Massachusetts Institute of Technology



March 15, 1978 Volume 22 Number 27

# **Scientists Develop Carcinogen** Potency **Predicting System**

By PAUL M. RAEBURN Staff Writer

A team of scientists in the MIT Department of Nutrition and Food Science has developed a system which shows promise as a method of predicting the potency of newlyidentified carcinogens.

The researchers use a computer to find correlations between molecular structure and carcinogenic potency for carcinogens that have already been studied, and these correlations are used to estimate the potential carcinogenicities of compounds that haven't been tested. The basic technique was developed by Professor Corwin Hansch, of Pomona College in Claremont, Ca., who used it to assess relative potencies of various drugs

The MIT system, if it can be expanded into a reliable general procedure, may possibly reduce dependence on expensive, time-consuming methods of animal testing, according to Dr. John S. Wishnok and Dr. Michael C. Archer, who led the research. "It's becoming important to find an alternative to animal testing, because the number of compounds requiring evaluation has been steadily in-creasing," Dr. Wishnok said.

The research team included Dr. Wishnok, a bioanalytical chemist and lecturer; Dr. William M.

Marine Corps.

Gunnery Sgt.

Albert S. Wil-

son, Jr., has

ported to the

NROTC unit at

MIT as its first

Marine instruc-

tor. In Septem-

ber he will be

re-

recently

Navy ROTC Adds Marine Option

Rand, lecturer and biostatistician; and undergraduate Andrew S. Edelman.

Research by Dr. Archer and his colleagues has dealt with an important class of environmental carcinogens called nitrosamines. The research is part of a comprehensive study of nitrosamines being done in the Department of Nutrition and Food Science.

Nitrosamines occur infrequently in the environment, but there is evidence that they can be formed in the body from nitrite, a common food additive, and nitrogen-containing compounds in foods. Nitrite can also be formed in the body from nitrate, which is found in several vegetables and in the drinking water of some areas.

The MIT study used published data on the carcinogenic potency of about 30 nitrosamines. The figures for potency were based on the total amount of each nitrosamine that had to be given to a group of laboratory rats to produce tumors in half of the rats. The smaller the dose needed, the more potent the carcinogen.

The data on potency were fed into the computer along with a wide range of information on the physical and chemical properties of each of the nitrosamines. The

(Continued on page 7)



SURE SIGN that spring is on the way is puddles of melted snow at the bases of the beech trees near the Student –Photo by Calvin Campbell Center.

### **Turkey Quakes Predictable, Scientist Says**

An MIT geogphysicist has determined that two recent earthquakes in Turkey could have been predicted, saving many lives, if qualified personnel had been monitoring the area with scientific instruments.

Interviews with villagers living

Faculty to Meet

faculty will be held today (Wednesday, March 15) at 3:15pm in Room 10-250. Agen-

-Presentation and initial discussion of the report of the Ad Hoc Committee on Grading (the report was published as a supplement to Tech Talk last week, March 8).

of the advising system by Professor Hulsizer.

in the area at the time of the quakes led Dr. M. Nafi Toksoz, professor of geophysics in the MIT Department of Earth and Planetary Sciences, to conclude that "physical precursors were definitely observed before the earthquake.'

Dr. Toksoz, who presented his findings at a recent meeting of the American Geophysical Union, is director of MIT's George R. Wallace Geophysical Observatory. He was also a member of the seismology team for the Viking mission to Mars.

The earthquakes occurred in populated areas in eastern Turkey on September, 6, 1975, and November 24, 1976. "Because the quakes occurred in populated areas, they provided a rare opportunity for us to find out if any unusual events preceded them," Dr. Toksoz said. Dr. Toksoz interviewed villagers

during the first week after each earthquake, and again several

Commuter Service to be Explored

#### months later.

The 1976 earthquake measured 7.3 on the Richter scale, and was recorded by instruments at MIT's Wallace Observatory. It destroyed over 80 per cent of the dwellings in an 800-square-mile area. Four thousand lives were lost.

"Villagers observed a number of phenomena from two weeks to a few minutes before the earthquake," Dr. Toksoz said. "These ranged from booming sounds to unusual behavior of dogs. In two villages along the western half of the fault, noises resembling thunder were heard several times during the two weeks preceding the quake. These could have been due to small foreshocks, even though shaking was not felt," he said.

Residents of one village on a lake told Dr. Toksoz that they heard unusual sounds coming from the

(Continued on page 7)

MIT Naval ROTC midshipmen junior year at Quantico, Va., for can now obtain commissions in the precommissioning training. Known as "Bulldog Cruise," this US Marine Corps upon graduation. Midshipmen choosing the Marine training is a rigorous and intensive option share the same program introduction to the Corps. Upon successful completion of their senior year, students will be comwith other Navy ROTC midshipmen for the first two years. Bemissioned as Second Lieutenants ginning with the junior year, they specialize in courses tailored to the in the Marine Corps.

The newly commissioned Marine officers are then assigned to the Basic School in Quantico, Va. Here further training, orientation and enhancement of basic skills are given. After Basic School, many occupational fields are available, among them infantry, aviation, communications, engineering, electronics and computer science.

The first midshipman to choose

A regular meeting of the da items include:

-Comments on the review

**Donors** Needed At Blood Drive

Joined by Capt. Joseph Paler-mo who is cur-

rently assigned to the 3rd Marine Division in Okinawa.

In addition to special courses, Marine option students spend six weeks of the summer of their

A delegation of Russian oceanographers are visiting MIT during the week of March 13 for a series of discussions with US colleagues from various institutions, including MIT, on the POLYMODE program, a joint US-USSR oceanographic study currently being carried out in the western North Atlantic.

The delegation, led by Professor Andrei S. Monin, director of the P.P. Shirshov Institute of Oceanology in Moscow, includes scientists from that institute and from the Marine Hydrophysical Institute in Sevastopol. With the group is Dr. V.A. Shirey of the Oceanographic Commission of the USSR

the Marine option at MIT is Curtis H. Fennell, a senior in Earth and Planetary Sciences. He will be the first Marine to be commissioned at the Institute. Fennell has been given an aviation guarantee and will start aviation training after completing Basic School.

### Russian Scientists Visit Polymode

Academy of Sciences.

Host for the meetings is the US POLYMODE Office at MIT. Mr. Robert Heinmiller is US executive manager. The US delegation will be headed by Professor Allan R. Robinson of Harvard University.

Other MIT people scheduled to participate in the meetings are Professor Henry M. Stommel, assistant professor Glenn R. Flierl, and research assistant Claude Frankingnoul, all of the MIT Department of Meteorology, and Professor Carl Wunsch, of the Department of Earth and Planetary Sciences.

The Red Cross Spring Blood Drive will fall short of its goal without an infusion of new donors, judging by results at the midpoint of the drive on Monday.

At the close of the drive Monday evening, 568 pints of blood had been collected. With the goal set at 1,800-2,000 pints, many more donors are needed in the final three days of the campaign.

There was one encouraging sign, however, according to Jim Mc-Cormack, a junior in interdisciplinary science who is cochairman of the drive. "There has been a definite increase in the number of employees who are giving blood," he said. "I hope the trend will continue because they can make a big difference in how successful the drive is."

Hours of the drive are 9:45am-3:30pm the rest of the week. Appointments may be made by calling x3-7911. No appointments will be made after 2pm on Friday, March 17, in order to accommodate last-minute, walk-in donors.

#### Following the success of the emergency bus service operated by MIT during the recent blizzard, Chancellor Paul E. Gray has asked an ad hoc working group to explore a wide variety of organized transportation services which the Institute might operate on a regular basis.

The working group consists of: Professor Alan A. Altshuler, head of the Department of Political Science; Howard F. Miller, executive

### No Paper

Tech Talk will not be published on March 29. The Institute Calendar and Institute Notices in the March 22 issue will cover the period of March 22 through April 9. Deadline for submitting items for those sections will be Friday, March 17, at noon.

assistant to the director of Physical Plant; Walter L. Milne, assistant to the president for urban relations; Dr. Barbara Scott Nelson. assistant to the president and chancellor; Professor Paul O. Roberts, director of the Center for Transportation Studies: Professor William M. Siebert, Department of Electrical Engineering and Computer Science; O.R. Simha, director of the Planning Office; Philip A. Stoddard, vice president for operations; Mr. Reynolds W. Thompson, senior planner in the Planning Office; and James P. Womack of the Center for Transportation Studies.

The MIT Planning Office is currently exploring a number of alternatives, including the possibility of continuing the express bus service developed during the storm. The Planning Office invites comments and suggestions from members of the MIT community. Please call x3-5831 or send suggestions to the Planning Office, Room 12-156.

### Grant to Fund Undergraduates

For the seventh consecutive year, the MIT Department of Nutrition and Food Science has been awarded a National Science Foundation (NSF) Undergraduate Research Participation grant.

The grant will support work of 12 undergraduate students for 10 to 12 weeks during the summer of 1978 with a stipend of \$900 each. The grant requires that research projects be carried out in the Department of Nutrition and Food Science

Additional information and applications may be obtained from the department's student office (16-321, x3-1712) or from Dr. Charles L. Cooney, NSF-URP program director (16-229, x3-3108). Applications must be turned in by April 14, 1978. Applicants who are accepted will be notified by May 1, 1978.

### AARP to Focus **On Security Tips**

Sgt. Harold Murphy of the Cambridge Police Department will give a presentation at the next meeting of the MIT-Cambridge chapter of the American Association of Retired Persons (AARP) on Tuesday, March 28, at 5pm in the Mezzanine Lounge at the Student Center.

In his illustrated talk, Sgt. Murphy will cover techniques for burglary prevention and safety tips for men and women.

The MIT-Cambridge chapter now has more than 150 members enrolled. Membership is open to all who are 55 years of age or older, whether or not they are retired. Anyone interested may visit the March meeting and sign up with James Maclary, membership chairman.

Refreshments will be served.

### Math Contest Winners Named

Three winners have been announced in the Third Annual Undergraduate Math Club Contest held during IAP.

The winners are freshman James Theiler of Albuquerque, N.M., and sophomores Albert Galick of Belle Mead, N.J., and Paul Heckbert of San Jose, Ca. They will receive plaques at a future meeting of the math club.

About 180 students picked up entry forms for the contest, which was open to all undergraduates. The winners were selected by members of the mathematics faculty on the basis of their solutions to a dozen problems requiring no advanced mathematics.

### SAA to Sponsor **Oriental Art Sale**

The Student Art Association will sponsor an exhibition and sale of original oriental art in West Lounge on Mar. 20 and 21 from 10 to 7pm.

The exhibition of approximately 500 paintings and graphics includes some which date back to the 18th century. Among the modern pieces are woodcuts, etchings, serigraphs lithographs, and mezzotints by well-known artists such as Saito, Azechi, Mori, Katsuda and Maki. The price range is wide, and prints are shown in open portfolios, making browsing easy. A repre-sentative from Marson, Ltd., the exhibitors, will be on hand to answer any questions you may have.



#### Announcements

Application for the April MCAT (Medical College Admission Test) is now available in the Preprofessional Advising and Education Office, Rm 10-186. Application deadline is Mon,

Conversation Exchange®-The MIT Wives' Group has compiled a list of international women interested in exchanging foreign language conversation for English conversation Contact: Karen Devine, x3-2916.

Discount tickets for the Mar 29, Boston Symphony Orchestra open rehearsal are on sale now at the Technology Community Associates Office, Rm W20-450.

Embroiderv\*\*-Open House, Tues, March 14, 10am-3pm, Rm 10-340. See finished projects and works in progress or bring your own pieces and embroider for any length of time. Info available about approaching classes and work-shops. Blackwork, one-day workshop, Monday, April 10, 10am-3pm, led by Priscilla Gray. Blackwork is a delicate style of embroidery using one color thread on linen. Limited enrollment, registration required. Contact: Lillian Alberty, 491-3689, or Nancy Hollomon, 723-4763

Freshman Evaluation forms will be available from advisors by Wednesday, March 8. An evaluation form should be filled out for every subject for which freshmen are registered and turned in to instructors by Friday, March 24. Extra forms will be available in the FAC, 7-103.

Help Wanted, Theatre-People to sew chicken suits, scrounge convertible baby carriages, re-build Broadway and aviate in Kresge clouds. No experience necessary. Musical Theatre Guild needs help for spring production of "Guys and Dolls" to open in April. If interested, visit Rm W20-453 or call x3-6294

Housemaster Tutor Program-The Office of Dean for Student Affairs is accepting applications from MIT graduate students for tutor positions. Students should have at least one year of graduate work at MIT and experience as a resident of one of the Institute Houses as an undergraduate or as a campus resident at another university. Seniors who have lived on campus who will be first-year graduate stu-dents are also eligible. Contact: Dean Seelinger, Rm 7-133.

Memorial Service for the victims of the recent terrorist attack in Israel. Fri, Mar 17, 1pm, MIT Chapel. Sponsored by Jewish, Episcopal, Lutheran, Catholic chaplains of MIT.

Official Notice\*\*-Add Date: Fri, Mar 17, last day to add subjects to registration.

Official Notice\*\*-Fri, Mar 17: last day for juniors and seniors to specify an elective to or from pass-fail grading.

Pre-School Swim Program\*\*-Sat, Mar 18-Apr 24, 9am & 10am, Swimming Program for Parents and Children-Sign up now for children (2-5 yrs). Sponsored by Child Care Office. Fee: \$18. Info: Child Care Office, x3-1592.

Spring Art Classes\*\*-Registration for the following SAA classes still open: Tues Night Open Life Drawing, Weekend Pottery Workshop, Chinese Brush Painting, Stained Glass, Framing Workshop. Drop by SAA Office, 1-5pm, Rm W20-429, x3-7019.

Toys are needed for the Wives Group babysitting service. At present there are fewer toys available than before. If you have toys that your child or children no longer play with or if you are leaving MIT and would like to donate some toys to the collection, call Karen Devine, 253-2916, or bring them to the babysitting room 494, Student Center at any meeting of Wives Group on Wednesday afternoon from 3-5pm.

TWO Spring Crafts Fair\*\*-Thursday Friday, April 20-21, 9am-3pm, Lobby Bldg 10. Anyone can participate but crafts must be handmade. Info: Penny Quint, 322-8301.

Weight Control Group\*\*-10-week series be-

MIT Juggling Club\*-Juggling practice. Sun-days 1pm-4pm, Thursdays 7pm-10pm, through the Spring Term, Rm 407, Free

MIT Motorcycle Club\*\*-Regular meetings first Tuesday each month beginning March 7, 7:30pm, Muddy Charles Pub (50-110). All old ers and any interested newcomers welcome. Info: x3-6924.

National Society of Black Engineers-Sun. Mar 19, 3pm, Rm 50-105. General Body Meeting, agenda items include delegate selection for national conference.

MIT Rugby Football Club\*-Preseason training for spring at Rockwell Cage, Tuesdays & Thursdays, 7pm. Info: Charlie Cox, x5-7393 Dorm.

Shotokan Karate Club\*\*-Practice, Mondays & Tuesdays, 6-7pm, Fridays, 6-8pm, duPont, T Club Lng. Info: Bill Kerr, x5-6518 Dorm.

MIT Soaring Association Meeting\*-Thurs, Mar 16, 7:30pm, Mezzanine Lounge, Student Center. Soaring Movies, coffee & donuts served.

ACM Student Chapter Meeting\*\*-Fri, Mar 17, 4pm, Rm 8-314. We will discuss upcoming activities including the MIT Open House, lectures, and programming contests

T'ai Chi at MIT<sup>®</sup>-Meetings Thursdays, 4:15-6:15pm, Rm W20-407. Prof E. Liu, director. All welcome

### New UROP Listings

For more detailed information on UROP opportunities listed, MIT undergraduates should call or visit the Undergraduate Re search 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.

Health Care Analysis-Robert B. Brigham Hospital

Seven-day Rehabilitation Unit: Therapists currently work for eight consecutive days and are off for six; the entire department reports on Thursday for in-service training and to plan for continuity of care. The effect of the sevenday schedule in facilitating earlier discharge of in-patients has not yet been analyzed. There is also a need to quantify the effect of the change on the use of rehabilitation services, the length of therapy sessions, patient out-comes, and total and unit costs and revenues. The results of the study will be used for hos-pital and departmental planning and evaluation purposes

Neurobiology Laboratories-Boston VA Hospital

Histochemical study of factors modifying neuronal membrane permeability and uptake of large molecules by nervous system cells. Studies will be done of improved methods for tracing fiber connections in brain with emphasis on horseradish peroxidase. Horse radish peroxidase will be used to assess brain response to stress. Experiments are performed in rats; procedures include exposure to small animal surgery, histological and histochemical processing of brain tissue for light microscopy. Data will be analyzed and graphically represented. A background in neuroanatomy would be helpful.

