, three men were crucified. We must not forget that all three were crucified for the same crime of extremism. Two were extremist for immorality, and thusly fell below their environment. The other, Jesus Christ, was an extremist for love, truth, and goodness, and thereby rose above his environment. So, after all, maybe the South, the nation and the world are in dire need of creative extremists.

I had hoped that the white moderate would see this. Maybe I was too optimistic. Maybe I expected too much. I guess I should have realized that few members of a race that has oppressed another race can understand or appreciate the deep groans and passionate yearnings of those that have been oppressed and still fewer have the vision to see that injustice must be rooted out by strong, persistent and determined action. I am thankful, however, that some of our white brothers have grasped the meaning of this social revolution and committed themselves to it. They are still all too small in quantity, but they are big in quality. Some like Ralph McGill, Lillian Smith, Harry Golden and James Dabbs have written about our struggle in eloquent, prophetic, and understanding terms. Others have marched with us down nameless streets of the South. They have sat in with us at lunchcounters and rode in with us on the freedom movement. They have languished in filthy roach-infested jails, suffering the abuse and brutality of angry policemen who see them as "dirty nigger lovers." They, unlike so many of their moderate brothers and sisters, have recognized the urgency of the moment and sensed the need for powerful "action" antidotes to combat the disease of segregation.

Let me rush on to mention my other disappointment. I have been so greatly disappointed with the white church and its leadership. Of course, there are some notable exceptions. I am not unmindful of the fact that each of you has taken some significant stands on this issue. I commend you, Rev. Stallings, for your Christian stand on this past Sunday, in welcoming Negroes to your worship service on a non-segregated basis. I commend the Catholic leaders of this state for integrating Springhill College several years ago.

But despite these notable exceptions, I must honestly reiterate that I have been disappointed with the church. I do not say that as one of those negative critics who can always find something wrong with the church. I say it as a minister of the gospel, who loves the church; who has nurtured in its bosom; who has been sustained by its spiritual blessings and who will remain true to it as long as the cord of life shall lengthen.

I had the strange feeling when I was suddenly catapulted into the leadership of the bus protest in Montgomery several years ago that we would have the support of the white church. I felt that the white ministers, priests and rabbis of the South would be some of our strongest allies. Instead, some few have been outright opponents, refusing to understand the freedom movement and misrepresenting its leaders; all too many others have been more cautious than courageous and have remained silent behind the anesthetizing security of stained glass windows.

In spite of my shattered dreams of the past, I came to Birmingham with the hope that the white religious leadership of this community would see the justice of our cause, and with deep moral concern, serve as the channel through which our just grievances could get to the power structure. I had hoped that each of you would understand. But again I have been disappointed.

I have heard numerous religious leaders of the South call upon their worshipers to comply with a desegregation decision because it is the law, but I have longed to hear white ministers say follow this decree because integration is morally right and the Negro is your brother. In the midst of blatant injustices inflicted upon the Negro, I have watched white churches stand on the sideline and merely mouth pious irrelevancies and sanc-

tionous trivialities. In the midst of a mighty struggle to rid our nation of racial and economic injustice, I have heard so many ministers say, "Those are social issues which the gospel has nothing to do with," and I have watched so many churches commit themselves to a completely other-worldly religion which made a strange distinction between bodies and souls, the sacred and the secular.

So here we are moving toward the exit of the twentieth century with a religious community largely adjusted to the status quo, standing as a taillight behind other community agencies rather than a headlight leading us to higher levels of justice.

I have travelled the length and breadth of Alabama, Mississippi and all the other Southern states. On sweltering summer days and crisp autumn mornings I have looked at their beautiful churches with their spires pointing heavenward. I have beheld the impressive outlay of their massive religious education buildings. Over and over again, I have found myself asking: "What kind of people worship here?" "Who is their God?" "Where were their voices when the lips of Governor Barnett dripped with words of interposition and nullification?" "Where were they when Governor Wallace gave the clarion call for defiance and hatred?" "Where were their voices of support when tired, bruised and weary Negro men and women decided to rise from the dark dungeons of complacency to the bright hills of creative protest?"

Yes, these questions are still in my mind. In deep disappointment, I have wept over the laxity of the church. But, be assured that in my tears have been tears of love. There can be no deep disappointment where there is not deep love. Yes, I love the church; I love her sacred walls. How could I do otherwise? I am in the rather unique position of being the son, the grandson and the great grandson of preachers. Yes, I see the church as the body of Christ. But, oh! How we have blemished and scarred the body through social neglect and fear of being nonconformists.

There was a time when the church was very powerful. It was during that period when the early Christians rejoiced when they were deemed worthy to suffer for what they believed. In those days the church was not merely a thermometer that recorded the ideas and principles of popular opinion; it was the thermostat that transformed the mores of society. Wherever the early Christians entered a town the power structure got disturbed and immediately sought to convict them for being "disturbers of the peace" and "outside agitators." But they went on with the conviction that they were "a colony of heaven;" and had to obey God rather than man. They were small in number, but big in commitment. They were too God-intoxicated to be "astronomically intimidated." They brought an end of such ancient evils as infanticide and gladiatorial contest.

Things are different now. The contemporary church is so often a weak, ineffectual voice with an uncertain sound. It is so often the arch supporter of the status quo. Far from being disturbed by the presence of the church, the power structure of the average community is consoled by the church's silent and often vocal sanction of things as they are.

But the judgment of God is upon the church as never before. If the church of today does not recapture the sacrificial spirit of the early church, it will lose its authentic ring, forfeit the loyalty of millions, and be dismissed as an irrelevant social club with no meaning for the twentieth century. I am meeting young people every day whose disappointment with the church has risen to outright disgust.

Maybe again, I have been too optimistic. Is organized religion too inextricably bound to status-quo to save our nation and the world? Maybe I must turn my faith to the inner spiritual church, the church within the church, as the true ecclesia and hope of the world. But again I am thankful to God that some noble souls from the ranks of organized religion have broken loose from the paralyzing chains of conformity and joined us as active partners in the struggle for freedom. They have left their secure congregations and walked the streets of Albany, Georgia, with us. They have gone through the highways of the South on tortuous rides for freedom. Yes, they have gone to jail with us. Some have been kicked out of their churches, and lost the support of their bishops and fellow ministers. But they have gone with the faith that right defeated is stronger than evil triumphant. These men have been the leaven in the lump of the race. Their witness has been the spiritual salt that has preserved the true meaning of the gospel in these troubled times. They have carved a tunnel of hope through the dark mountain of disappointment.

I hope the church as a whole will meet the challenge of this decisive hour. But even if the church does not come to the aid of justice, I have no despair about the future. I have no fear about the outcome of our struggle in Birmingham, even if our motives are presently misunderstood. We will reach the goal of freedom in Birmingham and all over the nation, because the goal of America is freedom. Abused and scorned though we may be, our destiny is tied up with the destiny of America. Before the pilgrims landed at Plymouth we were here. Before the pen of Jefferson scratched across the pages of history the majestic word of the Declaration of Independence, we were here. For more than two centuries our foreparents labored here with wages; they made cotton king; and they built the homes of their masters in the midst of brutal injustice and shameful hu-

miliation—and yet out of a bottomless vitality they continue to thrive and develop. If the inexpressible cruelties of slavery could not stop us, the opposition we now face will surely fail. We will win our freedom because the sacred heritage of our nation and the eternal will of God are embodied in our echoing demands.

I must close now. But before closing I am compelled to mention one other point in your statement that troubled me profoundly. You warmly commended the Birmingham police force for keeping "order" and "preventing violence." I don't believe you would have so warmly commended the police force if you had seen its angry violent dogs literally biting six unarmed, non-violent Negroes. I don't believe you would so quickly commend the policemen if you would observe their ugly and inhuman treatment of Negroes here in the city jail; if you would watch them push and curse old Negro women and young Negro girls; if you would see them slap and kick old Negro men and young boys; if you would observe them, as they did on two occasions, refuse to give us food because we wanted to sing our grace together. I'm sorry that I can't join you in your praise for the police department.

It is true that they have been rather disciplined in their public handling of the demonstrators. In this sense they have been rather publicly "non-violent." But for what purpose? To preserve the evil system of segregation. Over the last few years I have consistently preached that non-violence demands that the means we use must be as pure as the ends we seek. So I have tried to make it clear that it is wrong to use immoral means to obtain moral ends. But, now I must affirm that it is just as wrong, or even more to use moral means to preserve immoral ends. Maybe Mr. Connor and his policemen have been rather publicly non-violent, as Chief Pritchett was in Albany, Georgia, but they have used the moral means of non-violence to maintain the immoral end of flagrant racial injustice. T. S. Eliot has said that there is no greater treason than to do the right deed for the wrong reason.

I wish you had commended the Negro sit-inners and demonstrators of Birmingham for their sublime courage, their willingness to suffer and their amazing discipline in the midst of the most inhuman provocation. One day the South will recognize its real heroes. They will be the James Merediths, courageously and with a majestic sense of purpose, facing jeering and hostile mobs and the agonizing loneliness that characterizes the life of the pioneer. They will be old oppressed, battered Negro women, symbolized in a seventy-two year old woman of Montgomery, Alabama, who rose up with a sense of dignity and with her people decided not to ride the segregated busses, and responded to one who inquired about her tiredness with ungrammatical profundity; "my feet is tired, but my soul is rested." They will be young high school and college students, young ministers of the gospel and a host of their elders courageously and non-violently sitting-in at lunchcounters and willingly going to jail for conscience sake. One day the South will know that when these disinherited children of God sat down at lunchcounters they were in reality standing up for the best in the American dream and the most sacred values in our Judeo-Christian heritage, and thusly, carrying our whole nation back to those great walls of democracy which were dug deep by the founding fathers in the formation of the Constitution and the Declaration of Independence.

Never before have I written a letter this long, (or should I say a book?). I'm afraid it is much too long to take your precious time. I can assure you that it would have been much shorter if I had been writing from a comfortable desk, but what else is there to do when you are alone for days in the dull monotony of a narrow jail cell other than write long letters, think strange thoughts, and pray long prayers?

