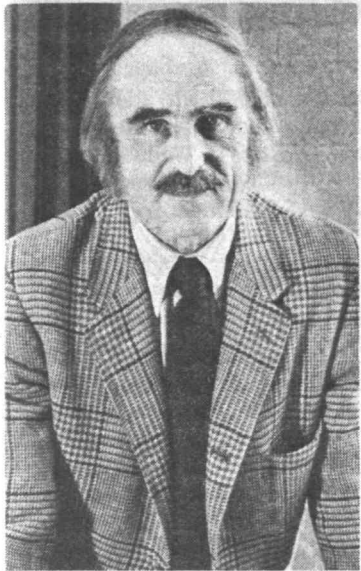


Shapiro Appointed Institute Professor

Dr. Ascher H. Shapiro, Ford Professor of Engineering at MIT, has been appointed Institute Professor at MIT in recognition of his contributions in fluid dynamics and in engineering education.

The announcement of the ap-



Professor Shapiro

pointment was made by MIT President Jerome B. Wiesner. The rank of Institute Professor at MIT is one that is reserved for scholars of special distinction. As is customary, Dr. Shapiro's appointment to the distinguished rank was made on the nomination of members of the MIT faculty.

"Dr. Shapiro's research in the field of fluid dynamics has been highly innovative, of enormous importance to the field, and widely acclaimed," Dr. Wiesner said.

"He has also achieved worldwide recognition for his contributions to the teaching of fluid mechanics, notably in developing a series of educational films. These films—sponsored by the National Science Foundation—have been instrumental in propagating the subject, in improving the competence of students, and in spurring development throughout the field."

Dr. Shapiro received SB and ScD degrees from MIT in 1938 and 1946. He became an instructor in

(Continued on page 12)

Lottery To Return

THE TRIP—the popular lottery sponsored by the MIT Quarter Century Club to benefit the MIT Community Service Fund—is due to return to MIT next week.

One new twist to this year's lottery is that there will be two winners, according to Robert J. Radocchia, chairman of the board of the Quarter Century Club. Two two-person trips will be awarded, one to Spain, departing May 6, and one to Tokyo, departing May 21.

Winners will receive a pair of free tickets for the Quarter Century Club trips, which provide round trip ground and air fare, first class hotel accommodations, daily breakfasts, tickets to special events and sightseeing tours.

Chances on THE TRIP are \$1

(Continued on page 12)

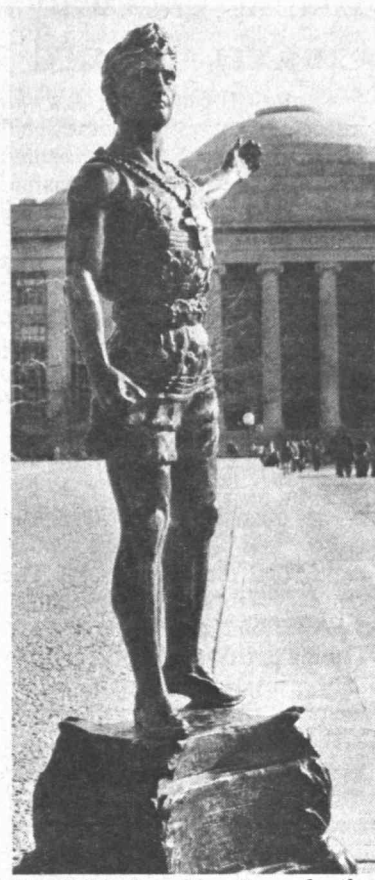
Cancer Researchers Help Dedicate Seeley G. Mudd Building Thursday

By BARBARA A. BURKE
Staff Writer

The Seeley G. Mudd Building, which houses MIT's Center for Cancer Research, Cell Culture Center, and Arteriosclerosis Center, will be dedicated Thursday, March 6.

The dedication will feature a luncheon address on the national cancer program by Dr. Thomas J. King, director of the Division of Cancer Research Resources and Centers, the National Cancer Institute, National Institutes of Health.

Several noted researchers will take part in a symposium on cancer research prior to the



The "Little Iron Man," won by the MIT foil team last year, may have a new home after this weekend's Intercollegiate Fencing Championships, to be held at MIT. See story, page 8.

dedication. They include three recipients of the Nobel prize in medicine—Dr. James D. Watson of Harvard University; Dr. Gerald M. Edelman of The Rockefeller University; and Dr. Salvador E. Luria, director of the MIT Center for Cancer Research.

Dr. Michael G.P. Stoker, director of research of the Imperial Cancer Research Fund Laboratories, London, England, will also speak, as will Professors David Baltimore and Herman N. Eisen of the Center for Cancer Research. MIT President Jerome B. Wiesner will give introductory remarks. Professor Walter A. Rosenblith, MIT Provost, will pre-

Open House to Feature Working Life Exhibit

For Clayton Whittaker, who has been working at MIT for close to 26 years, MIT Employees' Open House on March 22 will bring back

the good old days in two very special ways.

He will enjoy a long-awaited chance to relive some childhood experiences at the MIT Model Railroad, and he will be featured in a unique slide show of MIT employees engaged in their daily jobs, to be screened continuously in the lobby of Building 7.

Mr. Whittaker, who delivers about 2,000 pieces of MIT mail every day, worked as a night cleaner, assistant head janitor, head janitor, and night watchman before assuming his present job 20 months ago.

He is one of approximately 30 employees featured in the slide display mounted by the Department of Building Services to pay tribute to the daily work experiences of MIT's custodians, shippers, floor polishers, stagehand custodians, and night machine

(Continued on page 7)

Supplement

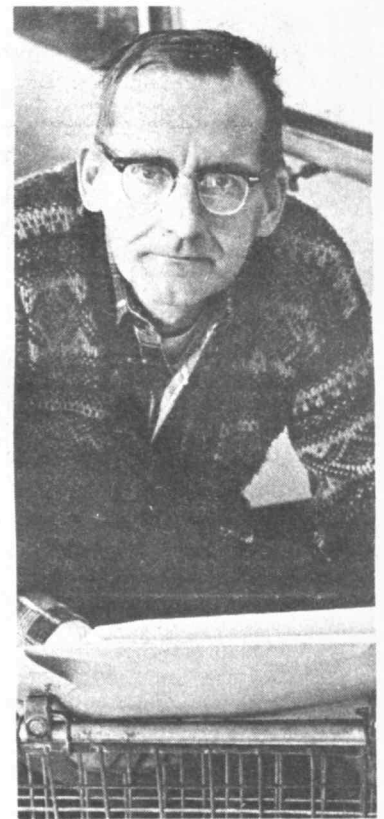
A supplement, The 1975 Bi-weekly Salary Review is included as a four-page pull-out section in this week's Tech Talk.

Blood Drive Begins Today

If you see a giant blood drop parading through the Institute halls this week, you are not hallucinating—you are merely viewing a student in a "blood drive creation" recruiting people for MIT's March blood drive which opens Wednesday, March 5, in the Sala de Puerto Rico in the Student Center.

The drive, which runs through

(Continued on page 8)



Clayton Whittaker

side. The symposium, which is open to the public, will begin at 9:30am in MIT's Kresge Auditorium.

Formerly a candy factory, the structure that is now called the Seeley G. Mudd Building was completely gutted, renovated and rebuilt to provide completely new laboratory and research facilities for the three centers. The six-floor building is about 80,000 square feet in gross area.

The Seeley G. Mudd Building has been made possible by a grant from the Seeley G. Mudd Fund, and by construction grants to the Center for Cancer Research from

(Continued on page 11)

MIT

Reprints from
REPORTS ON RESEARCH

Chemist Develops Hemoglobin-like Molecule

Blue-Black Blood Substitute

A chemist at MIT has made a molecule that binds and releases oxygen much like hemoglobin, the protein in red blood cells that picks up oxygen in the lungs and releases it in the tissues.

He hopes to modify the molecule—which now works only when dissolved in toxic solutions—so that it can replace real blood in blood transfusions.

Jack E. Baldwin, professor of chemistry at MIT, believes that artificial blood made of his "capped porphyrin" molecules would be safer in blood transfusions than real blood, because capped porphyrin is not a protein and thus can be more readily sterilized by heating. Hemoglobin, a protein, is denatured by heat.

"Blood is hazardous stuff," Professor Baldwin says. "Many cases of hepatitis are contracted from transfusions. And

even if the blood donor is healthy, blood often undergoes changes during storage."

His blue-black blood substitute would eliminate this danger, he says, and would probably also be cheaper than real blood.

And since capped porphyrin is a very efficient carrier of oxygen, it could also be used as a blood supplement for those who need extra oxygen—such as mountaineers climbing at high altitudes. Capped porphyrin can carry 17 times more oxygen than an equal weight of hemoglobin, a much larger and more complex molecule.

But Professor Baldwin does not believe that the artificial blood could be used as a permanent substitute for blood in persons with blood diseases.

"We won't have any bloodless individuals walking around—that's more science fiction than anything else."

In fact, researchers are still a long way from using synthetic blood even for temporary transfusions. Professor Baldwin estimates that it will be at least six months before the blood substitute can be successfully put into a non-toxic emulsion of glycerides and water. Dr. Robert P. Geyer, professor of nutrition at the Harvard School of Public Health, will then transfuse the emulsion into rats to see if they can survive without blood.

Research on the potentially useful blood substitute grew out of purely academic research into the nature of hydroxylating enzymes, which add hydroxyls (groups consisting of one hydrogen atom and one oxygen atom) to waste products, to make them soluble so they can be excreted. Such enzymes are common in the liver.

Study of these enzymes, which contain

porphyrins, led to the realization that perhaps porphyrins could be made that could reversibly bind oxygen.

With funds from the Heart and Lung Institute of the National Institutes of Health, and from the MIT Health Sciences Fund, the researchers succeeded in building such a porphyrin, first with models, and then in the laboratory.

The molecule works because the iron atom that binds the oxygen is in a protected position—like the four iron atoms in each hemoglobin molecule.

The oxygen molecules can get at an iron atom, to be bound to it, but the protected ("capped") position keeps a second iron atom from binding to the oxygen. If two iron atoms did bind to one oxygen molecule, the iron-oxygen group would break

(Continued on page 5)

The Esthetics of Drought: Art, Magic, and Invisible Technology
 Wednesday, March 5, 1975
 8pm
 Room 26-100
 Dr. Hans Guggenheim
 Anthropologist
 and
 Director of the Center for
 Studies of Integrated Design Art and Materials
 Topics of Music

A Report on How
 an African People
 the Dogon of Mali
 have been fighting the drought for centuries
 by using their knowledge of environmental art
 and magic. This lecture will discuss the
 ways in which the Dogon have used their
 knowledge of the environment to create
 a way of life that has allowed them to
 survive in one of the most arid regions of
 the world. The lecture will be held in
 Room 26-100, Room 26-100, Room 26-100.
 Sponsored by the
 Council for the Arts at MIT
 and the
 Department of Architecture



Dogon Lecture

Art, magic and an invisible technology used to fight the West African drought by the Dogon people of Mali will be the subjects of a lecture by the noted anthropologist Dr. Hans Guggenheim, Wednesday evening, March 5.

The lecture, entitled "The Esthetics of Drought," will be presented in Room 26-100 beginning at 8pm and is sponsored by the Council for the Arts at MIT and the Department of Architecture. It is open to the public without charge.

Dr. Guggenheim has recently returned from Mali where he and a team of MIT architectural and engineering students have been working on a technological system to fight the continuing problems of drought without destroying the balanced beauty of the Dogon's ancient villages and way of life.

Dr. Guggenheim's lecture will be illustrated with slides showing the Dogon working side by side with American students in making use of modern technology while preserving the ancient rituals, art, myth, and magic that characterize their existence in the 20th century as much as they did 600 years ago.

Music Notes

Pianist Erdely to Be Soloist With Symphony Orchestra

The pianist Beatrice Erdely will be guest soloist with the MIT Symphony Orchestra in a concert Saturday, March 15 and during its April tour of four New England universities.

The upcoming concert will take place at 8:30pm in Kresge Auditorium. Tickets are \$1.00 and will be sold at the door the evening of the concert.

The orchestra, under the direction of David Epstein, will perform the overture to Schubert's opera *Des Teufels Lustschloss*, Ruggles' *Portals*, Bartok's *Concerto for Orchestra* and Mozart's *Piano Concerto in A Major, K.488*.

Two of the works on the program, *Portals* and the Schubert overture, are unfamiliar to audiences. *Portals* was written in 1926 by the American composer Carl Ruggles. It is a short piece, consisting of alternating declamatory passages and sustained lyrical phrases.

Although the Schubert opera has passed out of the current repertory, the overture remains an interesting concert work, with aspects of the dramatic and melodic qualities that became hallmarks of the composer's mature style.

Mrs. Erdely has appeared as soloist with major orchestras, among them the Chicago Symphony, the Cleveland Orchestra and the Grant Park Festival.

She began her studies at the American Conservatory of Music in Chicago and was a student of the late Eduard Steuermann in New York.

Mrs. Erdely has been a recitalist at Town Hall, New York, and on ABC-TV and made numerous concert tours with her husband, violinist Stephen Erdely, MIT associate professor of music. Mrs. Erdely is currently a member of the piano faculty of the New England Conservatory of Music and also teaches at Brandeis University.

The 96-member MIT Symphony Orchestra has received critical acclaim for performances in recent years. Last spring the orchestra presented three concerts—all by invitation—during its concert tour.

The orchestra's March concert program will also be presented at Wellesley College on April 17, at Brown University on April 19, at the University of New Hampshire on April 21 and at the University of Connecticut on April 22.

Ali Akbar Khan Returns Mar. 16

The noted Indian sarodist, Ali Akbar Khan, one of the world masters of Indian raga music, will give his third concert at MIT, 8pm, Sunday, March 16 in Kresge Auditorium.

In a review full of praise for Khan's concert at MIT last year, *Globe* music critic Michael Steinberg called the performance "stupendous."

Khan will be accompanied on the tabla drums by Zakir Hussain, a noted Indian tabla player.

Khan, who is from a distinguished family of musicians, has toured extensively throughout the world, frequently appearing with sitarist Ravi Shankar and western musicians, notably Julian Bream, Yehudi Menuhin and jazz saxophonist John Handy.

He has performed in Newport Folk Festival, the Festival from India at Philharmonic Hall and the Berkeley and Monterey Jazz festivals. He is also a recording artist

with the Connoisseur Society and Apple record labels.

Ticket prices are \$3.00 and \$5.00. Tickets will be available at the door of Kresge the evening of the concert. For reservations call Tritantri Kala Kendra, a school of Indian music in Boston, at 277-9104.

Islamic Qawwali Concert Planned

An unusual concert of Qawwali music, the mystical devotional music of Islam, will be presented by the Sabri Brothers of Pakistan, 8pm, Saturday, March 8, in Kresge Auditorium at MIT.

The Sabri Brothers and their troupe is an ensemble of 10 singers and musicians. The group has performed extensively in Pakistan, Europe and South Africa and records on the EMI label. They are currently making their first concert tour of the United States and Canada.

The Qawwali music tradition, new to many western audiences, dates from the middle ages. The songs, which are evangelical in spirit, are derived from the Koran and the poetry and writings of the Sufis, a mystical movement within Islam.

The songs are arranged with solo singers singing the main phrases and a chorus singing refrains. Musicians accompany them on harmoniums, tablas and dholaks, two headed drums.

Tickets are \$3.00 and \$1.00 for MIT and Wellesley students. For reservations call 253-3210.

Miller Sculpture Exhibition At MIT Faculty Club

An exhibition of work by the sculptor Rose Schechet Miller, of Brookline, is currently showing at the MIT Faculty Club through the month of March.

The exhibition of more than 24 sculptures is mounted in the Club lounge and corridor. It includes some of her most recent work—a series of abstract works on the elements earth, air, wind and fire—that are executed in metal and stained-glass and combine light effects and kinetics. There is also a selection of representational figures in bronze, terra-cotta and welded-steel.

Mrs. Miller is a graduate of Massachusetts College of Art and teaches privately and gives sculpture courses at the Boston Center for Adult Education. She is an active member of several art groups, among them the Boston Visual Artists Union and the New Eng-

Robert E. Moran Becomes Roman Catholic Chaplain

His first New England winter disappointed him—"I really was looking forward to a lot more snow"—but almost everything else about his new assignment as Roman Catholic chaplain to MIT has pleased the Rev. Robert E. Moran, C.S.P.

Fr. Moran, a Chicago native, was assigned to MIT at the start of the fall term, replacing the Rev. Stanley F. MacNevin, C.S.P., who now is a chaplain at Ohio State University. His previous assignment was teaching sociology of religion and supervising the parish work of soon-to-be-ordained seminarians at the Catholic University of America in Washington, D.C.

Ordained in 1964, Fr. Moran obtained his Ph.D. in sociology at the University of California, Santa Barbara.

Fr. Moran's office is in W-2 (312 Memorial Drive) where he works in collaboration with a lay campus chaplain, Steve Murphy. They view the chaplaincy as having a three-fold nature—worship services, social action and education. Programs, speakers and services are designed with those three areas in mind.

"I would welcome the suggestions of students, faculty or staff on any new program or directions they think we might usefully undertake," Fr. Moran said, "One thing I'm thinking about is a course on religion. It is surprising that so little attention is paid to this, in terms of Institute offerings."

Fr. Moran is currently conducting a study group on Catholic beliefs, meeting Thursday evenings at 8pm in the second floor



Fr. Moran

library of W-2. In addition, Mr. Murphy and Rabbi Mel Gottlieb are offering a Wednesday noon study group on the Prophets, ancient and contemporary.

ULSP Applications

Applications are still being accepted for summer field-work projects in the MIT Urban Legal Studies Program. (See *Tech Talk*, Feb. 19) Information may be obtained from Clyde Mitchell, tel. 494-0330.

United Way Cites MIT Campaign

Dean Peter P. Gil and MIT have been selected by United Way's volunteer leadership to receive an achievement award based on the results of the 1974-75 employee campaign, which was headed by Dr. Gil, associate dean for teaching programs at the Sloan School.

The announcement coincided with the final report of the campaign which shows a total of \$103,128 in contributions and pledges, an increase of \$2,244 over last year.

"In the face of the worst economic crisis in years," Dean Gil said, "the people of the MIT community never lost the desire to support those agencies which provide the services and programs that help so many. I am proud of their response."

The MIT campaign resulted in 2,940 individual gifts from 2,746 people, an average contribution of \$35.07.

The United Way Achievement Award reads: "Presented to Peter Gil for noteworthy achievement in support of the 1974 United Way of Massachusetts campaign."

Questions?

The Question and Answer section on employment policies and practices will be continued next week.

Claudia Liebesny of the Office of Personnel Services would like to receive questions that are of general interest in writing at her office, E19-230. Questions and answers will be printed, as space allows, anonymously. Those not selected for printing will be answered individually when the name and room number of the person is enclosed.

Questions of a personal nature should continue to be referred to the Personnel Officer assigned to the department for which a person works.

Environmental Internships

MIT students have been invited to apply for paid summer internships being offered through the Environmental Intern Program of the Massachusetts Audubon Society.

A variety of jobs will be available throughout New England and New York. The program is designed to offer students an opportunity to work on environmentally related projects with public service agencies, municipal offices and private groups.

The deadline for applications is March 14. Candidate selection is determined by academic qualifications and a demonstrated interest in the field. For applications, job listings and other information see Professor David J. Rose in Rm. 24-210 or Professor Michael W. Golay in Rm. NW13-222.