#### Materials Science and Engineering

Reaction Injection Molding (RIM) is a new technique in which monomers are polymerized and processed simultaneously, thereby offering numerous advantages over conventional injection molding. So far, polyurethane based filled plastics are the only successful RIM products and are used in automobile bumpers. This project will be an investigation of a novel way to make nylon and polyester plastic by RIM process, which will provide higher modu lus than polyurethane. Contact Prof. C.S.P. Sung, x3-6681, 8-109.

#### Mass. Energy Policy Office

Opportunity for student with background in economics to help in assessment of market potential for integrated community energy systems in New England. The student will be working with questions involving pricing, franchises, sources of capital and costs, and rate structures for public utilities. A senior with some knowledge of energy principles (BTU's, kilowatt hours, etc.) would be preferable. S/he should have some fifteen hours a week available.



#### Placement

The following companies will be interview ing during the time period covered by the cur-rent Institute Calendar. Those interested may sign up in the Career Planning and Place Office, Mon-Fri, 9am-3pm, Rm 12-170, x3-4733. Wednesday, March 15-Bell Telephone Labs Data Resources, Inc; Honeywell, Inc; Jet Propulsion Lab; Keydata Corp; Lewis & Saunders, Inc; Maxwell House Coffee Div/ General Foods Corp; Northeast Utilities; Raytheon Co.

Thursday, March 16—Aerospace Corp; ARCO; Cummins Engine Co; DEC; Donovan, Ham-ester & Rattien, Inc; Eurothern Corp; Grumman Aerospace Corp; GTE Sylvania; ICI Americas, Inc; Rheem Manufacturing Co; Rockwell International; TI Equipment Group Friday, March 17-Aerospace Corp; Com-merce Dept/Patent & Trademark Office; Dranetz Engineering Labs, Inc; Equitable Life Assurance Society; Gilbane Building Co; Naval Ocean Systems Lab; Outboard Marine Corp; Owens-Corning Fiberglas; Oxirane In-ternational; Rockwell International; Sikorsky Aircraft; Taylor Instrument Co; Turner Construction Co; Varian Associates.

Monday, March 20- Computer Consoles, Inc. Datalog Div/Litton Systems, Inc; General Electric; Los Alamos Scientific Lab; Perkin-Elmer Corp; Plantronics, Inc; Sanders Asso ciates

Tuesday, March 21-Analog Devices Semiconductor; Caltex Petroleum; Celanese Corp; GTE Automatic Electric, Inc; Keane Asso ciates, Inc; Los Alamos Scientific Lab; Mit-subishi International Corp; New England Electric System; Perkin-Elmer Corp; Physics International Co; Prime Computer; Raychem Corp; TI/Sciences Services Group; Weyerhauser.

Wednesday, March 22-Bolt, Beranek & New man; Courier Terminal Systems, Inc; Los Alamos Scientific Lab; Microwave Research Corp; MIT Lincoln Lab; National Air Oil Burner Co, Inc; State of Illinois Bureau of the Budget; Tandem Computers, Inc.

#### Preprofessional

Application for the APRIL MCAT (Medical College Admission Test) is now available in the Preprofessional Advising and Education Office, 10-186. Application deadline is March 20, 1978.

Baylor Summer Surgery Laboratory Program The purpose of this program is to develop and maintain the interest of well qualified students who have a medically oriented career in mind. Students assist in scheduled experiments in our laboratory as well as conduct independent experiments. A stipend is provided to help defray living expenses. The program is open to college students and is not restricted to Texas residents. For additional information, contact the Preprofessional Ad-vising and Education Office, 10-186, x3-4158.

### Graduate Study

Carl E. Menneken Fellowship for Scientific Research\*\*-Naval Research is offering a \$1,000 fellowship to further the progress of engineering and science in areas of importance to the US Navy. Candidates should submit the topic and a brief description of their thesis, along with a supporting statement from their thesis advisor. Applications postmarked no later than Sat, Apr 1. Info: Graduate School Office, Rm 3-136.

The Senate Student Programs Office is now accepting applications for the second Senate Legislative Fellows Program, September 1, 1978 to August 31, 1979. Students currently enrolled in a graduate program who are New York State residents are eligible to apply. Fellows are placed in professional staff positions that might lead to public service careers, but students in those disciplines not normally associated with political life, such as sciences, engineering and business are encouraged to apply. For further information, contact the Graduate School Office, 3-136, x4869.

### **Religious Activities**

The Chapel is open for private meditation 7am- 25 Years Ago 11pm daily.

Friday, March 17 Channel 8: 10:30-12noon DANIEL PATRICK MOYNIHAN at Kresge Auditorium. Recorded 12/7/77. OFFSHORE, ONSHORE Explores 12-1pm the role of offshore drilling in the uest for gas and oil. CYCLE OF LIFE with sculptor Vince Recci. Produced by John Barnett. RHETORIC & JOURNALISM with Ed Diamond. Guest: Bruce Lock-lin of the Bergen Record 1-1:30pm lin of the Bergen Record. SIGVARD EKLUND Director General of the International Atomi Energy Agency. Recorded 3/24/77 as part of the "World Change & World Security" lecture series.

RHETORIC & JOURNALISM with Ed Diamond. Guest: Bruce Lock-lin of the Bergen Record. PHYSICS AND SOCIETY: THE

COUNTRY'S ENERGY PROB-LEMS, by Prof. Henry Kendall. Recorded as part of the "Physics Potpourri" (IAP #293), January,

CYCLE OF LIFE with sculptor Vince Recci. Produced by John

LIVE FROM HARVARD: DIF

FERENTIATION AND BIOSYN-THESIS OF GLÚCOSAMINOGLY-CANS by Dr. Albert Dorfman, University of Chicago.

DANIEL PATRICK MOYNIHAN at Kresge Auditorium. Recorded

11 NECEST AND SOCIETY: THE PHYSICS AND SOCIETY: THE NUCLEAR FUEL CYCLE by Dr Erriest Moniz. Recorded January, 1978 for the "Physics Potpourri"

BASEMENT VIDEO PRESENTS

FEEDING THE CABLE Film and videotape from everyday and not-so-everyday life. Live from the Film Section.

Barnett.

(IAP #293)

Christian Service<sup>\*</sup>—Sundays, 10:45am, Chapel. Singing, preaching, sometimes testi-monies, prayer following. All invited. 10:45am

MIT Hillel Services\*—Daily Minyan: 8am, Rm 1-136. The Downstairs Minyan (Conservative Egalitarian): Saturdays, 10am, 312 Memorial Dr. Reform: Fridays, 6:30pm, Chapel. Orthodox: Fridays, Sundown, Kosher Kitchen (50-005); Saturdays, 9am, Bush Rm (10-105).

Holy Week Events\*-Palm Sunday, Mar 19, services as usual, 9:15am, 12:15pm & 5:15pm. Tues, Mar 21, A Celebration of the Sacrament of Penance, 8pm, MIT Chapel. Wed, Mar 22, Lutheran-Episcopal Service of Holy Communion, 5:05pm, MIT Chapel. Film: The Para-ble, 7:30pm, 312 Memorial Drive. Holy Thursday, Mar 23, a preparation for the Celebration of the Last Supper, 5:05pm, MIT Chapel. The Catholic Liturgy of Holy Thursday, 8pm, Chapel. Good Friday, Mar 24, Lutheran-Episcopal Observation between Noon & 1pm. The Catholic Liturgy for Good Friday, 3-4:30pm, MIT Chapel. The Easter Vigil Service begins 11pm, Saturday evening, Mar 25, Chapel. Easter Sunday, Mar 26, Catholic Liturgies, 9:15am & 12:15pm only

Interdenominational-Worship and holy communion, Wednesdays, 5:05pm, Chapel, spon-sored by Lutheran-Episcopal Ministry. Get acquainted supper following. Info: Randy Clark, x3-6921

MIT Islamic Society\*-Friday Prayers held in Kresge, Rehearsal Rm B, 1pm.

Prayers—Every Friday, 7:30pm, MIT Chapel. MIT Baha'i Association. Info: Call Mahmoud, 492-2889

Prayer Time\*\*-Bible class, Fridays, 1-2pm, Rm 20E-207, guest speakers, music, refresh-ments. Miriam R. Eccles, founder-director, Alpha and Omega Missionary Society.

MIT Vedanta Society\*-Meditation and dis-courses on the Gita by Swami Sarvagatananda, of the Ramakrishna Vedanta Society of Boston. Fridays, 5:15pm, Chapel.

> **Echoes** March 12 - 18

### 50 Years Ago

Laurence Luey, '29, captured two swimming titles by winning the New England A.A.A.U. and the New England intercollegiate championships in his favorite event, the backstroke.

Less than 25 per cent of the freshmen are wearing their cardinal and gray ties this year. The largest number of violators come from the same fraternities who back this freshman tradition and have upperclassmen on the Freshman **Rules** Committee and the Institute Committee. Freshmen in dormitories are adhering to the rules, possibly because they are leery of physical punishment which the Dormitory Committee does not hesitate to impose on violators.

#### 40 Years Ago

Four articles on advanced photography featured in this issue of Tech Engineering News will appeal to the many people interested in photography. Among the four is "Dye-Sensitized Photographic Emulsions," written by Avery A. Ashdown.

The lawn between the two East Campus houses may never recover from a Saturday celebration of the eclipse of the third moon of Jupiter. At midnight a large bonfire was started and fed with scraps of wood, kerosene and a dummy named "Major Moon." Every powerful amplifier on East Campus was turned to full volume

### Harris Appointed To Medical Board

Dr. Jeffrey E. Harris, assistant professor of economics, has been appointed by Gov. Michael Dukakis to the Massachusetts Board of Registration and Discipline in Medicine. Professor Harris is also a physician who practices at the Massachusetts General Hospital.

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Health Information Service, Medical Dept. Enrollment limited. Modest fee charged. Info: x3-1316.

#### Club Notes

Association for Women Students\*\*-Weekly meetings, Saturdays, 4pm, Rm 3-310. MIT community welcome

MIT Bridge Club®—ABCL duplicate open pairs game Thursdays, 7pm, Rm W20-473. Info: 494-8593. Admission .25.

MIT/DL Bridge Club\*\*-ACBL duplicate bridge Tuesdays, 6pm, Rm W20-473.

MIT Chess Club\*-Meetings, Saturdays, 1-6pm, Rm W20-407. Speed chess, analysis and tournaments, Info: Brad, x5-8156.

MIT Folk Dance Club\*\*-International: Sundays, 7:30-11pm, Sala de Puerto. Balkan: Tuesdays, 7:30-11pm, Student Center, Rm 491. Informal: Fridays, Noon-2pm, Kresge (Lobby 7, if bad weather). Israeli: Wednesdays 7:30-11pm, Sala de Puerto.

MIT Go Club\*\*-Regular meetings, Wednes-days, W20-473, Thursdays, Rm 4-145, 8pm. Players of all ranks, play games, sometimes informal talks on strategy & tactics. Instruction available for beginners

Shop\*\*-Mon-Fri, 10am-6pm, Rm W30-031. Fees: \$10/term for students, \$15/term for community. Info: x3-4343.



March 15 - 21, 1978

#### Wednesday, March 8

Channel 8 10:30-12noon

SIGVARD EKLUND Director Gen-eral of the International Atomic Energy Agency. Recorded 3/24/77 as part of the "World Change & World Security" lecture series. BASEMENT VIDEO PRESENTS EFEDING THE CABLE Film and 2-3pm FEEDING THE CABLE Film and 4:30pm videotape from everyday and not-so-everyday life. Produced by the MIT Film Section. OFFSHQRE. ONSHORE Explores the role of offshore drilling in the quest for gas and oil. Tuesday, March 21 Channel 8:

#### Thursday, March 16

Channel 8: 12-1pm

1-3pm

7-8pm 8-9pm

12-1pm

1-2pm

2-3pm

RHETORIC & JOURNALISM with Ed Diamond. Guest: Bruce Lock-Ed Diamond, Guest: Bruce Lock-lin of the Bergen Record. PHYSICS AND SOCIETY: THE NUCLEAR FUEL CYCLE by Prof. Ernest Moniz. Recorded January, 1978 for the "Physics Potpourri" 1-3pm 3:30-4:30pn (IAP #293). BASEMENT VIDEO PRESENTS 4:30pm FEEDING THE CABLE Film and videotape from everyday and not-so-everyday life. Produced by the MIT Film Section.

to add to the festivities.

Prepared by Marcia Conroy, MIT Historical Collections, x4444.

> **TECH TALK** Volume 22, Number 27 March 15, 1978

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Mail subscriptions are \$10 per year. Checks should be made payable to MIT and mailed to Business Manager, Room 7-102, MIT, Cambridge, MA 02139.

3-4:30pm

Channel 8:

12-2pm

11:30-1pm

11am-12noon

Monday, March 20

2-3pm



BROWSERS ABOUNDED last week at the MIT Libraries' annual book sale in the Bush Room. In the two-day sale, the Libraries sold nearly 5,000 items—

surplus books, records, maps, etc.—and netted almost \$2,000. Proceeds from the sale will be used to replace lost or missing materials.

### Sloan Alumni Meet to Discuss Studies in Law

Several alumni, including prominent lawyers, met with Sloan School of Management faculty and administrators recently to discuss teaching and research at the school related to the study of law.

The all-day "Informal Meeting on Law" included brief reviews of past and present teaching and research in the law area, and proposals for the future. The participants considered what kind of law and how much of it should be required as part of a young manager's preparation, and they also gave their views on appropriate research.

The alumni who took part included: Paul A. Heinen, vice president, general counsel and secretary, Chrysler Corporation (SM, 1963, Sloan Fellow); Henry H. Perritt, Jr., assistant general counsellabor and environmental affairs, Consolidated Rail Corporation (SM, management, 1970); W. John Swartz, executive vice president, Santa Fe Industries, Inc., and vice president-administration, The Atchison, Topeka and Santa Fe Railway Company (SM, 1967, Sloan Fellow); and Edger H. Twine, associate general counsel, Atlantic Richfield Company (SM, 1973, Sloan Fellow).

Two non-alumni who took part were Frederick A.O. Schwarz, Jr., partner in Cravath, Swaine & Moore (he was unable to attend but sent a message), and Laurence H. Stone, vice president and general counsel, Federal Reserve Bank of Boston.

Sloan participants included Dean William F. Pounds; Peter P. Gil, associate dean and director of Sloan Fellows Program; the Michael S. Scott Morton, associate dean and chairman of the Master's Programs Committee; Alan F. White, director of Executive Development Programs and the MIT Program for Senior Executives; Gordon F. Bloom, senior lecturer; Stanley M. Jacks, senior lecturer; Jeffrey A. Meldman, assistant professor of management science; and J.D. Nyhart, associ ate professor of management in the Sloan School and Department of Ocean Engineering, and coordinator of Law-Related Studies at MIT.

Nominations Sought

For Major Awards Nominations are now being sought for a variety of major awards to be presented at the annual Awards Convocation in May.

Karl Taylor Compton Prizes, established by the Boston Stein Club in memory of MIT's ninth president, honor outstanding contributions in promoting high standards of achievement and good citizenship in the MIT community. Nominees may be undergraduates, graduate students or student organizations.

William L. Stewart, Jr., Awards recognize students for outstanding contributions to extracurricular life. Stewart Awards are a memorial to Mr. Stewart, a 1923 graduate of MIT and a member of the Corporation from 1952 until his death in 1963.

The Everett Moore Baker Award for outstanding undergraduate teaching is named in memory of Mr. Baker, who was dean of students at MIT from 1947-50. The award is made to a young faculty member in recognition of interest and ability in inspiring undergraduate understanding of academic work. Selection for the award is made by a student committee.

The James N. Murphy Award is presented to an employee whose spirited contributions to the MIT community have won a place in the hearts of students. Mr. Murphy was manager of West Campus from 1955 until his death in an accident in 1966.

Nominations and supporting statements for these awards should be sent to Dean Robert J. Holden, Rm. W20-343. Deadline for nominations is April 11.

The Goodwin Medal, named for the first dean of the Graduate School, Harry Manley Goodwin, honors conspicuously effective teaching by a graduate student. Nominations and supporting documents for the Goodwin Medal should be sent to the Graduate School office, Rm. 3-136, by April 15.

The Chalmers International Students Award will be given for the second time this year in recognition of outstanding leadership in an academic or extracurricular activity that spans international boundaries and cultures. The award is a memorial to the late Professor Paul M. Chalmers, advisor to foreign students from 1944-65. Nominations should be addressed to Professor Glenn C. Williams, Rm. 66-366, by April 1.

