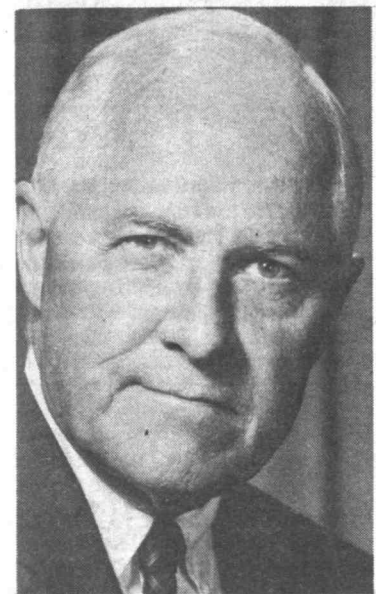


Thomas K. Sherwood, Emeritus Dean, Dies

Memorial services will be held Sunday, Jan. 25, at 3:30pm at the First Unitarian Church in Berkeley, Calif., for Dr. Thomas K. Sherwood, a distinguished chemical engineer and former dean of engineering at MIT, who died Wednesday, Jan. 14, in Berkeley.

Dr. Sherwood, who was 72, was a founding member of the National Academy of Engineering and a



Professor Sherwood

member of the National Academy of Sciences. He was an authority on mass transfer under molecular and turbulent flow conditions, and one of his books, *Absorption and Extraction*, revised with co-authors in subsequent editions, has been a leading text in this field since its publication in 1937.

From 1940-46 he was a technical aide, section chief, and division member of the National Defense Research Committee, a consultant to the Baruch Committee in 1942, and an expert consultant to the War Department in 1944. He served as technical advisor of the Office of Saline Water of the US Department of Interior from 1952 to 1961 and in 1960 was chairman of the planning committee for the Research Study at Woods Hole on Salt Water Conversion.

Dr. Sherwood received the William H. Walker Award of the American Institute of Chemical Engineers in 1941, its Founders Award in 1963, and the US Medal for Merit in 1948. He was Priestly Lecturer at Pennsylvania State University in 1959. He received the Warren K. Lewis Award and the E.V. Murphree Award in Industrial and Engineering Chemistry, both in 1972. His honorary degrees included a Doctor of Engi-

(Continued on page 8)

Mutant Bacteria Produce Antibiotic Streptomitin A

A new antibiotic has been produced at MIT by feeding a special diet to mutant bacteria.

The antibiotic, streptomitin A, is related to streptomycin, which was the first clinically useful broad-spectrum antibiotic.

Preliminary studies indicate that the new antibiotic kills microorganisms similar to those responsible for pneumonia, some urinary infections, bacterial meningitis, tuberculosis, inflammation of the bone marrow,

endocarditis (inflammation of the lining of the heart and its valves) and gastroenteritis (inflammation of the lining of the stomach and intestines).

Its discoverer, Professor Arnold L. Demain of the Department of Nutrition and Food Science says that it is too early to predict just how useful streptomitin A will be in treating patients.

But he says that the search for new antibiotics is important. For one

(Continued on page 8)

Channel 10 Makes Debut

The future of television at MIT was the subject of a live four-hour inaugural broadcast of Channel 10 last Friday on MIT's new cable TV system.

Channel 10, administered in January by MIT Student Cablevision in conjunction with the Center for Advanced Engineering Study, is expected to operate on an unscheduled basis in its initial weeks, according to Randall Wilson, coordinator.

Last week's first program featured live interviews with Professor Roy Kaplow, chairman of the Cable TV Policy Committee, Dr. Louis Menand, special assistant to the Provost; Peter Buttner, associate dean for student affairs; Edwin Diamond, political science lecturer and head of MIT's TV News Group, and Professor Ithiel de Sola Pool, chairman of the Planning Committee for MIT Cable.

A telephone interview with MIT lecturer Ann MacIntosh, who was attending a conference on cable at the New York Media Center, was a special highlight of the broadcast's newsmagazine format.

"We hope to use Channel 10 as an access channel for all student work," Wilson said. "The information and training workshops being held this month at the Center for Advanced Engineering Study are preparing several students for TV production

work during the rest of the academic year."

Other students to contact for information on Student Cablevision are Nancy Lukitsh, news director of MITV; Mark Abate of the Video Development Group; and John Feingold of the Media Evaluation Group.



Freshman Jonathan Brauhut tries out a television camera.



An IAP course called "Singing, Swinging Saws" was just the thing for Katherine Thomas, a freshman from Hockessin, Del., who had a saw but didn't know how to play it. She learned in the course taught by Brian Raila [at left], a sophomore in humanities and science from

Baltimore, Md. Three students learned to be "sawyers" during the two-week course, and may use their newfound skills to record a soundtrack for the TV cable or, perhaps, a future concert.

'Little Ice Age' Seen Coming

If you're worried about the next ice age, it's probably at least 10,000 years away and perhaps more than 80,000 years in the future.

But the beginnings of a "little ice age" may be upon us long before that, in about 125 years or so, bringing with it extremes of weather that could include cold winters and hot summers in the middle latitudes, severe drought in interior areas and severe weather with winter coastal storms and summer hurricanes in the United States and northern Europe.

Those are the educated guesses of Dr. Hurd C. Willett, an MIT meteorologist widely known for his theories that cyclic changes in the sun—so-called sun spot cycles—are the primary causes of major changes in patterns of weather and climate on earth.

Writing in the January issue of *Technology Review*, MIT's national journal of science and technology, Professor Willett uses his studies of such solar cycles to venture some predictions about the earth's future weather. In doing so, he reiterates his belief that solar energy variations, rather than man's pollution of the atmosphere, have been responsible for climactic fluctuations noted in the past 50 years.

In the article, Professor Willett reports that his solar-climatic hypothesis "has performed remarkably well—indeed, without one serious error—in a number of long-range forecasts of climatic trend."

His past predictions included one in 1951, in which he forecast correctly that the temperature level over much of the world would fall significantly during the next 15 years, and one in 1955, in which he accurately

reported that the severity and frequency of hurricanes along the North Atlantic coastal areas of the United States would decline sharply during the sixties, but probably increase somewhat along the Gulf Coast.

While a new ice age of widespread glaciation is still too distant to be predicted, according to Professor Willett, the onset of a "little ice age" could well occur in a 30-year period during the first half of the twenty-second century, from 2110 to 2140, which will represent the peak of the current 720-year solar activity cycle.

He said the weather might match that of the years 1370 to 1400, the most severe period of "climatic stress" on record, when all of northern Europe had strong blizzards and

extreme cold in winter and heat and drought in summer.

That period was followed by the last "little ice age" several centuries long, he said, from about 1500 to 1850, in which there was rapid advance and finally slow retreat in glaciation. Thus, if the climatic stress period of 2110 to 2140 materializes, Professor Willett said, the next little ice age would be from about 2200 to 2550.

Dr. Willett, professor of meteorology, emeritus, also makes a series of nearer predictions in the *Technology Review* article, covering the next 180 years and all predicated on the assumption that expected solar activity will occur.

Some of these predictions:

(Continued on page 8)

Medical Department Begins DES Screening Program

The MIT Medical Department has announced establishment of a protocol for women concerned about the possible use of DES (Diethylstilbestrol) by their mothers.

Much publicity has recently been devoted to development of adenosis—abnormally placed glandular tissue—either on the cervix or in the vagina—by women whose mothers were treated with DES. DES, a synthetic estrogen, was used from the mid 1940s to the early 1970s in the US to sustain pregnancies of women with histories of previous miscarriages or to treat women with vaginal bleeding during pregnancies.

Although adenosis is present in 80 to 90 percent of women whose moth-

ers were treated with DES, only a very few—four in 1,000—have been diagnosed as having adenocarcinoma, a cancer amenable to treatment if diagnosed early.

Women who think they may have been exposed to DES in utero may call the medical clinic, x3-4481, to arrange for a screening. Initial contact will be made with Mary Wheeler, RN, PA, who will answer questions, give further information about DES, and provide forms to request information from the mother's obstetrician and the hospital where the woman was born to document details of her exposure.

Later, a gynecologist will conduct an internal examination including a specific diagnostic procedure to determine changes indicative of DES exposure.

Women whose histories and examinations confirm DES exposure may be eligible for followup by DESAD, a research program at Massachusetts General Hospital. The program is funded by the National Institutes of Health and offers follow up care at no cost to women.

Women who have positive findings on physical examinations but lack documentation required for the DESAD program, may continue follow up care through the MIT Medical Department.

Come Celebrate IAP

All members of the MIT community—employees, faculty and students—are invited by MIT President Jerome B. Wiesner and Chancellor Paul E. Gray to come to an IAP party Wednesday, Jan. 21, between the hours of 3 and 4pm in the lobby of the Vannevar Bush Bldg. (Bldg. 13).

There will be refreshments and live music by The Intermission Trio Plus One, composed of Dr. Roy Lamson, humanities professor emeritus and special assistant to the President for the Arts, on the clarinet; Warren Rohsenow, professor of mechanical engineering, on the piano; Arthur Litchfield, of the purchasing office, on the drums and Ken Steiner, MIT '73, on the bass. Dr. Harold Edgerton, Institute professor emeritus, will join the group on the guitar for two numbers.

INSTITUTE NOTICES

Announcements

Undergraduate Seminars—There are still a number of openings for spring term. Upper-class students are eligible. Students should pre-register in Undergraduate Seminar Office, Rm 7-105, x 3-3621. More info available there.

Discount Tickets—Tickets for Wed, Jan 28 BSO open rehearsal available at TCA, Stu Ctr Rm 450, x 3-4885.

Indian Scholars—There is a booklet in Registry of Guests, Rm 7-121, entitled "Visiting Professor Scheme" which the Government of Tamilnadu in Madras hopes may interest you. Please drop by.

All Foreign Students—Please pick up Alien Address Report Cards for yourself and your family during Jan in Foreign Studies Office, Rm 3-107.

Westgate Nursery School—Immediate openings in 2, 3 & 5 day programs, 9am-12n weekdays, for MIT children ages 2½-4½. Information: Fran Olsen, x3-5907.

Wellesley-MIT Exchange—Spring term course descriptions, schedules & registration information available in Exchange Office, Rm 7-108.

February Degree Recipients—Cards enclosed with Feb degree notice must be returned to Rm E19-344 no later than Fri, Jan 23 to indicate whether diplomas are to be mailed, called for in person, or if attendance at Commencement, May 28, 1976 is planned.

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.

Mass. General Hospital **Boston, Ma**
Projects include: 1) Understanding the nature of the vascular changes in acute respiratory failure. The influence of interstitial water in the lung on blood pressure and vascular resistance within the lung. This will involve blood pressure and flow measurements in awake and anesthetized lambs and modelling the results; 2) Studying the effects of new ultrathin polymeric materials as membranes for artificial lungs. In specific, surface effects on platelet lifespan are being carefully evaluated. There are also several more specialized projects such as: gas transport in antarctic fishes, acute pulmonary fibrosis after acute respiratory failure, and clinical testing of artificial lung in acute respiratory failure available.

Deaconess Hospital **Boston, Ma**
Students are invited to participate in a study of the physiological roles and significance to the animal of various biochemical components, usually enzymes, found in tissues. Specific projects include the quantification of the amino acid composition of many tissues under varying physiological conditions; the quantitative determinations of enzymes specifically related to organ function; and the identification of which enzyme functions are absolutely necessary for growth or biochemical differentiation to occur. Other available projects include: the developmental formation of certain enzymes in a single tissue; chemical identification and partial purification of isoenzymes from different tissues; the study of concurrent changes in physiology and morphology of that tissue; and a study of the effects of an exogenously-altered physiological state on enzymes.

Tufts Medical School **Boston, Ma**
Multiple antibiotic resistance in bacteria is a major health problem. This laboratory is studying this plasmid-mediated infectious resistance which can be transferred easily among various bacterial species. The approach is to isolate the piece of extra-chromosomal DNA (R factor) away from the bacterial cell and to study control of its replication and transfer. Other work concentrates on the regulation of expression of certain antibiotic resistance genes, most notably that to tetracycline. The only requirement is experience in sterile technique, but background of molecular biology is recommended.

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

A Social Assistance Information File
An undergraduate is encouraged to work

with MIT faculty and staff of the Cambridge Public Library to develop a Public Information System that will help citizens of Cambridge public and private assistance centers. A data bank of available services will be gathered in areas such as child care, health, legal services, education, employment, housing, recreation, nutrition, etc. Students interested in social applications of computer data processing, organization and retrieval will find the project challenging. Contact Dr. M.M. Kessler or Prof. Roy Kaplow, Rm 13-5160, x3-3322.

Sloan School of Management—Center for Information Systems Research

Research opportunities exist for students with strong interest in computer-based information systems. These opportunities center around the development and evaluation of an experimental relational system for managing large data bases. A hierarchical approach is planned, with focus on the following levels: a relational file system, relational operators, an access control level, and a relational DML processor. Contributions ranging from conception and design to implementation and performance evaluation are sought in areas such as: storage and index structures, search algorithms, privacy, concurrent access control and compound query strategies. Performance simulation and analysis are also relevant. Contact Dr. Murray Edelberg at MIT, x3-7655 (Rm E40-365) or at the Sperry Research Center, Sudbury, Mass., tel. 1-369-4000. **Graphic Arts Research Foundation (GARF)** **Belmont, Ma**

GARF, in conjunction with the chairman of the Dept. of Linguistics at Harvard University, is interested in meeting with MIT undergraduates and faculty regarding the following three project topics: 1) *Literacy & the cost of reading materials*: the analysis of the relationship among literacy level, standard of living and the costs in local currency of reading materials. 2) *Keyboard for different writing forms*: developing fundamental concepts that will aid in optimizing keyboards. 3) *A description of typesetting requirements in Islamic countries*: as part of their development program, the foundation has been interested in the right-to-left joining scripts that are used for most of the books and other printed works in the Islamic world. With the now well-organized engineering program for machines for the conjunct writing forms of India, they would like to study the typesetting requirements of the various Islamic societies of Asia and Africa as well as of the scholarly users in Europe and the Americas.

New England Aquarium **Boston, Ma**

The New England Aquarium is interested in involving undergraduates in the following research projects being conducted at the Aquarium. 1) Measurements of metal complexing capacity in real water systems and its effect on phytoplankton productivity. 2) Determination of heavy metal associations in fresh water and marine sediments. (Knowledge of fundamental analytical chemistry techniques needed). 3) Gas chromatography of inorganic oxygen containing anions (1 year research experience, familiarity with statistics, experimental design, and good laboratory techniques required).

Barnstead Corporation **Boston, Ma**

The Barnstead Corporation is a manufacturer of water purification systems for research and medical applications. The Corporation wants to collaborate on a study of why microorganisms and pyrogens recontaminate sterile water samples after distillation and purification is performed. Barnstead will supply the necessary equipment but work will be done at MIT. Students must locate a faculty supervisor and lab space. Pay or credit available.

Graduate Studies

Health Sciences Fund Fellowships

The Health Sciences Fund, Inc. is offering five graduate fellowships in the field of the life sciences and biomedical engineering for the coming academic year. These fellowships, which pay \$325 per month plus tuition and medical fees for a 12-month period, are available to students who have selected or are pursuing a PhD thesis topic in the field of the life sciences. Graduate students who wish to be considered for nomination should submit a summarized research proposal to their department head. In turn, each department will choose a single nominee and submit his or her name with substantiating documentation for the fellowship. These nominations should be sent to Dean Kenneth Wadleigh, Room 3-136, before March 1st, 1976. Selection of the five fellowship recipients will be made by a committee appointed by the Dean of the Graduate School. Although these fellowships will usually be available for only a single year, they may be renewed for a second (terminal) year upon demonstration of major progress on thesis research. Students holding fellowships during the current year may apply for a second year of support.