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Pro Football Can Offer Tip to Health Care Teams

Sloan Study Recommends More Practice

By ROBERT C. DI IORIO
Staff Writer

Health care teams should take a tip from professional football teams and practice more, according to researchers at MIT's Sloan School of Management.

Irwin Rubin, Ronald Fry and Mark Plovnick investigated 40 health teams throughout the country as part of an extensive Sloan School effort to develop, test and evaluate educational models for workers and managers in health delivery systems and medical schools.

They found that many health teams "are seen as not functioning as well as potentially possible."

But that doesn't mean the team approach should be abandoned, they said. It must be expanded and made more effective. But how?

The answer, they say, is practice.

"A football team spends 40 hours per week practicing and learning teamwork for the two hours on Sunday when they must deliver," they said. "Teams in other settings—like a health team—seldom spend two hours per year practicing the way they work together."

Dr. Rubin, Mr. Fry and Dr. Plovnick have developed a structured educational program aimed at improving the productivity of health care teams. The program will soon be available as a self-

instructional work book from Ballinger Publishing Co. of Cambridge, Mass.

The Educational Programs in Health Management Project at the Sloan School is supported by the Robert Wood Johnson Foundation and is directed by Richard Beckhard, senior lecturer at the Sloan School and a noted consultant in the health care field. It is moving on several fronts.

"In addition to the work on the effectiveness of health teams," Professor Beckhard said, "Sloan School researchers are looking into the management of the interface between primary care institutions and community health centers with hospitals. Other researchers have developed and are testing curricula innovations for nursing and medical schools aimed at the problems of educating health workers in primary care practice.

"Still other researchers are examining the gap between what nurses and physician extenders are trained to do and what they actually do."

In addition to the programs led by Professor Beckhard the Sloan School's activities in the health field include programs aimed at

medical schools in collaboration with the Association for American Medical Colleges. The Sloan School recently announced a new health executives management program leading to the master's degree in management.

The self-instructional program for health care teams requires the team to work together—to practice—for seven weekly three-hour sessions. The program has been field tested by 12 teams, several of them in New England, the rest spread geographically over the country.

Teams that have undertaken the program report improved team coordination, higher morale, better follow-up and management of patient care, better utilization of team members' resources, an increased sense of effectiveness and a perceived improvement in patient care, the MIT researchers said.

Rigorous empirical data about patient care is not available, but there is "substantial perceptual evidence—from both team members and administrators—that better care is being delivered as a direct result of the developmental program," the MIT researchers said.

The team concept must be expanded, the MIT researchers said, because certain health care goals require a team approach. An example: comprehensive, family-centered health care, which requires the coordinated efforts of several interdisciplinary health workers.

A basic problem with most teams, the MIT investigation found, is that the individual members have been trained to be individual specialists, not to be team members.

"On most health teams, therefore, full utilization of the team's human resources is stymied because people relate to each other solely as role categories."

The researchers contend that "the knowledge and skills needed to manage the inherent problems caused by interdependence, on a day-to-day basis, can and must be learned through an explicit educational process called team development."

The rationale for team development, they say, "is that by investing time to explicitly focus on the problems of coordination among team members, the team will avoid greater time and energy losses resulting from ineffective coordination."

However, the MIT investigation found that freeing up time for team development often is a difficult task in itself.

"Getting the program to a team has invariably been a lengthy and difficult process," the MIT researchers report.

"Health administrators and managers are under severe environmental constraints which represent major obstacles to freeing up the time required for team development. Management's response to these constraints confronts directly the issue of its commitment to team care.

"Some systems argue, for example, that the team development is important but teams should do it on their own time—lunch hours, evenings, weekends, etc. The subtle (but powerful) message thereby communicated is that management is not committed to finding ways to support a program that the team perceives as high priority. The team is likely to lose some of its own commitment in such a situation."

On the other hand, the MIT researchers said, when management is willing to free up the time required for development training, "a positive, self-reinforcing motivational pattern is set in motion."

Mumford Appointed Visiting Professor

Distinguished scholar Lewis Mumford has returned to MIT for the third consecutive spring semester, this year serving as the Charles Abrams Visiting Professor.

Professor Mumford, a noted author and thinker in the fields of architecture, technology and planning, is teaching a seminar entitled "The Natural and Cultural History of Urbanization." In addition, he will participate in the Institute's Technology and Culture lecture series.

Announcement of Professor Mumford's appointment was made jointly by Professor Walter A. Rosenblith, provost, Dr. Harold J. Hanham, dean of the School of Humanities and Social Science, and Professor Langley Keyes, head of the Department of Urban Studies and Planning.

This year Professor Mumford will spend the entire semester at MIT. Last spring he and his wife, Sophia, visited the Institute from March 1 through May 15.

To date, Mumford has authored some 30 books, and is now preparing another, scheduled to appear in the fall of 1975. "Findings and Keepings: Analecs for an Autobiography" will be published by Harcourt, Brace, Jovanovich Publishing Company.

Among his earlier principal works are *Technics and Civilization* published in 1934, *The Culture of Cities*, (1938), *The Condition of Man*, (1944), and *Art and Technics*, (1952).

Later books include *The Myth of the Machine, Vol I: Technics and Human Development*, (1967), and *Vol. II: The Pentagon of Power*, (1970). His book entitled *The City in History* received the National Book Award for 1962.

Although Mumford describes himself as a "generalist, not a

specialist in any single area," he has been a pioneer scholar in the following fields: American architecture after 1835, American literature, history of technology, contemporary urban and regional development, and the origins and historic development of cities.

In 1971, he was awarded the Smithsonian Institution's rare Hodgkins medal of "ecology" for his work in bringing together and evaluating the contributions of both the sciences and the humanities.

Additional awards and honors received by Mumford include three Guggenheim fellowships, the Emerson-Thoreau Medal of the American Academy of Arts and Sciences in 1965, and the Leonardo da Vinci Medal from the Society for the History of Technology in 1968.

Mumford is a native of New York City and attended the City College of New York and Columbia University. He received the honorary LL.D degree from Edinburgh University in 1965 and the honorary Doctor of Architecture degree from the University of Rome in 1967.

He is also a member of the American Philosophical Society and the American Academy of Arts and Sciences, and was awarded an honorary membership in the American Institute of Architects and the American Institute of Planners.

Included among the numerous university appointments Mumford has held are: professor of humanities, Stanford University, 1942-44; professor of city and regional planning, 1951-59, and research professor, 1959-61, University of Pennsylvania; visiting professor, MIT, 1957-60; research professor, University of California at Berkeley, 1961-62.



The mime team of Hank Chapin and Patsy Du Bois who make up Boston's Suitcase Circus will create an imaginary circus with pantomime characters from the big top, noon, today (Wednesday, March 5) in the Building 7 Lobby.

'Very Cold Winter Forecast' Was a 'Bust'

An MIT meteorologist acknowledged this week that his long-range forecast last November of a very cold winter in central and eastern US had been a "bust."

Dr. Hurd C. Willett, a specialist in long-range forecasts based on variations of sunspot cycles, blamed the erroneous prediction "on the failure of the sun to perform as expected."

He said he remained confident in the validity of basing forecasts on sunspot activity. The problem this year was the result of a situation that, if anything, lends support to the hypothesis that solar activity influences the weather, he said.

Dr. Willett, professor of meteorology, emeritus, originally had predicted in November of 1973 that

the next three winters would be milder than usual in eastern US.

He did this on the assumption that a double sunspot cycle phase then occurring—and the weather that would be associated with it—would continue throughout the period.

This would have been the normal pattern, he said.

The pattern did, in fact, hold for the winter of 1973-74, which turned out to be milder than normal as predicted.

Dr. Willett decided to change the forecast for the next two winters, however, when it appeared—wrongly, it turned out—that some exceptional solar activity would take place. This was a phenomenon that had occurred only

twice in about 180 years—in the 1790s and again in the 1870s.

He then issued his revised forecast this past November, calling for a cold winter instead of a warm one. But because there was very little climatic information available from the two previous periods of exceptional solar activity, particularly in the 1790s, he hedged his prediction by giving the new forecast a relatively low confidence rating.

As it turned out, he reported, the anticipated unusual solar activity did not take place. Instead, the sun and the weather followed normal patterns.

This meant that the first prediction—of three mild winters in succession—should have been

kept in force.

"In view of the failure of the sun to perform as expected," he said, "it is really gratifying that the weather failed in parallel fashion. If either one had behaved as predicted, without the parallel solar-climatic behavior of the other, it would have been much more damaging to the solar-climatic hypothesis."

Dr. Willett said that the failure of the exceptional solar activity to materialize "strengthens the argument for much-needed research by solar physicists on variable solar activity."

He said that the lack of research funds has prevented the kind of complete study that would clear up many of these uncertainties.

The Tech Begins Indexing Project

Members of the staff at *The Tech*, the student newspaper, are seeking funds to complete a full subject index of the newspaper's 94 volumes.

All issues of the newspaper have recently been put on microfilm to save space and preserve them against deterioration. *The Tech*, which was first published in 1881, constitutes one of the fullest records of MIT student life.

The joint project to modernize and catalogue *The Tech's* back issues was begun in 1972 under Paul Schindler '74, then news editor of *The Tech*.

Support for the microfilming and computer-aided index work has come from former members of *The Tech* board, the Activities Development Board, the Institute Archives and the Provost's Office.

MIT Joins Telescope Consortium

Astronomers at MIT will soon have regular access to a 52-inch telescope at Kitt Peak, Arizona.

MIT has joined the University of Michigan and Dartmouth College in moving the University of Michigan's 52-inch wide Cassegrain-Coude telescope from its site near Ann Arbor to the Kitt Peak National Observatory.

The move has been made possible by a \$100,000 grant from the Alfred P. Sloan Foundation. The three schools will raise the additional \$200,000 needed to move the telescope and build two buildings to house the telescope and researchers. Construction of the buildings has already begun; the telescope itself is expected to be moved by April.

"At an altitude of 6,300 feet above sea level, one of the new location's advantages will be a steadier atmosphere, resulting in clearer images," said Professor W. Albert Hiltner, chairman of the astronomy department at Michigan. Professor Hiltner will serve as the observatory's first director.

"The sky isn't as cloudy as it is in the Midwest," he said, "and one can observe fainter stars because the artificial illumination from cities is greatly reduced. It will be at least ten times more efficient to place the telescope at Kitt Peak."

This increased efficiency, he said, has made it possible for the University of Michigan to share

the telescope with Dartmouth and MIT.

The telescope will be used primarily for optical studies of x-ray sources, such as x-ray galaxies, the diffuse remnants of stellar explosions, and collapsed stars—including neutron stars and candidates for black holes.

Astronomers at the three universities have conducted extensive optical studies of these objects, often collaboratively. Among the MIT researchers who will be working with the telescope are Professors Hale Bradt, George W. Clark and Claude R. Canizares of the Department of Physics, and Dr. Jeffrey E. McClintock, staff member of the Center for Space Research.

Professor Robert A. Alberty, dean of the School of Science, and Professor Bradt represented MIT in the negotiations that led to the creation of the University of Michigan, Dartmouth, MIT Astronomy Consortium.

The telescope being moved to Kitt Peak complements the existing optical telescope facility at MIT—the MIT Wallace Astrophysical Observatory, 40 miles north of Cambridge.

The Wallace Observatory has two telescopes, a computer-controlled 24-inch and a 16-inch. At Wallace, students and staff can get observing experience at a location

convenient to MIT. Also, complex focal-plane instruments can be used and tested there before being shipped to Arizona.

The move of the Michigan telescope to Kitt Peak this spring is particularly timely because of the MIT x-ray astronomy orbiting observatory (Small Astronomy Satellite, or SAS-C), which will be launched from Kenya, Africa, this May.

The satellite, funded by the National Aeronautics and Space Administration, will probe the sky for x-ray sources. With the Kitt Peak telescope, astronomers from the three universities will be able to coordinate optical observations of x-ray sources with the x-ray observations made by SAS-C.

A two-dimensional single photon detection system will be an important tool in making such observations.

The system is being developed at MIT by Clark, Canizares, McClintock, engineer Patrick Peterson of the Center for Space Research, and physics graduate student Doran Bardas.

It is composed of a camera and a spectrograph. The camera can detect a single photon of light coming from an object in space, and its time of arrival. The spectrograph shows what colors, or wavelengths, make up the light. That information can be used to determine the nature of the object emitting the light.

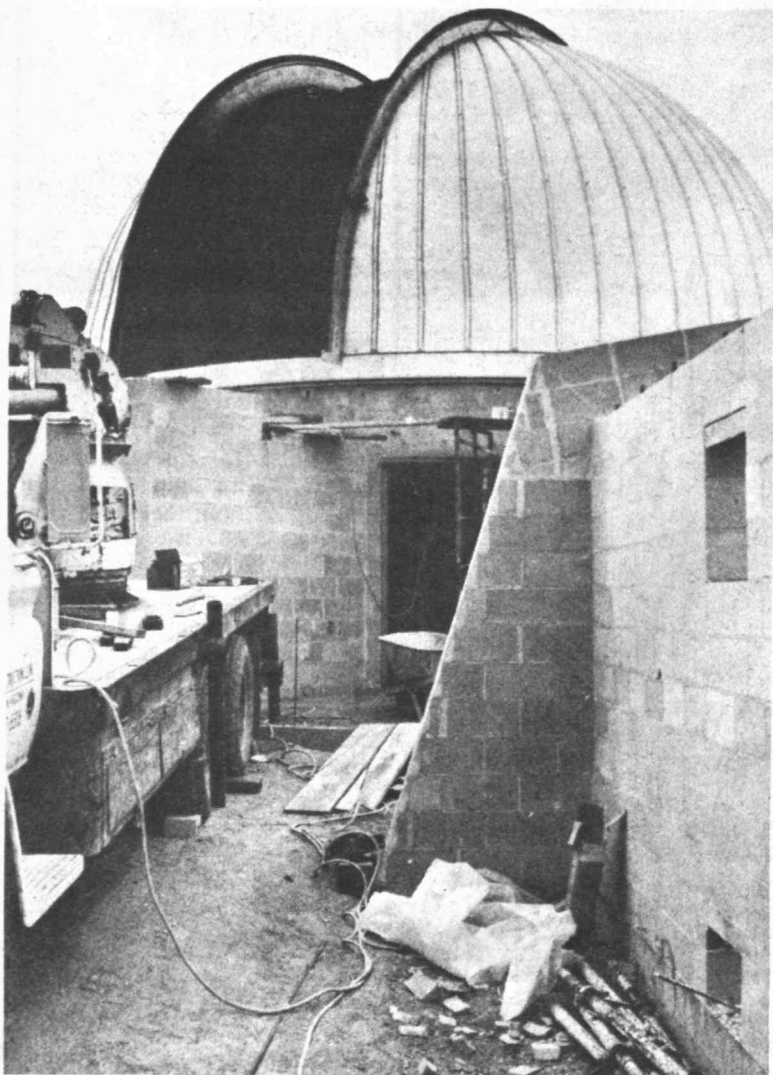
The ability of the system to record the time each photon arrives, to fractions of a second, is important, because x-rays emitted by some objects in space vary wildly from moment to moment. With the MIT photon detection system, astronomers will be able to look at optical emission from x-ray sources at the same instant that SAS-C studies their x-ray emission.

The Kitt Peak Observatory is a national center for optical astronomy. MIT researchers who visit there will be able to meet eminent astronomers from many other universities. The observatory is operated by the Association of Universities for Research in Astronomy, funded by the National Science Foundation.

Diamond on Spectrum

Edwin Diamond, lecturer in MIT's Department of Political Science, contributing editor to *New York* magazine, free-lance writer and radio commentator, has been substituting for the vacationing John L. Jessup on CBS radio's personal opinion series *Spectrum*.

Mr. Diamond, who comments regularly on the Post-Newsweek radio and television stations, made his debut with the *Spectrum* team the last week in February and will continue through the end of this week.



Buildings are under construction to house the University of Michigan's telescope at Kitt Peak.

Traveling Solar Energy Lab to Visit Campus

A mobile solar energy laboratory is coming to MIT as part of a country-wide tour and is expected to be here in time for the Employees' Open House on March 22.

The Transportable Solar Laboratory—equipped to convert the sun's energy for heating and cooling buildings—is sponsored jointly by the newly created US Energy Research and Development Administration (ERDA) and Honeywell, Inc. It is scheduled to be at MIT from March 22 to April 21.

In Cambridge, as it has elsewhere in its travels across the

country, the combination laboratory-demonstration project will gather data to help establish how effectively the sun can be used in place of conventional fuels for heating and cooling homes, offices and factories in various climatic regions.

MIT students, faculty members and employees will have an opportunity to visit the laboratory along with high school science teachers and students, state, city and federal officials, architects, engineers and others.

The laboratory's stay also will include the dates of the MIT-Boston Globe High School Science Fair, April 17-19.

The laboratory consists of two

trailers—one containing solar heating and cooling test equipment and a weather station, and the other representing a building to be cooled or heated and supplied with hot water by sun power. The second van also contains educational displays that describe the principles of solar conversion for use in briefing visitors.

A key element of the laboratory is its 625-square-foot solar collector array. It is composed of individual panels each made of an outer layer of tempered glass, an inner layer of clear plastic and a solar energy-absorbing panel that heats water circulating through it.

The glass and plastic trap the solar energy for most efficient ab-



SCHOLARSHIP RECIPIENT Gail Pinderhughes, a second year graduate student in architecture from Washington, D.C., is presented with notification that she won a \$900 scholarship from the Boston Chapter of Links, Inc., by John B. Turner, assistant dean of the graduate school. Links, Inc., is a national organization of approximately 2,000 black women which supports youth services, international services and fine arts. In addition to giving two scholarships to graduate students, the Boston Chapter of Links, Inc., has sponsored drug abuse programs and art shows for black artists.

Photo by Calvin Campbell

NASIC Plans Demonstration

Sample searches for reference material in more than 30 academic disciplines will be one of the highlights of a lecture/demonstration sponsored by MIT's NASIC (Northeast Academic Science Information Center) information retrieval system Thursday, March 13, from 9:30am-5:30pm in the Stein Map Room of the Science Library (14S-100).

The computer-assisted library search program, introduced at MIT just over a year ago, provides access to more than 3.5 million references in subject areas covering almost all fields of research at MIT.

Visitors to the demonstration are expected to be given five minutes of free on-line time to develop a printed reference list in the subject of his or her choice.

Among the newest data bases incorporated into the system are the following:

—INSPEC: Corresponds to the three sections of *Science Abstracts* (*Physics Abstracts*, *Electrical and Electronics Abstracts*, and *Computers and Control Abstracts*). Over 2,000 periodicals, 500 conference proceedings, 4,000 reports, 2500 theses, 3,000 patents and 300 books are indexed annually. Over 400,000 items now available for computer recall. Updates: 11,000 new records added monthly.

—NTIS: Complete Weekly Government Reports/Announcement file from National Technical Information Service. Covers government-sponsored research in 22 major subject disciplines from more than 240 agencies. Updates: More than 2500 records added every two weeks. Through special arrangements with NTIS, the documents themselves can be ordered on-line, in fiche, film, or hard copy format.

—POLLUTION: 30,000 citations in all major areas of pollution—journals, conference proceedings, government reports, business and trade publications and ma-

terials with limited foreign circulation. Monthly updates. This is a new experimental file.