New this year is the James R. Killian, Jr., Community Service Award for outstanding contributions by an independent living group toward local or charitable projects. Named in honor of MIT's tenth president and former chairman of the Corporation, the award is co-sponsored by the Interfraternity Conference (IFC) and the MIT Community Service Fund. Nominations should be sent to the IFC office, Rm. W20-413 by April 11.

## Broader Collaborations Sought by Film Section

Could a film or videotape enhance some activity or project—teaching, research, or extra-curricular—that you're involved in? If so, the Film Section of the

If so, the Film Section of the Department of Architecture may be the place to turn.

The Film Section, which recently established a Master of Science

Mechanical Engineering; "Finger Film," a taxonomy of gestures related to touch sensitive computer display for the Architecture Group; "Low Cost Fish Ladders," for the MIT Sea Grant Office; "Paris Every Day in the Winter," an analysis of urban built form and public space for the Department of Architecture; Tugger War,'' a 2.70 design competition for the Department of Mechanical Engineering; "Centerbeam," a film about the Center for Advanced Visual Studies sculpture erected at the Documenta Exhibition in Germany in the summer of 1977; "Eclipse," about a field trip conducted by the Department of Physics. Professor Leacock said the Film Section also has taken on a number of projects from outside MIT. The list of sponsors, he said, includes Harvard Law School, the Opera Company of Boston, the Draper Laboratory, South Carolina Educational Television, Boston Model Cities, Massport, the Harvard Board of Fellows, the United States Equestrian Team, the Gardner Museum, and the Merce Cunningham Dance Company. 'We are capable of projects which involve a wide variety of interests, and we are anxious to solicit more,' Professor Leacock said. He stressed, however, that the Film Section is not a production service, but is devoted "to cultivating thoughtful and inno-

## Quinlan, Noblesse Named To Doherty Professorships

Dr. Alician V. Quinlan, assistant professor of mechanical engineering, and Francis Noblesse, assistant professor of ocean engineering, have been named the 1978 Henry L. Doherty Professors and Dr. Ole S. Madsen, associate professor of civil engineering, was given the chair for a second year. The awards were presented by Dr. Alfred A.H. Keil, Chairman of the MIT Sea Grant Policy Committee, following the announcement by MIT Provost Walter A. Rosenblith.

Professor Quinlan's primary research interests have been in reaction-transport dynamics in living systems, element-cycle dynamics in aquatic and terrestrial ecosystems, and environmental engineering. Her work on quantitative modeling of ecosystems, coupling biochemical and thermal fluid dynamics, has attracted wide attention in the US and abroad.

The Doherty professorship supplements a Sea Grant project by enabling her to conduct research on the quantification of the behavior of ecodynamic systems. In her project she will be investigating the processes responsible for algal blooms which annually foul Nahant Bay beaches and will evaluate various methods to prevent or control the problem.

Professor Quinlan is a Rockefeller Foundation Fellow in Environmental Affairs. She received her SB in Life Sciences from MIT (1968), her MS in Physical Oceanography (1970) from the University of Alaska and an interdisciplinary PhD in Environmental Engineering from MIT (1975).

Professor Noblesse has developed an exact, analytical approach for calculating ship wave resistance which will be beneficial to naval architects. The problem of designing ships with reduced resistance has troubled engineers and architects for over a century and has been the subject of considerable research activity during the last several decades.

The Doherty award will permit Professor Noblesse to translate his theory into a practical design tool. During the year he will apply his theory to both a simple mathematical hull and to a typical ship.

Professor Noblesse came to MIT in 1977 from Stanford University where he was a research associate in the Department of Aeronautics and Astronautics. He received his PhD in ship hydraulics (1974) and his MS in hydraulics (1971) from the University of Iowa. His undergraduate work was completed in France where he received a BS in engineering (1969).

During his second year in the Doherty chair, Professor Madsen will continue a project to provide a better understanding of the hydrodynamics responsible for beach erosion and will work to improve measures that can be used in beach protection.

Professor Madsen's primary interests have been in fluid mechanics and coastal engineering. He received his ScD in civil engineering from MIT in 1970 and an MSc in civil engineering from the Technical University of Denmark.

While making the awards, Dr. Keil described the Doherty professorships as a "valuable method for assisting and encouraging the professional development of MIT junior faculty members involved in the development of the oceans and their resources."

The professorships, established in 1973 through a grant from the Henry L. and Grace Doherty Charitable Foundation, Inc., are administered by the MIT Sea Grant Program under the direction of Dean A. Horn.



OFFERING CONGRATULATIONS to the new Doherty Professors is Professor Alfred A.H. Keil, former dean of the School of Engineering, left. They are Professor Francis Noblesse, center, and Professor Alician N. Quinlan.

### Protein Study Book Issued

### Student Project Funds Available

The MIT Community Service Fund, which supports the volunteer activities of MIT students and employees in the greater community, is seeking small, programrelated proposals from students and student groups.

Because of an unexpected foundation grant to CSF in support of Tutoring Plus, the Fund has up to \$5,000 available for support of other or new projects. Funding may not be requested for salaries, but is available for materials. Deadline for filing proposals is March 29.

Further information is available from Carmen Besterman in the Community Service Fund office, Rm. 5-208, x3-1988. degree program in film and video, is interested in involving its graduate students in projects initiated by other sectors of the MIT community.

"The need for better communication in research among diverse science, engineering and technical fields has been a major concern of the Film Section during the 10 years of our existence," explained Richard Leacock, professor of cinema and head of the Film Section. "We have responded to this need by fostering collaboration between moviemakers and engineers, and through teaching filmmaking skills to students in a wide range of disciplines at MIT."

Professor Leacock said that Film Section students and faculty over the years have produced a number of films in connection with projects sponsored by different departments and groups at the Institute.

A sampling of these films, many of which have been used as research tools, include:

A film about computer music synthesis for the Experimental Music Studio; a film on linkage systems for the Department of -

Protein Resources and Technology, a 656-page volume that is the result of a major study undertaken by MIT for the National Science Foundation, is now available.

Edited by Dr. Max Milner, senior lecturer, Department of Nutrition and Food Science, Professor Nevin S. Scrimshaw, head of the department, and Pro-

vative use of new media forms through teaching and research."

"Some film or videotape needed by your department or group might afford valuable working experience to a graduate student filmmaker," he explained. "It should be understood, however, that a student would undertake a project not in the role of hired technician, but in a spirit of collaborative exploration." He added that all projects are closely supervised by faculty and staff.

For additional information, contact Professor Leacock, Rachel Strickland or Ross McElwee (Rm. E21-010, x1606). fessor Daniel I.C. Wang, a member of the department faculty, the work is the result of the joint efforts of MIT, the NSF and 220 leading scientists to produce a definitive work on protein resources, problems and research priorities, looking forward to US food needs to the end of the century.

The book makes available for the first time a wide variety of information on the protein problem. The first section recommends support of intermediate and long-term research for strengthening food and food production capacities and analyzes the factors that influence protein supply.

The second section assesses US and foreign protein production and consumption. The final section reviews specific protein resources.

Protein Resources and Technology is published by AVI Publishing Co., Inc., Box 831, 250 Post Road East, Westport, Conn., 06880.

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### **Events of Special Interest**

Soul Food Sale\* — MIT Black Students Union, 11am-1:30pm, Thurs, Mar 16, Lobby 10; Fri, Mar 17, Bush Rm 10-105.

March 15

through

March 26

Steel Band Concert\* — Featuring Silver Stars Steel Orchestra. Sponsored by Technology Children's Center, Inc. A benefit performance to raise funds for MIT's Nursery School and Day Care Center. A two hour concert of classical and semi-classical music and calipso music. Sat, Mar 18, Sala de Puerto Rico, Stratton Student Center. Admission: \$2.50 donation, tickets on sale in Lobby 10, Mon, Mar 6 through Mar 17, and at the door evening of concert. Refreshments: Fruit Punch at intermission for slight charge.

### Seminars & Lectures

#### Wednesday, March 15

Continuity and Change in Egyptian Politics\* — Nazli Choucri, associate professor, political science. Center for International Studies and Political Science Department Seminar, 12-2pm, Rm E53-482.

Mantle Convection and the Thermal Structure of the Plates\* – Dr. Barry Parsons, earth and planetary science. Oceanorgaphy Sack Lunch Seminar, Noon, Rm 54-425. Coffee served, bring own lunch.

Bistable Optical Devices\* - Dr. Peter W. Smith, B.T.L., Holmdel, NJ. EECS Optical Seminar, 2-3pm, Rm 36-428.

Environmental Assessment of Advanced Technologies\* — Dr. James Gruhl, Energy Laboratory. Electric Power Systems Engineering Laboratory Seminar, 3pm, Rm 4-149.

Searching for Super-Heavies\* — Prof Stephen Steadman, Undergraduate Physics Colloquium, 4:15pm, Rm 4-339. Social Hour Follows.

Village Water Resource Development In Mali; A Case Study in Appropriate Technology\* — Ken Strzetch, Energy Work for Third World Countries, 5pm, Rm 24-117.

Symbolic Computer Model of San Francisco<sup>\*</sup> — Mike Gerzso, faculty, architecture. Architecture Department Lecture Series Slide Talk, 5:30pm, Rm 7-431. Wine served.

#### Thursday, March 16

Adaptive Optics\* — Raymond P. Urtz, Rome Air Development Center. Modern Optics and Spectroscopy Seminar, 11am-Noon, Rm 66-110. Coffee at 10:30am.

Saccadic Eye Movements and Their Clinical Relevance\* – Dr. William Scott, Director of Pediatric Ophthalmology, University of Iowa. Psychology In-House Seminar, Noon, Rm E10-013.

Heat Transfer to Impacting Drops and Post Critical Heat Flux Dispersed Flow\* — Gail Kendall, Doctoral Thesis Presentation, mechanical engineering, 3:30pm, Rm 3-133.

Earthquakes, Booms, Flames, and the Sources of Terrestrial Carbon\* — Prof Thomas Gold, Cornell University. Physics Colloquium, 4:15pm, Rm 26-100. Tea 3:45pm, Rm 26-110.

Catalysis System with Finite Bandwidth Distrubances\* — Gilmer L. Blankenship, Systems Communication and Control Seminar, 4pm, Rm 39-500.

Development of a Gas Chromatography/Mass Spectrometry Method For Quantitation of Dilantin in Serum\* — Agnes Van Langenhove, speaker, 4pm, Rm 8-105.

**Special Structure and Fixed Point Problems\*** — Michael Todd, Cornell University. Operations Research Seminar, 4pm, Rm 24-121. Refreshments: Coffee and Donuts.

Supercritical Heat Transfer in Superfluid Helium\* — Prof Paul Dimotakis, aeroanutics and applied physics, Caltech. Special Thermodynamics Seminar, 4pm, Rm 3-343. Coffee served 3:45pm.

Space Time and Scale (Concerning Use of Scale Models in Spatial Behavioral Research)\*\* — Dr. Alton de Long, School of Architecture, University of Tennesse. Density and the Quality of the Built Environment Seminar Series, 7-9pm, Rm 9-150.

Chemical Engineering Seminar<sup>\*</sup> — George A Huff, Catalytic Hydrodesulfurization of Dibenzothiophene, 2pm, Howard Brenner, University of Rochester, title to be announced, 3pm, Rm 66-110.

Measuring Military Balances: Central Europe\* — R. Lucas Fisher, US Arms Control and Disarmament Agency. Defense and Arms Control Students Seminar, 3:30-5:15pm, Rm E53-482.

Stabilization of Instabilities by Externally Induced Turblance\* – Ady Hershcovitch, sponsored research technical staff. Plasma dynamics Seminar, 3:30pm, Rm 36-261. Coffee at 3:15pm.

Magnetic Excitation Ferro, Magnetic Metallic Glasses\* — Prof Robert Birgeneau, physics. Center for Material Science and Engineering Seminar, 4pm, Rm 9-150. Refreshments at 3:30pm.

Plato on Human Motivation\* - Prof John Cooper, University of Pittsburgh. Philosophy Colloquium, 4pm, Rm 16-310.

Accessory Optic and Vestibulo-Cerebellar Systems\* — Prof John I. Simpson, Physiology and Biophysics, New York University Medical Center. Psychology Colloquium, 4:30pm, Rm E10-013. Coffee at 4:15pm.

Art and Politics\* — , sponsored by SACC, Ralph Fasanella, artist, will lecture 8pm, Rm 9-150.

#### Saturday, March 18

Bottle Babies Blues: Malnutrition and the Multinational Corporation\* — Lois Hoppes, coordination of Boston Impact; Ed Baer, International Students an Participation in Development and Wellesley Hunger Action Committee, Workshop and panel discussion emphasing campus participation and film: Bottle Babies, 12:30-5pm. Rm 14E-304. Info: Krishna Razan x3-6923.

#### Monday, March 20

Implication of a Complete Nuclear Explosives Test Ban\* — Herb York, professor of physics, University of California. CIS on Technology and International Security Seminar, 4pm, Rm E53-482.

Levels of Certainty in Nutrition Policy Decisions\* — Dr. J.P. Habicht, Cornell University. International Nutrition Policy Seminar, 4pm, Rm 66-168.

Manual Control and Workload Research in Germany\* – Dr. Gunnar Johannsen, Research Institute for Human Engineering, Federal Republic of Germany. Man-Machine Systems Laboratory Seminar, 4pm-5pm, Rm 1-132.

**Permeability Properties of Renal Capillaries\*** — W.M. Deen, assistant professor, chemical engineering. Committee on Biomedical Engineering Seminar, 4pm, Rm 37-252. Coffee served.

Real Time Forecasting of River Flows\* — Peter Kitanidis, civil engineering. Water Resources and Environmental Engineering Seminar, 4-5pm, Rm 48-316.

Spiral Modes in Galaxies as a Problem in Fluid Mechanics: A Final (?) Report on Esydotial Theory\* — Prof Chia-Chiao Lin. Sponsored by Math Department, 4pm, Rm 2-338. Refreshments at 3:30pm, Rm 2-349.

#### Tuesday, March 21

Estimating the Implause Response of a Non-Lunia Filter Using the Crossbispecrum<sup>\*</sup> — Prof Melvin Hinich, Virginia Polytechic Institute and State University. Math Department, seminar on Statistics, 4pm, Rm 2-338. Coffee & Tea, 3:30pm, Rm 349.

Laser Doppler Velocimeter Measurements in Turbulent Shear Flows\* — Prof Paul Dimotakis, aeronautics and applied physics, California Institute of Technology. Fluid Mechanics Seminar, 4pm, Rm 5-234. Coffee at 3:50pm.

Privacy versus Freedom of the Press\* — Tony Winsor, chairman, Mass Security and Privacy Council; Bill Plante, vice president, Mass Newspaper Publishers Association; Jeffrey Meldman, assistant professor, Sloan School of Management. Seminar in Information Systems and Law, informal debate and group discussion, 4-6pm, Rm E52-143.

The Swiss Hail Experiment\* — Dr. Albert Waldbogel, ETH, Zurich, Switzerland. Meterology Seminar, 4pm, Rm 54-100. Coffee and Tet 3:30pm, Rm 54-923.

Optical Studies of X-Ray Sources: A Potporri of Recent Galactic an Extragalactic Results\* — Prof Claud R. Canizares, physics. Astro Physics Colloquium, 4:15pm, Rm 37-252. Refreshments at 3:45pm.

Gene Transfer in Mammalian Cells\* — Dr. Frank Ruddle, biology, Ya University, New Haven, Connecticut. Biology Colloquium, 4:30pm, Rm ( 120. Coffee at 4pm, 5th Floor Vestibule, Bldg 56.

Pro's and Con's of Nuclear Energy\* – Dr. Helen Caldicott, Childrens Hospital, Medical Center; DeLynden Lersch, Stone & Webster. WISE Seminar, 8pm, Rm 10-340.

#### Wednesday, March 22

Recent Laboratory Studies of Langmuir Circulations and Their Application to the Mixed Layer of the Ocean\* - Dr. Allan Faller,

#### Friday, March 24

Problems of US Policy in Africa\* — Richard M. Moose,  ${\rm Ass}_{\rm istar}$  Secretary of State for Africa. International Studies Seminar,  $12:45_{\rm pn}$  2:15pm, Rm E53-482.

**Chemical Engineering Seminar\*** — William W. Doerr, The Reaction, Sulfur Dioxide and Oxygen with Fully Calcined Dolomites, 2pm. Alfred Anderson, University of California, Santa Barbara, title to be announce 3pm, Rm 66-110.