If I have said anything in this letter that is an understatement of the truth and is indicative of an unreasonable impatience, I beg you to forgive me. If I have said anything in this letter that is an overstatement of the truth and is indicative of my having a patience that makes me patient with anything less than brotherhood, I beg God to forgive me.

I hope this letter finds you strong in the faith. I also hope that circumstances will soon make it possible for me to meet each of you, not as an integrationist or a civil rights leader, but as fellow clergymen and a Christian brother. Let us all hope that the dark clouds of racial prejudice will soon pass away and the deep fog of misunderstanding will be lifted from our fear-drenched communities and in some not too distant tomorrow the radiant star of love and brotherhood will shine over our great nation with all of its scintillating beauty.

Yours for the cause of Peace and Brotherhood,

Martin Luther King Jr.

MARTIN LUTHER KING, JR.

This supplement coordinated by the Office of the Special Assistant to the President and the Chancellor for Minority Affairs. Special thanks are extended to: Rev. John Crocker, Religious Counselor, Episcopalian; Patricia Garrison, assistant to EEO Officer; Rabbi Mel Gottlieb, Religious Counselor; Ricardo Hall, director, MIT Gospel Choir; Yolanda Hinton, student; Rev. Robert Moran, Religious Counselor, Roman Catholic; Steven Murphy, Associate Chaplain; Zoraida Navarro, student; Rev. Constance Parvey, Religious Counselor, Lutheran; Bernard Robinson, student; and Barbara Wyatt, secretary, Minority Affairs Office.

Science. Nutrition & Food Science Seminar. 2pm, Rm 15-124. Note: Previously scheduled for Thurs, Jan 9).

Developments in Cockpit Traffic Situation Display - R.W. Sampson, aero/astro Highlights in Aeronautics and Astronautics Seminar (6a). 2pm, Rm 33-206.

Nuclear Power: An Open Discussion of the Issues (227h)* - Organized by Pat De Laquil, John Hendricks, and Howard Shaffer, Nuclear Engineering Seminar. 2:30pm, Rm NW12-222. Refreshments.

Sex and Religion - Connie Parvey, Religious Counsellors' Office; Tom Odo, Dignity, gay Catholics' organization. Changing Lifestyles and Modern Times (352c). 3pm, Rm 14E-304.

Students Talk About Law School (288) - Former MIT students attending law school will speak on their experiences and feelings about law school and how MIT prepared them for it. Professional Advising & Education Seminar. 3:30pm, Rm 3-133.

The Crab Nebula: A Unique Astrophysics Laboratory - Hale V.D. Bradt, physics. Lectures in Physics (265). 3:30pm, Rm 4-231.

The Titus Bode-Law in the Solar System: Physical Reality vs. Numerology - Aviva Brecher, earth & planetary sciences. Earth & Planetary Sciences Lectures (83). 4pm, Rm 54-425.

Laugh! The Light Just Turned Yellow and I Can't Stop in Time (27) - Find out what Sam Benichasa, Draper Lab, did when he got a ticket for going through a red light for this reason. Independent Offerings. 4:45pm, Rm 4-159.

The Black Church - Reverend John Bryant, St. Paul's AME Church, Cambridge. Dean for Student Affairs Black Perspective Seminar. 5pm, Rm 10-280. Refreshments.

Thursday, January 23

Reclamation of the Charles River - J. Smith, Process Research, Inc. Innovations in Advanced Wastewater Treatment Technology Seminar (70). 9am, Rm 48-423.

The Economics of the Great Depression and its Lessons for Today (96) - Panel discussion with Peter Temin, economics. Charles Kindleberger, Ford Professor of Economics; and Michael Weinstein, Economics Seminar. 10:30am, Rm E52-394.

Lecture by Representatives of the Boston Women's Health Collective (333) - Two of the original members of the Collective, which wrote *Our Bodies, Ourselves*, will lead an informal discussion. Women's Forum Lecture. 12n, Rm 10-105.

Spectrophotometry for Biochemists - Bill Horschkey, Gilford Instruments. Instruments and Techniques in Biology Seminar (33). 12n, Rm 16-310.

Spectroscopic Investigations of the Planets from Spacecraft - Donald G. Rea, Jet Propulsion Laboratory, California Institute of Technology, will speak on the Mariner and Pioneer missions; **Formation of Molecules in the Interstellar Medium** - William Klemperer, chemistry, Harvard University. Spectroscopy Laboratory Symposium (318a). 1-5pm, Rm 6-120.

Identification with Parents in a Changing World** - Lora Heims Messman, clinical psychologist, medical, consultant, League School of Boston for Mentally Ill Children, Technology Wives Organization Child Development Seminar (369a). 2pm, Stu Ctr West Lge (babysitting Stu Ctr Rm 473).

Energy from the Wind - Rene H. Miller, H. N. Slater Professor of Flight Transportation; head of aero/astro. Highlights of Aeronautics and Astronautics Seminar (6a). 2pm, Rm 33-206.

Operations Research Center Seminar Series (181) - Herbert Ayres, vice president, operations research division, Morgan Guaranty Bank. 2:30pm, Rm 24-121.

The Binary X-Ray Stars - George W. Clark, physics. Lectures in Physics (265). 3:30pm, Rm 4-231.

Three Dimensional Seismological Image of the Earth's Crust and Upper Mantle - Keiiti Aki, earth & planetary sciences. Earth & Planetary Sciences Seminars (83). 4pm, Rm 54-425.

The Bane of Bureaucracy... and the Boon - Curtis Roosevelt, head of the non-Governmental Organizations section, United Nations. Professionals in Development Seminar (372b). 8pm, Rm E14-304.

Friday, January 24

Aquaculture-a Means for Tertiary Treatment - J. Goldman, Woods Hole Oceanographic Institution. Innovations in Advanced Wastewater Treatment Technology Seminar (70). 9am, lecture and field trip will be at Woods Hole.

What is Philosophy of Mind? - Jerry Fodor, philosophy. What is Philosophy? Seminar (251). 2pm, Rm 4-231.

The Space Shuttle for Scientific Research - J.F. McCarthy, aero/astro, director of Center for Space Research. Highlights of Aeronautics and Astronautics Seminar (6a). 2pm, Rm 33-206.

Putting it All Together: The Prospects for Change and Reform - Morty Manford, former president, New York City's Gay Activist Alliance; Chris Miller, Women's Lobby (tentative). Changing Lifestyles and Modern Times (352c). 3pm, Rm 14E-304.

Bubble, Bubble, Toil and Trouble - Irwin Pless, physics. Lectures in Physics (265). 3:30pm, Rm 4-231.

A Conjecture on Visual Texture Discrimination - Bela Julesz, Bell Laboratories, New Jersey. Psychology Seminar. 4:30pm, Rm E10-013. Coffee 4pm.

Community Meetings

Technology Wives Organization General Meeting** - Florence Rubin, president of Massachusetts League of Women Voters, will speak on "Citizen Participation in Government". Wed, Jan 15, 8pm, Rm 10-340. Free. Refreshments. Info, Ruth Stumpp, 494-8365.

Today's Women (Women's Discussion Group)** - "Good Motherhood Through Breastfeeding" will be discussed by Caroline Stanton and Patricia Burdick, representatives of Le Leche League. A short film on breastfeeding technique will begin the discussion. Technology Wives Organization. Thurs, Jan 16, 8pm, Stu Ctr West

Lge. Free. Refreshments. Spouses and friends welcome. Linda Napier, 494-8121.

PDP-11 Users Group Meeting* - Tues, Jan 21, 2:30pm, Rm 13-5002. Coffee 2pm.

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

A Commemoration of the First Passing of Grandlaf, SR 1419, January 25 (328c) - Contact Robert Sacks, Tang 15-F, if you would like to participate in the commemoration of Tolkien's greatest character. Sat, Jan 25, 9am, Stu Ctr Mezzanine Lge.

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

Social Events

Strat's Rat - Dance to WTBS music and drink light or dark beer, 16 oz for 25 cents. Sat, Jan 17, 8:30pm, Sala. Free, college ID required.

Ice Skating Party - Sat, Jan 18, 8pm, ice rink, sponsored by Hillel. Followed by entertainment and refreshments in Hillel Bsmnt.

Hillel Brunch - Sun, Jan 19, 11am. Albert Axelrad, Hillel director at Brandeis, will speak on "A Radical Zionist Perspective on the Current Middle East Situation".

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

Ad-Hoc Over 30's Singles Chowder and Marching Society - Luncheon meeting in Stu Ctr East Lge (small dining room off Lobdell), Fri, 12:30-1:30pm. New members always invited. Look for the table with the red balloon. Suzanne, x3-3131 or Marty x8-1206 Draper.

Movies

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

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

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

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

What Makes Opera Grand? - Lenard Bernstein film, sponsored by the philosophy department. Thurs, Jan 16, 3pm, Rm 26-100.

Sex in Films - Films from the Multi-Media Resource Center of the Institute for Sex Research (Indiana University-the Kinsey Institute) and films of pornography will be shown. Changing Lifestyles and Modern Times (352c). Thurs, Jan 16, 3pm, Stu Ctr Rm 491.

Kitty Hawk to the Moon - Serendipity or Science? - Barker Engineering Library Film Series (190). Thurs, Jan 16, 5pm, Rm 10-500.

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

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

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

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

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

2000-Year-Old Body from West-Han Dynasty; Cultural Relics Unearthed During the Cultural Revolution; New Archeological Discovery of Ancient Relics of Chan-Sha Tomb I - CSC Films with English narration. Sun, Jan 19, 2pm, Kresge. Free with MIT ID.

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

Afternoon of Bio-Flicks (28) - Developmental biology films. Mon, Jan 20, 1pm, Rm 16-310.

City Life in China (321) - Film and slides. Independent Offerings. Mon, Jan 20, 2pm, Rm 3-415.

The Water Below; The Sea River (Amazon River); The Little Plover River Project: A Study in Sand Plains Hydrology; The Beach; River of Sand - Earth & Planetary Sciences Theatre (75). Mon, Jan 20, 4pm, Rm 54-100.

The Russians: Insights through Literature - Humanities Film Festival (186). Tues, Jan 21, 12n, Rm 4-270.

City Life in China (321) - Film and slides. Independent Offerings. Tues, Jan 21, 2pm, Rm 3-415.