—PSYCHOLOGICAL ABSTRACTS: On-line equivalent of the monthly publications of the American Psychological Association. World's scientific literature in psychology and related disciplines is categorized under 17 major classifications. More than 800 journals, technical reports, monographs and scientific treatises are monitored for inclusion. Updates: approximately 200 new records added monthly.

—SOCIAL SCISEARCH: World-wide journal coverage in 50 broad social science and humanities subjects. Forward as well as backward searching is possible through citation searching, based on the theory that a subject relationship exists between a cited author and the author citing him or her. (i.e., All 1975 references to a major article published in 1957 will probably be related in some way.)

Obituary

T.R. Sandberg

Theodore R. Sandberg, 69, of Malden, who retired as a driver at the MIT Graphic Arts Service in 1971, died on Monday, March 3. Mr. Sandberg came to work at the Institute in 1965. He is survived by his wife Florence T., and his son Charles F. Shiffer of California, four sisters and two brothers.

Echoes

March 3-March 7

50 Years Ago

Disappearance of explorer Richard O. March, '05, during uprising of "White Indians" in Panama reported by the AP. March believed to have led the rebellion.

P.C. Davidson, '25, and his musical saw were novelty at Technology-Sargent Concert.

With Tech athletic teams on a losing streak, the chess team defeated the Bay State players.

Professor A.A. Blanchard will lecture on theories that matter is made up of electrons and protons.

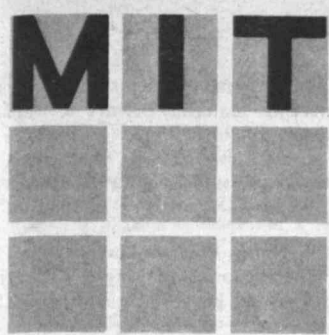
25 Years Ago

Professor Hans Mueller, unfolded theory on the foundation of optics.

Buckminster Fuller, designer of the Dymaxion houses and car, lectured on "Energetic Geometry."

Job opportunities for seniors not improved over last year's prospects because of a surplus of engineers. Expected salary range for SBs—\$250-300; SMs—\$300-375; PhDs—\$400 and up.

(Prepared by Ethel Newell of the MIT Historical Collections, x3-4444.)



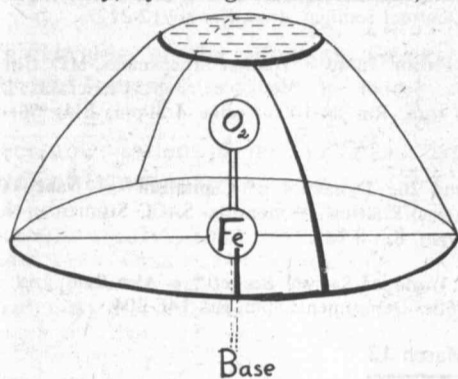
Reprints from REPORTS ON RESEARCH

(Continued from page 1)

down into two iron oxide molecules, and there would be no way to recover the oxygen.

But so far the capped porphyrin reversibly binds oxygen only when it is in a concentrated—and toxic to humans—solution of a base called n-methyl imidazole. This base plays the dual role of binding to the exposed underface of the capped porphyrin, to protect it; and of donating electrons to the iron, to make it bind oxygen better.

The researchers' next objective is to bind the ligand to the porphyrin permanently, by strong covalent bonds, to



"Capped porphyrin" oxygen complex

eliminate the need for the toxic solutions. Professor Baldwin estimates that this will take at least six months.

"Making molecules is not a trivial undertaking," he says. "We're building molecular structures of a complexity that previously could be made only by living creatures—and they have a few million years on us in terms of knowing how to do it."

—Barbara A. Burke

Boom Busted

There was a time when the sonic boom was thought to be the greatest impediment to the development of a United States supersonic transport (SST).

Now there is a way of dealing with the boom, according to an MIT researcher. But he concedes that another environmental problem—exhaust gases—probably will rule out any American SST for the foreseeable future.

"The chances are very good that we will be able to eliminate the effects of the sonic boom at ground level, Wesley L. Harris Sr., associate professor of ocean engineering and aeronautics, said. "But now we are faced with the problem of having the SSTs release unacceptable amounts of engine exhaust gases into the stratosphere and thus depleting the ozone concentration."

Furthermore, he said, a solution to the exhaust problem is approximately 15 years away.

"Probably an entirely new engine will have to be developed which would be based on utilizing hydrogen fuel, or present engines will have to be modified to burn below stoichiometric conditions," he said.

As for the sonic boom, MIT researchers have calculated that it can be eradicated in two ways and in two stages, Dr. Harris said.

"The first step would be to design a somewhat slower plane—one that flies at transonic speeds—and to change the shape of the fuselage, making it a waisted-body aircraft instead of a full-bodied one," he said.

"We are convinced this would prevent its boom from reaching the ground—and then with experience from this first generation of aircraft, we could go on from there to refine the design to produce larger, faster SSTs.

The American SST, as originally conceived, would have flown at Mach 2.5, or about 1,800 miles per hour. The French

and Russian SSTs cruise at about Mach 2, or 1,400 miles per hour. A transonic plane as envisioned by the MIT researchers would travel between Mach 1.05 and 1.25—about 800 miles per hour, or 250 miles per hour faster than the Boeing 747, the fastest of the subsonic jetliners.

The "waisted body" is described by Dr. Harris as a "relatively new concept in aeronautical design."

A silhouette of the fuselage shows that it is pinched in toward the middle somewhat reminiscent of a Coke bottle shape—unlike the straight lines of the French-English Concorde and the Russian TU-144.

"The same principle is at work," Professor Harris said. "We have to change what the airplane will look like in order to change the air flow around it. This controls the intensity of the shock wave (sonic boom) and keeps it from reaching the ground."

The slower, smaller transonic plane would have an additional advantage as a first generation SST, Dr. Harris said, because it would provide much greater fuel economics than a full-blown SST.

"You pay very heavy fuel penalties at very high speeds and with high loads," he observed.

While it is clear that "we can design around" the sonic boom, Dr. Harris said, the exhaust problem apparently defies quick solution.

"If each of a fleet of 1,000 SSTs made four flights a day, 55,000 kilograms of fuel would be released into the stratosphere each flight," Dr. Harris said. "This would reduce the ozone concentration by about 20 percent," he said, "increasing our exposure on earth to ultraviolet radiation."

"We are being told that skin cancer can be caused by the cumulative effects of exposure to ultraviolet radiation," he said, "and I doubt whether the American people would want to accept that risk."

"The Concordes and TU-144s are going into service in the near future and even their limited numbers may present problems," he said. "But they are not expected to multiply very quickly. An infusion of American SSTs, however, would greatly aggravate the problem unless the emissions were controlled."

Dr. Harris said SST-related research has been curtailed drastically in the past several years, but the focus for the people still active is now the exhaust gas problem.

The sonic boom research at MIT is being carried out under a Sloan Basic Research Grant. Dr. Harris' principal research assistant has been Luis Murillo of Panama, a graduate student.

—Charles H. Ball

Heart Sounding

Sounds too high to be heard by human ears may soon take the guesswork out of treating heart attack victims.

A probe that uses high-frequency ultrasound to measure dead tissue in the heart is being tested by scientists at MIT and is expected to be ready for clinical use in a year to a year and a half.

According to its developer, Dr. Padmakar P. Lele, the device will give physicians the information they need to skirt the dual dangers of inadequate treatment and unnecessary surgery.

Dr. Lele, (MD, PhD), professor of experimental medicine in the MIT Department of Mechanical Engineering, says that methods now used to determine the severity of heart attacks are very imprecise.

In the ultrasonic system, a small ultrasound-emitting-and-detecting probe is used to differentiate between the dead and live regions of the heart.

The system works because dead and living heart tissue absorb different amounts of ultrasound at various frequen-

cies. This was discovered in 1971 by Dr. Lele and Jerry Namery, a former electrical engineering graduate student at MIT. Dr. Lele theorizes that the differences occur because the proteins within oxygen-starved tissue change shape as the tissue dies.

The development of that scientific discovery into a practical device to aid heart attack victims has been funded by the National Heart and Lung Institute.

Dr. Lele and his colleagues recently tested the probe system on water-filled balloons made to contract and expand like a beating heart. Now, they plan to test it on dogs. They also will work to improve the computer programs that analyze the probe measurements.

The work requires a rare combination of interest in biomedicine, and skill with computers and mechanics. Dr. Lele says that he would welcome qualified graduate students who wish to work on the project.

Physicians using the ultrasonic detection system would first place an ultrasound-emitting-and-detecting transducer on the patient's chest to test the front of the heart. If necessary, they would also insert a similar but much smaller probe into the patient's body, through the blood vessels or esophagus, to test the rest of the heart. Dr. Lele estimates that a complete examination would take about 15 minutes.

The probe would emit ultrasonic pulses, and measure the "echoes" that are reflected off the back surface of the tissues. These echoes would be analyzed by the computer to determine which tissues were dead and which were alive. The results would be immediately displayed on a screen.

The engineers developing the system faced a number of problems. One was the motion of a beating heart, which makes any probe on the chest wall or inside the heart undergo constant changes of angle with respect to the heart tissue.

Dr. Lele, Charles M. Aden, Dr. Mark Hubelbank and their colleagues solved that problem by using a broad-band ultrasonic pulse, containing a wide range of frequencies, to obtain a curve showing how tissue reflects ultrasound throughout those frequencies. The shape of the curve is the same regardless of small differences in the angle, so that diseased tissue can be detected even when the probe is not perfectly perpendicular to the heart.

The motion of the heart also posed a second problem: because of that motion, few of the ultrasonic "echoes" are clear enough to be analyzed. Dr. Lele and his team had to develop a computer program that will select and analyze the few useful echoes. The program can now analyze up to 100 echoes per second.

Although Dr. Lele expects more problems before he is through, he says that "the bulk of the work has been done." If he is lucky, he says, the system may be ready for use in six months.

"More realistically, I think it will be a year to a year and a half," he says.

—BAB

Light Changes

Researchers at MIT have shown that ultraviolet light can decompose water into hydrogen and oxygen. Their research is the first conclusive evidence that light can convert water into a fuel, in the form of hydrogen.

However, the reaction is inefficient: only one percent of the light energy is converted into chemical energy. Also, visible light will not produce the reaction.

The decomposition of water by ultraviolet light requires a small electrical potential (0.2 volts) and a titanium dioxide crystal, which acts as a "photoassistance agent," serving to absorb light energy.

The MIT researchers plan to experi-

ment with different photoassistance agents and different reaction temperatures in an attempt to increase the efficiency of the reaction, and to make it work with visible light.

They also plan to explore the possibilities of using the system to produce electricity from light, and using it to add electrons to—or strip electrons from—molecules other than water. The products of such reactions could be useful to chemists.

The MIT research, directed by Mark S. Wrighton, assistant professor of chemistry, was stimulated by reports from Japan that such a reaction was possible. The research was funded by the National Aeronautics and Space Administration. Professor Wrighton's initial results will be published in the *Proceedings of the National Academy of Sciences, U.S.*, in a paper entitled "Photoassisted Electrolysis of Water by Irradiation of a Titanium Dioxide Electrode."

The MIT researchers confirmed that the oxygen evolved during the reaction came from the water, not by decomposition of the titanium dioxide crystal placed in the water.

They also confirmed that the reaction can be sustained indefinitely by constant illumination.

To conduct their experiments, the researchers put into a beaker of water a titanium dioxide crystal and a piece of platinum, connected by a wire. Inert ionic substances were dissolved in the water to allow an electric current to flow. The titanium dioxide and platinum are electrodes, establishing electrical contact with the water.

When ultraviolet light from a laser was used to illuminate the titanium dioxide, and electrical potentials as low as 0.2 volts (not enough to decompose water) were applied, hydrogen and oxygen gas were produced.

According to Professor Wrighton, this is how the reaction works:

Activated by the light, the titanium dioxide strips an electron from a negative hydroxyl ion present in the water. (Water constantly shifts to and from its molecular form and its ionized form, of positive hydrogen ions and negative hydroxyl ions.)

The stripped hydroxyl ions—now electrically neutral—probably combine, Professor Wrighton says, to form hydrogen peroxide, which then decomposes to yield oxygen on or near the electrode surface.

The electrons stripped from the hydroxyl ions travel along the wire to the platinum electrode, where they react with the positive hydrogen ions in the water to form hydrogen atoms. These in turn couple to form hydrogen on the electrode surface.

To confirm that the oxygen evolved came from the water, and not from the titanium dioxide, the researchers tagged the water with oxygen isotopes; they then measured the relative amount of oxygen isotopes in the gas evolved at the illuminated electrode. They also measured the electron flow along the wire, to see whether it corresponded with the amount of gas recovered. As a final check, they weighed the titanium dioxide electrode before and after the reaction, and found it unchanged.

From their measurements, the researchers concluded that ultraviolet light will decompose water, in the presence of the electrode system.

However, the reaction will not take place without a small battery attached to the wire. The electrical potential required—0.2 volts—is much less than is required to decompose water—1.23 volts—when electricity is the only energy source. The small electrical potential required is believed to be necessary both to favorably effect a change in the electronic energy levels of the titanium dioxide electrode near the water, and to overcome the resistance of the electrode system.

The researchers are now experimenting with different electrodes and reaction temperatures in an attempt to induce the decomposition of water by low energy visible light, rather than high energy ultraviolet light, which is only a small fraction of the light available from the sun.

—BAB

THE INSTITUTE CALENDAR

March 5
through
March 16

Events of Special Interest

Corporation Joint Advisory Committee on Institute-Wide Affairs (CJAC) Meeting* - Peter Richardson, director of admissions, will discuss admissions at MIT. Wed, Mar 5, 5:30pm, Rm 10-300.

The Esthetics of Drought: Art, Magic, and Invisible Technology* - Dr. Hans Guggenheim, anthropologist and writer on African art. Council for the Arts and Department of Architecture Lecture with slides of important Dogon art, monuments and tapes of music. Wed, Mar 5, 8pm, Rm 26-100.

Seeley G. Mudd Building Dedication* - Thurs, Mar 6, Kresge. Morning Symposium: Opening remarks by President Jerome B. Wiesner; Provost Walter A. Rosenblith, presiding. Limits of Oncology - Dr. Michael G. P. Stoker, director of research, Imperial Cancer Research Fund Laboratories, London, England; Some New Views of the Cell Structure - Dr. Gerald M. Edelman, biochemistry, Rockefeller University, 1972 Nobel Prize in medicine; The Academic Community and Cancer Research - Dr. James D. Watson, molecular biology, Harvard University, 1962 Nobel Prize in medicine. Commenting on talks: David Baltimore, American Cancer Society Professor of Microbiology, and Herman N. Eisen, biology, both of the Center for Cancer Research; Dr. Salvador E. Luria, Institute Professor, director of the Center for Cancer Research. Luncheon Dedication Program (by invitation): Dr. Frank J. Rauscher, Jr, director of the National Cancer Institute, will speak on The National Cancer Program; Dr. Howard W. Johnson, chairman of the MIT Corporation; President Wiesner; Dr. Robert D. Fisher, chairman of the Seeley G. Mudd Fund. Tours of the Mudd Building will follow.

MIT-Red Cross Blood Drive** - Weekdays, Wed Mar 5-Fri Mar 14, 9:45am-3:30pm; (except Mar 6 & 10, when is 2:30-8:15pm); Sala. Forms available at TCA. For info or appointment call x3-7911.

Lincoln Laboratory Spring Blood Drive - Conducted by the Lexington Red Cross. Mon & Tues, Mar 10 & 11, 9:30am-3:15pm. Contact I. Perry, x225 Linc.

Annual Sea Grant Program Review and Site Visit** - Wed, Mar 5, 8:30am-6pm; Presentations by Sea Grant staff and principal investigators of proposed projects and progress reports on existing ones. Thurs, Mar 6, 9am-12n: Program evaluation and discussion. Site visit team led by Arthur G. Alexiou, director, Institutional Support Programs, National Sea Grant Program, Washington, DC.

Joint MIT-Harvard Program in Energy Regulation - Informal program started by MIT's Nuclear Engineering Department and Harvard Law School. The principal focus will be on topics of mutual interest in the area of energy regulation; the first year is expected to focus upon regulation of nuclear power. Interested students are invited to an organizational meeting Thurs, Mar 6, 9-11am, Rm 12-142. Contact Prof Golay, x3-5824. or Prof Rose, x3-3807.

Seminars and Lectures

Wednesday, March 5

Rectification of Shelf Waves - John Bennett, earth & planetary sciences. Oceanography Sack Lunch Seminar. 12n, Rm 54-311. Bring lunch, coffee served.

Plasma Sources* - Leslie Bromberg, G. Nuclear Engineering Doctoral Seminar. 3pm, Rm 38-136.

Space-Time Reactor Kinetics: The Alternating Direction Checkerboard Method* - John Hendricks, G. Nuclear Engineering Doctoral Seminar. 3pm, Rm NW12-222.

Finite Difference Simulations of Turbulent Channel Flows at High Reynolds Numbers - Ullrich Schumann, advanced study program, National Center for Atmospheric Research. Applied Mathematics Seminar. 4pm, Rm 2-338. Coffee 3:30pm, Rm 2-349.

Cross Sections for Fast Reactor Analysis* - O. Kadiroglu, G. Nuclear Engineering Doctoral Seminar. 4pm, Rm NW12-222.

The Indian Case* - Daniel Patrick Moynihan, Harvard University JFK School of Government. Joint MIT-Harvard Arms Control Seminar. 4-6pm, Rm 2-190.

Racism* - Jean Cohn-Mirer, Law Commune. SACC Studies on the Left Series. 7:30pm, Rm 4-156.

Thursday, March 6

Underwater Photography* - Harold Edgerton, Institute Professor & Professor of Electrical Measurements, Emeritus. Electrical Engineering Seminar. 12n, Rm 4-402.

Photodetectors for Optical Communication* - H. Melchior, Bell Telephone Lab. Electrical Engineering Optics Seminar. 3pm, Rm 39-400.

Guidelines for Aerospace Engineering in the Marketplace* - J. Russell Clark, LTV Aerospace Corp, Dallas, Texas. Aero/Astro General Seminar. 4pm, Rm 33-206. Coffee 3:30pm, Rm 33-222.

Statistical Energy Analysis of Offshore Platform* - Kim Vandiver, G. Interdepartmental Acoustics Seminar. 4pm, Rm 5-134. Coffee 3:30pm, Rm 1-114.

Electrical Charging in Fuel Filtration* - P. Huber G. Mechanical Engineering Thermal-Fluid Seminar. 4pm, Rm 3-343. Coffee.

The Masses of Hadrons* - Sheldon Glashow, Harvard University. Physics Colloquium. 4:15pm, Rm 26-100. Refreshments 3:45pm, Rm 26-110.

Cyclic Nucleotides, Synaptic Function and Nutrition* - Dr. Floyd E. Bloom, Laboratory of Neuropharmacology; National Institute of Mental Health; St. Elizabeths Hospital, Washington, DC. Nutrition & Food Science Seminar. 4:15pm, Rm 54-100. Coffee 4pm.

Friday, March 7

Analysis of Methanation Reactors* - S. Senkan, G. Chemical Engineering Doctoral Seminar. 2pm, Rm 10-105.

Radiation and Thermal Problems of Implantable Power Sources* - Fred N. Huffman, Thermo Electron Corp. Nuclear Engineering Biomedical Applications of Radiation Seminar. 3:45pm, Rm NW12-222. Coffee, 3:30pm.



One of Amos Chan's photographs included in an exhibition of his work in the Hayden Corridor Gallery through March 23.