Stress Corrosion Cracking in the Power Industry: An Engineer's Night mare; A Scientist's Meal Ticket\*\* — F. Peter Ford, staff metallurg General Electric, Schenectady, New York. Mechanical Engineer Seminar, 3pm, Rm 3-133. Coffee 4pm, Rm 1-114.

### **Community Meetings**

The Tech Lodge<sup>\*\*</sup> — Regular communication of Richard C. MacLaur Lodge AF & AM. Wed, Mar 15, 7:15pm. Dinner at 6pm. Masonic Temp 1950 Mass Ave, Cambridge, MA.

**Oriental Cooking**<sup>\*\*</sup> — Co-sponsored by Wives Geoup. Hsui-Hsing Cha will demonstrate the art of Chinese wok cooking. Mon, Mar 20, Noon-1p Rm 10-105.

Buying A Car Seat\* — Sally Barnett and Pat Bartosheski, Mass Chapter Action for Child Transportation Safety will talk about car travel with bab and young children with a brief film clips. Prenatal and Parent Educati Group meeting. Tues, Mar 21, Noon, 3rd floor Conference Room, Infirma Bring your lunch, coffee and tea served. Info: 253-1316.

How to Buy a House<sup>\*\*</sup> — Technology Wives Organization. Ruth Cretell Real Estate Broker. Tues, Mar 21, 7:30pm, Mezzanine Lounge. Fre refreshments served.

Creative Photography Lecture Series\* — New and Old Vistas Photography, Speaker Gyorgy Kepes. Wed, Mar 22, 4:30pm, Creativ Photography Gallery, 120 Mass Avenue. Open Mon-Fri, 9-10pm, Sat, 10at 6pm, Sun, Noon-8pm. Info: 253-4424.

Eating in Response to Stress<sup>\*\*</sup> — Don't let pressure control your eatin You control it. Nutrition and Food Science discussion, Every Thursda Noon, Rm 37-272.

Tech Wives Excercise Class\*\* — Technology Wives Organization. An ho of excercise taught by professional Barbara Demps. Every Monday throug May 1, 8pm. Info: Linda Morecroft at 494-8434.

### Wellesley

Wellesley College Dance Group\* — Two free dance performances, Thus Fri, Mar 16 & 17, 8pm, Houghton Memorial Chapel, Wellesley Colleg Tickets available at door.

Wellesley College Chamber Orchestra\* — Directed by Debra Weinstei Pavanne for a Dead Princess by Maurice Ravel, Haydn's Symphony 44 The Farewell Symphony and the Mozart Flute Concerto in G Major, K. 31 with An Palik, Flautis. Sat, Mar 18, 8pm, Houghton Memorial Chapel, We lesley College, Wellesley. Free. Info: 235-9744.

### Social Events

Mezz Coffeehouse\*\* — Sponsored by SCC. Coffeehouse performers in relaxed atmosphere. Fri, Mar 17, 9am-Midnight, Mezzanine lounge, 3 floor, Student Center. Refreshments coffee, donuts, cider. Free.

Strat's Rat\* — Sponsored by SCC. Dancing and drinking live DJ; beer wine: 35¢/glass, 3/\$1; wine avail by bottle. Fri, Mar 24, 8:30pm,1am, Sals Puerto Rico, 2nd floor, Student Center. Refreshments: beer, wir munchies, soda. Admission: Free, College ID Required.

### Movies

The Confession\*\* — Director Costa-Gavras, French with English subtitu Sponsored by the department of humanities, Wed, Feb. 15, 7pm, Rm 66-1

The Big Sleep\*\* - LSC movie. Fri, Mar 17, 7 & 10pm, Rm 26-100. Adm sion 75c w/MIT or Wellesley ID.

Monty Python and the Holy Grail\*\* - LSC movie. Fri, Mar 17. 7 9:30pm, Kresge. Admission 75¢ w/MIT or Wellesley ID.

A Woman is a Woman\* — By director Jean-Luc Godard, (France 1961. min). Fri, Mar 17, 8pm, Rm 6-120. Donation \$1.25.

Bottle Babies Blue: Malnutrition and the Multinational Corporatio — Sponsored by the International Students and Participation in Development, and Wellesley Hunger Action Committee. Sat, Mar 18, 12:30pm. J 14E-304.

Theory of the Drift Instability in a Sheared Magnetic Field\*\* - Dr. P. Kaw, Princeton Plasma Physics Laboratory. Plasma Theory Seminar, 3pm, Rm 36-261.

#### Friday, March 17

**Responding to Alton de Long**<sup>\*\*\*</sup> — Maurice Smith and Don Lyn Lyndon, architecture. Density and the Quality of the Built Environment Seminar Series, 11am-1pm, Rm 3-415.

Managing Rail Marketing\* — Wade German, Senior Manager Commercial Systems, Union Pacific Railroad. Center for Transportation Studies Lucheon/Seminar, Buffet lunch Noon, \$1. Lecture 12:45, Free. Mezzanine Lounge, Student Center.

The Treatment of Familial Hypercholesterolemia\* — Jean Davignon, MD, Clinical Research Institute of Montreal, Montreal, Quebec, Canada. Arteriosclearosis Center Seminar, 12:30-2pm, Rm E17-421.

Infomal Report on a Trip to South Africa, Namibia, and Zambia\* – Prof Robert I Rotberg, history and political science. Center for International Studies Seminar, 12:45-2:15pm, Rm E53-482.

Use of Job Site Mini-Computers on Medium/Large Construction Projects\* — Paul Teicholz, Systems and Data Programming Manager, Guy F. Atkison, San Francisco, California. Sponsored by Harvard/MIT Joint Center for Urban Studies and MIT Civil Engineering, 2pm, Rm 1-350.

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**Application to the Mixed Layer of the Ocean\*** – **Dr. Allan Faller**, Physical Oceanography, W.H.O.I. Oceanography Sack Lunch Seminar, Noon, Rin 54-915. Coffee served, bring own lunch.

Aerial Profiling of Terrain Using Pulsed GaAs Lasers\* — Dr. Douglas Youmans, Draper Laboratory. EECS Optics Seminar, 2-3pm, Rm 36-428.

The American System of Manufacturing: A Retrospective Technology Assessment\* — Merritt Roe Smith, associate professor, history, Ohio State University. Technology Studies Program Seminar Series, 4pm, Rm 20D-205. Coffee served at 3:30pm.

**Tracking the Solar Wind, to Jupitar and Beyond\*** — **Dr Alan Lazarus,** senior research scientist, physics. Undergraduates Physics Colloquium, 4:15pm, Rm 4-339.

Engineers in Society\* — Sir William R. Hawthorne, master, Churchill College, University of Cambridge, 5pm, Rm 37-252.

#### Thursday, March 23

Fifty Years of Radiation Theory\* — Victor F. Weisskopf, professor emeritus, physics. Modern Optics and Spectroscopy Seminar, 11-Noon, Rm 66-110. Coffee at 10:30am.

**The Impact of Frances Perkins\*** — **Joanne Florino,** Ph.D Candidate, Cornell University. History Section, Humanities Seminar, 4-5pm, Rm 14N-317.

The Exciting Saga of the A<sup>\*</sup> – Prof Ronald Aaron, Northeastern University. Physics Colloquium, 4:15pm, Rm 26-100. Tea served 3:45pm, Rm 26-110. Jabberwocky\*\* - LSC Movie. Sat, Mar 18, 7 & 9:30pm, Rm 26-100. mission 75¢ w/MIT or Wellesley ID.

Midnight Movie: The Ipcress File\*\* — Sponsored BY SCC. Sat, Mar Midnight, Sala De Puerto Rico, Student Center. Bring your blankets and on the floor. Free.

Citizen Kane\*\* - LSC Movie. Sun, Mar 19, 6:30 & 9:30pm, Rm 26-1 Admission 75¢ w/MIT or Wellesley ID.

My life to Live\* — By director Jean-Luc Godard, (France 1962, 85 Fri, Mar 24, 8pm,Rm 6-120, Donation \$1.25

Deliverance\* — LSC movie. Sat, Mar 25, 7 & 9:30pm, Rm 26-100. Add sion 75¢ w/MIT or Wellesley ID.

Midnite Movie: West Side Story\*\* — Sponsored by SCC. Sat, Mar Midnight, Sala De Puerto Rico, Student Center. Bring your own blans and sit on the floor. Free.

A Midsummer Night's Dream\* - LSC movie. Sun, Mar 26, 7 & 9:3 Rm 26-100. Admission 75¢ w/MIT or Wellesley ID.

### Music

Faculty Recital\* — Marcus Thompson, viola, associate professor of mu Joining him in the recital will be Seth Carlin, pianist, and Maryse Car harpsichordist. Wed, Mar 15, Kresge Auditorium, Free.

-Hour Chapel Concert\* - A solo harpsochord rectial by Maryse din. Thurs, Mar 16, Chapel, Free.

st Artist Series\* - The Concord String Quartet, founded in 1971, will form Beethoven, Op. 18, No. 4; Ben Johnston, Crossings; Schubert, Op. in G Major, D 887. Sat. Mar 18, 8pm, Kresge Auditorium. Free.

oral Society\* — John Oliver conducts an all Schumann program: chtlied, Requiem fur Mignon, and Der Konigssohn, Op. 116. Sun, Mar 8pm, Kresge Auditorium. Admission: \$4 unreserved; \$5 reserved; \$2 MIT Wellesley Students.

ntracts and Compliments\* - Vincent Ricento, baritone and Thomas owski, pianist, perform a recitation contrasting vocal writing in over four miries and in four countries. Mon, Mar 20, 8pm, Kresge Little Theater.

n-Hour Chapel Concert\* - Chalres Robert Stephens, baritone and pert Strizich, lute. Songs and solos from Renaissance Italy and zabethan England. Thurs, Mar 23, 12:10pm, MIT Chapel. Free.

### Exhibitions

Search of Photography\* - Lecture Series by Charles Harbutt. ident of Magnum. Historical analysis of major figures and trends in ography since the turn of the century. Thurs, Mar 16, 7:30pm, Free. Ire Kertesz. Creative Photography Laboratory Gallery, 120 Mass Ave,

hard Smith, Recent Work '72-'77\* - Organized and sponsored by the T Committee on the Visual Arts with grants from the British Council and dential. Public preview Fri, Mar 17, 8-10pm, informal-gallery talk by the st, 7-8pm, A BBC filmed interview daily, 12:45 & 2pm. Open through 19, Hayden Gallery, 160 Memorial Drive, Camb, MA. Gallery hours: n-Fri, 10am-4pm.

Igerton's Stroboscopic Projects\* - Photographs and demonstrations by rold Edgerton selected from forty years of investigations of natural enomina. Sponsored by ther Compton Gallery Committee with the assistance of the Committee of Visual Arts. Through Wed, April 12, Mon-Fri, 9am-5pm. Margaret Hutchinson Compton Gallery, Maclaurin Building 10.

James Wilson Rayen, Recent and Revised, 1975-1978\* - Wellesley College Museum. An exhibition of paintings and drawings by James Wilson Rayen, associate professor of art and director of the studio art major at Wellesley. Through Sun, Mar 26, 8:30am-Noon and 1pm-5pm, Sunday 2pm-5pm. Gallery talks Sundays, 3pm. Jewett Arts Center, Wellesley, Free.

Tower and Roof and Pinnacle: The Architecture of College Hall\* - Wellesley College Museum. A selection of 19th century photographs of College Hall, Wellesley and a series of preliminary drawings made by the architects of College Hall, Hammatt Billings and J.E. Billings, showing the evolution of the design. Through March 23, Mon-Fri, 8:30am-Noon and 1pm-5pm, Sun, 2pm-5pm. Gallery talks Sundays, 3pm. Jewett Arts Center, Wellesley,

Famous Conductors\* - Music Library, Rm 14E-109. Photographs with biographical notes on famous conductors from Lully to Stokowski.

MIT Historical Collections\* - Permanent exhibition Mon-Fri, 9am-5pm, Bldg N52, 2nd floor. Katharine Dexter McCormick, '04; Vannevar Bush, '16; and 1876 Exhibit, Bldg 4 corridor. The New Technology Ex-hibit 2nd floor balcony of Lobby 7. Energy Exhibit bldg E40, 1st floor. Radiation Laboratory Exhibit main corridor, Bldg 8. Center for Space Research, Astrophysics Exhibit main corridor, Bldg 4. Bldg 6 Dedication Exhibit. Blacks at MIT, Lobby 7.

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.

Strobe Alley\* - High speed photographs by Harold E. Edgerton, Institute Professor and Professor of Electrical Measurement, Emeritus. Bldg 4, 4th fl.

### **Athletics**

IM Rifle\*\* - Preliminary rifle shootoff, 4 man teams and individuals. Mon. Mar 21-24, 3:30-7pm, Rifle Range. Info: x3-3296 or x3-3255, register before Mar 21.

### Theatre

An Evening of One Act Plays\* - MIT Dramashop. The Old One-Two by Prof A.R. Gurney, Jr.; The Lesson by Eugene Ionesco; Come and Go by Samuel Beckett. Fri & Sat, Mar 17, 18, 8pm, Kresge Little Theatre. Coffee and Cake to follow, audience critique after play. Free.

### Dance

Javanese Women's Dance\*\* — Explanation of and Performance by Lizzy van Paradijs. Wed, Mar 15, 3-5pm, West Lounge, Student Center. Babysitting provided.

Hamaker Israeli Folk Dance Troupe\* - Sponsored by MIT Hillel. Dance performance, Sat, Mar 25, 8pm, Kresge Auditorium. Admission: Students and Senior Citizens \$2.50; Adults \$4. Info: Call 354-8796 or 253-2982.

MIT Dance Workshop\* - Classes taught by Beth Soll. Modern Technique, Wed, 6-7:30pm, Rm W31-125. Mon, 5:15-6:45pm, Rm W31-225. Improvisation Composition, Mon, 7-8:30pm, Rm W31-225. Independent Student Work, Wed, 7:30-8:30pm, Rm W31-125. Info: 266-1202 or x3-5286.

Kundalini Yoga\* - Rediscovered technology of consciousness, come join the MIT Kundalini Yoga Group with Gurucharan Singh Khalsa to exercise, mediatate and get high. Thurs, 5:30pm, Mezzanine Lounge, Student Center. Info: Dan Buchhelz 776-9045.

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 Mar 22 through Apr 9 to Calendar Editor, Rm 7-102, x3-3270, before noon, Friday, Mar 17.

# Brain Research Leads to Arithmetic Teaching System

An MIT scientist's research on how the brain reacts when it is confronted with a new abstraction has led to the development of a novel way to teach school children multiplication and division.

Dr. Alan Natapoff, a physicist with the Man-Vehicle Laboratory in the Center for Space Research, has successfully used his "stra-tegic arithmetic" to teach learning disabled children how to multiply and divide. He says standard populations without memory problems could learn these processes in onethird to one-tenth the time schools now devote to such instruction.

Dr. Natapoff has demonstrated his technique in classrooms in several sections of the country. He teaches in the Harvard-MIT Division of Health Sciences and Technology, headed by Dr. Irving M. London, and is working regularly with seriously learning disabled children in the Boston area.

Professor Laurence R. Young, who heads the Man-Vehicle Laboratory, said strategic arithmetic has proved to be "an exciting example of an important, although unforeseen, practical application of fundamental research.

The MIT research has led to applications of Dr. Natapoff's teaching techniques in remedial programs for students with learning disabilities, and for high school and post-high school students who have difficulty with math. His techniques have been used at the **Boston School Department's Mario** Umana Harbor School in East Boston.

At the college level, a new approach for teaching supposedly unteachable math students, based on the method developed by Dr. Natanoff is being acquired by professors at the University of Massachusetts. The project is supported by a \$50,000 grant from the US Department of Health, Education and Welfare. It was a search for a task against which to test his theoretical approaches to higher abstract thought that led Dr. Natapoff to investigate the teaching of simple multiplication and division of whole numbers. "Consider the paradox presented by the teaching of arithmetic," Dr. Natapoff says. "Multiplication and long division are abstractly very closely related. Therefore, they should be similar in difficulty. But they are not. Multiplication is taught far more readily than is division. Our hypothesis suggests that the root cause is not any significant difference between the two processes, but rather some very significant differences in the pedagogic strategies used currently to convey them.

Those contemporary strategies,

Dr. Natapoff says, require some 150 hours to teach both multiplication and division to students without learning problems, and about 10 per cent fail to master them.

"Thus, the total remedial population, including learning disability segments, is some quarter of a million students per year. This burden is passed on to junior high schools and high schools, and even colleges."

