

MIT to Establish First Regional Cell Culture Center

A major facility to grow and supply virus and mammalian cell cultures to biomedical researchers throughout the Boston area will be established at MIT with a \$403,200 grant just received from the National Science Foundation.

Principal investigator for the facility will be Professor Phillips W. Robbins of the MIT Department of Biology. When in operation, the facility is expected to become a prototype for similar regional cell culture centers which may be established elsewhere in the country.

Biomedical researchers frequently require large amounts of living cells for basic biological research as well as for the study of disease, Dr. Robbins said. Such cultures are difficult and expensive to grow—often too expensive for smaller research operations.

Also, Dr. Robbins said, scientists growing large numbers of cells may often be able to combine their experiments, each using a specific portion of one cell culture.

For these reasons, plus the quality control a central professionally-run central facility

would offer, many researchers feel that a large-scale culture facility would greatly aid their work.

The MIT cell culture facility will be able to grow large amounts of many kinds of cells for research projects, at little or no cost to the scientist.

The facility will also provide an opportunity for research on new techniques of growing large-scale cell cultures for biomedical research. MIT scientists Dr. Daniel Wang and Dr. William Thilly of the Department of

Nutrition and Food Science, plan such work in the new facility.

Among the initial users of the facility will be the departments of biology and nutrition at MIT, Massachusetts General Hospital, Harvard University, and the newly-established Cancer Research Center on the MIT campus.

The facility will be located in the same building as the MIT Cancer Research Center, occupying the major part of one floor in the Center's building. It will contain equipment for growing cells and separating their components,

within a suite of laboratories especially designed to exclude contaminants and to contain the organisms.

The facility will be run by a director versed in the techniques of growing cell cultures, and will be staffed by trained technical assistants and other support personnel.

An operating committee composed of scientists from MIT and other Boston-based institutions will oversee use of the facility. The first operating committee will be
(Continued on page 8)

Future of Beef

Samuelson Foresees Price Increases,
Cites Worldwide Shortage, Affluence

MIT Economist Paul A. Samuelson believes beef prices will go even higher this winter following the lifting of the government's price freeze.

Some observers have said present high prices are caused by cattle producers holding animals off the market until the freeze ends Sept. 12. They expect lower prices when supplies increase.

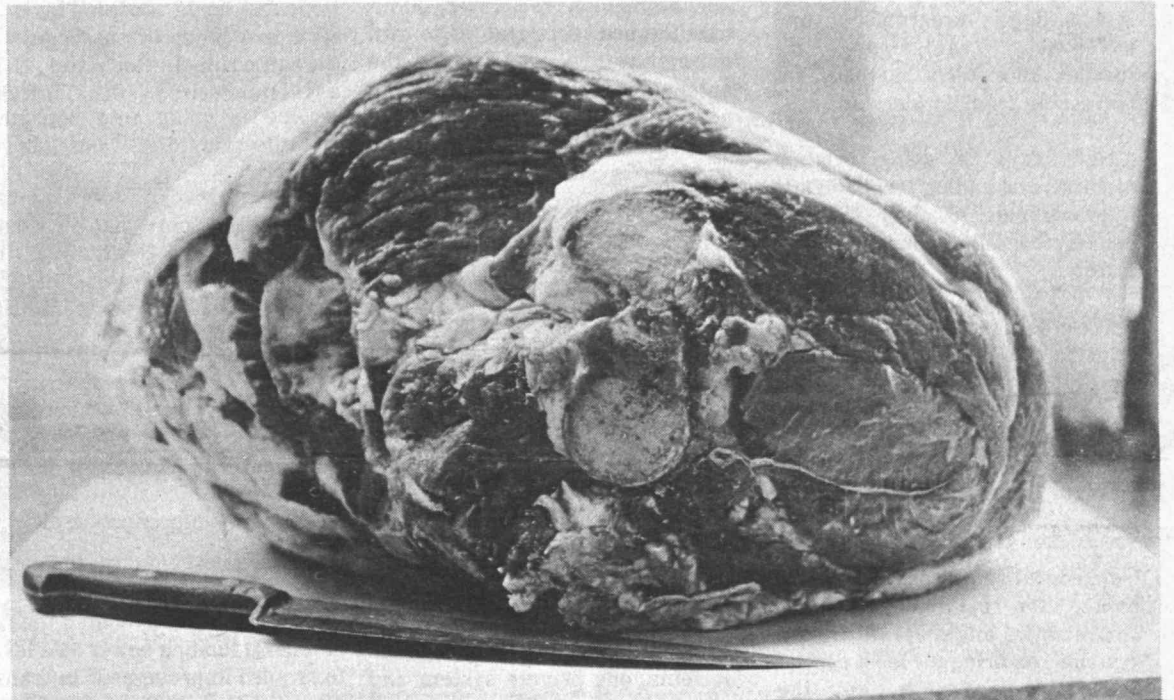
Professor Samuelson, expanding on a weekend television interview (WKBG-TV), said the government may be forced by present shortages to end the price freeze before the scheduled Sept. 12 deadline.

If the government can hold out until the scheduled deadline, the backlog of cattle in the supply chain could be large enough to produce a temporary lowering of prices when the price freeze ends.

But bargains will be short-lived.

There is a real shortage of beef in this country and abroad, Professor Samuelson says. The backlog of cattle withheld pending an end to the freeze will not meet demand. Thus prices will go up.

The world wide shortage of beef—Japanese department stores have taken to selling beef in "gift packages" at \$12 to \$16 a pound—is due as
(Continued on page 8)



RARE SIGHT?—That's what beef may be soon, says MIT economist Paul A. Samuelson. But as for now, this 65-pound chunk, carved into "steamship

rounds" and served Wednesday night by the Institute dining service, will satisfy hundreds of appetites.
—Photo by Susan Pogany

Program Aims to Breed 'New Generations of Edisons'

Students at MIT will attempt to tread the entrepreneurial paths of famed innovators of the past under the stimulus of a new 1.1 million-dollar program funded by the National Science Foundation (NSF).

To help produce new generations of Edisons, Fords, and Wrights, in a university environment, MIT will provide its

students an electrified atmosphere in which to conceive, develop and distribute new products to a worldwide market.

The program, funded for five years by NSF, will develop a sequence of courses called "Socio-Technological Innovation Seminars," and an operation facility called the "Innovation Co-op."

Group discussion sessions and

other methods of fostering innovative ideas in technology, marketing, financing and other related fields will be featured in the courses. The aim of the courses is to produce working models of actual products with market potential.

Outstanding student proposals will be selected by the co-op under the guidance of experienced

industrialists to receive the final professional push for pilot production. If all goes well the matured product will be licensed out to existing industries or to new spinoff industries.

In addition to academic recognition, tangible contributions by students will be rewarded with an incentive program yet to be devised—perhaps rewards, prizes

or royalties. The incentive program, it is hoped, will inspire more activities in socio-technological innovation among the students, faculty, and other members of the community.

An evaluation system will be devised to accompany the main program.