MIT Club Notes

MIT Bridge Club—IAP meetings Jan 9-31: Tues & Thurs, 7pm, Stu Ctr Rm 407. Sun, Jan 25: MIT Open Pairs Championship 1:30pm & 7pm, Stu Ctr Pezzanine Lounge.

MIT/DL Bridge Club—Duplicate bridge Tues, 5:30pm, Stu Ctr Rm 473.

MIT Buddhist Association—New members welcome, open to MIT community. First meeting Sun, Jan 25, 8pm, Stu Ctr Rm 407, will feature film "Buddhism in China." Interesting refreshments. If interested please call x5-7256 Dorm, evgs.

MIT Figure Skating Club—A chance for figure skaters who feel confident at skating forwards and who can at least make an attempt to skate backwards to meet as a group. Sun, weather permitting, 11:30am-1pm, skating rink. Free, need athletic card & skates.

MIT Goju Karate Club—Mon, Wed & Fri, 7-9pm, Stu Ctr Rm 407. Info: 536-1830.

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

MITHRAS—A magazine of & about poetry, fiction, art, etc. is looking for new staff members from MIT community. Anyone interested should contact Jim Adams, x5-7269 Dorm, or Guy Nordenson, x5-8349 Dorm or 494-8974.

MIT Juggling Club—All interested people invited to attend meetings Sun, 12n-2pm, Walker Gym.

MIT Shim Gum Do Club—Instruction by 10th degree black in zen swordsmanship, karate

and stick fighting techniques. Beginners always welcome. Mon-Fri, 5-7pm, Stu Ctr 4th fl or Sala. Jeff, x3-5934.

MIT Soaring Association—General meeting Thurs, Jan 22, 7:30pm, Stu Ctr Rm 473. Coffee & donuts. Movie will be shown.

MIT Tae Kwon Do Club—Meetings daily during IAP, 12n-2pm, Stu Ctr West Lge.

Religious Activities

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

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

Celebration of Holy Communion—MIT

Lutheran & Episcopal Ministry, Wed, 5:05pm, Chapel. Supper following, 312 Memorial Dr.

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

Hillel—Traditional services Fri, 4:30pm, K kosher Kitchen & Sat 9am, Chapel.

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

The Society of Friends (Quakers)—Luncheon Fri, 12n, bsmnt of 312 Memorial Dr. For those interested in the Society of Friends and possible formation of worship group on campus.

Vedanta Society: Talks on Meditation—By Swami Sarvagatananda. Fri, Jan 23 & 30, 5:15pm, Chapel.

Johnson Promoted

Donald B. Johnson, assistant director in the MIT Development Office, has been promoted to associate director, effective January 1, 1976.

The announcement was made by Dr. Michael F. Luck, director of development, who said Mr. Johnson's increased supervisory responsibilities would be in support of MIT's \$225 million Leadership Campaign.

Mr. Johnson, of Nashua, N.H., was formerly director of development at

Cazenovia College in New York and the University of North Carolina, where he also pursued graduate studies.

He holds an AB degree in English from Hamilton College (1962). In April he and Dr. Luck will address the New England Conference of the Council for Advancement and Support of Education (CASE) on the topic, "Don't Look Back: Something Might Be Gaining On You—An Evaluation of Development Programs."



CABLE TV SCHEDULE

January 21 through January 28

CHANNEL 8

Wednesday, January 21, 1976

9:00am Lyophobic Colloids—Lecture 2: Interaction of Flat Double Layers—Professor J.Th.G. Overbeek
10:00am Stochastic Estimation—Lecture 9: The Steady-State Kalman-Bucy Filter: Continuous Time Case—Professor Michael Athans
11:00am Introduction to Experimentation—Lecture 9: The Poisson Distribution—Professor Ernest Rabinowicz
12:00 noon MIT Science Reporter with John Fitch. Guest—Dr. Ronald Parker, National Magnet Laboratory
1:30pm A Conversation between Louise Nevelson, Wayne Anderson and the Audience
3:00pm Engineering in the '70s—Mathematics and Public Policy—Professor Alvin W. Drake
4:00pm MIT, the Institution—1975 IAP Seminar—Part 2: MIT, Perspective and Style
5:00pm MIT Science Reporter (R)

Thursday, January 22, 1976

10:00am Stochastic Estimation—Lecture 10: The Steady State Kalman Filter: Discrete Time Case—Professor Michael Athans
11:00am Introduction to Experimentation—Lecture 10: The Best Straight Line—Professor Ernest Rabinowicz
12:00 noon Women's Program with Niti Salloway (R)
1:00pm Lyophobic Colloids—Lecture 3: Interaction between Spherical Double Layers—Schiller Layers—Professor J.Th.G. Overbeek
2:30pm James Michael Curley the Man—Francis Moloney, Boston Public Library
4:00pm Humanitas—The Biblical View of Humanity—Nahum Glatzer, Boston University

Friday, January 23, 1976

9:00am Lyophobic Colloids—Lecture 4: Van der Waals Forces—Professor J.Th.G. Overbeek
10:00am Stochastic Estimation—Lecture 11: Numerical Example: Estimation of Positions, Velocities, and Accelerations—Professor Michael Athans
11:00am Introduction to Experimentation—Lecture 11: Plotting Other Functions—Professor Ernest Rabinowicz
12:00 noon Threshold to Tomorrow with Myron Tribus. Guest: Professor Ira Dyer
1:00pm NOVA—The Crab Nebula (courtesy WGBH)
2:00pm Historical Collections Seminar—Part 2: Life at Boston Tech—Azel Mack, '15 and Waldo Pike, '15
3:30pm A Student's Guide to Career Opportunities in Nutrition and Food Science—Professor James Flink
5:00pm Threshold to Tomorrow (R)

Monday, January 26, 1976

9:00am Lyophobic Colloids—Lecture 5: Van der Waals Forces—Influence of a Medium-Retardation Lifshitz Method Experiments—Professor J.Th.G. Overbeek
10:00am Stochastic Estimation—Lecture 12: Numerical Example: Sensor Tradeoffs—Professor Michael Athans
11:00am Introduction to Experimentation—Lecture 12: Correlation—Professor Ernest Rabinowicz
12:00 noon Video Wallpaper—The Architecture Machine
2:00pm 1972 World Peace Lectures—Karl Deutsch
3:30pm Cambridge Forum
5:00pm Video Wallpaper (R)

Tuesday, January 27, 1976

10:00am Stochastic Estimation—Lecture 13: Suboptimal Nonlinear Filtering Algorithms (1)—Professor Michael Athans
11:00am Introduction to Experimentation—Lecture 13: The Technical Report (1)—Professor Ernest Rabinowicz
12:00 noon Classical Dance of India—Indrani Rahman
1:30pm Lyophobic Colloids—Lecture 6: Combinations of Attraction and Repulsion—Application to Colloid Stability—Professor J.Th.G. Overbeek
3:30pm McCarthy Era Seminar—Professor (Emeritus) Albert Hill
5:00pm Classical Dance of India (R)

Wednesday, January 28, 1976

9:00am Electrokinetics—Lecture 1: The Four Effects and the Zeta Potential—Professor J.Th.G. Overbeek
10:00am Stochastic Estimation—Lecture 14: Suboptimal Nonlinear Filtering Algorithms (2)—Professor Michael Athans
11:00am Introduction to Experimentation—Lecture 14: The Technical Report (2)—Professor Ernest Rabinowicz
12:00 noon Personnel Program with Jim Culliton
1:30pm Installation of Oldenburg's Colossal Ashtray. Music by Paul Earls
3:30pm Engineering in the '70s—Biomedical Engineering—Professor Robert Mann
4:00pm MIT, The Institution—1975 IAP Seminar—Part 3: MIT, Descriptive Indices
5:00pm Personnel Program (R)

Echoes

50 Years Ago

Technology Course IV sophomores received more points than those of any other school in the recent design competition conducted by the Beaux Arts Institute of Design.

A Radio Phantom Dinner broadcast was held for MIT Alumni in 67 cities over the US, England, Cuba and Hawaii. Messages were heard from New York, Washington, Rochester and Walker Memorial at MIT during the evening activities.

40 Years Ago

The Department of Mechanical Engineering held a special program in commemoration of the 200th anniversary of the birth of James Watt, inventor of the steam engine, January 20.

The Institute Committee passed a resolution condemning the kidnapping of students and other hazing after a particularly extreme case occurred in which a student was abducted and his head shaved.

25 Years Ago

A camera shutter with capability of exposure from 4-10 microseconds was the latest product of research by Harold Edgerton '27, Kenneth Germeshausen '31 and Herbert Grier '33. The new shutter was developed for use in industrial research.

The January issue of *Technology Review* reported on the near completion of the Institute's linear accelerator, which had been started soon after WWII at the Research Lab of Electronics.

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

TECH TALK
Volume 20, Number 23
January 21, 1976

Tech Talk is published 45 times a year by the News Office, Massachusetts Institute of Technology. Director: Robert M. Byers; Assistant Directors: Charles H. Ball, Barbara Burke, Robert C. Di Iorio, Patricia M. Maroni, Joanne Miller, William T. Struble, and Calvin D. Campbell, photojournalist; Reporters: Sally M. Hamilton, Ellen N. Hoffman; Institute Calendar, Institute Notices, Classified Ads: Susan E. Walker.

Address news and editorial comment to MIT News Office, Room 5-111, MIT, Cambridge, MA 02139. Telephone 253-2701.

Mail subscriptions are \$6 per year. Checks should be made payable to MIT and mailed to the Business Manager, Room 5-111, MIT, Cambridge, MA 02139.



Hundreds of persons attended public receptions last Friday, Jan. 16, opening a major exhibition of works by artist Claes Oldenburg, right, seen here in a discussion with Professor Wayne Andersen, chairman of the MIT Committee on the Visual Arts. At left is Stephen Ringle, Hayden Gallery manager. Receptions were held concurrently in MIT's Hayden Gallery and the Institute of Contemporary Art, Boston, which are collaborating in presenting the show of 250 Oldenburg works in sculpture, drawings, and prints. Well over 1,000 persons have visited Hayden Gallery since the

exhibition opened on Saturday—an unprecedented attendance. In a major review in the *Boston Globe*, art critic Robert Taylor said the exhibition "... marks an important, indeed historic occasion in the annals of Boston art." Taylor also said the show "... represents an unprecedented instance of collaboration between two major art institutions hereabouts. We are going to see more of this ... a general pooling of cultural resources ... The Oldenburg show is a portent of things to come."

Land Use Workshop Draws 200 Local Officials

Massachusetts' new Growth Policy Development Act, providing for the establishment of local growth policy committees at the municipal level, was accorded equal amounts of praise and skepticism by some 200 local officials and citizen advocates who gathered at MIT Monday for an all-day workshop on Growth Policy and Land Use Management.

In a series of small workshops and group discussions linked by MIT's Cable TV system, the participants grappled with issues of private property rights, governmental regulation, and the costs of managed growth.

The Workshop, organized by Professor Lawrence Susskind of the Department of Urban Studies and Planning, through a grant from the Massachusetts Foundation for Humanities and Public Policy, will issue a video-tape summarizing the proceedings for use in local and regional discussions of growth policy.

"The workshop accomplished its goal of heightening each local growth policy committee member's sensitivity to basic value dilemmas at the heart of the land use controversy in Massachusetts, Professor Susskind said at the conclusion of the day.

Representative Robert Wetmore and Senator William Saltonstall, who played a key role in developing the legislation to establish a "bottom-up" policy of planning in the state, observed during the evening session that up to this year, most Massachusetts legislators had little or no awareness of land use problems in their districts.

Under the terms of the bill, local growth policy committee persons will have up to six months to report to the Office of State Planning on areas of critical planning concern in their respective cities and towns.

A highlight of the workshop, according to several participants, was a simulation exercise involving an environmental controversy in Westboro, Mass. The hypothetical hearing on "The Cedar Swamp Controversy" was based on the actual designation of a 1500-acre wetland in July as a critical environmental area instead of an area developable for industrial and commercial purposes. Conference participants used actual letters and documents provided by protagonists and antagonists in the case to act out roles of political, development, and environmental interests.

Frank Keefe, director of the nine-month-old Office of State Planning, said the facsimile discussion taught participants to listen to the views of others.

Other state officials and members of the original Wetmore Commission who attended the workshop were Representative Robert Gillette, Frederick Winthrop, Commissioner of Agriculture, John Marino, Commissioner of Commerce and Development, and Ellis Goldman of the Department of Community Affairs.

MIT Junior Competes For Glamour's Top 10

Wendy C. Irving, a junior majoring in architecture at MIT, will be one of the contestants in *Glamour* Magazine's Top Ten College Women Contest of 1976.

Ms. Irving, of Eliot, Me., who said she entered the contest at the suggestion of her boyfriend, is planning to work as an environmental designer for an architectural firm after graduation from MIT.

A defender of the belief that athletics and academic achievement

are compatible goals, she is a member of MIT's varsity women's crew team, the women's swim team and a former member of the tennis team.

During her sophomore year she conducted an extensive cost analysis study of the development of Newark, New Jersey's watershed area in Passaic County. She attempted to show that the use of solar energy and environmentally sound housing units would be cost-efficient over the cycle of the proposed project.

Under MIT's UROP program she developed and built a system for controlling the noise pollution problem in the computer room of the Department of Architecture.

Prizes for the top ten contest winners include \$500 in cash, a trip to New York City, with planned cultural events and shopping privileges, and a photo-essay on each winner in the September College issue of *Glamour*.



Visiting Committee Seeks Student Opinions

The Corporation Visiting Committee on Student Affairs will meet on campus Friday (Jan. 23) and Saturday (Jan. 24) to discuss student-generated agenda items including housing, athletics, student governance, minority education, Talbot House and the Freshman Advisory Council.

Most meetings of the committee are open to any students who would like to attend. Friday meetings will be 8:30am-noon and 1-5pm in McCormick Hall, Brown Living Room. The Saturday session will be 8:30am-noon in the Student Center, West Lounge.

Members of the Visiting Committee will be present in a number of the dining halls for dinner with students Friday evening. Students are also particularly invited to an open discussion from 8:30-10pm Friday in the Student Center Mezzanine Lounge.

Members of the Visiting Committee on Student Affairs are:

D. Reid Weedon, Jr. (chairman) of Arthur D. Little, Inc., Cambridge; Gerald A. Berlin, attorney-at-law, Boston; Russell N. Cox, president of General Investment & Development, Co., Boston; Irene du Pont, Jr., senior vice president and director, E.I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Dr. Edmund W. Gordon, professor of education and clinical professor of pediatric psychology, Columbia University; James A. Hester, coordinator of applied research, Kaiser Foundation Health Plan, Inc., Los Angeles; The Honorable Jerome H. Holland of New York; Karen D. Hunzicker of Boston.

William I. Koch, president, Koch Venture Capital, Inc., Wellesley Hills; Geraldine S. Kunstadter of New York City; Caroline J. Malcolm of London, England; Gregory Smith of Marblehead, Mass.; Dr. Richard W. Tsien, associate professor of physiology, Yale School of Medicine.

Dr. Joseph B. Wheelwright, clinical professor emeritus, University of California; Dr. Emily L. Wick, dean of the Faculty, Mount Holyoke College, and Dr. Harry Woolf, provost, Johns Hopkins University.

Edith Nelson Appointed Campaign District Officer

The appointment of Edith E. Nelson as New England district officer for the MIT Leadership Campaign has been announced by Kenneth S. Brock, director of resource operations.

Miss Nelson joins four other district officers—Robert H. Bliss, Kevin J. Kinsella, James N. Phinney and Arnold H. Singal—working in support of MIT's five-year, \$225 million capital campaign. Campaign goals include increasing the endowment, funds for student housing, educational and research facilities, and support for new teaching and research programs.