The algorithm for subtraction used in Dr. Natapoff's strategic arithmetic was learned by thousands of people-including Dr. Natapoff-in grade school, but Dr. Natapoff has invented techniques for teaching the system effectively

In multiplication and division, he has invented the algorithms themselves, as well as the tactics for teaching them. It is the overall program of matching and creating algorithms and tactical pedagogy that is referred to as strategic arithmetic.

Using the Natapoff strategic arithmetic, multiplication and division can be taught in 22 lessons for which 50 class hours should suffice, Dr. Natapoff said.

"With learning disability groups in pilot sessions, those 22 lessons can be covered in fewer than 20 hours, with an efficient yield. It is not unusual to work successfully with such groups and have them learn multiplication alone in five hours, to the point of being able to multiply three-digit by four-digit numbers, this after years of previous frustration and failure with standard methods."

Dr. Natapoff teaches multiplication and division by breaking these abstractions into small, rehearsable bits, and then rehearsing them suitably. He uses small bits because, according to his theory, "abstractions involve random processes in short-term memory and those are inefficient for large tasks." The rehearsing allows "the effective use of evolutionarily older and more powerful sensory abstract faculties." (See example in box.)

disturbs the flow of ideas "and demands a care and precision that is incompatible with the uncertainty of young students first encountering subtraction."

By contrast, strategic arithmetic involves only eight digit changes of two kinds, each requiring only the placement of "the single most legible numeral we have, 1," Dr. Natapoff said.

"When the work is complete, the original problem is still legible. This is an advantage for conveying

the concept and it is urgent in later applications such as long division. As long as subtraction is seen as a difficult conceptual task, it is impossible to convey any higher abstraction (such as division) that depends on it. If subtraction lays down an illegible tableau of thatched numerals, conveying division by examples will be hampered by the inability of sensory abstract faculties to extract and comprehend the larger pattern, for the illegible thatchy

How does strategic arithmetic work? Here is an example provided by Dr. Natapoff:

"Arithmetic maps the abstractions of numbers onto operations on sensory counters-numerals. In good design, the mapping must be easily acquired and the sensory operations compact. In one popular contemporary strategy, there are difficulties in both senses.

The example below shows the popular strategy on the left and Dr. Natapoff's suggested design on the right.

	3	2	9	9								1			
	A	8	ø	ø	5				4	3	0	0	5		
-	2	7	6	6	8			-				6			
182	1	5	3	3	7								7	_	

The first step in each case, the step needed to produce the first digit, 7, is:

		2	9	9				4	3	0	0	5	
	4	8	ø	¢	5					6			
-	2	7	6	6	8		_	 2	/	0	1	0	_
13		1			7							7	

Dr. Natapoff criticizes the popular strategy because nine different modifications involving four different places, are needed. "By hypothesis," he said, "the difficulty of the whole scheme is determined, essentially, by the difficulty of its hardest parts. Here, the hardest part is quite difficult. Therefore, the efficiency may be expected to be very low, which it is, and the design is suspect.'

The underlying numerical transformations are:

components."

What he views as design weaknesses in the traditional system have been tolerated, Dr. Natapoff says, "because most students are able to overcome them." What is not always recognized, however, is that "the price must be paid in severe difficulties with divisiondifficulties that are conceded." He also notes a further problem:

"Some intelligent students are denied access to arithmetic because of marginal muscular problems. The additional burden imposed by poor design becomes an obstacle to the acquisition of conceptual mastery for students whose fine muscular control is less than perfect."

What does all this mean to kids with learning problems? The closing lines of a letter from a Marblehead, Mass., teacher to Dr. Natapoff, give the answer. The teacher is writing about a boy who was underconfident, learning disabled, and extremely troubled by math.

"The Natapoff method became Kerry's panacea," the teacher wrote. "A logical, sequential system-involving little memorytruly turned his life around . . . His outlook, self-concept and his spirit have changed drastically. This child is proud and happy with himself.'

The teacher closed by reporting that during a recent tutoring session Kerry looked up and said: "You know, I'm going to teach my kids to do arithmetic like this when I grow up."

### Sloan Alumnus Named to UN Post

"Without rehearsal, the student must rely on what Dr. Natapoff theorizes is an "evolutionarily new, primitive and weak faculty based on a random and unreliable process," hence the connection between his theory of the evolutionary character of creative abstraction and the strategy underlying successful pedagogy.

Dr. Natapoff says the "relative illegibility" of the popular method which involves crossing out numbers and substituting new ones, "is not repaid by any advantages not possessed by its competitor."

Erasing the original numbers frays the fabric of the problem, 43005 - 27668 = (42990 + 15) - (27660 + 8)

=(42990 - 27660) + (15 - 8)

=(42990 - 27660) +7

"The particular difficulty is that transforming 43005 into 42990+15 is cumbersome and obscure. It means changing four digits of the minuend, 43005, simply to prepare for the simple target subtraction 15-8. More, three of those four changes are themselves, subtractions. Unless there were no other way to do it, there would be no defense for so decomposing subtraction, bootstrap fashion, into simple subtractions connected by chains of potentially indefinite length of other simple subtractions," Dr. Natapoff said.

The ideal solution, Dr. Natapoff said, would involve only steps already mastered, such as addition. His method, he points out, does not use any linking subtractions and involves no more than two digits of the calculation at any stage.

The transformations underlying the Natapoff method are:

43005 - 27668	=(43000+15)-(27670 +8)
=(43005+10)-(27668+10)	=(43000 - 27670) + (15-8)
=(43000+15)-(27678)	=(43000 - 27670) +7)

"This involves only additions, Dr. Natapoff said. "It takes advantage of the closure of non-negative integers under the addition of 1. That is, every non-negative integer is followed by another one. The weakness of the popular method is that the same is not true of subtraction. The non-negative integer 0 is not preceded by a nonnegative integer. As the example shows, this complicates the linking steps (since they involve subtractions) where linking steps based on addition are simple.

A Ghanian diplomat chosen for the new second-ranking United Nations post of Director General for Economic Development is a graduate of the 1972 MIT Program for Senior Executives at the Sloan School.

Kenneth Dadzie, 47, Ghana's Ambassador to Switzerland and Austria, was selected by UN Secretary General Kurt Waldheim from candidates from third world countries. Some diplomats see the position as a possible stepping stone for succeeding Mr. Waldheim, whose second term runs out in 1982.

Sloan's Program for Senior Executives is an intensive nineweek course of study designed for senior-level executives. Participants reside at the Endicott House in Dedham, taking their course work on campus at the Sloan School and at Endicott House.

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Guitar, Gibson Les Paul delux, \$275. Ken x7673

W Frye boots, sz 612, \$15. Lisa x3-6898.

4 Cragar SS mags, compl w/4 nw tire, H78-15, white walls, \$350. Linda x3-5476. Brand nw Parallax 2221 spks, exc cond, \$125 or

best. Call 247-8691. Stax electrostatic SRX Mk II headphn w/SRD7 energizr, \$120 firm. BJ x5-8669 Dorm.

W figure skates, exc cond, sz 9, \$8. Call x3-2281. C crib w/ adjstbl sides & mat ht; feeding tbl; chest

of drawr; chang tble, \$25, for everythng. Call x3-3834 or 926-4259 aft 6 eve.

Motorola, AM/FM car stereo radio w/pr 3" door, 6" rear deck spkrs, \$60 or best; 3 Mich 185-14X stl rad, far cond, \$15 ea, best. Sandy 492-7872 eve. Zenith 21" B&W console TV, \$35; Eico 2510 classic series recvr, \$25; both in gd cond. Call x3-6116.

5 piece fireplc set, \$15 or best. Vernell x3-4733. Lab coat, sz 42, cot blue, heavy duty, fl lgth, sligh use, \$7. Rosaline x8-1401 Draper.

Lv for Calif, 2 stud snows, steel bltd rad, white wis, 7,000 mls, 185-13, 1 rim, \$50 pr; Court reporter steno w/stand, \$125. Debbie x8-1304 Draper.

Head ski outft (jacket & warmup pants) W sz 9/10, worn 1, best. Call x5-8619 or lv msg for Virginia Chen 253-5961.

Oran generator & regulator, 32/40 volts, 2 KW. Sheila x3-5705

'69 Dodge Cornette, 4 dr sedan, 87K, auto trans runs wl, bdy dent, \$300. Call 258-2836 day or 325-

'69 Mercury Marque, gd run cond, \$500 or best Linda x3-5476.

'69 Opel, 30 mls per gal, 55K, 1 ownr, gd run cond, must sell, \$500 or best. Call eves or wkend (1) 655-1083.

'69 Pontiac Calina, lw milg, vry gd cond, PS & PB

auto, V8, 4 dr, dark green w/nw battry, mufflr, shcks, vry gd buy, \$500 or best. Call Jose at 266-

'70 Malibu 4 dr, 350 eng, turbo hydro trans, AS

'70 VW squarebck, gd run cond, \$400. Call Joe x5-

'71 Toyota Corolla, 2 dr sedan, stand shift, top drvng cond, AM/FM, almst nw, snows, \$1,200 or best. Call 332-1857.

Datsun, 4 dr delux, AM/FM, mod 510, exc work cond, super gas mlg, nwly painted, \$1,100. Call x8-1620 Draper or 232-6868.

'71 Gremlin, 59K, 2 dr sedan, \$650 or best. Call

'71 VW Bus 75 eng, convertd to camper, great for trip, nw snows, r/windw defog, AM/FM, nw muff, great trans. best. Perry x5-7203 or 494-8120 Dorm.

'71 BMW 2002, 4 spd, sunrf, metal green w/nw mech, AM/FM; \$2,900 or best. June Yuson x5-8643

'72 Chevy Nova, auto trans, PS, radio, snows, ask \$950. Nicholas x3-6605.

'72 Merc Montego sta wagon, 66K, gd cond, \$1200.

'72 Porsche 914, metal gold, gd cond, hi mlg, but runs vy well w/many nw part, AM/FM, conies, 1 ownr, \$2495 or best. Call Peter x3-1587 or (1) 365-

'72 Vega, 59K, nw eng, nw tires, many other nw

parts, exc mech cond, slight bdy damage, \$500 or best. Call x5-9636.

'73 Chev Malibu wagon, auto, PS & PB, AM/FM stereo, roof rack, 350 cu V8, low hgway mlg, runs exc cond, ask \$1,450. Call x3-2772.

'73 Land Rover, 31K, exc cond, \$3,200. Call x3-

'73 Volvo, red, 4 spd w/overdrv, vry gd cond, many extra, \$2,450. Dan x3-5882.

'73 VW Super Beetle, stand, ex cond insd & out,

Movng must sell: '73 Super VW, 52K, \$1,500 wl nego, bdy gd cond. Call Anne x3-7140 or 661-6964.

own/tan, exc cond, best. Call 438-675

nw tire & snows, \$1,950 or best. Susan x3-6240

ech & bdy work, so its

PS, PW, etc, nd some mech & cheap, \$500. Call Mike x3-2736.

Vehicles

8742, eves.

6660 Dorn

864-8802 eve.

Call Gerry x3-2455.

Dorm.

4421

329-5158 eve

Housing

4023

### For Sale, Etc.

2 tickets to Viginia Slim's tennis finals, Sun, Mar 19, 3pm, \$9 tckts, \$15 pr. Mark x7856 Linc, 862-7978 eve.

Amatur radio beam antenna, TA33-junior w/balun & AR22L rotor & cable, usd 1 yr, clean & ready to go, \$100. Hank x7287 Linc.

Yamaha FG180 guitar, \$150 w/case. Call x3-5254. Guild 6 strg elect guitar, gd cond. Call 389-4110 aft 2pm

Discount lift ticket for Mittersill and Bretton Woods. Call John x8-2002.

2 ticket, The Damnation of Faust, Berlioz, Mar 28, m, Opera Co, Bos., \$40. Call x3-2916

8-track car stereo, nw in bx w/wrrnty card, \$35 or best; Smith Corona lghtwght manu prtbl (pica type) typewrtr; \$35; Sankyo Super 5 CM, Super 8 camra, auto zoom & expsr, \$70. Call Paul x3-2351

Prtbl 9" TV, nds work, \$5. Call x3-7235.

Walnut formica top dinette set w/4 chairs, gd cond, \$100. Call 861-0279.

Tw sz cot, almst nw, comfort & conv, prc nego. Call Sue x3-1702

Paint spraying comprs, gun access, 1/3 HP, \$40; Axian wedging tol, cutting, attachmt, nosal, hoses, \$20. Call 484-5109.

Stereo set, about 17 hrs old, Heathkit FM tunr, Realistic amplfr nds work, AR manu trntbl, 2 Electrostat II sprks, best. Bill x3-3276.

Heisling ski boots, sz 8, \$10. Call 696-3750. ADS 500 spkrs, 6/mos old, \$199; PE trntbl, b/dc, nw cartdg, \$65, nego. Mike 661-8857 lv msg.

Hot point air cond, 3 yrs old, \$125; timer for same \$10; Fan \$5. Andy x3-1833.

JVC 4333 compact stereo; AM/FM, phono, stylus, w/S.E.A. \$100 or best; Studiocraft 440 Bose, spkrs, \$250/pr or best. Call Roger x3-690 raft 440 by

Hot Point Washr mach, apt sz, 7lb load, exc cond, \$85 or best. Call Jim x3-5033.

Usd goalie equip, incl sz 8 skates, \$150. Call Joe x3-5829

Tires, H 78-15 mntd on Ford/Mercury whls, bias bltd, poly sdwalls, glass blts; pr Firestone blckwall, ½" tread remain; pr Firestone blckwall, 3/16" tread remain; pr Delta std snows, whwall, 3/8" tread re-main; 1 spare. Call Bob ... 1371 Linc or 899-3524.

Pr tire chains, fits E78-14, F78-14, others, \$10. Geri Baldwin Spinet piano, superd cond, best over \$750. Call 267-7397 8-9 morn only.

Fl sz, sofa-bed, \$35; coffee tble, \$4 chest of drwrs, \$15; 2-draw steel file cab w/hanger, ex cond, \$20; 7 gal Sears fully auto humidifier, yr old, \$20. Call x3-3834

Polaroid SX-70 Alpha 1, \$120; Metrotec few-1 equalz, \$50; non-work teletype ASR-33 w/nw rinter, \$100 or best; elect organ, \$100 or best. Call

Almst brand nw SR56 calculator programmbl w/anu, runs battries, AC, adapt & carry case incl. Call Polly x5-8220 Dorm.

Albums for sale: misc select, gd cond, \$1 ea. Call Pete x3-5353 or see Pete, Rm 1-314.

Chrome/glass coffee tble, \$30; W sz 7 Roch climp boots, \$35 or best; plant hangr \$3.50. Call x3-6025.

Ski pants (blue bib), worn once, \$50 or best. Call x5-8619 or lv msg x3-5961 Virginia Chen.

3.2 cu ft, refrig, mint cond w/all org packg, \$70; hot plate, \$5; Pioneer SR202W stereo reverb amp, exc cond, \$45; 200mm F4 lens for OM sys, gd cond w/-case & 1A filter, \$110. Call 262-6079.

Moving sale: L-shapd couch, \$125; 5 ft lng desk, sewng tble to match. \$20 ea \$50; antique chairs, 6 for \$25; 4 carpets gold, \$5-\$125. Call Roger x3-6472 HP 25 w/applc program, instruct manu & charger,

\$70. Bruce

#### Animals

Free to lovng home 3, 7 wks old kittens, traind, callico, B&W, gray w/whit. Helen x3-2710.

### Lost and Found

Lost: If anyone found a lost ring, please call x5-8641 or bring to campus police Found: 1 small beagle, Fri, Mar 10, morning, in Kendall Sq. Call Donna x3-2269.

### Wanted

1 Speaker. Call Carol x3-3724.

Lookin for nw Mary Poppins to care for 4 yrd old, 2 afternoons a week. Call x3-1592.

2 pr skis, Head stone 180 & 190cm, Lou x5767 Linc. You advertised for Volvo tires, reg & snows. Call 732-1265 day or 354-7039 eve.

Sm refrig now or early Apr. Call Sue 729-4671 eve 732-1060 day.

Someone to install linoleum fl. Call Rick x7477 Linc

Used couch. Judy x3-8020. VW highway tires, 5-60x15. Call Paul x5-7325 Dorm

Yamaha classic guitar. Marilyn x3-1549. '71 Buick Riviera or Old '75 or '76 Cutlass Salon. Call x8-3552 Draper

Accommodation during summer (June-July) nr Harvard Sq; house prefered, prepare to take care pets/plants. Call Dr. Sylvia Weir x3-7368.

### Roommates

Belmt 2nd P, 25+, lg sunny apt in 2 famly hse. Call Martin x8-1159 Draper.

