Massachusetts Institute of Technology



August 30, 1978 Volume 23 Number 4

MIT Sky Opera, Icarus, To Premiere in Washington

The world's first sky opera, Icarus, will be premiered on the Washington, DC, Mall September 8 and 9, by artists from the MIT Center for Advanced Visual Stu-

Based on ancient Greek mythology, Icarus is the creative brainchild of Otto Piene, CAVS Director and inflatable sculpture artist, and Paul Earls, a CAVS Fellow, composer and laser artist.

The production will be presented both evenings at 8:30, weather permitting. The site will be the "Centerbeam" exhibit, a collaborative work of some 24 fellows at CAVS, on display this summer through mid-September at the eastern corner of the Washington

Icarus will not be a conventional opera of opera house genre. Rather, it will occur as an open musical event, developing and changing with the music, the weather and the participation of the audience and performers.

'Action," says Mr. Piene, "is the backbone of the project . . . the launching pad for the task of getting Icarus to fly."

The music of Icarus is a combination of live, pre-taped and electronic music, structured around the lift-off of Daedalus and Icarus and their return to earth. The personalities of the father and the son are musically represented by John Fleagle, a member of Alexander's Feast (an early music/folklore ensemble from Boston), and the nationally acclaimed Columbus
Boychoir of Princeton, Donald
Hanson, director. Nora Post, oboeist, and Selim Earls, harpist, will also be featured performers.

The "Centerbeam" sculpture will take on the role of the opera's Minotaur. Laser projections of music and computer-generated images will be incorporated into

(Continued on page 5)

Student Insurance

Those students who have not Waivers must do so immedi-Rm. 12-134.

Waivers

filed their Student Insurance ately. Forms are available in

Sea Grant Presents Plan To Redevelop Lynn Harbor

Effective use of Lynn's natural and man-made waterfront resources could revive the city as an economic and residential center, according to a study issued by the MIT Sea Grant Program.

The report, "Lynn Harbor: Planning for Coastal Development," describes the results of an investigation conducted by a faculty and student team in response to a request from the City of Lynn. The group, part of a design subject at MIT, from January, 1976, to June, 1977, explored the development prospects for the underused Lynn harbor. The report makes proposals to help the city redevelop and manage the harbor so it can become an asset to the city.

Lee to MIT?

With the Boston Red Sox leading the race for the American League pennant, questions have arisen about the fate of faltering pitcher Bill Lee. Boston Globe sports columnist Ray Fitzgerald made some suggestions last week, in-

"Send him to MIT, where he could be utilized as a visiting professor on interterrestrial bodies, with special emphasis on the probability that the universe is composed of black holes, into which we will all eventually fall."

Like many coastal industrial cities, Lynn, once a thriving center for North Shore commerce, industry, and residence, suffers from loss of population and jobs, a shrinking economic base, loss of retail sales and deterioration of physical structures, the report

However, operating from the premise that "no single public policy will provide the solution to all the problems that exist," the study group, led by Professor William W. Seifert of the Department

(Continued on page 8)

MIT Health Plan

The following change in psychiatric benefits for MIT Health Plan members becomes effective September 1, 1978:

benefits will increase from a limit of \$750 to \$1,000 per member per

-Additionally, co-payments for approved therapy will increase from \$15 to \$20 per visit for individual therapy and from \$7.50 to \$10 per visit for group therapy.

the MIT Health Plan, call x3-1322.



Halfman Appointed Acting I

Robert L. Halfman, professor of Simonides, to whom the Office of

aeronautics and astronautics and associate dean for student affairs since 1972, has been named acting dean for student affairs, effective September 1, following



Dr. Carola B. Eisenberg, who will

join Harvard Medical School. Announcement of Professor Halfman's appointment was made by Vice President Constantine B.

Off-Campus

Housing Scarce

There is at present an

extreme shortage of off-cam-

pus housing in the Cambridge

Incoming students, single or

married, in need of housing

are urged to go to the Off-

Campus Housing Service, Rm.

E18-301, for information con-

cerning roommate listings

and apartment rentals. List-

ings are updated daily and

free telephone service is avail-

able for local calls concerning

members, who can temporar-

ily house single students or

families are asked to call Off--

Campus Housing, x3-1493, to

list their accommodations.

Students, faculty and staff

the listings.

and greater Boston areas.

the Dean for Student Affairs will report during a four-to-six month period of reappraisal of the organization and structure of student support responsibilities initiated by Chancellor Paul E. Gray earlier this month.

In announcing the review, Chancellor Gray said:

"Such a reappraisal has not taken place at MIT for nearly two decades in spite of the fact that there has occurred, particularly in the past 10 years, a shift of historic significance in the relationship of students to institutions of higher education.'

"Dean Eisenberg will never be replaced as a person, and we will not attempt to search for a permanent successor until the review is completed," Mr. Simonides said. "In the interim, we are fortunate that Professor Halfman has agreed to be acting dean. He is superbly qualified to lead the office. His experience at MIT goes back many years as a student, faculty member, associate chairman of the Faculty, chairman of the Experimental Study Group Program for the past four years, and, for the last six years, associate dean for counseling."

Professor Halfman, as acting ean, will serve as the initial point of contact with individuals and groups within and outside the MIT community on all operational aspects of the DSA office. He will continue as the senior member of the counselling section, will direct and coordinate the work of the other program sections of the Office, and will provide stability and leadership to the DSA staff. He will also continue as chairman of the

Other major program sections of

T to Note MIT

MIT will soon join a number of its sister institutions such as the Museum of Fine Arts, Massachusetts General Hospital and Harvard University in having a subway stop bear its name.

The MBTA has agreed to rename the Kendall Square station on the Red Line as the Kendall/MIT stop. New graphics are being designed by the MBTA and will be installed at the station sometime this fall.

the Office include Student Activities, under Associate Dean Robert J. Holden who is also the dean in residence on campus and carries several other responsibilities; the Office of Freshman Advising headed by Associate Dean Alan L. Lazarus; and the Residential Program Section, headed by Associate Dean Robert A. Sherwood.

In addition, associate and assistant deans will continue to carry special program responsibilities such as the programs for women students (Dr. Holliday Heine), minorities (Ms. Mary Hope), the undergraduate seminar program (Ms. Bonny Kellerman), prepro-fessional advising (Ms. Susan Houpt), and administration and budget (Ms. Alice Seelinger). These programs cut across the major program sections and some extend beyond the office into wider

(Continued on page 3)

Service Planned For Gen. Lampert

A memorial service for Lt. General James B. Lampert (USA, Ret.), vice president for resource development at MIT, will be held Friday, Sept. 8, in the MIT Chapel

at 2:30pm. General Lampert, who was 64, died July 10 at Walter Reed Army Medical Center following an illness of several months. The funeral was held July 13 at West Point where

General Lampert was buried. Before coming to MIT in 1972. General Lampert had a distinguished 40-year career in the US Army which included assignments as superintendent of West Point. Principal Deputy Assistant Secretary of Defense and High Commissioner of the Ryukyu Islands. (A full obituary is included in Tech Talk, July 12. Copies are available in the News Office, Rm. 5-113.)

Survivors include Mrs. Lampert, the former Margery F. Mitchell; two sons, James B. Lampert, Jr., of Milton, and the Rev. Richard B. Lampert of Binghamton, N.Y.; a daughter, Mrs. Richard M. (Hester) Hill of Pelham, N.Y.; and six grandchildren.

Memorial contributions may be made to the West Point Fund or to the American Cancer Society.

Benefits Increase

-The outpatient psychiatric

For further information regarding this benefit, or any questions on

Boasts Most Women Ever

More women than ever before will be in evidence when the Class of 1982 arrives at MIT this week.

Class of 1982

The class, numbering approximately 1,070, includes 235 young women (22 per cent), an increase of six per cent over the Class of 1981. The previous high was 20 per cent entering in the Class of 1978.

"As gratified as we are about the increase this year," said Peter H. Richardson, director of admissions, "we are still concerned that many young women of equal skill and education are missing opportunities to capitalize on a sciencebased education and the professional potential it brings.

Gains also were recorded for the number of minority students expected to matriculate. A total of 97 black, Puerto Rican, Chicano and native Americans, including 70 men and 27 women, have accepted admission. They represent a 14 per cent increase over the Class of 1981.

In addition, the class will include 36 foreign students from countries other than Canada, which has 10.

All freshmen are due on campus by Friday afternoon, Sept. 1, when the Freshman Picnic will launch a 10-day Residence/Orientation week. During that period, the new students will select their living groups-dormitories or fraternities-meet their advisors, be introduced to more than 100 extracurricular activities and, finally, select their courses of study. Registration at MIT is Monday, Sept. 11; classes begin Tuesday,

While half of the new students come from New England or the

(Continued on page 3)

Computer Handicaps Racing Yachts

By ELIZABETH C. VAN HORN Staff Writer

Long and narrow is fast . . . short and wide is slow.

On this basic truth, yachtsmen have been trying for over a century to handicap racing yachts. Their efforts to even the odds have fallen short of the ideal because of the physical problems of measuring a boat in a boatyard, and the intellectual problem of processing the information thus gathered.

This summer, 72 yachts in a fleet of 162 ocean racers sailed from Newport to Bermuda under the new Measurement Handicap System (MHS) which has been called the first scientifically based handicap system. MHS was developed by the United States Yacht Racing Union (USYRU) from research done at MIT in the H. Irving Pratt Ocean Race Handicap Project with Professors Justin E. Kerwin and John N. Newman, both of the Department of Ocean Engineering, as principal investigators.

The research project was funded by yachtsmen in the hope that an "owner's rule" could be developed-that is, that an older boat, well maintained and well sailed, would have a chance at winning even when matched against the newer "racing machines"-to replace or to be an option to the present International Offshore Rule, known as a "designer's rule," which has made rapid obsolescence the norm in ocean racing.

Until the introduction of the MHS, measurements of length, beam and depth were taken at specified points along a yacht's hull. These figures, plugged into formulae, produced her "rated length." A lump added at the right place could change the yacht's rated length significantly without seriously affecting her speed. Thus are rules confounded . . . and races

MHS rests on a new mechanical measuring device developed by Professor Owen H. Oakley and George Clemmer, a research assistant in the Department of Ocean Engineering, and a "Velocity Prediction Program" (VPP) which enables a computer to process the measurements and estimate the speed of the boat under different

feature:

conditions.

The measuring device makes it possible for one person to measure the exact curve of a yacht's hull at as many as 15 to 20 stations rapidly and easily, recording the data simultaneously on a miniature loop of magnetic tape.

The device is mounted on a tripod to be set up along a measured baseline beside the yacht. The instrument itself includes a length of Kevlar string (which has virtually no stretch) stored on a drum and connected to a tension spring which keeps it taut when extended. The string is also connected to a wand with which the operator can reach any part of the

It is a simple matter for the operator, standing beside the boat, to move the wand vertically up the hull from its centerline and to press the record button on one of the handgrips of the wand when the coordinates (shown on a digital display also provided on the wand) are satisfactory. Length of the boat and the distance along its hull where the offsets are taken are shown on the baseline.

The recorded data is then mailed to the USYRU in Newport, R.I., where it is processed to produce an estimate of the yacht's performance at various points of sail and wind velocities. A sailboat, after all, does not sit bolt upright in the water. It is subject to forces of wind and current, and with changes in these, the dimensions of the submerged part of the hull change significantly. The same is true of the sails and the portion of the hull above the water. Changes in sail trim and shifts in the position (and therefore weight) of the crew are also factors to be con-

The VPP incorporates three elements to make it possible for a computer to perform the tasks necessary to make a valid prediction. They are:

1. An estimate of the hydrodynamic forces and moments acting on the hull for appropriate ranges of heel angle, leeway angle and velocity;

2. An estimate of the aerodynamic forces and moments acting on the sails and on the above-water parts of the boat for appropriate

procedures, and English and other

courses may answer questions

newcomers often have when they

first arrive. A new and enlarged

QUAINTED: An Information

Guide to MIT and the Boston Area,

If you are from abroad and new

to the Institute, please come to the

Bush Room (10-105) any time dur-

ing the Open House for refresh-

ments and conversation. A chil-

dren's corner will help keep young

ones happy while their parents are

meeting members of the Institute

who would like to get to know

Players Audition

The MIT Community Players

have been auditioning for their fall

production, Death of a Salesman,

by Henry Miller, to be presented in

October. There will be a special

audition for members of the MIT

community tonight, August 30,

from 7-9pm, in Kresge Rehearsal

Room A. If you wish to participate,

either onstage or backstage, you

are encouraged to attend.

information guide, GETTING

also will be available for \$2.50.

International Open House Agenda

AN EVENING WITH INSTITUTE FACULTY AND STAFF

will be presented as part of the International Open House and will

Dr. Louis Menand, Special Assistant to the Provost and

Professor Fred McGarry of Materials Science & Engi-

K. Nagaraja Rao, senior research associate, Center for

SEPTEMBER 5, 1978

7:00pm

The Bush Room (10-105)

Please come and join in the discussion!

Sponsored by the Medical Department and the Foreign Student Office.

Senior Lecturer in political science

Claire Kramsch, lecturer in humanities

will be held

Policy Alternatives

The sixth annual International

Open House, sponsored by the

Medical Department and the For-

eign Student Office for all new-

in the Bush Room, September 5,

9:30am to 8:00pm, and Septem-

ber 6 and 7 from 9:30am to 5:00pm.

All international newcomers-

students, faculty, staff, visiting

scientists. Fellows, and their fami-

lies-are invited to attend, to talk

informally with members of the

MIT community, and to become

acquainted with the services and

programs organized by groups at

The Open House is an oppor-

tunity for the spouses of new inter-

national members of MIT to meet

others and to learn about pro-

grams open to them. Representa-tives from the Wives' Group, Eng-

lish classes for foreign wives, the

MIT Women's League, the Tech-

nology Wives' Organization, and

other groups will be on hand to

describe their programs. Written

material on housing, employment

comers from abroad,

MIT

ranges of heel and of apparent wind angles and velocity; and

3. An algorithm to balance these forces and moments and, allowing for differences in crew position and sail trim, to find the optimum combination for maximum velocity of this particular boat at several wind angles and velocities.

This summer's Bermuda Race was the first test of MHS. The 72 boats racing in the MHS Division ran the gamut from stock to custom designs, old to new. Time allowances were assigned to each boat on the basis of her predicted velocity under a hypothetical set of sailing conditions representative of a typical Bermuda Race. The greatest time allowance, 29.87 hours, was given to a 24-year-old wooden Concordia yawl named

When the results were in. Professor Newman said of the winners of the five classes competing in the MHS Division, "A more varied group of successful ocean racers is hard to imagine." Their range reflected the makeup of the division itself, from custom to stock designs, from old to new. In Class B (with fastest elapsed times), Ted Turner's custom built Tenacious did a second to a stock boat, Ramsing's Solution. But the overall winner of the MHS Division on corrected time was Babe, the 24-year-old wooden Concordia

INSTITUTE NOTICES

Announcements

Library closing-The Student Center Library will be open during the Labor Day weekend, Sept 2 through Sept 4. All other libraries will be

Loan Exit Interview Deadline**—All September degree candidates who have student loans administered by MIT must report to the Student Loan Office, E19-225, by Sept 8 for an Exit Interview. Office hours are 9-5, Monday-Friday. The Loan Exit Interview is required by the Institute to maintain your good standing on the degree list.

Physical Education**—Registration for physical education classes will be held Tuesday, Sept 12, 8:30am to 11am, in the du Pont Gym-

MIT Community Players**-Auditions for "Death of a Salesman" will be held Wednes-day, Aug 30, 7pm-9pm, Kresge Rehearsal Room A. Anyone interested in acting or in technical duties welcome. Info: 323-0376

Grade Reports for students attending regular summer session will be mailed to the term ad-dress Friday, Sept 1, 1978. Students should report corrections in address to the Registrar's office, E19-355, no later than Friday, Aug 18, 1978. Telephone requests will not be ac-

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

Club Notes

Beginning sailing instruction**—every Wednesday 5:15pm at MIT Sailing Pavilion.

MIT Bridge Club*—ACBL 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 Go Club*-Regular meetings Mon, Sept 11, 8pm, W20-491, Thurs, Sept 14, 8pm, W20-407. Players of all ranks available, instruction for beginners, occasional lectures on strategy and

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

MIT Juggling Club*—Thursdays 7:30-11pm Rm 407 Student Center; Sundays 1-4pm Kresge Oval. Visitors welcom

Summer series racing**—Racing skipper rating required, Tuesdays and Thursdays 5:15pm. Novice racing, provisional rating required, Mondays 5:15pm throughout the sum-

MIT Women's Rugby Club**-Practice every Friday 5:30-7:30pm. Games alternate Saturdays. Any woman with athletic card welcome. Info, call Sharon x3-6825.

Women's Soccer Club**-No experience neces sary. Those interested contact Patty McDaniel, x3-5009.

Religious Activities

The Chapel is open for private meditation 7am-

Interdenominational-Worship and holy communion, Wednesdays, 5:05pm, Chapel, spon-sored by Lutheran-Episcopal Ministry.

MIT Islamic Society*—Weekly Friday prayers, 1pm, Kresge Auditorium, Rehearsal Room B.

Christian Service*-Sundays, 10:30am, Chapel. Singing, preaching, sometimes testi-monies. Prayer following. All invited.

New Subjects

21.418 American History to 1865 MWF 11:00 Room 13-2101 Prereq.: None Year; U (1) Hum. D.

A survey of American history from the colonial period through the Civil War that emphasizes the connection of social, economic, and politi-cal development. Topics include the character of the early European settlements in North America; social and economic change in the the Revolution; regionalism and industrialization; Jacksonian politics and reform; territorial expansion; slavery, sectionalism and the crisis of the 1850s; and the conduct and impact of the Civil War. A. Brinkley, P. Maier

21.419 American History since 1865 Prereq.: None Year: U (2) Hum. D.

A survey of American history since Reconstruction that traces the growth and moderni-

CABLE TV SCHEDULE

August 30 - September 5, 1978

Wednesday, August 30

RHETORIC AND JOURNALISM with Prof. Ed Diamond and guest Bruce Locklin from the Bergen BASEMENT VIDEO PRESENTS:

11-11:20am The Henry Moore Sculpture Dance by the MIT Dance Workshop

DOLPHINS: A look at our intelligent friends
CYCLE OF LIFE: Sculptor Vince
Ricci makes molds from a
dancer's body

ENGINEERING, POLICY, AND SOCIETY by Courtland Perkins, President of the National Academy of Engineering

Thursday, August 31

10-11am

FAILURE OF THE SPAULDING POND DAM by Dr. Steve Poulos, Principal, Geotechnical Engi-neers, Inc.