The program, originated by the
(Continued on page 8)

MIT Center to Guide US Transport Research

MIT's Center for Transportation Studies has been awarded a \$105,500 grant by the National Science Foundation (NSF) to help guide the NSF and other federal agencies in identifying needs for basic transportation research.

Under the grant, six teams of researchers from the center will make a major assessment of the country's transportation problems as well as the knowledge available and needed to solve them. The study represents the first such investigation—involving transportation—funded under NSF's program of Research Applied to National Needs.

The MIT teams will include researchers from the School of Engineering and the Departments of Architecture, Urban Studies

and Planning, Economics, Political Science and the Alfred P. Sloan School of Management—all of which are members of the center. Director of the project will be Dr. Robert W. Simpson, professor of aeronautics and astronautics, and a member of the steering committee for the center.

The interdisciplinary teams will include experts on different modes of travel. Team specialties will be in one of six areas of transportation: intercity passenger, intercity freight, urban passenger, urban freight, international passenger, and international freight.

Each team will assess the problems in its particular area by reviewing the history of transportation, forecasting its future, and

studying the effects of transportation policy.

The teams will also report on the state of knowledge in each area, the need for new research tools, and long-term research projects that could be most effective in solving transportation problems.

Finally, the MIT teams will combine their findings and rank the identified problems according to national importance, ease of solution, time and cost involved, and other factors. Their final report will also develop possible guidelines and strategies for NSF, the Department of Transportation, and other agencies to use in funding basic transportation research.

According to Dr. Simpson, the NSF grant will not only lead to better knowledge of transportation

research needs, but will encourage communication among the various experts in the MIT Center for Transportation Studies. The Center was formed in the fall of 1972 to coordinate the transport-related activities going on throughout the Institute.

"One of our needs is to develop multidisciplinary 'renaissance men' to create new understanding of our transportation problems," said Dr. Simpson.

"Transportation plays a pervasive role in the economic and cultural sectors of our society," he said. "The transportation industry employs one out of five persons in this country, and involves one-fifth of our Gross National Product.

"The form of our cities and the industrial locations and population
(Continued on page 2)

Inside:

An MIT urban transport expert tells Congressmen that cities need a mix of public transit and automobiles. Story Page 2.

Limited "Dial-a-Bus" system is rolling in Rochester, N.Y. Story on Page 2.

Edgerton expedition will search for the "cheesebox on a raft"—the ironclad Monitor, first of many ships of her type. See Page 3.

An MIT student was the first person on the scene of the recent Delta airliner crash at Logan airport. He recounts his experience on Page 8.

Cities Need Auto-Transit Mix, Congressmen Told

Public transportation can be a valuable means to increase the quality of urban life, but it should not totally replace the automobile in the central city, says urban transport expert Dr. Daniel Roos, associate professor of civil engineering at MIT.

In testimony Monday, July 30, before the Subcommittee on Urban Transportation of the House Committee on Banking and Currency in Washington, D.C., Dr. Roos asserted that the automobile and public transportation could complement each other in urban areas.

Dr. Roos, representing MIT's Energy Laboratory and the Center for Transportation Studies, made a number of other points in his testimony on "Energy Implications of Public Transportation Systems":

—The integration of all transportation systems in a given area is vital to efficient transit to reduce wasteful duplication.

—Imaginative scheduling, public information programs, and advertising campaigns are feasible short-term methods for increasing transit ridership.

—New ways of using existing facilities and adding technological improvements to older systems can be of significant help in aiding transit.

—The cost of mass transit is not as important to the consumer as the quality of service.

—The federal government should use its mass transit funding as a lever to improve and rationalize outmoded transit systems.

—If federal funding is limited to money for capital purchases, communities might opt for transit systems requiring the most capital outlay, in order to get the maximum amount of federal money.

—Although energy savings from use of mass transit instead of the automobile are significant, they are secondary to the advantages of lower pollution, higher mobility, improved land-use, and lower congestion in urban areas.

In advocating both automobile and public transit use in urban areas, Dr. Roos noted that the automobile has greatly changed

travel patterns in the city. Although radial trips into and out of the city once predominated, they are being replaced with "reverse" commuting, circumferential commuting, and a more general diversity of trips throughout metropolitan areas.

Thus, he said, it is questionable whether people should be convinced to give up automobile use in urban areas.

Instead, said Dr. Roos, public transit should be used to provide

ride bus systems should also be tried," said Dr. Roos. For instance, an exclusive busway on the Shirley highway (south of Washington,

D.C.) provides a travel time of 14 minutes by bus, as compared with 37 minutes by car. As a result, the market share of buses has increased from 20 percent of all passengers to more than 50 percent.

The computer could be a significant force in improving existing transportation, Dr. Roos

"American transit is an anachronism, a system designed in the 19th century trying without success to serve a 20th century society. American transit has done little to evolve from a position of modal supremacy, which it once held, to one of modal complementarity, and as a result, currently languishes in a role of modal deficiency."

While the federal government should require improvement of service as a prerequisite for

changing urban development patterns."

The energy savings from mass transit, though important, are by no means the major reason for its use, said Dr. Roos, citing a recent study by the Department of Transportation.

"Shifting 50 percent of all urban commuters to buses would produce only a 2 percent savings in transportation fuel requirements. In contrast, a shift of 50 percent of urban commuters to car pools would result in a 6 percent savings. A major lifestyle change such as substitution of video-phones for all transportation trips would produce a savings of 40 percent."

Dr. Roos pointed out that an automobile carrying a single person has a net efficiency of ten to 20 passenger-miles per gallon, compared with efficiencies of 100 or more for buses or trains. However, he said, as more people ride in a car, its net propulsion efficiency quickly approaches, and in certain cases surpasses, that of public transit.

"Shifts from auto to transit would, of course, be highly desirable, but the major positive impacts would not be related to energy, but rather in terms of social benefits through increased mobility, improved land utilization, decreases in congestion, pollution, etc.

"Urban transportation represents considerably more than the simple movement of people. Rather, it represents a dominant instrument of urban and economic development, social change and the quality of life," Dr. Roos told the congressmen.

Blackham to Speak

Anne Blackham, chairwoman of the Governor's Commission on the Status of Women, will speak at the meeting of the Women's Forum at Lincoln Laboratory on Tuesday, August 14. The meeting will be held at noon in Room A-166, Lincoln Laboratory.

Dial-a-Ride Buses Rolling in Rochester, N. Y.

As of last Monday, citizens of Rochester, N.Y., can pick up their telephones, dial a number, and request a radio-dispatched mini-bus to pick them up at their door and deliver them to their destination, making slight detours to service other passengers.

Customers using such a system can feasibly get almost taxi-like service for almost bus-like fares. This latest in a series of "Dial-a-Ride" systems around the country was developed by the Rochester

Regional Transportation Authority in consultation with Professor Daniel Roos and Assistant Professor Nigel Wilson of MIT's civil engineering department.

The seven mini-buses initially put into service in Rochester can carry as many as 25 passengers, but they represent only the beginning. If the system is successful, more buses will be added, and the engineers will introduce a computer to sort out the bus routes. The Dial-a-Ride can thus become much larger, and at the same time, more efficient.

mobility to those without access to an automobile, reduce or eliminate the need for families to own more than one car, replace the automobile during congested peak hours, and decrease the number of automobile miles through "park-and-ride" systems.