Except for Mr. Phinney, based in New York, the district officers have

headquarters at MIT but work closely with area leaders in identification and solicitation of alumni, friends, foundations and corporations who can make major gifts to the campaign. They also work in close collaboration with Alumni Association field representatives.

An alumna of Elmira College, Miss Nelson has made her career in the financial field. She was administrative assistant to the vice president and head of the Mutual Fund Division of the State Street Bank and Trust Company, and later joined Massachusetts Financial Services, Inc., where she was a member of the administrative staff. Most recently she was associated with a small Boston investment banking firm.

As a district officer, Miss Nelson will have responsibility for all six New England states except for Fairfield County, Ct., which is served from New York City.



Goodenough Wins Centenary Award

Dr. John B. Goodenough, leader of the electronic materials group at Lincoln Laboratory, has been awarded a Centenary Lectureship by the Chemical Society of Great Britain.

During the latter part of January, 1976, Dr. Goodenough will deliver a Centenary Lecture at seven universities in England and Scotland and at a half-day symposium in London. His subject is "Predicting Atomic Moments and Magnetic Order in Solids."

The Centenary Lectureship is an honorary appointment by The Chemical Society to encourage scientific interchange between Britain and other countries.

Laser Mirror Method Measures Atom Attraction

Using a mirror to turn one beam of laser light into two beams of different colors, MIT physicists have made the first measurements of the attraction between neon and excited sodium atoms.

They found that these forces are 20 times greater than predicted by a frequently-used method of calculation.

The measurements were made by former graduate student Gary M. Carter, Professor David E. Pritchard, undergraduate Martin Kaplan (now a graduate student), and postdoctoral fellow Theodore W. Ducas, of the Department of Physics and the Research Laboratory of Electronics. The work was funded by the National Science Foundation.

To conduct the experiment, the physicists sent a beam of sodium atoms into a beam of neon atoms, exciting the sodium atoms just before the collision by making them absorb light from a laser. They then measured the deflection of the sodium atoms caused by the neon atoms.

The trick of using a mirror to turn one laser beam into two different colors was necessary because sodium has a double ground state. Each level of the ground state can be excited only by absorbing a slightly different color of light yet the researchers had only one laser.

The trick worked because of the Doppler shift. The Doppler shift is the change in apparent wavelength of sound, light or other radiation that occurs when the waves are

emitted by an object moving toward one or away from one.

If the waves are thrown off an object moving toward one, the wave emitted later have a shorter distance to go, so the waves begin to pile up: the wavelength is shortened.

Similarly, if the waves are emitted by an object moving away from one, the waves emitted later have farther to go, and the waves get stretched out: the wavelength is longer.

With sound, the change in wavelength changes the pitch; a train whistle drops as the train passes.

With light, the change in wavelength changes the color. When the wavelength is shortened, the light is shifted to the blue end of the spectrum; when it is lengthened, the light is shifted toward the red.

The same shifting takes place when the source of the waves is motionless, but the observer is moving toward it or away from it.

To take advantage of this phenomenon, the researchers chose laser light of a color midway between the colors needed to excite the two ground levels of sodium. The light was sent into the beam of sodium at an acute angle, like a car entering a freeway. Since the sodium atoms were moving away from the light, they "saw" it shifted to the red, just enough to be absorbed by some of the atoms.

The beam of light then hit a mirror on the other side of the sodium beam and bounced

back, moving into the sodium like a car entering a freeway the wrong way. This light was shifted blue—just enough to excite the remaining sodium atoms.

When the atoms decayed back to their ground state, they were continually re-excited, so that a significant number of them were in the excited state when they hit the

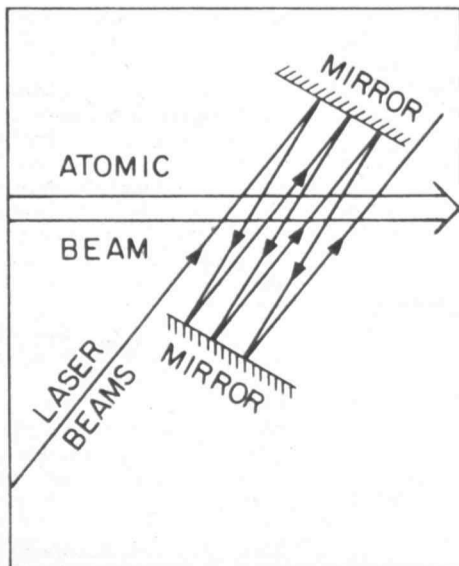
beam of neon atoms. The attraction between the sodium and neon atoms was then determined by measuring how many sodium atoms were deflected in different directions.

Since neon is one of the inactive "noble gases," holding itself aloof from other elements, the attraction between it and the excited sodium was expected to be slight. Indeed, the researchers found that the energy of attraction was only .015 electron volts. (Typical energies between atoms are about four electron volts—sufficient to make stable molecules.)

But although this figure is very small, it is 20 times the figure predicted on the basis of "pseudopotential calculations"—a way of calculating forces between atoms by concentrating on the outer electrons, accounting for the exclusion and electrostatic forces of the other electrons by the use of a fictitious repulsive potential called a pseudopotential.

The MIT experiment thus calls into question this method of calculating forces, at least for very weak attractions. [Measurements by other physicists of stronger attractions have agreed fairly well with such calculations.]

"There has been a fair amount of work based on results of these calculations," Professor Pritchard said. "So our results will have wide repercussions."



Drawing shows laser beam-mirror reflection system in schematic representation.

THE INSTITUTE CALENDAR

January 21
through
February 1

Events of Special Interest

Editor's Note: Anyone connected with MIT — students, employees and faculty — are encouraged to participate in IAP activities. Some courses, in fact, are particularly designed for "lay-people." The number in parentheses in many Calendar entries refers to the IAP course number, in case additional information is needed.

Physics for Everyone (289) — Wed, Jan 21: A Feast of Sounds — Walter H. G. Lewin, physics. **Mon, Jan 26:** High Energy Physics: What's It All About? — Wit Busza, physics. **Thurs, Jan 29:** The Large and the Small — Philip Morrison, Institute Professor and Professor of Physics. All 12n, Rm 6-120.

Earth & Planetary Sciences Lectures for Non-Science Personnel — **Wed, Jan 21:** Prospecting for Minerals on the Sea Floor — R. Burns, geochemistry. **Fri, Jan 23:** Earthquakes — Nafi Toksoz, geophysics, director of George R. Wallace, Jr. Geophysical Observatory. **Tues, Jan 27:** Rock Mechanics and Earthquakes — W. R. Brace, geology. All 12n, Rm 54-611.

You Are What Your Mother Made You — Sanford Miller, nutritional biochemistry; **How What You Eat Affects Your Brain** — Richard Wurtman, endocrinology & metabolism. Research in Nutrition & Food Science Seminar (260). Thurs, Jan 22, 12n, Rm 16-134. "Lay people" encouraged to attend.

Molecular Biology for the Non-Scientist (23) — Thurs, Jan 22: Cell Differentiation — Charles Holt, biology, academic officer, Rm 56-401. **Mon, Jan 26:** Genetic Studies of Cultured Mammalian Cells — Raymond Baker, genetics. Rm E17-6th fl conference rm. Both 1pm.

Selected Topics in Fiber and Polymer Technology — Mechanical Engineering Seminar (235a) dedicated to Emery I. Valko. Speakers: H. Mark, Polytechnic Institute of New York; A. Schwartz, consultant; R. MacGregor, North Carolina State University; D. Weigmann, Textile Research Institute; G. Tesoro, visiting professor, mechanical engineering; R. Richardson, Allied Chemical Company. Fri, Jan 23, 9-5pm, Stu Ctr Mezzanine Lge.

Alcoholic Cirrhosis — Charles S. Davidson, MD, visiting professor of medicine, director of Clinical Research Center; **How the Body Utilizes Dietary Proteins** — Hamish N. Munro, physiological chemistry. Research in Nutrition & Food Science Seminar (260). Thurs, Jan 29, 12n, Rm 16-134. "Lay people" encouraged to attend.

Seminars and Lectures

Wednesday, January 21

Science Citation Index Seminar* — Susanne Durling, Libraries. Science Library Seminar with demonstration of SCISEARCH. 10am or 2pm, Rm 14S-100.

Engineering in Diagnosis — Roger Mark, MD, electrical and bioengineering, HST. The Role of Basic Science & Engineering in the Development of Modern Medicine Seminar (190). 10am, Rm 16-310.

Tidal Power (mostly lunar power, but the sun helps, too) — John W. Leslie, US Corps of Engineers, Waltham, Ma. Solar Energy Options: General and Fluid Dynamics Aspects Seminar (53). 10am, Rm 48-316.

Technical Society Membership — What It Does for You and What You May Expect From It* — L. V. "Mike" Honsinger, president, SNAME. Ocean Engineering Seminar. 10:15am, Rm 5-314. Refreshments 10am.

Exchange Rate Policy — 1975 — Rudiger Dornbusch, economics. Economics Seminar (71). 10:30am, Rm E52-394.

Invention and New Enterprise Development Seminar — Edward C. Brainard, Environmental Devices Corp. Aeronautics & Astronautics Seminar (8). 12n, Rm 37-212.

So You Want to Start a Business — Arnold E. Amstutz, senior lecturer, management. Sloan Luncheon Seminar Series (332c). 12:15pm, Rm E52-461.

Contract Law: A Brief Introduction** — Jeffrey A. Meldman, Sloan School. IAP Introduction to Law Series (324). 1pm, Rm E52-143.

Shallow-Water Ship Hydrodynamics — Ernest O. Tuck, University of Adelaide, Australia. Ocean Engineering Seminar (269). 2pm, Rm 5-314.

Census Data: Who Uses it at MIT* — David Birch, JCUS; Julie Moore Ede, research engineer; Lester Thurow, economics & management. Census Data Seminar (161). 2pm, Rm 10-105. Coffee. Info: Ann Longfellow, x3-7052.

Are Life Sciences Compatible with Hard Science or Engineering? — Biology Seminar (18a) on integrated and double-degree programs. 2pm, Rm 56-520.

IAP Math Club Lecture Series — Jeanne Bamberger, education & music. Mathematics Seminar (225a). 2pm, Rm 3-370.

Noiseless Civilian Transportation via Helicopters — Wesley L. Harris, aero/astro, ocean engineering. Highlights in Aeronautics & Astronautics Seminar (4). 2pm, Rm 33-206.

Spectroscopic Studies on Transition Metal-Containing Enzymes — Edward I. Solomon, chemistry. New Research Activities in Chemistry Seminar (36). 2:30pm, Rm 6-233.

Careers in Medicine — Samuel D. Clark, MD, medical department. Preprofessional Advising & Education Seminar (189). 3pm, Rm 7-133.

Bicycle Repair — Peter Fiedowsky, U. Experimental Study Group Wednesday Seminar (138). 3pm, Rm 24-612.

The Forest as a Resource* — John Calhoun, Forest Fuels, Inc. Ecology Action Seminar. 3:30pm, Rm 10-250.

Nuclear Sizes and Shapes by Scattering of Various Projectiles — Claude Williamson, senior research scientist, physics. Lectures on Physics (285). 3:30pm, Rm 6-120.

Round Hill-First Interdisciplinary Lab — Edward Boyles, '22. Historical Collections "They Were There" Seminar (423) with photos &/or films from the period. 3:30pm, 2nd fl, Bldg N52. Pre-register.

Shedding Light on the Colors of Minerals — Roger G. Burns, geochemistry, & Bruce M. Loeffler, G. Earth & Planetary Sciences Lecture Series (63). 4pm, Rm 54-425.

Cape Verde After Liberation: Technology for Freedom* — Ray Almeida, TCHUBA, Boston. Seminar on Appropriate Technology. 7pm, Intl'l Stu Lge.

Thursday, January 22

Raman Spectroscopy and Membrane Structure Colloquium — Survey of Membrane Structure: Ellen J. Henderson, chemistry, 9:30am. Raman Spectroscopy of Biomolecules: Richard C. Lord, chemistry, director of Spectroscopy Laboratory, 11am. Spectroscopic Studies of Hemoglobin-Free Erythrocyte Ghosts: Joseph L. Lippert, Rochester Institute of Technology, 1:15pm. Raman Spectra of Erythrocyte Membranes: Donald F. H. Wallach, Tufts Medical School (tentative), 2pm. Spectroscopy Lab Seminar (200). Rm 6-120.

Public Relations in the Nuclear Industry — Mark Gottlieb, G. Nuclear Engineering Seminar (251a). 10am, Rm NW12-222.

The Study of Disease — Stanley Robbins, MD, chairman of pathology, Boston University Medical School. The Role of Basic Science & Engineering in the Development of Modern Medicine Seminar (190). 10am, Rm 16-310.

Wave Power Extraction — S. H. Salter, University of Edinburgh, Scotland. Solar Energy Options: General and Fluid Dynamics Aspects Seminar (53). 10am, Rm 48-316.

Rainbows, Halos, Sunsets and Other Beautiful Phenomena in the Sky — Walter H. G. Lewin, physics. Physics Seminar (292). 10:30am, Rm 6-120.

Corporate Law: A Brief Introduction** — Arthur Z. Gray, Union Pacific Foundation, New York. IAP Introduction to Law Series (324). 1pm, Rm E52-143.

Shallow-Water Ship Hydrodynamics — Ernest O. Tuck, University of Adelaide, Australia. Ocean Engineering Seminar (269). 2pm, Rm 5-314.

History of Labor Organization in the US — Mark Ghouralal, Charles Reichman & Arlie Sterling, undergraduates. Economics Seminar (70). 2pm, Rm E52-394.

Upward Mobility of Women in Management — Phyllis Wallace, management; Lotte Bailyn, organizational psychology & management. Sloan School Seminar (332d). 2pm, Rm E52-461.

Landing a Summer Job: Wrap-Up Workshops** — Anne Thompson, assistant dean for student affairs; Sandy Cohen, assistant director of admissions. IAP Workshop. 2pm, Stu Ctr Mezzanine Lge.

Radiation Heating: The Second Thermal Barrier — J. R. Baron, aero/astro. Highlights in Aeronautics & Astronautics Seminar (4). 2pm, Rm 33-206.

Applications of Operations Research in Business and Industry — Klaus Heis, president, Icon, Inc. Operations Research Center Seminar Series (185). 2:30pm, Rm 24-121.

Organic Synthesis: Biogenesis and Biomechanism — William H. Rastetter, chemistry. New Research Activities in Chemistry Seminar (36). 2:30pm, Rm 6-233.

Native American Issues* — Will Basque, director of Boston Indian Council. Ecology Action Seminar. 3:30pm, Rm 10-250.

Obese Neutron Stars — Kenneth Brecher, physics. Lectures on Physics (285). 3:30pm, Rm 6-120.

Genome Expression During Germination of Bacterial Spores — Annamaria Torriani, biology. Nutrition & Food Science Seminar. 4pm, Rm 16-134.

Chemical Evolution of the Earth's Crust and Mantle — Stanley Hart, geology & geochemistry. Earth & Planetary Sciences Lecture Series (63). 4pm, Rm 54-425.

The Whale Brain — The Anatomical Basis of Intelligence* — Dr. Peter Morgane, Worcester Foundation for Experimental Biology. Ecology Action Seminar. 7:30pm, Rm 10-250.

Where are the James Michael Curleys of Today?* — The Honorable Kevin White, Mayor of Boston. The City of the Age of Machine Politics: James Michael Curley's Boston Series. 8pm, Rm 9-150.

Obese Neutron Stars — Kenneth Brecher, physics. Lectures on Physics (285). 3:30pm, Rm 6-120.