INDIA: TRUTH AND STEREO-TYPE—A discussion by natives and visitors

BASEMENT VIDEO PRESENTS: 12noon-1pm effects using the Experimental RHETORIC AND JOURNALISM with Prof. Ed Diamond and guest Jack Nessel

Friday, Septem

10-11am

RHETORIC AND JOURNALISM with Prof. Ed Diamond and guests Ed Miller, Cathleen Kushman, and Larry Anderson, all from the Harvard Post DOLPHINS: A look at our intelli-

gent friends
VIDEO CLUB PRESENTS: The
MIT Concert Band
FAILURE OF THE SPAULDING
POND DAM by Dr. Steve Poulos,
Principal, Geotechnical Engi-

Monday, September 4 Channel 8: 10-11am ENGINEERING, POLICY, AND

11-11:20am

ENGINEERING, POLICY, AND SOCIETY by Courtland Perkins, President of the National Academy of Engineering BASEMENT VIDEO PRESENTS: Henry Moore Sculpture Dance by the MIT Dance Workshop INDIA: TRUTH AND STEREOTYPES—A discussion by natives and visitors.

12:15pm and visitors

CYCLE OF LIFE: Sculptor Vince 12:30-12:50pm

CYCLE OF LIFE: Sculptor Vince Ricci makes molds from a dancer's body
RHETORIC AND JOURNALISM with Prof. Ed Diamond and guests Ed Miller, Cathleen Kushman and Larry Anderson, all from the Harvard Post

Tuesday, September 5

10-11am

1-2pm

RHETORIC AND JOURNALISM with Ed Diamond and guest Jack

11am-12noon

VIDEO CLUB PRESENTS: The MIT Concert Band
BASEMENT VIDEO PRESENTS:
Video Dance—Dancers with special effects using the Experimental

ENGINEERING, POLICY, AND SOCIETY by Courtland Perkins, President of the National Academy of Engineering

zation of social, economic and political institutions. Topics include Reconstruction and the "racial settlement" of the late nineteenth century; immigration; industrial and busin development; agrarian unrest and the populist movement; progressivism; World War I and its aftermath; the New Deal; World War II and the Cold War; the growth of the modern Presi dency and the expansion of the role of government; the civil-rights movement; the Vietnam years and beyond. A. Brinkley, P. Maier

21.420 America in the 1930s -first meeting Thurs., Sept. 14, Room 14N-329D Prereq.: None Year: U (1)

An examination of the American experience during the Great Depression. The course will explore the economic and social impact of the Depression, the policies of Franklin Roosevelt and the New Deal, the transformation of the labor movement, the emergence of radical and dissident political movements, the agrarian crisis, and developments in literature and the arts. Readings in both secondary works in contemporary literature, with an opportunity for brief independent research projects. A

21.816 Science and Society in Modern China

This subject examines social, cultural and political aspects of the development of science modern science will be set in the context of traditional Chinese conceptions of natural and social order, the relations between philosophy and material technology, and the connections between knowledge and political power. The introduction of western science in the 19th and 20th centuries will be related to the onset of China's continuing revolution and to western imperial expansion in east Asia. Against this background the place of science in the People's Republic will be discussed, with particular attention to the Cultural Revolution and its consequences. Specific topics to be covered include: the role of American missionaries as transmitters of science and medicine in the 19th century; social Darwinism in China; the use of science as an ideology during the first Chinese Revolution; and Maoist views of science, medicine and technology.

New UROP Listings

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

Department of Psychology

This project involves the development and design of a new perceptual test for use with patients with focal brain lesions. The student is invited to participate in all phases of the operation, including experimental design, statistical analysis and actual testing of normal control subjects. In addition, the interested student might attend the weekly research meetings of the neuropsychology lab in which current projects and related issues are discussed. Familiarity with computers required. Contact Suzanne Corkin, E10-003A, x3-5762, or Dennis Klatt, 36-523, x3-3201.

Electronic Systems Laboratory
Projects are in progress to study how "intelligent" computer interfaces and other techniques can be employed to make it easier for inexperienced users to retrieve information from multiple, heterogeneous computer systems and data bases. For student res interest and preferably prior study and/or experience in one or more of the following areas are required: information science, computer science, computer programming, computational linguistics, artificial intelligence, psychological testing, or biomedical information uses. Contact Prof. J.F. Reintjes, 35-418, x3-2353, or Richard S. Marcus, 35-406,

Psycho-Immunology Research Project B.U. Medical Center

This is a multidisciplinary research effort investigating the influence of psychosocial factors on human immunity. Areas of research in progress are: 1) an investigation of the influence of stress, emotions and personality on the cell-mediated immune response to influenza vaccine in a human volunteer population; 2) a study of the influence of psychosocial factors on the clinical course and management of cancer; and 3) the influence of stress and psychosocial factors on resistance to bacterial infection in patients undergoing elective surgery. Familiarity with correlational and analysis-of-variance methodology essential. Elementary statistics and biological or social science major a prerequisite. Twenty hrs./ week minimum commitment. Pay may be

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Page 2, Tech Talk, August 30, 1978

Mathematician Quillen Honored by Fields Medal

Dr. Daniel G. Quillen, professor of mathematics at MIT, was awarded the prestigious Fields Medal at a recent meeting in Helsinki, Finland, of the International Congress of Mathematicians.

The Fields Medal is given to persons under 40 years old for unusually outstanding accomplishments in mathematics. Recipients are chosen by an international selection committee. The award is considered to be the equivalent of a "Nobel prize" in mathematics, since Nobel prizes are not given for mathematics.

Three other mathematicians were honored with the Fields Medal at the Helsinki meeting. They are Charles Fefferman of Princeton University, Pierre Deligne of the Institut des Hautes



Professor Quillen

Scientifiques in France and Gregor A. Margulis of the Institute of Information Transmission in Moscow

This brings to 24 the total number of Fields Medals awarded since the prize was established in 1932 by a bequest from Canadian mathematician John Charles Fields. The first two Fields Medals were presented in 1936, and one of

them was given to MIT mathematician Jesse Douglas.

Professor Quillen was honored for his work in algebraic K-theory, and his proofs of the Adams and Serre conjectures. Algebraic K-theory is a new research area that uses the techniques of geometry and topology to solve problems in algebra.

One of Professor Quillen's MIT colleagues has said that Professor Quillen's proof of the Adams conjecture—an important problem in topology—is a "beautiful proof" done "in a way that astounded everyone."

The Serre conjecture, which deals with abstract algebraic objects called modules, has stumped some of the great algebraists of the world since it was first posed in 1954. Professor Kenneth M. Hoffman, head of the MIT mathematics department, calls Professor Quillen's proof "ingenious and surprisingly short."

Professor Quillen has earned the respect of his colleagues for his ability to master many different areas of mathematics, and apply the results of one area to problems in another.

Earlier Professor Quillen received the Cole Prize of the American Mathematical Society for his work in algebraic K-theory in 1975. He was elected to the National Academy of Sciences this past spring.

Professor Quillen came to MIT in 1964 as a C.L.E. Moore Instructor in mathematics. He spent 1968-1969 in Paris as an MIT Sloan Fellow in Mathematics. He was a member of the Institute for Advanced Study at Princeton University in 1969-1970, and he became professor of mathematics at MIT in 1971. In 1973-1974, Professor Quillen went back to Paris as a Guggenheim Fellow. He received his PhD from Harvard University in 1964

Professor Quillen lives in Newton, Massachusetts.



THE INVISIBLE WORLD, subject of a fall, 1979, National Geographic TV special, has been the special preserve of Professor Harold E. (Doc) Edgerton for years, so it was to be expected that the producer of the special would pay a visit to MIT's wizard of the strobe light whose high-speed photograpy has allowed millions to see the "invisible" beauty that

surrounds us. For example, as in this photograph, the rapid, deft hand movements of a juggler. Shown with Dr. Edgerton is Charles Miller, a lecturer in the Department of Electrical Engineering and Computer Science, long an associate of Doc's on high-speed photography projects. The juggler is Skip King.

-Photo by Calvin Campbell

Halfman Appointed Acting Dean

(Continued from page 1)

MIT community activities.

Vice President Simonides will be the senior Institute officer and member of the Academic Council responsible for the Office of the DSA. He will direct the review of DSA organization and external relations, and will be responsible for major policy decisions, new appointments, staff evaluation and budget, in consultation with Dean Halfman and appropriate members of the DSA staff.

The Department of Athletics, headed by Professor Ross A. Smith, will continue to be a part of the Student Affairs area.

In announcing the review of student-related organization two weeks ago, Chancellor Gray set four objectives:

(a) Review and define the scope and responsibilities of the DSA

(b) Review the relations of the Office with the faculty and with the Institute's educational program, including admissions, academic advising and personal counselling, discipline, athletics, campus environment, and the coupling of the Office to the work of the standing

faculty committees.

(c) Review the relations among student support areas and recommend appropriate changes or improvements in the organization of these areas and their interaction with the DSA and with each other.

(d) Recommend the appropriate leadership for the DSA Office, guided by the reviews in (a), (b) and (c), and take whatever steps are necessary to put this leadership into place.

Mr. Simonides has been attending DSA staff meetings and meeting individually with members of the staff to familiarize himself with the work of the office and to establish guidelines for the internal and external review.

Since the announcement was made on August 16, Mr. Simonides said he has heard from many faculty members, students and staff members who have suggestions and want to contribute to the

"Right now," he said, "I am trying just to listen with an open mind and to think about the issues and how best to understand them."

Dean Halfman came to MIT as an undergraduate in 1940 and received the SB degree in aeronautical engineering in 1944. After serving in the US Navy for two years, he returned and received the SM degree in 1947.

He was named assistant professor in 1948, associate professor in 1955 and professor in 1964. From 1957-61 Professor Halfman was executive officer of the department and later served as its deputy head

Between 1962 and 1970 Professor Halfman represented MIT in various capacities in the Kanpur Indo-American Program. He served at the Indian Institute of Technology at Kanpur, India, from 1962-63 and as program leader from 1966-68.

Professor Halfman served as the first associate chairman of the faculty during 1970-71 and has been a member of many standing committees of the faculty including the Committee on Educational Policy and the Committee on Graduate School Policy. He also was a member of the Special Task Force on Education and was a founder of the Experimental Study Group, an independent learning program for freshmen.

Peer Help Service to Begin, Organized by Students

A new student-organized Peer Help Service will begin operating on campus this fall.

The new service will be an addition to already existing student counseling and support services such as the Dean for Student Affairs Office, the psychiatric service and the social work service of the Medical Department.

The Peer Help Service will be an informal, anonymous, advising, referral and information service operating from 7pm to 6am modeled after Harvard's highly

Keefe Promoted In Development

Richard W. Keefe, assistant director of the Development Office, has been promoted to associate director of the office effective August 1.

Mr. Keefe will continue to provide administrative support to MIT's \$225 million Leadership Campaign and to act as special liaison to President Jerome B. Wiesner. To these duties he will add responsibility for the day-to-day operation of the Development Office and he will increase the number of external visits he makes on behalf of the Leadership Campaign.

A Boston area native, Mr. Keefe received the AB in political science from Stonehill College and the MA in political science from Boston College. Mr. Keefe served as 1st lieutenant, US Army, and later was assistant chief of the Manpower Development Branch, United States Aid for International Development. Before coming to MIT he was director of Alumni Relations at Stonehill College. Last year he was selected for the Outstanding Young Men of America award

Mr. Keefe and his wife live in Pembroke, Mass.

successful Room 13 project which has been in operation for several years.

"We hope to have a service students will feel free to call or drop in at any hour of the night," said Andy Adler, a senior in linguistics and philosophy from Plainview, N.Y., one of the organizers of the group.

"Students are reluctant to disturb the established help resources later at night and the access to the dean or psychiatrist on call is cumbersome. The Peer Help Service will provide immediate contact."

Mr. Adler emphasized, however, that the Peer Help Service can not be expected to offer long-term service.

"It is a supplement to, and not a substitute for, regular MIT services to students," he said.

The service hopes to establish a group of 30 student counselors, half male and half female, who will work in pairs about once every two weeks. Counselors will have a brief initial training period to learn listening and counselling skills and information resources, followed by supervised group meetings. Group supervisors will be members of the professional student support staff

At present there are about 10 counselors who have completed initial training and will recruit and train more students during R/O Week and the early part of the term. It is hoped the Peer Help Service will be operational at the beginning of October. Plans call for it to be situated in the Campus Room, between Ashdown House and the religious counselors' house.

Meanwhile, flyers on the Peer Help Service are available in the Information Center (7-121) and messages may be left at x3-7839 or in the Dean for Student Affairs Office (7-133).

Class of 1982

(Continued from page 1)

Middle Atlantic states, 11 per cent are from the South Atlantic, 15 per cent from the North Central, seven per cent from the South Central and 11 per cent from the Western states. Nearly 80 per cent attended US public high schools, 15 per cent independent or church-related schools and six per cent overseas schools.

The oldest freshman this year is 23 and the youngest will soon be 16. Sixty-five members of the class already have ties to MIT as sons or daughters of alumni, faculty or staff. Another 13 are grandchildren, while 35 are brothers or sisters of present students.

ters of present students.

Nearly 30 per cent of the class (317 students) were admitted under MIT's Early Action Program through which they are notified of acceptance by Christmas if their completed applications have been received by November 1. In addition, 60 per cent of the freshmen have been given college credit for work done or tests taken before their matriculation at MIT.

While over 80 per cent of the freshmen ranked in the top 10 per cent of their high school classes (in schools that compute rankings),

their scholarly pursuits were matched by their extracurricular activities.

They're very interested in sports, have taken active parts in music, drama, debate and school publications and have been class or club officers. Many have had part-time jobs and others have worked full-time during the sum-

During the upcoming R/O week they will have the opportunity to get involved in the activities that reflect their interests as members of the MIT community.

MTG to Present Godspell

Boasts Most Women Ever

The MIT Musical Theatre Guild will present nine performances of the musical *Godspell* beginning September 1 at the Kresge Little Theatre.

Evening performances will start at 8:00 on Sept. 1, 2, 8, 9, 15 and 16. Matinees are scheduled for 3pm on Sept. 2 and 10.

Admission to all evening shows is \$4.00; \$3.50 for matinees; and \$2.00 with an MIT I.D. to all shows. There will be an additional matinee performance for freshmen only on Sept. 9 with free admission.

The Godspell musical is based on the Gospel according to St. Matthew. Paul Gonyea, director of the Musical Theatre Guild's production, says each performance is expected to be somewhat different to allow for improvisation from the cast. The producer is Bob Van deKloot, choreographer is Sharon Glazer and music director is Ed Roberts, who works at MIT's Lincoln Lab.

There are about 60 active members of the Musical Theatre Guild, many of them MIT students, some from the MIT community and others from the Boston area.

The group performs two major shows annually and one or two smaller productions during the academic year. In November, the members plan to present the Greek musical Zorba.

For more information or reservations, call 253-6294.

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August 30 through September 10

Events of Special Interest

TCA-Red Cross Blood Drive* - Give blood: Wed, Sept 6 and Thurs, Sept 7, 9:30am-3:45pm, 4th floor, Student Center. Refreshments will be provided.

An Evening with Institute Faculty and Staff* - Sponsored by the Medical Department and the Foreign Student Office as part of the International Open House and will feature: Dr. Louis Menand, special assistant to the Provost and senior lecturer, political science; Claire Kramsch, lecturer, humanities; Prof Fred McGarry, materials science and engineering; Prof Philip Morrison, physics; K Nagaraja Rao, senior research associate, center for policy alternatives. Tues, Sept 5, 7pm, Rm 10-105. Please come and join the discussion.

Community Meetings

MIT Go Club R/O Activities* - Planning for you, instruction for beginners, and players of all ranks will be around to play. Sun, Sept 10, 1pm, Student Center Room W20-473.

Bowling League** — Lincoln Laboratory 10-pin bowling league starts, Wed, Sept 13, 5:45pm, Turnpike Bowladrome Rte 2, Cambridge ABC-WIDC sanction, mixed league. Interested in joining? Call Art Salkins x5741 Lincl or Tony Augustine x7736 Lincl.

Social Events

Faculty Club** - Tues, Sept 12, Lobster Night, baked or boiled lobster, salad bar, dessert cart, \$8.50 incl tax. RSVP x3-4896.

Faculty Club** - Open Monday thru Friday: Luncheon served Noon-2pm; Dinner served 5:30-8pm. Happy Hour Monday thru Friday, 4:30-6:30pm, wide variety of drinks \$1.05.

Exhibitions

MIT Student Art Lottery and Loan Exhibition* - Sponsored and organized by the Committee on the Visual Arts. Over 100 framed prints and posters by comtemporary masters from the List Student Loan Program and Catherine N. Stratton Collection of Graphic Art. For loan to full-time registered MIT students. On view Hayden Gallery and Hayden Corridor Gallery, Sept 5-15, 10-4pm; Wed evenings 6-9pm. Fri, Sept 15, 1pm Gallery Closing Lottery winners announced at 5pm, party in Gallery.

Gyorgy Kepes, The MIT Years: '45-'77* - Organized and sponsored by the Committee on Visual Arts with the assistance of the Compton Gallery Committee. On view at the Compton Gallery, Mon-Fri through mid Sept, 9am-5pm, Building 10, 1st floor, MIT. Info: 253-4400.

Charles Stark Draper: Many Facets of the Man* - Major photographic show on view Mon-Fri, 9am-5pm, Historical Collections, 265 Mass Ave, 2nd floor, Camb, Mass. For information call 253-4444.