Estuarine Heritage; Oceanography: Science of the Sea; River of Ice: Life Cycle of a Glacier - Earth & Planetary Sciences Theatre (75). Tues, Jan 21, 2pm, Rm 54-100.

The Captain's Daughter (Pushkin)** - Foreign Literature & Linguistics Film. Tues, Jan 21, 3pm, Rm 10-250.

Cartouche - French Film Series (119). Tues, Jan 21, 7pm, Stu Ctr Rm 407. Followed by discussion in French with native speakers.

City Life in China (321) - Film and slides. Independent Offerings. Wed, Jan 22, 2pm, Rm 3-415.

Legacies of the Ice Age; The Restless Earth: Evidence from Ancient Life; Yosemite National Park: Its Geology, History and Beauty - Earth & Planetary Sciences Theatre (75). Wed, Jan 22, 2pm, Rm 54-100.

One Man's View of His Own Culture - Richard Leacock, architecture, will discuss his work. The Anthropologist as Film Maker (139). Wed, Jan 22, 4:30pm, Rm 9-150.

Signals for Survival - Humanities Film Festival (186). Thurs, Jan 23, 12n, Rm 4-270.

The Restless Earth: Plate Tectonics; Earthquakes; Geology and Man - Earth & Planetary Sciences Theatre (75). Thurs, Jan 23, 2pm, Rm 54-100.

Edison and the Movies - Serendipity or Science? - Barker Engineering Library Film Series (190). Thurs, Jan 23, 5pm, Rm 10-500. Coffee.

Edison and the Movies - Serendipity or Science? - Barker Engineering Library Film Series (190). Fri, Jan 24, 12n, Rm 10-500. Coffee.

A Shot in the Dark** - LSC. Fri, Jan 24, 7 & 9:30pm, Rm 10-250. Admission \$.50.

Day of Wrath (Dreyer) - Film Society. Fri, Jan 24, 7:30 & 9:30pm, Rm 6-120. Admission \$1.

Ice Station Zebra** - LSC. Sat, Jan 25, 7 & 10pm, Rm 10-250. Admission \$.50.

Twenty Thousand Leagues Under the Sea** - LSC. Sun, Jan 26, 7 & 10pm, Rm 10-250. Admission \$.50.

Music

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

Theatre

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

Dance

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

Exhibitions

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

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

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

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

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

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

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

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

Athletics

Home Schedule - Wednesday, January 15 - F "B" Basketball. Chauncy Hall, 5:30pm, Rockwell Cage. **V "B" Basketball**. Emerson, 7:30pm, Rockwell Cage. **Saturday, January 18 - Track**. Williams, Tufts, 1pm, Rockwell Cage. **V Fencing**. SMU, Norwich, 2pm, duPont fencing room. **V Hockey**. Maine (Portland-Gorham), 7pm, ice rink. **Monday, January 20 - JV/F & V Basketball**. Wesleyan, 6:15pm, 8:15pm, Rockwell Cage. **W Swimming**. Northeastern, 7pm, Alumni pool.

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

Hillel Basketball - Thurs, Jan 16, 7:45pm, duPont Gym.

***Open to the public**

****Open to the MIT community only**

*****Open to members only**

Send notices for January 22 through February 2 to the Calendar Editor, Room 5-111, Ext. 3-3279, before noon Friday, January 17.

King Day Program Is Listed



In April, 1968, when the civil rights leader, Rev. Martin Luther King, Jr., was assassinated in Memphis, Tenn., the MIT campus, like the rest of the nation, was plunged into mourning. Above is the

West Campus scene from those dark days of 1968 when black flags and bunting helped express the grief of the Institute and its people.

Associated Press Photo

(Continued from page 1) Special Assistant to the President and Chancellor for Minority Affairs, by the MIT Religious Counselors, and by numerous MIT students and staff.

Theme will be "Dr. Martin Luther King, Jr.: What He Means." Those wishing to

participate are asked to meet in silence in Lobby 7 at 12 noon and march to Kresge.

Included on the program will be recordings of Dr. King delivering portions of famous speeches ("I Have a Dream," "I Have Been to the Mountain Top"), selections by the MIT Gospel Choir directed by

Ricardo Hall, invocations by Rev. Eddie McBride of the MIT Community Fellows Program and by Rev. John Bryant of St. Paul's Church, Cambridge.

Following Mr. Jones' address, members of the audience will be invited to present remarks of their own.

Mortgage

(Continued from page 1) in the conference.

The study was undertaken to determine if the standard mortgage instrument—which calls for a fixed rate of interest and a fixed periodic payment for a stated period of time—was contributing to the sharp decline in housing starts and the difficulties of the mortgage-lending institutions.

The conference will be held in the Marlborough Room, Room 37-252, beginning at 9am.

The schedule for Thursday includes an introduction by Dr. Modigliani and an analysis of non-conventional residential mortgages by Richard A. Cohn, assistant professor of finance, and Stanley Fischer, associate professor of economics, both of MIT.

Thursday afternoon will be devoted to a discussion of the financial determinants of the demand for housing and the stimulation of macroeconomic impact of alternative mortgage instruments.

On Friday Dr. Lessard will review the experience some foreign countries have had with alternative mortgage instruments and Daniel M. Holland, professor of finance at MIT, will analyze the tax and regulatory status of alternative types of instruments.

The conference will conclude with an overview Friday afternoon by Dr. Modigliani.

Professor Singer In Panel on Sexism

Irving Singer, professor of philosophy at MIT, will be one of three panelists discussing the question, "Is Sex the Basis of Sexism?" at the Cambridge Forum on Wednesday, Jan. 15, at 8pm at 3 Church Street.

Dr. Singer is the author of a recent book on *The Goals of Human Sexuality* and an earlier book on *The Nature of Love: Plato to Luther*. A portion of the discussion will be re-broadcast on WGBH on Monday, Jan. 20, at 7:30pm.

Woven Art Show At Faculty Club

Hand-dyed and woven rugs and wall hangings by Claudia Ogilvie, Belmont, daughter of Professor Robert E. Ogilvie, are currently on display at the MIT Faculty Club bar this month.

The selection of works by Ms. Ogilvie, who is a full-time, self-taught weaver, includes rugs of her own designs in russet, emerald, brown and wheat colors and wall hangings based on Scandina-

vian and colonial designs. All were done on a Finnish toika loom.

Ms. Ogilvie, who has been weaving for over five years, majored in architecture while attending the University of Washington and mentions architecture as having the greatest influence on the designs she creates. Her weavings have regularly been on display and for sale in the Christmas Store in Cambridge.

Teuber to Pose Riddle of Sight

Some of the clues to the riddle of sight lie with the visual illusions which "deceive" our eyes, according to Dr. Hans-Lukas Teuber, head of the Department of Psychology.

Dr. Teuber will use this riddle for a demonstrated lecture on perception and perceptual illusions of interest to children and adults Sunday, Jan. 19 at MIT.

Dr. Teuber will speak at 3pm in

Rm. 26-100. The lecture will benefit the MIT Cooperative Nursery School and the MIT Day Care Center.

To illustrate the lecture, Dr. Teuber will reproduce a spectrum of visual illusions using line patterns, dots, circles, film strips, a mix of colors and contours and projecting hidden "impossible" pictures that have more than one reading.

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

New Alberty Book

Publisher John Wiley and Sons has recently published a revised fourth edition of the standard college text *Physical Chemistry*, authored jointly by Professor Robert A. Alberty, dean of the MIT School of Science, and the late Dr. Farrington Daniels, professor of chemistry at the University of Wisconsin.

An accompanying book, *Physical Chemistry Problems and Solutions*, written by Dean Alberty is expected to be released soon.

Aliens Must File

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

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

Blood, Sweat And Tears

The famous rock music group Blood, Sweat & Tears will come to MIT on Sunday, Feb. 2, for two performances in Kresge Auditorium.

The concerts, which are being sponsored by the president's office of the Undergraduate Association, will be at 7pm and 9:30pm.

During the first week of ticket sales, Jan. 13-20, tickets at \$3.99 per person are being offered solely to the MIT community, according to Steven M. Wallman, a senior in urban studies from New York City. Mr. Wallman and Phuong D. Trinh, a second-year biology student from Silver Springs, Md., have made arrangements for the concerts.

Tickets, all for reserved seats, are on sale in the Undergraduate Association office, W20-401, in the Student Center.

Seminars on MIT Are Continuing

The continuing IAP seminar on "MIT—The Institution," which meets daily from 9:30am to noon through Jan. 24, will feature a discussion of "History, Tasks, and Directions" (Jan. 15 in Rm 3-133 with Chancellor Paul E. Gray, Provost Walter A. Rosenblith, and Professor Elting E. Morison.

Associate Provost Hartley P. Rogers, Jr. and Deans Thomas M. Hill, William L. Porter, Donald L. Blackmer, James D. Bruce and Robert A. Alberty will lead a seminar Thursday (Jan. 16) on "Academic Tasks and Operations."

"Research Tasks and Operations" with speakers Albert G. Hill, vice president of research, Jerrold R. Zacharias, Institute Professor Emeritus, and Margaret L.A. MacVicar, associate professor of physics, will be the topic of discussion Friday (Jan. 17).

President Jerome B. Wiesner

and President Emeritus Julius A. Stratton will visit the seminar Monday (Jan. 20) to discuss "The Institution As Seen By The President."

The subject of "The Alumni" will be examined the following day, Tuesday (Jan. 21), by Frederick G. Lehmann, financial vice president and treasurer of the Alumni Association.

Upcoming discussions will look at "Fiscal, Budgeting and Development," "Personnel and Operations," and "The Students." Scheduled speakers for the three concluding seminars are Stuart H. Cowen, vice president for financial operations, John A. Currie, director of finance, Nelson C. Lees, director of resource planning and Vice Presidents John M. Wynne and Philip A. Stoddard.

Speaking on behalf of the students Jan. 24 will be Deans Carola B. Eisenberg and Irwin W. Sizer.

Model Builder

(Continued from page 1) the sails.

"I used to make the ships for give-away—to whoever wanted them," he said. "Now I give them to friends. This is the largest boat I've made. I am going to sell it. Originally, it was for my son who lives in Florida, but it is too large and fragile to crate and ship."