Cambport, F rmmate, to share 4 BR apt, w/3 friend F stud, avail Apr 1, furn rm, porch, \$75/mo plus util. Call x3-7027

### Carpools

1 or 2 P's w/car to join darpool from N.E. Natick, Wellesley Fells area. John x3-7421.

#### Miscellaneous

Iranian will to teach Farsi, technical or non-tech, Fee nego. Call Karen Devine x3-2916.

Going to Wash, DC, over Spring brk? ride w/us on International Express, round trip charter bus, Mar 28-Apr 1. Call World Affairs Council, 267-6674 for info.

Heatng, air cond, vental, insulat work to be done. Call Authur Dubois 891-7499 aft 4:30p

WI type, anythng, tech, etc, IBM correct Select, reas rates. Virginia x3-6885 or x3-3229.

Wl type theses, manu, tech, fast & accur, IBM Correct Select. Debbie x3-1848.

Wl type: gen, tech, theses, IBM Correct Select. Ginny x3-3929.

Wl type, gen, tech & theses. IBM Correct Selectric Call x3-2153

Wl type, manu, reports, IBM Self Correct, fast & accur. Call x3-4528.



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, out-side the offices of the Special Assistant for Women and Work (10-215) and Minority Affairs (10-211),

Admin. Staff, Asst. Director, Council for the Arts to assist in the promotion of the Arts at MIT and administer the Councilresearch experience also required. Experience in microscopy, biochemishe promotion of the Arts at MIT and administer the promotion of the Arts at Mi1 and administer the Council's committee and office work: provide in-itial screening of fund requests from MIT arts groups; process grant applications and arrange dis-tribution of funds; assist in writing, editing and producing Council Newsletter; supervise logistics for Council's Annual Meeting; act as office for Council's Annual Meeting; act as office manager; participate in meetings with department heads, faculty and students on matters relating to arts activities within the Institute. Bachelor's degree or equivalent combination of education and experience and ability to write well required. Knowledge of at least one art form and at least one user's experience in acts administration desirable year's experience in arts administration desirable. A78-10 (3/15).

Administrative Staff, Programming Analyst in the Office of Facilities Management Systems with a small group which is involved in the development of a new computerized space inventory system which will include an equipment inventory compo-nent. Other office projects include: systems sup-port of the INSITE II system for MIT and a consor-tions of a these institutions and tradient the space tium of other institutions, and testing the space cost analysis system. Responsibilities will include coordinating and carrying out in-house programm coordinating and carrying out in-house programm-ing and system development projects; designing and assisting in testing acceptance and installation procedures; preparing user manuals; training users. A Bachelor's degree, or equivalent, in com-puter science required, plus some experience in programming, systems analysis and design. Amount and relevance of experience will deter-mine level of position. Knowledge of PL/1 and COPTPAN and of the IBM OG Amount and relevance mine level of position. Knowledge of PL/1 and FORTRAN and of the IBM OS operating systems FORTRAN and of the IBM OS operating user-oriented also necessary. Experience in writing use documentation is an asset. A77-73 (3/8)

Sponsored Research Staff, Computer-Systems Sponsorea Research Staff, Computer Systems Engineer, in the Meteorology Department, Weather Radar Laboratory to design interfaces and oversee the programming of two computer-radar systems used to obtain weather radar data. A minimum of an S.B. degree in computer science preferred. Familiarity with special-purpose digital equipment for weather-radar measurements (i.e., sweep integrators) and knowledge of machine and higher level languages and of operating systems re-quired. R78-46 (3/8).

Sponsored Research Staff in Urban Studies and Sponsored Research Staff in Urban Studies and Planning to do regional economic research on employment, energy and transportation problems; prepare reports; submit computer runs; maintain tapes, discs, cards and computer workbooks. Ex-cellent economic background, at least 1 semester of linear algebra plus experience in doing computa-tions, preferably on the IBM 370/168 required. Research experience and Fortran programming ex-perience preferred. Non-smoking office. 35 or 40 perience preferred. N hrs./wk. R78-9 (1/25).

Exempt, Administrative Assistant, in the Center Exempt, Administrative Assistant, in the Center for Policy Alternatives to review, correct and prepare various payrolls; prepare various forms re: employee status; maintain various filing systems; prepare budgets, projections and accounts; oversee project and department accounts; perform various eccurative generative distributes resided accounts; project accounting services; distribute project accounts; purchase all equipment and furniture; responsible for requisitions, invoices and payments. Good typ-ing skill, good communication skill required Ability to work well with other people and capacity for high volume of detailed work also required MIT experience preferred. 40 hrs./wk. E78-9 (3/8).

Administrative Asst. V in the Architecture Dept. to type course materials, journal articles, cor-respondence and technical reports; assist in development and maintenance of filing system; arrange travel; schedule meetings. Ability to work with students, faculty and outside professionals and familiarity with research operation, as well as record keeping experience required. B78-89 (3/8).

Secretary V in the Dean for Student Affairs Office Secretary V in the Dean for Student Antaits Office of Freshmen Advising to answer questions and provide guidance for students and advisors; plan and carry through projects; assist in publication of Freshmen Handbook; handle mail; perform ac-counting services. Good organizational skills, billion est priorities and conditioned different no. ability to set priorities and coordinate different ac s required. Knowledge of MIT helpful. B78tivitie 101 (3/15)

Secretary V in the Neurosciences Research Program to type correspondence, scientific right to type correspondence, schedule ap-pointments; maintain files. Good secretarial skills and good educational background required, as well as tact and poise in dealing with prominent visitors. Interest in brain science and behavior and millingers to hear gainstiffs, tormischemi a willingness to learn scientific terminology; bibliographic and library research procedures desirable. B78-104 (3/15).

Sr. Secretary V to the Director of the MIT Alumni Sr. Severally to the Director of the Anti-Attinue Fund to arrange committee and other meetings; assemble relevant materials; prepare travel itinerary and expense reports; type and compose correspondence and other materials. Excellent typ-ing and shorthand skill required. Organizational ability and good telephone manner important. Ability to expersive indement recognize neiorities Ability to exercise judgment, recognize priorities and to work independently also important. B78-79 (3/1)

Secretary V to the Director of both the MIT-Secretary V to the Director of both the MIL-Industry Polymer Processing Program and the Lab for Manufacturing and Productivity to prepare general correspondence; supervise activities of 1 secretary; coordinate work of additional personnel ocassionally; plan and supervise technical con-ferences, workshops and liaison meetings; prepare budgets; monitor lab personnel; assist in develop-ing lab procedures. A minimum of 5 years ing lab procedures. A minimum of 5 years secretarial experience, with at least 3 at a senior secretarial level required. MIT experience and writing ability preferred. 40 hrs./wk, B78-80 (3/1).

Secretary IV-V in the Provost's Office to handle a Secretary IV-V in the Provost's Office to handle a variety of duties: arrange travely; answer and place telephone calls; file; type and compose cor-respondence. Excellent typing skill and good com-mand of English language required. Ability to recognize priorities and ability to work well under ure also required. B77-7

assist in organizing meetings and conferences; orders supplies, services; monitor accounts; main-tain reference library; arrange travel. Good typing and organizational skills required. Technical typing skill or willingness to learn necessary. MIT experience desirable. B78-88 (3/8).

Secretary IV to two staff members in the Admis-sions Office to type correspondence; answer telephones; schedule meetings and appointments; arrange travel; maintain files. Will also share arrange travel; maintain files, will also snare receptionist work and assist with special projects, Excellent typing skill and command of English language, as well as organizational ability re-quired. Secretarial experience also required. Knowledge of MIT desirable. Non smoking office. B78-8 (1/11).

Secretary IV to the Treasurer of the Corporation will perform varied duties in a busy office: in-cluding a large volume of contact with other In-stitute offices and representatives of outside organizations; take and transcribe shorthand dicorganizations; take and transcribe shorthand dic-tation; arrange travel; reconcile office accounts, Position requires good organizational skills and ability to complete detailed projects with ac-curacy. Excellent secretarial skills including shorthand also necessary. College or secretarial school training and office experience preferred. Position begins in January, 1978. B77-647 (11/9).

Secretary III for the Council of the Arts office and staff to type; file; xerox; answer telephones. Good typing, organizational and office skills required. B78-99 (3/15).

Secretary III in the Medical Dept.'s Student In-surance Office to process Medex and Medicare forms; type and maintain student insurance waiver lists; update microfiche; make check deposits; prepare reports. Will also type correspondence, re-quests and vouchers; xerox; answer telephone and inquiries re: student health. Good typing skill, ap-titude for figures and ability to deal with the public effectively required. Insurance claims experience is desired as well as some formiliority with medical desired as well as some familiarity with medical terms. Individual will also provide telephone, reception and secretarial support to the Financial Manager. B78-83 (3/8).

Communications Console Operator III, full-time and part-time, in the Physical Plant Ad-ministrative Services section to operate the Facilities Management Systems computer console which monitors various aspects of the physical en-vironment; communicate with control center and with various shops tising phones, nages radio with various shops using phones, pages, radio transceivers; expedite all incoming call as necestransceivers; expedite all incoming call as neces-sary; perform various clerical functions as re-quired. High school graduation, or equivalent, English language skill and ability to react ap-propriately to emergency conditions required. Comparable experience and familiarity with com-munications control systems terminology and equipment desirable. B78-92: Full-time: 9AM-5PM; B78-91: Full-time: 4PM-12Midnight, some weekend and holiday hours required. B78-93: Saturday and Sunday, 12 Midnight-7:30AM. (3/8).

Library Asst./Secretary IV in the Dewey Library to handle telephone inquiries, file; maintain library's reference collection; assist in processing un-catalogued library collections; assist in special catalogue maintenance projects. Will also handle payrolls and schedules; order and control library unplice and maintenance files that files the consupplies and maintain related files; type cor-respondence and reports. Must possess flexibility and initiative as well as good typing skills. Previous library experience and formal secretarial training desirable. B78-102 (3/15).

Sr. Keypunch Operator III, temporary, in the Alumni Association to record data entry and verify, Keypunch-key to disk operation, emphasis on speed and accuracy. One to two years' ex-perience required. Temporary 9-15 months. B78-97, B78-98 (3/15).

Clerk II, part-time, in the Physics Dept. to xerox and collate course material; prepare envelops for mailings; maintain xerox records. Will also do some light typing; file; help secretaries with paperwork. Some typing helpful; ability to work in a busy environment with little supervision, 17.5 hrs./wk. Mon. and Wed.: 9-5; Fri.: 9-12:30, B78-95 (3/15)

Hourly, Groundperson for the Athletic Complex to Houry, Groundperson for the Athletic Complex to learn all aspects of grounds and building work in-cluding lining fields; operating the ice machine; setting up for athletic events; caring for lawns and removing snow. Physical stamina for lifting heavy loads such as concrete blocks, gravel and snow and a Massachusetts driver's license is required. Ability to work an irregular schedule in accordance to the needs of the operation also necessary. A to the needs of the operation also necessary. A special physical examination will be required. H78-16 (3/15).

Hourly, Second Class Firer, in the Physical Plant Houry, Second Class Filer, in the ruysteal riant to keep it in an orderly and neat condition. Must have Mass, driver's license and ability to obtain Third Class Engineer's license. Experience on equipment related to license required. Must be wil-ling to work any and all shifts. H78-27 (3/15).

Hourly, Waiter/Waitress, part-time, in the MIT Faculty Club to take orders; pick up food orders; serve food from banquet trays; clear and reset tables; perform various other duties pertaining to dining room service. Experience helpful. Must be able to speak and read English. 20 hrs./wk. 11:00AM-3:00PM, Mon.-Fri. H78-25, H78-26 (3/8).

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

ADMINISTRATIVE STAFF:

A77-3, Systems Programmer, Info. Processing Serv. (2/16) A77-62, Industrial Liaison Officer, Ind. Liaison

A77-73, Sr. Appl. Analyst, Off. of Facilities Mngm't. Syst. (11/16) A77-79, Applications Prog., Info. Proc. Serv.

(12/14)

'74 Chevy Beleville wndw, sport van, 630 1 ton, PS & PB, 35 V8, 2 air cond, front end stck, tow pckg, 47K, under coat zbart, 12 passng, no work nd, perf cond, nw tire std snows, \$4,300. Don x8-3337 or '74 Mustang II, Mach I, superb cond, auto, PS & PB, AM/FM stereo, only 41K, \$2,495. Call 547-'74 VW sedan, sun roof, 6000K, best, must be seen. Call 625-4006, 4pm-8pm. '75 Ford Mustang II GHIA, 4 cyl, AM/FM, auto, '76 Mercury Capri, white w/beige inter, AM/FM, radials, 4 spd, 19K, exc cond, \$3,700. Call 479-6242

**CLASSIFIED** ADS X3-3270

Ads are limited to one per person per issue may not be repeated in successive issues. All ads must be accompanied by full name and Institute extension. Persons who have no extensions or who extension. Persons who have no extensions or who wish to list only home telephones may submit ads by coming in person to the *Tech Talk* office, Rm 7-102, and presenting Institute identification. Ads may be telephoned to x3-3270 or mailed to Rm 7-102. **Deadline is noon Friday before publication**.

BSR 2240X trntbl, Kodak Teleinstmtc & GAF pcket cameras, all exc shape, cheap; also M wool sportscoat, european cut, nvr usd, sz 36R. Call 494-9220 eve.

B/W 12" TV, \$35. Call John x3-7826

Set of drums; nw set Timdales. Call Paul x8-1357 x8-4515 Draper

Pr full suspension legal file cabnt, 2 drw, blck, unused \$80 ea or best. Call 926-3653 eve

Konica auto-52 35mm amera, rangefndr type, auto exposure w/manual override, 7 yrs old, but exc cond, ask \$50. Call Mike 868-0444.

Yamaha YP-D6 direct drv tnnble, 6/m perfect cond, list \$260 in stores, no crtdg. Call Mike 8 12pm at 267-5921.

High spd paper tape punch \$50. Marko x3-6903.

Sailboat kit, 11' mirror dinghy, half prc \$175. Stan Zish x56141 Havstack.

W ski boots Humanic foam filld, sz 8-812 red, ask \$25. Carl x3-2250.

2 Maple tw sz bed, \$60; Wool rug & mat, 8x11, blue geo desgn, gd cond, \$60; 3-way fl lamp, \$25; sofa, 5 yrs old, \$100. Call 625-4574.

Hollywd dbl bed, 5 drw dresser, nw bx sprg & matt, \$150 firm. Call aft 3pm, 484-0494.

Stl belted radials, FR78-14, org 40K guartee, usd ls than 1500mi, \$60/pr or best. Call 783-3089 eve.

US stamps block, plate block, sheets, reas prc. Call

Acton brick frat Color Acton, brick frnt Colonial hse, quite st, nr center, extensv panel up/down, 4 BR, 2 B, spac K, dn rm, lv w/firepic, lg sup sound pro study, lg study or famly, fl basmt w/dark rm, 2 car garge or poss apt. arce w/skate rink or poss tennis, \$81.5. Call x3-4629

Acton: emclte 7 rm raised ranch, 21/2 B, 3 BR, lg county K, lv rm w/fireplc, fireplc in walkout famly rm, 2 car garge, 12 arce w/beau 69.9. Call for deatils x5766 Linc. b arce w/beaut pastural view

Acton, Sep entrance home, 314 arc, landscp settng, 3 BR, LR w/fireplc, DR, eat in K, famly rm, 2 car garg, 1<sup>1</sup>/<sub>2</sub> B, enc porch, 25 min to Linc, sell by ownr, low \$60's. Call Sushanta x5878 Linc, or 263-8190

Arl, by owner, 3 BR, Colonial, hardwd flrs, 2 B eat in K, dn rm, fireplcs LR & panel famly rm, sun-porch, garage, lg fence yard, nr T, \$51,009. Call 643-1689

Belmt, 2 famly hse, 1<sup>s</sup>BR on top fl, to share w 2 M grad stud, nr T, clean, quite, \$127/mo & util. Call 484-6923 aft 5pm.

Lovely 2 rm apt, prv home, for quiet, respons P, close to Harvard & MIT, avail Apr 1. Call 864-6379.

Melrose, 5 rm apt, 1st fl, 2 fam hse, free park, close to T, unheat \$250/mo, avil Apr 1. Tony x8-1397 Draper.

Salem, Antiq: Eleg Greek rivl, ca 1830 w/LR. libry. dn rm, K & pnty, 4 BR, 6 fireple, 3 B (1 wiffreple), lg bckyrd, gd cond, exc area, walk to train & bus, reduce to \$65,000. Call Eva x3-5742 more details.

Sudbury retrt, charm, 1 BR, cabin, winterz buildbl lot, 3.2 arc, beaut wood land, rare wild flwers, \$52.9. Call 227-1614 eve, 235-4950 days.