The Compton Years* — A photographic essay of the lives of Dr. & Mrs. Karl Taylor Compton. Mon-Fri, 9am-5pm, Historical Collections, 265 Mass Ave, 2nd floor, Camb, Mass. For information call 253-4444.

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

MIT Historical Collections* — In house exhibits include antique globes; The Ellsworth A. Wente Collection of motors and meters; rare instruments including compasses, sundials and other measuring devices from the 17th and 18th centuries; Early Alumne and several exhibits of memorabilia and photographs honoring prominent graduates of the Institute. On view daily, 9am-5pm, 265 Mass Ave, 2nd floor, Camb, Mass

MIT Historical Collections" — Permanent exhibition Mon-Fri, 9am-5pm, Bldg N52, 2nd floor. Katharine Dexter McCormick, '04; Vannevar Bush, '16; Bldg 4 corridor. The New Technology Exhibit 2nd floor balcony of Lobby 7. Energy Exhibit, Bldg E40, 1st floor. Solar Energy, Bldg 8, main corridor. Center for Space Research, Astrophysics Exhibit, main corridor, Bldg 4. Bldg 6 Dedication Exhibit.

The Outdoor Collection* - There are many fine pieces of contemporary sculpture displayed on the MIT campus, including works by Alexander Calder, Louise Nevelson, Pablo Picasso, Henry Moore, Tony Smith and Jacques Lipschitz. For information and guides to the campus, call the Informa-

MIT Science Fiction Society* - Come and visit the world's largest lending science fiction library. Hours posted on door, Rm W20-421.

Musical Caricatures* - Music Library, Rm 14E-109. Numerous cartoons of various aspects of music, especially pictures of famous composers and conductors.

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

Theatre and Shows

according to Saint Matthew. Evening performances: Sept 1, 2, 8, 9, 15, 16, 8pm; Matiness: Sept 2 & 10, 3pm; free performance for freshmen, Sat, Sept 9, 3pm, Kresge Little Theatre. Admission: \$2 w/MIT ID; outsiders \$4 even

Godspell* - Presented by the Musical Theatre Guild, based on the gospe

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

*Open to the public

**Open to the MIT community only

****Open to members only
Send notices for Sept 6 through Sept 17 to Calendar Editor, Rm 5-113, x3-3270, before Noon, Friday Sept 1.

Tesoro Receives '78 SWE Award

Dr. Giuliana C. Tesoro, adjunct professor in the Department of Mechanical Engineering, has been honored by the Society of Women Engineers as the 1978 recipient of its Achievement Award.

Dr. Tesoro, widely regarded as one of the most productive textile scientists living today, has gained international distinction for her contributions to the science and technology of polymers, fibers and fabrics. Among her significant achievements are the development of durable anti-static treatments for synthetic fibers and, more recently, work on polymer combustion, fire retardance, and the chemistry of flame retardant finishes for cellulosic fibers.

She is the third MIT woman to be honored in recent years by the society with its achievement award. Professor Sheila Widnall was the 1975 recipient and Professor Mildred Dresselhaus received the award in 1977.

Dr. Tesoro joined the Fibers and Polymers Division of the mechanical engineering department in 1972 as a senior research associate. She was appointed visiting professor in 1973 and adjunct professor in 1976. Dr. Tesoro has held several important posts in industry and as a teacher. She holds the PhD in organic chemistry from Yale University

A native of Venice, Italy, Dr. Tesoro has been a citizen of the United States since 1946. She is married to Victor Tesoro. They have two grown children, Claudia and Andrew.

MIT Oarswoman Named to Team

MIT's Diane Medved (Leawood, Ks.), a junior chemical engineering major, recently qualified for the United States National Women's Rowing Team.

Ms. Medved qualified for the US Team while rowing for the College Boat Club of Philadelphia, Pa. The 6'3" oarswoman rowed in the number three position of the club's four-oared shell and traveled to Seattle to participate in the National Women's Rowing Association Championships held June 15-18. The following week the club traveled to the open trials for the national team held at Lake Burnaby, British Columbia.

From July 4-August 7, the 14-woman team, coached by the Yale women's crew coach, Nat Case, traveled throughout Europe.

Nuclear Reactor 20th Anniversary Marked

The first nuclear reactor to be built in the northeastern United States is entering its third decade of safe and useful operation at MIT, upgraded, redesigned and more versatile than when it first went critical on July 21, 1958.

The five megawatt facility. operated by the interdisciplinary Nuclear Reactor Laboratory, is different in many vital ways from the research tool first proposed in 1954 by James R. Killian, then MIT's president.

For one thing, it is now a hybrid reactor, employing light water for cooling and moderation and heavy water for a reflector.

Dr. Manson Benedict, Institute Professor, Emeritus, speaking at the July 27 ceremony marking the 20th anniversary, recalled the history of the MIT reactor including the many contributors to this major project and the benefits which have been derived for MIT and the nation as a whole.

MIT used the occasion of the anniversary to honor Dr. Benedict, who, in 1954, was one-half of the entire MIT nuclear engineering faculty, and the late Professor Theos J. Thompson, who joined the project in the spring of 1955 and headed the Research Reactor Design Group. He was killed in a plane crash in 1970.

Photographic portraits of Professors Thompson and Benedict were presented to Mrs. Thompson and Mrs. Benedict. MIT Research Vice President Thomas F. Jones, Jr., said the portraits will be hung in the foyer of the laboratory as a permanent tribute to the men whose early efforts meant so much to the establishment of the research reactor.

In his remarks on the early days of the reactor, Professor Benedict paid tribute to his late colleague. "The man who should be speaking, as you all know, is Tommy Thompson, but his untimely death in 1970 made that impossible and deprived MIT and our nation of one of our most gifted and productive engineers.

Chancellor Paul E. Gray said the successful modification to the research reactor, which took about two years and is now completed, would not have been possible without the foresight displayed by Professor Thompson

"It is to the abiding credit of Tommy Thompson that he assumed future refinements would be needed and gave us a design which made such refinements feasible."

The chancellor said the MITR-II, as the reactor is now called, "represents a redesigned and upgraded reactor, thanks to Professor David Lanning and to Lincoln Clark, Jr." He also paid tribute to many others who were instrumental in the upgrading.

The new design has made the reactor into a fundamentally dif-ferent research tool," Dr. Gray said. "It has three times as much beam flux for major users, such as the neutron scattering experiments group under Professor Clifford Shull and his colleagues in physics. The quality of the neutron flux has been greatly increased at low energies, and this is very important for a wide range of experiments. We have seen a factor of 10 improvement in low energy neutron flux, in terms of signal to noise ratio."

The quality of the neutron beam in the medical facility has been improved, the chancellor went on. "The fast neutron background used to be a significant part of the focused dose delivered to the patient. Now it is a minor part."

Dr. Gray pointed out that the ceremony was really a "triple feature"-the 20th anniversary of the reactor, the completion of the modification, and the start of the third year of a new mode of operation for the research reactor.

"Two years ago," Dr. Gray said, "the Institute took an important and carefully considered step in establishing the Nuclear Reactor Laboratory as a separate freestanding interdisciplinary research center in the full sense of the MIT tradition. Prior to that the MIT reactor was operated and administered by the Department of Nuclear Engineering. On July 1, 1976, the responsibility for the laboratory was transferred from the Department of Nuclear Engineering to the Office of the Vice President for Research. . . . On April 3, 1976, Dr. Otto K. Harling was appointed the first director of the newly established laboratory, and so this new mode of operation is the third element of our celebration here today."

Dr. Gray pointed out that there has been a "remarkable turnaround in the economics of the reactor operation under Dr. Harling's leadership."

The annual volume of MIT research involving the reactor laboratory has grown from \$900,000 in fiscal 1976-77 to an estimated \$2.2 million in the new fiscal year.

He said the increase means that the laboratory is now supporting "nearly three times as much MIT research volume in the third year of reorganization of the labora-

The net deficit of the laboratory has also been cut in half-from \$386,000 in 1976-77 to an estimated \$185,000 in the new fiscal year.

To illustrate MIT's commitment to the Nuclear Reactor Labora-

BENEDICT, THOMPSON HONORED—Portraits of Professors Manson Benedict and the late Theos J. Thompson were presented to Mrs. Benedict, left, and Mrs. Thompson by Dr. Thomas F. Jones, Jr., MIT's vice president for research, at ceremonies July 27 marking the 20th anniversary of the MIT research reactor and the completion of the reactor modification.

tory, Dr. Gray pointed out that the Institute has invested \$3 million of its own resources in the reactor design.

"The \$3 million represents roughly half of the total money which the United States has spent on research reactor improvement during the past five years. I know of no more dramatic illustration of a private institution acting in the national interest than the investment we have just made in this research facility."

MIT Provost Walter A. Rosenblith, whose remarks at the ceremony dealt with the role of the laboratory in advancing education, said 1,000 articles and papers of technical literature have been produced as the result of research at the reactor.

The provost reported that of 1,400 papers listed through 1970 by the American Nuclear Society, 174 were from MIT, and the institution in second place had generated 70. (The high productivity universities all had a nuclear research reac-

"That's the kind of distribution that we would like to maintain, and I hope you will in the next 20

In reporting on what the future holds for the laboratory, Dr. Harling said he was not going to paint "an unrealistically rosy picture." He warned that difficult fiscal problems still remain, but said that the "creation of an interdepartmental center around the MITR was a positive step in meeting the challenges of a changing pattern of reactor utilization as well as of tightened research budgets . . .

"When the NRL was started we had a deficit which was twice our

income. We are now projecting an income which is twice our deficit...

". . . I am optimistic that with continued hard and effective work on the part of the NRL staff and with a reasonable level of administration support we will be able to continue the present trend of increasing and broadening the use of the specialized capabilities of the NRL. This should result in the continuation of the general trend of significant improvements in the ratio of MIT research volume to the net operating cost or deficit." Professor Harling provided an

overview of the major reactor utilization areas and activities of the Nuclear Reactor Laboratory. He also assessed the relative health or strength of these areas which included traditional research areas such as neutron scattering studies of condensed matter, neutron and nuclear physics, nuclear engineering, reactor operation training, medical irradiations, neutron radiography and a variety of service irradiations. Of these, neutron scattering and neutron physics have always been strong at MIT and these research areas continue to be highly important, he said. Reactor utilization areas which have received special attention since the formation of the Nuclear Reactor Laboratory include nuclear trace analysis, irradiation damage studies of materials for nuclear power reactors and medical isotope production. These three areas are now relatively healthy and are projected to continue to grow. Other areas such as medical uses of the MITR-II offer the potential for much stronger programs, and these opportunities will be pursued in the future, Professor Harling

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Remanufacturing' May Be Way to Extend Product Life

What homeowner hasn't heard these fateful words about some household appliance: "This just isn't worth repairing. You'll have to get a new one.

Until now, there has been little hope of appeal from such a sen-

But two researchers at the MIT Center for Policy Alternatives-Robert T. Lund and William Michael Denney-think there is at least one alternative that ought to be given further consideration.

The process of "remanufacturing," they say, has the promise of providing lower-cost, like-new products while also creating new jobs, especially at unskilled and semiskilled levels.

Lund and Denney, who have been involved in a study of ways to extend product life, believe that the time has arrived for a serious assessment of "the neglected alternative," remanufacturing, which essentially means disassembling worn-out products and utilizing the still-useful parts to make products that are virtually as good as their brand-new counterparts.

"Even when a complex durable product such as an automobile, an appliance or a machine has come to the end of its useful life," they explain in a recently issued report, there is much in that product that retains its full functional value if the components could be put to use again. The brushes in electric motors may wear out but the armatures and their windings are good; bearings may fail, but the castings in which they are set are still sound. Each of these functionally useable parts has a value (as represented by the materials, labor, energy and overhead costs associated with its manufacture) that is many times the residual material value as scrap. Remanufacturing is an approach that finds intermediate methods of preserving the functional value of the original product-essentially giving older prod-

Steven Rivkin undertook to explain the Federal Communication

Commission's comprehensive

regulations regarding cable tele-

vision back in 1972, soon after those

regulations appeared. Cable Tele-

vision: A Guide to Federal Regula-

tions (which was published by the

Rand Corporation) was the widely-

read book in which Rivkin gave the

"intended, likely" meaning of the

complex of rules and regulations

resulting from five years of de-

liberation by the FCC about cable

A New Guide to Federal Cable

Television Regulations revisits

and updates the subject, now that

five more years of elaboration and

"fine tuning" in government con-

trols have elapsed. Rivkin, an

attorney, examines how the rules

and regulations have fared in

actual practice; he also details the

subsequent changes that have been

made in them as a result of citizen

and industry feedback since 1972.

He has made full use of the thou-

sands of certificates granted by the

FCC and a like number of inter-

pretive proceedings it has held to

resolve and refine disputed and

A significant feature of the new

book is the material it contains on

the expected impact of the new

copyright law pertinent to cable television that became effective

In outlining the purpose and

structure of his book, the author

writes: "Whatever the merit of the

FCC's accomplishments, the rec-

ord of federal regulation of cable

television during the past five

years has become a subject worthy

of objective study and analysis,

whether as a basis for prescribing

some future change, as a case study of regulatory triumph,

tragedy, or mediocrity (take your

pick), or merely to enable the

many interests affected by regu-

lation to cope with the volume of

particular details spawned by regulation. Whatever the reader's

purpose, making such up-to-date

ambiguous points.

January 1, 1978.

TV systems.

ucts new lives."

Lund and Denney make clear that they are not speaking of unit-by-unit rebuilding of products, which would be too small in scale to have significant economic impact. Rather, they are referring to "the highly organized business" of total disassembly of products, pooling of interchangeable parts, and production line reassembly with some replacement of worn parts.

"It is a strategy," they explain, "aimed at capturing the residual functional value in a used product that might otherwise be destined for disposal, by reprocessing all useable parts to arrive at a like-new product or functional value nearly equal to the original."

The researchers say that remanufacturing stacks up well against other methods of extending

"Unlike strategies aimed simply at increasing the life of the original product (for example, increased durability)," they say in their "remanufacturing helps deal with the fact that all products do eventually wear out. While repairs can keep a product in operation for an extended period, there arrives a time when repair costs become prohibitive and the unit is discarded. When this happens, the residual value of the product (or of its salvageable parts) is entirely lost . . . Through remanufacturing, one has the opportunity to preserve a much larger share of the product's functional value over an extended period."

As an employment booster, Lund and Denney note that remanufacturing involves a number of process steps that are relatively labor intensive. The bulk of the work is in parts refinishing, testing and assembly, where people are needed. Remanufacturing, therefore, can provide a stimulus to new jobs not only in the remanufacturing operations, but also in the

wisdom available to whomever wishes to use it is the aim of this

MIT Press Publishes Book

On Federal Cable Regulation

"As in the earlier volume, that ecumenical aim dictates the format of this book. The presentation will seek to attain objectivity, by both articulating the FCC's regulatory posture and identifying unresolved issues known or suspected to exist. Moreover, this book will again attempt to be practically helpful to users however far they may be from the umbilical center of regulation in Washington, D.C., by including in a single sourcebook all key reference materials and forms. (The rules themselves, as in effect in mid-1977, are reproduced as they relate to this commentary, throughout this book, and other useful and exemplary material is contained in the Appendix, complementing the expository sections of the book.) The plan of the book-presenting a summary overview for the general reader in the first chapter, with detailed exploration of particular rules in the ensuing topical chapters-aims to make sense to readers of various orientations, interests, and professional backgrounds who must develop and maintain a working grasp of federal cable television regulation."

This study was undertaken with the support of the National Science Foundation.

John S. Szurley

John S. Szurley, a security guard at the Lincoln Laboratory since 1962, died August 14 at the age of 64.

Mr. Szurley, who lived in Tewksbury, is survived by his widow Victoria T. (Suslowicz) Szurley; two sons, James F. Szurley of Jefferson, N.H., and Peter P. Szurley of Tewksbury; four sisters, Mrs. Helen Davidowicz of Bradford, Adam (Grace) Bernat of Tewksbury, Mrs. Mary Seymour of Lowell, Mrs. Michael (Sophie) Urbanowicz of Tewksbury; and a brother, Joseph Szurley of Tewks-

development of collection and to add to their household stock-a distribution networks needed to sustain such an industry.

As in all matters involving extended product life, remanufacturing has some potentially negative factors. For example, remanufactured products would compete with some portion of the new product market, and theoretically the new jobs mentioned by Lund and Denney might be created at least in part at the expense of existing jobs of the new product industry. The researchers say they are convinced, however, that remanufacturing carries fewer of these risks than most other strategies.

While remanufactured products undoubtedly would compete with some portion of the new product market, they say there is a high probability that the lower prices on the remanufactured models will create a new market among lower income consumers and even among higher income consumers wanting

second refrigerator, for example.

Remanufacturing is also seen by the researchers as an attractive way of providing lower-cost replacement assemblies to repair products still in use. There is an active remanufacturing industry, they note, for major automobile parts, such as alternators, starter motors and water pumps-lowercost replacement costs that directly contribute to prolonging the lives of automobiles that might otherwise be abandoned.

Lund and Denney concede that a number of issues need to be better understood before remanufacturing can be successfully implemented on a large scale. One of the major problems is the need to establish efficient channels for both collecting discarded products and, at the other end of the line, for distributing and retailing the reprocessed products. It would also be helpful if emphasis were given to new product

designs that allow for easy disassembly for maximum salvage of

To explore these and other questions, a conference on remanufacturing has been scheduled for late November in Washington, D.C. under the sponsorship of several governmental agencies, including the Office of Technology Assessment, the Department of Energy, and the Bureau of Standards. Lund, who is on the conference steering committee, says that the idea of remanufacturing is "growing like a mushroom," the interest in it spurred by such considerations as consumer benefit, resource conservation and the development of new technologies.

"There is excitement in Washington on this," he comments, "and we may soon see the federal encouragement of remanufacturing as a socially beneficial pro-

MIT Sky Opera, Icarus, to Premiere

(Continued from page 1) the early stages of the event-projected on the wall of the nearby National Air and Space Museum and on steam screens rising from "Centerbeam."