Dynamics of Three-Dimensional Vortex Filaments - Anthony Leonard, NASA-Ames Research Center. Applied Mathematics Seminar. 4pm, Rm 2-338. Coffee 3:30pm, Rm 2-349.

Thermal Properties of Glasses at Low Temperatures* - Dr. Richard Stevens, Harvard. Materials Science Colloquium. 4pm, Rm 9-150. Tea 3:30pm.

Utilization of Fusion Neutrons from Two-Component Tokamak Reactors* - D.L. Jassby, Princeton Plasma Physics Laboratory. Magnet Lab & RLE Plasma Dynamics Seminar. 4pm, Rm 36-261. Refreshments 3:50pm.

The Role of Research in Fire Protection* - Raymond Friedman, director of research, Factory Mutual Research Corporation. 3pm, Rm 3-133. Coffee 4pm, Rm 1-114.

Roll-Over in LNG Tanks* - K. A. Griffis, G. Chemical Engineering Doctoral Seminar. 3pm, Rm 10-105.

Twilight, Stratospheric Aerosol and Volcanic Eruptions - F. Volz, Air Force Cambridge Research Laboratories. Meteorology Seminar. 4pm, Rm 54-100. Refreshments 3:30pm, Rm 54-923.

Lecture* - Mike Albert, UAP 1969, organizer of Rosa Luxembourg SDS at MIT, author of *What is to be Undone?* Social Action Coordinating Committee Lecture & Discussion. 8pm, Rm 1-190.

Monday, March 10

Conceptual Design of the Safety Research Experimental Facility* - Armando Travelli, applied physics div, Argonne National Laboratory. Nuclear Engineering ANS Student Branch Seminar. 3:30pm, Rm NW12-222. Coffee & donuts 3pm.

Multiple Model Adaptive Control of the F-8 Aircraft* - Michael Athans, electrical engineering, director of ESL. Electrical Engineering Decision & Control Group Seminar. 4pm, Rm 39-500.

Linearized Contact Vibration Analysis* - P. Ranganath Nayak, Tata Engineering and Locomotive Co. Ltd, Poon, India. Applied Mechanics Seminar. 4pm, Rm 5-134. Coffee 3:30pm, Rm 1-114.

Decision Tree Complexity - Michael L. Fredman, mathematics. Applied Mathematics Colloquium. 4pm, Rm 2-338. Coffee 3:30pm, Rm 2-349.

Dynamics of Materials Availability* - David B. Brooks, minerals economics research div, Department of Energy, Mines & Resources, Ottawa, Canada. Materials Science & Engineering and Center for Policy Alternatives, Materials Policy Seminar. 4pm, Rm 9-150.

Streptomyces Genetics, Plasmids and Antibiotic Production* - Dr. David A. Hopwood, John Innes Institute of Norwich, England. Nutrition & Food Science Microbiology & Biochemical Engineering Seminar. 4pm, Rm 16-134.

Design and Analysis of Mass-Conserving Model of Ecodynamic Systems* - Alicia Quinlan, Radcliffe fellow, Harvard University. Civil Engineering & Parsons Laboratory, Water Resources & Hydrodynamics Seminar. 4pm, Rm 48-316. Coffee 3:45pm, Rm 48-410.

Slide Show & Lecture on the Culture, Architecture and Pottery of the Anasazi Indians of Chaco Canyon, New Mexico** - Maria



An untitled photograph from the current exhibition of Roland Freeman's photo-documentary work at the MIT Creative Photography Gallery through March 19.

Vitagliano, artist. Student Art Association. 5:30pm, Stu Ctr Rm 429.

Tuesday, March 11

MHD: Generator Systems and Materials Problems** - H. K. Bowen materials science & engineering. Materials Science & Engineering Ceramic & Glass Seminar. 9am, Rm 16-310.

Aero/Astro General Seminar* - Russell L. Schweickart, director of user affairs, NASA. 4pm, Rm 35-225. Coffee 3:30pm, Rm 33-222.

Teaching in a Law School - Tomar Frankel, law professor, Boston University Law School. Preprofessional Advising & Education and Law Related Studies Forum on the Legal Profession. 4pm, Stu Ctr Mezzanine Lge.

Hillel Lecture* - Amnon Rubenstein, dean of Tel Aviv University Law School, distinguished author and lecturer. 8pm, Stu Ctr Mezzanine Lge.

Wednesday, March 12

Response Matrix Method Applications* - Yovan Lukic, G. Nuclear Engineering Doctoral Seminar. 3pm, Rm NW12-222.

Recent Developments in Laser Gyroscopes* - Barry Levitt, Raytheon Co. Laser Applications Seminar. 4pm, Rm 35-225. Coffee.

Numerical Study of the Return of Axisymmetric Turbulence to Isotropy - Ullrich Schumann, advanced study program, National Center for Atmospheric Research. Applied Mathematics Seminar. 4pm, Rm 2-338. Coffee 3:30pm, Rm 2-349.

Gamma Heating in Fast Reactors* - M. Kalra, G. Nuclear Engineering Doctoral Seminar. 4pm, Rm NW12-222.

A Biological Proton Pump - Walther Stoerkenius, MD, University of California School of Medicine, San Francisco. Biology Colloquium. 4pm, Rm 54-100. Coffee 4:30pm, Bldg 56, 5th vestibule.

Depression and the Dynamics of Capitalism* - Nancy Glazer, Union of Radical Political Economists. SACC Studies on the Left Seminar. 7:30pm, Rm 8-105.

The Art and World of Samuel Beckett* - Alec Reid, Irish dramatic critic. Humanities Department. 8pm, Rm 14E-304.

Thursday, March 13

NASIS Information Bazaar* - All-day teach-in/demonstration of computer-aided literature retrieval. 9:30am, Rm 14S-100. Continuous searching of all 14 data bases, covering literature of particular disciplines featured at specific times. Bring sample questions. Free on-line reference print-outs. Coffee & food. Info: NASIS Coordinator, x3-7746.

Unsteady Flow in a Collapsing Tube* - Roger Kamm, G. Mechanical Engineering Thermal-Fluids Seminar. 4pm, Rm 3-343. Coffee.

The Physics of Ion Transport in Axon Membranes* - Malcolm W. Strandberg, physics. Physics Colloquium. 4:15pm, Rm 26-100. Refreshments 3:45pm, Rm 26-110.

Implications of Segregation and Smoking: Pilot Study of Penn Central Commuters* - Elaine Perriello, Berton Freeman & Mary Palshaw, epidemiology and public health, Yale University; **The Control of Indoor Air Pollution*** - Dr. Karl Raab, research chairman, Society to Overcome Pollution (STOP). Action on Smoking & Health Open Meeting. 7:30pm, Stu Ctr West Lge.

Friday, March 14

The Gelation of Liquefied Natural Gas* - L. Shanes, G. Chemical Engineering Doctoral Seminar. 2pm, Rm 10-105.

Experimental Determination of Heat Capacity of Liquids Above Boiling Point* - J. L. San Jose-Alcalde, G. Chemical Engineering Doctoral Seminar. 3pm, Rm 10-105.

The Applications of Magnetic Liquids in Seals, Bearings and Dampers* - Frederick D. Ezekiel, F. D. Ezekiel Co. Mechanical Engineering Seminar. 3pm, Rm 3-133. Coffee 4pm, Rm 1-114.

Heart and Brain Imaging with MGH Positron Camera* - Bernard Hoop, Jr, Physics Research Lab, MGH. Nuclear Engineering Biomedical Applications of Radiation Seminar. 3:45pm, Rm NW12-222. Coffee 3:30pm.

Numerical Simulation of Toroidal Pinches* - C.K. Chu, Columbia University. Magnet Lab & RLE Plasma Dynamics Seminar. 4pm, Rm 36-261. Refreshments 3:50pm.

Community Meetings

The Wives' Discussion Group** - Wed, 2:15-4pm, Stu Ctr West Lge. Babysitting in Stu Ctr Rm 473.

Men's Undergraduate Discussion Group - The group will discuss male consciousness, relations, communications and identity. Sponsored by the Religious Counselors. Wed, 8pm, 2nd fl seminar rm, Bldg W2.

Welcome Party - Sponsored by Technology Wives Organizations for all new Tech Wives and their husbands. Sun, Mar 9, 3-5pm, Rm 10-340.

Women's Forum** - Meetings Mon, 12n, Rm 10-105. (Tues in case of Mon holiday).

MIT Community Players* - Members of the Boston Light Opera Company will sing selections from "Trial by Jury" and "HMS Pinafore" at the meeting Mon, Mar 10, 7:30pm, Rm 4-160. Everyone welcome.

Etching Classes** - First meeting Mon, Mar 10, 7:30pm, Stu Ctr Rm 429. Student Art Association class taught by Lessel Mansour. Printmaking from metal plates with images cut into them by acid.

Matrons' Annual Dinner*** - Paul A. Samuelson, Institute Professor, economics, Nobel Laureate, will speak at the dinner. Thurs, Mar 13, Faculty Club. Cocktails (cash bar) 6pm, dinner 7pm. Reservations: \$6.50/person, must be made by Fri, Mar 7. Mrs. Peter Grant, Apt 2-12A, 100 Memorial Drive, 868-3667.

1975 Biweekly Salary Review

Massachusetts Institute of Technology

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Statement by John M. Wynne, Vice President, Administration and Personnel

This *Tech Talk* supplement summarizes the initial recommendations of the Working Group on Office Clerical Issues. The Working Group began in early February to consider and make recommendations on the conduct of the April Biweekly salary review. Having submitted this first report, the participants in the Working Group will now continue their efforts, giving further attention to questions related to performance evaluation, better communications, compensation, and career paths.

The Working Group had its origins in a report submitted to me in early September by Buzzy Bluestone, a Sloan School graduate student. I had asked him to study the use of performance evaluation forms in a number of Engineering departments during the 1974 Biweekly review in order to learn as much as possible about what worked well and what didn't in the course of the review. His report, based on many interviews with secretaries, administrative officers, and faculty supervisors, identified a number of problems: misunderstanding about the review process, confusion about the grade structure, lack of clarity in work expectations, and others.

With the help of Professor Leo Moore of the Sloan School, I sought to get a broader understanding of these problems, Institute-wide, in meetings with departmental administrative officers and by encouraging, during the fall, meetings of Biweekly employees.

Out of the administrative officer meetings, about fifteen persons were chosen to form half of a Working Group. An equal number of departments, typically departments other than those from which the administrative officers came, were invited to select Biweekly participants in the Working Group. On the campus these were selected in meetings of Biweekly employees. Faculty members were invited to serve on the committee by participants. All the participants and their departments are listed elsewhere in this supplement. Taken together, they are a good cross-section of the Institute's departments, laboratories, and centers and bring to their task a wide range of experience and viewpoint.

The Working Group, meeting for the first time on February 10 and again on February 12 in a full day meeting at Endicott House, organized itself into four task-oriented subgroups:

I Performance evaluation;

- II Communications;
- III Compensation; and
- IV Career paths.

Each group defined both short-range goals, related to decisions which had to be made prior to the 1975 Biweekly review, and longer range goals aimed at improving policies, practice, and relationships affecting the opportunities and satisfactions of office clerical work at MIT.

The recommendations summarized in this supplement are the product of many hours of work over the past three weeks by people working well together and committed to their task. On Friday, February 28, each of the subgroups presented their reports to the entire Working Group. Out of the vigorous discussion that followed, emerged a consensus of Biweekly, faculty and administrative participants. Recommendations were made to me, representing the administration, urging the division of the moneys available for salary increases into a general and a merit component, the use of two alternative discussion formats which the group devised, a set of guidelines for discussions dealing with job responsibilities and opportunities for using unused skills, and, finally, extensive and full communication of all facts about the review.

These recommendations have been accepted, and the 1975 Biweekly review will be conducted in accordance with them.

The recommendations by themselves do not assure an effective review. The key is open communication between supervisor and employee about the work and the working environment, including ways to improve mutual understanding and satisfaction in this working relationship. Such communication must be two ways and each MIT supervisor is urged to approach this review with a readiness to initiate and to engage in an open exchange between two persons at work on a common goal.

The task of the Working Group is not ended with the completion of this first set of recommendations. They will plan to evaluate how well their recommendations succeeded in providing a more satisfying review experience for all involved in order to modify their future application. They will also focus their attention on the longer range questions, including the grade structure as a part of the career path issue, further improvement in feedback on the job, better communication of policies and procedures, and a more extensive study of the issues involved in compensation.

I look forward to their further recommendations on these issues.

Guidelines for the Salary Review

Eligibility
Effective Date

The annual review of all Biweekly employees on the payroll as of January 6, 1975, will be effective on March 31, 1975.

A new and hopefully improved procedure, which is based on the recommendations submitted to John Wynne by the Working Group on Office Clerical Issues, will be used this year. The time frame for completion of the process is limited by the need to make appropriate payroll changes before the March 31 effective date. The assistance of all persons involved in this effort in working within these constraints will be greatly appreciated.

Nature of
Salary Increase

The funds available for this year's increase are 10% of the eligible January 6th Biweekly payroll, adjusted for subsequent terminations and increases. This figure was determined after a careful analysis of the Institute's competitive position with regard to the outside market and an examination of budgetary constraints. As recommended by the Working Group, the percentage allocated will be separated into two components this year—a general increase of 6% and a merit increase of 4%.

General
Increase

The general increase, amounting to 6% of the 10% review allocation, is an increase which is intended to recognize, but not necessarily cover, the increases in living costs that everyone experiences. A 6% general increase should be given to each eligible employee who has performed at an acceptable level. Acceptable is a level of performance below the average expected of an individual, but not low enough to deserve penalization through a reduced general increase. A recommended increase of less than 6% must be

accompanied by a letter of justification which will be forwarded to the department's Personnel Officer through the appropriate Dean, Vice President or the Provost.

Merit Increase

The remaining 4% of the total review funds (10%) are to be proportionally allocated to reward individual merit. It is assumed that the employees in most departmental units have reached different levels of achievement in their jobs and that a sincere attempt will be made by each supervisor to distribute these funds equitably by merit. If the requested merit component of the salary increase exceeds 6%, (ie, greater than 12% overall) a supporting letter must be forwarded to the department's Personnel Officer through the appropriate Dean, Vice President or the Provost.

Communication-Evaluation Formats

Beginning March 5, the Administrative Officer (or equivalent) of each department will give each eligible Biweekly employee the choice of two communication-evaluation formats which were developed for use this year by participants in the Working Group. It is hoped that these formats will stimulate more open discussion between Biweekly employees and their supervisors. In addition, they will facilitate the evaluation process which no one claims to be an easy task. A thoughtful discussion of strengths and weaknesses in work and supervisory skills as well as past and future expectations, will be beneficial to everyone involved.

Employees and supervisors may record their comments independently or in the presence of each other. Each supervisor should meet individually with the Biweekly employee at this point to discuss the working relationship. In the case of more than one supervisor working with an employee, each is asked to be involved in making comments on the form. Both the **Employee Utilization Analysis** and **Performance Review** formats (facsimiles shown on back page), require the signature of both/all parties.

These aids should be returned to the Administrative Officer (or equivalent) and will go no further than the employee's department headquarters or division office in the case of Lincoln Laboratory. These forms will not become a part of an individual's permanent record in the Personnel Office unless specifically requested in writing by the employee. Forms retained in department headquarters will be destroyed within one year of completion.

After these discussions have taken place the supervisor(s) should convey these recommendations to the Administrative Officer by March 11. These recommendations should be considered formative until recommended by the department and approved by the appropriate Dean, Vice President or the Provost.

Small Departments

As previously mentioned, the combined general and merit increases for each organizational unit should not exceed the overall 10% budget. In the case

where an organizational unit is below a critical size (10) to allow for a normal distribution of work performance, a grouping for purposes of comparison will be coordinated by the department's Dean, Vice President or the Provost (or another designated staff member). Departments which fit into this category will be contacted by their Personnel Officer with instructions as to who will coordinate this effort. Review printouts from smaller departments are due in the office of the coordinator on March 12. Review printouts from departments with more than ten eligible employees are due in the office of the Dean, Vice President or the Provost by March 14. M.I.T. departments will be expected to meet the budget allocation for the review, without regard to individual levels of available funding. However, the use of all budgeted funds for merit increases is not expected in cases where individual performances within the unit do not warrant the full amount.

Should an employee feel dissatisfied with the salary decision or discussion mechanism, that person should contact the department's Administrative Officer and/or Department Head for further discussion. If still dissatisfied, the individual should see his or her Personnel Officer. After these channels have been exhausted, further assistance can be obtained from the Special Assistants for Women and Work and Minority Affairs as described fully in the non-union grievance procedure published as part of the Institute Affirmative Action Plan.

Chronological Summary of the 1975 Salary Review

- January 6 Date of hire cutoff for eligibility for the Biweekly Salary Review.
- March 1 Recommendations made to the Vice President, Administration and Personnel by the Working Group on Office Clerical Issues.
- March 5 *Tech Talk* supplement mailed to all Biweekly employees eligible for the salary review.
- March 5 & 6 Packets containing computer printouts, extra supplements and communication-evaluation formats to be picked up in E19-284 by Administrative Officers (or equivalent).
- March 6-11 Administrative Officers to ask each Biweekly employee to choose one of the communication-evaluation formats to complete.
- March 12 Discussions held between each Biweekly employee and supervisor and salary recommendations conveyed to Administrative Officer by supervisor(s).
- March 12 Review computer printouts containing salary recommendations due in Office of Dean, VP or the Provost for small units identified as being below critical size (see instruction section).
- March 14 Review computer printouts containing salary recommendations due in Office of Dean, VP or the Provost for all other departments.
- March 17-19 Administrative Officers to inform supervisors of final salary decisions.
- March 31 Salary increases become effective.
- by April 4 Supervisors to convey final review decision to employees (re-

view letters distributed by Personnel to Administrative Officers).

April 9

First paycheck reflecting salary increase distributed to employees.

late April

Evaluation of the new review process to be conducted by the Working Group on Office Clerical Issues.

Present and Proposed Grade Range Information

1974/75 Biweekly Grade Minimum and Maximum for 35 Hour Work Week

	II	III	IV	V	VA
No. of Employees	124	452	721	341	10
Grade Maximum	139	157	182	204	235
Grade Minimum	93	108	122	140	156

1975/76 Biweekly Grade Minimum and Maximum for 35 Hour Work Week

	II	III	IV	V	VA
Grade Maximum	149	169	196	219	253
Grade Minimum	98	113	128	147	169

Questions about the review process can be referred to Personnel Officers on campus, or to the staff of the Lincoln Personnel Office, x7305, in the case of Biweekly employees working at Lincoln. Comments and questions about the recommendations of the Working Group on Office Clerical Issues are welcomed by the participants whose names and extensions are provided herein.

March 1, 1975

Mr. John M. Wynne
Vice President
Administration and Personnel
7-201

Dear Mr. Wynne:

We are pleased to submit the entire set of recommendations of the Working Group on Office Clerical Issues for your consideration. These recommendations are our best effort for the 1975 review and as such, should be considered provisional. As part of our long-range goals, we recommend an assessment of this year's review process to better fulfill our commitment to make long-range recommendations.

Because we believe that all parties concerned should have access to the same information simultaneously, we recommend that there be a *Tech Talk* supplement concerning the review, that departmental meetings occur, and that the Working Group members be utilized as an information resource.

Because we believe that frank and open discussion between immediate supervisors and employees is the keystone of the review process, we recommend the use of evaluation forms as a stimulus to open discussion. We strongly feel that education is the essential element and regret that this year's time constraints have precluded any intensive study in that area.