Wat-Belmt line, 2 rm, basmt apt, ktte & B w/heat & util. Prv park, must be single, \$215/mo. Dick x3and in the Personnel Office, (E19-239)

Personnel Interviewers will refer any qualified ap plications on all biweekly jobs as soon as possible after their receipt in Personnel.

as who are NOT MIT employees should call the Personnel Office on extension 3-4251.

#### Information on openings at Lincoln Laboratory (Lexington, Ma.) is available in the Personnel Office

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

Dick Higham Pat Williams Carolyn Scheer (Secretary — Tertia Perkins)	3-4278 3-1594 3-1595
Virginia Bishop Richard Cerrato Ken Hewitt (Secretary — Paulette Chiles)	3-1591 3-4266 3-4267
Sally Hansen	3-4275

3-4269

Lew Kathleen Rick (Secretary — Jenni Leibman)

Academic Staff, Technical Assistant, in the Academic Staff, Technical Assistant, in the Biology Lab to perform experiments concerning genetics, development and neurobiology of a microscopic multicellular eukaryote; prepare media and chemical solutions. A B.A. or B.S. in biology, general microbiological and sterile techniques required. Professional lab research experience also required. Experience in microscopy, biochemistry and phtotgraphy helpful. Non-smoking lab. C78-4 (3/15).

Secretary IV in the National Magnet Lab to schedule appointments; arrange travel; type cor-respondence, technical reports; edit correspondence; answer and screen calls; xerox; per-form receptionist duties. Excellent typing including technical typing skill, good organizational skills and good command of English required. Ability to interact with a variety of people and to work under occasional pressure also required. College or business school training and a minimum of rs of experience necessary. 40 hrs./wk. B78-100 (3/15)

Secretary IV, part-time, in the Biology Lab to type correspondence, manuscripts and grant applica-tions; file; handle petty cash account; order lab supplies and maintain requisitions. Good typing and ability to transcribe machine dictation re-quired. One to two years' secretarial experience preferred as well as shorthand skill. B78-103 (3/15).

Secretary IV to perform secretarial and ad-ministrative duties for the Office of the Vice Presi-dent, Administration and Personnel. Duties include arranging meetings, travel and appointstatistical tables and various other material; com-municating with a wide variety of people, both within and outside the MIT community; answering phones; maintaining files and records; assisting in special projects as required. Excellent typing and special projects as required. Excellent typing and organizational skills; good command of the English language and a minimum of 5 years secretarial/clerical experience required. Ability to set priorities, work well under pressure and deal with sensitive and highly confidential information with discussion and highly confidential information with discretion also necessary. 37.5 hrs./wk. B78-90 (3/8).

Secretary IV for 1 faculty member in the Civil Engineering Dept. to assist in academic and research activities: type course material, sals, research papers; maintain filing system;

(1214) A77-80, Manager, Info. Proc. Serv. (12/14) A77-82, Associate Director, Sloan School (12/14) A77-83, Dir. of Personnel Relations, Personnel Relations (12/14)

Jerations (12/14) A77-86, Systems Prog., Info. Proc. Serv. (1/11) A77-87, Systems Prog., Info. Proc. Serv. (1/11) A77-91, Sr. Prog. Analyst, Info. Proc. Serv. (1/11)

A77-92, Editor/Writer, News Office (1/11) A78-3, Asst. Dir., Office of Minority Ed. (2/1) A78-5, Staff Writer, Resource Devel. (2/22) A78-8, Admin. Staff, Dean for Student Affairs (3/8)

A78-9, Gallery Mngr., Committee for the Visial Arts (3/8)

#### BIWEEKLY

B77-518, Sec. III-IV, Mech. Eng. (10/5) B77-611, Sec. IV, Elec. Systems Lab. (11/2) B77-655, Sec. IV, Chemical Eng. (11/16) B77-671, Admin. Asst. V, National Magnet Lab. (12/7)B77-672, Sec. IV, Nutrition & Food Sci. (12/7) B77-679, Sec. V, Nutrition & Food Sci. (127) B77-679, Sec. V, Nuclear Sci. (127) B77-679, Sec. V, Personnel Office (127) B77-729, Sec. IV, Earth & Planetary Sci. (1/4) B77-743, Sec. III, Admin. Comp. Serv. (1/1) B77-743, Sec. IV, Earth & Planetary Sci. (1/11) B77-747, Sec. IV, Political Sci. (1/11) B77-753, Sec. IV, Tech. Adaptation Prog. (1/11) B77-755, Sec. IV, Earth & Planetary Sci. (1/11) B78-2, Clk./Sec. III-IV, Ctr. for Cancer Res. B78-4, Sec. IV, Civil Eng. (1/18) B78-5, EDP PROJ. Devel. Lib. V, Admin. B78-5, EDP PROJ. Devel. Lib. V, Admin. Jomp. Serv. (1/18) B78-8, Sec. IV, Admissions (1/18) B78-13, Actg. Asst. V, Comptroller's Benefit Off. (1/25) B78-16, Sr. Clk. III, Div. of Lab. Animal Medicine (1/25) B78-25, Sec. III-IV, Urban Studies & Planning (1/25) B78-27, Admin. Asst. V, Civil Eng. (1/25)

Page 6, Tech Talk, March 15, 1978

### **Turkey Quakes Predictable, Scientist Says**

#### (Continued from page 1)

lake. Residents of another village reported an increase in water from a spring, accompanied by seepage of oil. Barking and howling of dogs was reported to have occurred from a few minutes to a few hours before the earthquake, but there was no unusual behavior of farm animals noted before the earth-

#### quake.

"Since there had been no major earthquakes in the region for a few generations, the villagers probably had no preconceptions about earthquakes," Dr. Toksoz said, "so we believe the reports we received were unbiased.

The 1975 earthquake registered 6.7 on the Richter scale, and resulted in the loss of 2,400 lives.

rector of the Center and co-chair-

man for the sessions. "Many mis-

understandings have been cleared

away, data presented and com-

pared and new ideas explored. The results have been valuable both for

The planning for the meetings

originated at the CIS; recent sessions have been organized col-

laboratively with the Program on

Science and International Affairs

at Harvard, and, in the case of the

German meetings, with the Ameri-

MIT participants, in addition to Professor Skolnikoff, have in-

cluded, for one or more meetings,

Professors Henry D. Jacoby and

Robert S. Pindyck of the Sloan

School, Professor Paul L. Joskow

of the Department of Economics,

Professor George W. Rathjens of

the Department of Political Sci-

ence, Professor David J. Rose of

the Department of Nuclear Engi-

neering, and Dr. Thomas L. Neff of

the Energy Laboratory. Professor

Carl Frederich von Weizacker and

the Max Planck Society were the

corresponding organizers in

Germany, and Dr. K. Mari and

the Japan Atomic Industrial

Original support was provided

by the Rockefeller Foundation and

the American Council on

Germany; recent meetings have

can Council on Germany.

policy and research purposes."

Survivors of this quake reported only one unusual phenomenon-a brightening of the sky the night before the earthquake. A group of geologists working 200 miles away also noticed this brightness in the direction of the earthquake epicenter. "It is clear that the brightness must have been in the upper atmosphere or ionosphere, and the long duration of the effect seems to rule out the possibility of a flash due to a meteorite falling to earth," Dr. Toksoz said.

A similar brightness in the sky had been reported before two earthquakes in Japan, Dr. Toksoz said. "It is a curious coincidence, but we do not know if it has anything to do with the earthquake,' he said.

### Carcinogen Predicting

(Continued from page 1)

computer found quantitative relationships between carcinogenic potency and two properties of the nitrosamines.

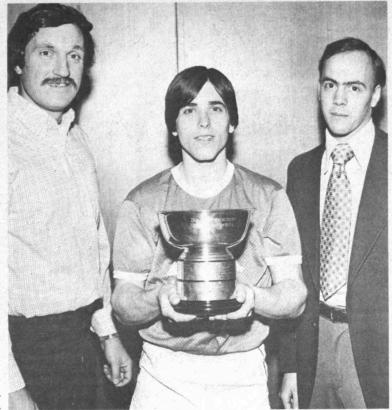
One property is the relative ease with which a nitrosamine can dissolve in water and hydrocarbons. "We found that the nitrosamines that dissolved fairly well in both water and hydrocarbons were the most carcinogenic," Dr. Wishnok said. "and that makes sense. Molecules that do not dissolve easily in hydrocarbons are less able to pass through cell walls, which consist largely of hydro-carbon-like molecules. Molecules which are highly soluble in hydrocarbons, on the other hand, and consequently less soluble in water, tend to be held up in the cell walls. They don't reach the interior of the cells. But molecules that dissolve in water and hydrocarbons can apparently pass easily through the cell walls and into the cells, where they can ultimately initiate tumors."

The other property found to correlate with carcinogenicity is the ease with which a nitrosamine can be metabolized within the cell. "We've found, as we suspected, that the carcinogenicity of a nitrosamine is affected by the reactivity of a particular carbon-hydro-gen bond," Dr. Archer said. "And our findings support previous research that indicates that this bond is the site where metabolism begins.

"In short, we've learned that the potency of a nitrosamine is determined by its ability to get to a place where it can do some damage, and the ease with which it can be metabolized to a form that does the damage," Dr. Archer said.

In a related study, Dr. Archer and Dr. Wishnok have suggested that the nitrosamines present in the highest concentrations in the environment may not pose the greatest risk. They have developed a quantitative expression of the relative hazards of carcinogens based both on their potency and their levels of occurrence.

"Our work is one example of the increasing use of computers to approach chemical and biological problems," Dr. Wishnok said. "It is a method of problem-solving that will probably become more widespread, though I don't think the computer will ever replace the test tube," he said.



Coach Walt Alessi and captains past and present, this year's senior captain Gordon Zuerndorfer (Lexington, Mass.) and last year's cocaptain Roger Renshaw (Havertown, Pa.) display the Marsters Trophy for Most Improved Collegiate Lacrosse Team in New England for 1977. MIT shares the trophy with co-winner New England College.

## Lacrosse Team Wins Improvement Trophy

### By JILL A. GILPATRIC

Director of Sports Information Last year's lacrosse team brought in their first winning season since 1970, with eight wins and four losses. The previous year they had only won four games and lost eleven. The Tech team was recently named co-winner (with New England College) of the Marsters Trophy for Most Improved Collegiate Lacrosse Team in New England for 1977.

Coach Alessi and his 1978 team travel to Virginia on March 24 for the start of their season schedule. On their way down south the 24-man team wil play a scrimmage against Haverford College in Philadelphia. From there they will move on to Virginia where they will scrimmage Hampden-Sydney College, take a day's layoff and then compete against host Randolph Macon. On March 29, Alessi and his team will move on to Washington, D.C., to meet Georgetown University. On their return trip to MIT, the team will stop off at Kean College in Union, N.J. From there they will return to MIT to open their 1978 regular season, weather permitting, at Babson on April 1.

MIT coaches Bruce Keeshin and Linda Laatsch will conduct a Boys and Girls Gymnastics Camp this summer in three sessions, July 3-14, July 17-28 and July 31-August 11. Each session consists of ten lessons held Monday through Friday, with hour-long classes at 1, 2, 3, and 4 o'clock. The cost for the two-week session is \$30.00 and registrations will be accepted until the first class meeting of each

. . .

at 3:00pm and the competition starts at 4:30pm. Admission is \$1.00 and will go to the United States Gymnastics Federation.

The entry fee is \$10 per gymnast. Each competitor will receive a special Junior Olympic T-shirt free (March 25 deadline). All entries must be received no later than Apri 13.

\* \* \*

SPORTS NOTES: Freshman Leslie Harris (Malvern, Pa.) finished 15th out of 88 competitors in the All-Around event at the EAIAW Regional Championship meet last Friday at the University of Pittsburgh. Fifteen teams from the East were selected to participate in the competition along with a very select group of individuals. In the preliminary competition Leslie scored an impressive 9.0 in vaulting, 8.80 on uneven bars, 8.60 on balance beam and an 8.35 in floor exercise . . . . Golf coach Jack Barry and his eight-man team will head for Florida on March 24. On Saturday and Sunday they will stay at Sea Island, Georgia, and will spend the remainder of the week at Florida Institute of Technology in Melbourne. While there the team will primarily practice but will also play against host FIT twice . . . . The memorial service for Sylvio N. Vitale, fencing coach at MIT for 27 years, will be held Friday at 11:00am in the MIT Chapel. Mr. Vitale died last month in Florida after a brief illness.

### Morse to Present **First AIP Prize**

## **CIS** Participates in Series **Of Nuclear Energy Meetings**

The Center for International fessor Eugene B. Skolnikoff, di-Studies has completed the first year of a series of nuclear energy policy conferences held bilaterally with major nuclear energy states.

Three of the conferences have been held with Germany, and the first with Japan has recently been completed in Tokyo. Additional sessions are being planned with the Japanese, and possibly with other key nuclear energy states.

The purpose of the conferences, which the CIS has been organizing, is to explore in a small, private, structured framework key nuclear energy policy issues, especially those that are the source of differences in policy arising out of non-proliferation concerns. Issues that have been discussed include nuclear fuel assurance, alternative fuel cycles, factors relating to reprocessing and breeders, uranium supply, multinational facilities, waste disposal and related subjects.

The delegations on both sides have consisted of a mix of academic, industry and high-level government participants. Although no formal reports are issued from the conferences so as to encourage candor and openness in the discussions, background papers for each of the sessions have been prepared and, in most cases, subsequently published independently.

"The conferences held so far have proven to be very successful, allowing a kind of discussion across backgrounds, disciplines, official responsibilities, and nationalities not normally occurring in any other setting," said Pro-

- B78-28, Sec. IV, Lab. for Nuclear Sci. (2/1)
  B78-48, Sec. IV, MIT Press (2/15)
  B78-48, Sec. IV, Mech. Eng. (2/15)
  B78-69, Sec. IV, Psychology Dept. (2/15)
  B78-62, Admin. Asst. V, Civil Eng. (2/22)
  B78-63, Sec. IV, Architecture Dept. (2/22)
  B78-64, Admin. Asst. V, Civil Eng. (2/22)
  B78-67, Edit. Asst. IV, MIT Press (3/1)
  B78-71, Sr. Clk. IV, Lab. for Comp. Sci. (3/1)
  B78-74, Sec. IV, Nutrition & Food Sci. (3/8)
  B78-78, Sec. IV, Nutrition & Food Sci. (3/8)
  B78-78, Sec. IV, Nutrition & Food Sci. (3/8)
  B78-78, Sec. IV, Nutrition & Food Sci. (3/8)
  B78-79, Sec. V, MIT Alumni (3/8)
  B78-80, Sec. IV, Sloan School (3/8)
  B78-84, Sec. IV, Resource Planning (3/8)
  B78-85, Dental Asst. IV, Dental Clinic (3/8)
  B78-85, Sec. IV, School of Humanities & Social
  Sci. (3/8)

- B78-87, Computer Oper IV, Admin. Comp. Serv.
- ACADEMIC STAFF: C77-36, Social Worker, Medical (10/5) C77-45, Tech. Asst., Nut. & Food Sci. (12/7) C77-46, Tech. Inst., Aero/Astro. (1/11) C78-1, Tech. Inst., Mech. Eng. (1/18) C78-3, Tech. Inst., Biology (1/25)

- E77-44, Admin. Asst., Nuclear Reactor Lab. (1/4)./4) E77-54, Eng. Asst., Ctr. for Mat. Sci. (12/14) E77-56, Estimator/Scheduler, Physical Plant

been supported by the Ford Foundation as part of their interest in stimulating international discussions following completion of the Ford/Mitre report on nuclear energy issues.

Forum in Japan.

- R77-112, Magnetic field coil design, National Magnet Lab. (6/22) R77-137, Experimental Physicist, Bates Linear R77-139, Programmer, Res. Lab. of Elec. (8/31) R77-161, Elec. Engineer, Mech. Eng. (9/7) R77-170, Combustion Engineer, Energy Lab.
- 0/26) R77-192, Computer Language Devel., Lab. for
- (11/9)
- R77-209, Res. Scientist, Energy Lab. (11/30) R77-211, Computer Syst. Design, Lab. for Com-puter Sci. (12/7)
- R77-212, Frog. Language Design, Lab. for Com-puter Sci. (12/7) R77-213, Computer Software Design, Lab. for Computer Sci. (12/7) R77-216, Oceanographic Res., Earth & Planetary Sci. (12/14) R77-221, Neurochemist Res., Nutrition & Food Sci. (12/14)
- Sci. (12/14)
- (1/4) R77-230, Computer Syst. Designer, Lab. for
- Comp. Sci. (1/11) R78-1, Cell Culture Chemist/Biologist, Cell Culture Ctr. (1/18)
- R78-2, Chief Oper., Lab. for Nuclear Sci. (1/18) R78-3, Submicrometer Structure Devel., Res.