Performers will be situated on a platform near the sculpture, with music being heard from loudspeakers on and around "Centerbeam" and from the sky. The flying Daedalus will sing and play several instruments, and speakers will be built into the inflatable Icarus sculpture.

The actual task of launching Icarus will require a crew of MIT artists and engineers as well as audience volunteers. The success of Icarus will, in fact, depend on the audience's active participa-

"As with all such sky events," says Mr. Piene, "we couldn't do it without the energetic and physical support of the audience."

Greek mythology tells of Icarus, the young boy who would not heed his father's warning and flew too close to the sun, his wax and

feathered wings melting in the

In Mr. Piene's rendition, Icarus will take form in a 15-foot-high inflatable sculpture, built with airinflated red dacron. Air-filled, clear polyethylene wings with a span of 20 feet will be attached to the Icarus character.

The sculpture will be flown with the support of nine 100-foot-high helium-filled looped tubes. It will interface with a metal frame rigged with nylon ropes, connecting the inflatable to an airinflated tube, or stem, jutting out 100 feet from earth.

Daedalus, father of Icarus, and here a performing musician, will be similarly lifted 50 feet from earth with an air-inflated stem and helium-filled looped tubes

The exact timing of the Icarus opera is flexible. The 60 minutes of music is designed to be lengthened or shortened according to the needs of the moment.

According to Mr. Earls, composer, Icarus "draws its inspiration from the traditions of Baroque opera, folk outdoor theater, experimental music and media, Greek drama and 20th century technology.'

The libretto, also by Mr. Earls, is taken from the works of Ovid, Nietzsche and Gertrude Stein.

Mr. Piene and Mr. Earls agree that the theatrics, the music and the technology of Icarus are all integrated into the story.

"It's the cohabitation of earth and sky," they say.

In this way, Icarus may actually be in the true spirit of the ancient Greek theater.

Prior to the Icarus performances, Mr. Piene plans to launch several of his inflatables during the Labor Day holiday weekend (weather permitting). He has scheduled his "Black Silk Rose" and "Red Anemone" for the afternoon of September 3.

On Monday evening, September 4, Mr. Piene plans to launch his Milwaukee Anemone" and "Brussels Flower" from the roof of the National Air and Space Mu-

Wins Rockefeller Grant

Casdin-Silver

One of the nation's leading holographers, Harriet Casdin-Silver, has been awarded a grant from the Rockefeller Foundation to continue work as a fellow at the MIT Center for Advanced Visual Studies.

A hologram may be described as a sculpture of light. In the laboratory, a holographic plate or film is exposed to the interference pattern caused by a split laser beam. The plate or film is then re-exposed to a light source and the threedimensional imagery is reconstructed in space.

Ms. Casdin-Silver has been working with the art and technology of holograms for about eight years. While she does make use of objects in the manipulation of some of her work, she is also credited with the concept of using laser light alone, without an object, to create holographic imagery.

In 1969, Ms. Casdin-Silver began exploring holography in the research laboratories of the American Optical Company in Framingham, Mass.

"Using the laser to shape and form space is magical," she says. "The light is very fascinating. the work allows me to integrate all my creative experience.'

Writing about the spirit of holography, Ms. Casdin-Silver said, "It is light . . . mystery . . . energy . . . eternity."

The artist arrived at holography from a mixed background of theater, broadcasting, audiovisual arts and environmental art.

She has held teaching positions at Clark University and the Worcester Art Museum, was assistant professor (research) of physics at Brown University and is presently at MIT, where she teaches holography as an art form.

This summer she held classes at Tufts University as part of the Summer Film and Media Institute and conducted a five-day workshop, "Holography: Art and Application," for Harvard Graduate School of Design and the MIT School of Architecture and Plan-

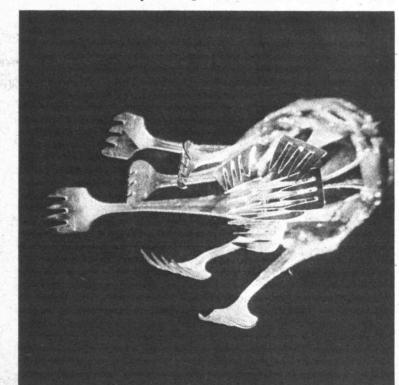
Today (Wednesday, Aug. 30) Ms. Casdin-Silver will lecture at the Hirshhorn Museum in Washington, D.C., in a program sponsored by the Smithsonian Institution's Resident Associates.

Her unique solar-tracked holograms are presently on public display in Washington as part of the summerlong exhibit "Centerbeam," a group work by the fellows at MIT's Center for Advanced Visual Studies. She is also showing national exhibition in Tokyo.

According to Rosemary Jackson, director of the Museum of Holography in New York City, Ms. Casdin-Silver's work represents "the most advanced use of holography as an art form." The museum's first one-person show, "Harriet Casdin-Silver: Holography," was a major exhibition there in 1977

While the Rockefeller Foundation award is not designated for work on a particular project, Ms. Casdin-Silver does have goals for the future. She is interested in the development of holographic movies and holography as a communications medium.

'From the beginning," she says, "I have intended to integrate my theater and media experience with my holography. Imagine a movie projecting from a screen in three dimensions. Pasara . . . it will happen."



Equivocal Forks, a hologram by Harriet Casdin-Silver.

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CLASSIFIED X3-3270

Ads are limited to one per person per issue and may not be repeated in successive issues. All ads must be accompanied by full name and Institute extension. 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 5-113, and presenting Institute identification. Ads be telephoned to x3-3270 or mailed to Rm 5 113 Deadline is noon Friday before publication

For Sale, Etc.

Moving, must clear out child things, B clothing birth to 7 yrs, toys, books, carrge, bouncer, car bed, bath tub, feed tble, seats, etc, pick & choose, no of-fers refused. Call Willie x5536 Lincl.

Bike, Phillips Eng, M 3 spd, blue, flly recond, excond, \$45. Call Emily x3-3600.

Giant scrn video projector TV, perf cond, usd little, \$695; also pr G70-14 can replc G78-14 fiberglss belt whitewll snows on Mercury rims, usd 1200 mi, \$60. Call Bob 726-3945 days.

Refrig/frzr, 14 cf, hotpoint, 2 yrs old, exc cond, \$200 or best, move mst sell. Call David x3-2454.

DR set 9x12 gold rug, buffet & misc items. Call

Polyethylene film .006 mill 12'W x 85'L, \$24. Call

Tires (4) Mich X rad, 165-13 on Datsun whls, \$60; sink white prslyn, sz 22x30x6", \$10. Pls call 862-

Piano Kohler & Campbell Symphony-walnut, brnd nw, w/bench, all guar, org \$1200 ask \$700. Call Oliveira x3-5573 or 233-5904 eves.

Technics SA-5070, 15 watts/chan. Call Howard x5-

Antique brass & iron bed w/ furn cust made box spring & matt recntly, refnshd 78"1x55"w, \$400; walnut china cab w/glss frnt 75"h x 17"d x 28"w, exc cond, \$150. Call x3-7850.

Whirlpool gas dryer, 2 yrs old, exc cond, \$175. Call

Car radio FM convrtr, \$20; pr snows, 1 spare, mntd \$40; 4 Pontiac hubcaps, \$12 or \$5 ea; left ry-quartr panel, tail end piece nw, for '69 Firebird. Call for prc x3-8276 Darrell or 787-4522.

Minolta SR-T leather camera case, lst \$25, nvi usd, \$14; GE hair dryr, \$5; Sunbeam jet mist ht comb, \$2; pocketbks, \$1 ea; clubchr, nd re-uphlsty, no offer refusd. Call Betty 232-2993 kp try.

23" Zenith fl mod color TV, 8 yrs old, gd cond, mahog cab, \$65. Call Jerry x5-6284 Lincl.

Furn, bkshives, tw matt & box sprng, drssr, chrs, lg tble, coffee tble, sm desk. Call 923-9152 eves.

BMW saddlebags, \$20. Call Chris x3-8021.

Movng sale, GE dryer yr old, auto drying sensor, \$150 or best; orange shag carpet 11x11 w/pad, \$75; fl mdl sunlamp, \$20; shop cart \$5, desk chr, \$10. Call Dennis x3-5845.

Martin 000-18 guitar list at \$850, unblyble deal at \$395, mst sell, nd money. Call Beth x3-3896.

Skydiving jumpsuit M about 6'2" tall, blue w/orange stripes, exc cond, \$70. Call x3-6548

Bkcase, bkshlves, baby car seat, hair dryer, csst recrdr. Call Lee x3-7097.

2 end tbles, \$25 ea. Call Loyld x3-2215.

Brand nw, beige winter coat nvr worn, sz 6-7, beaut wrap around. Call x3-8276.

2 bikes 20" & 15", exc cond, best. Call 395-7265.

2 mobile radio FM transvrs, 50MHZ, 40 watts. Call Dick x3-6472.

Grn painted 10 drwr chest, \$35; red mod plastic sectional wine rack, \$3/section. Call Bob x3-7085.

Golf clubs & bag, \$60; guitar \$40; 3 sp bike \$30; pack & frme \$25; Quartz iodide head lamps, \$15; sz 91: ice skates \$8; 3 lamps, 4 chairs, rocker \$15, bean bag chr \$25; file cab, \$20; coffee tible \$20; case/desk, \$40; gold rug, \$50. Call x3-2424.

GE 9 cf refrig, vy gd cond, \$80; dbl bed matt, box spr & frme, \$25; drssr w/mirror, \$25. Call Debbie x3-6226 or 492-4859.

Beaut lg wood desk, couch, gd cond. Call x3-1791.

Color TV, 25" RCA console nw pic tube w/yr wr-rnty, exc cond, sat guarantd, \$225 or best. Call 484-

Ceramic X'mas tree w/lights. Call x7317 Lincl.

Mst sell now, Welbuilt Powermaster 112 ton A/C, 12 str guitar, auto AM car radio, best. Pls call Sarah 277-4862 kp try.

Free work refrig, you move it. Call Beth x3-3896.

K tble & 4 chrs, drssrs, refrig & child's desk, bunk bed w/matt & fl sz foam rubber matt. Call Irv x7212 Lincl or 738-8621.

Dog harness, suitbl for pulling cart or sled, trcking, or just walking the dog, fits w/36" chest or lss, hvly padded, strong nyln, \$6. Call Gerald x3-4726.

Office desk 60"x30", all wood w/vy comfortble exec chr, \$120 or best; office desk, metal, wood top, 24"x48" w/chr, \$100 or best; sm round dine tble, top wood, stl pedstal w/2 chrs, \$20; coffee tble & end thle \$120 Call Ali x3-4242

Pr lg Advent spkrs, walnut veneer, exc cond, \$194. Call Chip 492-0089 or x3-4671.

DR set, sofa, metal study desk w/chr, best. Call

Philco 21" color console works w/schematics, \$25: gas range 36); white, cleand, best. Call Bob x3-2593.

open hutch, walnut, exc cond, also csstt tapes. Call Rich 787-5288 lv msg.

12x12 brwn shag rug, \$70; 3 lamps, \$8-\$30; ht curlers, \$10; 6 plates, \$2.50; 5 glsses, \$3; brwn scatter cushion, \$2; vacuum cleanr & attach, nds repair, \$5; laundry basket, mugs, platic bowl, broom, fl mop, polystyrene cooler & ice pack, \$2, lv country mst sell, all nego. Call Roger x3-6723.

The Dept of EECS has a number of surplus oscilloscope for sale, sold only to MIT Employees, faculty, staff, students. Please contact Charles Paton for further information x3-4635.

Furn vy usd cheap, DR tble, waterbed w/home made frme, 2 easy chrs, sngl bed matt, port Hoover wash mach. Call 661-3504 aft 2pm.

Lg wood desk, \$60; dbl matt, \$20; sm chest of draw, \$15. Call Steve x3-7268.

M Centurion race bike, \$160; 12 str guitar, \$80; sgl bed w/frme, \$20; sm couch, chairs, bureau typwrt, lights, etc. Call x8-1812 Draper. ureau, stereo,

Lv country, want to sell: bed kng sz, \$20; sofabed, sngl person, gd cond, \$25; dine tble & 2 chrs, \$15; B&W TV, \$10; coffee tble, org \$100 now \$25. pls call x3-6076 work hrs.

Sears Coldspot mini refrig, nw, waist high, 1½x-3x2½; \$100; Ig usd refrig, about 7 yrs old, vy big & rmy, Ig frzr spc, \$150, loc at McCormick hl. Call x3-2422 & Iv msg for Z.

Sim frol w/1800W htr & blowr, nw cond, \$60;

slding glss dr 5' wide, \$75; 10 awning windws 3x4' w/scrnc, \$35 ea. Call Bill x437 Lincl.

Conn organ, 2 61 note indpnd manuals, 25 notes

pedalboard, sustain on ea man, 21 spking voices, incl chimes, best. Call Dick x3-2761.

Hvy duty wood frme see-door, 32"x80"x2"; Beleved

edge glss paine, reasonbl, just re-cond Singer Zig-Zag sew mach, \$50; round K thle & misc hse hold

Antique windup Victrola console mod, exc work cond, complt w/100 needls & ten 78rpm records, \$125; antique sleigh blanket, blck bearskin, lind, approx 4x6; \$50; qn sz, ht waterbed, pltform base w/lap seam matt & liner, \$175. Call Peter x3-6893.

Science Mag, Jan '75-present free. Call Peter

Advent mod 100A noise reduct unit w/built-in mix-

er, level controls; can decode Dolby FM w/simultaneous recording. Call Zaeem x3-2843 or

Lg solid pine drssrs, desks, & bkcases, \$60 ea or best; sturdy steel frme beds & matts. Call 661-

Playpen with padded rail, \$15; jumper/walkr, chr, \$6. Call Kat x3-7691.

2 loud spkrs, \$18; M suits 42L, \$15 ea; tble lamp, \$5 ea; lawn sweeper, \$4. Call Michael x8-2884

Motors 1/3 & 1/4 HP; 24 VDC motor & generators

6 VDC 3 brush generator; motor oil 30 HD 17 qts/\$6. Call x3-6472.

Kg szd quiltd bedsprd ea org \$60; contemp abstrct

flowerd print, multi-colord \$25; solid deep avacado grn, \$20. Call Jeannie x8-2577 Draper.

Nw color TV Zenith 17", \$295. Call Rigo x3-7639.

Shag carpet, orange, about 11'x12' + 1g extr pcs & thick pad for underneath, ask \$100; lounge chr, blck vnyl w/swivel mount, \$40; sunlamp, fl mod, yr old, \$300 ro best; curtain rods, several szs, adj, any reasonbl offer considerd. Call Dennis x3-5845.

Philips 212 turntble, \$100; Nikko 5055 recvr \$200; KLM 102 spkrs, \$150; Ig flawlss mirror, \$15; B&W TV \$10; chr \$7; curtains \$14; matt \$7; sew mach, nego. Call 492-8204 eves.

Child's drssr, vacuum clean, movie projectr, elect

openr. Call Susan x3-6771 or 731-1896

Old upright piano \$75, gd tone, mst sell by 8/31. Call Sully x3-6693.

Qu sz bed, exc qual, 10 yr old, \$40. Call x3-7500.

'63 Galaxy 500, lw mlg, 289 V-8, stblzrbars pioneer AM/FM, 8 trck, Jensen tri-axle Spkrs, \$800 or best.

'64 VW sunrf, sound motor, few dents, mst sell,

'65 Olds Cutlass, 70K, best; 2 pr wood shutters, lg unusd wok. Call 862-2751.

'65 Pontiac Catalina, PS, auto, A/C, runs wl, nds work, \$200. Call Terry x3-5050 or 354-1773.

66 Chevy Impala 4 dr, hdtp, 109K, runs well, \$300.

'66 Volvo 121 sedan 4 dr, gd run cond, usd daily 2

'67 Chry T&C wg, 99K, org, clean, auto, PS & PB,

AM, gd tires, batt, nw exh, tail gate nds work

'68 Dodge Cornet 318 V8, gd run cond, \$500 or best.

'69 Dodge Dart, 4 dr, custom, exc drive & gd on gas, best. Call 395-8751 aft 3pm.

'69 Renault R10, 65K, general cond gd, runs wl but nds chassy welding. Call x7402 Lincl or 646-0177

'69 VW Poptop camper, 38K on reblt eng, rads, frnt spare, fogs titled, sticker, \$1400. Call Bob x8-1557 Draper or 891-9018 aft 7pm.

70 Pontiac Lemans, PS, 3 spd, nw cltch, gd cond,

'71 Charger (SE) exc cond, jst paintd, nw steel rads pin strips, Eng 440 CID lw mlg, vnyl roof, trans, 10 mos old. Call 933-0620.

'71 Chrys stat wg, exc cond, A/C, mst sell, \$1000 or best. Call Stanley x265 Lincl.

'71 Fiat, red, reblt eng, drvs beaut, ask \$650. Call x7746 Lincl days or 492-5725 eves.

'71 Toyota, gd transp, nw disc brkes, runs gd, \$750 or best. Call Larry x3-5969.

mfflr, r/windo defog, ign kill switch, \$1200. Call Barry x7772 Lincl or 862-0612.

'71 VW Pop-top camper, slps 4, exc cond, \$1850 or near offer. Call Jeremy x3-6488.

'72 Grand Torino, 62K org mi, mint cond, 4 drs, auto, PS, \$1300. Call 492-6350 aft 6pm.

'72 Olds 98, 62K, auto, \$1200 or best; nw car seat,

A/C, gd gas mlg, 69K, mech welcome, \$1200 or best. Call 783-9052.

'72 142E Volvo, 70 KM, gd cond, AM/FM csstt stereo, A/C, snows, \$1300. Call 494-0466 aft 5pm.

72 VW Bug, 62K, nw exhst sys, shocks, brks, clutch, \$1100. Call Karen x8-1163 Draper.

'73 Capri, 4 cyl, AM, lux dec int, r/window defg,

snows, exc cond, \$1,700 or best. Call 869-6393 aft

'73 Datsun 510, \$1400; Raleigh bike, 5 spd, lk nw, \$90. Call x3-4233 or 547-8038 Ilan.