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psychology, 11:30am. Cezanne's Conceptions of Space — Judith Wechsler, history of art, 2pm. Some Roots in Cubism — Marinart Teuber, art historian, 3:30pm. All Rm E10-013.

The Federal Comprehensive Employment and Training Act (CETA) — How is it Working in Eastern Massachusetts? — Charles A. Myers, Sloan Fellows Professor of Management, director of industrial relations section; Thomas A. Barocci, Sloan School lecturer; Phyllis Wallace, management. Sloan School of Management Seminar (326). 10am, Rm E52-461.

Medicine: Hematology, Oncology, and Pediatric Medicine — David Nathan, MD, pediatrics, Harvard Medical School; chief of hematology oncology, Childrens Medical Center. The Role of Basic Science & Engineering in the Development of Modern Medicine Seminar (190). 10am, Rm 16-310.

Solar Power: Potential and Constraints — William S. vonArx, Wood Hole Oceanographic Institution. Solar Energy Options: General and Fluid Dynamics Aspects Seminar (53). 10am, Rm 48-316.

Student Financial Aid and Tuition Assistance** — Nelson Armstrong, assistant director, Financial Aid Office; John B. Turner, assistant dean, Graduate School Office; Yvonne Littlewood, Graduate School Office; Ellen O'Hare, Tuition Assistance Office. Being a Minority Employee and Student at MIT (361b). 12n, Rm 4-231. Minorities encouraged to attend.

Invention and New Enterprise Development Seminar — Richard Eckhardt, EDC Corp. Aeronautics & Astronautics Seminar (8). 12n, Rm 37-212.

Comparison of Modern, Random-Vibration-Based Wind Load Analysis Procedures for Structural Building Codes* — Emil Sirmiu, Center for Building Technology, National Bureau of Standard, Washington, DC. Civil Engineering Constructed Facilities Division Seminar. 1pm, Rm 1-350. Coffee.

Theoretical Formalism for the Kinesiological Trajectories of a Computer Simulated Neuro-Musculo-Skeletal System — John E. Wood, G. Mechanical Engineering Doctoral Thesis Presentation. 1pm, Rm 5-217.

Patent Law: A Brief Introduction** — Jeffrey A. Meldman, Sloan School. IAP Introduction to Law Series (324). 1pm, Rm E52-143.

Shallow-Water Ship Hydrodynamics — Ernest O. Tuck, University of Adelaide, Australia. Ocean Engineering Seminar (269). 2pm, Rm 5-314.

Do We Live Inside a Supercluster of Galaxies? — Paul Joss, physics. Problems in Modern Astrophysics Seminar (291). 2pm, Rm 37-212.

Organo-Transition Metal Chemistry and Homogeneous Catalysis — Richard R. Schrock, chemistry. New Research Activities in Chemistry Seminar (36). 2:30pm, Rm 6-233.

Improving Heat Pump Performance via Compressor Capacity Control — Analysis and Test* — Carl Hiller, G. Mechanical Engineering Doctoral Seminar. 3pm, Rm 3-133.

Hugo Wolf's Eichendorff-Lieder — Martin Dyck, German, literature. Winterliederfest (110). Lecture and recordings in German. 3pm, Rm 14N-225.

Nuclear Collective Motion — Arthur Kemman, physics. Lectures on Physics (285). 3:30pm, Rm 6-120.

Stunt Flying and Early Instrumentation — Charles S. Draper, '26, Institute Professor and Professor of Aeronautics & Astronautics Emeritus. Historical Collections "They Were There" Seminar (423) with photos &/or films from the period. 3:30pm, 2nd fl Bldg N52. Pre-register.

The Dolphins and the Tuna Industry* — Alix Jay, ex-tuna fisherman, editor of The Porpoise News. Ecology Action Seminar. 7:30pm, Rm 10-250.

Monday, January 26

Registration for Professional Engineers — Why, Where, When and How?* — Dave Goldman, PE, vice president, Mass. Society of Professional Engineers. Ocean Engineering Seminar. 10:15am, Rm 5-134. Refreshments 10am.

The Impact of Oil Decontrol — Jerry A. Hausman, economics. Economics Seminar (72). 10:30am, Rm E52-394.

Cultural Survival: Examples from the Amazon Basin and Borneo — Representatives from Cultural Survival, Inc, including David Maybury-Lewis, anthropology Harvard University; Pia Maybury-Lewis, Robert Hahn, Brandeis University. Victims of Progress: Indigenous People and the Modern World Seminar (121a). 12n, Rm 14E-304.

High-Speed Photography as an Engineering and Scientific Tool — Harold E. Edgerton, Institute Professor and Professor of Electrical Measurement, Emeritus. The Uses of Sonar and Underwater Photography Seminar (90a). 12n, Rm 4-402.

Dynamics of Social Systems — Jay W. Forrester, Germeshausen Professor, Sloan School. Sloan Luncheon Seminar Series (332c). 12:15pm, Rm E52-461.

Historical Origins of Lie Group Theory — S. Helgason, mathematics. Mathematics Seminar (222). 1pm, Rm 2-390.

Economics of Anarchy — Steven Hayworth, G. Topics in Political Economy Seminar (78). 2pm, Rm E52-394.

Second Symposium on Undergraduate Research in Chemistry — William H. Rastetter, chemistry. Chemistry Seminar (41). 2pm, Rm 4-270.

Reliability Problems in Digital Aircraft Control — Albert L. Hopkins, aero/astro. Highlights in Aeronautics & Astronautics Seminar (4). 2pm, Rm 33-206.

The Galaxy That Didn't Explode: M 82 — Philip Morrison, Institute Professor and Professor Physics. Lectures on Physics (285). 3:30pm, Rm 6-120.

Early Works — Harold Edgerton, '27, Institute Professor & Professor of Electrical Measurements, Emeritus. Historical Collections "They Were There" Seminar (423). 3:30pm, 2nd fl Bldg N52. Pre-register.

Genetics of Mammalian Cells in Culture — Raymond Baker, genetics; Phillips Robbins, biochemistry; Phillip Sharp, biology.

discussions on Cancer Research Seminar (134). 4pm, Rm E17-6th fl conference rm.

Tuesday, January 27

Economics of Energy Supply and Demand - David O. Wood, DSR Staff. Energy Laboratory: Seminar Series (137). 10am, Rm 39-500.

The Multi-National Corporations: A Critical View** - Arthur D. MacEwan, economics, University of Massachusetts, Boston. Seminar on Technology, Merit and Equality. 12n, Stu Ctr Mezzanine Lge.

Sloan Luncheon Seminar Series - Thomas J. Allen, organizational psychology & management. Sloan School Seminar (332c). 12:15pm, Rm E52-461.

Can a 5 Megawatt Research Reactor Find Fulfillment in Medicine? - An afternoon at the MITR. Nuclear Engineering Seminar (247a). 1pm, Rm NW12-222.

New Developments in Rotocraft and Wind Turbines - Norman D. Ham, aero/astro. Highlights in Aeronautics & Astronautics Seminar (4). 2pm, Rm 33-206.

Estimating Undiscovered Oil and Gas - Eytan Barouch, management science (visiting); **The Greatest Story Ever Told (sic)** - Arnold Barnett, operations research & management. Operations Research Center Seminar Series (185). 2:30pm, Rm 24-121.

The MIT Bag Model of Elementary Particles - Kenneth Johnson, physics. Lectures on Physics (285). 3:30pm, Rm 6-120.

Some Aspects of Crustal Movement in Afghanistan - Peter Molnar, marine geology. Earth & Planetary Sciences Lecture Series (63). 4pm, Rm 54-100.

In Vitro Assembly of Microtubules* - Dr. Joanna Olmstead, biology, Rochester University. 4:30pm, Rm 4-270. Coffee 4pm, Bldg 56, 5fl vestibule.

Wednesday, January 28

Collective Bargaining Environment - D. Quinn Mills, industrial relations. Sloan School of Management Seminar (324b). 10am, Rm E52-542.

Capitalism and Freedom - Miles Morgan, political science and philosophy. Philosophy Seminar (272). 2pm, Rm 2-131.

Advanced Concepts in Thermal Area Air Traffic Control - Robert W. Simpson, aero/astro. Highlights in Aeronautics & Astronautics Seminar (4). 2pm, Rm 33-206.

Performance Evaluation of a Multiprocessor in Real Time Environment* - Jaynarayan Lala, G. Aero/Astro Doctoral Seminar. 2pm, Rm 37-476.

Elementary Iceboat Performance - Robert Halfman, aero/astro, visiting associate dean for student affairs, ESG chairman. ESG Wednesday Seminar (138). 3pm, Rm 24-612.

Can Radio Astronomy Help Detect Breast Cancer? - Alan Barrett, physics. Lectures on Physics (285). 3:30pm, Rm 6-120.

Career Planning - An Insiders View** - Jay Curley, recruiting firm of Bernard Haldane. Season Sloans Dinner Meeting. 5:30pm, Fac Club Rm 4.

Thursday, January 29

Applications of Operations Research in Business and Industry - Newton Garber, RCA, David Sarnoff Research Center. Operations Research Center Seminar Series (185). 2:30pm, Rm 24-121.

Friday, January 30

Sonar, Especially Side-Scan Sonar: Discussion and Demonstration* - Robert Henderson, EG&G, Inc. Strobe Lab Seminar. 12n, Rm 4-402.

Affirmative Action and Open Discussion on the Future of Minorities on Campus** - Patricia A. Garrison, assistant EOP officer. Being a Minority Employee or Student at MIT Seminar (316b). 12n, Rm 4-231. Minorities encouraged to attend.

The Economics of Academic Journals* - Antony Smailes, International Publishing Corporation of London, England (world's largest publishing house). Systems Dynamics Seminar. 3:30pm, Rm E52-461.

Photography of Life in Loch Ness* - Robert Rines, electrical engineering; Charles Wyckoff, Applied Photosciences, Inc, Needham. Strobe Lab Seminar. 5pm, Rm 10-250.

Community Meetings

Gay Warner Memorial Lectures - Sponsored by Women's Forum. Lectures by DeAnne Rosenberg, independent management consultant. Wed, Jan 21 topics include assertiveness training, concepts of risk and power. Coffee & donuts 5pm, lectures 5:30-7:30pm, Sala. Info: Brenda Ferriero, Rm 39-564, x3-4102.

Boston Bicentennial for Foreigners (92) - Sponsored by Wives Discussion Group & Medical Department. Wed, Jan 21: **Victorian Boston:** films and exhibitions. Wed, Jan 28: **Where is Boston:** multimedia presentation on contemporary Boston. Bus leaves Ashdown 1:15pm, sign up Rm 11-203. Fee: \$1.

Equal Rights Amendment - Discussion of Mass State ERA, how it differs from federal ERA, how it will effect your life. Speaker: Ann Kendall, interim chair, Committee to Ratify the Massachusetts State ERA. TWO meeting. Wed, Jan 21, 7:30pm, Rm 10-340.

Women's Health Week - IAP activities sponsored by Women's Forum. Thursday, Jan 22: Wendy Midgely & Fanny Guterman, "Obesity and Behavior Modification", Rm 3-446. Fri, Jan 23: Open meeting on "How Women can Handle Work Stresses", Dr. Rochelle Friedman, psychiatrist. Rm 10-340. All 12n-1:30pm.

Middle East Simulation Game** - A simulation of a crisis or crises in the Middle East with participants playing the parts of concerned parties. Sponsored by political science department. Thurs, Jan 22 & Fri, Jan 23, 9am Thurs-12n Fri, 1st fl Bldg 4. Free. Party following completion. Info: Ernest or Yale, 494-9205.

One Full Day of Live Remote Cable Broadcast - Fri, Jan 23. Student produces television special.

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

Medical Emergencies - What to Do When Your Child... ** - Marcia West, RN, pediatrics, medical department. Medical Department Parents' Discussion Group. 12n, Rm 10-340. Refreshments.

Social Events

Hillel Brunch* - Sun, Jan 25, 11am, Rm 10-105. \$1.50 non-members, \$1.25 members.

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

Movies

King Kong - Barker Library Film/Food Fest (157b). Wed, Jan 21, 12n, Rm 10-500. Lunch for sale.

The Distinction of Past and Future - Feynman Film Series (283a). Wed, Jan 21, 1pm, Rm 26-100.

The Turbulent Ocean - Earth & Planetary Sciences Film Theatre (62). Commentary by Carl Wunsch, physical oceanography. Wed, Jan 21, 2pm, Rm 1-190.

King Kong - Barker Library Film/Food Fest (157b). Wed, Jan 21, 2:30pm, Rm 10-500. Wine & cheese for sale.

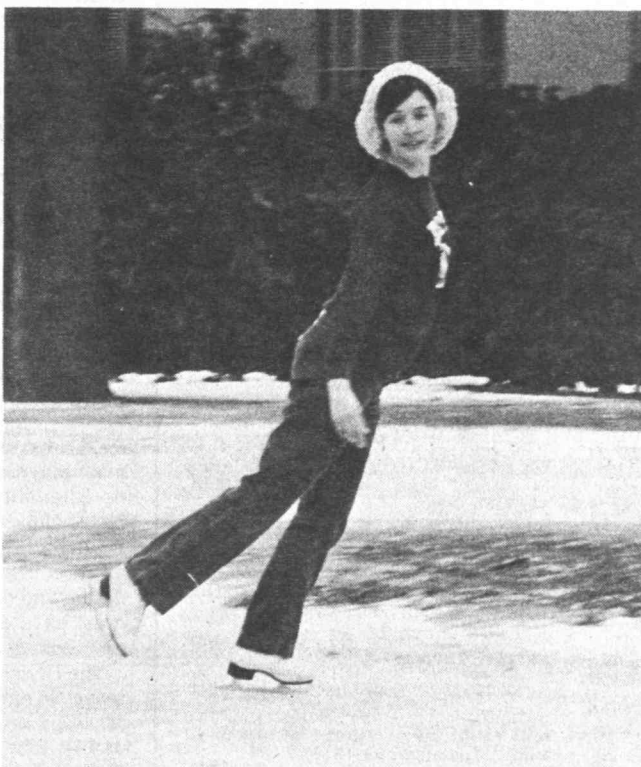
You Might Just As Well Say That 'I See What I Eat is the Same as I Eat What I See' - Oxford Philosophy on Film (277). Wed, Jan 21, 3pm, Rm 26-100.

King Kong - Barker Library Film/Food Fest (157b). Wed, Jan 21, 5pm, Rm 10-500. Wine & cheese for sale.

Soylent Green - LSC. Wed, Jan 21, 7 & 9:30pm, Rm 26-100. Admission \$.50, ID required.

Whale Films* - Including films by Jacques Cousteau. Ecology Action Films. Wed, Jan 21, 7:30pm, Rm 10-250.

Skylab-Space Station I - Skylab Movie Series (10). Thurs, Jan 22, 12n, Rm 35-225.



Unlikely skating spots are a specialty with Barbara A. Wilson, a junior in materials science and engineering from Bedford, Texas, who finds the frozen surface of Killian Court an excellent rink. She does her roller skating in the lobby of Building 7.

The Social Beaver; A Bell for MIT - Historical Collections Pictures of the Past Film (409). Thurs, Jan 22, 12n & 1pm, Rm 6-120.

Probability and Uncertainty: The Quantum Mechanical View of Nature - Feynman Film Series (283a). Thurs, Jan 22, 1pm, Rm 26-100.

Exploration of the Moon and Planets - Earth & Planetary Sciences Film Theatre (62). With slide show from Mariner & Pioneer missions narrated by Nafi Toksoz, geophysics, director of George R. Wallace, Jr, Geophysical Observatory. Thurs, Jan 22, 2pm, Rm 1-190.

Joyce at 34; Betty Tells her Story - Sex Roles: Films and Discussion (417). Thurs, Jan 22, 7pm, Rm 14-0615. Admission \$.25 (opt). Followed by small mixed discussion groups.