Because we believe that we must deal with the issue of performance and that the employee understand its relation to the salary increase, we recommend a general, across-the-board increase. This would comprise 60 percent of the available funds. The general increase is intended to recognize, but not necessarily cover, the increase in living costs. We recommend that 40 percent of the available funds be used for a merit increase which is intended to recognize individual efforts exceeding a basic level of acceptable work.

We would like to assure you of our continued commitment to assess and improve the review process. We hope that at the very least, we have made beneficial recommendations.

Sincerely,

THE WORKING GROUP ON OFFICE CLERICAL ISSUES

Enclosure

MEMBERS OF THE WORKING GROUP ON OFFICE CLERICAL ISSUES

Group I—Performance Evaluation

Beckley, Lawrence	Center for Space Research		
Berger, Margaret	Humanities	37-287	3-6103
Bovet, Philippa	Mathematics	W16-002	3-2906
Leonard, Nancy	Physical Plant	2-236	3-4381
McCarthy, Barbara	Research Lab. of Electronics	E18-260	3-3928
Muehlner, Suanne	Library	36-417	3-2510
Quivey, Frederick	Health Sciences and Technology	14S-216	3-5653
	MIT-Harvard Program / Sloan School	E52-472	3-2964
Tapley, Idella	Economics	E52-373B	3-3366

Group II—Communications

Baker, Marsha	Elec. Eng. & Computer Science	NE43-515	3-6014
Cohen, Robert	Chemical Engineering	12-145A	3-3777
Golding, Pat	Chemical Engineering	12-135	3-4651
Grayson, Jim	Sea Grant	1-207	3-7138
Hildebrand, Kate	Urban Studies & Planning	7-338	3-2025
Hughes, Herb	Project MAC	NE43-101	3-3568
Jones, Katharine	News Office	5-111	3-2701
Kilson, Richard	Lincoln	A-128	181-7404
Liebesny, Claudia	Personnel	E19-239	3-1595
Miola, Lori	Medical	3-017	3-7824

Group III—Compensation

Barringer, Charles	Engineering	1-206	3-3294
Brophy, Terry	Library	14E-210	3-5691
Christiansen, Lynn	Center for Advanced Eng. Study	9-225	3-7326
Cochrane, John	Nuclear Engineering	24-108	3-3803
Crossley, Terry	Physics Hdqrs.	6-107	3-4870
Dzengelski, Jean	Sloan	E52-443	3-5230
Egan, Larry	Lab. for Nuclear Science	24-034	3-6186
Frangioso, Maureen	Lab. for Nuclear Science	26-445	3-7062
Kistiakowsky, Vera	Physics	6-101	3-4853
Langdale, Dan	Financial Aid	5-120	3-4971
Monahan, Evelyn	Comptroller's Office	E19-545	3-2768

Group IV—Career Paths

Carrol, F.L.	Lincoln Laboratory	A-149	181-601
Evleth, Pam	Biology	56-601	3-6711
Garchinsky, Ann	Center for Advanced Eng. Study	9-367	3-7431
Gordon, Ann	School of Architecture & Planning	7-233	3-4401
Hrbek, Jarmila	President's Office	3-208	3-4665
Joss, Marjorie	Mechanical Engineering	3-254	3-2021
Mauriello, David	Center for Materials Sci. & Eng.	13-2149	3-6850
Manditch, Helene	Joint Center for Urban Studies	53 Church St.	3-2029
Roy, Mary Ann	Lincoln Laboratory	L-164	181-5302
Walsh, Susan	Information Processing Services	39-565	3-4104

Recommendations of the Working Group on Office Clerical Issues

Distribution of Review Funds

In making recommendations on the Biweekly Salary Review process, we were concerned with the distribution of funds allocated rather than the actual percentage of the increase. Because of the confusion in the past regarding the nature of the salary increase, we recommend a review structure which separates a general component from a merit component. Our use of the term *general increase* means the salary increase that is intended to recognize, but not necessarily cover, the increases in living costs that everyone experiences. The term *merit increase* means that increase which recognizes individual efforts above a basic level of acceptable work.

We recommend that the general increase be 60 percent of the total available review funds. The award of this amount assumes that the individual has performed at an acceptable level. Acceptable is a level of performance below the average expected of an individual but not low enough to deserve penalization through a reduced general increase. A recommended increase of less than 60 percent must be accompanied by a letter of justification.

The remaining 40 percent of the total review funds should be proportionally allocated to reward merit. A request for an exceptional individual merit award must be accompanied by a letter of justification. For example, if the total available review funds in a given year allows a 10 percent departmental review budget, 6 of the 10 percent would comprise the general component and the remaining 4 percent would be available to reward individual merit. If a requested merit increase exceeds 6 percent, such an increase would be considered "exceptional" and would require a letter of justification. If on the other hand, the total available review funds were 5 percent, 3 of the 5 percent would comprise the general component and the remaining 2 percent would be available to reward

individual merit. In this case, a merit increase exceeding 3 percent would require a letter.

Present grade level should not be a factor in determining individual increase amounts. Therefore, it is our recommendation that each grade receive the same percentage increase. Also, every department in the Institute should be expected to meet the budget allocated for the review, without regard to individual funding levels available. The use of all budgeted funds for merit increases is not mandatory in the case where individual performances within the unit do not warrant the full amount.

As outlined, the total funds distributed to employees in this combined general and merit increase method, should not exceed the overall budget percentage for the organizational unit. If an organizational unit is below a critical size to allow for a normal distribution of work performance (e.g. 10 employees being reviewed), a grouping for purposes of comparison should be coordinated at a higher level of the organizational structure (the appropriate Dean, Vice President or the Provost).

Communication—Evaluation Aids

The Working Group recommends, as a pilot proposal for the 1975 April Review, that one of two forms be used throughout the entire Institute community. It is our hope that the forms will stimulate more open discussion between Biweekly employees and their supervisors. For the longer term, we believe that this part of the review process should be separated in time from the salary review process, although it may have some bearing on salary decisions.

We acknowledge that undertaking a performance review in this way will not be easy—and it is not our intention to pretend to make it so. Maintaining personal relationships inherent to employment assignments is important to all and demanding of all. We hope that constant attention will be given to developing a mutual understanding of these assignments and the rights and responsibilities pertaining to them.

As illustrated elsewhere, the *Employee Utiliza-*

tion Analysis form is more structured than the *Performance Review* form, but the two have the same goal. We recommend that the Biweekly employee select whichever form is preferable. We recommend the following:

A. Distribution Procedure

1. The Personnel Office will distribute a supply of each form to the attention of the Administrative Officer (or equivalent) in all departments.
2. This person will give each Biweekly employee a copy of both forms.
3. The Biweekly employee will choose the form preferred.

B. Completion Procedure

1. The employee and immediate supervisor may record their comments independently, or they may record their comments in the presence of each other.
2. It is important that at this point a discussion take place. Each Biweekly employee should meet individually with supervisors to discuss their working relationship and expectations. In the case of more than one supervisor working with a Biweekly employee, each supervisor should be involved in making comments on the evaluation form.
3. Forms should be signed by both parties. Information contained on these forms may contribute to the determination of the merit increase.

C. Final Disposition of Forms

1. Forms should be returned to the Administrative Officer (or equivalent). The form will go no further than the employee's department headquarters or division office in the case of Lincoln Laboratory.
2. The percentage recommendation should be conveyed to the department's Administrative Officer (or equivalent) by the supervisor.
3. When the amount of the merit increase is determined, if it represents some change in the supervisor's recommendation, this information must be conveyed back to the supervisor by the Administrative Officer (or equivalent).
4. It is the responsibility of the supervisor to convey the final merit increase decision to the employee before the first pay check reflecting the change is distributed (April 9).
5. We recommend that these forms not become a part of the permanent record. However, if the employee desires, this form may be included in the personnel record.
6. We recommend that the forms be destroyed within one year of completion.

Methods of Communicating the Review Process

We recommend that a supplement to *Tech Talk* should be prepared which is solely devoted to the recommendations of the Working Group and the instructions to all participants in this year's review. It should appear on March 5, 1975, and contain the following:

- A. A full and detailed presentation of the review as it will be carried out this year.
- B. Facsimiles of the forms to be used for career information and performance evaluation.
- C. A complete, verbatim text of the recommendations as submitted to John Wynne.
- D. A history of the formation of the Working Group.
- E. A list of the Working Group participants.
- F. A graph (if available) giving the numbers of Biweekly employees at each salary level by grade and for the total Biweekly payroll.

We further recommend that departmental meetings occur to provide an opportunity to discuss and clarify the new review procedures. We suggest that Working Group members be contacted to serve as resource persons.

Should an employee feel dissatisfied with the salary decision or discussion mechanism, that person should contact the department's Administrative Officer and/or Department Head for further discussion. If still dissatisfied, the individual should see his/her Personnel Officer. After these channels have been exhausted, further assistance can be obtained from the Special Assistants for Women and Work and Minority Affairs as described fully in the non-union grievance procedure published as part of the Institute Affirmative Action Plan.

Purpose of Performance Review and Employee Utilization Analysis Format

The job performance of employees in clerical, secretarial and other positions included under the Institute's Biweekly payroll is reviewed once each year. The review objective is twofold: 1) to measure an employee's job performance to allow the most equitable Institute-wide distribution of pay increases, and 2) to facilitate a closer understanding between supervisor and employee of what the "job" entails. It has been observed that a group of duties comprising a "job" often cannot be separated from the person assigned to do them—that such duties may emerge as a somewhat different "job" for different people. The term "job/person" unifies this concept.

The purpose of the communication-evaluation aids is to implement communication between immediate supervisor and employee. Each is not really a form, but a format for use by employee and supervisor as the basis for a discussion and upon which to base some conclusions.

It will be Institute policy this year to use one of two types of communication-evaluation aids by each employee and his/her immediate supervisor(s); though no exceptions to the spirit of that policy will be allowed, the style of evaluations should be appropriate to the individuals involved. No copies of this form will go further than the employee's "unit" (departmental or other) headquarters. All copies will be destroyed about one year after their completion unless the employee requests inclusion in the personnel record.

Instructions for the *Employee Utilization Analysis* can be found on the format. Instructions for the *Performance Review* are printed on facsimiles of the forms below. The instructions do not appear on the forms themselves. If you have any questions or need assistance please call your Administrative Officer or Personnel Officer.

April 1975 Performance Review Part I
Employee comments

Employee's name _____

Instructions

Part I should contain comments the employee feels are important. If the inclusion of the job description in some form seems important to either supervisor or employee, it should be developed and included. It should be recognized, that there is one specific policy that prevails Institute-wide. Personal services for a supervisor are not a part of any employee's job. In your considerations remember that whatever you write will be followed by a discussion and that you are not contributing to a permanent record. Note the positive/negative aspects of your duties, how they relate to a larger function, problems you encounter (with any solutions you have identified) or whatever you feel is appropriate.

Supervisor's
Initials

Signed

Date

This document is not to become a part of any permanent personnel file and should be destroyed after the next follow-on review or upon the termination of the employee.

(Preamble: This form has been devised to facilitate open discussion between employee and supervisor, and to provide an acceptable means for recording the important elements of this relationship. It should be completed in combination with appropriate discussion, rather than in a serial fashion. The form is intended for use only within the Department, except at the request of the employee.)

Employee Utilization Analysis

Part I (To be completed by employee)

NAME: _____ POSITION: _____

DEPARTMENT: _____

DEPT. SUBGROUP (if applicable): _____

NAME(S) OF SUPERVISOR(S): _____

Detailed description of current activities and responsibilities carried out in your position:

Do you have any relevant skills/qualifications not being utilized in your current position?

April 1975 Performance Review Part II
Supervisor comments

Employee's name _____

Part II should reflect the supervisor's thinking about the job/person, strengths and weaknesses, how the employee performs relative to potential. It should be emphasized that comments need not be all-inclusive but should contain points to be considered during a subsequent discussion with the employee.

Employee's
Initials

Signed

Date

This document is not to become a part of any permanent personnel file and should be destroyed after the next follow-on review or upon the termination of the employee.

Employee Utilization Analysis

Part II (To be completed by supervisor/s)

EMPLOYEE'S NAME: _____

CURRENT POSITION/CLASSIFICATION: _____

SUPERVISOR'S NAME: _____

(Please answer the following questions in as much detail as you feel necessary. If you need more space, please attach another sheet.)

1. After discussion with the employee, can you say that he/she is carrying out her/his present assigned responsibilities as detailed in Part I? If not, please explain.
2. In your opinion, is the employee being effectively utilized in her/his present position?
3. Does the employee want to accept more responsibility and would he/she be able to handle it? What possibilities exist in the present context for her/him to diversify and/or take on more responsibility?
4. (Only answer if applicable.) Do you foresee any opportunities within the Department for further development of this employee's potential? If yes, please explain.

April 1975 Performance Review Part III
Jointly prepared by supervisor and employee

Employee's name _____

Supervisor's name _____

Part III should be completed as an outgrowth of a discussion between supervisor and employee. That discussion should include a joint consideration of Parts I and II as well as opportunities seen for more diversity, increased interest in the use of skills, abilities, and education. Part III, then, should be used to record short term (six months or so) objectives for the job/person as agreed upon between the employee and supervisor. The objective of this part is to allow greater objectivity at the next review.

Signed _____ Date _____

This document is not to become a part of any permanent personnel file and should be destroyed after the next follow-on review or upon the termination of the employee.

Employee Utilization Analysis

PART III (It is recommended that supervisor/s and employee should have discussed Parts I and II before completing Part III.)

COMMENTS OF EMPLOYEE (optional):

COMMENTS OF SUPERVISOR/S (optional):

Employee _____ Supervisor _____ Date _____

Social Events

Entry MacGregor Dance* - Dance with live band playing rag & rock Sat, Mar 8, 8:30pm, MacGregor House. Dress: pantsuits or dresses for women, jackets (tie not necessary) for men. Admission: women free, men \$1. Beer & booze, Jan, 494-8552.

Oriental Night Buffet*** - Wed, Mar 12, 5:30-8pm, Faculty Club. Buffet. Sponsored by Faculty Club.

Strat's Rat - Sat Mar 15, 8:30pm, Sala. Light & dark beer \$.25/16 oz cup (\$1 for 5). Music by WTBS, requests until 1am. College ID required.

24 Hour Coffeeshop* - 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.

Singles Cocktail Hour - Sponsored by Ad-Hoc Over 30's Singles Chowder and Marching Society. Wed, Mar 12, 5:30-8pm, Faculty Club. Admission \$1, new, prospective members welcome.

Movies

Protemkin* - Humanities Film. Wed, Mar 5, 7pm, Rm 14N-0615. Free.

Contempt (Godard)* - Film Section. Wed, Mar 5, 7pm, Rm E21-010. Free.

Boundary Layer Control; Flow Instabilities - Fluid Mechanics Films. Thurs, Mar 6, 4pm, Rm 33-319.

The American Automobile - Barker Engineering Library Film. Thurs, Mar 6, 5pm, Rm 10-500. Free. Coffee.

The American Automobile - Barker Engineering Library Film. Fri, Mar 7, 12n, Rm 10-500. Free. Coffee.

Westworld** - LSC. Fri, Mar 7, 7 & 9:30pm, Rm 26-100. Admission \$.50, ID required.

Red Desert (Antonioni) - Film Society. Fri, Mar 7, 7:30 & 9:40pm, Rm 6-120. Admission \$1.

Silent Running - SCC Midnite Movie. Fri, Mar 7, 12m, Sala. Free, college ID required.

The Last Detail** - LSC. Sat, Mar 8, 7 & 9:30pm, Rm 26-100. Admission \$.50, ID required.

Accupuncture Anaesthesia; Peking Aerobatic Troupe Performance; Environmental Sanitation in China Today; Little Eight Route, Puppet Show* - Chinese Student Club documentaries with English narration. Sun, Mar 9, 2pm, Kresge. Admission \$.50 CSC members, \$.75 others.

King of Hearts** - LSC. Sun, Mar 9, 6:30 & 9pm, Rm 26-100. Admission \$.50, ID required.

Turbulence; Rotating Flows - Fluid Mechanics Film. Mon, Mar 10, 4pm, Rm 33-319.

Cameraman; Sherlock Junior (Keaton)* - Film Section. Tues, Mar 11, 7pm, Rm E21-010. Free.

Now for Something Completely Different* - Humanities Film. Tues, Mar 11, 7:30pm, Rm 4-370. Free.

Colonial Six; Five Foot Square; Stop Destroying America's Past* - Humanities Film. Tues, Mar 11, 7:30pm, Rm 14N-0615. Free.

Navigator; The General (Keaton)* - Film Section. Wed, Mar 12, 7pm, Rm E21-010. Free.

Turbulence; Rotating Flows - Fluid Mechanics Film Thurs, Mar 13, 4pm, Rm 33-319.

Future Fuels and Fusion - Barker Engineering Library Film. Thurs, Mar 13, 5pm, Rm 10-500. Free. Coffee.

Future Fuels and Fusion - Barker Engineering Library Film. Fri, Mar 14, 12n, Rm 10-500. Free, Coffee.

Everything You Always Wanted to Know About Sex (but were afraid to ask)** - LSC. Fri, Mar 14, 7 & 9:30pm, Rm 26-100. Admission \$.50, ID required.

Blow-Up (Antonioni) - Film Society. Fri, Mar 14, 7:30 & 9:45pm, Rm 6-120. Admission \$1.

The Anderson Tapes - SCC Midnite Movie. Fri, Mar 14, 12m, Sala. Free admission with college ID.

Clockwork Orange** - LSC. Sat, Mar 15, 7 & 10pm, Rm 26-100. Admission \$.50, ID required.

Taming of the Shrew** - LSC. Sun, Mar 16, 6:30 & 9pm, Rm 26-100. Admission \$.50, ID required.

Lobby 7 Events

Tae Kwon-Do Demonstration* - Jae Kim, president. Wed, Mar 5, 12n.

Suitcase Circus* - Mime group. Thurs, Mar 6, 12n.

Music for Guitar* - Andrew Cohen. Fri, Mar 7, 12n.

Marty & Fred* - Classical guitar. Tues, Mar 11, 12n. Free.

MIT Horn Club* - Wed, Mar 12, 12n. Free.

Music

MIT Chamber Music Society Concert* - Baroque and Rococo music in three parts by Rossi, Pergolesi, Jenkins and Boyce. Wed, Mar 5, 5:15pm, Music Library. Free.

French Flute Sonatas* - Carol Epple & Nancy Roth, Baroque flutes; Margaret Panofsky, viola da gamba; Frances Fitch, harpsichord. Thurs, Mar 6, 12n, Chapel. Free.

Qawwali Music from Pakistan* - Sabri Brothers of Pakistan. Non-Western Music Program at MIT. Sat, Mar 8, 8pm, Kresge. Admission: \$1 w/MIT or Wellesley student ID, \$3 others.

Chapel Concert* - Marion Ruhl, soprano. Thurs, Mar 13, 12n, Chapel. Free.

Music Library Concert* - John White, piano, and Rodney Godshall, bass playing works by Nietzsche. Thurs, Mar 13, 5:15pm, Music Library. Free.

Spring Festival of Jazz* - MIT Festival Jazz Ensemble, MIT Concert Jazz Band, Halbert White Sextet, Harvard University Jazz Band, Lowell State College Studio Orchestra. Fri, Mar 14, 8:30pm, Kresge. Free.