'73 Fiat 124 Spider, 70K, some rust, mech vy gd, roll bar, 7 whls, \$1500. Call x3-8405.

'73 Pinto Squire 51K, std trans, mech gd, bdy dam & rust, \$3000 or best. Call Henry x8-3705 Draper.

'73 Saab 99LE, exc cond, 24K, AM/FM, A/C, trailr htch, nw brks. Call Phil x8-1327 Draper or 494-9010

'74 Dodge Dart Swinger 2 dr, 6 cyl, PS, auto, vy gd cond, ask \$2395 or best. Call 646-6021.

'72 Opel Rallye 1900cc eng, perf cond, star

'71 VW Superbtle, vy gd cond, 70K, 3 nw tires,

d, 40K, PS, A/C, bucket

83K, \$800 or best. Call 661-1864 or 628-4847.

Stereo equip: Accuphase 200 wt amp + p w/4 yr grnty, great buy. Call John x3-1791.

Vehicles

\$300. Call x3-4829.

Call Ralph x7395 Lincl.

\$250. Call x3-2220.

Call Alicia x8-4465 Draper

'71 Ply Duster, gd cond, 4 seats, \$1000. Call 277-5114.

\$17 or best. Call 494-8508

Kenmore washr, gd cond. Call 232-4613.

items. Call x3-5117.

4128.

'74 Fiat 128 stat wg, 49K, exc cond, nw tires, disc pads, batt, \$1600. Call Len x8-1365 Draper. '74 Maverick 41K, 4 dr vnyl rf, auto, PS, AM/FM, bucket seats, \$2500. Call Phil x3-3939.

74 Vega GT htchbck, 36K, A/C, PS, air shcks cust int, best. Call Arvola x3-5845.

74 Vega, 33K, auto, \$1150. Call Herbert x3-5040 or

x5-9715 Dorm '75 Audi Fox, 2 dr, auto, stereo, rads, top cond, 36K. Call x8-1418 Draper.

'75 MG Midget white, 26K, reblt eng & cltch. Call '75 Toyota Celica GT, 5 spd, nw tires, exc cond, 45K, \$2900. Call Judy x7423 Lincl.

'76 Honda motorcyc, 550 Four, only 675 mi, execond, Call x7734 Linel.

'76 Kawasaki KD 125 Dirt bike, vy gd cond, bought nw in '77 as lftovr, nw Bassani e w/helmet, \$375. Call 272-4358. ani expan

76 Ply Volare Premier wg, 6 cyt, auto, PS, PB, A/C, AM/FM, lugg rck, mny extrs, 40K, mint cond, \$3,750 firm. Call 729-4546 eves.

'77, Ford Granada, silvr w/red vinyl interior, PS & PB, auto, 6 cyl, only 17K, ask \$3,825. Call x3-2772.

'77 Suzuki GS400, exc cond, pad back rest, lugg rack, crsh bar & helmets, 2000mi, \$950. Call x5-6444 Dorm or 494-0256.

78 Toyota Corona, 4 dr sedan delux, AM/FM, PS auto, lw mlg, ask \$4200 or best. Call Linda x463 Lincl.

Fiberglss boat, '76, 15' tri-hull w/40 hp eng, fll canvas, galvanized trailr. Call 275-1669

Housing

Arl, 212 rm studio apt, sep enter incl ht & hw, \$230/mo, avail Sept 1. Call Sophie x3-3345 or 484-

Brkline, 2 rms, bath, sep entr, share K, \$130/mo. Call 731-8327 eve.

Apt for rent, beaut, 2 BR, 2B, clse to Harv Sq, \$410/mo. Call Turgut x3-3494.

Lex, 1900 hip roof colonial, 9+rms of gracious prv living on quiet st nr centr w/4 BR, EI K-aid K, 2 fl B, in-law poss, fl attic, bsmt, pool/cabana-gar on ¼ acre adj cons land, mid-low 90's. Call Paul x8-1394 Draper or (1) 256-0659.

Unique 2 yr old architect desngd 3 BR contemp, 2B, oak firs, skylightd live area w/beamed ceiling, ht frpl, breakfast deck off master BR, sundeck, 2 car gar lg enough for boat, hvyly treed loc on quiet dirt rd, Pembroke Lake area. \$60's. Call x8-1179 Draper.

Som, 3 rm apt, off st park, no util, \$150/mo, Call

Shares are avail for Ski Chalet southern VT nr Stratton, \$150 per share for season. Call Miro x3-

Mansard roofed hse, Winchestr, 3/4 acre wood lot, LR, DR, den, mod K, pantry, 3 lg BR, 2 sm BR, 1'-18, 18R & studio on 3rd fl, 6 frpl, 1g porch, 2 car gar, nr sch & ctr of town, \$115,000 by owner. Call 729-4449.

Animals

Wtd gd home for gerbils, owner allegic. Call Beth

Pure bread Siamese champ petgr, vy affect; 7 mo old F Bluepoint w/danish lines; 10 mo old M Seal Point. Call x3-4986 or 232-8256.

2 cats nd home: F spayed yr, white w/brwn & blck marks; M 6 mos, 2-tone drk grey stripes w/white bib & socks, both hve all shots, also avail free cat carrier, food/water dish, leash & collar. Call Sandy v2.7092

Free kittens 2 ornge & white, 1 ornge. Call Ed x8-1811 Draper

4 cosmic kittens + mom avail in four-6 wks free, from a gd home. Call Rebecca x3-5668.

112 yr old, affect, lng haird, cat, great w/kids, nds a gd home. Call Sandy x3-2291.

2 vy sweet grey & white 4 mos old kittens nd home desperately, 1M, 1F. Help! Call Denise x3-4380. Daphne, a beaut, multi-color, yr old cat nds gd hme. Call Joan x3-2672.

Lost and Found

Lost: A solid silver bracelet on the lawn front of Student Ctr. Call x3-7691.

Found: Muddy Charles, lady watch, identify to claim. Call x3-4599.

Wanted

Austrailian couple nd furn 1 BR apt, Sept 1 for Visit prof at MIT sks 1 BR furn apt Sept-Jan, Harv Sq or Beacon HI area prefer. Call x3-4141.

Usd A/C up to 6000 BTU. Call x5-9797 Dorm or x3-

Would like copy of B.C. Cullity's elements of X-ray diffration. Call Nancy x3-3697.

Pr old roller skates, sz not important, cheap. Call Chris x3-4765.

Cat carrier, hvy duty. Call Christine x3-7173. HP 40 Calculator. Call Frank x3-7530.

Roommates

2 prof 27 yr old F's sks 3rd F to shr lg 8 rm furn ½ hse on Newton-Brighton twnline, park, washr, porch, \$100 + util. Call Betsy x3-2698.

Camb M or F to shr 2 BR archit desng twnshebetwn MIT & Harv, K, LR, DR, frpl, 1'z B, sur deck, off st park, no smoke or pets, \$250/mo inclutil. Call Roland x8-4655 Draper or 864-0131.

Nd F rmmte no-smoke or pets, 3 BR apt, 15 min walk from MIT, \$128/mo, bt incl. Call Leslie 492-4859 aft 5:30pm or Faye 354-4535.

F rmmate wntd to shr beaut spac 3 BR apt w/2 frienly W, nice neighd nr Harv Sq, \$120/mo per persn, incl ht, avail Sept 1, no smoke pls. Call Peg-gy x3-6418 or Peggy, Chris or Jan 547-3498.

2 rmmates wntd; shr nw 3BR lux duplx cor loc, nr T, stores, etc, park, lg LR, ww, lg K, D&D, bsmnt, electronic lab, prefer EE/CS, no smoke. Call 646-8230 or x5822 Lincl. Lincl, shr miles adj conservation land, 20 min from Camb, sk resp persons over 25 for warm peacefl coop but indepnd living, \$200/mô + util, sorry no pets. Call Esther/William 259-0959.

F sks F rmmte for duplx Camb apt nr river has park, dish ww, Camb park stickr, allows park on Mem Dr. \$175/mo incl ht. Call 661-8705 aft

For anytime betwn Sept 1-Oct 1, F resp early 20's sks same to shr spac sun, clean apt 20 min walk from MIT, 15 from Harv \$115/mo, incl ht & ht water, on T, nice view, friendly & art atmosphere. Call Margie x3-4333 days or 354-4241 eves, musicing selection.

Miscellaneous

We specialize in day care for children undr 2, Lex. Call 861-7984.

Having a small party? Let me do all the work! Delicious hmemade variety of foods. Call 396-5011 aft 3pm Maria.

Heating, A/C, ventltn, insulatn work to be done. Call Arthur Dubois 893-5174 anytime.

WI do general, tech or theses typing, IBM Select, 10 yrs exp. Call x3-1564.

WI type theses, reports & papers, IBM Self-Correct. Call x3-7205.

Any kind of typing done. Call Susan x3-4701.

WI type theses, MS, reports, IBM select, fast & accur. Call x3-4528.

Typing theses, MS, reports, structure work equations, no problems. Call Carol x3-1864.

WI type, anythng, tech, etc, IBM Correct Select, reas rates. Virginia 926-8894.

Surplus Property

MIT surplus property for transfer or sale for

Cage & bottle washers, Mfg Better Built, mod 5000; Trailer, Van Type, Mfg Spim, serial 49, 19'10" long, 8'2" high floor to roof, 7'9" wide, dual

Worthington Air Compressor, 2 stage w/60hp motor, Pittsburgh Letrodyer Dehumidifier sz 250, mod BWC & 1 electric magnet, 5 tons, 6'x6' dia, deflecting type 3/4" cap.

NOTE: the hyphenated number after each item below is the property number.

Potter electronic counter, 479-101; Rutherford time Potter electronic counter, 479-101; Rutherford,time Delay Generator, Mod A2, 479-35; Cathod Ray Oscilloscope, DuMont Mod 304-A, 727-321; Cathod Ray Oscilloscope, DuMont Mod 322-A, 879-205; Ballantine AC Voltmeter, 643, 537-3; Square Wave Generator, Mod 71, Measurements Corp., 446-10; Audio oscillator, H-P Mod 202B, 535-4; Relay Rack, 727-316; Relay Rack, 727-317; Relay Rack, 7129-9; Heiland Oscillograph*, 727-338; Heiland Oscillograph*, 727-338;

* These items are obsolete and beyond reasonable repair, but we have salvaged galvanmeters and bridge balance units which are being used on other equipment in the laboratory.

Please contact W.A. Derry x3-2777.

POSITIONS AVAILABLE

This list includes all non-academic jobs currently Inis its includes all non-cademic jobs currently available on the MIT campus. Duplicate lists are posted on the Women's Kiosk in Building 7, outside the offices of the Special Assistant for Women and Work (10-215) and Minority Affairs (10-211), and in the Personnel Office, (E19-239).

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

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

3-1595

(Secretary — Tertia Perkins)	
Virginia Bishop Richard Cerrato Ken Hewitt	3-159 3-426 3-426
(Secretary — Paulette Chiles)	

Carolyn Scheer

Sally Hansen 3-4275 ce Milan Kathleen Rick 3-4269 (Secretary - Jenni Leibman) Admin. Staff, Asst. to the Dean in the Dean for

Student Affairs Office to advise, couns undergraduate and graduate students in a variety of matters: administer requests for readmission, withdrawal, reduced cademic loads, etc.; advise faculty members and others on policy and procedures; confer with students and student groups on a wide variety of student-related subgroups on a wide variety of student-related sub-jects; refer students to appropriate resources; assist others in their interactions with students; provide follow up assistance to students with special needs; support student organizations and activities. Master's degree or equivalent and counseling ex-perience required. Knowledge of MIT and direct experience as an MIT student helpful. Interper-sonal and communicative skills also required. A78-co. 10 to 10.

Admin. Staff, Admin. Officer in the Laboratory of Admin. Staff, Admin. Other in the Laboratory of Architecture and Planning to establish and monitor all fiscal, personnel and administrative systems for the Laboratory and the Dean's Office, School of Architecture and Planning. Will assist in development, preparation, monitoring and execution of research, general and fund accounts, act as general office manager for Lab. Financial as well as general administrative skills required. Interper sonal skills also necessary. MIT experience i preferred. A78-55 (8/30).

Admin. Staff, Asst. Director, in Resource Planning Admin. Staff, Asst. Director, in Resource Flaining to perform a broad range of educational fundraising activities: identify and evaluate prospective donors, advise Institute officers and others with regard to visits with prospective donors; do an extensive amount of writing including specialized correspondence, proposals and other material.
Position may include limited travel and donor contact. At least 3 years' active, consecutive and tact. At least 3 years' active, consecutive experience in fund-raising, preferably in a university environment, is desirable, A78-56 (8/30). Admin. Staff, Data Base Manager, in the Property Office. Office of Facilities Management Systems to convert data into a meaningful code for a property computer system; maintain property inventories; retrieve data from computer system and act as central data source about property; reconcile ac-counting statements of equipment purchase; prepare related statistical analyses. A Bachelor's degree, including basic mathematics course work required. Some experience in property manage-ment and computerized systems desirable. A78-59

Admin. Staff. Property Administrator, in the Property Office, Office of Facilities Management Systems to supervise activities of Data Base Manager and Property Data Collector; oversee in corporation of acquired equipment into inventory collect financial data for use in cost-related collect financial data for use in cost-related calculations; assist in acquiring government surplus property. A Bachelor's degree, including college level math and accounting course work, or equivalent required. Experience in property management, and computerized systems desirable. At least 1 year's supervisory experience, and certification as a Professional Property Manager desirable. A78-58 (8/30).

Admin. Staff, Property Auditor, Supervisor, in the Property Office, Office of Facilities Management Systems to supervise activities of Property Inven-tory Auditor. Will be responsible for developing and implementing a system for inventory of all of the Institute's moveable equipment; research data recording equipment for prospective acquisition; prepare estimated data for equipment when actual prepare estimated data for equipment when actual data is not available; reconcile inventory results with existing property records. A Bachelor's degree, or equivalent, and at least 1 year of superisory experience required. Experience in property management and with computerized systems desirable as is knowledge of scientific and office equipment. Certification as a Professional Property Manager desirable. A78-57 (8/30).

Admin. Staff, Systems Programmer in Information Processing Services to support the Administrative Computing System currently running on an IBM 370/148 with VM, DOS/VS and VS1 operating systems and applications such as CICS/VS. Work entails bringing up new releases, system tailoring, problem analysis, applying fixes, documentation and consulting. Proficiency in systems programming in all or most of the above systems, experience in a business data processing environment re-quired. Bachelor's degree, or equivalent education/experience combination also required. A78-38 (8/16)

Admin. Staff, Director Video Operations and Educational Video, Office of the Provost, to work with faculty to explore and develop use of video technology to enhance and enalrge current educational programs, and to experiment in the new application of visual materials in educational, creative and scholarly activities. Responsibility will include management of video staff and extensive facilities and equipment, participation in developing video-use policy and in the development of funding. Position requires professional level experience as an educational innovator, and in working with faculty to produce and/or locate educational materials. General administrative and supervisory experience is also necessary. with faculty to explore and develop use of vide supervisory experience is also necessary. Familiarity with video operations and production practices and issues related to management of video activities, as well as an advanced degree are desirable. A78-53 (8/16).

Admin. Staff, Asst. to the Director, Career Plann Admin. Staff. Asst. to the Director, Career Planning and Placement Office to primarily provide career and placement counsel to students in architecture, urban studies, humanities and social science. Will develop, through research and contact with faculty, employers and others, a thorough knowledge of relevant issues, resources, as well as information in job hunting techniques. Will also assist in generating campus recruitment visits by employers and in encouraging the listing of job openings with the Office. A broad educational background and an interest in the professions relevant to the academic fields indicated required. Applicants must have the interpersonal skill and imagination to assist others in planning academic programs and professional careers. A78-54 (8/16).

programs and professional careers. A78-54 (8/16). Admin. Staff, Financial Aid Officer, in the Student Financial Aid Office to counsel students and parents (through personal meetings and correspondence) on financial problems and aid eligibility, utilizing an ability to perform need analysis, and a knowledge of aid programs, federal regulations and programs. May participate in policy development, prepare reports on fund status, assist in fund appeals, and prepare policy statements and procedural guidelines. Excellent communications skill, a Bachelor's degree, or equivalent, and 5 or more years professional excellent communications in the statements and procedural guidelines. communications skill, a Bachelor's degree, c equivalent, and 5 or more years professional ex-perience in student financial aid administration re quired. A78-49 (8/16).

Admin. Staff, Sr. Consultant-Trainer in the Office Admin. Staff, Sr. Consultant-Trainer in the Office of Personnel Development to plan, design, implement and evaluate training programs and activities; assess MIT community needs for new activities; provide consultation services; research training and development materials and activities. document, evaluate and report on personne development activities; conduct supervisory train ing. Selected applicants will be expected to con-duct a 1-2 hour training activity which will be evaluated by Office staff. Experience in superevaluated by Office staff. Experience in super-visory training, management development, organization development, affirmative action, adult education, process oriented adult group work, and training program evaluation. required. Also necessary are writing skills, advanced degree in behavioral science, or related field, plus at least 50 hours of small group training experience with adults. A78-51 (8/16).

Academic Staff, Asst. Engineering Librarian in the Engineering Library to be responsible for collection development; provide library users with reference service; promote effective collection development.

M.L.S. from an accredited library school and
minimum of 1 year of collections/reference experience in science or engineering library required.

Undergraduate degree in science or engineering
desirable. C78-6.