Accelerator (8/31)

- Computer Sci. (10/26) R77-201, Prog./Data Analyst, Earth & Planetary
  - Sci
  - R77-212, Prog. Language Design, Lab. for Com-

  - R77-228, Plasma Physicist, Res. Lab. of Elec.

  - R(8-3, Submicrometer Structure Devel., Res.
     Lab. of Elec. (1/25)
     R78-8, Computer Usage Res., Sloan School (2/1)
     R78-9, Regional Economic Research, Urban
     Studies & Planning (2/1)
     R78-18, Theoretical Physicist, Lab. for Nuclear
  - Sci. (2/22)

 Erradian Construction Scheduler, Physical Flant (11/9)
 Er8-1, Unit Coordinator, Medical (1/25)
 Er8-8, Audiologist, Medical (1/25)
 Er8-8, Tech. Asst., Lab. of Computer Sci. (2/22)
 Er8-7, Nurse, Clinical Res. Ctr. (3/1) E78-7, Nurse, Clinical Res. Ctr. (3/1) E78-8, Machine Shop Super., Lab. for Nuclear Sci (3/8)

#### HOURLY:

H77-89, HVAC Designer/Draftperson, Physical Plant (10/5)

Plant (10/5)
H77-137, Tech. A, National Magnet Lab. (9/14)
H77-170, Waiter/Waitress, Endicott House,
Dedham (2/15)
H77-201, Tech. A, National Magnet Lab. (1/18)
H77-206, Elec. Tech. A, Energy Lab. (3/1)
H78-20, Tech. C, Lab. for Nuclear Sci. (3/1)
H78-23, Mach. A, Nutrition & Food Sci. (3/8)

#### SPONS. RES. STAFF:

R77-37, High Energy Physics Res., Bates Linear Accelerator (3/9)

R77-51, Sr. Research Engineer, Energy Lab.

R77-53, postdoc. res., Physics, Res. Lab. of Elec. (4/6)

R77-73, Plasma Physicist, National Magnet Lab. (4/27)

Lab. (4/27) R77-74, Plasma Physicist, National Magnet Lab. (4/27) R77-79, postdoc. res., Physics, Lab. for Nuclear Sci. (5/4) R77-80, postdoc. res., Physics, Lab. for Nuclear Sci. (5/4)

Sci (5/4)

R77-91, Sr. Accelerator Physicist, Lab. for Nuclear Sci. (5/18) R77-93, Design Engineer, National Magnet Lab.

(11/9) R77-94, Design Engineer, National Magnet Lab.

(11/9)R77-95, Biophysicist, National Magnet Lab.

(5/25)

R77-97, Chemical Eng., Energy Lab. (6/1) R77-105, Managing Dir., Energy Lab. (6/22)

R78-19. Theoretical Physicist, Lab, for Nuclear Sci. (2/22) R78-20, Theoretical Physicist, Lab. for Nuclear

Sci. (2/22)

R78-21, Theoretical Physicist, Lab. for Nuclear

R78-28, Theoretical Physicist, Lab. for Nuclear Se (2/22)

Sci. (2/22) R78-30, Writer. Lab. for Computer Sci. (2/22) R78-30, Program Counsel, MIT/Wellesley Upward Bound Prog. (2/22) R78-36, Programmer, Lab. for Computer Sci.

(3/1)

 3/1)
 R78-37, Tech. Asst., Ctr. for Cancer Res. (3/1)
 R78-42, Computer Analyst, Sloan School (3/1)
 R78-43, Energy Analyst, Energy Lab. (3/8)
 R78-44, Engineer, Earth & Planetary Sci. (3/8)
 R78-45, Tech. Officer, Tech. Adaptation Prog. (3/8)

 
 The following positions have been FILLED since the last issue of TECH TALK:

 R78-40
 Spons. Res. Staff

 E78-4
 Exempt

 B77-731
 Acct. Rep. V

 B78 10
 Soc. W
 Acct. Rep. Sec. IV Sec. IV Sr. Clk. III Sec. IV Clk. II B78-12 B78-33 B78-66 Sr. Clk. III B78-75 Hourly Cook's Helper Admin. Staff Sec. IV H78-21 H78-24 A77-89, B78-77

The following positions are on HOLD pending final decision: H77.207 Hourly Sr. Clk. III B68-73 B77-590 Sec. IV

Dr. Wishnok and Dr. Archer plan to extend their methods to other classes of carcinogens.

#### **Margaret** Davis

A Funeral Mass was held Saturday, March 11, for Margaret Davis, 68, of Boston, a retired employee of the MIT Faculty Club, who died March 8. Ms. Davis, who worked here from 1962 until her retirement in 1974, is survived by a sister, Mae Hughson of Hyannis.

### Angus Morrison

Angus Morrison, 51, of Hull, a night custodian in Physical Plant, died Monday, March 13. Mr. Morrison, who came to MIT in 1955, is survived by a sister, Betty Campbell, of Hull.

session.

Bruce Keeshin, coach of the MIT Men's Varsity Gymnastics Team, is a former national and international competitor and clinician at numerous clinics and coach at summer camps. Linda Laatsch is coach of the Tech Women's Gymnastics Team. She is a former member of the University of Michigan Women's Gymnastics Team and has coached at summer camps.

For further information please contact Coach Keeshin at the MIT Athletic Department, 253-4919.

\* \* \*

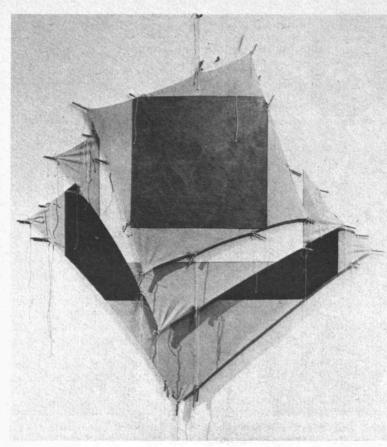
The Massachusetts Boys 8-17 Junior Olympics Championships will be held at MIT on Sunday, April 9, hosted by Coach Bruce Keeshin. Those competitors who qualify from the Intermediate and Advanced Divisions will go on to the Regionals on June 25 at West Point, N.Y.

Warmups begin at 10:30am and the compulsories begin at 12:00 noon. Warmups for optionals start

Dr. Philip M. Morse, MIT professor of physics emeritus and chairman of the governing board of the American Institute of Physics (AIP), will present the first AIP Prize for Industrial Applications of Physics at the March 1978 meeting of the American Physical Society in Washington, D.C.

Recipient of the prize will be Dr. Robert D. Maurer, who received the PhD degree from MIT in 1951. Dr. Maurer, who is manager of applied physics research at the Corning Glass Works, will be cited "for contributions made to the practical application of optical communications through the understanding and discovery of materials and techniques for the fabrication of glass fiber waveguides."

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Golden Russian (1976) by Richard Smith is part of an exhibition of Smith's recent work to be held at the Hayden Gallery March 19-April 19, 1978. The work, which measures 84 inches by 90 inches, is acrylic on canvas with aluminum rods and string.

# Richard Smith Works On Exhibit in Hayden

Fourteen key works by British artist Richard Smith—several of which have not been exhibited previously in the United States will be included in an exhibition entitled "Richard Smith: Recent Work 1972-1977" to be held at MIT's Hayden Gallery and Hayden Corridor Gallery from March 19-April 19, 1978.

Smith will be present at a preview of the exhibition March 17, from 8-10pm, following his informal gallery talk at 7pm. Both the preview and the gallery talk are open to the public free of charge.

The exhibition, organized and sponsored by the MIT Committee on the Visual Arts with grants from the British Council and the Prudential Insurance Company of America, will include a filmed interview of the artist produced by the BBC. The film will be shown daily in Hayden Gallery at 12:15pm and 2pm.

Though he is recognized as a leading contemporary painter, Smith has been known in the United States in recent years primarily for his graphic works. Among the paintings included in the MIT exhibition are White Rope, from the collection of the Museum of Modern Art in New York; Five Finger Exercise, which was conceived at the Sarabhai estate in India; Livorno, from the collection of the British Council; and Sloop. loaned by the Sydney and Frances Lewis collection. In conjunction with the Hayden Gallery showing, a major work by Smith for the Prudential Insurance Company will be

Diary (1975), for example, resembles sheets of parchment, and Mr. Smith has said that the kiteworks, seen in a group, look like a "laundry or indoor regatta." In the kiteworks, it is the materials, rather than the images, that suggest these associations.

Smith developed an international reputation in the 1960s for his investigations into the possibilities of shaped canvases. His imagery was influenced by the mass media and popular culture of London in the 1950s, and by American pop art, which he encountered on intermittent trips to the United States in the early 1960s.

In his essay for the catalog accompanying the exhibition, Wayne Andersen, professor of history, theory and criticism of art at MIT, says: "His (Smith's) assimilation of advanced painting has been omnivorous, but more remarkable in how he sustained a visually pragmatic way of painting through a succession of changes. It's the constants in his work that ultimately justify the hindsighted teleology that moves from the present position of his art to its beginnings, omitting nothing. The ease with which the development appears almost passively as internal logic may be attributed to his extraordinary visual intelligence and high consciousness."

A 32-page catalog containing Professor Andersen's essay, four color and several black and white reproductions, complete biographical and bibliographical information, and with a cover design by Smith, will be on sale at Hayden Gallery. The catalog was published by the Committee on the Visual Arts and distributed by the MIT Press.

### **Concord String Quartet to Play Here**

The Concord String Quartet will perform works of Beethoven, Johnston and Schubert in a free concert Saturday, March 18, at 8:00pm in Kresge Auditorium.

The group will perform Beethoven's Opus 18, No. 4, in Co Minor; Ben Johnston\*'s *Crossings;* and Schubert's Opus 11 in G Major, D. 887.

The Concord String Quartet, founded in 1971, is Quartet-in-Residence at Dartmouth College in Hanover, N.H. The four musicians combine their teaching duties and concert series at Dartmouth with radio and television appearances, interviews, and constant travelling that takes them annually to one hundred cities in this country and abroad. As champions of American music, they have given the world premieres of more than fifty works. On the other hand, they frequently perform the complete quartets of Beethoven, Schubert, and Bartok, as well as most of the other standard literature. They have made ten recordings which have received numerous awards, including two Grammy nomina-

### Four Centuries Of Vocal Music To Be Presented

A recital contrasting four centuries of vocal writing will be presented by baritone Vincent Ricento and pianist Thomas Zajkowski Monday, March 20, at 8:00pm in the Little Theatre of Kresge Auditorium. Admission is free.

Composers represented in the program include Scarlatti, Monteverdi, Caccini, Poulenc, Wolf, Moniuszko, Chopin, Duparc, and Busoni. The concert will also highlight the role of the piano as an integral part of these compositions, as well as an accompanying instrument.

Mr. Ricento has performed with the Philadelphia Orchestra, and in opera productions in Philadelphia, St. Jean de Luz, France, and Salzburg, Austria. He has given numerous recitals of French music in and around Boston, and has performed a cycle of "Romances" by Luigi Cherubini in what is believed to have been the American premiere.

Mr. Zajkowski has given recitals in New Jersey, Philadelphia, and Boston. He studied with Mrs. George F. Boyle in Philadelphia and with Byron Janis in New York. He recently travelled to Europe to record the keyboard works of Luigi Cherubini.

Both Mr. Zajkowski and Mr. Ricento have been instrumental in premiering works of the French repertoire in this country.

tions.

Raised in Seattle, Washington, Mark Sekol studied violin with his father, Vilem Sokol, and completed his studies with Dorothy Delay and Robert Mann at the Juilliard School. Andrew Jennings, second violin, was a scholarship student of Ivan Galamian at the Juilliard School, where he also worked with Felix Galimir and the Juilliard Quartet. Violist John Kochanowski studied with Robert Mann and Walter Trampler at the Juilliard School. Norman Fischer, the cellist, began his studies in his home town of Plymouth, Michigan, and later attended the Oberlin Conservatory, where his principal teacher was Richard Kapuscinski.

### Choral Society to Perform Three Works by Schumann

The MIT Choral Society, under the direction of John Oliver, will perform three works by Robert Schumann Sunday, March 19, at 8pm in Kresge Auditorium.

Tickets, at \$5 and \$4, will be available at the door or by calling x3-3210. Tickets are \$2 with MIT or Wellesley ID.

The program will include Requiem fur Mignon, Op. 986, Nachtlied, Op. 108, and Der Konigssohn, Op. 116.

"All three of these pieces are different," said conductor John Oliver. "One is very literary, one explores the natural world, and one is based on a fable." The Requiem is based on Goethe's book, Wilhelm Meister. Nachtlied is a tone poem describing the night sky, and Der Konigssohn is the story of a king's favorite son who overcomes great difficulties to cross the sea and establish a kingdom of his own.

The soloists will be Patrice Pastare, soprano, Laurie Stewart, soprano, Mary Crowe, mezzosoprano, Donna Hewitt, mezzosoprano, Alexander Stevenson, tenor, and Jerrold Pope, bass. Maynard Goldman is the concertmaster.

Both Mr. Stevenson and Mr. Pope, who will be the principal soloists, have sung with the Choral Society before. Mr. Stevenson recently drew rave reviews in New York City for a performance of Sir Michael Tippett's oratorio, A Child of Our Time, with the Boston Symphony Orchestra under Colin Davis. Mr. Pope, of the Yale University School of Music, has been a fellowship student with the Tanglewood Festival Chorus.

Mr. Oliver, who has led the MIT Choral Society since 1972, has received national recognition as conductor of the Tanglewood Festival Chorus, formed in 1970. The Chorus is recognized by conductors, critics, and the public as one of the world's great orchestra choruses. Mr. Oliver is also conductor and music director of the John Oliver Chorale, a 40-voice chorale ensemble. The Chorale's recent recording of Donald Martino's Seven Pious Pieces has been released on New World Records.

The 160-voice MIT Choral Society was formed in 1947.

### Dramashop One Acts to Present Ionesco, Becket, Gurney Plays

MIT Dramashop will present its third set of one-act plays on Friday and Saturday, Mar. 17 and 18, at 8pm in the Little Theatre. Audience criticism will be sought after the performances when coffee and cake will be served.

Three plays are on the bill: Ionesco's The Lesson, Samuel Beckett's Come and Go, and The Old One-Two by MIT humanities professor, A.R. Gurney, Jr.

The Lesson is Ionesco's second play, and is one of the earliest examples of the theater of the absurd. In the framework of a private tutorial given by an elderly professor to a young pupil, it explores the underlying tension and motives of the formal teaching process. Becket's *Come and Go* is an absurdist theater vignette filled with foreboding and ineffable despair. The Dramashop production of this small play will be set to electronic compositions by the Dutch composer Henk Badings.

The Old One-Two by A.R. Gurney, Jr., is a farce, written in 1971. The play deals with a confrontation between a literature professor and a young student and with a new young dean eager to exploit the situation for his own ends. The play has been produced on college campuses across the country, and, in 1975, on BBC radio. This is its first performance at MIT, where its central issue originated.



displayed in the lobby of the Prudential Building in Boston.

Smith's recent works, commonly referred to as "kiteworks," ex-plore the phenomena of weightlessness and gravity. A variety of "non-art" materials such as aluminum rods, tapes, string or rope are affixed to painted canvas surfaces, both as unconventional means of support and as alternatives to brushwork and line drawing. The works are either tacked to the wall singly or in overlapping sheets, or strung out and suspended from the ceiling. The way the paintings hang, a major concern for Mr. Smith, is determined by the weight of the canvas structure.

Even though Smith's work deals with a variety of issues common to the mainstream of modernist art, his imagery comes from everyday encounters, not from other art. The exhibition will also be presented at the Chrysler Museum in Norfolk, Virginia, and the Walker Art Center in Minneapolis.

Hayden Gallery is open to the public without charge Sunday through Friday from 10am to 4pm. Further information is available from the MIT Committee on the Visual Arts, x3-4400.

### Oriental Cooking

A demonstration of oriental cooking by Hsui-Hsing Chang, cosponsored by the Wives Group, will be featured at the next regular meeting of the Women's Forum, Monday, March 20, from noon to 1pm in Room 10-105.

THE SILVER STARS, a widely acclaimed steel orchestra, will perform at 8:30pm in the Sala de Puerto Rico, Saturday, March 18, in a benefit concert for Technology Children's Center, Inc. Tickets, at \$2.50, for the concert are still available daily noon-2pm in the Maclaurin Lobby (Building 10).

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