MIT Symphony Orchestra* - Program includes Schubert, Carl Ruggles, Mozart and Bartok. Sat, Mar 15, 8:30pm, Kresge. Admission: \$1 at door.

MIT Glee Club Concert* - Singing "King David" by Honnerer. Sun, Mar 16, 3pm, Kresge. Admission \$1 at door.

Classical Guitar Society* - Featuring Nicholas T. Secor. Sun, Mar 16, 8pm, Kresge Little Theatre. Admission: \$1.50.

Ali Akbar Khan in Concert* - The noted Indian sarodist will be accompanied by Zakir Hussain on the tabla. Sat, Mar 16, 8pm, Kresge. Tickets: \$3 & \$5, at the door. Reservations: Tritantri Kala Kendra school of Indian music, 277-9104.

MIT Chamber Music Society Concert* - Wed, 5:15pm, Music Library. Free.

Dance

Scottish Country Dance Classes* - Sponsored by the Folkdance Club. Teachers from the Boston Branch of the Royal Scottish Country Dance Society. Basic classes: Wed, Mar 12 & Tues, Mar 25; 8-10pm, Stu Ctr Rm 407. Free.

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 5pm, Stu Ctr 491.

Theatre

One-Act Plays* - Dramashop presents *The Bedtime Story* by Sean O'Casey and *Resurrection and Calvary* by W. B. Yeats. Fri, Mar 14 & Sat, Mar 15, 8:30pm, Kresge Little Theatre. Free.

Exhibitions

Crossroad: Black America* - Photography exhibition by free-lance black photographer, Roland Freeman. Creative Photography Gallery, Fri, Feb 28-Wed, Mar 19, 10am-6pm, 3rd fl Bldg W31. Free.

Amos Chan: Photographs* - Sponsored by the MIT Committee on the Visual Arts. Fri, Feb 21-Sun, Mar 23, Hayden Corridor Gallery (Bldg 14W).

Drawings by Abstract-Expressionist Painters* - Works by Willem de Kooning, Arshile Gorky, Jackson Pollack, Franz Kline and Philip Guston. Fri, Feb 21-Wed, Mar 26, daily 10am-4pm, and Tues 6-9pm, Hayden Gallery.

Faculty Club Exhibit* - Metal and stained glass sculpture by Rose Miller. Mon-Fri March, 9am-11pm, 6th fl Bldg E52.

Joan Brigham - Steam Fountain Projects* - Drawings of a project which would tap existing underground steam lines in Boston. Mar, Mon-Fri, 9am-5pm, Center for Advanced Visual Studies (W31).

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.

Photographs* - Showing the original 19th century MIT buildings in downtown Boston and step-by-step views of construction in Cambridge. Bldg 4 Corridor.

Athletics

Home Schedule* - Friday, March 7 & Saturday, March 8 - V Fencing. Intercollegiate Fencing Assoc Championships, duPont fencing room. **Saturday, March 8 - Rifle.** NRA Collegiate Sectional, rifle range. **Saturday, March 15 - Pistol.** NRA Collegiate Conventional Sectional, 9am, duPont pistol range. **Sunday, March 16 - Pistol.** NRA Collegiate International Sectional, 9am, duPont pistol range.

Student Community Baseball - Begins Sat, Apr 5. Sign up at the IM office, W32-132, by 5pm, Tues, Mar 11. Cost: \$5/player. Info: Tom, x3-2435, 661-1926.

Rugby Football Club Practices** - Tues & Thurs, 8pm, Rockwell Cage. Full medical insurance necessary. Info, x3-6221.

Women's Athletic Council* - Meetings 1st & 3rd Tues of each month, 7:30pm, duPont conference rm. Info: Mary Lou Sayles, director of women's athletics. x3-4910.

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

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

Send notices for March 12 through March 23 to the Calendar Editor, Room 5-111, Ext. 3-3279, before noon Friday, March 7.



MICHELANGELO'S DAVID serves as a model for a hologram in three-dimensional images—one of 40 demonstrations scheduled for MIT Employees' Day, Sat., Mar. 22. The demonstration by Professor

Shaoul Ezekiel (1) and graduate student Tony Pires is a joint presentation of the Department of Aeronautics and Astronautics and the Research Laboratory of Electronics.

Open House Coming

(Continued from page 1)
operators, to name a few of MIT's support personnel.

The effort was conceived and filmed by Ms. Megan Marks, training coordinator for Building Services.

She said that the devices used to carry out the heavy "behind-the-scenes" work of MIT's Building Services and Physical Plant Departments would also be on display in one of the day's main exhibit areas. Battery-powered sweepers, scrubbers, water pick-up machines are some examples of the equipment vital to the jobs of 540 employees of those departments.

The question, "How does MIT run?" also serves as a point of departure for more than 35 other Employees' Day exhibits.

Professor Shaoul Ezekiel, associate professor of aeronautics and astronautics, will take up questions people frequently ask about laser holography, while Professor Samuel M. Fleming, of the Department of Chemical Engineer-

ing will treat the fundamental properties of casting in a demonstration that will provide souvenir MIT medallions to the children of Employees' Day visitors.

Employees will get an idea of how athletics function at MIT by either taking a tour of the DuPont Athletic Center facilities or having a free swim in the Alumni Pool, where bathing suits and towels will be provided.

Along the walls of the Sala de Puerto Rico in MIT's Student Center will be a unique record of photographic achievement: "Mike and Johnny Levens"—a father and son exhibit now on display at the Creative Photography Laboratory in Building W-31. Employees' Day visitors will be able to view the exhibit during the official open house reception scheduled for 2:00-3:30pm, where they will be received by Chancellor and Mrs. Paul E. Gray and other members of the administration.

Fencing Championships Slated

MIT will be the scene of the 78th Annual Intercollegiate Fencing Championships, Friday and Saturday, March 7 and 8. The I.F.A. is one of the oldest intercollegiate sporting events in the nation.

Twelve traditional schools are entered in this year's event. Army, City College of New York, Columbia, Cornell, Harvard, MIT, Navy, University of Pennsylvania, Princeton, Rutgers, Yale, and defending champion New York University.

The favorites for the three weapon championships are New

York University, Columbia and Navy. The Violets of New York University have won the team title two straight years and four of the last five I.F.A.s.

Besides the Alumni Three-Weapon Trophy, the entrants will be fencing for four other coveted awards.

The "Little Iron Man," oldest of all intercollegiate athletic trophies, goes to the victorious foil team. MIT won this award in 1974, the first time the Engineers have gained an individual weapon's team title in the history of the meet.

Twin loving cups, commemorating the achievements of former US Olympic fencers, are prizes for the successful epee and sabre teams, won by New York University and Columbia in 1974, respectively.

The George L. Cointe Award, presented by the Cornell University Alumni and undergraduate fencers in memory of their former fencing coach, will be awarded to the individual who best demonstrates the qualities of outstanding sportsmanship during the Championship competition.

MIT Experiment to Ride Aboard Apollo-Soyuz Flight

By CHARLES H. BALL
Staff Writer

The MIT research team that designed a highly successful crystal growth experiment for the Skylab space flights has prepared a new experiment for the upcoming Apollo-Soyuz joint US-USSR manned space mission.

The new experiment is an extension and refinement of the earlier research, in which indium-antimonide crystals were melted and regrown in space in order to study

the effects of zero-gravity on crystal growth.

The follow-up experiment is similar in design to the first experiment, according to Dr. Harry C. Gatos and Dr. August F. Witt, but "is far more sophisticated" and contains important new features. It was possible to incorporate these in the experiment, they said, "because we now know more and have more facilities available."

The MIT experiment is one of seven that will be done using a growth apparatus developed under the direction of the National Aeronautic and Space Administration's Marshall Space Flight Center in Alabama. The apparatus is an upgraded modification of the system used for the Skylab crystal experiments.

The experiments will be carried out by the US astronauts in the Apollo spacecraft that will link up in earth orbit with the Russian Soyuz spacecraft in the first international space flight.

The space mission, called the Apollo-Soyuz Test Project, is scheduled for launch July 15.

The crystal experimentation has been developed at MIT by Dr. Gatos and Dr. Witt with their associates at the MIT Center for Materials Science and Engineering.

Dr. Gatos is professor of electronic materials and professor of molecular engineering in the Department of Materials Science and Engineering and the Department of Electrical Engineering and Computer Science. Dr. Witt is professor of materials science and engineering.

In the Skylab III and IV experiments, carried out in 1974, crystals of indium antimonide were partly melted in space. Then the melted portions were regrown, in the absence of gravity, to enable the scientists to compare directly the portions of the crystals grown on earth and the portions grown in space.

The scientists described the results as beyond their expectations, demonstrating that space-grown crystals were perfectly uniform—a type of uniformity never achieved on earth.

"Successful as our experiments were in the Skylab mission," the scientists said, "they were by necessity limited in scope."

For example, they said, because of power limitations it was not possible to incorporate in the Skylab experiment instrumentation for a continuous recording of the microscopic rate of growth.

But this will be done in the Apollo-Soyuz mission, with its greater power availability, by pulsing electrical currents into the crystals as they grow.

The additional power also will make it possible to perform the experiment with germanium, which has a higher melting point than indium antimonide and for which electrical analytical techniques are available for the quantitative analysis of crystal growth and segregation phenomena.

Mumford to Speak

Dr. Lewis Mumford, Charles Abrams Visiting Professor of Urban Studies at MIT, will deliver the first of three lectures on *The Old Culture and the New Technology* Tuesday, March 11, at 4pm in Rm. 9-150.

The Mumford lecture series, sponsored by the Seminar on Technology and Culture at MIT, will summarize, refine and expand on the major themes about which Dr. Mumford has been speaking and writing throughout his career as a scholar.

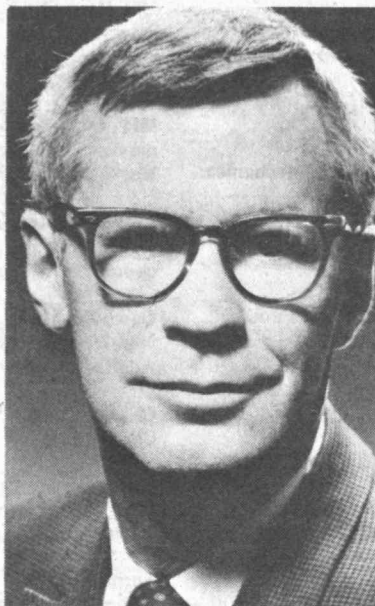
David Saxon, '41, to Head University of California

An MIT alumnus, Dr. David S. Saxon, has been named to become president of the University of California on July 1.

The 55-year-old Saxon, a member of the University of California faculty since 1947, is currently provost of the university-wide system and executive vice chancellor of the Los Angeles campus. He was appointed fourteenth president of the university on Saturday to replace Charles J. Hitch, who is retiring.

Saxon, a native of St. Paul, Minn., received the SB and PhD in physics from MIT, in 1941 and 1944. He was with the staff of the MIT Radiation Laboratory from 1944 to 1946, when he became an associate physicist with Phillips Laboratories in New York. He went to UCLA as an assistant professor of physics the next year.

His fields are theoretical physics, nuclear physics, quantum



Dr. Saxon

mechanics and electromagnetic theory. He won the Distinguished Teaching Award at UCLA in 1967.

Blood Drive to Open Today

(Continued from page 1)

March 14, will be opened from 9:45am to 3:30pm all weekdays except Thursday, March 6 and Monday, March 10, when the hours will be from 2:30pm to 8:15pm.

"In past years, MIT has been the largest educational donor in Massachusetts and, because we have this excellent record, all members of the MIT community and their families receive unlimited free blood coverage from the Red Cross," said Marian Tomusiak, blood drive chairman. "It is important, however, for MIT to maintain a good record for this coverage to continue."

The response to the drive has been unusually slow this year, with only 800 appointment forms returned—about half the response expected. "We hope to get more registration forms in and we are also welcoming walk-ins," she said.

Registration forms can be obtained from the roving blood drop, in the lobby of building 10 or from the Technology Community Association Office (W20-450). Those 17 years of age and younger need parental permission.

To encourage donors, two competitions, one between fraternities and one between dormitory living groups will be held. Winners, who will each receive a half keg of beer donated by Dormcon, will be determined by the ratio of donors to the number of people in the living group or fraternity.

Also, any donor may "trade a pint of blood for a pint of beer." At the drive, the donor will receive a receipt for a free beer at the next Strat Rat, Saturday, March 15. The beer is being donated by the Student Center Committee.

Any further questions on the drive can be answered by calling the TCA office at x3-7911 or 3-4885.



TYPE A? Jerry Puzo (inside the blood drop) Gail Rubin (left) and blood drive chairman Marian Tomusiak advertise the drive in the lobby of Building 7.

This Week in Sports

Fencers Win Sixth New England Title

By PETER M. CLOSE
Director of Sports Information

MIT's fencing team swept aside all competition as it rolled to its sixth straight New England intercollegiate title at Boston College last Saturday. The Engineers won all three individual weapon titles totaling 54 points, easily outdistancing runnerup Brandeis who had 41.

Tech's individual weapon winners were Senior C. Dong Park (Demarest, New Jersey) sabre, Sophomore Richard Reimer (Richmond Hill, New York) foil, and Senior Holt Farley (Annadale, New Jersey) epee. Park and Farley were defending champions in their respective events. MIT's other top scorer was Sophomore Arlie Sterling (Norfolk, Mass.) who placed third in the foil.

Last weekend's championship marks the eighth New England title won by Coach Silvio Vitale. The MIT veteran coach of twenty-five years has posted a career total of 135 victories. The current crop of fencers were 14-2 during the regular season, winning thirteen straight before the New England Championship.

Sports Notes

—Senior Gary Wilkes (Brooklyn, New York) placed fourth in the New England Collegiate Track and Field Championships last weekend and teammate, Sophomore Richard Okine (Aflao, Ghana) took a fifth in the 50 yard hurdles. Both trackmen are eligible to compete in this weekend's annual I.C.4.A Championships at Princeton University.

—MIT's pistol team (7-1) earned their best win of the current season, beating Navy 3, 176-3, 160. The Engineers also demolished Boston State 3, 176-2, 784. Junior Steve Goldstein (Providence, Rhode Island) led the Tech marksmen with an 815 X 900. The shooters' next competition is the National Collegiate Sectionals at MIT, March 15.

—MIT's Gymnastic team (2-8) on the regular season, came up with a creditable fifth in last weekend's New England Championships at Plymouth State.

—In the National Collegiate Squash Championships at Princeton, MIT's number one player Masood Ahmed (Karachi, Pakistan) lost in the first round to William's Frank Giammattei, three games to two. Masood had lost to Giammattei earlier this season by the same games margin. Masood then proceeded to win his first two matches in the consolation bracket only to lose in the finals to Franklin and Marshall's John Edwards, three games to one.

—Junior Peter Horowitz (Croton, New York) jumped to a hill record of 82 feet at Rindge, New Hampshire as the MIT ski team placed third in the Franklin Pierce Carnival.

Basketball Ends

MIT's basketball team (9-16) finished their season losing to W.P.I. 75-69 last week but Senior Captain Al Epstein (Great Neck, New York) finished his season and career just the way any one basketball player would like to call it a game. The six-foot, backcourt ace hit his last nine shots from the floor and finished with 20 points for the night. Epstein, who broke his own single season assist mark with 148, finished his collegiate career scoring 508 points (7.2 p.p.g. average). His 376 career assists also are an MIT record.

In retrospect, the season was disappointing in the won-lost column, but there were some outstanding individual efforts throughout the campaign.

Junior forward, Cam Lange (Houston, Texas) finished the year with 563 points (22.5 p.p.g. average) and moved up to third on the All-Time MIT career scoring list with 1,301 points. Lange was named three times to the E.C.A.C. Division III weekly All Star team. Junior center Pete Jackson (St. Louis, Missouri) raised his career total to 954 pints and should be Techs seventh 1,000 point scorer early next year. Jackson tallied 451 points (18.8 p.p.g. average) this season, and was named once to the E.C.A.C.'s weekly All Star squad.

Lots of Orders For Sloan Review

The article by Philip H. Dougherty in the *New York Times*, referring to the Winter issue of the Sloan Management Review, read: "Copies can be obtained from the Review in Cambridge, Mass., 02139, for \$4. It might be worth the investment." A lot of folks took his advice.

The first batch of mail to arrive at the Review office in E52 after Dougherty's column appeared Feb. 18 contained 65 requests. The next day 77 more arrived. The day after 101. Mail requests for the issue had reached 431 by the end of last week and about 65 phone calls had been received.

The article in the Review on which Dougherty's column focused led the Winter issue and reported on a study which showed how Annheuser-Busch cut Budweiser advertising expenditures yet increased sales. Several newspapers in other cities which take the *New York Times* news service also picked up the story.

Positions Available

(Continued from page 9)

Neutron Activation Analysis utilizing Cockcroft Walton neutron generator. Experiments involve phantom targets and animal subjects. Coordinate data collection with other research agencies; carry out data analysis on Ge(Li) detector gamma ray spectra; program new data analysis systems. BS degree, experience in biomedical radiation physics, dosimetry measurements, chemical analysis for phantom development. New graduates, please submit list of relevant courses taken. 40 hr/wk. Position runs March 1-August 31, 1975. D75-24 (2/12).

DSR Staff, temporary, in Joint Center for Urban Studies will work on study of inter-regional migration; review data sources on US migration patterns; develop model and computer program for analysis; prepare written report. Ph.D. or equivalent in urban planning, graduate level study in sociology, experience in development of computer-simulated models, advanced programming capability required. Job runs 3/1/75-1/31/76. D75-26 (2/12).

Admin. Staff, Business Officer, in Harvard-MIT Program in Health Sciences and Technology will manage budgetary and administrative affairs of interinstitutional aspects of Program; prepare, maintain and control budgets, prepare grant applications, progress, manpower and patent reports; execute principal investigator and Steering Committee directives, act as subcontractor liaison. Knowledge of Public Health Service and MIT grant and contract regulations, accounting skills, experience with research proposal preparation and administration required. A75-9 (2/12).

DSR Staff temporary, part-time, will do instrumental neutron activation analyses of rock samples including sample preparation, operation of a multichannel analyzer, and semiconductor detectors; data analysis. Lab experience in analytical geochemistry, specifically in areas above, required. Frequent night and weekend work required. Half-time apt. 7 months. D75-22 (2/12).

Admin. Staff Asst. Accounting Officer for Student Loans, in Comptrollers Acctg Office will assist in collection of student loans through personal interviews, correspondence with borrowers; maintain control of data for computerized loan system; act as liaison with computer operations; assist in preparation of management and government accounting reports. BS in accounting or business management, ability to exercise tact, judgment, accounting experience necessary. Previous account collection experience helpful. A75-8 (2/5).

Admin. Staff, Asst. Programming Coordinator, Office of Administrative Information Systems will review program specifications, assist in control of program schedules, develop program standards, assist in staff education relating to new concepts, act as technical liaison for new systems development; design and write programs; perform other related functions as required. Experience with PL/1, COBOL and BAL required. A75-7 (2/5).

DSR Staff, Programmer in Project MAC Automatic Programming Group to work on the construction of a system to convert English descriptions of management information systems into PL/1 programs; refine syntax for expressing intermediate levels of system description; implement software for translation; determine and implement criteria for optimizing PL/1 program output. Knowledge of LISP 1.5 language, mgt. inf. systems implementation techniques and mathematics related to optimizing configurations in a stochastic environment required. Position begins 6/1/75. D75-20 (2/5).