Acad. Staff, Marketing Representative, in the Medical Department to be responsible for the development, implementation and coordination of marketing programs for the MIT Health Plan, a comprehensive prepaid health care program for employees and their families. Will participate in employees and their families. Will participate in planning market strategies; develop marketing and promotional materials; present the Plan to MIT community members. Will handle member relations and coordinate internal and external enrollment procedures. Previous HMO or related marketing experience preferred. A Bachelor's degree and well developed written and spoken communication skill becomes pressure (278, 236, (4), (5)). munication skill also nece

Sponsored Research Staff, Administrative Officer in the Center for International Studies to handle all financial, personnel, purchasing, physical plant and other (non-academic) administrative matters and other (non-academic) administrative matters for the Center. Will act as primary administrative liaison between the Center and all levels of In-stitute staff, outside agencies and organizations. A Bachelor's Degree in Business Administration or an equivalent combination of education and experience required. Demonstrated financial management experience and experience with MIT administrative procedures desirable. R78-172

Sponsored Research Staff, in the Division for Study and Research in Education to assist in teacher development research project; assist project coordination in scheduling; participate in-lobserve teacher training seminary. observe teacher training seminars; assist in development of insights and skills of cognitive selfreflection. Experience in teaching, observing skills required. R78-178 (8/30).

wored Research Staff, Project Coordinator, in the Division for Study and Research in Education to coordinate a teacher development project to schedule teacher seminars, classroom observations

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and development of trial teacher training materials; participate and observe teacher training seminars; assist in development of insights and skills of cognitive self-reflection; assist in write-up of research results. Experience as teacher, supervisor of teachers, observer of teachers and children and evaluation of curricula and classroom performance required. Training in cognitive psychology and music required. R78-179 (8/30).

Sponsored Research Staff, Medical Technologist in small Clinical Research Center Laboratory to perform clinical tests on patients in 12-bed research unit and on research studies done on an outpatient basis. Will be working with various types of automated equipment, as well as a PDP-12 computer system performing hematology, clinical microscopy and chemistry tests. Bachelor's degree plus graduate of an accredited school of Medical Technology with ASCP registration required, as well as 2-3 years' experience in a hospital laboratory. Candidate must be reliable and able to work accurately with minimal supervision. R78-185 (8/30).

Sponsored Research Staff, Research Engineer in the Artificaial Intelligence Laboratory to work on IJSP programming and hardware development. Several years experience with LISP programming, SUDS drawing, programming and computer hardware design required, R78-184 (8/30).

Sponsored Research Staff, Admin. Asst., Editor in the MIT Sea Grant Program, to assist the Communications Officer to participate in disseminating research results to various audiences in the marine research community. Will edit technical material for comprehension by varied users; prepare articles, summaries and printed literature; supervise printing production; act as media liaison. Strong journalistic skill and training, and preferably professional experience required. Bachelor's degree, or equivalent in sciences or journalism also necessary. R78-177 (8/30).

Sponsored Research Staff, Experimental Plasma Physicist (temporary), in the National Magnet Laboratory to conduct postdoctoral research in the area of laser produced plasmas in magnetic fields; set up plasma diagnostic equipment and interpret data for a number of experiments. Will contribute to the conceptual development and implementation of advanced plasma diagnostic techniques for laser-produced plasmas. A PhD in plasma physics, quantum electronics or related fields required. Familiarity with laser-produced plasmas and high energy CO, lasers desirable. Temp. for 1 year. R78-186 (8/30).

Sponsored Research Staff, Programmer in the Center for Space Research to maintain and improve a data analysis system for the acquisition, presentation and reduction of data produced by an orbiting x-ray observatory: reorganize, rewrite and redocument existing software, as well as develop new software. Work will range from modification of the operating system, Fortran compiler, or subroutine library to the writing of Fortran applications programs. At least 2 years experience with assembly language required. Knowledge of Data General's operating system and computer hardware experience desirable. R78-160 (8/16).

Sponsored Research Staff, Electronic Engineer, in the Haystack Observatory to assist in design and development of microwave receiving equipment to be applied to radiometric measurements for radio astronomy using the Haystack radio telescope. Will develop RF and IF systems, frequency multipliers, phase lock loops, synchronous detectors etc., supervise construction, bench test, and system integration of such equipment. A Bachelor's degree in Electrical Engineering or Physics required. Familiarity with the design of microwave circuits involving waveguide and associated components also necessary. Applicants should have at least 2-years' related experience. R78-159 (8/16).

Sponsored Research Staff, Program Director, in the Neurosciences Research Program to perform collaborative conceptual research. PhD and extensive academic experience required, as well as ability to evaluate and interpret judgments about research. Broad neuroscience background and excellent interpersonal skills also required. R78-154 (8/16).

Sponsored Research Staff, Experimental Physicist/Electrical Engineer in the National Magnet Laboratory to do postdoctoral research on high magnetic field properties of semiconductors and antiferromagnetic materials. Research involves use of optically-pumped lasers and a Fourier Transform spectrometer. PhD in solid state physics or a related field, experience with lasers, some familiarity with far infrared research required. R78-158 (8/16).

Sponsored Research Staff, Organic Chemist, in the National Magnet Laboratory to assist in the synthesis of lipids, amino acids and peptides labeled with stable isotopes which will be used in a cell culture media. Position requires Bachelor's degree or Master's degree in organic chemistry with related experience in the synthesis of labeled compounds. R78-157 (8/16).

Sponsored Research Staff, Systems/Scientific Programmer for the Alcator Fusion Project in the National Magnet Laboratory to do RSX-11M system programming to support the operation of a PDP-11/15 computer installation. Will manage computer operation and serve as consultant to small user community. Will also participate in specialized data acquisition hardware interfacing. Bachelor's degree or a higher degree in computer science, or a related field required. RSX-11M system programming experience, as well as some electronics background also necessary. R78-162 (8/16).

Sponsored Research Staff, Systems Analyst, temporary in the Energy Laboratory to develop and implement methods for decentralizing power generation, using photovoltaic-based systems. Duties will include model formulation and development, programming, and systems analysis and application. Bachelor's degree in computer science and experience in systems analysis required. Temporary 6 months. R78-163 (8/16).

Sponsored Research Staff, to work in the immunology laboratory of the Center for Cancer Research. Will immunize and bleed mice; perform lymphocyte cultures and cell fusion; work with radioactive isotopes. A Bachelor's degree, or equivalent, required. R78-171 (8/16).

Sponsored Research Staff, Research Analyst in the Center for Policy Alternatives to perform research and policy analysis in environmental/occupational health and safety, regulatory policy, technological innovation, and problems related to the use of human capital in the work environment. Good writing, interpersonal and communication skills required, as well as interest and/or experience in the subject areas indicated. Masters or doctorate degree in biochemistry and graduate education in policy analysis emphasizing economics, statistics and decision theory also necessary. R78-166 (8/16).

Sponsored Research Staff, Programmer, for the x-ray astronomy group of the Center for Sapce Research to maintain and improve a Data General real time disk operating system for acquisition, presentation and reduction of data produced by an orbiting x-ray observatory: reorganize, rewrite and document existing software as well as develop new software. Work will range from modification of the operating system, Fortran compiler, or subroutine library to writing of Fortran application programs. Some experience with hardware is desirable. At least 2 years experience with assembly language required. Knowledge of Data General's operating system is desirable. R78-168, R78-170 (8/16).

Sponsored Research Staff, Editor, part-time, in the Sea Grant College Program to edit a new publication "Reports on University Research in Ocean Engineering", encompassing research efforts of 5 or more leading universities, focusing on ocean engineering and very closely allied, relevant disciplines. Will work with others to formulate publication and editorial policy; recommend editorial material; perform background research;

write articles; interview academic practitioners; oversee publication and distribution. Demonstrated capability in "hard" science or engineering writing/reporting is required. Degree in ocean engineering and marine related experience desirable. Degree in engineering or hard science field acceptable. Approximately 20 hrs./wk. R78-110 (5/31).

Exempt, Dental Hygienist, in the Medical Dept. to perform initial examination and charting: prophylaxis, periodontal treatment, plaque control, taking and processing dental x-rays, screening emergencies, and patient education. Must be Registered Dental Hygienist. Excellent interpersonal skills also necessary. Bachelor's degree and some periodontal care experience preferred. 37.5 hrs./wk. E78-842 (8/30).

Exempt. Engineering Asst., in the National Magnet Laboratory to assist in the design and supervision of high performance water-cooled and superconducting magnet systems; design and specify tolerances and components for high pressure, high velocity water-cooling systems and for cryogenic and vacuum equipment. Experience in the design of mechanical equipment and knowledge of engineering materials, manufacturing processes and assembly techniques required. Ability to make calculations of stress, heat transfer, thermal deformations and electrical current flow also required. Experience in the design of magnetic systems desired. E78-43 (8/30).

Exempt, Admin. Asst. in Clinical Research Center to be responsible for operations management of Center and to supervise some clerical employees. Will coordinate and help prepare research proposals, annual reports and other documents. BA or BS degree or equivalent is required. Experience in hospital administration is preferred, especially in cost accounting systems. E78-46 (8/30).

Exempt. Asst. Accountant, in the MIT Press to maintain detailed inventory accounting records, including job cost records and for books in process and the computerized perpetual inventory of bound books; assist in preparation of monthly financial statements and budget/actual comparisons; reconcile accounts and general ledger, calculate sales commissions; prepare special tite sales analyses and financial or cost analyses. Bachelor's degree in accounting including cost accounting or equivalent work experience required. Knowledge of computerized data processing helpful. E78-47 (8/30).

Exempt. Admin. Asst., for the Medical Dept. Psychiatric Service to assist in the overall administrative operation of the Service, and directly supervise Service secretaries. Good organization skills, ability to deal with complexity in coordinating administrative activities required. Supervisory experience is preferred, as is a history of progressively responsible positions. Institute experience is desirable. E78-48 (8/30).

Exempt. in the Undergraduate Research Opportunities Program Office of the President/Chancelor, to assume responsibility for preparation of main directory; freshmen orientation activities; handle publicity; arrange program symposium and conferences; maintain financial records; schedule large meetings for faculty, students, and other participants; supervise student employees; prepare in dependent correspondence; counsel students; draft evaluation letters. Perform and/or direct some clerical duties. Good organizational, writing, communication and clerical skills required. Initiative, flexibility, ability to set priorities, willingness to work long hours when necessary also required. E78-40 (8/16).

Exempt, Registered Nurse, in the Clinical Research Center to be responsible for general and specialized nrusing procedures and medications on a 12 bed research unit; take charge duties when necessary; keep records of all patients' conditions and studies performed. Massachusetts registration and graduation from an accredited school required, as well as at least 2 years experience. Accuracy and good interpersonal skills also required. E78-41 (8/16)

Account Asst. V in the Medical Dept. to be responsible for Dept.'s accounting system and direct supervision of the Accounts Receivable Unit. Some college training in business administration or accounting or equivalent and I year's accounting and supervisory experience required. Knowledge of health insurance reimbursement and data processing systems preferred. B78-500 (8/30).

Section Head V, part-time, in the Sea Grant Program to be responsible for its Information Center: order materials; catalogue books; process journals and newsletters; maintain reference information and subject and documentary files; notify staff of recently published information; conduct searches; compile bibliographies and directories; oversee report distribution; respond to inquiries. Good organizational and interpersonal skills required. Some college training preferred, as well as some library training or expereince in science, engineering or environmental fields. 20 hrs./wk. B78.442 (8/16).

Accg. Asst. V in the Comptroller's Accounting Office to assist in accounting control of large computer system, and to operate system independently when necessary. Will type, total, record, correct and control all input/output of system; research and correct invoiced transactions; maintain supporting documentation file; reconcile accounting control accountis. Extensive experience in an accounting function and with computerized systems required. B78-398 (8/16).

Admin. Asst. V for a research group in the Civil Engineering Dept. to administer grants; prepare and monitor budgets; maintain files; coordinate living arrangements for foreign project participants. Will also handle administrative duties related to doctoral program; schedule exams; process appointments. Responsibility also involves general office administration, editing, preparing diagrams and other visual aids for reports. Administrative and editing skills, some graphics experience required. Typing skill is desirable. B78-418-(8/16).

Tech Asst. IV, Part-time, in Psychology to assist in cognitive psychology experiments; run experimental sessions with 2 to 16 year-old children; code and analyze data; act as school liaison. Bachelor's degree is preferred. Research experience in cognitive psychology helpful. 30 hrs./wk. B78-502 (8/30)

Sr. Secretary V to the Director of the Clinical Research Center to handle duties related to administration of the Center: maintain patient and administrative files; coordinate grant and proposal preparation; compose and type correspondence; take meeting notes. Excellent secretarial skills including shorthand, demonstrated organization skill required. At least 5 years' secretarial experience preferred. B78-460 (8/30).

Sr. Secretary V in the Chairman's Office: coordinate appointment calendar; maintain filing system; answer phones and inquiries; maintain petty cash. Excellent communication skills, ability to establish priorities, good typing skill and ability to work under pressure required. 37½ hrs./wk. B78-466 (8/30).

Secretary V to Deputy Director of a 2-year international energy study in the School of Engineering Responsibility will include general administrative and secretarial duties; meeting and travel arrangements; supervision of clerical employees; distribution of project materials; coordination of publishing activities. In addition to excellent general secretarial skills, applicants should have some college training and at least 3 years' secretarial experience. Position requires overtime work. B78-389 (8/30).

Secretary V in the Humanities Dept. to provide administrative assistance to the Director of the Writing Program: handle correspondence; type; schedule appointments; assist in preparation of teachers' schedules; record student grades; take meeting notes; provide administrative supervision of faculty search process; assume full office respon-

sibility in Director's absence. Excellent organizational, typing, shorthand/speedwriting skills and strong ability to assume responsibility required. Knowledge of MIT procedures helpful. B78-469 (8/30).

Secretary V, temporary, to Department Head, Psychology Dept. Will maintain all teaching and research files; monitor grant expenditures; perform duties to assist Graduate Admissions Committee including answering inquiries from prospective students; maintaining related records. Excellent typing and shorthand skills as well as substantial secretarial experience required. Temporary for approximately 3 months. B78-468 (8/30).

Secretary V in the Chemical Engineering Dept. to coordinate graduate seminar series; perform faculty searches; schedule meetings, work on a variety of special projects; reserve conference rooms; handle mail; prepare correspondence; gather statistics; answer requests; maintain files; schedule appointments; type technical material. Secretarial experience, ability to anticipate problems, and willingness to work additional hours required. Shorthand, dictaphone and typing skills also required. B78-395 (8/16).

Sr. Secretary V to Director, Parsons Laboratory, Civil Engineering Dept. to schedule meetings, seminars, travel; type correspondence and technical reports; monitor research accounts; prepare procedures. Position requires excellent secretarial skills including a command of the English language. Applicants must be able to interact effectively with students and others. Pamiliarity with MIT procedures preferred. B78-399 (8/16).

Secretary IV/V in the Physics Dept. to 2 faculty members and several research students; write research proposals; advise students; interact with wide range of offices, personnel and committees; greet visitors; monitor accounts; write manuscripts and speeches; maintain records, files, and library; arrange travel. Excellent secretarial and organizational skills and ability to set priorities required. B78-480 (8/30).

Secretary IV/V to Vice President, Office of the President and Chancellor. Will handle a variety of duties in a very busy office; arrange and coordinate complicated meeting and appointment schedules; maintain communications among many people and offices in the Institute. In fall of 1978, will handle additional responsibility related to student affairs administration to support a special assignment to V.P. Excellent typing, shorthand and organization skills, and command of language are essential. Ability to anticipate, recognize and organize priorities, and work as a part of a team are also required, as well as willingness to assume responsibility, and to work, independently, under pressure. Applicants should be resourceful in handling complex situations and able to exercise discretion, tact and judgment. B78-497 (8/30).

Secretary IV in the Laboratory for Computer Science to provide general secretarial support to a senior faculty member: type manuscripts; correspondence; edit-text through use of computer; arrange travel and appointments; assist in preparing course material. Position includes student contact. Applicants must be able to take responsibility for overall office operation; initiating procedures as necessary. Will eventually provide secretarial support to an additional faculty member. Machine transcription, typing skill required. Experience with computer text editing is helpful, but selected applicant can be trained. B78-457 (8/30).

Secretary IV, part-time, in Architecture Dept., Environmental Policy and Design Program to share in providing secretarial services to a student/faculty research group: prepare course materials; schedule meetings and appointments; type; operate word processing equipment. Position requires excellent typing, organization and interpersonal skills. 15 hrs./wk., mornings. B78-465 (8/30).

Secretary IV to a Biology Dept. faculty member to perform secretarial duties related to the operation of a 25 person research laboratory and to supervisor's other academic responsibilities: type correspondence, manuscripts, proposals from machine dictation or handwritten draft; order supplies and administer petty cash and other routine office procedures. Excellent typing skill as well as secretarial experience required. B78-397 (8/30).

Secretary IV to 3 or 4 faculty members in the Ocean Engineering Dept. to type correspondence, technical reports, class material from hand written draft and tape; maintain files; monitor account expenditures; maintain petty cash; prepare travel vouchers; arrange travel; schedule appointments; xerox; perform occasional library work. Good secretarial skills, ability to transcribe from tapes required. Technical typing skill and knowledge of MIT procedures helpful. B78-489 (8/30).

Secretary IV to 2 faculty members in the Civil Engineering Dept. to type technical material; arrange travel; organize and arrange schedules for seminars and meetings; handle routine inquiries; file; maintain accounts. Technical typing skill or willingness and ability to develop skill required. 878-484 (8/30).

Secretary IV, part-time, to one MIT professor, one visiting professor and their research assistants to maintain a small library of reports and related materials; type correspondence, class notes, manuscripts, proposals, reports, etc.; file, xerox, make travel arrangements. Applicant must have good general secretarial skills. Technical typing ability and knowledge of MIT preferred. 20 hrs./wk. B78-487 (8/30).

Secretary IV to 3 faculty members in the School of Humanities and Social Science to handle all general secretarial duties including dictation and arranging travel and meetings. Will occasionally assist other faculty and Dean's Office with typing. Knowledge of French, German or Italian is helpful. Applicants must have typing and transcription ability. B78-470 (8/30).

Secretary IV to 3 faculty members in the Management Science Group, Sloan School, to handle all general secretarial duties including typing from machine dictation, preparation of class material, formatting of drafts and final typing. Will independently answer inquiries from students and others. Excellent general secretarial skills, ability to do minor editing and proffreading required. Technical typing skill desirable. B78-463 (8/30).

Secretary IV in the Patent and Copyright Office to type patent applications, correspondences; handle all other general office procedures including maintenance of records and files. Excellent typing and at least 2 years' secretarial experience required. Shorthand skill preferred. B78-494 (8/16).