Existing facilities could be greatly improved by advertising campaigns, flexible scheduling, and marketing programs to provide special services, said Dr. Roos. But such short-term improvements should be accompanied by efforts to integrate the entire system.

"For example, the San Francisco area is served by a total of eighteen discrete transit operations, including three major transit systems with overlapping service areas, a commuter rail line, two private commuter bus services, four public suburban bus systems, one private system and airport limousine, jitney, taxi and ferry service," he said.

"Promising new ideas such as exclusive busways and park-and-

said. Computerized dispatching of taxicabs could enable taxis to service a group of passengers on the same ride. In Rochester, N.Y., a computerized "Dial-a-Ride" service is going into operation soon, he said. (See box, above.)

Although transit ridership can be increased somewhat by lowering prices, Dr. Roos told the committee members that research has shown definite limits to the increase achieved by this means.

Relative patronage increases are far less than the relative fare reductions, he said, and people have shown that they are far more concerned with the quality of service.

Dr. Roos also advocated the use of federal funding power as a lever to require improvement in transit systems. He said that unrestricted subsidy of transit operations has merit, but is not sufficient to produce better transit.

federal funding, it should not establish general requirements for all cities, he said.

"A good solution for one area is a poor solution for other areas," he said. "The government should require each urban area to formulate an action program specifying positive steps it will initiate to qualify for operating subsidies."

Dr. Roos also cautioned against limiting federal funding to spending for capital equipment. Some communities might, for instance, build capital-intensive rail lines where they are inappropriate, he said.

"A viable operating assistance program, however, would enable many urban areas to utilize less capital-intensive operations that make more sense for their needs. Many non-capital-intensive options can be implemented relatively quickly and have the flexibility to adapt to today's

MIT Transport Center to Guide US Research

(Continued from page 1)
distributions of our nations are determined to a large extent by the availability and quality of transportation services."

Team leaders for the project will be Dr. Simpson (International Passenger); Dr. Paul O. Roberts, professor of mechanical engineering and director of the center (Intercity Freight, Urban Freight);

Dr. Rene H. Miller, professor and head of the Department of Aeronautics and Astronautics (Intercity Passenger); Dr. Ralph Gakenheimer, associate professor in the Department of Urban Studies and Planning (Urban Passenger); and Dr. Ernst G. Frankel, professor of ocean engineering (International Freight).

1973 American Tennis Tourney to Draw Top Players

The American Tennis Association's 1973 National Championships will be played on MIT courts Aug. 13 through Aug. 18.

The finals competition on Saturday, Aug. 18, will be televised live in the Boston area by WGBH-TV (Channel 2), which will feed tapes to the Public Broadcasting System (PBS) for rebroadcast nationwide. Bud Collins will do the television commentary, assisted by former ATA player Althea Gibson. Arthur Ashe will also be on hand on Saturday. Court-side seating for 2,000 spectators will be available.

The tournament is being hosted by the Sportmen's Tennis Club of Boston and sponsored by Pepsi-Cola. This is the 57th year of the tournament and the second year the competition has been played at MIT.

MIT's role in the tournament has been expanded this year through the efforts of James C. Allison, Jr., assistant to the president and chancellor for minority affairs, who is currently on leave from the Institute.

Many of the players, their families and friends—approximately 400 people—will be housed on campus, primarily in Baker, Burton, and MacGregor Houses. In addition, many of the social events that comprise a large part of the week-long tournament will take place on campus. They include a cocktail party on Sunday, Aug. 12, a buffet supper on the following Monday, and various parties.

On Tuesday, Aug. 14, the MIT Admissions Office will hold an open house in the Bush Room (10-105) for potential applicants to the Institute and those interested in college admissions in general. John A. Mims, Assistant Director of Admissions, will be present to answer questions about minority admissions and financial aid.

The American Tennis Association was founded in 1916 by blacks who wished to provide other blacks an opportunity to participate in organized, competitive tennis. The first national tournament was held in Baltimore in 1917 and has been an annual event since then.

Both the ATA and the US Lawn Tennis Association adopted a policy of integration in 1940 when Donald Budge and Jimmy McDaniel played an interracial match in New York City.

Top-ranking amateur tennis players from across the country will be at MIT for the competition. Scheduled events include singles and doubles matches for all age groups ranging from the seniors' division to youth.

During the tournament all West Campus courts will be unavailable to the MIT community, but Walker courts will be open throughout this period. The MIT community is encouraged to attend the free-admission competition. Tourney information may be obtained from Randolph Burton in the Office for Minority Affairs, ext. 3-4941, who is handling coordination of the tournament.

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Please address all news and comment to the editorial office, Room 5-111, Ext. 3-3277.

Edgerton Expedition to Search for Sunken *Monitor*

MIT's Doc Edgerton is going fishing—for a cheese box on a raft.

The USS *Monitor*, the Union ironclad that helped revolutionize naval warfare during the Civil War, is the target of an Aug. 14-31 sea-going expedition that will utilize a side-scan sonar developed by Harold E. Edgerton, Institute Professor emeritus.

The expedition, supported by the National Geographic Society, is headed by John G. Newton, marine superintendent of the Duke University Marine Laboratory's Oceanographic Program, and includes Robert E. Sheridan, University of Delaware professor, and Gordon P. Watts of

the North Carolina state department of art, culture and history.

Dr. Edgerton hopes the side-scan sonar will pinpoint the *Monitor's* location beneath the treacherous waters off North Carolina's Cape Hatteras where the vessel sank nearly 111 years ago, nine months after the historic encounter with the Confederate ironclad *Virginia*, the former Union ship *Merrimac*.

(Whether historians were influenced by alliteration or Yankee chauvinism can be argued, but the fact remains that the Confederate navy called its ship the *Virginia*, not the *Merrimac*. The Union vessel *Merrimac* was burned when US forces left

Norfolk in April 1861. The Confederates salvaged the hull, turned it into an ironclad and renamed the vessel the *Virginia*.)

The search will be made from the research vessel *Eastward*.

It was the *Monitor's* silhouette—freeboards less than two feet high, a flat expanse of deck, a revolving, two-gun turret—that gave rise to the cheese-box-on-a-raft nickname and that will distinguish its sonar image from other wrecks.

Unfortunately, it was a silhouette as unseaworthy as it was unique.

Under tow on Dec. 30, 1862, by the sidewheel steamer USS *Rhode Island*, the *Monitor* foundered and sank during a

gale. Sixteen members of the 65-man crew were lost.

Although the deck log of the *Rhode Island* put the location of sinking as two miles north of outer Diamond Shoals or 15 miles due east of Hatteras lighthouse, the exact site has remained unsettled because the dangerous waters are a graveyard of ships. At least eight hulls are thought to be located within a five-mile radius in water ranging from 70 to 102 feet deep.