Mr. Fici, who lives with his wife, Phyllis, in Everett, works the four to midnight shift in Bldg. 37. He retired as a mackerel fisherman 13 years ago after the boat he was skippering caught fire and sank. He still works on the Boston docks managing the unloading of fishing boats from time to time.

Bement Honored

Dr. Arden L. Bement, Jr., professor of nuclear materials in MIT's Department of Metallurgy and Materials Science, was presented the Award of Honorary Member by the American Society for Testing and Materials (ASTM) Committee E-10 on Nuclear Applications and Measurement of Radiation Effects at its winter meeting in San Diego last month.

In his workshop not long ago, Mr. Fici stood with the recently completed boat and detailed its points—"fully planked hull, over 100 carved pulley blocks for adjusting sails, a functioning rudder connected to the wheel, lifeboats with oars and working water pumps...."

"Each of the boats I make has something different. It is not just that almost every part is hand-made. They are my own designs; they come from my mind."

Inflation

(Continued from page 1) participating in a panel discussion on inflation following opening remarks by Dr. Williams.

Dr. Earl Graves, publisher and editor of the magazine *Black Enterprise*, will deliver the keynote address at the luncheon which will be held in the Sala de Puerto Rico at the Stratton Student Center.

Among the panelists and workshop leaders will be Thomas Atkins, president of the Boston NAACP chapter, and representatives from Arthur D. Little, Inc. and the Institute for New Enterprise Developments.

Florence Luscomb at 87

(Continued from page 1) momentum and Florence organized small "parlor meetings" with other MIT women. Ellen Swallow Richards, MIT's first woman student, was an instructor then and would meet with women students as an unofficial dean of women, Ms. Luscomb recalls.

Nor did MIT have women's housing facilities in those days. To attend classes, Florence had to walk six miles a day.

But, the opportunity to study architecture at MIT was an exciting proposition for a woman in 1905 and Ms. Luscomb remembers her first year "was one of the happiest" in her life.

After graduation in 1909, Ms. Luscomb went to work for one of the few employers who would hire a woman in 1909—another woman—Ida Annah Ryan, an outstanding architect who had graduated from MIT in 1905. The two eventually went into partnership and worked together until World War I halted all building.

At that time, Ms. Luscomb,

already immersed in the suffrage movement, began devoting herself to full-time social and political reform. She became executive secretary of the Boston Equal Suffrage Association for Good Government. She later became the president of The College Equal Suffrage League of Massachusetts and assistant executive secretary of the Massachusetts Civic League. She was involved in pressing for more humane conditions in garment "sweat shops," aided in union organizing and even ran for governor of Massachusetts in 1952 on the Progressive Party ticket on the platform of "feminism, socialism and the peace movement."

She spent many hours over the past 65 years on the picket lines, soap boxes and street corners campaigning for labor movements, equal rights, peace movements and women's rights. Yet, with all her numerous accomplishments behind her, Florence Luscomb prefers to remain in the mainstream of social action, battling away—this time for communes.

MIT Study on Railroad Freight Producing Results

By CHARLES H. BALL
Staff Writer

An MIT study of the reliability of railroad freight operations already is producing positive results, according to the president of one of the nation's major railroads.

W. Graham Claytor Jr., head of Southern Railway, says in the magazine, *Railway Age*, that the research project was "one of the most productive partnerships I have known among the government, the academic community and the railroad industry."

The partnership began with a three-year study of service reliability—for the Federal Railroad Administration of the US Department of Transportation—by the Transportation Systems Division of MIT's Department of Civil Engineering.

The study, directed by Dr. Joseph M. Sussman, associate professor of civil engineering and head of the Transportation

Systems Division, began in 1971, based on data supplied by eight US railroads. In 1972, Southern became the test-tube railroad—the road on which reliability theories would be put to the test.

As reported in *Railway Age*, MIT and Southern focused on one operating area—which included four hump class yards, four major flat yards and more than 900 miles of main line—to analyze performance and then come up with a "basic strategy for improving reliability."

In their final report, the MIT researchers concluded that unreliability could be improved "in the short run and without major capital expenditures."

The major problems, they found, were "in the yards," with the classification yard at the heart of the trouble.

"The more times a car is switched, the more likely an unreliable move will occur," they said. "The unreliability in-

duced by over-the-road problems tends to be small when compared with the substantial unreliability induced by yard operations, and particularly missed connections."

"The research indicates," they added, "that substantial improvements in reliability can be accomplished by modification of operating policies such as those governing train dispatching, train length, train schedules and the classification process. Put another way, the railroads can achieve improvements using mechanisms wholly within their control—that is, without spending a great deal of money on capital facilities and without awaiting major institutional or commercial changes in, for example, work rules or line abandonment procedures."

Southern President Claytor said that this advice was translated into changes in operating procedure "so that actual re-

sults might be measured against what was expected."

"They weren't sweeping changes, and they involved no policy decisions," he said.

What happened? In most cases, he said, the changes "did improve reliability to a clearly-measurable degree. They also resulted in cost-savings that in some instances were slightly greater than had been predicted."

The experience convinced him, he said, that the MIT researchers had come up with a blueprint for real and valuable improvement in the reliability of railroad service."

"What clearly emerges from the research study and recommendations," he said, "is a direct challenge to our industry: We can have greater service reliability if we want it enough and are willing to work hard enough to get it."

Absorbable Materials Being Developed At MIT for Subdermal Contraceptives

By ROBERT C. DI IORIO
Staff Writer

A unique system that can deliver a year's supply of a birth control drug from a slowly dissolving capsule implanted under the skin has been developed at MIT.

The biodegradable capsule is broken down and absorbed by normal body action in the same manner as absorbable sutures which have been commonplace in surgery for years.

Dr. Paul M. Newberne, professor of nutritional pathology in the Department of Nutrition and Food Science, leads the team that developed the slow-release delivery system. Working with him are Dr. John B. Stanbury, professor of experimental medicine, Yutta Salinas, a technical assistant in the department, and John B. Gregory and Dr. Donald L. Wise, both of Dynatech R/D Co., Cambridge, a manufacturer of polymers from which the capsules are made. Lester C. Bartholow of Mineral Ridge, O., formerly a graduate student at MIT, earned a master's degree under Dr. Newberne working on the project.

The system was perfected in experiments on laboratory rats and dogs using norgestrel as the birth control agent, Dr. Newberne said.

It has not yet been tested on humans.

The biodegradable, contraceptive-carrying, subdermal capsule is considered preferable to the long-developed but seldom used non-dissolving capsules because the need to remove the capsule after the birth control drug is exhausted is eliminated.

The MIT professor said the delivery system's greatest potential use will probably be in developing countries where medical supervision is minimal.

"Oral contraceptives have proven unacceptable to women in developing countries because they require intermittent use," he said. "The convenience of the implantable, biodegradable capsule would be a tremendous advantage. Just imagine what it would mean in a country such as India if we could break—even if we only broke it once—that cycle of a baby every year."

The convenience factor of the implanted capsule may make it attractive to women in developed countries as well, Dr. Newberne

said.

"There is no question that as we refine the process we can make the capsules smaller," he said. They could be implanted anywhere on the body, but under the skin of the back would be the location of choice for most women, Dr. Newberne believes.

Would norgestrel used subdermally be likely to produce the same kinds of unpleasant side effects that some women experience with oral contraceptives? Dr. Newberne said more testing is needed before that question can be fully answered, but there is reason to expect that the subdermal application may prevent the skin discoloration some women develop after using oral contraceptives.

"Taken orally, there is a big dose to absorb, but the slow-release nature of the subdermal delivery system, we think, will eliminate that problem," Dr. Newberne said.

The capsules are made by embedding the copolymers of lactic

and glycolic acid with the norgestrel and then extruding them into cylinders.

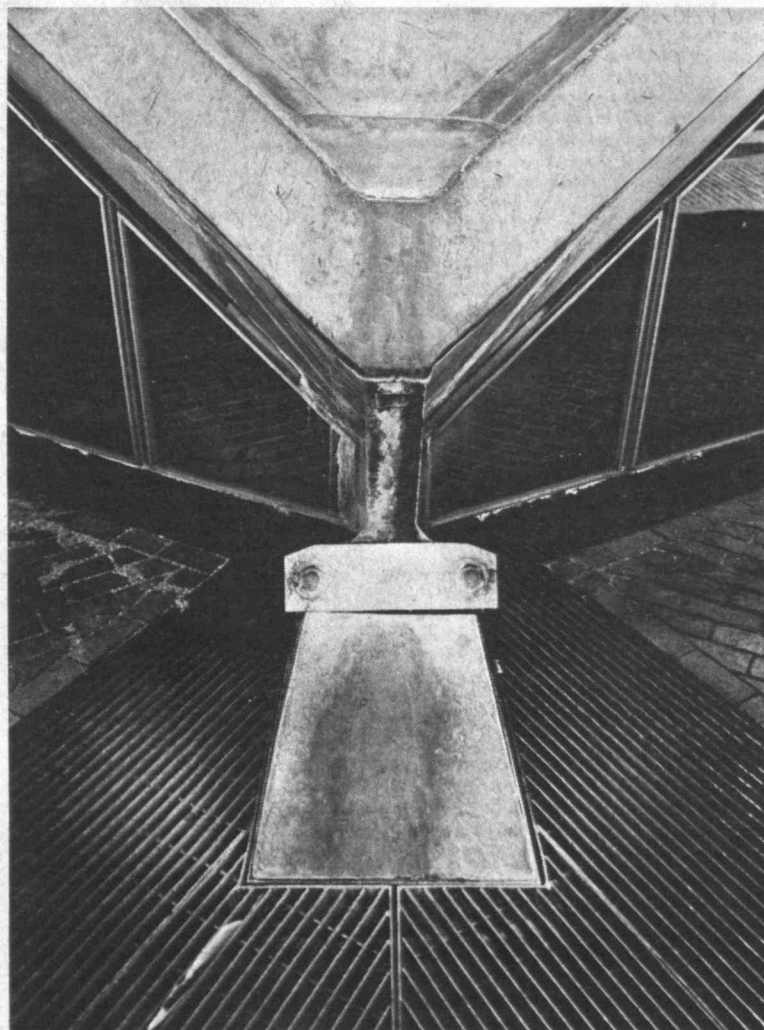
The cylinders are placed under the skin using a large hypodermic-like instrument called a trocar.