DSR Staff, Programmer in Clinical Decision Making Group, Project MAC will supervise construction and clinical testing of computer system to advise physicians regarding the administration of digitalis. Familiarity with pharmacokinetics of digitalis and its clinical administration, general medical knowledge including cardiovascular physiology, thorough knowledge of LISP 1.5 and ITS operating system required. D75-19 (2/5).

DSR Staff, temporary, Programmer, in Project MAC will design and implement multi-variate Laurent and pusieux series expansion system and combinatorial simplification routines. Several years of experience in programming of symbolic manipulation algorithms, LISP and ITS experience. BS and/or MS, Math, required. Temporary through August 31, 1975. D75-18 (2/5).

DSR Staff, temporary, part-time, in Joint Center for Urban Studies will develop and administer telephone interviews to explore status and social stratification; code and keypunch other questionnaire data. BA in sociology, some experience in design and

administration of survey research instruments, knowledge of SPSS and other statistical instruments for programming required. Recent graduates, please submit list of relevant courses taken. 21 hrs/wk. Temporary through 6/30/75. D75-29 (2/19).

Technical Assistant, Acad. Staff in Nutrition and Food Science will perform specialized and routine chemical analyses on body fluids; operate and maintain mass spectrometer, Beckman automated amino acid analyzer; assist in new methodology development; occasionally supervise other lab personnel. BS, chemistry, biology or medical technology and minimum 2 years experience in clinical chemistry required. C75-4 (2/5).

DSR Staff, Senior Research Engineer, Energy Lab, will perform research functions in Magneto-hydrodynamics Test Facility including the design of high temperature electrode insular test modules; fabrication of ceramic compositions by sintering, melting, flame spraying; design diagnostic equipment for measurements in MHD test channel. Will assist graduate students with experiments; write technical progress reports. Ph.D. in Ceramics. 5 yrs. experience in high temperature materials test and characterization equipment (SEM, Microprobe, Instron, etc.) required. D75-15 (1/29).

DSR Staff, in Sloan School System Dynamics Group will assemble, organize and maintain computer files and develop command procedures for the execution of the national economic model. Bachelor's degree (Math., Eng., or Science), strong interest in both economic and system dynamics, minimum 1 yr programming experience required. D75-17 (1/29).

DSR Staff in Arteriosclerosis Center will have responsibility for maintaining fiscal records for grants shared between Institute and Mass Gen'l Hosp; process payroll, personnel and purchasing actions; assist in Federal and other grant proposal preparation; act as liaison with MGH. Strong accounting background, experience in grant administration, familiarity with MIT and/or MGH accounting, personnel functions required. D75-14 (1/29).

DSR Staff, Electrical Engineer, in National Magnet Lab, will perform daily operation of Low Field Lab; maintain sensitive magnetic detectors and display equipment, design and construct new equipment, perform human body measurements. Laboratory-oriented person with knowledge of low-frequency electronics, and experience with magnetics and cryogenics is desirable. Candidates should be able to work with hospital patients and to do occasional evening and weekend work. 40 hr/wk. D75-7 (1/22).

DSR Staff, Biophysicist, in National Magnet Lab will supervise day-to-day operation of Low Field Lab where magnetic fields produced by the human body are measured, perform specific lab measurements, design lab equipment. Experience with low-frequency electronics, magnetics, heart and lung physiology required. Must be available for occasional evening and weekend work. 40 hr/wk. D75-8 (1/22).

Admin. Staff, Systems Programmer, in Programming Development Office will work on IBM 370/145, with DOX, providing support to the application programming group and some user applicants should be familiar with IBM operating systems and assembler language. Experience with PL/1 and CICS desirable. A75-3 (1/22).

Admin. Staff, in Sloan School System Dynamics Group will have responsibility for organizing and coordinating liaison with outside professional and financial sponsors for major multi-sponsored project dealing with socio-economic change in US. 5-10 yrs senior level public policy background in long-term national and/or global issues (i.e., resources, energy, food, economic growth). Extensive writing, public speaking required. Knowledge of and/or willingness to learn system dynamics methodology and application to national and world issues essential. Grant/contract management experience desirable. A75-4 (1/22).

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

DSR Staff, in Joint Center for Urban Studies will be principal researcher on development of computer-based man-

power information system for construction industry, labor unions. MBA, 2 years experience in industrial labor relations, working knowledge of construction industry, and ability to supervise program development and operational system required. 74-1484-R (1/8).

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

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. Bachelor's 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 scientific and technological publications. 74-1397-R (11/20).

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, the ability to work effectively with students required. 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 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 microanalysis and assessment of data. Ph.D. in plasma physics or related area required; familiarity with tokamak devices desirable. 74-1136-A (9/11), 74-1512-A (1/8).

DSR Staff 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).

In-patient Staff Nurse, Exempt, in Infirmary will do bedside nursing and may assist with emergency and first aid treatment. Mass. licensed RN with 2 yrs experience in medical/surgical nursing required. First-aid or emergency clinic experience desirable. Must be able to work all shifts and weekends on rotating basis. (40 hrs) E75-5 (3/5).

Clinic Nurse, Exempt, in Emergency Clinic will evaluate and treat patients, administer first aid and admit patients as necessary. Mass. licensed RN with 2 yrs clinic experience, preferably in emergency room required. Expertise in physical assessment desirable. Must be able to work permanent evenings (4pm-12am) and rotate all weekend shifts. (40 hrs) E75-6 (3/5).

Engineering Asst., Exempt, temporary, in Earth and Planetary Sciences will design and construct low noise electronics for use with imaging system employing the silicon vidicon. Background in electrical engineering, 1 year experience in circuit design using junction field effect transistors (JFETS) desirable. Position is for 6 months. E75-4 (2/19).

Administrative Assistant, Exempt in Civil Engineering Student Information Office will have responsibility for operation of office, including implementation of academic policy deci-

sions, maintenance of student records and statistics, coordination and editing of catalog copy, counseling of students, recording secretary for departmental committees. Knowledge of MIT policies and procedures, ability to operate independently, organization and office management skills required. Bachelor's degree preferred. E75-1 (1/22).

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

Tech. Asst. IV part-time, in Psychology Dept. neurophysiology lab will be involved in mammal motor control and coordination research. Primary duty is care, feeding and training of animals; will also manufacture testing equipment, assist in laboratory procedures, in data analysis and in general upkeep of lab. Familiarity with elementary electronics and digital logic helpful. High school graduate, or equivalent, required. 30 hr/wk. B75-79 (3/5).

Admin. Asst. V to Director, Fossil Fuels Program, Energy Lab, will handle administrative and secretarial duties; type, edit, verify accuracy of technical material; independently compose correspondence; coordinate work of other secretary during peak loads; arrange meetings, travel; assist in registration process and perform other duties as required. Individual may monitor accounts and set up library. College degree, 5-7 yrs secretarial experience, knowledge of MIT procedures required. B75-85 (3/5).

Secretary V to faculty and staff members in Mechanical Engineering will direct students and technicians in MIT procedures, supervise other secretaries, maintain student records, maintain accounts records, perform other standard secretarial duties as required. Excellent typing, preferably technical, ability to compose own correspondence, organization skills required. B75-88 (3/5).

Secretary IV to two Offices of Industrial Liaison Program will assist in providing services to member companies, arrange campus and company visits, distribute research publications, arrange meetings, compile statistics, prepare proposals and perform standard secretarial duties. Maturity, shorthand/speedwriting skill, previous secretarial experience required. B75-87 (3/5).

Secretary IV to an Associate Director of the Alumni Fund. Will develop and maintain consolidated file for major gift development, compose some correspondence independently, arrange meetings, luncheons, do some statistical work. Good typing, shorthand/speedwriting, and some college training required. Flair for writing and financial public relations background helpful. Will be trained to use IBM Auto Typist. B75-86 (3/5).

Secretary IV to Director, Development Office, will handle general office duties including large volume of error-free typing, plan and lay-out typed materials, arrange appointments and schedule, operate IBM Magnetic Card II typewriter (will be trained). Excellent typing, editing, proofreading, organization skills required. Shorthand helpful. B75-26 (1/22).

Secretary III-IV in Artificial Intelligence Lab will handle secretarial duties for faculty member and assistant; compose memos and letters, type proposals and manuscripts; assist group secretary in publication typing and maintenance of group library; perform other standard office duties. Accurate typing, editing skills, willingness to learn computer editing and to work with frequent interruptions required. B75-53 (2/5).

Secretary III part-time, in Earth and Planetary Sciences will manage office one full day per week in absence of regular secretary; type, answer phones and perform other standard secretarial duties. Good typing skills and ability to work independently required. Knowledge of MIT procedures helpful. Position is for one day per week, preferably mid-week. B75-77 (3/5).

Secretary III in Medical Department will transcribe case histories, routine correspondence, prepare mailing, file, assist with other secretarial duties in a variety of areas; provide support of 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).

Library General Asst. III in Libraries Catalogue Section will type master catalogue entries on OCLC 100 terminal; perform clerical aspects of reclassification and cataloguing; type reference cards for authority files and divisional catalogues. High school graduate or equivalent with some college or business school training; excellent

typing skill, ability to implement complex directions required. Library experience helpful. B75-76 (2/26).

Sr. Clerk IV in National Magnet Lab will type letters and various forms, process invoices for payment, reconcile accounts, prepare budget reports and perform related duties as required. High school graduate, or equivalent, typing skill, previous office experience required. B75-84 (3/5).

Sr. Acctg. Clerk IV in Earth and Planetary Sciences will monitor several accounts, process accounting and payroll material; maintain current records to assist in budget proposal preparation and purchasing decision; perform related duties as required. Some typing may be included in position. Ability to handle detail and work with figures required. Accounting background helpful. B75-89 (3/5).

Sr. Clerk III-IV to the Director of Purchasing and Buyer for Furniture and Office Equipment will handle a variety of clerical duties. Accurate typing required for correspondence, purchase orders, budgets, price lists; process invoices; maintain log books, files and schedules. Ability to determine priorities, to deal with figures and details, and to work with frequent interruptions required. B75-83 (3/5).

Clerk III, part-time, temporary in Office of Personnel Relations will assist in the assembly and manuscript typing of benefits and policy statements. Grammar and typing skill, resourcefulness required. Familiarity with MIT helpful. 17½ hrs/wk., for approx. 2 mos. B75-78 (3/5).

Technical Typist III in Chemical Engineering will type reports, manuscripts, proposals from rough drafts and with use of word-processing equipment. Excellent typing, organization and grammatical skill, technical typing (or willingness to learn), necessary. Work will be coordinated by secretarial supervisor. Possible job-sharing opportunity. B75-38 (1/29).

Acctg. Clerk III in Comptroller's Acctg. Office Benefits section, will type letters and forms, act as receptionist. Opportunity for training for other department functions. Typing skill, ability to use adding machine, accuracy with figures required. Familiarity with computerized systems desirable. B75-61 (2/12).

Clerk II, part-time, in Chemical Engineering will assist secretaries in headquarters and graduate office: route materials, xerox, file, maintain office supplies. Willingness to assist in routine tasks required. 15-20 hrs/wk. B75-73 (2/26).

Emergency Medical Service Asst., h/ry 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).

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).

Grounds crew member in Physical Plant will lift heavy loads such as rubbish, platforms, fertilizer, concrete blocks, lumber, gravel and equipment onto trucks; shovel snow. Should be experienced in grounds crew duties such as cutting grass, watering lawns, and general care of lawns. Mechanical aptitude helpful. Special physical examination to meet needs of Grounds Operations. Mass driver's license required. H75-12, H75-13 (2/26).

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 (2/26).

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

B75-67	Sr. Clerk IV
B75-32	Secretary III
F75-2	Messenger II
B75-69	Secretary III
E75-2	Exempt
A75-2	Admin. Staff
B75-65	Secretary III-IV
F75-1	Dishwasher
B75-66	Secretary III
B75-72	Secretary III
74-1110-A	DSR Staff (cancel'd)
74-1301-A	DSR Staff (cancel'd)
B75-40	Secretary IV
b75-71	Clerk-Typist II
B75-75	Lib. Gen. Asst. III
74-1485-R	Secretary III
B75-64	Secretary III

The following positions are on HOLD pending final decision:

74-1366-R	Admin. Staff
B75-34	Sr. Clerk IV
74-1495-R	DSR Staff
C75-2	Acad. Staff

INSTITUTE NOTICES

Announcements

Talbot House Committee—GSC is now accepting nominations for an opening on the Talbot House Committee. All graduate students are eligible. GSC, Rm 50-110, x3-2195.

Students Needed for 24 Hour Coffeehouse—Students needed to work varied hours at the Coffeehouse. An all-student staff is needed, and the Coffeehouse may have to close down if interested students aren't found. UA office, x3-2696.

BSO Discount Tickets—Tickets for Thurs, Apr 2 open rehearsal are now available at TCA, Stu Ctr Rm 450, x3-4885, 11am-3pm.

Student Discount Tickets—For the Boston Ballet Thurs, Mar 13-Sun, Mar 16, Music Hall. Order thru TCA, Stu Ctr Rm 450, x3-4885, 11am-3pm.

Technical Typing Course—Offered by the Training Section of the Office of Personnel Development. Class meets Tues & Thurs, 11am-12n, Mar 11 thru May 1. Info: Thelma Chandler, x3-1912.

Family Day Care Program—Openings for children 3 months to 5 years for part or full-time care. Homes available on campus, in Camb, Belmont, Arl, Wellesley, Lex. Child Care office, Rm 4-144, x3-1592.

Technology Children's Centre Cooperative Nursery School—Summer school will run from June 16 to July 25. Both Eastgate and Westgate will have 5, 3 or 2 day programs for children 2 $\frac{1}{2}$ -4 $\frac{1}{2}$ years old. Fran Olson, director, x3-5907.

Association for Women Students—Patricia A. Graham, former professor of history, Barnard College; author of *Women in Academia*; head of the Radcliffe Institute, will speak on "Women & the Work Force." Co-sponsored by AWS and WISE. Wed, Mar 5, 8pm, Rm 3-310.

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.

Retroactive UROP Credit

It has come to our attention that certain UROP laggards are petitioning to register retroactively for fall term 1974 UROP credit (or even before). Be it known that if you are doing so due to your own screw-up, e.g., not seeing your advisor to make out an Add Card, not turning in a Roll Card, not submitting a Lab Requirement petition to COC in advance of seeking substitution of your work for the requirement, etc., CAP and COC probably will not smile on your case.

Clapp and Poliak Engineering Design Awards

Funds are still available for Clapp and Poliak Engineering Design Awards for the spring and summer. These awards are available to MIT undergraduates to support projects which best suit the donor's stated objective which is "to give greater recognition to the role of design in engineering education" and "to contribute to the advancement of design as an area of professional study and specialization, by providing an opportunity for qualified students to further their education in this broad field." Undergraduates are encouraged to submit proposals for materials and supplies and/or wages for engineering design projects.

Professor Flowers, Rm 3-453A, x3-6234, or UROP.

Operations Research Center

The Operations Research Center is considering delivery systems for both inter-departmental and outside mail for the Institute. The aim is to develop a more efficient system for receipt, distribution, and collection of mail. The project involves both 1) data collection and analysis to assess the demands on the system in terms of distribution patterns for mail, and 2) design of a delivery system to process these demands as best as possible.

T.L. Magnanti, x3-6604, or J.F. Shapiro, x3-7165.

Modern Procedures for Clinical Psychological Testing

Clinical psychological tests may be classified as either subjective or objective depending on whether or not the clinician is required to interpret the responses. Objective tests such as true/false are susceptible to the subject willfully giving incorrect answers, while subjective tests are susceptible to variabilities of the clinician (interpreter). New procedures are being developed for administering and objectively scoring classical tests (such as Rorschach Ink Blot test) which offer potential advantages in terms of reliability and ease of use. Opportunities are available for undergraduates to help in designing the tests and writing computer programs to facilitate the interpretation of the results.

R.E. Curry, Rm 37-219, x3-7756.

Bolt, Beranek & Newman, Inc.

The Physical Sciences Division (Division I) of BBN has suggested three research project areas for undergraduates: 1) An investigation of the relationship between the acoustical properties of tissue and specific pathological states (biophysics/biomedical engineering/medical ultrasonics). 2) The development of analytical techniques relating ultrasonic measurements to the acoustical properties of tissue in the presence of scattering and multiple reflections (medical ultrasonics/applied math/applied physics/biomedical engineering). 3) The development and evaluation of new piezoelectric techniques for producing short, broad-band pulses of ultrasound (electrical engineering/medical ultrasonics/biomedical engineering). Credit only, with possible funding available in the future.

Cabot Corporation.

Satellite Division Kokomo, Ind.
Cabot Stellite is a producer of abrasion resistant, corrosion resistant, and high temperature resistant alloys. Cabot has requested assistance in research to determine the recrystallization characteristics of two new corrosion resistant alloys. It is suggested that metallographic techniques be utilized to define the recrystallization temperature and rates of grain growth leading to appropriate mathematical treatments of grain growth kinetics. Work can be done at MIT with continuation into the summer a possibility. Pay or credit available.

Natick Research Labs

The Natick Army Research Labs would like to discuss research possibilities with MIT undergraduates. The Labs are engaged in a large number of research projects of concern to the civilian sector as well as to the Army. The following areas are being studied at the Labs: organic materials, food and nutrition, applied math, physics, psychology, human engineering, textiles, heating, refrigeration, mechanical compression, microwave heating, computer-aided manufacturing, packaging, pollution abatement, environmental medicine, and engineering communications. Pay or credit available.

Placement

The following companies will be interviewing during the time period covered by the current Institute Calendar. Those interested may sign up in the Career Planning and Placement Office, Mon-Fri, 9am-3pm, Rm 10-140, x3-4733.

Wednesday, March 5—The Analytic Sciences Corp; Aluminum Co of America (ALCOA); The Boeing Co; Colgate-Palmolive Co; Jefferson Chemical Co, Inc; Logicon, Inc; Tektronic, Inc; Texas Instruments, Inc.

Thursday, March 6—Applied Physics Lab of the Johns Hopkins Univ; American Hospital Supply Corp; Becton, Dickinson & Co; Loral Corp, Electronic Systems & IAC Div; Lulejian & Associates, Inc; Arthur G. McKee & Co; Mobil Oil Corp; Monolithic Memories, Inc; Union Carbide Corp, Carbon Products Div.

Friday, March 7—Applied Physics Lab of Johns Hopkins Univ; Lulejian & Associates, Inc.; Arthur G. McKee & Co; Mobil Oil Corp; Monolithic Memories, Inc; Union Carbide Corp, Carbon Products Div; Union Carbide Corp, Linde Div; Union Carbide Corp, Chemicals & Plastics Div; Digital Equipment Corp; Ingersoll-Rand Co; Martin Marietta Aerospace.

Monday, March 10—Cypheretics Corp; Environmental Protection Agency; Sanders Associates, Inc.

Thursday, March 13—American Smelting & Refining Co; The BDM Corp; CBS Lab, a Div of CBS Inc; Duffy Mott Co, Inc; General Electric Co; General Resistance, Inc; Naval Sea Systems Command & Naval Ship Engineering Center; Ocean & Atmospheric Science, Inc; RCA Corp; Worthington Pump Inc.

Friday, March 14—General Resistance, Inc; Naval Sea Systems Command & Naval Ship; General Atronics Corp, a subsidiary of the Magnavox Co; Goddard Space Flight Center; Uniroyal, Inc.

MIT Club Notes

MIT Chapter of AAUP—Open meeting Wed, Mar 5, 12n, Rm 10-105.