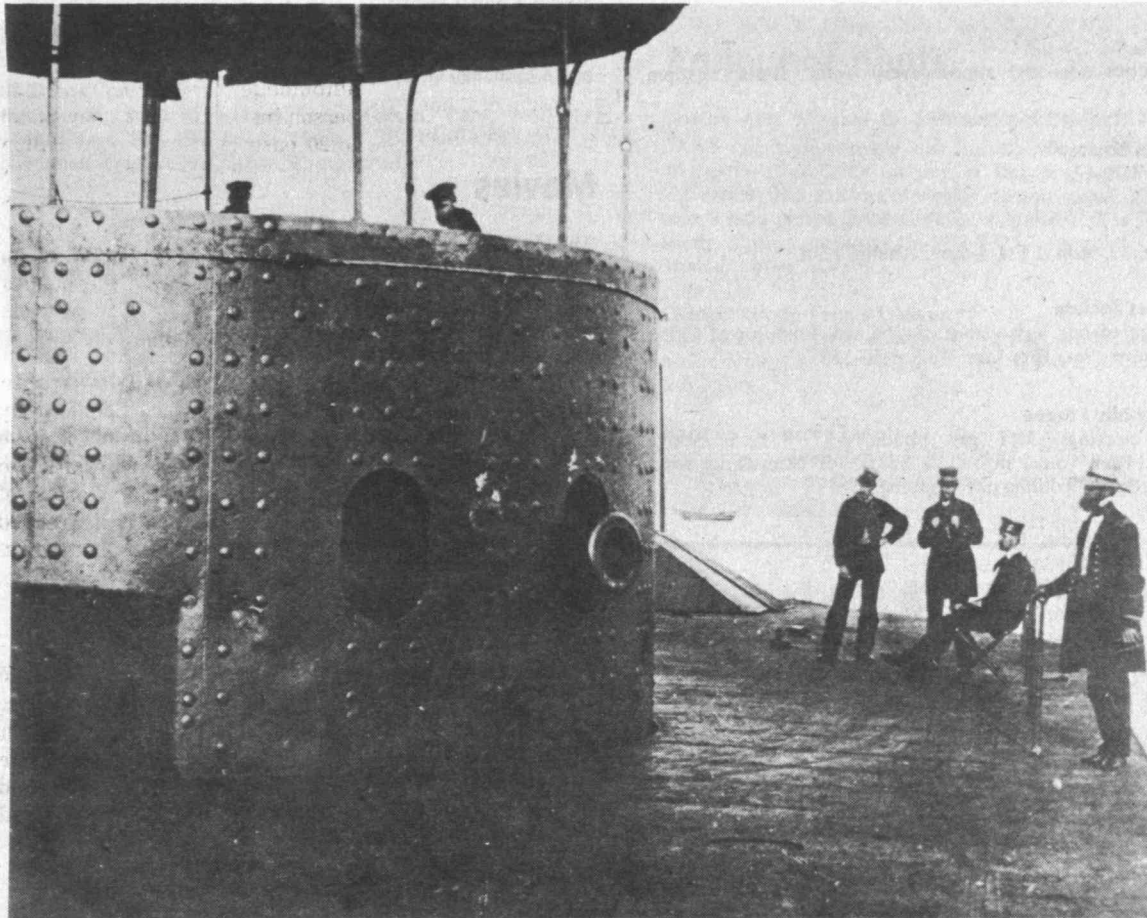
None of them, however, looks like a cheese box on a raft and the side-scan sonar's ability to "draw" an outline of underwater objects is expected to narrow the possible locations to two or three. Divers then will be called in for a closer look.

Dr. Edgerton, 70, best known for his research that transformed the stroboscope from a scientific curiosity into an important tool that made ultra high-speed photography possible, some years ago extended his interests to short-pulse sonar instruments which he designs, builds and uses to chart underwater phenomena

usefulness of the contents of her hull, which would provide a time-capsule of the mid-nineteenth century.

"The examination of the USS *Monitor* can provide us with much information unavailable elsewhere. Because the vessel was abandoned intact and has remained outside the grasp of would-be salvors or souvenir hunters, it will provide an uncontaminated and undisturbed example of shipboard life on a class of vessels of which it alone survives to represent. The USS *Monitor* is not only the best representative of a class of vessels which revolutionized warfare at sea; she is the prototype revolving-turret vessel.

"Historical records indicate that the *Monitor* contained over 40 patentable innovations which, for reasons of expedience, were not applied for during the period of her construction. As designer-inventor John Ericsson was required to complete the vessel from keel up within 90 days, we can assume that there were many



The *Monitor*, showing scars and dents from her historic battle with the Confederate ironclad *Virginia*, in a photograph taken after the encounter

on March 9, 1862. From the booklet, "Monitors of the US Navy: 1861-1937," in the Hart Nautical Museum files.

The *Monitor* sank because serious design defects compromised watertight integrity and made her unseaworthy.

Yet the design survived, says MIT's Harold E. Edgerton, because the Secretary of the Navy's office suppressed suggestions for improving seaworthiness.

The result: As recently as 1957 river gunboats of the *Monitor* type were being used in the U.S.S.R. and Rumania.

the world over.

In addition, with support from the National Geographic Society, Dr. Edgerton pioneered in developing electronic flash equipment and cameras capable of making pictures miles beneath the sea.

"The significance of locating the wreck of the *Monitor*," Dr. Edgerton said, "lies in her pivotal role in the naval history of the Civil War and her value as a prototype. Also of great importance is the related historical

details and alterations which cannot be found in the existing construction records," Dr. Edgerton said.

The expedition has another goal, this one geological.

Using essentially the same investigative tools as in the hunt for the *Monitor*, Professor Sheridan will conduct a geomorphic study of a unique ridge and trough on the continental shelf south of Hatteras Inlet.

The study may provide information from which the origin of similar features on the Atlantic Shelf could be generalized.

3 PERFORMANCES

Players Will Present *The Soldier's Tale*

The MIT Community Players will present three performances of Igor Stravinsky's *The Soldier's Tale* this Friday and Saturday evenings at the Little Theater in Kresge Auditorium.

There will be one performance Friday starting at 8:30pm and two performances Saturday—the first starting at 7pm and the second at 9:30pm. Tickets, at \$2.50, will be available at the door or by reservation (253-4720 or 253-2311).

Besides the Stravinsky tale, the program will include a companion piece, *Facade*—a reading of poetry by Edith Sitwell with background music composed by the English composer, William Walton.

The Stravinsky production, directed by Jeffrey A. Meldman, is one of the most ambitious undertaken by the MIT group. It combines interludes of dance, narrative, dialogue and music to portray the story of a soldier who sells his violin—and his soul—to the devil. A highlight will be three dances by the soldier and his princess—the recently revived tango, an old-fashioned waltz and the Stravinsky version of ragtime. Dancing the soldier will be Christopher Peterson, and dancing the princess will be Susan Steinberg.

The Community Players, who usually confine their productions to more conventional drama, decided on *The Soldier's Tale* to utilize the variety of talent at their disposal.

Director Meldman, an instructor in electrical engineering at MIT, brings a strong dramatic background to the production and has previously served as faculty advisor to the Institute's Musical Theatre Guild. Christopher N. Blair will conduct the small chamber orchestra in the Stravinsky score. Blair is a student both at MIT—where he is studying acoustics in the mechanical engineering department—and at the New England Conservatory of

Music. Judy Williams of the Movement Laboratory in Boston choreographed the show.