"Now that we have worked out the mixture (of polymers) to the point where we get steady, long-term release, we must determine how the steroid (the contraceptive drug) reacts when used in this fashion," Dr. Newberne said.

Norgestrel—marketed as an oral contraceptive pill under the brand name Ovral—has been in safe use for many years, he said.

"But we don't know if it will act differently when used in conjunction with the carrier."

The carrier-contraceptive combination will be tested for two years on rats and dogs, Dr. Newberne said. The results of those tests will be evaluated by the Federal Drug Administration. Dr. Newberne expects it will be three years before human subjects can be tested.



ONE OF THREE steel pintles that connect the 1,500-ton roof at MIT's Kresge Auditorium to buried concrete buttresses makes an arresting photographic pattern for News Office photographer Joseph Schuyler. The roof, which can be thought of as a three-corner orange peeling, is supported only at the three pintle points and is not connected to interior walls, permitting expansion and contraction without interior damage. The roof ranges from eight inches thickness at the top to 20 inches near the bottom. Kresge was designed by the late Eero Saarinen and was completed in 1955.

GSC Seeks Help

The Graduate Student Council is searching for a manager of its graduate newspaper, to obtain ads and articles and coordinate production. The position is 20 hours/week. For information, call x3-2195 or Bob Reynolds, x3-6752.

Law, Government Programs Begun

Several new fieldwork and internship opportunities in law and public affairs have been developed at MIT in conjunction with the Department of Urban Studies and Planning and Political Science.

Timothy Bird, Law-Related Fieldwork Coordinator, said students who want to get involved in these programs, which include UROP placements, work/study situations and academic credit undertakings, should contact him at Rm 4-209 on x3-1368 or 3-1355.

Book Published

Dr. Stephen D. Senturia, associate professor of electrical engineering at MIT, and Dr. Bruce D. Wedlock, director of the Lowell Institute School and lecturer in electrical engineering, are co-authors of a new book, *Electronic Circuits and Applications*, published last month by John Wiley.

An undergraduate research seminar (17:67), which will be taught by F. Christopher Arterton, assistant professor of political science, will provide field placements and research assignments on legislative and governmental processes, plus an opportunity to investigate public issues. Other projects will be available in public agencies and non-profit research organizations.

Dr. Elliot Honored

Dr. John F. Elliot, professor of metallurgy in the Department of Metallurgy and Materials Science was recently named honorary member of the Society of Mining and Metallurgical Engineers of Venezuela. The Society cited Dr. Elliot's "indisputable professional achievements and invaluable contributions to the development of metallurgical science."

CLASSIFIED ADS

Ads are limited to one per person per issue and may not be repeated in successive issues. All ads must be accompanied by full name and Institute extension. Only Institute extensions may be listed. Members of the community who have no extensions may submit ads by coming in person to the Tech Talk office, Room 5-111, and presenting Institute identification. Ads may be telephoned to Ext. 3-3270 or mailed to room 5-105. Please submit all ads before noon, Friday, January 17.

For Sale, Etc.

Lady Vanity elec rollers; nw, \$5. x3-7138.

Suede coat, f sz 8 or 10, deep prpl, orig \$140, \$50 or best. Ann, x3-4401.

Metal radiator cover, 42" L, 25" H, 10" W, \$20. Dan, x7722 Linc.

TI SR-50 pkt calc, purchased on MIT account & pref to sell to prsn or program on same, \$149.95. Undergrad Seminar Office, x3-3621.

Snows, 7.35x15 Uniroyal winteride, used 1 seas, \$25/pr; GE refrig, yel, 17 cu ft, \$25. x3-3545, Rm 16-534.

Big office sz typwrtr, Smith Corona 450, Bob, 734-5728, aft 7.

TI SR10 calc, orig \$89.95, wl sell for \$50. Gene, x7124 Linc.

Ski equip, seas old: m sz 9½ Rieker boots, \$20; m lg warm-ups, \$8. Rob, x3-3732.

Dominico refrig, 10 cu ft, 2½ yrs, \$100 nego. Amy, x3-5737.

Moving, wl sell, best: Philco 9000 BTU ac; mtl bkese; K stools; K cab; tbl lamps; plants; wall hangings; towels; misc K ware; f 10 spd bike. Cali, 547-3371, evgs.

Electronic junk, everything must go. Lambda pwr supplies, some nw, 1/3 or list, build 40 W/ch pwr amp over IAP for less \$40. George Doerre, x3-3162, lve msg.

Pr TDC-4 spkrs, gd cond & sound, \$80. Scott, 661-9698, lve msg.

Thorens TD-125 w/Shure/sme 300 tonearm, arm nw, base 2 yrs, \$275. Al 521-1150, lve msg, kp try.

Snows, 2, 5.20x13, not radial, exc cond, Tom, x3-3074.

M Bauer hcky skates, sz 11, \$10. Carol, x3-7604.

Rogers 26" bass drum, blk diamond pearl, exc cond, wl trade for 15" high hats or xtra tall cymbal stands. Rick, x8-1595 Draper.

Sheepskin sz 5 or 7 coat, nds cleaning, best; handmade Amer Indian turq & slvr jewelry. Arlene, x3-7722.

Used Sony TC-350 tape deck, incl sound-on-sound & blank tape, \$150. Mike, x3-1822.

Lambert 10 spd bike, used once, \$140. x7773 Linc.

Sansui Au 505 integrated amp, exc lk nw cond, wrnty, orig ownr, \$140 or best. x0341 Dorm.

Bobby Orr hcky skates, sz 10, used once, \$10. Arye, x3-7511.

Metal locator, Heathkit GD-48, exc cond, \$50; oscilloscope/vectorscope, Eico 465K, w/probes, exc cond, \$150. Klaus, x3-7350.

Pr hand-made "Bose 901" spkrs w/equalizer, \$250 firm. Call, 266-0520.

Early Amer furn: coffee tbl, rock chr, 2 step tbls, full length mirror. x3-5824.

(Continued on page 10)

Classified Ads

(Continued from page 9)

Traynor PA sys w/amp, 2 columns, \$190; Maestro rhythm jester w/foot pedal, \$90; Armstrong youth 3 spd racing bike, \$50; Radatron car radar detector, \$18. Call, 783-J654, evgs.

Konica Hexanon 28 mm & 100 mm lenses, also fltrs, 55 & 58 mm sizes. C Therrien, x367 Linc.

\$2 bills: damaged, \$2.15; reas cond, \$2.50; nicer, \$2.85; asst sm stamp collections incl precancelled and "perfins"; want to buy coins & tokens of Palestine. x7593 Linc.

Norge washer, 2 cycle w/fltr sys, \$40. Call, 484-0802, aft 1pm.

Dynaco Mark III 60 W power amps, 2, w/Pat-4 preamp, sys great for Bose 901's. Tony, x3-7441.

F fashion clogs & platform shoes, sz 8B, cheap. Heien, x3-7690.

Skis: Kneissel Redstar 205 cm, Salomon 404 bndgs, Reiker boots (9 1/2), best. Call, 864-5272, evgs.

Sony TC-100 mono cassette player-recdr, compl, ask \$75; few blank & pre-recdrd tapes. Steve, x0147 Dorm.

Mahog head & ftbrd for twin bed, \$15; dbl bed matt & box spr, \$15; Dovre locking car top ski rack, adjustable, \$5; lamp, \$5. x3-7508.

Ski equip: 185 cm metal skis w/Dovre step-in bndgs & f sz 7 1/2 bckl ski boots, \$30. Cynthia, x3-5814.

Stanton 681EE stereo phono crtrdg w/replacement stylus, all exc cond, 1 mo old, \$60, nego. Jim, 247-8764, lve msg.

Aristo studio rechenschieber, der aristokrat of sliderules, incl Linse und 4 digit akkuranz fur den preis eines qtr of a calculator, 50 cm lang, spottbillig (inexpensive) nur \$25. Drew, 923-0640.

Danish mod couch, 8' long, brn, ask \$80. Charles, x3-1639.

K2 competition skis, 205 cm, w/505 bndgs, poles, best. Felix, x9104 Dorm.

Fuji Spec tourer 10 spd bike, 21" frame, used 3 mos, lk nw, \$90; kryptonized lock, chn & xtra lock, \$10. Yosuke, x8732 Dorm.

Blk sheep fur rug, 5'8"x 6'8", six pelts, \$80. x3-5156.

Snows, 6.50x13 rayon 4 ply t-less, v little wear, \$22/pr. x9865 Dorm, aft 6.

Sofabed, recliner, tbls & lamps, \$120; clr TV & tbl, \$220; desk, chr, lamp, \$40; twn beds, drwrs-chests, tbl, \$120; frame, springbox (full), tbls, lamps \$40. Neves, 924-5565.

Brothers sew mach, zig zag & all other attach, \$40; console cab, also avail, \$30. Call, 527-1596.

Garrard 40B trnttbl, gd cond, \$20; 2 spkrs, 6 1/2" w/coaxially mtd tweeter, \$22; Packer bckl ski boots sz 4, used once, \$10. Dan, 734-0872, aft 6pm.

Falk x-entry ski boots, sz 8 1/2-9, worn once; Villom 3 pin bndgs, nvr used; both \$10; wanted: Bose 901 spkr stands, iron brd. Doug, x3-7193.

Wht rabbit fur coat, sz 10, \$50. x3-7902.

Studio couch, \$50; 3 pc settee, blu, sts 8, \$200; vac, \$45; washer, \$50; bkshlvs, \$20; 2 K tbls & 4 chrs; beaut low tbl w/inlay, 2 chrs, \$250; 2 armchrs, \$5/ea. Call, 267-6012, evgs.

Sun lamp, used once, \$20. Terry, x3-5788.

M 3 spd bike w/bkskts & lites, \$35; stu desk, \$20; easy chr, \$5; 2 spd fan, \$3. Dave, x3-2413.