Seeking New Laws - Feynman Film Series (283a). Fri, Jan 23, 1pm, Rm 26-100.

The Earth: Its Oceans; Fire Under the Sea; The Invisible Planet (Barnard's Star) - Earth & Planetary Sciences Film Theatre (62). Fri, Jan 23, 2pm, Rm 1-190.

Language and Creativity - Oxford Philosophy on Film (277). Fri, Jan 23, 3pm, Rm 26-100.

Films: The Dolphins* - Ecology Action Films. Fri, Jan 23, 3:30pm, Rm 10-250.

And Now for Something Completely Different - LSC. Fri, Jan 23, 7 & 9:30pm, Kresge. Admission \$.50, ID required.

Chinese New Year; Taiwan - China's Western Dragon - Films on New china sponsored by Chinese Students' Club. Sat, Jan 24, 2pm, Rm 10-250. Free.

The Manchurian Candidate - LSC. Sat, Jan 24, 7 & 10pm, Rm 26-100. Admission \$.50, ID required.

Dial M for Murder - LSC. Sun, Jan 25, 7 & 9:30pm, Rm 26-100. Admission \$.50, ID required.

Geysers and Hot Springs; Grand Canyon; Kilauea: Eruption of 1959; Arctic Islands of the Frozen Sea - Earth & Planetary Sciences Film Theatre (62). Mon, Jan 26, 2pm, Rm 1-190.

Girls at 12; Clorae and Albie (Chopra) - Sex Roles: Films and Discussion (417). Mon Jan 26, 7pm, Rm 14-0615. Admission \$.25 (opt). Followed by small mixed discussion groups.

Cat on a Hot Tin Roof* - Foreign Literature & Linguistics Movie. Mon, Jan 26, 7:30pm, Rm 26-100. Free.

MIT Progressions; Making Electrons Count - Historical Collections Pictures of the Past (409). Tues, Jan 27, 12n & 1pm, Rm 6-120.

San Andros Reef Tract; The Other Side of the Mountain; Space Navigation; Jupiter Odyssey - Earth & Planetary Sciences Film Theatre (62). Tues, Jan 27, 2pm, Rm 1-190.

La Bete Humaine - French Film Series (97). Tues, Jan 27, 7:30pm, Stu Ctr Mezzanine Lge.

The Earth's Changing Surface; Aerial Photo Interpretations of Hydrologic Resources; Earthquake!; Nuclear Propulsion in Space; Radio Astronomy Explorer - Earth & Planetary Science Film Theatre (62). Wed, Jan 28, 2pm, Rm 1-190.

Journey to the Center of the Earth** - LSC. Wed, Jan 28, 7 & 10pm, Rm 26-100. Admission \$.50, ID required.

The Second Manned Mission - A Scientific Harvest - Skylab Movie Series (10). Thurs, Jan 29, 12n, Rm 35-225.

The Russians are Coming, The Russians are Coming** - LSC. Fri, Jan 30, 7 & 10pm, Rm 26-100. Admission \$.50, ID required.

Bhuvan Shome (Mrinal Sen)* - Sangam. Indian movie with English subtitles. Sun, Feb 1, 2:30pm, Rm 26-100. Admission \$.50 with ID. Info: x5-7469 Dorm. Indian refreshments for sale.

Music

MIT Trombone Choir* - Concert of music written and arranged for group of trombones. Thurs, Jan 22, 5:15pm, Music Library; Fri, Jan 23, 12n, Bldg 10 Lobby Both concerts free.

Theatre and Shows

MIT Shakespeare Ensemble* - Scenes from *Henry IV* part 2, *Richard III*, *Measure for Measure*, *Othello*, and *The Glass Menagerie* (Williams). Mon Jan 26, 7:30pm, Chapel.

Dance

MIT Folk Dance Club* - Couple Dance Workshop with Mandala Folk Dance Ensemble. Sat, Jan 24, 12n, Sala.

MIT Folk Dance Club - International: Sun, 7:30-11pm, Sala. **Balkan:** Tues, 7:30-11pm, Stu Ctr 491. **Informal:** Fri, 12n-1:30pm, Bldg 7 Lobby. **Israeli:** Thurs, 7:30-11pm, Sala.

Exhibitions

Claes Oldenburg Exhibition - Sponsored by Committee on the Visual Arts and Institute for Contemporary Art. Exhibit Sat, Jan 17-Wed, Feb 25, Hayden Gallery. Hours: 10am-4pm daily, 6-9pm Tues. Opening reception Fri, Jan 16, 8-11pm.

Amenoff Exhibition* - Drawings and paintings on paper, by Gregory Amenoff. Thru Wed, Feb 25, Hayden Corridor Gallery.

MIT Historical Collections* - Permanent exhibition Mon-Fri, 9am-5pm, Bldg N52, 2nd fl. **Bicentennial Exhibits:** Katharine Dexter McCormick, '04; Vannevar Bush '16; and Karl Taylor Compton, in Bldg 4 corridor.

Schumann at Work on a Song* - Music Library exhibit of manuscript facsimiles & pictures. Daily, 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.

Athletics

Home Schedule* - Wednesday, January 21 - JV/F Basketball. Phillips Exeter, 3pm, Rockwell Cage. **W Basketball.** Univ of Lowell, 7:30pm, Rockwell Cage. **Thursday, January 22 - W Swimming.** Bridgewater, 6pm, Alumni Pool. **Friday, January 23 - V Squash.** Franklin & Marshall, 7pm, 4:30pm, squash courts. **V Indoor Track.** Coast Guard, 5:30 & 7pm, Rockwell Cage. **Saturday, January 24 - V & W Fencing.** Dartmouth, 1pm, duPont fencing rm. **V & W Gymnastics.** Yale, 2pm, duPont Gym. **V Hockey.** Clark, 7pm, ice rink. **JV/F Hockey.** Graham, 2pm, ice rink. **V Squash.** Stony Brook, 2pm, squash courts. **V Swimming.** Boston College 2pm, Alumni Pool. **JV/F Squash.** Croton, 2:30pm, squash courts. **Monday, January 26 - V Basketball.** Tufts, 8:15pm, Rockwell Cage. **JV/F, V Basketball.** Tufts, 6:15 & 8:15pm, Rockwell Cage. **V Hockey.** Fitchburg, 7pm, rink. **Tuesday, January 27 - V Gymnastics.** Dartmouth, 7pm, duPont Gym. **V Swimming.** RPI, 6pm, Alumni Pool. **Wednesday, January 28 - V Hockey.** Nichols (host), 7pm, rink. **JV/F Hockey.** Thayer Academy, 3pm, rink. **V Indoor Track.** Colby, 7pm, Rockwell Cage. **V Wrestling.** GBCAA, 5:30 & 7pm, wrestling rm. **Thursday, January 29 - JV/F Basketball.** BB&N, 4pm, Rockwell Cage. **Friday & Saturday, January 30 & 31 - V Wrestling.** Brown, NY Maritime, Central Conn, Fri 11am & 2:30pm, Sat 1:30pm, wrestling rm. **Saturday, January 31 - JV/F, V Basketball.** Coast Guard, 6:15 & 8:15pm, Rockwell Cage. **V Fencing.** Brown, Lehman, 1pm, fencing rm. **W Fencing.** Brown, Providence, 1pm, fencing rm. **JV/F Hockey.** Emerson (host), 2pm, ice rink. **V Indoor Track.** Bowdoin, 1pm, Rockwell Cage.

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

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

Send notices for January 28 through February 8 to the Calendar Editor, Room 5-111, Ext. 3-3279, before noon Friday, January 23.

CLASSIFIED ADS

Ads are limited to one per person per issue and may not be repeated in successive issues. All ads must be accompanied by full name and Institute extension. Only Institute extensions may be listed. Members of the community who have no extensions may submit ads by coming in person to the Tech Talk office, Room 5-111, and presenting Institute identification. Ads may be telephoned to Ext. 3-3270 or mailed to Room 5-111. Please submit all ads before noon, Friday, January 23. They will be printed on a first come, first served basis as space permits.

For Sale, Etc.

Fabulous Tappan 400 elec stove, 4 brm, oven on top, pan cab bttn, stainless stl top, 10 yrs, best. Call, 784-2526.

Teac AC-9 auto cassette tape deck w/fast rev, fast frwd, auto change-over slide rack, yr old, gd cond, \$65. Wendy, x3-7402.

Pr Koss ESP-9 electrostatic headphones w/energizer, hrldly used, \$95. Steve, x3-7220.

Revereware whistling teakettle, avocado, nvr used, in crtn, \$4; collaps plastic waterbottle for camping, 2-3 gal, \$1; pr Springmaid pillowcases, still in pkg, \$.75/pr; free wool scraps for patchwork or child skirt. Janis, x3-4716.

Xtra lg wd desk, 3'5" x 5'10", v gd cond, ask \$45. Marty, x3-1935.

Smith Corona Profile 800 elec add mach, \$25. Lee, 262-5090.

Sofa, 90", moss grn w/gold & wht flowers, tapestry velour, yr old, hrldly used, ask \$500. Shirley, x182-183-214 Bedford Fl Facil.

DR furn, 42" rd tbl w/12" leaf, 6 chrs, hutch, \$150; chrome & glass chandelier; handmade 5x7 Columbian rug. David, x3-6291.

Ital antique vase; antique slvr spoons. Caren, x3-6121.

Mtl 200 cm skis, m sz 10 boots, alum poles, \$10/pkg; ice hcky & scuba paperbacks. Tom, x3-4710.

RCA b&w TV, 21", mahog housing, \$20. x3-2008.

Pr 205 Atomic mtl skis, \$15; pr 9 1/2 mens Koflach ski boots, \$10; sunlamp/stand, \$10; mw Sunbeam mist stick curler/styler, \$9. Liz, x3-5831.

Auto ratio car tape deck mdl GES w/fm converter, \$50 firm; Garrard mdl MK3 trmbt w/dust cover, \$25 or best. Call, 665-4183, aft 6.

Accordion, gd cond; Delco car batt, 12V, \$9. Fiorello, x8-3511 Draper.

Pr Semperit stud radial snows, sz 175SR13, mtd 13" Fiat 124 rims, exc cond, \$75 or best. Nancy, x5348 Linc.

Bauer hcky skates, sz 10, \$10. Peter, x3-2627.

Karate outfit ("gi"), fits 5'7"-6'1", hrldly used, \$10. Bob, 666-4565.

K sz matt, box spr, frame. Call, 862-3952.

Amer Oriental rug, 9x12', \$50. Call, 566-2891, evgs.

Beaut stereo stand, must be seen, \$30; 3 mos old wd desk, \$30; easy chr for it, \$15; 10 spd bike, 3 mos, w/\$20 lock, barely used, \$80; all avail now. Mehran, 547-8636, evgs.

Bose 901 series II spkrs, w/stands, grnty. Ron, x7668 Linc.

Qual lead crystal ware, 2 cut glass pitchers, \$18/ea; 2 bowls, \$18/ea; Wedgewood strawberry leaf closed dishes, \$40/8; slvr casserole, \$22. Carol, x3-1332.

Used Electra Voice EV 1178 rcvtr, v gd cond, \$65; 2 sm spkrs, \$10/ea. Call, 734-0872.

Pr 180 cm Voit skis w/tyrolean bndgs, gd cond. Call, 325-2813, aft 6.

Plate glass mirror, 56x30", gd cond, \$25. Diane, x8-1766 Draper.

Long dresses & skirts, sz 14, \$5-\$10; pr Gdyr Volvo tires, 6.85x15, gd cond, \$10; Bauer hcky skates sz 13, \$5; Scandinavian baby carriage, \$25; baby port-a-bed, \$5; xcntry ski boots sz 4, \$5. Gundersen, x3-6085.

Heathkit AD-27 compact stereo ctr, fm & BSR 510 w/roll-top cabinet, 12 W/chnl, 1 1/2 yrs, \$180 or best. Cameron, x5-9540 Dorm.

Antique glass front bkcses, 2, exc cond. Call, 864-6379, aft 5.

Beaulieu 4008ZMII Super 8 movie camera, 6-66 mm var spd zoom, 2-70 fps, var shutter, sync sound, batt charger, cable release, var fltrs, nw \$1,200, discount about \$800, used 15X, 1 1/2 yrs, mint cond, \$580. Bob, x252 Linc.

Pr PDQ Bach tkcts, Feb 2; 30 reels BASF rcrding tape, 1200 & 1800, \$1.50-\$2 ea or \$40 total. Louis Tsien, 723-5036, evgs.

Padded half moon bar, formica top, 2 stools, 2 shlvs, sliding panel, open panel, v gd cond, \$200. Agnes, x3-1467.

Heathkit AR-2020 amfm, 4 chnl rcvtr, assembled, \$275. Ben, x181-56-112 Millstone.

Wht m lg karate suit ("gi"), w/wht belt, gd cond, \$15. Susan, x3-4701.

Fischer 205 cm skis w/Tyroliia step-in bndgs, \$45 or best. Tom Schwartz, x3-6894.

Refrig, about 14 cu ft, \$50; bureau, \$30; 4 untouched gals Latex paint, 3 brnt gold, 1 pastel grm, \$5/gal; pr G78x14 snows, \$20. Steve, x3-6959.

Hand hairdryer, Pro 1200, b nw, \$15. Linda, x3-5296.

Red French vlvt 12x12 carpet w/padding, \$250. Mike, x5773 Linc.

Amer Oriental 9x12 rug, brn, bge, org & blu, just cnded, \$45; VW bug hubcaps, 2, \$2.50/ea. Erica, x3-2117.

Microfiche reader, Xerox 2240, \$170; tele-photo lens, Teletent 300 mm, f5.5, \$80. Call, 494-0046.

Skis, Fischer Alv mtl, 205 cm, Tyroliia step-in bndgs, poles, used 5 times, best. Stan, x3-5049.

Pr H78x15 Cntrypolitan stud ww snows, gd cond, \$30. Alex, x8-1583 Draper.

Realistic r-to-r tape deck, \$6; 190 cm wd skis w/cable bndgs, \$20; Dynaco SCA 35 amp, bad transformer, \$30; jewelry & knick knacks, x5-8644 Dorm.

CCM wht fig skates, girl sz 11, nr perf cond, \$25 nw, \$12; Bauer hcky skates, boy sz 13, gd cond, \$8; Sears dbl runner skates, blk, sz 11, \$1. Hal x5809 Linc.

Oriental rug, 3'3" x 5'3", worn; crtns, var sizes & colors. x3-7902.

Clark's Wallabees, f sz 7N, 2 wks old, b nw, exc cond, brn leath, too sm, nw \$34, \$27 or best. Barry, x3-6526.

Clothes washer, 8 mos, from Lchmere; rug, 9x18 w/pad. Call, 567-5404.

HP 70 bus financial calc, 4 mos, w/handbk batt recharger, carry case, pd \$225, consider any reas offer. x5-9422 Dorm.

Stud ww snows, 2 ea, 6.00x12, 4 full ply nylon, Le-Havre, used 2 mos, \$30. Call, 861-9459.

Spaulding 175 cm skis w/Spaderman bndgs, exc cond, \$130. x3-3783.

Empire 999 TE/X deluxe stereo crrtdg, used 2 mos, exc cond, compl w/mtg hrdware, instr, list \$65, \$15. John, x5525 Linc.

Tapes, 100 8 trk asst rock, \$100; 8 trk amfm in dash, \$50; car spkrs, \$15/pr. Tim, x3-4181.

Vehicles

'65 VW Karman Ghia, gd cond, \$300. Beverly, x3-1530.

'65 Volvo 122S, 4 dr sed, 60K, gd cond, radio, \$650. x3-4307.