MITCP includes people from all parts of the Institute, except undergraduates who have their own drama workshop. The group has been presenting plays for over 40 years, originally organized under the auspices of the MIT Matrons as the Drama Club.

MITCP presents three major shows a year and two smaller workshop productions. Scheduled for this winter is Henrik Ibsen's *The Doll House*.

Catalogue Out In New Format

Volume I, Number 1 of a new publication, *Courses and Degree Programs*, has just been published and is now being distributed to all continuing students and faculty and staff at the Institute.

The 360-page book supercedes *Descriptions of Subjects* and is designed to serve the needs of currently registered students more efficiently by providing all academic information they need for registration.

Courses and Degree Programs will be an adjunct to the *General Catalogue*, as was its predecessor.

Open House

Members of the Institute community are invited to attend the open house at the first apartment building to be completed in MIT's Housing Program in Cambridge. The open house will be held Thursday, August 9 from 2:30 to 6:30pm at the Hamilton Street complex, located between Brookline and Pearl Streets with the front entrance on Erie Street.



LET IT BEE! This swarm of bees appeared in a tree outside the third floor of building 20B last week and hung around for five days, long enough to be photographed by Mary Anne Barnett, of Watertown, a photographer for the Research Laboratory of Electronics, who took the picture with a 300mm lens about 20 feet away.

THE INSTITUTE CALENDAR

August 8
through
August 17

Community Meetings

Women's Forum

Meetings and discussions. Mondays, 12n, Great Court, if raining - Bush Rm, 10-105.

Lincoln Laboratory Women's Forum

Ann Blackham, chairwoman of the Governors' Commission on the Status of Women, will speak at a general forum meeting, Tues, Aug 14, 12n, Rm A-166.

MIT Silver and Quarter Century Clubs

Annual steer roast banquet. Open to all members of the Clubs, retired members of the Clubs, retired members of the community, and their spouses. Thurs, Aug. 16, 5:30pm, Kresge Plaza (if rain - Sala de Puerto Rico). Reservations, Bob Radocchia, x3-7914.

SCEP

Summer meetings cancelled. First meeting in fall: Wed, Sept 19, 7:30pm, W20-400.

Course Evaluation**

Sponsored by TCA & SCEP. Come and help out. For info, call Robert, 494-8889 evgs, or lve msg at TCA, W20-450, x3-4885.

MIT Club Notes and Meetings

Bridge Club

ACBL Duplicate Bridge. Thurs, 6pm, Stu Ctr Rm 473. IMP-scored team games, (similar to rubber bridge scoring). Call Jeff, x3-5285 or 864-5571.

Chinese Choral Society***

Singing, every Sun, 3-6pm, W20-473.

MIT Chinese Student's Club*

CSC softball practice, every Sat, 2pm, Briggs Field. Refreshments. All are welcome.

Classical Guitar Society

Classes, group or private. Mon & Thurs, 5-8pm; Sat, 8am-12n; Rm 1-132, 134, 136. Vo Ta Han, 494-8353.

Goju Karate Club*

Open to the Cambridge Community. Mon, Thurs, 7-9pm, Stu Ctr Rm 407. Call 253-2018.

Hobby Shop

Mon-Thur, summer term, 12n-5pm, Rm W31-031. Fees: \$10/term for students; \$15/term for community. Call x3-4343.

Kung Fu Club**

Northern Praying Mantis. Tues, Thurs, 7-9pm, T-Club Lounge. For info, H.C. Wong, 876-5071.

MIT/DL Duplicate Bridge Club**

Tues, 6pm, Student Center Rm 473. Call Jeff, x3-5285 or 864-5571.

Outing Club*

Every Mon & Thurs, 5-6pm, W20-461.

Rugby Club**

Informal practice sessions: almost every Tues, Thurs, 5:30pm, Briggs Field.

Science Fiction Society*

Fri, 6pm, Rm W20-421.

Scuba Club**

Compressor hours, Mon & Fri, 4-6pm, Alumni Pool.

Strategic Games Society

Come try some of our new games: Star Lord, Emperor of China, Feudal, & Acquire. Sat, 1pm-1am, Walker 50-318.

Student Homophile League

No summer meetings. MIT gay phone, 492-7871, is active, Sun-Thurs, 8-11pm, (most nights aft 12m), for counseling, social activity info, help in "coming out" rapping.

Student Information Processing Board Meeting*

Mon, 7:30pm, Rm 39-200.

Tech Squares*

Western style square dancing. Tues, 8-11pm, Sala de Puerto Rico, Beginner's Dance, Tuesday, Aug. 21. Come and try it. Admission: \$1, first time free.

Tiddlywinks Association*

Tues, 7-11pm, St Ctr Rm 407.

MIT Wheelman**

All aspects of bicycles and bicycling discussed, events planned, advice and help given. Thurs, 7:30pm, Rm 1-203. Call Harry, x3-2384.

Social Events

Summer Coffee House*

The MIT 24-Hour Coffee House has re-opened as a 12-Hour Coffee House for the summer. *Inexpensive food, candy, and non-alcoholic drinks are sold.* Relax, games, read. Open: daily, 3pm-3am, center lge, 2nd fl, Stu Ctr.

Friday Afternoon Club**

Music, conversation and all the cold draft you can drink. Fri, 6pm, the Thirsty Ear, Ashdown basement. Admission: \$1 men, 50 cents women. Must be over 18.

Muddy Charles Pub**

Join your friends for music, beer, wine, snacks, conversation at the Muddy Charles Pub, 110 Walker. Hours: Mon-Fri, 11:30am-2pm and 4-8pm; call GSC, x3-2195.

Movies

The Monitors

LSC. Fri, Aug 10, Rm 10-250. Admission 50 cents. No ID's.

The Nanny

LSC. Fri, Aug 17, 7:30pm, Rm 10-250. Admission 50 cents, no ID's.

Triple Mandarin Movie Feature

CSC presents: The Blade Spares None, Call of the Mountains, Magic Bowl. Sat, Aug 18, 6pm, Kresge. Tickets: \$2 adults; \$1 children; members free with membership card.

CLASSIFIED ADS

Ads are limited to one per person per issue and may not be repeated in successive issues. All ads must be accompanied by full name and Institute extension. Only Institute extensions may be listed. Members of the community who have no extensions may submit ads by coming in person to the Tech Talk office, Room 5-111, and presenting Institute identification. Ads may be telephoned to Ext. 3-3270 or mailed to room 5-105. **Please submit all ads before noon, Friday, Aug 10.**

For Sale, Etc.

Crib, \$20; car seat, \$7, infant, \$1.50; baby, child & maternity clothes; other baby items. Sein-Ming Mau, x3-3757.

Ricoh twin reflex camera/eastpho flash, \$35; Olivetti port typewr, \$40; 20" Generalaire fan, \$8; twin bed, \$15; work bench, \$15; \$5 ea for iron, board/cover; lace up ski boots, man's sz 7, woman's sz 9, cubco bindings, wood skis, lamp, \$6; hamper, \$2. Jhara, 491-0334 or x3-6849.