Upright piano, nds work, \$60; 9x12 gold wool rug, \$30; 2 wd chrs, \$5/ea; hi-intensity lamp, \$5; drafting lamp, \$10. Ginny, x3-2380.

Admiral washer, 5 mos old, 18 lb, still under wrnty, \$100. Exielena, x8-3579 Draper.

Drake 2B rcvr w/spkr & Q multiplier, exc cond, \$200. x249 Linc.

Rentals on PA systems, lite shows, hi qual mics & mixers; party decorations & effects expertly designed. Call, 876-6555, days.

Mahog bkcase, 4 shlvs + lower sliding door cab, \$45; Polaroid 1970 mdl camera, lk nw; man Royal typwrtr w/case, exc cond; RCA 8 trk tape player, 5 yrs, gd cond; best. Diane, 926-4712, aft 6pm.

Lg Advent spkrs, 2 pr, 1 w/wint cab, 8 mos, 16 mos left wrnty, other pr util cab, 4 mos, 20 mos left wrnty, all perf, best. Ken, 272-7488.

Harmony folk guitar, stl string, hrdly used, w/case, pitch pipe & other access, \$75. Craig, x3-6893.

Moving to Eur, must sell immed for cash: beds, sofa, tbls, much more. Paul, 277-7396.

K sz waterbed, 7 yr of 9 yr grnty, frame, htd, \$120. Phil, x3-3545.

Wstghse roaster w/ml cabinet, \$50. Tony Ruggelo, x5713 Linc.

HP-45, yr old, \$250. Ed, x3-7130.

Misc toys & child books; baby carriage, \$25. Mrs. Gundersen, x3-6085.

Elec guitar amp, hrdly used, \$35. Mike, x461 Linc.

Ski boots, sz 10, \$5. John, x3-1836.

Ski boots, sz 5 & 7 1/2, cheap. John, x8-2006 Draper.

Pr Delta B78x13 stud snows, used 1 mo last seas, \$35. Huggins, x3-5757.

HP 45 calc, \$250. Bob, x3-6394.

Framus folk guitar w/case, \$80; 60/40 parka, nw, \$15; rcrds, \$1/ea. Call, 354-7046, evgs.

Flip-lock tripod, max ht 60", \$25. x3-1996.

BSR mini rcrd changer, bk shlf sz, dust cvr & slnt base, \$200 or best. Dorothy, x3-6394.

Sony CF 620 stereo cassette amfm, 2 spkrs, \$150; 58" Barregrafter ski poles, \$3; 9" b&w TV, poor sound, \$15; 44"x16" desk, \$15. Call, 494-8798, evgs.

HP 45 calc, 2 mos, mint cond, all std access, wrnty, list \$325, \$245. Kolm, x3-5554.

Random bike parts: handlebars, rims, crankset, etc. Gerald, 536-0823, late pm or early am.

Raleigh f sports bike, 26", 2 nw tires, exc cond, \$60. Call, 862-4197.

HP 45 calc, b nw, full wrnty, \$295. x9780 Dorm.

Hcky skates, 2 pr, sz 10 & 13, gd cond, \$10/ea or best. Pete or Colleen, x0484 Dorm, evgs.

Random bike parts: handlebars, rims, crankset, etc. Gerald, 536-0823, late pm or early am.

HP 45 calc, b nw, full wrnty, \$295. x9780 Dorm.

Hcky skates, 2 pr, sz 10 & 13, gd cond, \$10/ea or best. Pete or Colleen, x0484 Dorm, evgs.

'62 Merc Meteor, gd cond, 2 dr V8, avail immed, \$300 or best. Sunny, x3-2174.

'64 Olds 88, gd run cond, nw snows, best. Call, 861-9506.

'65 Dodge Coronet sed, std, runs well, current inspection stkr, \$230. Call, 494-8182.

'65 Chevy step-van, 20 K max, \$250. Sue Thomas, x3-5831.

'66 Chevy, V8, runs well, \$275 or best. x3-7799, aft 2pm.

'67 Dodge Coronet, 2 dr, 6 cyl, std, \$250. Alan, x3-7826.

'67 MGB-GT, grn, nw rebilt eng, nw batt, 4 nw tires, gd cond, \$1,350 or best. James, 427-2480, evgs.

'68 VW bus, 2 yrs old eng, nw muff, nds body work, \$850 or best. x3-2811.

'69 Ford LTD wgn, 10 psngr, p st & br, ac, hi mileage, gd run cond, \$475. Bill, x3-3936.

'70 Chevy Nova, auto, 6 cyl, exc cond, 47 K, nw 4 yr batt, 8 K on tires, 8 mos left on 5 yr wrnty, lvg state, must sell, \$1,500. Call, 273-1412.

'70 Jeep commando, 4 whl drive, fm radio, auto, lo mileage, v cln, \$2,300. x3-4257.

'70 VW bug, red, 64 K, radials, snows, \$750. Ho, x3-6740.

'70 Maverick, auto, v gd mech cond, perf body, int lk nw, gets gd gas mileage, \$1,150 or best. x3-7824.

'71 Ford Pinto, 2 dr, radio, nw snows, nw exh sys, grn, std, 55 K, \$1,100 or best. Rick, x5845 Linc.

'71 Pan Am Mark I Mustang, hi perf eng, mint cond, 5 K, nw ovrsz tires, see in Camb, \$1,600; Bowmar calcs, nw in box: MX80, was \$44, \$27; 2 MX75, w/charger, \$25. Don, x8-3333 Draper.

'73 Audi GL100, 22 K, lk nw, x196-389 EDC.

'74 Merc Montego MX Brougham, ac, 4 K, \$3,650. Mark, x3-2256.

'71 Honda 350, exc cond, reas. Cynthia, x3-7126.

'71 Pan Am Mark I Mustang, hi perf eng, mint cond, 5 K, nw ovrsz tires, see in Camb, \$1,600; Bowmar calcs, nw in box: MX80, was \$44, \$27; 2 MX75, w/charger, \$25. Don, x8-3333 Draper.

'71 Chevy Vega htchbck, 3 spd trans, radio, trailer hitch, \$925. x3-4471.

'73 Audi GL100, 22 K, lk nw, x196-389 EDC.

'74 Merc Montego MX Brougham, ac, 4 K, \$3,650. Mark, x3-2256.

'71 Honda 350, exc cond, reas. Cynthia, x3-7126.

'71 Pan Am Mark I Mustang, hi perf eng, mint cond, 5 K, nw ovrsz tires, see in Camb, \$1,600; Bowmar calcs, nw in box: MX80, was \$44, \$27; 2 MX75, w/charger, \$25. Don, x8-3333 Draper.

'73 Audi GL100, 22 K, lk nw, x196-389 EDC.

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'71 Honda 350, exc cond, reas. Cynthia, x3-7126.

Back Bay stu, mod K & B, avail now, \$160. Call, 494-8212, evgs.

Bos, Comm Ave, 5 min MIT, spac mod BR w/beaut front view nwly renovated Somerset Hotel, sep K, all nw appl, ww, ac, dw, v qt, exceptional security, avail now. Marge, 267-9012.

Bos, sub 2/1-8/31, nr Kenmore Sq, Beac St, 2 BR, lg LR. Greg, 734-0698. evgs.

Camb condo, BR, nw K, in fine older bldg, on river, nr Harv Sq, \$30,000. Wm Sweeney, x3-4301.

Camb, Lg & sunny BR, LR, sep K & B, back porch, in old hse, nice-nbrhd, nr Porter Sq, 1/2 blk Mass Ave & T, park in driveway, \$178 incl util. Maria, x3-6164.

Dorchester, 2nd fl, 5 rm & sunporch, red line T at Fields Crnr, \$175 htd. Debby or Bruce, 876-0435, days.

Nahant, 4 BR hse on ocean, fully furn & equip, avail Feb-May, \$270 + util; want place to store sm car on blks for 2 yrs. Marshall Devor, x3-5798.

Newton, BR apt, nw K w/d&d, sep driveway, nr T, yard, avail 2/1, \$240 htd. Bill, x8-4520 Draper.

Newton Crnr, 1/2 hse, 4 BR, DR, LR, B, K, blk from T, qt nbrhd, avail immed, \$400 + util. Vance, x3-7787.

Nwtnville, 3 BR, ww, washer & dryer, free pkg, avail now, \$275 unhtd. x3-1627.

Moving to Eur: sub Northgate mod 2 BR apt, ac, d&d, Indry, etc; 70 Toyota Corolla 1200, \$750 or best; furn; bed; K utensils; appliances; TV. Call, 628-1363.

Duplex apt, 3 BR, no pets, ref & secty deposit, \$275 + ht. x5569 Linc.

Free hamsters, 3 mos. x3-5788, Rm E10-235.

Found: after Christmas, horn-rimmed glasses, Publications Office RLE, Rm 20A-122. x3-2569.

Used accordion. Debbie, x3-6736.

Students: Fr, bilingual Canadians & Amer for psych exper w/pay. Judy, lve name & nmbr, x3-7369.

Want: 100% reliable prsn w/own transp to care for 4 yr old boy 1 aft/wk, 11:30-3, M, W or F, your choice, \$2/hr. Mrs. Kinsey, 527-0618.

Someone to drive '69 VW to Calif during IAP, gd tires & gd mech cond, 1 or 2 people, arrive up to 1/25. Louisa or Sam, 536-6468, anytime.

Ring light nded during IAP for documenting neurophysiology lab 9.014. Al, x8769 Dorm.

M stu volunteers for 45 day nutr study, involves compl diet, collections, bloods, pay. Miss Holmes, x3-6337.

Used umbrella or similar baby stroller, gd cond. Poppy, x3-5125.

Qt conservative m, 23, seeks rm in hse or apt, pref lg co-op. John, 354-2542.

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BR can be furn or un, avail 2/1, \$150 incl util. Graham, x321 Linc.

Rmmate to share 4 rm Som apt w/f, 2 cats, pref someone who works nites, 15 min MIT, \$70 incl ht, util, x3-2754.

Share Bkline apt w/3 m, own BR, nr T, Indry, grocery, avail 2/1 or sooner, \$96 + share util. x3-5239.

Neat f rmmate for cln, mod, safe 2 BR Camb apt, carpet, dw, washer & dryer, pkg, on T, \$145 incl ht. x3-5939.