'67 Pont Le Mans, std, 8 cyl, roomy, perf mech & body, \$795. Sia, x3-3911.

'67 Ford Cntry Sq wgn, runs gd, \$390. Frank, x8-3632 Draper.

'68 Peugeot 404, fall sticker, runs but nds work, \$100 or best. Craig Bolon, x3-3877.

'68 Chevy Nova, exc run cond, 60K \$700. David, x3-5720.

'68 Ford Frlna, mech gd, exc run cond, nw tires, nw batt, body may nd some work, \$200 nego. Nana, 494-0466.

'69 VW, gd running order, \$650 or best. Kate, x3-2024.

'70 Mustang, 250 cu in grn, vinyl top, econ car, xtras, gd cond, ask \$1,100. Call, 354-2208, kp try.

'70 Ply Satellite wgn, gd cond, 6 cyl, \$750. John, x8-1642 Draper.

'70 Saab 99E, 71 K, Konis, Michelins, nw exh, '72 transmission, cassette player, tach, gauges, Carello hdlttes, \$1,200 or best. Bob, x3-7305.

'70 VW bus, snows, gd cond, \$1,400; '71 Superbeetle, 50 K, nw tires, fm 8 trk, exc cond, \$1,500. Call, 354-7901, evgs.

'72 Linc Mark IV, all power, amfm stereo, radials, tilt whl, AC, 38 K, \$4,000. Ken or Larry, 667-6859.

'72 Renault 12 wgn, front whl drive, nw eng, clutch & radial snows, \$2,000, x477 Linc.

'75 VW bus, amfm, stereo 8 trk, 4K, exc cond, \$5,000. Bonnie, x381 Linc.

Housing

Allston, BR mod apt, ww, 10 min MIT, nr T, off-st pkg avail, avail 2/1 w/8/31 opt, \$210 incl ht, hot wtr. Call, 787-4066, aft 5.

Back Bay, lg 4 BR apt, LR w/frpl, bay wndws, eat-in K, sunny, 10 min walk MIT, avail 2/1, \$360 + sec dept. Call, 266-5742.

Bos, Bay State Rd, lg, attractive effc apt to sub. Howard, 266-4363.

Bos, Kenmore area, 2 BR, LR, fully equip K, AC, avail immed, \$330 incl ht. Call, 267-3312.

Maynard condo apt, 2 BR, ww, screen bale, all elec, \$28,000 or rent \$290 w/opt to buy, psbl 7 1/2% mortgage take-over. Steve, x8-4147 Draper.

Bartlett, NH, ski rental, 3 BR mod chalet, slps 12, 2 frpl, 2 min Attitash, \$150/wk, \$550/mo, \$1,500/seas, from 2/1. x3-2868.

Ski rental, Fryeburg, Me, 3 BR chalet, frpl, 10 min Pleasant Mtn, 20 min N Conway, \$125/wk. Steve, x5584 Linc.

Animals

Free pup, f glدن rtrvr/Siberian husky, 6 wks, blk, exc dog; we own parents.

Samuelson to Participate in Lecture Series

For the third consecutive year, MIT's Nobel Prize-winning economist Paul Samuelson is a key contributor to the syndicated lecture

Tech Wives Plan ERA Discussion

The Massachusetts State Equal Rights Amendment will be the topic of discussion at the January meeting of the Technology Wives Organization on Wednesday (Jan. 21), 7:30pm, in the Emma Rodgers Room (Rm. 10-340).

Ann Kendall, interim chair of the Committee to Ratify the Massachusetts State ERA, will be guest speaker. Ms. Kendall is also Massachusetts co-coordinator for National Organization of Women (NOW) and a member of the Governor's Commission on the Status of Women.

The discussion will focus on what the State ERA is, how it differs from the federal ERA, the status of both and the effect each will have on the lives of women.

All interested members of the MIT community are welcome to attend the meeting.

Ralph Markson, 899-1834, evgs.

Free spayed f cocker-poodle, tan & wht, 4 yrs, hsebrkn, gentle & loveable. Linda, x3-6909.

AKC pug pups, 5 f, m, born 1/13, x7071 Linc.

AKC blk lab pups, gd w/chldrn. Nancy Burke, 522-6700.

Lost and Found

Found: 12/15, m watch, in duPont pkg lot. Jan, 648-4636.

Lost: \$10 reward for rtn of sm blk Coop memo book lost Mon, 1/12, vcty of either Bldg 2 or Kresge. Howard Boles, x5-8261 Dorm. I'm desperate!

Wanted

Port elec typwrtr & Konica C35 or similar camera. Ron, x3-6740.

Refrig. x5-8532 Dorm. evgs.

Place to store intermed sz car, Feb thru June. Michael, x3-5840.

We nd use of refrig in vcty of 3 Ames St, price nego Kathleen or Men, x5-6685 Dorm.

Mtl detector for a few hrs, wl pay. Dick, x3-1639, or lve msg.

Freelance programmer to write Multics Graphics DIM for HP plotter. Colleen Dahlen, x5-6486 Dorm, evgs.

Concertina, cheap (?). Bob Cronin, x8-4646 Draper.

Russian typwrtr. Bill, x8-3546 Draper.

Scandinavian xcntry skiers want to rent cabin on occasional wknds nr gd trails. Magdalena, x3-4830.

Babysitting job wanted. Marianne, 266-7349, evgs.

Sum hse or condo rental on Cape Cod, nd 3-4 BR, must be nr beach, other amenities, rent by mo or half seas. Phil, x3-7296.

Roommates

Rmmate for Wellesly hse, own rm, grad stu pref, non-smoking, \$135 + util. Marko, x3-6903.

Tang, m for 3 BR apt, 22nd fl, avail 6/1 or anytime spr sem, must make arrangements now. Tom, x3-6726.

Share lovely hse w/frpl, grand piano, grdn, terrace, garage, woods, 15-20 min MIT, rent arranged Call 484-6833.

M rmmate to share lg Wrtwn duplex w/4 grad stus, nr T, shopping, \$45 + util. Call, 926-3909.

F rmmate, 22+, lg 4 BR bkline apt, free pkg, 2 blks T, ASAP, \$105. Kitty, x8-2885 Draper.

Share apt in 2 fam Bri hse, 2 BR, study, DR, frpl, scr back porch, yard, garage, 2 blk Comm Ave & T, avail 2/1, \$137 + \$25 util/prsn. Jim, x3-3703.

F, non-smoker, share apt across from Orson Welles, avail immed, \$106 incl ht. x3-6757.

F to share mod AC 2 BR Newton apt, tennis courts, pool, free pkg, nr T, Rt 9, 128, Pike, \$152 + util. Call, 964-5892.

Carpools

Form or join carpool, Wilmington Rt 62 & 93 to MIT/CSDL, hrs flex. x8-3325 Draper.

Ride wanted Wilmington to & from MIT daily. Peter Allaman, x3-1738.

Wl take riders Ari, W Som to Draper & MIT, 7:30-4:30. Bill, x8-3546 Draper.

Miscellaneous

I am mthr of 18 mos old baby, wl babysit full time in my licensed day care home, Eastgate, wl eventually sit nites & wknds, price nego. Call, 494-8422.

course, "The Molding of American Values," with circulation in more than 200 of the nation's newspapers.

The two-credit correspondence course, featuring essays by professors from Harvard University, Smith College, Cornell University, and the University of Chicago in addition to MIT, discusses such issues as private enterprise, business empires, advertising, and government regulation of the economy.

Dr. George A. Colburn, business director of the project, which is based at the University of California at San Diego, said registration for the current course would be open until mid-February. The course com-

prises 18 weekly lectures by newspaper in conjunction with occasional classes and exam sessions at local universities, plus a supplementary kit of readings, for \$7.90.

Cooperating Massachusetts newspapers for the upcoming series are the Cape Cod Standard Times, the Lawrence Eagle-Tribune, the Southbridge Evening News, the South Middlesex News, and the seven newspapers connected with Minute-man Publications, Inc., of Lexington, Mass.

Course participants will have the option of attending related classes at Cape Cod Community College and Merrimack College in North Andover.

Employment Q & A

By DONNA TAYLOR
Office of Personnel Relations

Q: If I continue to take courses while on leave of absence without pay from MIT, am I eligible for reimbursement under the Institute's Tuition Assistance Plan?

A: The Tuition Assistance policy permitting reimbursement for persons who are employed part-time is interpreted to include, effective Jan. 1, 1976, those who work parts of a year and are on leave without pay for the balance. Reimbursement will be pro-rated on the basis of the proportion of the calendar year the individual is on full pay status. The payment will be made following return to employment at MIT.

For example, a person working on a 50 percent basis, is entitled to 50 percent of the normal Tuition Assistance benefit. Therefore, if you normally work full time and a three-month leave without pay is approved, the tuition reimbursement would be 9/12 or 75 percent of the regular tuition benefit.

The selected course of study must still meet all of the requirements of the Tuition Plan regarding applicant and course eligibility and must be approved by the Office of Personnel Development. Further information may be obtained from Ellen O'Hara, x 3-4276.

Q: I would like to apply for the Certified Professional Secretary Examination, which costs approximately \$75.00. Would this fee be reimbursed under the Tuition Assistance Plan?

A: Effective Jan. 1, 1976, the Tuition Assistance Plan will reimburse the cost of certain licensing/certification fees, including the Certified Professional Secretary Examination, the High School Equivalency Exam, and licensing fees for electricians, plumbers and nurses, among others. Inquire at the Office of Personnel Development, x 3-4276, for further information.

Q: Under what conditions is a terminated employee eligible for unemployment compensation benefits?

A: Eligibility for unemployment compensation is determined by the Massachusetts Division of Employment Security and not the employer. When an individual files for benefits, DES requests information from all recent employers, as well as the individual, on the reason for termination and on wages earned. In order to qualify for benefits, a person must have earned \$1200 in the preceding year and must be available and looking for work.

The Division is primarily interested in establishing whether the employer or employee initiated the separation. A recent amendment to the Massachusetts Employment Security Law which became effective Jan. 4, 1976 provides that if the employee left his/her work 1) voluntarily without good cause attributable to the employing unit, 2) by discharge shown to be attributable solely to deliberate misconduct in willful disregard of the employing unit's interest, or 3) because of conviction for a felony or misdemeanor, then the claimant/employee is disqualified from receiving unemployment compensation benefits for an indefinite period of time. Some of the most typical reasons for voluntary terminations are: looking for other work with greater job interest or higher wages, relocation, further education, and voluntary retirement.

However, if it is determined that the reason for separation is attributable to the employing unit, then (with the exceptions of discharge due to deliberate misconduct and conviction of a felony or misdemeanor) the termination is usually considered by DES to be involuntary and the claimant is therefore generally found to be eligible for benefits. The most typical reasons for terminations of this kind are: layoff or completion of stipulated work, lack of funds, discharge due to lack of skill or ability, and mandatory retirement at age 65.

Each employer and claimant has the right to request a review on any determination made by the Division.

Q: What is "Write On"?

A: "Write On" is a feedback vehicle developed by the Personnel Office several years ago to encourage any questions or comments about Institute policy and practices. A new supply of the self-addressed forms is in process of being sent to the headquarters office of each department.

As this column cannot continue without questions, I encourage you to utilize a "Write On" form to submit questions for possible inclusion in the column.

Lowell Institute School

Massachusetts Institute of Technology

Career Development Courses

Effective Public Speaking • Op-Amp Applications • Engineering Problem Solving
Digital Electronics • Introduction to Technical Writing • Scientific Glassblowing
Introduction to Microprocessors • Mechanical Drafting • Creative Photography
TV Systems Technology • High Speed Photography & Videography
Introduction to Electronics • Machine Tool Fundamentals

For over 70 years, men and women wishing to further their careers in technical fields have turned to MIT's Lowell Institute School for top-quality, low-cost educational opportunities. For a bulletin and application contact:

MIT Room 5-118, Cambridge, MA 253-4895

POSITIONS AVAILABLE

This list includes all non-academic jobs currently available on the MIT campus. Duplicate lists are posted on the women's kiosk in Building 7, outside the offices of Special Assistants for Women and Work (10-215), and Minority Affairs (10-211), and in the Personnel Office (E19-239). Personnel interviewers will refer any qualified applicants on all biweekly jobs Grades II-IV as soon as possible after their receipt in Personnel. Persons who are not MIT employees should call the Personnel Office on extension 3-4251.

Employees at the Institute should continue to contact their Personnel Officers to apply for positions for which they feel they qualify.

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

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

Sally Hansen 3-4275
Lewis Redding 3-2928
(secretary — Susan Bracht)

Spons. Res. Staff at Project MAC to design and supervise implementation of a simulation facility for hypothetical computer architectures. Duties include logic design and programming for digital systems, utilizing microprocessors. Experience in designing simulators for computer architectures required. D76-4 (1/21).

Spons. Res. Staff, Project Coordinator in Energy Lab for N. England Energy Management Information Systems Project. Will report to principal investigators; hire personnel; work with government and other agencies to identify applications; plan work to fulfill agency application requirements. Will also evaluate employees, report progress, design and implement work procedures. Requires MBA, or equivalent; experience in computer programming and systems analysis, personnel and business administration. Experience with government agencies desired. D76-7 (1/21).

Acad. Staff, Technical Instructor, part time to manage Foreign Literature and Linguistics Language Laboratory. Duties include hiring and training of student personnel; instructing lab users; assisting in material selection; administering exams; substituting for teaching staff (administering assigned tapes; supervising lab classes). Will also prepare tapes; maintain tape library; oversee equipment repair. Some facility with German, French, or Russian, supervisory skills and ability to work independently required. Position is for academic year (Sept. — May) only, 9am-2pm, Mon.-Fri. Selected applicant must be able to substitute for student staff during other operating hours as required. C76-1 (1/14).

Acad. Staff, Technical Asst., in Biology to conduct studies on the interaction between various chick cells and RNA tumor viruses. B.A. or B.S. in Biochemistry, Biology or related field, experience in tissue culture, preferably including work with viruses required. Recent graduates, please submit list of relevant courses taken. C76-2 (1/14).

Asst. to the Treasurer, Admin. Staff, to supervise and perform financial studies of MIT retirement and retirement-related employee benefit plans and other financial operations of Treasurer's Office. Will also perform financial studies under direction of V.P., Financial Operations. Conduct liaison with other MIT departments, outside actuaries, accountants, investment advisors, legal advisors. Degree in business administration, economics or related field required. (Advanced degree preferred.) Experience with financial administration analysis, preferably in a university environment, and with legal procedures also necessary. Familiarity with MIT desirable. A76-1 (1/14).

Academic Staff, Asst. Humanities Librarian for Selection will assist in development of Humanities collections and of selection policies; supervise special projects to evaluate collections; participate in reference service and in reading list and bibliography preparation. MLS from accredited library school, at least three yrs. experience in Humanities collection development, subject competency in one or more Humanities fields, organizational and supervisory skills, reading knowledge of at least 2 modern foreign languages required. C75-31 (11/12).

Inpatient Nurse, Exempt, in the MIT Infirmary to do primarily bedside nursing; may be called upon to assist with first aid and emergency care. Must be a Mass. Registered Nurse with at least one year nursing experience, preferably Medical/Surgical. 3pm-11pm shift but flexibility to work all shifts required. E76-1, E76-2, (1/14).

Admin. Asst. V, part-time in Center for Advanced Visual Studies to assist full-time Admin. Asst. in varied duties to support project and academic activities of resident Research Fellows; perform secretarial responsibilities (answer phones, type correspondence);

handle accounts; perform some editorial duties. Typing skill, ability to solve problems independently and to work well with people required. Shorthand, familiarity with the arts (arts administration, fund-raising) desirable. 20 hrs/wk., 9am-1pm, with flexibility to work additional hours. B76-15 (1/14).