Dr. set w/tbl, 4 chrs, china cab, buffet, \$40 or best; sgl bed, gd cond, Henry, x3-5872.

Pr of Carrymore bike carrier bags, blk canvas side bags for lug carrier, used season, 11 1/2 x 11 1/2 x 4 1/2 w/2 1/2 x 2 1/2 x 10 outside pocket on ea bag, orig \$19, ask \$12.50. Ralph, x7508Linc.

Sgl box spring & matt, brass head board, \$50. Allen, x3-7906.

Kng sz water bed frame, \$25 or best. Judy, x3-6101.

Big zapper 2ft high, 14" diameter, 15 watt blacklight orig \$60. Guy, x5597Linc.

Easy elect dryer, lk new, auto & timed cycles, all fabrics & temps, inc vent kit, \$90. Mike, x7735.

Hellicrafters S-107, short wave recvr, 6 yrs old, gd cond, \$35. 547-9446.

Moving sale: refrig, frost free, orig \$310, now \$215; dish wash, orig \$190, now \$120; a c, orig \$150, now \$75; hand mower w/catcher, orig \$67, now \$30 - all exc cond. Ira, x3-5879.

Men's 26" bike, 3 spd, exc cond, exc 2nd gear slips, \$25. Mike, x7436Linc.

Tent camper, Trade Winds Catalina, full equip, hard top, slps 6-7, hardly used, plastic cover still on cushions, in Bedford, \$995. x7451Linc.

Bureau, 6 drw w/mirror, \$25; sgl bed, gd cond, \$15. Rhonda, x3-7271.

Upright piano, exc cond, new keys & hammers, \$100. Sue, x3-5679.

Frostfree refrig; gas dryer; 9x12 oriental rug; 25 yds of red carpeting, console sewing mach; formica top K cabinet; blk onyx pedestal tbl. Glenn, x8-3584 Draper.

Twin upholstered gold head boards, exc cond, \$25. Al, x149Linc.

Crib, \$15; dbl bed, \$10; baby bkpack carrier, \$10, all gd cond, Guy, x5597Linc.

Healthways campack, scuba back pack & scuba flag & mast, best offer. Anita, x3-2049.

Pr girls' bike trainers, 10", 14", best. Pat, x8-2004 Draper.

Dbl bed, box spring, matt, exc cond, \$40. John, x3-1878.

Slpng bag, 70"x31" w/zippered carrying case, \$5. Carol, x359 Linc.

Car roof rack, adjustable, \$15 or best. Ted, 354-5814.

Rug, 9x12, bl green shag, \$100; bureaus, \$7, \$10; blue DR sofa, \$200; desk, \$25; straw chr, \$3; butterfly chr, \$12; Scott stereo, \$200. Charlotte Gilson, x3-1632.

Heathkit HP-13B, Mobile SSB pwr supply, \$50; New-Tronics Hustler Mobile resonators, 40, 20, and 15 meters, \$25. Steve, x3-2083.

Admiral a c, 4 yrs old, \$50 or best, Dynaco preamp, \$40; KLH Tuner, \$75. Les, 354-0807 evgs til 9pm.

Brwn dresser, \$75; bkcase/headboard for king-queen sz bed, \$70; wood panel cupboard w/sliding doors, \$40; K tbl w/formica top, \$50; 5 kitchen chrs, swivel, padded, \$25; bolster pillows, covers, and spread fo; Hollywood bed, \$10; 13 cinder blocks for \$5; shower curtain, mat, rug, \$5; pr lamps, \$20; lame, \$5; Muriel, 391-6583 or x8-2896 Draper.

Moving sale: beaut wooden Lr set, 2 chrs, couch, coffee tbl, 6 mos new, \$150; lgt frame couch, yr old, \$15; dining tbl, \$10; bedroom set, dbl bed w/2 dressers w/mirror, \$60. Jim, x3-7519.

Women's 3 spd Raleigh b-ke, barely used, \$45 or best. 354-3497.

Coldspot refrig, gd cond, \$50; GE gas dryer, exc cond, \$75; 23" blk & wht, UHF-VHF TV, \$30. Nelson, x3-5738.

Sgl bed w/cast iron frame, gd cond, make offer. Jules, 353-0220.

Bedroom suite, Lane, 4 piece Qu sz, head and foot boards, men's 5 drw dresser w/mirror, women's 6 drw dresser, bedside tble, box spring and matt spread incl, \$275; Fedders a c, 1800 BTU, 3 yrs old, \$140. Call x3-4868 or 495-2262.

Gerard turntbl SL72B w/cart-80c-230, \$60 or best. Van, x3-6784.

Queen sz bed, \$65; Dr tbl w/4 chrs, \$40; 2 chrs, \$3; bk shelves, \$4; desk lamp, \$1; bike, yr old, 3 spd, \$45. Pierre, x3-4670 or 494-9274.

Gibson refrig, 2 dr, 18 cu ft, 3 yrs old, lk new, \$150; crib w/matt, beaut all maple, orig \$100, now \$25; serviceable old baby carriage, gd cond, \$10. Ron, x3-5781.

Bedroom set, \$25; steel wardrobe, broom closet; odds and ends. Gene, x3-5848.

Bike, women's, 3 spd, exc cond, \$40; Fabiano hiking boots, sz 10, \$15. Wayne, x3-2445.

Tektronix 513-D oscilloscope, needs wk, \$100; Hellicrafters S-36 AmFm rcvr 28 MHz-145 MHz, perhaps 25 yrs old, \$25; voltage reg... tor pwr supplier 250 V, 100MA, \$10; dio amps 7-10 watt, \$4 ea. George, x3-5827.

Sears 3KW alternator 110-220v w/25 hrs, sm desk, chest of drws, car seat, stroller, changing tbl, 2 new blue & wht handmade appalachian quilts. Dave, x8-3584 Draper.

Ac, 12000 BTU, \$120; arm chr, match sofa, blue, \$35; port stereo in leather case, \$18; rug, 9 x 12, blue, \$15; rug, 9 x 12, brwn, \$10, both rugs have pads; 2 slp bags, \$4 ea; port hair dryer, \$7; elect roller kit, \$9; stand lamp w/tbl, \$5 and other things. Moshe, x3-2784.

Twin bed, yr old, exc cond, \$45; wood desk w/3 drws, formica top, \$15. Jerry, x3-2380.

Broiler oven, Blk Angus Petite, \$12. Peter, x3-3139.

Concord 550 4tr stereo tape recdr, w/sound on sound & trans a track recording, VU meters, digital counter, 2 mikes and separated spkrs, v gd cond, \$130. Joseph, x3-3835 or x3-7764.

B&W TV, pole lamp, LR set, sofa, tbl, chr, lamp, sm K tbl, old trunk, Steve, 489-3411.

Beaut Mason upright piano w/bench, \$299 or best; electronic programmable music box, "Muse", \$149. Carpets, like new, 8x10, red & blk, \$39 and 9' x 6' orange, \$19. Richard, x3-6028 It afternoons.