Rmmate, Som 4 BR apt, own rm, gd nbrhd, 10 min MIT by T or bike, avail now, \$81 + ht & util. Ron or Ken, 628-7688.

F, mid 20's, 4th for spac Som apt, non stu pref, 1 mi Davis Sq, nr T, \$85 htd. Call, 628-0348.

Rmmate for 2 BR Cent Sq apt, own prtly furn rm, ac, ww, \$92 htd. Call, 661-1668.

F, 3 m, seek 5th to share lg 5 BR Newtonville hse, LR, DR, lg furn bsmnt, washer & dryer, attrac loc & lg lawn, \$100 + util. Dorian, x3-2656.

Rmmate for 2 BR Cent Sq apt, own prtly furn rm, ac, ww, \$92 htd. Call, 661-1668.

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Rmmate for 2 BR Cent

operations, development and implementation of project strategies and policies. Two and one-half year commitment and residence in NY State demonstration area required. Experience in operation of demand-responsive transit systems and advanced degree in transportation engineering or planning are necessary. 74-1416-A (12/4).

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

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

Administrative Staff, EDP Internal Auditor, will perform EDP auditing, reviews of system, post audit of computer system; develop audit programs, questionnaires; write and present reports. Bachelor's degree in business administration, accounting major, or equivalent combination of education and experience, graduate work in computer science and experience in computer systems analysis and programming required. 74-1366-R (11/6).

DSR Staff in Artificial Intelligence Lab will be responsible for maintenance and repair of PDP 11/45 computer and its peripheral equipment, debug software problems, recognize and correct hardware faults. Some PDP 11/45 programming and equipment experience required and the ability to work effectively with students. 74-1306-A (10/23).

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

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

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

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

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

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

DSR Staff-Physical Chemist in the Research Laboratory of Electronics must be experienced in molecular beam techniques and surface science to conduct experiments on semi-

conductors and related materials. Ph.D. in Physical Chemistry required. 74-1110-A (9/4).

DSR Staff-Scientific Programmer in Earth and Planetary Sciences will work on analysis of celestial mechanics data from Mariner 9, MVM, Viking, Pioneer Venus Probes and other space related projects. Design, write, modify and run Fortran data-analysis program, advanced knowledge of Fortran and minimum of 1 year professional programming experience required. Background in math, physics, engineering; knowledge of IBM/360/JCL and assembler useful. Submit resume. 74-1267-A (10/9).

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

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

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

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

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

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

Secretary IV to Executive Director, Neuroscience Research Program working with international, interuniversity organization of scientists in research relating to human nervous system, will type from machine dictation, arrange appointments, meetings and conferences, compile and organize special reports, perform other routine office duties. Willingness to learn scientific terminology, bibliographic and library research procedures, secretarial skill required. Interest in sciences of brain and behavior, shorthand skill helpful. 37½ hr/wk. B75-7 (1/15).

Secretary IV to the Assistant Dean for Student Affairs will perform secretarial duties primarily related to fraternity and housing areas, assist other staff members with overflow work, provide assistance to students and other office visitors with a wide variety of questions and requests. Excellent typing, organization skill, and ability to use dictation equipment is necessary. B75-4 (1/15).

Secretary IV to new research group in Center for Policy Alternatives working with programs related to industrial and social applications of technology in foreign countries: compose short memos and letters, type formal proposals, arrange travel and meetings. Excellent typing and shorthand required; 3 years business or international experience, facility with Spanish and/or Portuguese, Bachelor's degree desirable. B75-5 (1/15).

Editorial Secretary IV (temporary) for Humanities Writing Program will help tabulate and prepare fund-raising proposals and questionnaires; act as liaison between Program and Institute; prepare reports and news letters. Accurate typing, editing and proofreading experience, organization skill required. Fund-raising helpful. Temporary through 6/30/75. B75-16 (1/15).

Secretary IV to Co-Directors, Office of Personnel Development will handle a variety of general secretarial duties and involvement in several simultaneously occurring projects. Duties including typing, preparing summaries of meetings, organizing and maintaining files, scheduling appointments, compiling materials, participation in office group meetings and activities. Flexibility and initiative-taking important. Good interpersonal as well as secretarial skills necessary. College work in behavioral science and/or experience in training or counseling groups desirable. Opportunities for career development exist. B75-14 (1/15).

Secretary IV in Harvard-MIT Program in Health Science and Technology will assist in preparation of contract proposals and budgets, handle correspondence, take and write-up meeting minutes, arrange symposia and seminars, maintain small library, perform other secretarial duties. Secretarial skills, experience in budget preparation, organization ability required. Non-smoking office. 74-1506-A (1/15).

Secretary IV in Harvard-MIT Program in Health Sciences and Technology will handle secretarial duties in 3-person Administrative Office: coordinate meetings, site visits and seminars, arrange travel, handle large mailings, type from machine dictation, file. Excellent typing skill, including technical, required. Familiarity with MIT and/or Harvard helpful. 37½ hr/wk. B75-10 (1/15).

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

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

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

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

Secretary IV in the Center for International Studies will handle general secretarial duties for 3 faculty members involved in research projects on nuclear power and urban economics. Schedule meetings, seminars, travel arrangements; type correspondence, papers. Technical typing ability desired; college background or equivalent experience preferred. Some flexibility in hours is possible. 74-1497-R (1/8).

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

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

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

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

Secretary III-IV, temporary, in Planning Office will perform secretarial duties for Assistant Director in area of space administration, and assist other secretaries, as required: type from machine dictation and handwritten material, xerox, file, schedule and coordinate meetings. Fast, accurate typing, and ability to work under pressure required. Temporary to June 30, 1975. B75-9 (1/15).

Secretary III-IV to two Industrial Liaison Officers will assist member companies by providing publications, symposia information; handle appointments, correspondence, files, phones. Good typing, poise in dealing with Program members required. Shorthand skill, familiarity with dictation equipment and with MIT helpful. B75-15 (1/15).

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

Secretary III in Project MAC headquarters will answer phones, receive visitors, type forms and correspondence, process monthly billing. Excellent typing, knowledge of office procedures required. Office experience preferred. B75-6 (1/15).

Secretary III, part-time, in School of Humanities and Social Science Dean's Office will perform secretarial duties relating to Technology Studies Program: type from machine dictation, arrange meetings, answer telephones, do occasional library research; may be trained for computer input. Typing skill, accuracy and ability to work with minimal supervision required. 20 hrs/wk. Temporary to 6/1/75. B75-8 (1/15).

Secretary III in Civil Engineering will provide secretarial services for faculty and research group: type reports, proposals, correspondence, answer phones, handle inquiries. Excellent typing skill, accuracy and proofreading ability required. Familiarity with dictation equipment helpful. B75-13 (1/15).

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

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

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

Secretary III to faculty and research group in Research Lab of Electronics will type manuscripts including technical material, make appointments, independently reply to correspondence and compose replies from oral instruction. Shorthand skill and excellent typing ability required. 74-1174-R (9/25).

Computer Operator IV in Clinical Research Center will determine equipment set-up, detect and correct errors for storage of medical data. Familiarity with PDP12 clinlab software operation, and focal programming and at least 1 year experience in these areas required. Data processing educational training is preferred. 40 hr work week. B75-11 (1/15).

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

Library General Assistant III in Office of Administration Information Systems will assemble data input and output files for computer processing, review control listings for completeness and accuracy, organize finished outputs, maintain validity of tape library functions. Clerical skill with emphasis on code matching required. 37½ hr/wk. 74-1483-R (1/8).

Sr. Clerk IV in Medical Department will coordinate all input and output data for departmental information system, acquire all source material, distribute final reports; monitor and

edit all phases of data processing; may handle light secretarial duties, as needed. Experience with data processing systems, accuracy with detail, and some college training required. B75-3 (1/15).

Sr. Clerk IV, Order Processing, at MIT Press will handle all phases of order process through use of Flexowriter (for computer input), including cash receipts, information updates, mailing list changes, deletions, cancellations, price quotations; assist customers with telephone inquiries and orders; make arrangements for special orders. Good typing skill required. B75-1 (1/15).

Sr. Acctg. Clerk IV in Medical Department Business Office will have responsibility for preparation, processing and distribution of all purchasing, accounting and payroll functions: accounts receivable and payable, petty cash, purchase orders and requisitions, vacation and sick leave records. Will also act as departmental liaison with Maintenance Superintendent. Accounting and/or payroll experience, ability to work with accuracy and under pressure, to keep a variety of material up to date, typing skill required. 37½ hr/wk. B75-2 (1/15).

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

Sr. Clerk III, Receptionist, in Medical Department will schedule Surgical Clinic appointments, obtain preliminary patient information, order medical records, direct patients and visitors, light typing skill, previous work experience, ability to deal with people in mature manner required. 37½ hr/wk. B75-12 (1/15).

Emergency Medical Service Asst., hrly, in Campus Patrol will accompany ambulance on emergencies, drive, have responsibility for ambulance equipment and supplies, perform other related duties. Emergency Medical certification, 3 yrs. directly-related experience, Mass. drivers license, and ability to work flexible hours required. 40 hr/wk. H75-8 (1/15).

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

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

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

3rd Class Engineer at the Power Plant may work any and all shifts and do all kinds of work, consistent with self sufficiency of the Plant. Mass. Third Class Stationary Engineer's license or a license of a higher grade required. Experience on high pressure boilers, oil and gas fired with automatic combustion controls, turbine driven auxiliaries: AC and DC generation, switchboard, and fed water control required. Some experience on turbine-driven equipment is desirable. 74-422-A (5/29).

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

74-1459-R	Secretary IV
74-1476-R	Secretary III
74-1473-A	Secretary IV
74-1474-R	Secretary IV
74-1477-R	Secretary V-VA
74-1501-R	Tech. Typ. III
74-1126-A	DSR Staff
74-1457-R	Secretary IV
74-1472-R	Hrly (cancel'd.)
74-1490-R	Hrly.
74-1494-R	DSR Staff

The following positions are on HOLD pending final decision:

74-1181-R	Secretary III-IV
74-783-A	DSR Staff

Labor Market May Affect Welfare Demand

By ROBERT C. DIORIO

Staff Writer

Does the labor market in which the family bread-winner works have any effect on how frequently a family needs welfare assistance...or on the relative magnitude of welfare income...or on the likelihood of the family breaking up?