A'nanda Ma'rga—Meditation classes Tues, 1:30-3:30pm, Stu Ctr Rm 407 and 8-10pm, Rm 36-153; Wed, 10am-12n, Stu Ctr 407.

MIT Ballroom Dancing Club—The club will be very active this term, with regular workshops, lessons & dances. For specific info watch for signs, or call Pete "Twinkle-Toes" Travis, 536-1300.

Bridge Club—ACBL Duplicate Bridge. Open pairs Tues, 6-9pm & Thurs, 7-10:30pm. Multiweek team of 4 events Fri evg & Sat aft (separate events), call for details. Intermediate Lessons: Thurs, 6:45pm, non-expert pairs games 7-8:30pm. All events Stu Ctr Rm 473. Jeff, 864-5571.

MIT/DL Bridge Club—ACBL Duplicate Bridge. Tues, 6pm, Stu Ctr Mezzanine Lge.

Chess Club Simultaneous Chess Exhibition—Lubomir Kavalek, 3rd-ranked chess grandmaster in the US, will play all challengers simultaneously on Thurs, Mar 13, 7:30pm-12n, Rm 10-105. Challengers should bring chess sets. Spaces are limited, pre-registration advised. Sponsored by MIT & Beefaroni Chess Clubs. Participation \$10 (\$7.50/members), observers free. Info: Merrill Kaitz, 489-1482.

MIT Go Club—Play Go game Thurs, 7:30pm, Stu Ctr Coffeehouse. Refreshments available.

MIT Gospel Choir—Members and musicians needed. Rehearsals are Sun, 4-6pm, Stu Ctr Rm 407. Those interested are encouraged to attend.

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

MIT Karate Club—Shotokan style. Classes Mon, Wed, 8-10pm, duPont Wrestling Rm; Fri, 6-7:30pm, T-Club Lge. Beginners welcome.

MIT Kung Fu Club—Instruction in the art of Chinese boxing, Northern Praying Mantis style. Classes Tues, Thurs, 7-9pm, Stu Ctr Rm 407. Visitors welcome. Info, Dave Smith, 494-8683.

MIT Numismatic Society—Wed, 7pm, Theta Delta Chi (372 Memorial Drive).

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

R/O Week Committee—Introductory, organizational meeting Thurs, Mar 6, 5pm, Rm 3-133. Interest forms are available in FAC office, Rm 7-103, for those who are unable to attend.

MIT Science Fiction Society—Meetings Fri, 5pm, Rm 1-236. Info: library, Stu Ctr Rm 421, x9144 Dorm.

MIT Scuba Club—Compressor hours Mon & Fri, 4-6pm, Alumni Pool.

Strategic Games Society—Offers opponents and discounts on merchandise to members plus gaming and periodical library. Sat during IAP, 1pm-1am, Walker Rm 318. Info: Steve Simmons, x8265 Dorm or Gary Brennan, x0280 Dorm.

Student Homophile League—Meetings 1st & 3rd Sun of the month, 4pm, Rm 1-132. Info, talk, help in coming out, call Tom at the Hotline, x3-5440. Come on out—the water's fine! Note: bulletin board moved to Bldg. 3.

MIT Tae Kwon Do Club—Beginner and advanced classes. Tues, Thurs, 5-7pm, Stu Ctr 491.

Tech Model Aircrafters—Flying in duPont Gym Sat, Mar 15, 6-10pm.

TCA General Meeting—Including discussion of Blood Drive next TCA party or dinner, HoToGAMIT. Tues, Mar 11, 7:30pm, Stu Ctr Rm 450. Old & new people welcome. Refreshments.

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—Thurs, 7-9pm, Rm 8-105. Dale, 354-1907.

Campus Crusade for Christ/College Life—Family time, singing, prayer, teaching from God's word. Fri, 7:30pm, Rm 37-252.

Catholic Belief Classes—Study group to look deeper into the Catholic faith. Thurs, 8pm, 2nd fl seminar rm, Bldg W2.

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

Cancer Researchers Give Dedication Symposium

(Continued from page 1)

the National Cancer Institute, National Institutes of Health; to the Arteriosclerosis Center from the Ambrose Monell Foundation and the National Heart and Lung Institute; and to the Cell Culture Center from the National Science Foundation.

The Center for Cancer Research is the largest of the three centers in the Seeley G. Mudd Building. It is a non-clinical center; its 70 researchers—professors, students and staff researchers—are approaching cancer research at the level of basic research. Research is divided into four major areas—virus research, cell biology, immunology and cell development. The center is supported by grants from numerous agencies, including the National Cancer Institute and the American Cancer Society.

The cancer center has obtained some of the cells and viruses needed for its research from the Cell Culture Center. This center was established in 1974 and funded by the National Science Foundation to provide cells and viruses in mass quantities to researchers, primarily in New England and the northeastern part of the US. There is no charge for the service. Applications from researchers are screened by a committee of professors from MIT and other universities.

Dr. P.W. Robbins, professor of biochemistry, is head of the laboratory. Mr. Donald J. Giard is director. The Cell Culture Center itself will be dedicated March 28. The program will include a symposium on cell biology, which will highlight the goals and aims of the National Science Foundation Human Cell Biology Program, under the leadership of Dr. Herman Lewis.

The Arteriosclerosis Center was established in 1971 to study the causes and prevention of arteriosclerosis—hardening of the arteries. The researchers are concentrating on atherosclerosis, the most common form of arteriosclerosis, and the most common cause of heart attacks and strokes. The center is operated in cooperation with the Massachusetts General Hospital. It is funded by the National Heart and Lung Institute and the Ambrose Monell Founda-

Hillel Services—Fri: Traditional 6:15pm, Kosher Kitchen; non-Traditional 8:30pm, Chapel. Sat: Traditional 9am, Chapel. Mon-Fri, Minyan 7:30am, Rm 7-102.

Interdenominational Holy Communion Service—All members of the Institute welcome. Wed, 5:05pm, Chapel. Revs Parvey and Crocker.

MIT Islamic Society—Congregational prayers Fri, 12:15pm, Kresge rehearsal rm B; discussion session Sat, 4pm, International Stu Lge (2nd fl Walker). Refreshments.

Lenten Prayer Group—Fri, 7:30pm, Interfaith (Bldg W2) bsmt. Will follow theme of Sun readings.

Prayer Time—Lunch hour prayer and Bible class led by Miriam R. Eccles. Fri, 1-2pm, Rm 20E-226a.

Prophets—Wed, 12n, 2nd fl seminar rm, Bldg W2. Bring lunch, drinks provided. Discussion of Old and New Testament Prophets.

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.

Vedanta Society—Services Fri, 5:15pm, Chapel. Swami Sarvagatananda will lead meditation & Gita discourses.

tion. Its director is Dr. Robert S. Lees, a physician and professor of cardiovascular disease.

The building dedication will begin at noon with a reception at the Faculty Club, followed by a luncheon. The dedication address

The Seeley G. Mudd Building is named for Dr. Seeley G. Mudd, physician, educator and philanthropist, who died in 1968.

During his lifetime, Dr. Mudd contributed more than \$10 million to private colleges and universities. In his will he established the Seeley G. Mudd Fund, with assets of more than \$40 million, to be used for construction of buildings bearing his name at colleges and universities across the nation.

3 Named at OAIS

Three changes in staff appointments in the Office of Administrative Information Systems have been announced by Joseph M. Patten, director of OAIS.

They are:

Paul J. Saia Jr., of Peabody, an assistant manager of systems development, has been appointed manager of systems development, replacing Kenneth T. Finney Jr., who recently joined Bell Canada Ltd. in Montreal.

Peter H. Flagg, of Reading, formerly a project manager, has been named to Mr. Saia's former post as assistant manager of systems development.

James F. Purtell, of Chelmsford, formerly an assistant programming coordinator, has been promoted to programming coordinator.

Share a Job?

Job-sharing is already a reality in a limited number of offices at MIT.

These successful experiments seem to indicate that job-sharing should be expanded. The Personnel Office encourages any current or prospective employees interested in flexible job-sharing opportunities to submit their names and available hours to their personnel officer. It is particularly helpful if people who wish to share job opportunities locate others with whom available hours would be compatible to cover a regular, full time work schedule.

Innovation Center Gets Response

In response to recent articles in the *Wall Street Journal* and the *Christian Science Monitor* on the MIT Innovation Center, under the direction of Dr. Y.T. Li, approximately 75 private inventors from outside the Institute have requested help from MIT students in developing their ideas.

The MIT Outside Innovation Program, a branch of the Center, is seeking student participation in the initial screening process and development of these unfinished inventions, ideas and products. Laboratory credit can be arranged.

Further information may be obtained from David Notestein, or Donna Savicki, at the MIT Innovation Center, Room 33-111, ext. 3-6947.

Berlin-type Wall Advocated to Heal Torn Cyprus

By LINCOLN P. BLOOMFIELD
(Lincoln P. Bloomfield is professor of political science in the MIT Department of Political Science. This commentary was recently presented on the WGBH-TV program, *The Evening Compass*.)

The Turkish Cypriots have said their proclamation is not a unilateral declaration of independence, but eventually envisage a federal republic of Cyprus. Nevertheless Athens has denounced it as arbitrary and illegal, and says it endangers the peace.

Thus the drama plays on to its logical—or illogical—finale. The Turkish Cypriots have for years felt their identity and political future threatened by calls for union with Greece—enosis—on the part of their Greek Cypriot neighbors who outnumber them four to one. The Turks have thus for years asked for autonomy in a bizonal federation. But the dominant Greeks rejected this and a UN force separated the sides for a decade until the Greek colonels, in a final spasm of irresponsibility,

ruptured the delicate balance last July with their anti-Makarios coup, followed five days later by the invasion of 40,000 Turkish troops. They are still there, occupying not 18 percent but 40 percent of Cyprus containing 70 percent of its mineral wealth—and responsible for 180,000 Greek refugees.

Recently some negotiations were underway on refugees, and possible solutions, and it may be, as the State Department will doubtless argue, that this-tilted

Turkish Cypriot leader Denktash and his associates into this new fait accompli.

Ironically, for the first time in years, there has been a government in Athens prepared to negotiate more generously with the Turks. But perhaps the most serious factor leading to the new crisis is the persistent weakness of the government in Ankara and its inability to negotiate seriously.

Greece may react violently or, if it does not, the unpredictable Archbishop Makarios might turn

to Moscow for help in facing down the Turks.

But in fact, the pre-conditions for a more lasting arrangement on that troubled island may be in process of taking shape. Indeed, two years ago, when he asked me what I would do, I half seriously advised Mr. Denktash to build a Berlin-type wall. There will surely be no peace on Cyprus until the two communities are effectively separated. But it must be on something approaching an equitable division of the territory.

Country Criticized for Past Policies

US Energy Independence Called Illusory Goal

A distinguished group of Americans—including Dr. Eugene B. Skolnikoff and Dr. Carroll L. Wilson of MIT—have characterized the goal of US energy independence by 1980 as illusory.

Such policies, they observed, are in conflict with Secretary of State Henry Kissinger's appeal to the United Nations for "our political imagination (to) catch up with our scientific vision."

In an 88-page report issued Feb. 3 by the United Nations Association the group of 24 corporate executives, scientists and academicians reported that the world is poorly organized to apply science and technology to urgent international problems of resources and development. The group also questioned the seriousness of the American commitment to resource conservation and criticized the US for past policies involving unilateral actions.

Dr. Skolnikoff is director of the Center for International Studies at MIT. Dr. Wilson is Mitsui Professor in the Problems of Con-

temporary Technology at the Sloan School of Management.

The United Nations Association is a private organization engaged in research and policy formulation aimed at making the United Nations and other international organizations more adequate to the needs of our times.

Culminating a two-year study, the United Nations Association policy panel called for:

- The appointment of a science advisor to the United Nations Secretary-General "to enhance the influence of the Secretary-General within and outside the UN system."

- The establishment of worldwide watchdog units to warn of potential environmental hazards.

- The creation of international institutes to coordinate investigations on specific problems such as: developing simple energy sources for poor economies, increasing legume yields, creating a greater variety of tasty vegetable proteins, and diversifying fertilizer

production, especially in tropical countries.

- The establishment of a Technology Selection and Evaluation Service "to help developing countries choose appropriate technologies and to provide them with systematic evaluation of the implications of those technologies."

The UNA National Panel on "Science and Technology in an Era of Interdependence," is chaired by Franklin A. Lindsay, President of Itek Corporation.

Citing the US because of its vast resources and complex relationships with other nations, the panel said: "While there has been a great deal of discussion in this country in the past few years regarding the importance of resource conservation, we believe that a serious commitment to conservation is still regrettably absent."

The report goes on to say: "The US has taken certain actions, such as the unilateral embargo on soybean shipments in 1973 and the call

for energy independence by 1980, which serve narrow autarkic ends and seem likely to impede rather than enhance international cooperation."

In reviewing the current apparatus for scientific policy making, the committee found "the US Government does not provide for systematic, high-level evaluation of how developments in science and technology affect foreign policy—or even domestic policy." This finding is underscored by the appointment by Vice President Nelson Rockefeller of a group to consider plans for a new science advisory council to the President.

Noting that an official national policy must be a prerequisite for any meaningful results, the panel stated: "Economic measures such as tax incentives (are) required in order to effect fundamental shifts in consumption patterns needed to further assure the efficient use of material resources."

The UNA panel also asserted: "We are concerned that the international community is poorly

organized to encourage the increased application of science and technology to pressing world problems, to assess the costs and dangers of various scientific and technological developments and to ensure that the benefits of science and technology are available to the greatest possible number of people."

"Until nations clearly acknowledge (their interdependence), international organizations will make only limited contributions, and threats to international stability, posed by increasingly complex global issues, will persist—and perhaps accelerate."

The report concluded: "US initiatives can be expected to meet with opposition from domestic interests as well as from governments suspicious of our motives. We believe, however, that the development of a policy aimed at building vigorous and responsive international institutions will quickly begin to repay the effort, with results very closely identified with our own national interests."

Shapiro Named Institute Professor

(Continued from page 1)
1940, assistant professor in 1943, associate professor in 1947 and professor in 1952. He was appointed Ford Professor of Engineering in 1962. No successor has yet been appointed to the Ford chair.

From 1964-65, Dr. Shapiro was chairman of the MIT faculty. He was head of the Department of Mechanical Engineering from 1965 to 1974.

Dr. Shapiro's research and professional activities for industry and government were for many years principally related to the engineering problems of power production and propulsion engines. During World War II, he directed for the Navy a laboratory charged with the development of torpedo engines. In 1948, he was a member of the Lexington Project, which evaluated the technical feasibility of nuclear-powered aircraft. At that time he invented a new form of nuclear-aircraft-propulsion system. In 1953, Dr. Shapiro directed Project Dynamo, which evaluated for the Atomic Energy Commission the technology and economics of nuclear power for civilian use.

More recently, Dr. Shapiro has worked on engineering aspects of medical problems. He has made contributions to the understanding of cardiovascular dynamics, to ureteral function, and to the

development of intra-aortic balloon counterpulsation for assisting heart failure patients.

He and his associates are currently working on the technique of external pneumatic compression for preventing thromboembolisms in hospital patients who have had major leg surgery or who are in protracted bed rest.

Dr. Shapiro holds six patents, has published more than 70 articles, and has written several books and three films in the areas of fluid dynamics, rarefied gas flows, thermodynamics, propulsion and power generation and biomedical engineering. He was founder and first chairman of the National Committee for Fluid Mechanics Films, which produced a series of films under NSF sponsorship that are widely used.

He also headed a curriculum study in the School of Engineering at MIT in 1958, and subsequently helped introduce recommended curriculum changes in the Department of Mechanical Engineering.

He received the Naval Ordnance Development Award in 1945, and a joint certificate for outstanding contributions from the War and Navy Departments in 1947. In 1956, he was the Akroyd Stuart Memorial Lecturer at Nottingham University, England. The American Society of Mechanical Engineers awarded him the Richards Memorial Award in 1960, "for outstanding achievement in engineering," and the Worcester Reed Warner medal in 1965, for "contributions to the permanent

literature of engineering."

Dr. Shapiro was elected to the American Academy of Arts and Sciences in 1952, to the National Academy of Sciences in 1967, and to the National Academy of Engineering, the nation's most prestigious professional organization for engineers, in 1974.

He is a Fellow of the American Society of Mechanical Engineers and of the Institute of Aeronautical and Astronautical Sciences, and a member of the American Society for Engineering Education, the American Association for the Advancement of Science, Tau Beta Pi, Sigma Xi, and Pi Tau Sigma.

Dr. Shapiro has three children, Peter, Martha and Mary. He lives at 111 Perkins St., Jamaica Plain.

Press Issues Catalog

Newly announced hardcover and paperback books available through the MIT Press Spring 1975

Lottery

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each, or three for \$2, and will be sold on campus by volunteers, including Community Service Fund trustees. They will be available daily, 11:30am-1:30pm in the lobbies of Buildings 7, 10, E19, Walker and outside Lobdell, beginning Wednesday, March 12, through Friday, March 21.

At Lincoln Laboratory, chances will be available from Ada Forrester, Rm. B-189.

The winning tickets will be drawn by Mrs. Priscilla Gray at the Employees' Day Open House Reception, Saturday, March 22, in the Sala de Puerto Rico. The first winner drawn will have his or her choice of trips, and the second-place winner will receive the remaining trip.

Members of the community also can enhance their chances of winning by submitting a catchy phrase to describe the activities of the Community Service Fund, according to Dean Peter P. Gil, co-chairman of the CSF trustees.

The motto selected by the CSF trustees will win 25 free lottery tickets. Mottos may be submitted at any of the lottery booths or by mail to Joseph S. Collins, Rm. 5-208, x3-1988. Mr. Collins also will provide information about the Community Service Fund. Deadline for submitting mottos is Wednesday, March 19.

catalog include a debate by Theodore C. Sorensen on presidential accountability after Watergate, a series of conversations with the late George Lukács, and a collection of biographies of women mathematicians.

The catalog describes 23 featured selections from the fields of humanities and society, linguistics, life sciences, mathematics and physical science and engineering.

Much of the information in offerings like *World Armaments and Disarmaments: SIPRI Yearbook 1975* by the Stockholm International Peace Research Institute, *The Car Culture* by James J. Flink, and *Watchmen in the Night: Presidential Accountability After Watergate* by Theodore C. Sorensen is not available or covered as thoroughly anywhere else.

Hardcover books that are now also available in paperback include *36 Lectures in Biology* by MIT Institute Professor Salvador E. Luria, *Loneliness: The Experience of Emotional and Social Isolation* by Robert S. Weiss with a foreword by David Riesman, *The New Jerusalem* (revised edition) by Arthur Kutcher, *Semantic Interpretation in Generative Grammar* by Ray S. Jackendoff, *Nutrition, National Development, and Planning* by Alan Berg, Nevin S. Scrimshaw, and David L. Call, *Women in Mathematics* by Lynn M. Olsen, *Communication with Extraterrestrial Intelligence: CETI* by Carl Sagan, and *Alexander Dovzhenko: The Poet as Filmmaker*, edited and translated by Marco Carynnyk.

Aid Forms Help

Any MIT employee having difficulty filling out college financial aid application forms can now receive assistance from MIT's Student Financial Aid Office.

The forms can be from any college to which an employee or an employee's child may be applying. They do not have to be MIT-related applications.

Employees can make appointments to be helped by any of the Student Financial Aid's seven staff members by calling the office at x3-4971, 4972 or 4973.