Admin. Asst. V, to handle administrative aspects of activities of large Earth and Planetary Sciences research group; coordinate and monitor expenditure of research funds; interact with government contract administrators; handle personnel matters, space, furniture, parking allocations. Will have responsibility for all secretarial/clerical duties and some library research. Typing skill, excellent administrative and supervisory abilities, as well as facility with figures required. B76-18 (1/14).

Sr. Secretary IV-V, part-time: will handle a variety of secretarial and administrative details for Mrs. Wiesner at their home in Watertown. Maintain calendars, record calls; work closely with Dr. Wiesner's secretary; handle arrangements for some Institute events; arrange travel; maintain files. Excellent typing and shorthand skills required. Discretion and tact essential to deal with confidential matters, and to work in a private home. Knowledge of the Institute preferred. 20-25 hrs/wk. B76-24 (1/21)

Secretary IV-V to Associate Department Head, Electrical Engineering and Computer Science: schedule appointments and conferences; maintain personnel files; respond to various correspondence independently; act as liaison with other Institute offices. Good secretarial skills, ability to set priorities and work with minimum supervision required. Shorthand skill, MIT experience desirable. B76-26 (1/21).

Secretary IV to Director and one other administrator, Information Processing Center: handle telephone, mail, routine correspondence; arrange travel and appointments; handle inquiries about information processing services. Contact will be with academic, research, administrative personnel of MIT and other universities. Requires previous secretarial experience. Interest in information processing as well as MIT background desirable. 40 hr/wk. B76-20 (1/21).

Editorial Secretary IV in Graphic Arts to prepare camera-ready justified and tabular material on IBM proportional spacing electric typewriter; operate Compugraphic Compu-Writer I, II and 7200 phototypesetting and photoheadliner systems. Knowledge of typesetting terms, justification, quadding, leading, kerning, type styles, specifications, required. High school graduate or equivalent, excellent typing and relevant working experience required. B76-19 (1/21).

Secretary IV, part-time to Chemistry Dept. faculty member: type correspondence, manuscripts, grant proposals, course material; arrange appointments; monitor research accounts. 1-2 years secretarial experience and technical typing skill required. 20hrs/wk. B76-25 (1/21).

Secretary IV to Center for International Studies faculty member involved in research on nuclear power and urban economics: arrange meetings, seminars, travel; type correspondence and professional papers. Excellent typing, organizational skills required. Previous secretarial experience necessary. B76-4 (1/14).

Secretary IV in Medical Dept. Psychiatric Service will work with 2 full-time psychiatrists and share secretarial responsibilities for part-time staff: transcribe machine dictation; type papers; arrange appointments and travel; maintain files. Will report to Service Admin. Asst. Secretarial experience, sensitivity in dealing with people required. Knowledge of keypunching desirable. 37½ hrs/wk. B76-14 (1/14).

Secretary IV to work for several Mechanical Engineering faculty members: type correspondence and technical material; arrange travel, appointments, coffee seminars; handle basic bookkeeping tasks. High school graduate, or equivalent, shorthand, machine transcription, technical typing skill required. B76-7 (1/14).

Secretary IV to Psychology faculty member: type correspondence, reports; maintain research accounts. Will also manage Departmental library; order journals, books; maintain card file, process and catalogue new materials; supervise circulation. Excellent typing, facility with figures, organizational skill required. College training preferred. B76-6 (1/14).

Secretary IV to Lab for Nuclear Science Purchasing Agent, Assistant Purchasing Agent and Buyer: handle varied duties relating to Lab purchasing process; type correspondence, purchase orders; obtain quotations; maintain files and other records. Supervise part-time and temporary employees. Excellent typing, organizational skills, ability to follow up on detailed work required. B76-8 (1/14).

Secretary III-IV in Center for Transportation Studies will type correspondence, reports; answer phones; arrange meetings and travel. 1-2 years secretarial experience or college training and the ability to work independently and under pressure required. MIT experience desirable. B76-16 (1/14).

Secretary III-IV in Psychology: type manuscripts, reports, correspondence from dictation equipment; act as secretary for introductory course (prepare class notes, maintain files, etc.); perform editorial duties for an international journal. Selected candidate will work as assistant to Department secretary and as junior secretary to Chairman. Excellent typing skills and command of English required. College training and previous secretarial experience desirable. B76-5 (1/14).

Secretary III to a several-member research group in Aeronautics and

Astronautics: type correspondence, reports, including technical material; handle other general office duties (act as receptionist; arrange travel; maintain special logs, supplies). Will assist other secretary with mailings and record-keeping duties. Good typing skill, ability to set priorities and work independently required. B76-2 (1/14).

Secretary III in Materials Science and Engineering Academic Office which handles all administrative aspects of Department's academic program (admissions, registration, dissemination of course and program information, etc.); will type correspondence, brochures; mail applications materials; arrange committee meetings; maintain student records. Position includes interaction with students, faculty, members of administration. Typing skill, facility with detailed work and ability to work independently required. Machine transcription skill helpful. B76-17 (1/14).

Sr. Library Asst. IV, Journals Processing Assistant to maintain flow of current periodicals being added to library's collection including check-ins, claims, processing of new titles, ordering replacements. Prepare materials for bindery; process monographs and monographic serials. College training, library experience and/or graduate library school training preferred. Applicants must be able to supervise others, set priorities and work independently. Typing skill necessary. B76-1 (1/14).

Dental Asst. IV, to work in MIT Dental Clinic. Will assist dentists, hygienists: prepare dental solutions; sterilize instruments; maintain examination rooms; assist with record-keeping and supply ordering. Requires completion of high school and approved Dental Assistant program. Previous work experience, ability to work under pressure, preferred. 37½ hrs/wk. B76-9 (1/14).

Sr. Clk. IV, temporary, in Summer Session Office to type admission letters, fee information, on IBM Memory Typewriter. Will also prepare registration material. Must be available throughout summer for Monday registration at 7:45am. Requires excellent typing, knowledge of IBM Memory Typewriter, facility with figures, ability to work under pressure. MIT experience desirable. Position runs 3/76-8/76. B76-21 (1/21).

Cashier III in Student Accounts, Cashier's Office, to receive cash payments; prepare cash deposit slips; log mail receipts; cash personal checks; prepare checks for deposit; prove cash fund. Ability to handle large volume of cash transactions accurately and with speed, to work well with others to use adding machine, plus 2-3 years office experience required. B76-23 (1/21).

Sr. Clerk III Medical Receptionist at the Medical Dept. main reception desk: schedule appointments; answer phones; prepare and maintain appointment sheets; direct patients and visitors; order medical records. Will assist at other desks as required. Some college training, experience in a similarly demanding, public-oriented position, ability to deal with people in a mature manner required. Typing skill also necessary. B76-3 (1/14).

Clerk III/Receptionist in the Environmental Medical Service will handle routine receptionist's duties; type technical and other materials; assist with varied clerical duties including occasional delivery of material to Institute locations and administration of Service library. High school graduate or equivalent, good typing skills, ability to deal well with people required. B76-13 (1/14).

Cashier II in the Walker Memorial Food Service will handle varied duties: act as cashier; prepare menu boards; handle varied bookkeeping procedures. High school graduate, or equivalent, formal training or working experience in bookkeeping procedures required. M-F 10:15am-7:15pm. B76-12 (1/14).

Photographer C in Earth and Planetary Sciences to handle varied duties relating to black and white photography: make contact and projection prints, process films; maintain apparatus; make slides; assist in data reduction and other lab tasks as required. Experience with darkroom procedures required. H76-1 (1/21).

Technician C, Radiation Protection, in the Environmental Medical Service will perform varied duties related to radiation protection program: assist in transporting radioactive material; handle radioactive waste; conduct radioisotope surveys, decontamination operations; set up radiation shielding. Will perform other related duties such as package delivery, maintenance of good housekeeping practices in laboratories. Mass. driver's license, high school graduate, or equivalent, with physics and chemistry course work required. 40 hr/wk. H76-2 (1/21).

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

- ADMINISTRATIVE STAFF:
A75-56, Sr. Consult./Trainer, Personnel Development (10/8)
A75-60, Systems Analyst, Off of Admin. Inf. Syst. (10/8)
A75-65, Acquisitions Editor, MIT Press (12/3)
A75-67, Acquisitions Editor, MIT Press (12/10)
A75-68, Project Planner, Planning Office (12/17)
A75-69, Admin. Asst. Information Proc. Center (12/17)
A75-71, Documentation Mngr., Off. of Admin. Inf. Syst. (1/7)
A75-72, Project Planner, Planning Office (1/7)
A75-74, Assoc. Staff Writer, Resource Planning (1/14)

BIWEEKLY:
B75-306, Sec. V, Physics (12/10)

This Week in Sports

Lange Challenges Hoop Scoring Record

Senior Cam Lange (Houston, Tex.) scored 16 points in a losing cause last Saturday against Trinity College, but the 6'-4" forward ended the game as the all-time MIT career scoring leader.

Lange's four year total to date is 1468 points in 79 games, topping the previous mark of 1466 set by Harold Brown 1969-1972. Brown set his record in a three-year career.

For three seasons, Lange has been MIT's top scoring leader. As a freshman, he scored 345 points for a 15.7 average. His sophomore season, he tallied 393 points—17.1 average, and last year was his most productive year, scoring 563 points for a 22.5 average. The 22.5 average ranked Lange thirteenth in the NCAA Division III 1974-75 statistics.

- B75-543, Sec. IV, Chem. Eng. (10/15)
- B75-632, Sr. Acctg. Clk. IV, Medical (11/26)
- B75-656, Sec. IV, Energy Lab (12/10)
- B75-665, Sec. IV, Biology (1/7)
- B75-671, Sec. III-IV, Off. of Pres. & Chan. (1/7)
- B75-672, Acctg. Asst. V, Cent. for Internat. Stud. (1/7)
- B75-681, Sen. Clk. III, Physical Plnt. (1/14)
- B75-685, Sec. IV, Medical Dept. (1/14)
- B75-687, Sec. IV, Sloan School (1/14)
- B75-688, Sec. IV, Medical (1/14)
- B75-689, Clk. IV, Civil Eng. (1/14)
- B75-691, Sec. III, Law Related Studies (1/14)

- ACADEMIC STAFF:
C75-31, Asst. Humanities Librarian, Humanities Library (11/17)
C75-32, Asst. Rotch Librarian for Visual Collections, Rotch Library (12/17)
C75-33, Asst. Science Librarian, Science Library (1/7)
C75-34, Admin. Officer, Materials Sci. & Eng. (1/14)
C75-35, Tech. Asst., Biology (1/14)

- SPONS. RES. STAFF
D75-8, Biophysicist, Nat. Magnet Lab (6/25)
D75-48, Economist, Energy Lab (6/25)
D75-107, postdoc. res., Lab for Nuc. Sci. (6/25)
D75-120, Systems Programmer, Lab for Nuc. Sci. (11/26)
D75-125, energy modeling, Energy Lab (8/6)
D75-161, Economist/Policy Analyst, Energy Lab (9/10)
D75-167, end-use technology, Energy Lab (9/17)
D75-169, Plasma Physicist, Res. Lab of Elec. (9/17)
D75-205, Research Engineer, Economics (10/22)
D75-210, machine vision research, Artificial Intell. Lab (10/29)
D75-219, continuing education, Chemical Eng. (11/5)
D75-220, Executive Director, continuing education, Chemical Eng. (11/5)
D75-222, biochemist, Nutrition and Food Science (11/12)
D75-226, neurophysiological research, Cent. for Space Res. (11/19)
D75-229, Research Engineer, Energy Lab (11/19)
D75-232, Programmer, Center for Space Res. (11/26)
D75-234, computer specialist, Proj. Mac (11/26)
D75-243, postdoc. res., computer science, Artificial Intell. Lab (1/7)
D75-244, postdoc. res., computer science, Artificial Intell. Lab (1/7)
D75-249, postdoc. res. physics, Lab Nuclear Sci. (1/14)
D75-250, postdoc. res. physics, Lab Nuclear Sci. (1/14)
D75-251, Joint Physiology Res., Mechanical Eng. (1/14)
D75-253, Mathematical model development, Energy Lab (1/14)
D75-255, Programmer, Earth & Planetary Sci. (1/14)

- EXEMPT:
E75-46, Admin. Asst., Center for Pol. Alt. (1/7)
E75-48, Observing Asst., Earth & Planetary Sci. (1/14)

- HOURLY:
H75-55, Tech. B, Lab for Nuclear Sci. (6/25)
H75-117, Tech. B, Radioactivity Center (10/15)
H75-120, Campus Patrol Officer (10/1)
H75-143, 2nd. Cl. Eng. (10/15)
H75-172, Tech. A, Environmental Medical Service (1/14)

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

- B75-684 Sec. III-IV
- D75-112 Spons. Res. Staff
- B75-475 Sec. V
- B75-690 Sec. IV
- D75-240 Spons. Res. Staff
- B75-667 Sen. Clk. III
- B75-580 Sen. Clk. III
- B75-675 Sec. IV
- B75-660 Sec. V
- B75-687 Sec. IV
- D75-247 Spons. Res. Staff
- B75-678 Sen. Clk. III
- D75-150 Spons. Res. Staff

The following positions are on HOLD pending final decision:

- D75-166 Spons. Res. Staff
- B75-676 Lib. Asst. III
- D75-178 Spons. Res. Staff
- B75-680 File Clk. II

This season, Lange (18.9 average, is trailing teammate Pete Jackson's (St. Louis, Mo.) 19.4 average in the scoring column. With 11 games remaining on the schedule, Cam has ample opportunity to add sufficiently to his scoring total to become the first individual to lead an MIT basketball team in scoring for four seasons.

MIT's track team (4-1) started off the new year with an impressive 64 to 54 win over Tufts and Williams 32. Junior Richard Okine (Aflao, Ghana) scored double victories in the 50-yard dash (5.6); and the 45-yard high hurdles (6.0) to lead the Engineers in scoring. Senior Jeff Baerman (Skokie, Ill.) ran 4:14.4 in winning the mile and was just one-tenth of a second off the MIT varsity record set by Ben Wilson in 1968. Junior Frank Richardson (Sac City, Iowa) won the two-mile in 9:10.4—a career best—beating his closest opponent by two hundred yards.

Off to their best start in recent years, the Tech trackmen look for win five while hosting the Coast Guard Academy on Friday night in Rockwell Cage.

MIT's undefeated wrestling team (4-0) was trailing Coast Guard 6-3 until 142 lb. Junior Joe Scire (No. Andover, Mass.) pinned his opponent at 6:37 for six team points. The Engineers built their lead up to 18-6 when 158 lb. John Thain (Antioch, Ill.) bested his opponent 7-5 for three team points. From then on, however, it was all Coast Guard as the Cadets won three straight decisions, narrowing the score to 18-15.

The last match of the meet pitted heavyweight Erland Van Lidth De Jeude (Mt. Vernon, N.H.) against Coast Guard's defending New England Champion Jim Murray. For the past two years, Murray has beaten Erland nine straight times, including twice in the New England Championship final. But last Saturday, Erland, the 6-6, 330 lb. not so gentle giant, ran up a 7-1 lead in match points and then pinned Murray at 7:38. The six fall points gave Tech a 24-15 meet victory.

Clapp and Poliak Awards Contest

The annual Clapp and Poliak Engineering Design Award competition for the spring term will be accepting proposals until Feb. 20, it was announced this week.

"These awards should be particularly attractive to students seeking alternatives to term-time jobs," said Professor Woodie C. Flowers, chairman of the committee to choose the winners.

The purpose of the competition, he said, 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."

Information on guidelines for participation are available from Professor Flowers in Room 3-453.

'Emergency: 100'

Establishment of a "911" emergency telephone number for the City of Cambridge has caused some confusion about MIT's emergency line, "100," according to Morton Berlan, superintendent of telecommunications.