A research team at MIT engaged in a series of studies on the structure of urban labor markets has turned up evidence that indicates the answer to those questions is probably "yes."

Since mid-1973, faculty and students in the Department of Urban Studies and Planning, working under the direction of Dr. Bennett Harrison, associate professor of economics and urban studies, have been cooperating with a research team from the Research Center for Economic Planning in New York City (RCEP) on a project entitled "Earned Family Incomes."

The project is sponsored by the Center for the Study of Metropolitan Problems of the National Institutes of Mental Health. Elliot Liebow, the widely known social scientist and author of *Talley's Corner*, is project monitor for the

NIMH.

The MIT team is refining and extending knowledge of the way urban labor markets operate. Quantitative and qualitative modes of analysis have been used to "model" the allocation of labor to high- and low-wage jobs and to inner city and suburban sites.

The labor market models are being studied against the background of a variety of other social institutions—schools, placement programs and the urban transportation and welfare systems.

The RCEP team, headed by economist Thomas Vietoriz of the New School in New York City, a lecturer at the MIT Department of Urban Studies and Planning, is developing social indicators of "labor market failure" that go beyond the single dimension of joblessness. They are seeking to determine the extent of involuntary underemployment and low-wage work in more than 50 large American cities.

The team's "subemployment" index has shown itself to be a better predictor of inter-city variation in such "urban crisis" phenomena as crime, family decomposition, drug use and housing deterioration than the conventional unemploy-

ment rate, the study's directors report.

Partly as a result of the RCEP team's work, the United States Bureau of Labor Statistics has decided to investigate the feasibility of creating an officially-managed annual subemployment index program for the United States.

In their study of labor market phenomena, Dr. Harrison and Dr. Martin Rein, professor of sociology in the Department of Urban Studies and Planning, are investigating the hypothesis that unstable local labor market conditions over time tend to produce unstable welfare experiences. Furthermore, they report, there is also some evidence that the labor market failure of working-class husbands increases the subsequent likelihood of family break-up.

Working papers from the project are expected to be available about Feb. 1.

Some of the project's specific areas include:

Development of a theory of the labor market search process of young workers by Paul Osterman, a joint PhD candidate in the departments of Urban Studies and Economics. Osterman expects the

initial work experience to be characterized by instability and low wages and a deliberate decision to "shop around." He will seek to determine who "settles down" into "good" jobs and who into "bad" and who fails to settle down at all. His study looks into the impact, if any, of early school placement and work experiences on the eventual pattern of work.

No Upgrade for Appalachians

A study of "reservation wages"—the minimum wage rate beneath which workers say they are unwilling to accept a job—by John Pucher, another PhD candidate in the department. He is seeking to determine to what extent high reservation wages reflect unrealistic expectations of what a worker is worth on the market.

An analysis by Les Burden, PhD candidate in economics, of the extent to which workers who begin their careers in "simple" jobs (jobs requiring few tasks) and jobs in which workers have little "control" over how the job is done tend to become confined to that class of jobs later in life.

A study of worker migration from the Appalachian region to cities in Ohio, Indiana and Illinois. Thomas Woodruff, who received

his PhD from the department last June and now is working in the Research Department of the United Mine Workers of America, found that the migration that peaked in the 1950s was caused less by workers choosing to search for better jobs than by deliberate policies of the coal industry, which by 1950 no longer needed a "reserve army" of local underemployed miners. The migration did not produce significant upgrading for Appalachians, Woodruff has found, and the study shows that dissatisfaction plus the current national demand for coal has led to a reverse migration back to the hills.

A study of whether jobs at suburban locations lead to steady work at higher pay for inner city residents. Sheldon Danziger, a PhD candidate in economics, found that in Cleveland, St. Louis and Detroit the answer was "no," indicating that discrimination in education and employment seem to confine ghetto dwellers to low-wage jobs, regardless of where those jobs are located.

The research effort is buttressed by a support staff consisting of Rochelle Weisbard, administrative assistant, and Dennis Linnell, staff programmer.

"We are going to cease to exist..."

Thurow Urges Public Power for New England

By LESTER THUROW

All forms of energy—oil, gas, and electricity—are almost twice as expensive in New England as they are in the cheapest parts of the United States—the southwest.

This is a situation that the economy of New England cannot tolerate for long.

Given energy cost differentials of this magnitude, businesses will gradually move out of New England. They cannot afford to stay if they have to compete with other businesses paying half as much for energy. If the politicians want to do something about the economy of Massachusetts and New England, they will focus energy. Raising or lowering state taxes by \$50 million or \$100 million is trivial by comparison.

Part of the cost difference is caused by the current regulations on gas and oil. Cheap gas and oil is

reserved for the states that have it. New England ought to work against these regulations so that the price of gas and oil will go up in the southwest or act to give us an equal share of the cheap gas and oil.

Since I think the latter is impossible, our efforts ought to focus on deregulating gas and oil prices. We already pay the higher prices and ought to force others to pay the same prices. If we don't, we are going to cease to exist as a viable economic region.

This brings us to electricity. New England has high electric costs for three reasons.

First, we must pay more transportation costs on the coal or oil that is used to generate electricity.

Second, New England's many small electric companies have never been large enough to take advantage of economies of scale.

Several MIT professors are among faculty members from Boston area universities who have been serving as occasional commentators in areas of their special expertise for the WGBH-TV Channel 2 news program, *The Evening Compass*. The commentaries represent the opinions of the individuals who present them and since not everyone can see the program every night, *Tech Talk* will publish selected comments by MIT faculty from time to time as a service to the MIT community.

And third, New England is almost the only region in the United States not to use some form of public power generation.

For years our own congressmen have consistently voted against

public power projects in New England. Public power is important not only because it would have brought us our share of national energy investments but because it would also have brought us economies of scale in generation.

But to advocate public power as partial solution to our high cost energy problems is not to say that every conceivable public power project would be good for New England.

The Dicky-Lincoln dam is a case in point. Even ignoring the environmental damage, Dicky-Lincoln is the wrong dam at the wrong place at the wrong time. Given water flow conditions it would be limited to peak load generation and would be expensive peak load generation because of the distance the power would have to be wheeled.

Since public power projects

have to break even under federal regulations, to build an inefficient dam would be to saddle the New England consumer with another unit of expensive power production. This is the last thing we need. We need a public power authority but it should focus on coal and nuclear powered plants.

The unfortunate truth is that New England just does not have any good sites for hydroelectric plants. Rushing off to build a dam—just any old dam—is not a solution to our problems. If the problem was that easy it would have been solved long ago.

Professor Thurow is professor of management and economics in the MIT Sloan School of Management and the Department of Economics. He presented the above commentary on a recent WGBH-TV *Evening Compass* news program.

South Africa gets time

Transition to African Rule Moving Swiftly

By WILLARD R. JOHNSON

Africans will almost certainly emerge from Rhodesia's upcoming constitutional conference with parliamentary strength equal to that of the whites. The conference will no doubt schedule a transition to African majority rule. Prime Minister Ian Smith had pledged that this transition would take a lifetime; now the prospect is that it will occur in a few months, or at most a couple of years.

The fall of Portugal, the weak man of southern Africa, precipitated these startling changes. A free Mozambique opens up new access routes to Zimbabwe freedom fighters. The experienced trainers, and the sophisticated guerilla equipment of the Mozambique movement—frelimo—now becomes available to the Zimbabweans. And to ice the cake, Rho-

desian trade could be cut off from seaport connections.

All this is plain for anyone to see, but those who have seen it most vividly are the white South Africans. They have responded to Zambia's President Kaunda with impressive boldness. Kaunda privately outlined the requirements and opportunities for detente in southern Africa.

A flurry of secret meetings followed. Prime Minister Vorster went furtively off to Ivory Coast, to dialogue with Presidents Houphouet-Boigny and Senghor. Smith moved stealthily about. Vorster then publicly called for peaceful coexistence, promising the withdrawal of South African paramilitary police from Rhodesia, if the guerillas would stop the violence.

Africans had made it clear this could happen only when their objective of ending white control was in sight. South Africa was, in effect, pulling the rug out from

under the Rhodesians. Vorster also hinted at an about face in Namibia, formerly known as South-West Africa—this would lead to African control of the area currently administered by South Africa.

It seems that Vorster has learned some important lessons from Vietnam. He is now trying to draw South Africa's defense perimeter realistically so as to avoid foreign entanglements that weaken the government's control at home.

As the *London Times* editorialized, a stable Zimbabwe under an African majority is preferable to Rhodesia under siege. Peace in Zimbabwe might promote a "reasonably moderate" Mozambique. South Africa could pursue trade and practical relations with a Mozambique preoccupied with its own development...African control in all the territories outside its own borders would take the inter-

national focus off South Africa, particularly if the latter drops the most conspicuous symbols of white superiority, as South Africa has indicated it plans to do...it may then buy enough time to implement the Bantusan policies of creating nine self-governing mini-states for its own African majority.

The key is to achieve moderate and inward looking African governments in the new troubled areas.

Vorster seems to have learned another lesson of the 1960s. This is that the nationalist leaders who arise out of a negotiated decolonization experience are usually moderates...they are not true revolutionaries who seek to promote deep social change from the bottom up. Their interests and outlooks are much more compatible with the trade, investment and security interests of the western world that would be those of any

regime that is created in the fire of actual guerilla warfare.

Thus, it was Smith and Vorster that finally brought the rival Zimbabwe "nationalists" leaders together in a unified movement. All previous African interventions to this end had failed. After holding them in prison for ten years, Smith sequestered Joshua Nkomo and Ndabaningwe Stiole across the border with barely more than a toothbrush, to create a merged "liberation" organization with which the whites might sit in conference for a constitutional settlement. As a reward the prison graduate leaders will get the trappings of rule.

Meanwhile, South Africa will get some time to rearrange things at home.

Willard R. Johnson is professor of political science at MIT and a specialist on African affairs. This commentary was recently presented on the WGBH-TV program, *The Evening Compass*.