Wardrobe closet, \$10; chrome glass top end tbl, \$25; hot tray, \$2. Susan, x3-1738.

Baby furniture, \$23; pressure cooker, \$20; bureau, \$15; leather chr, \$9; floor lamp, \$10. Sigrun, 666-2545.

Pr TDC 4 spkrs, 5 mos old, gd cond, \$110 or best. Marcia, x3-5150.

Raleigh 10 spd Touring bike, center pull brks, unused cond; inexpensive wood skis w/poles. Bill Beebee, x8-3661 Draper.

Lg dresser w/mirror, desk, solid rock maple, \$100 for all. Linda, x8-3555.

Pr Sears DynaGlas, XST, sz F-78-14, snos, studded, exc cond, almost new, \$50. Greg, x3-4781.

Sofa and refrig. Call 926-4799 evgs.

Old bedroom set, \$25; steel wardrobe, steel broom cabinet; odds & ends. Miriam, 327-8742 evgs.

Boat, 8ft fibergl, 3hsp Johnson mtr, \$95. Bart, x8-4098 Draper.

Free TV Zenith, port, wks but weak picture. Dave, x7670Linc.

Pr new glass belted wht wall tires, j78-14 orig \$80, now \$50, month old. X3-1805.

Vehicles

'61 Plym Valiant, auto, \$150. Chris, x3-2139.

'62 Mercedes Benz 190c, 4 dr sedan, gd cond, '70 Plym Valiant, 4 dr sedan, 6 cyl, auto, pwr st, 30K, 50K/5yr warr, mint cond. Yates, x694 Linc.

'63 Pontiac, gd cond, \$200. Sheng-Tuar, x3-2420.

'63 Chevy Belair, auto, p st, ac and radio, everything works, gd body, runs well, \$200 or best. Z, x3-2559.

'64 Plym Valiant, red, 4 dr, exc cond - eng & tr, 99K, \$250. Nigel, x3-5046.

'65 Pontiac Le Mans, 4 new tires, gd cond, nds tune up and wk on clutch. \$50. Deirdre, x3-5744.

'65 Volvo 122S St wgn, gd cond, radio, 4 gd tires, 2 studded snos, lv country. Suzanne, x3-7119.

'65 Corvair, runs well, reliable, must sell immed, \$150. Margaret, x3-3745 or 494-9044.

'65 Dodge Dart sta wgn, 65K, some rust. Carol, 263-5597.

'65 Mustang, 2 ext tires, exc cond, orig owner, \$300. Adriana, x3-2160 or 864-7994.

'65 Ambassador, auto tr, pw st, radio, lks & runs gd, \$250. 729-7243 evgs.

'66 Saab 96, for parts, eng in exc cond, best. 237-1350.

'67 VW sedan, w/snos. Steve, 489-3411.

'67 Merc Cougar, auto tr, pw st & brk, snos, gd cond, best. Tom, x5325 Linc.

'67 Chevy wgn, 8 cycl, std tr, pwr st, new tires, \$495. Richard, x3-2838.

'67 BMW 1800TI, must sell, \$200. RAY, x3-6654.

'68 Triumph spfire, 42K, wire wheels, \$600. George, x8-3644 Draper.

'68 Plymouth Fury III, stand, auto, p st, snos, exc cond, \$600. Sasajima, x3-3109.

'69 Fiat 124 st wgn, eng gd, body fair, 57K, \$650 or best. Andy, x3-7010.

'69 Firebird, blue, new front end, gd cond, \$900. Manoug, x3-7467.

'69 Volvo, P-1800s, dark green, overdrive, new radials, lug rack, AM/FM, exc cond, \$2,100. James, 484-5139.

'69 Olds, 442, orig owner, exc cond, Hurst 4 spd, posi-traction, blue/blk vinyl roof, \$1,500 firm, Jack, x8-3528 Draper.

'70 Dodge Polara, p st & brk, 4 dr hd top, blue, read defroster, \$1,200 or best. Joel, x164 Linc.

'70 Pontiac La Mans V8, 65K, w/snos, \$1000. x3-6095.

'71 Saab 99-E, 4 dr, w/sunroof and AM/FM, best offer. Mark, x7856Linc.

'71 Karmann Ghia, convert, 10K, exc cond, best. Charles, x5750 Linc.

'71 BMW, 12K, exc run cond, best. Christine, x3-4132.

Music

Madrigal Singing**

Every Mon, 7:30pm, Rm 4-260. For info, call John Chandler, x3-1909.

Theater and Shows

L'Histoire du Soldat

The MIT Community Players presents Igor Stravinsky's "The Soldier's Tale," directed by Jeffrey Meldman, conducted by Chris Blair and choreographed by Judy Williams. Also "Facade" with poetry by Edith Sitwell spoken to music by William Walton. Fri, Aug 10, 8:30pm, Sat, Aug 11, 7pm and 9:30pm. Kresge Little Theatre. Tickets \$2.50 at door or reservations, 253-4720 or 253-2311.

Once Upon a Mattress

MIT Educational Studies Playhouse musical production, produced and directed by Francis E. A. Piatti, conducted by C. Edward Wischmeyer, choreography by Miki Lovett. Fri-Sat, Aug 10, 11, 8:30pm, St Ctr - Sala de Puerto Rico. Tickets: \$1.50 at door. Information call 253-4882.

Dance

Folk Dance Club*

International, Sun, 7:30-11pm, Sala. Balkan, Tues, 7:30-11pm, Student Center Rm 491. Israeli, Thurs, 7:30-11pm, Sala. Afternoon dance break, Fri, 12:30-1:30pm, Kresge Oval.

Exhibitions

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.

Music Library Exhibit

Pictorial Exhibition, Mozart's Opera the Magic Flute. Daily, Rm 14E-109.

Religious Services and Activities

The Chapel is open for private meditation from 7am to 11pm every day.

Christian Bible Discussion Group*

Thurs, 1pm, Rm 20B-031. Call Prof. Schimmel, x3-6739, or Ralph Burgess, x3-2415.

Islamic Society*

Prayers, Fri, 12:15pm, Kresge Rehearsal Rm B. Discussions on the Qur'anic interpretations of various aspects of life, Sun 10am-1pm, W20-473 & W Lge.

Roman Catholic Masses

Sun, 10am, Chapel.

United Christian Fellowship*

Summer meeting. Fellowship, singing, sharing, praying. Newcomers welcome. Thurs, 8pm, Westgate I, Rm 708.

Westgate I & II Bible Study

Wed, 8pm, Westgate I, apt 1202. For information, 494-8405 or 494-8778.

Announcements

Boston Area Seminar for International Students Needs Volunteers
BASIS needs dependable and friendly volunteers to meet and aid international students arriving at Logan, Aug 15-Sept 15. Prefer volunteers who can make weekly commitment. Short preliminary orientation period necessary for volunteers. For information, call Sandy Shriver, coordinator, 723-8225, afternoons, or MIT Foreign Student Office, x3-3795.

Change: Group Tennis Lessons

The following time changes for group tennis lessons have been made: **Mon thru Fri, Aug 6-10:** beg 12n & 5:15pm; intermed 4:15 & 6:15pm.