Secretary IV to Coordinator of Alumni Career Services, Career Planning and Placement Office. Will correspond with alumni independently and on behalf of supervisor; develop job descriptions; maintain records and mailing list; act as receptionist in division; interact with company representatives, alumni and other visitors. Strong typing skill, interest in and ability to understand and transmit employment-related information to others required. B78-501 (8/30).

Secretary IV for a large research group in the Laboratory for Computer Science to attend grades meetings; explain graduate program requirements to students; compose letters; maintain records. Excellent typing, interpersonal and communication skills required, as well as willingness to learn computer text editing. Non-smoking office. B78-483 (8/30).

Secretary IV in the Medical Dept. to provide reception and secretarial support to a health care team, consisting of 2 physicians: answer phones; schedule appointments; order medical records; coordinate lab tests form preparation; transcribe medical case histories; handle routine correspondence and administrative reports; arrange travel; file; handle mail; may chaperone routine medical exams. Excellent typing, interpersonal and organizational skills and the ability to transcribe medical terminology required. Previous secretarial experience also required. 37.5 hrs./wk. B78-493 (8/30).

Secretary IV in the Nutrition and Food Science Dept. to 3 faculty members to type and distribute correspondence, class material, manuscripts, reprints and grant applications; maintain reports and files; answer telephones; schedule appointments and meetings; arrange travel; handle all other routine office procedures. Excellent typing and organizational skills required. Non-smoking office. B78-416 (8/16).

Secretary IV to faculty members in the System Dynamics Group, Sloan School; to handle varied typing duties using word processing equipment and/or typewriter (manuscripts, proposals, class materials); edit typed material; answer phones; arrange for printing and audio-visual services; handle minor research duties related to projects. Position requires the ability to organize projects and to handle detailed assignemtns. A good command of Engoish grammar and the ability to work occasional overtime also necessary. B78-408, B78-409 (8/16).

Secretary/Acctg. Clerk IV in the Nuclear Engineering Dept. to type; file; arrange travel; perform reception duties; record and summarize meeting minutes; assist in fund-raising and public relations activities. Some national travel included. Good knowledge of bookkeeping and preparation of business correspondence required. Bookkeeping experience also required. B78–426 (8/16).

Secretary IV in the Alumni Association to provide secretarial support to department, coordinate fund-raising projects; maintain gift totals; prepare course agents' mailings and liaison with departments. Good typing and organizational skills, problem solving ability and research skills required. Some overtime also required. B78-425 (8/16).

Secretary IV in the Center for Policy Alternatives to assist in programs related to industrial and social applications of technology in foreign countries. Will compose and type memos and letters; type formal proposals, reports, correspondence using word processing system; arrange meetings and travel; reconcile research accounts; perform all other general secretarial duties as necessary. Position involves extensive student contact. Typing and strong interpersonal skills required. Shorthand and/or speedwriting, a Bachelor's degree and facility with one or more foreign languages desirable. B78-429 (8/16).

Secretary IV to Executive Officer in the Chemical Engineering Dept. to type; take shorthand; file; answer phones; maintain petty cash; schedule appointments; arrange travel; handle routine correspondence. Office experience, business or secretarial school training and familiarity with MIT preferred. Organizational ability, shorthand and/or dictating equipment experience, good typing skill and ability to exercise discretion re: confidential material required. Must be willing to work irregular hours occasionally. B78-168 (8/16).

Secretary IV in the Laboratory of Architecture and Planning to handle a variety of general secretarial duties: (act as receptionist; type; order supplies; maintain files), and also assist in coordinating the administration of the Continuing Education Program (arrange housing for participants, as well as for supplies, equipment, use of facilities). The ability to handle several projects simultaneously and to establish priorities are required in addition to typing and interpersonal skills. B78-407 (8/16).

Secretary IV in the Division of Health Sciences and Technology to coordinate admission procedures for M.D. degree with Harvard Medical School; keypunch; keep records; compile statistics; schedule appointments; schedule, attend and take notes at committee meetings; perform all other routine secretarial duties. Good typing and organizational skills, ability to work under pressure and willingness to attend weekly evening meeting during admission period, Oct.-Feb., 5-8 PM, required. Shorthand skill preferred. B78-431 (8/16).

Secretary IV to 2 faculty members and other research groups in the Laboratory for Computer, Science. In addition to general secretarial duties, will type and edit technical material on a computer, compose correspondence from oral instruction. Applicants must be able to exercise initiative and be able to transcribe machine dictation. MIT experience and/or college training helpful. Selected applicant will be trained in computer text editing. B78-437 (8/16).

Secretary IV, part-time, in the Technology and Culture Seminar Office to help administer a series of luncheons, lectures, discussions and dinners: type letters, memos, meeting summaries; place and answer telephone calls; perform miscellaneous tasks as required. Good typing and organizational skills and initiative required. 8-10 hrs./wk., flexible. B78-450 (8/16).

Secretary IV in the Center for Space Research to provide secretarial support to a faculty/staff research group. Will type proposals, correspondence, articles; answer phones; arrange travel. Typing skill, as well as ability to organize work required. B78-445 (8/16).

Secretary IV in Nutrition and Food Science to work with small research group which is working in inhalation toxicology; type manuscripts, letters from machine dictation; file; monitor financial reports. At least 2 years' secretarial experience and the ability to work independently required. Some experience in editing and knowledge of medical biological terminology required. B78-453 (8/16).

Secretary IV, in the Aero/Astro Dept. to type letters and reports; take shorthand dictation for correspondence and meeting minutes; maintain files and records. Good interpersonal and organizational skills required, as well as excellent typing and shorthand/speedwriting skills. B78-357 (7/26).

Secretary IIII/IV in the Arteriosclerosis Center to type correspondence, medical consults, manuscripts and technical material; answer phones and inquiries; schedule appointments; perform related bookkeeping duties. Excellent typing and machine transcription skills, medical terminology, bookkeeping experience and knowledge of 3rd party billing required. B78-488 (8/3-488)

Secretary III/IV part-time, in Chimical Engineering to a faculty member: type manuscripts, correspondence; arrange travel; schedule appointments; transcribe machine dictation. Good organization, communication and typing skill required. Non-smoking office. 20 hrs./wk. B78-503 (829)

Secretary III/IV in the Center for Materials Science and Engineering Administrative Office. Will type budget materials, correspondence; answer phones; schedule meetings and appointments; compile reports; assist other secretary as necessary. Will also perform work related to special projects (preparation of directories, mailing lists, etc.). Typing skill, ability to handle a varying work load and to work as part of a team required. B78-459 (8/30).

Secretary IIII/IV in the Ocean Engineering Dept. to 2 faculty members and their research assistants to type correspondence, technical reports, proposals, class notes, etc.; xerox; file; arrange travel; monitor account expenditures; set up seminars and arrange for coffee and refreshments. Good secretarial skills required. Knowledge of MIT procedures and technical typing experience helpful. B78-490 (8/30).

Secretary III/IV to a number of faculty members in the Ocean Engineering Dept. to answer phones; maintain appointment calendars; arrange travel; xerox; type correspondence, reports, class notes; file. Good typing skills required, technical typing skill preferred. B78-485 (8/30).

Secretary III/IV for a senior faculty member in the Laboratory for Computer Science will type manuscripts and correspondence; arrange travel; manage a complex appointment calendar. Will also provide some support to a technical staff member. Some college training, and good typing required. B78-438 (8/16).

Secretary IIIIIV in the Office of Personnel Development to process applications for Tuition Assistance Plan; maintain files and college catalogue library; provide basic information about the Tuition Assistance Plan; type correspondence and reports. Good typing and organizational skills required as well as ability to work with figures and communicate effectively. Some general office experience necessary. Knowledge of MIT helpful. B78-336 (8/16).

Secretary III/IV in Food Services to screen calls and visitors; type correspondence, menus, reservations, notes, budgets; arrange meetings; schedule appointments; arrange travel; distribute office mail; compose some correspondence independently; file. Will also cost recipes and menus; obtain prices from purveyours; maintain accounting information. Good typing skill required. B78-136 (8/16).

Secretary IIII/IV to the Executive Director, Center for Energy Policy Research in the Energy Laboratory. Will type correspondence and reports; maintain files; arrange travel; handle all other general office procedures, as necessary. Good typing, English grammar and machine transcription skills required. Position may involve operation of word processing equipment for which selected applicant will be trained. At least 1 years' secretarial experience is necessary. B78-428 (8/16).

Secretary III in the Office of Facilities Management Systems to perform secretarial duties for OFMS as well as for the Property Office. Will type correspondence, reports, forms; handle clerical duties related to equipment data system; distribute property lists; prepare newspaper notices of surplus property; xerox and file; reconcile budget statements. High school training, I or more years' secretarial experience required. Good typing and machine transcription skills required. B78-472 (8/30).

Secretary III, temporary, in the Career Planning and Placement Office to be responsible for arranging company recruiting interviews; handle mail; collect and process home registry cards; develop and update foreign student directory; sort and file student sign-up cards; compile summer hiring lists; type schedules and lists. Accurate typing skill, ability to work effectively with a number of people, reliability and ability to work under pressure required. B78-473 (8/30).

Secretary III in the Ocean Engineering Dept. to two faculty members and several research staff members to type correspondence, class notes, proposals, reports, etc; file; xerox; arrange travel; schedule appointments; monitor accounts. Good typing skill required. Familiarity with office procedures helpful. B78-486 (8/30).

Secretary III in the Office of the Dean, School of Architecture and Planning to handle a full range of secretarial duties including the collection of statistics; greeting and assisting Office visitors; maintaining supplies; transcribing machine dictation and assisting in preparation for social functions. In addition to excellent secretarial skills, applicants should be able to manage several projects simultaneously. 878-495 (8/30)

Secretary III in the Sloan School Master's Program office to handle requests for information about the Program; answer phones; perform reception duties; perform secretarial duties for Associate Dean and Program Director. Good typing skill, telephone skills, flexibility and willingness to do a variety of tasks required. B78-423 (8/16).

Secretary III, part-time, in the Dean for Student Affairs Office to type; file; prepare checks; update records; answer telephones; xerox reports and minutes; handle mail; answer inquiries; schedule booths in Lobby 10. Good secretarial skills and excellent interpersonal skills required. 20 hrs./wk., flexible schedule. B78-441 (8/16).

Secretary/Receptionist III in Mathematics Headquarters Office to answer telephones, assist visitors and others with varied inquiries; sort mail; order and maintain supplies; prepare student payroll; provide general secretarial assistance to headquarters staff and faculty members. Excellent typing and organization skills required. Selected applicant will be trained in mathematical typing. B78-436 (8/16).

Lib. General Asst. III, part-time, in the Rotch Library, public service section to share responsibility for all functions of circulation desk (charging books, searching for missing items, recording statistics). Will also handle reserves duties (identifying, retrieving, processing material). Handle other general duties including filing in card catalog. Applicants must have the ability to effectively assist users, and to identify bibliographic resources in card catalog and other sources. Typing skill also necessary. Position is for 30 hrs./wk., with a work schedule primarily in evenings and on weekends. 11 month/year position. B78-435 (8/30).

Clerk Typist IV in the Resource Planning and Development Office to complete Bi-Weekly Adjustment Report; obtain and distribute payroll checks; occasionally handle payments, purchase orders; handle mail; act as key operator for xerox machine; perform reception duties; answer phones; maintain supplies; file. Excellent typing, filing and organizational skills and ability to handle several assignments at a time required. B78-474 (8/30).

Clerk IV, proofreader/publications coordinator, in the Development Office, Resource Planning, to proofread a wide variety of material; process requests for publications and assure that adequate supplies are on hand; assist administrators with typing, filing. Strong organization skill as well as typing and proofreading ability required. B78-475 (8/30).

Sr. Clerk IV in the Medical Department's Dental Clinic to maintain active and inactive patient records; prepare financial and statistical summaries; prepare patient billing and answer related patient inquiries; process insurance and other forms; type reports and correspondence; provide support for clinic/receptionist. Good typing and organization skills, the ability to handle detailed work required. Office experience preferred. 37.5 hrs./wk. B78-432 (8/16).

Sr. Clerk IV in the Alumni Records Office to perform data verification; process alumni fund contributions and matching company gifts; add new alumni to rolls; process mail. Good typing skill, the ability to work with accuracy and under occasional pressure required. B78-440 (8/16).

Tech. Asst. IV to assist in laboratory research in the Biology Dept. Will prepare tissue culture media; use analytical balance; sterilize by filtration; sterile-dispense serum and culture medium under supervision of staff member. Previous related laboratory experience required. High school graduation adn at least 1-2 years collegelevel biology or life science courses preferred. B78-451 (8/16)

Clerk/Typist IV in the Resource Planning Office to operate a Mag Card II system for typing proposals, case statement and other specialized material. Previous Mag Card II experience, good typing and organizational skills, and ability to work under deadline pressures required. Attention to detail and ability to work independently with minimal supervision also necessary. B78-143.

Clerk III in the Registrar's Office to assist in the registration of students; assist in maintaining student records; úse record keeping computer terminals; type form letters; file. Typing skill, facility with detailed work and accuracy with figures required. College training or working experience in a college environment is desirable. B78-464 (8/30).

Clerk Typist/Receptionist III, part-time, in the Naval Science Dept. to answer phones; greet visitors; answer student inquiries; type; maintain records and files; maintain master computer data file. Good typing and interpersonal skills, ability to

Sea Grant Presents Plan To Redevelop Lynn Harbor

(Continued from page 1) of Civil Engineering, found that a balanced land-use package incorporating industry, port facilities, recreational, commercial and residential uses, would make best use of the Lynn waterfront's diverse qualities.

The report suggests several redevelopment options, including creation of a special harbor district, construction of a marina, and exploitation of the benefits of federal programs such as the recently adopted Coastal Zone Management Act.

The Sea Grant report also includes a set of 21 specific recommendations for official city positions on land use and development of the harbor district. Successful implementation of many of the suggestions requires cooperation of several community groups-a factor that may ensure public discussion and participation in the redevelopment effort.

The group suggests that to improve long-term harbor water quality, the city should continue to separate the sewage discharge system from storm drainage and

Hudson Named In Student Aid

Stanley G. Hudson of Wellesley, associate director of the Undergraduate Research Opportunities

Program (UROP) since 1974, has been appointed associate director of the Student Financial Aid Office. Announcement of the appointment, which becomes effective September Mr. Hudson



6, was made by Jack H. Frailey, di-

rector of the office. A native of Wakefield, Mr. Hudson received the BA degree in psychology from Springfield College in 1967 and the MA degree in student personnel administration from Columbia University Teachers College in 1968.

After working part-time in college counselling and grant administration, Mr. Hudson was a Peace Corps volunteer in Korea. He returned to complete the MBA degree at the University of Chicago before coming to MIT.

Mr. Hudson is a member of the American College Personnel and Guidance Association, the American Personnel and Guidance Association and the Society for Field Experience Education.

He and his wife have two children and are former house directors at Dana Hall School.

set priorities and flexibility required, as well as familiarity with keypunching. High school graduation also required, secretarial school or equivalent work experience preferred. 20 hrs./wk. M-F, 9-1. B78-462 (8/30).

Receptionist III in the Center for International Studies to answer phones and inquiries; take messages; sort mail; route phone calls; forward mail; address and stuff envelopes; greet visitors; type. Typing skill and good interpersonal skills required. B78-492 (8/30).

Service Asst. III in the Sloan School coffee room to make coffee and collect money. Must be able to handle money with accuracy and to deal with the public. 14 hrs./wk. (Wed. and Fri.) B78-496 (8/30).

Asst Computer Operator III. in Administrative Computing Services to operate IBM 370/148, DOS and VSI, and EAM, perform all preoperational, operational and post operational duties; detect errors, and take corrective action, as necessary. At least 3 month's experience in operation of above equipment required. 40 hrs./wk. B78-498 (8/30).

Sr. Clerk/Receptionist III in the Office of Personnel Services to share responsibility for providing information to applicants and others on job status, specifications, and application procedures; assist specincations, and application procedures, assist-individuals in completing applications; handle a substantial amount of personal and telephone con-tact concerning employment and other matters process and route resumes. Perform a variety of other clerical duties as required. Will be trained to other certain duties as required. Win of tailine to operate word processing equipment. Typing skill, the ability to attend to many demands simultaneously and to clearly explain procedures and other information to others required. Office experience, preferably in a public service capacity is also necessary. Some college training helpful. B78-396 (8/16).

Clerk III in the Registrar's Office to assist in registration of students, maintenance of students' permanent records; use record-keeping computer terminals; file; type form letters; assist students. skill, facility with detailed work required.

Sr. Clerk III in the Office of Personnel Services to prepare forms to hire new employees or to record

take short-term steps, such as screening, to decrease the overflow in the north harbor, where the least tidal flushing occurs. The city should encourage intensive use of waterfront sites to increase tax revenues and employment, the report says, and should also encourage water-dependent uses of waterfront land, "specifically those uses requiring boat access."

Although the harborfront is a physical backdrop for the city, it is cut off from the town center by the Lynnway. The report says the city should "seek to establish public access along the water's edge of north harbor properties." Currently, there are two points of public access-at the Metropolitan District Commission Pier and at the municipal landing on Blossom Street. However, both points are removed from residential areas and downtown, and do not attract many users to the water's edge.

The report also suggests that the city encourage public use and enjoyment of waterfront areas by increasing public recreational space, and by taking measures to enhance the image of the harbor as a "place," referring to the diversity of activities, such as recreational boating, commercial shipping, and wharf activity, which make waterfront areas visually attractive and stimulating places to

Banning uses that are not waterdependent and planning activities to draw people to the waterfront, the report says, would help Lynn residents become more aware of the harbor.

The report, including a proposed work program for some of the tasks necessary to begin harbor improvements, will be used by the citizens of Lynn for use in current planning and development schemes, and by people interested in the problems of planning similar coastal urban areas.

The study was sponsored by the MIT Sea Grant Program, through the National Oceanic and Atmospheric Administration's Office of

LIS Occupies **New Quarters**

The Lowell Institute School, a denizen of Building 5 since the 1930s, has moved to the Ford Building (Rm. E19-734).