All emergency calls from MIT telephones—including dorm lines—should still be made to 100, an uninterrupted, direct line to the Campus Patrol. Emergency calls to MIT from outside telephones should be made on 253-1212 or the Patrol's regular number, 253-2997.

Campus Patrol maintains direct lines to the MIT Medical Department, the Cambridge Police Department and the Cambridge Fire Department. Emergency 100 calls can therefore be transmitted immediately to whatever agency is needed.

MIT Men Taste 'Joy' of Cooking

Food—from macrobiotic beans to Chicken Parisienne—is big at MIT this winter.

Acting mainly out of economic necessity, students are exchanging calculators for kitchen ladles to learn "How To Cook For One," "The New French Cooking," "Mexican Cooking," and "The Art of Macrobiotic Cooking."

The myriad culinary activities, all part of MIT's Independent Activities Period, are aimed largely at teaching students to enhance the flavor of protein, sodium, vitamins, niacin, riboflavin, and a host of other recommended daily allowances.

"There are hundreds of ways to enrich the nutritional value of pizza and other snack foods popular with dormitory students," according to Karen Brothers (MIT '68) who is teaching "Cooking: Good, Easy and Nutritious" every Monday and Thursday evening to 28 students in MIT's new all-male dormitory, New House.

She and her former MIT roommate Louise Silver, who is also teaching the class, explained that the idea grew out of their computer-based nutritional evaluation company, Consultus, Inc., of Wayland, Mass. Operating from a PDP-8 mini-computer in the Brothers' den, the service is offered on a licensing basis to nursing homes, newspapers, and individual consumers interested in recipe nutrient analysis because of dietary restrictions.

Among the nutrition-filled low-cost recipes they are teaching New House students are liver creole, tuna a la king, campfire stew, peanut butter cookies, cheesecake from cottage cheese, and granola bars. Many students prefer the challenge of creating in the dorm's new kitchens to MIT's \$580-per-semester meal plan.

Freshmen Bob Stall of Spring Valley, N.Y., and Bob Dawson of Norton, Va., where he did all the family baking, said they prefer cooking their own meals because they don't expect to eat out every night when they eventually have apartments of their own.

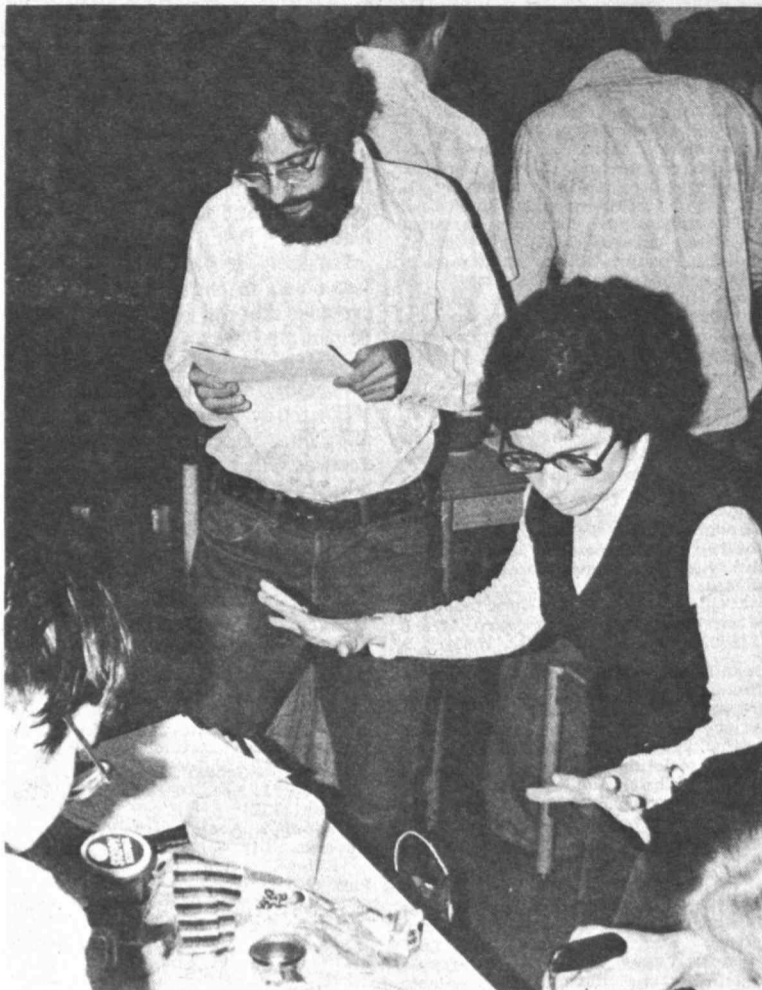
"We're getting a lot of practice this month, and with a little help from the evening classes, we're learning to prepare meals ahead and experiment with new combinations," Stall said.

Dawson and Stall, who are known to invite female visitors upstairs "to sample a slice of home-baked raisin bread," are part of a growing number of MIT students who enlist familiar scientific principles to devise new recipes.

"I don't know that we're any better at it because we're scientists," one novice chef said, "but I do think our attitude is better. We won't attempt anything unless we have every single ingredient, and if the formula calls for a third of a pound, you can be sure that it will be a third of a pound."

MIT Housemasters Jim Williams and Karen Goodall, who usually sample the results of the multiple-flavor cooking classes in their dorm, report a hidden benefit to sponsoring the activity.

"As the students gain confidence about their skills in the kitchen, we enjoy an increase in dinner invita-



DO-AHEAD DISHES—"things to fix when the spirit grabs you or that you can eat later when it doesn't"—were the subject of this week's cooking lesson in New House. Instructor Louise Silver, who teaches the class with her former MIT roommate, Karen Brothers, tries to bring order to a work table strewn with the unblended ingredients of "Nutritious Cheesecake."

tions," said Karen, who cooked 2400 pancakes herself for house residents one weekend this fall.

Joel Orlen, assistant to the Provost and chairman of IAP invited them to sponsor the activity because of the completely equipped kitchen facilities in New House. He first got the idea for an activity in easy, nutritious cooking when an advisee of his, Robert Klein, said he was making his own meals and hating it.

Maggie Lettvin, lecturer in physical education, was called in to suggest instructors for the class. She had known Karen Brothers and Louise Silver from previous discussions about collaborating on a cookbook.

"Now Bob Klein is shopping with definite menus in mind and buying vegetables like turnips and broccoli," Mr. Orlen said. "The outcome of such a class could have widespread effects on the entire university community," he added.

Food co-ops, group trips to local supermarkets, and renovation of dormitory kitchens are some of the ideas that have been mentioned for a post-IAP section of the activity.

For Patrick Lopes of Cambridge, Mass., the New House program in quick and easy menus is "too healthful" for his gourmet tastes. He wonders whether he should have signed up for "Middle-Eastern Cooking," where the curriculum included spinach pie, hummus, baklava, Syrian bread, and moussaka.

Other less traditional IAP offerings include "Let Food Be Thy Medicine," a workshop in nutrition and ecology based on Hippocrates' philosophy that the body can act as its own physician when provided with the right nourishment; "How Much to Eat, of What, and Why?" and "The New French Cooking," shared by eight students in the home of Professor Robert E. Jones of the Department of Foreign Literatures.

'Little Ice Age' Seen Coming

(Continued from page 1)

In the next 25 years the temperatures in all latitudes will fall to significantly lower levels than those reached in the mid 1960s. Whether this decline starts immediately, leading to lower levels in the 1980s, or starts in the 1990s with lowest levels reached in the 1990s, depends on sunspot activity.

No major, prolonged drought is foreseen in lower middle latitudes, except possibly in the Mexican border states of the United States.

In higher middle and subtropical latitudes, the next two decades promise to be a predominantly dry period, particularly in Canada and northern Europe. A similar ten-year period of severe drought is likely in southern Asia and subtropical Africa.

From 2000 to 2030, there should be an abrupt return to markedly warmer weather in the middle and higher latitudes, followed rather quickly by a return of temperatures to lower levels.

Mutant Bacteria Produce Antibiotic Streptomycin A

(Continued from page 1)

thing, many microorganisms develop resistance to known antibiotics, and substitutes are needed. For another, safer and more potent antibiotics are needed against many infectious bacteria and fungi.

Professor Demain and his colleagues produced the new antibiotic by a method called mutational biosynthesis, invented in 1969 by scientists at the University of Illinois. The MIT work was the first successful attempt to use the method to produce a derivative of streptomycin.

He hopes that his success will lead to the use of the technique to produce other derivatives of streptomycin.

"We anticipate a reawakening of interest in the streptomycin group of antibiotics," he said, "in the same way that semi-synthetic modification reopened the penicillin field some 15 years ago."

Mutational biosynthesis consists of taking bacteria that produce one antibiotic, and finding mutants that cannot produce the antibiotic unless they are fed a certain ingredient. The mutants are then fed a slightly different ingredient, so they will produce a different antibiotic.

The success of the technique depends on three conditions. The substituted ingredient must be able to get into the bacterial cell; enzymes that catalyze production of the antibiotic must be able to use the new ingredient; and the compound that is produced must be able to kill

microbes.

Professor Demain produced the new antibiotic along with Dr. Kozo Nagaoka, a former research associate now in Japan. The work was supported by the National Institute of Allergy and Infectious Diseases. Dr. J.R. Lemke, now in Germany, helped purify and test the antibiotic. Nadine A. Hunt, technical assistant in the Department of Nutrition and Food Science, also helped test the compound.

To produce streptomycin A, Professor Demain and Dr. Nagaoka first obtained a mutant of the bacterium *Streptomyces griseus*, that cannot produce streptomycin unless streptidine is added.

They did this by treating spores of the bacteria with a chemical that killed 99.5 percent of them. Of the survivors, one out of 834 was found to be the desired mutant.

The researchers then fed the mutant with compounds that differed slightly from streptidine. Several attempts failed, but the addition of 2-deoxystreptidine resulted in the new antibiotic.

New techniques such as mutational biosynthesis are increasingly important, Professor Demain said, because the old method of screening soil microorganisms for their ability to produce new antibiotics is becoming less and less productive.

The screening method "was quite rewarding for 20 years," he said, but "the number of unique molecules discovered has become vanishingly small."

Thomas K. Sherwood Dies

(Continued from page 1)

neering from Northeastern University in 1947, a Doctor of Science from McGill University in 1951, and a doctoral degree from the Technical University of Denmark. His colleagues named the "Sherwood Number" in his honor for the dimensionless number used in scientific literature to describe mass transfer correlations.

Born in 1903 in Columbus, Ohio, Thomas Kilgore Sherwood received the BS from McGill University in 1923 and the degrees of master of science, in 1924, and doctor of science, in 1929, from MIT. Professor of chemical engineering at Worcester Polytechnic Institute, returning to MIT in 1930 as assistant professor of chemical engineering. He was appointed associate professor in 1933 and to the rank of full professor in 1941. He served as Dean of Engineering at the Institute from 1946 to 1952.

In 1966 Dr. Sherwood was given special recognition as one of MIT's most eminent faculty members with his appointment as the first Lamot du Pont Professor of Chemical Engineering, a chair established by members of the du Pont family as a memorial to Lamot du Pont, a member of the MIT class of 1901.

Dr. Sherwood became professor of chemical engineering emeritus upon his retirement from MIT in 1969. He was visiting professor of chemical engineering at the University of California at Berkeley from 1970 until his death.

Professor Sherwood was also the author of the book, *A Course in Process Design*, and was a joint author of three other volumes, *Applied Mathematics in Chemical Engineering*, 1939, 1957, *Properties of Gases and Liquids*, 1958, 1966, and *Role of Diffusion in Catalysis*, 1963. In addition, he was author and joint author of more than 110 technical papers in various fields of chemical engineering, such as drying, heat transfer, absorption, extraction, and eddy diffusion. He held numerous patents.

Professor Sherwood's honors and appointments included memberships in the American Academy of Arts and Sciences, the American Society of Engineering Education, the American Chemical Society, and the American Society of Mechanical Engineers. From 1947 to 1949 he served as councillor of the American Institute of Chemical Engineers. He was an honorary life member of the Canadian Institute of Chemistry. He was also a member of Sigma Xi, Tau Beta Pi and Alpha Chi Sigma.

Professor Sherwood is survived by his wife, Virginia Howell Sherwood of Berkeley; three children, Thomas K. Sherwood III of Cambridge, Mass., Richard M. Sherwood of Denver, Colo., and Mrs. William T. Martin of Philadelphia, Pa.; and eight grandchildren.

Arrangements for a memorial service are to be announced. In lieu of flowers, contributions may be made to the American Cancer Society.

Temperature—Sensitive Mutants, A Key To Virus Growth

Virus mutations that are lethal to the virus at one temperature but permit growth at another are useful in studying how viruses develop: protein activity can be halted at different stages simply by changing the temperature.

To determine which proteins interact with each other, another kind of mutation can be used: "fixer" mutations that restore growth to a defective mutant at one temperature, but are themselves lethal at another.

These mutations do not eliminate the original mutation, but compensate for it, probably by affecting the interaction of proteins. Thus the mutants can help researchers deduce which proteins "see each other" during the life cycle of a virus: the protein affected by the original mutation, and the protein affected by the fixer mutation.

Unfortunately, up to now there has been no good way to obtain such handy mutants; most fixer mutants are difficult to study because they lack an identifying characteristic of

their own. Recently, however, Jonathan Jarvik, working under the supervision of Professor David Botstein of the MIT Department of Biology, showed that many virus mutants that die at certain temperatures will give rise to good numbers of fixer mutants which restore growth at one temperature but kill the virus at another.

They worked with viruses that infect bacteria. Of nine mutants that could not grow at low temperatures (cold-sensitive, or cs mutants), Jarvik and Botstein found that eight yielded fixer mutants that grow at cold temperatures, but not at hot temperatures.

The reverse procedure was less prolific. Of 13 mutants that could not grow at high temperatures (temperature-sensitive, or ts mutants), four yielded fixers that grow at high temperatures, but not at low temperatures.

About half the fixer mutations were in genes other than those affected by the original mutation. These mutations are ideal for studying protein interactions.

The work, supported by the American Cancer Society and the National Institutes of

Health, formed part of Jarvik's doctoral thesis. He is now at Yale University.

The procedure was simple. Jarvik and Botstein put about a million original cs mutants on each of 10 bacteria-covered petri dishes, and subjected them to cold. On each dish, one or two plaques formed, where survivor mutants had destroyed bacteria.

These mutants, called revertants, were grown in separate stocks and were tested for their ability to grow at high temperatures. Once the two researchers found one fixer mutant, they didn't look for any more from that stock, since most revertants in a stock have a common ancestor.

Once the mutants were found, the researchers had to determine whether they compensated for the original defect—still present—by making a second change; or whether they simply erased the original mutation.

This was done by "recombination," crossing the fixer mutants with unmutated, "wild type" phage. If the original mutation is still present in the fixer mutants, some of the progeny of the union have the original mutation, but not the fixer mutation. This is easily

determined by testing for growth at different temperatures.

Most of the fixer mutants that were tested this way did correct the original mutation by making a compensating change.

Besides studies of protein interactions, the temperature-sensitive and cold-sensitive mutants can be used to determine the order in which events take place, following a procedure the two researchers outlined several years ago.

Dr. Jarvik and Professor Botstein believe the method will be particularly useful for *in vivo* studies of more complex organisms, such as yeast cells or fruit flies.

"Even in a complex organism, the number of essential genes which can mutate to suppress (fix) any particular mutant is surely small," they reported in the *Proceedings of the National Academy of Sciences*.

"We therefore believe that the isolation of cold-sensitive or temperature-sensitive suppressors should allow one to zero in on small subsets of essential genes—some of whose products are physically or functionally related."