The rapidly growing curriculum and enrollment of LIS, which offers low-cost evening instruction in technical subjects, overcame the space available in the Pratt Building, necessitating the move to larger quarters.

Registration deadline for submitting applications for the fall term is Friday, Sept. 1.

change in status of current employees; answer telephone inquiries; perform special duties related to salary review process and other projects as necessary. Typing skill, ability to handle detailed work with accuracy required. Applicants should be high school graduate or equivalent and have at least 3 years' clerical experience. B78-452 (8/16).

Clerk III in the Resource Planning and Development Office, to maintain a variety of files and other records; maintain a sign-out system; post in-formation from correspondence onto work cards: maintain project boards and a control chart; may me related research duties. Excellent organization skills, the ability to handle confiden tial information with discretion required. Typing skill is also required. B78-454 (8/16).

Computer Operator III in the Center for Space Research will be responsible for acquisition of quick-loan data from the SAS-C X-ray astronomy statellite through use of NOVA minicomputer; operate 2 other computers to analyze satellite data. Will provide general assistance to duty scientist; file data assistance to duty scientist; file data; answer phones. Experience in computer operation required. Experience with NOVA preferred. 40 hr./wk., possibly including day/night shift red. 40 hr./wk., possibly rotation. B78-444 (8/16).

Sr. Clerk/Keypunch Operator III, temporary in the Office of Personnel Serivces to keypunch data; analyze and interpret data to determine input and resolve data problems. At least 3 years keypunch experience, preferably sombined with clerical duties, and ability to understand detailed procedures required. Ability to design program control cards desirable. Temp. for 2-4 months. B78-414 (8/16). B78-414 (8/16).

Service Asst. II. Part-Time, in Earth & Planetary Sciences to prepare tea and coffee; set up refreshments; run dishwasher; clean small kitchen and lounge; order supplies. Must be reliable and courteous. 15 hrs./wk., 2-5pm, M-F. Position is for academic year only, through May 1979. B78-458 (8/30).

Cashier II in the Food Service Dept, to check contract meals from master list; give and receive transfers from other units; maintain accurate accounting of each contract customer by meal; explain policies; answer inquiries. High school graduation preferred. Command of English language required. B78-482 (8/30).

Diet Aid II in the Clinical Research Center to be responsible for procedures used in preparing, weighing, cooking, and serving food for 10-15 patients on metabolic diets as well as regular diets; responsible for cleaning and sanitation practices in the kitchen and storage areas; handle dietician's duties in her absence. High school graduation re quired. Experience in food service preferred. B78-491 (8/30).

Hourly, Campus Patrol Officer, required 3-5 years experience in all phases of law enforcement (criminal law, court procedures, criminal investigation; report writing). Must obtain and maintain Emergency Medical Technician Certification. Must have successfully complete Police Academy training and must successfully complete any additional in-service training, must successfully complete any additional in-service training, must qualify with use of fire arms, maintain valid fire arms permit and valid drivers license. Additional requirements: security clearance, policy authority

and serving areas and other related duties as directed. Applicants must be able to read and speak English. Some experience working in kitchen hleptul. 40 hrs./wk., 11:30 am-8:30 pm, M-F. H78-

Hourly, Tech. B (Electronic), in the Center for Advanced Engineering Study to repair televisions, cameras, video decks and associated video production equipment and other related duties. Applicants should be graduates of 2-year day technical school, or equivalent. A knowledge of video waveforms, production, including audio, lighting, and portable remote setups is helpful. H78-137 (8/30).

Hourly, Asst. Animal Technician, in the Division of Laboratory of Animal Medicine to perform all duties involved in care of animals; work with various animals as assignments dictate; maintain, proper level of food and water; clean cages and trays; change bedding and/or litter; wash various apparatus related to animal care; monitor animals and notify supervisory of any changes. High school and notify supervisory of any changes. High school graduation required. Knowledge of and ability to

preferred. Wed.-Sun. H78-134 (8/30).

Hourly, Sr. Tech., in the Gas Turbine and Plasma Dynamics Laboratory of Aeronautics and Astronautics to be responsible for operation of transient wind tunnel including continual tunnel modification and construction of new mechanical experiments. Will work from verbal instructions and minimal sketches. Will work with students and supervise other personnel. Graduation from a 2-year day technical school, or its equivalent, and at least 5 years' applicable experience required. Extremely strong mechanical background required, including expertise with machine tools, welding, brazing and assembly. Selected applicant will be required to get Mass. State Blasting Perwill be required to get Mass. State Blasting Permit. H78-95 (8/30).

Hourly, Audio Visual Operator B to set up, operate and maintain all types of slide and motion picture equipment; clean, inspect and repair slides and films; maintain department record of equipment and films; drive motor vehicle; pick up and deliver

Hourly, Waiter/Waitress in the Faculty Club to Hourly, Watter/Waitress in the Faculty Club to take members' orders; pick up food in kitchen and serve to members; clear and reset tables and perform other duties relating to dining room service. Applicants must be at least 18 years of age, and able to speak and read English. 20 hrs./wk., 11 AM-3. PM, Mon.-Fri. with some weekend shifts possible. H78-127, H78-128 (8/16).

A78-20, Admin. Staff, Alumni Association (5/3) A78-22, Admin. Staff, Student Financial Aid Office. (5/10)

A78-27, Admin. Staff, Auditor, Audit Division A78-30, Admin. Staff, Design Manager, MIT

Press (6/7) A78-44, Admin. Staff, Industrial Liaison Officer

B78-165, Sr. Accg. Clerk IV, Sloan School (7/26) B78-166, Sec. III/IV, Student Financial Aid Of-

arms permit and valid drivers license. Additional requirements: security clearance, policy authority warrant under Chapter 147 10-G and the ability to pass Institute physical exam. 40 hrs./wk. Permanent shift assigned based on seniroity. Position includes long hours occasionally. H78-136 (8/30).

Hourly, Pot Washer, in the Food Service to clean all wares and equipment in the pot washing area, and to clean area floors and refrigeration units. Will also be responsible for daily cleaning of dining

Hourly, Tech. B (Electronic), in the Center for Ad-

work with animals also required, as well as wil-lingness to partake in AALAS seminars and train-ing programs. 1-2 years' animal care experience preferred. Wed.-Sun. H78-134 (8/30).

material and equipment; perform other duties as necessary. A minimum of 4 years applicable experience required. An unrestricted Mass. license, commercial driving experience, and ability to pass special driver's medical exam also necessary. H78-115 (8/16).

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

ADMINISTRATIVE STAFF: A77-3, Systems Programmer, Information Processing Serv. (2/16)

A77-86, Systems Programmer, Information Processing Serv. (1/11) A78-14, Asst. Dir., MIT Associates Program

BIWEEKLY:

HWEERLY: B77-655, Sec. IV, Chemical Engineering (11/16) B78-44, Sec. IV, Civil Engineering (1/18) B78-129, Sec. IV, Biology (4/12) B78-139, Sec. IV, Physics (7/12) B78-143, Clk./Typist IV, Resource Planning Of-

B78-154, Sec. III/IV, Lab for Nuclear Science

(7/26) B78-160, Sec. IV, Center for Policy Alternatives

B78-169, Sec. III/V, Student Financial And Office (4/19)
B78-167, III/IV, Mechanical Engineering (4/26)
B78-178, Sec. IV, Provost's Office (4/26)
B78-185, Account Rep. V, Administrative Com-

puter Serv. (4/26)

puter Serv. (4/26)
B78-226, Library Asst. III, Part-time, Center for
Policy Alternatives Library (5/31)
B78-275, Sec. IV, Harvard-MIT Division of
Health Sciences & Techn'y (6/7)
B78-282, Sec. IV, Part-Time, Humanities (6/14)

B78-293, Sec. IV, Medical Dept. (6/21)

B78-302, Sec. IV, Resource Development (7/12) B78-306, Sec. IV, Research Laboratory of Electronics (7/12) B78-314, Sec. IV, Libraries (7/12) B78-315, Sr. Clk. IV, Resource Planning (7/12) B78-317, Sec. IV, Center for Transportation Studies (7/12) B78-318 Sec. IV, Machanical Engineering (7/12)

tudies (7/12)
B78-318, Sec. IV, Mechanical Engineering (7/12)
B78-326, Sec. IV, Division for Study & Research
1 Education (7/12)
B78-328, Sec. IV, Humanities (8/16)
B78-329, Sec. IV, Part-time, Medical Dept.

B78-338, Clerk III, part-time, Comptroller's Ac-

cg. Office (7/26)
B78-343, Secretary IV, Energy Lab (7/26)
B78-345, Sec. IV. Linguistics & Philosophy
Dept. (8/16)
B78-349, Editorial Asst. IV, Center for Transpor-

tation Studies (7/26)

B78-357, Sec. IV, Aero/Astro Dept. (8/16)
B78-358, Sec. IV, Lab. for Computer Science

3/16) B78-359, Sec. III/IV, Nuclear Engineering (8/16) B78-371, Sec. IV/Admin. Asst. V, Provost's Of-B78-374, Sec. III/IV, Center for Cancer Research

(8/16) B78-380, Tech. Asst. V, Division of Lab. Animal Medicine (8/16)

ledicine (8/16) B78-382, Sec. V, Physics (8/16) B78-387, Sec. IV, Material Science & Engineer-

B78-392, Sec. IV, Division for Study & Research In Education (8/16)

ACADEMIC STAFF:

ACADEMIC STAFF: C78-5, Asst. Eng. Librarian, Engineering Library (4/5)
C78-6, Asst. Eng. Librarian, Engineering Library (4/5)
C78-9, Asst. Science Librarian, Libraries (4/19)
C78-12, Acad. Staff, Technical Instructor, Mechanical Engineering (6/7)
C78-14, Acad. Staff, Librarian, Part-Time, Libraries Exchange & Gifts Sections (5/10).
C78-15, Acad. Staff, Technical Associate, Biology (5/31)
C78-17, Acad. Staff, Research Associate (7/12)
C78-18, Acad. Staff, Nurse Practitioner/Physician Asst. (7/12)

cian Asst. (7/12) Acad. Staff, Archival/Manuscript C78-19.

C78-19, Acad. Staff, Archival/Manuscript Specialist, Libraries (7/12) C78-20, Acad. Staff, Archival/Manuscript Specialist, Libraries (7/12) C78-21, Acad. Staff, Archival/Manuscript Specialist, Libraries (7/12) C78-22, Acad. Staff, Asst. Librarian, Libraries

E77-54, Exempt, Eng. Asst., Center for Material E77-56, Estimator/Scheduler, Physical Plant

E78-19, Eng. Asst., Earth & PLanetary Science

E78-19, Eng. (5/3)
E78-24, Exempt, Food Production Supervisor, Food Service (6/7)
E78-27, Exempt, Admin. Asst., Libraries, Microreproduction Lab (6/14)

E78-35, Exempt, Tech. Supervisor, Physical Plant/Telecommunications Dept. (8/16)
E78-36, Exempt, Principal Operator, Physical Plant (8/16) Plant (8/16)

H77-89, HVAC, Designer/Draftsperson, Physical Plant (10/5) H78-23, Machinist A, Nutrition & Food Science

H78-64, Sr. Technician, National Magnet aboratory (5/31) H78-99, Sheet Metal Worker, Physical Plant H78-100, H78-101, Painter, Physical Plant (7/26) H78-103, Engineer, Third Class, Physical Plant

H78-106, Sr. Technician Electronic, National Magnet Lab. (8/16)

SPONSORED RESEARCH STAFF:

R77-53, Spons. Res. Staff, Res. Lab. of Electronics (4/12) R77-79, Postdoc. Res., Physics, Lab. for Nuclear cience (5/4)
R77-91, Sr. Accelerator Physicist, Lab. for

Nucelar Science (5/18) R77-97, Chemical Engineer, Energy Laboratory R77-112, Spons. Res. Staff, National Magnet

Lab. (8/16) R77-137, Experimental Physicist, Bates Linear Accelerator (8/31) R77-161, Elec. Engineer, Mechanical Engineer-

R77-201, Prog./Data Analyst, Earth & Planetary R77-209, Res. Scientist, Energy Laboratory

(11/30)
R77-211, Computer systems Design, Lab. for Computer Science (12/7)
R77-212, Prog. Language Design, Lab. for Computer Science (12/7)
R77-213, Computer Software Design, Lab. for Computer Science (12/7)
R77-221, Spons. Res. Staff, Nutrition & Food Science (7/26)
R77-228, Plasma Physicist, Res. Lab. of Electronics (1/4)
R77-220, Computer Software Designer Lab for R77-220, Computer Software Designer Lab for

R77:230, Computer Software Designer, Lab. for computer Science (1/11) R78-18, Theoretical Physicist, Lab. for Nuclear

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

R78-20, Theoretical Physicist, Lab. for Nuclear Science (2/22) R78-21, Theoretical Physicist, Lab. for Nuclear

R78-22. Theoretical Physicist, Lab. for Nuclear R78-28, Theoretical Physicist, Lab. for Nuclear

Science (2/22) R78-55, Staff Scientist, Arteriosclerosis Center R78-58. Spons. Res. Staff. National Magnet Laboratory (4/12)

R78-60, Combusion Engineer, Energy Lab (4/12) R78-64, Spons, Res. Staff, Earth & Planetary Science (4/12) R78-68, International Energy Economist, Energy

Laboratory (4/12) R78-70, Energy Analyst, Energy Laboratory

(4/12) R78-73, Computer Programmer, Energy Laboratory (5/10) R78-79, Spons, Res, Staff, Mechanical Engineer

(4/19)
R78-81, Spons. Res. Staff, Lab. for Nuclear Science (4/19)
R78-82, Spons. Res. Staff, Lab. for Nuclear Science (4/19)
R78-83, Spons. Res. Staff, Lab. for Nuclear Science (4/19)
R78-84, Spons. Res. Staff, Lab. for Nuclear Science (4/19)

R78-84, Spons. Res. Staff, Lab. for Nuclear Science (4/19)

Technical Asst., Nutrition & Food cience (4/19) R78-93, Res. Engineer, Civil Engineering Dept

(5/10) R78-101, Spons. Res. Staff, Lab. for Nuclear R78-102, Spons. Res. Staff, Lab. for Nuclear Science (5/31)

R78-103, Spons. Res. Staff, Lab. for Nuclear Science (5/31) R78-104, Physicist, Temp., Lab. for Nuclear Science (6/7) R78-105, Physicist, Temp., Lab. for Nuclear

Science (5/31)

Science (5/31)
R78-108, Programmer, Temp., Res. Lab. of Electronics (5/31)
R78-110, Spons. Res. Staff, Part-Time, Sea-Grant College Program (5/31)
R78-113, Spons. Res. Staff, Sloan School of Managment (7/12)
R78-117, Spons. Res. Staff, Temp., Economics Dept. (7/12)

R78-117, Spons. Res. Staff, Temp., Economics Dept. (7/12)
R78-119, Theoretical Plasma Physicist, National Magnet Laboratory (7/12)
R78-120, Spons. Res. Staff, National Magnet Laboratory (7/12)
R78-122, Spons. Res. Staff, Electrical Systems Laboratory (7/12)
R78-123, Spons. Res. Staff, Electrical Systems Laboratory (7/12)
R78-124, Spons. Res. Staff, Electrical Systems Laboratory (7/12)
R78-125, Spons. Res. Staff, Electrical Systems Laboratory (7/12)
R78-126, Spons. Res. Staff, Electrical Systems Laboratory (7/12)
R78-128, Programmer, Center for Space Research (7/12)

Programmer, Center for Space R78-131, Spons. Res. Staff, Programmer, Sloan School (7/26)

R78-133, Spons. Res. Staff, Sr. Microwave Systems Engineer, Natl. Magnet Lab. (7/26) R78-134, Spons. Res. Staff, Research Lab. of Electronics (7/26) R78-135, Spons. Res. Staff, Research Lab. of Electronics (7/26)

R78-136, Spons. Res. Staff, Lab. for Computer Science (8/16)

Science (8/16)
R78-141, Spons. Res. Staff, Biology (8/16)
R78-142, Spons. Res. Staff, Asst. to Director,
Sloan School (8/16)
R78-145, Spons. Res. Staff, Electronics
Engineer, Lab for Nuclear Science (8/16)
R78-146, Spons. Res. Staff, Electrical Engineer,

R78-146, Spons. Res. Staff, Electrical Engineer, Bates Linear Accelerator (8/16) R78-147, Spons. Res. Staff, Systems Program-mer, Lab. for Nuclear Science (8/16) R78-148, Spons. Res. Staff, Organic Chemist, National Magnet Laboratory (8/16)

The following positions have been FILLED since the last issue of *Tech Talk*: B78-344 Admin. Asst. V A78-39 Admin. Staff

Admin. Asst. V B78-369 B78-245 Sec. IV Sec. IV
Spons. Res. Staff
Sec. IV
Asst. Editor IV
Sec. IV
Sec. IV
Hourly, Technician B
Hourly, Technician A
Sec. IV
Cashier III
Sec. IV
Accg. Clerk IV B78-233 H78-92 B78-393 Accg. Clerk IV B78-327 Spons. Res. Staff
Sec. III/IV (part-time)
Spons. Res. Staff
Sec. III/IV
Clerk IV R78-69 Clerk IV Clerk IV
Hourly, Lab. Asst.
Sec. IV
Sec. IV
Clerk IV
Lib. Asst. III B78-381 Computer Op. III Computer Op. III Sec. IV (part-time) B78-443 B78-238 Admin. I Sr. Clerk IV Tech. Asst. IV Sec. IV B78-419 Exempt, Admin. Asst.

The following positions
HOLD pending final decision:
Hourly, Custodian following positions have been placed on Hourly, Custodian Hourly, Custodian

Hourly, Tech. B Sec. IV Sec. IV (part-time) Sec. IV

Hourly, Custodian Hourly, Custodian Hourly, Custodian Hourly, Custodian

Hourly, Custodian Hourly, Custodian

Sr. Clerk IV Sr. Clerk IV

Admin. Asst.

Administrative Staff

H78-91

B78-402 B78-476 B78-403

B78-417

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