Maggie's Exercise Classes

Summer schedule: daily, 1-2pm, 5:15-6:15pm; east end small track, good weather, or DuPont Athletic Center. Must have athletic card.

Dining Service

Wed, Aug 8

Lunch: Shrimp Foo Yong over rice w/oriental sauce
Dinner: Summer picnic - Super Special Steamship Rounds cut to order.

Thurs, Aug 9

Lunch: Baked Meat Loaf w/gravy
Dinner: Roast Canadian Bacon w/fresh plum sauce

Fri, Aug 10

Lunch: French Fried Codfish Cakes w/tomato sauce
Dinner: Baked Turkey & biscuit

Mon, Aug 13

Lunch: Grilled Liver w/onions
Dinner: Roast Leg of Lamb w/mint jelly

Tues, Aug 14

Lunch: Chicken Pot Pie
Dinner: Ham Steak Hawaiian

Wed, Aug 15

Lunch: Egg Foo Yong w/rice & oriental sauce
Dinner: Spaghetti w/meat sauce, "All You Can Eat"

Thurs, Aug 16

Lunch: Gaucho Pot Pie
Dinner: Baked Turkey & biscuit

Fri, Aug 17

Lunch: French Fried Ocean Perch w/tartar sauce
Dinner: Grilled Chopped Beef Steak w/mushroom sauce.

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

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

Send notices for Aug 15 through Aug 24 to the Calendar Editor, Room 5-111, Ext. 3-3279, before noon Friday, Aug 10.

'72 Datsun 510 wgn, 4 spd, radials, & 2 mounted studded radial snos, radio, \$2,100; '68 Mustang, 6 cyl stand, radials & 2 mounted snos, no rust, \$600; 2 dr refrig, \$110, Kitchenaid dishwasher, \$90. Michel, x3-5330.

'72 Volvo 144E, fuel injection, AM/FM radio, 15.5K, \$2,900. Duncan, x8-1579 Draper.

'72 Yamaha 350cc, 1.7K, 4 mo old, w/helmet, lock & chain, tools, \$725. Lance, x8-3200 Draper.

'66 Yamaha 305cc runs gd, rec passed Mass inspect, \$275. Ann, x8-1147 Draper.

'69 Triumph 250mc, lo K, gd shape, \$370. Porter, x3-5857.

Housing

Arl, n T, 2nd fl of 2 family hse, newly renovated 5 Rms, 2 porches, 1/2 basement, pking for 2 cars, unheated \$200/mo, no pets. John, x8-4575. Draper

Boston, So End twm hse, 9/1-1/74, 3 story, comp furn, 3 Br, 2 1/2 B, all appliances, no pets, 1 child max, mature couple pref, ref & security deposit req, \$350 incl ht & util. Dr. Clark, x3-4488.

Burlington hse, 3 Br split, 5 min fr school, family rm, laudnry, lots of extras, \$38.9. Merrill, x8-1185 Draper.

Camb, condomium, charming 5 Rm, riverview, 2 Br, ext lg Lr w/frplc, \$45,000. Prof Huang, x3-4823.

Woburn duplex, 3 br, Lr, Dr-K, basement, avail 9/1, \$250 plus util. Anthony, x5802 Linc.

W Yarmouth, 3 Br, 5 min walk to warm water Seagull beach. Margaret, x3-5654.

Maine, n Ranglely, 3 Br hse, lux, contemp, on lg lk, wilderness area, superb view, all activities, canoe incl. Jeannie, x8-2577 Draper.

Mashpee Cape Cod, for rent or sale, new retirement home w/water view of Santuit lk. Paul, x7868 or 7803 Linc.

Summer cottage on Kezar lake, Me, priv beach, canoe, 18 hsp boat, nicely furn, lg screened porch, view of Wht Mount, slps 8. Rachel, x8-2285.

Animals

Elegant well behaved and friendly blk m. 1/2 siamese. John, 354-8170.

M & f siamese kittens, 8 wks, \$15. Coco, x3-5125.

M German Shepherd, 7 months, gd w/children, shots, \$10. Bill, x7750 Linc.

Free Great Dane (we think), puppy, fem, 6wks, brindle color, x3-4974.

Lost and Found

Found: Irish setter nr corner of Amherst & Wadsworth, Camb. Vicki, x3-2065.

Lost: Parker sterling silver ball-point pen, betw main building and St Ctr, 8/1/73. Lin, x3-6631.

Wanted

Refrig, gd cond, wl pay, \$20-35. Marie, x3-3487.

Used Grundig stenerette dictating machines, wkng cond, Chas, x3-4202.

Typists to join the Grad Student Council typing pool; rates: 50 cents per page for straight typing, 60 cents per p. technical typing. Toni, x3-2195 or GSC office, Rm 50-110.

Draper employee nds ride to and from Main and Lexington Strs or Chatham apts in Watertown, beg 9/1. Ann Marie, x8-3702 Draper.

Fem rmmte to shr w/3 others 8 Rm Brookline twnhse, frplc, own rm, n T, avail 9/1, \$95/mo. Marilyn, x3-6255.

Mercedes Benz, '70 or '71, 220, 230 or 250, 4 dr sedan, petrol eng, gd cond. Mr. Dahanukar, x9757 Dorm or lve mesg x3-2961.

Apt needed in Camb or environs, for long term rent, for profess woman, reas rent, start mid Aug. Sally, x3-3277.

Record Club of America member to enroll me as a new member. Steve, x3-6031.

Apt needed in Camb, 2 Br, for 2 fem (quiet, considerate & gd neighbors), n T, betw Harv Sq & Porter. Michelle, x3-7753.

Fem seeks fem rmmte for mod Brighton apt, 3 Br, 2 B, LR, K, pond, avail 9/1. \$118/mo. Joan, x3-3889.

Rmmte for fall sublet - Sept to mid/end Nov, own furn Br in quiet residential neighborhood, n BU bridge in Camb, v cheap. Lloyd, x3-2427 or x3-2285.

Carpool betw Acton & Linc Lab. James, x5440 Linc.

Lees' Real Estate, course text, or other gd study material for real estate salesman test. Beverly, x8-4101 Draper.

Edixk sgl lens reflex camera. Dave, x3-5121.

Sm Hoover wash mach, Margie, x8-4013 Draper.

Fem, 2, 23, looking for a 3rd for Som apt n Porter Sq, own rm, \$85 plus ht. Rochelle, x3-6344.

Fem rmmte to shr apt w/2 others, own rm, Brighton, \$85. Lorraine, x3-1601.

Binocular microscope for beg medical std, Brian, x3-5872.

Used pressure canner. Bob, x3-2593.

Babysitter, Camb area. Loretta, x3-2361 or 2362.

Someone to teach me to drive, have own car, pay nego. Parker, 494-8494.

Used trunks. Mathuros, x3-6794.

Gd fem tennis player to play mixed doubles, 3-4 times a week, 6-7pm. Chuck, x3-1836.

Rmmte for Walker St, Camb apt, beaut location and facilities, prefer cellist, other strings, woodwinds, brass players nd not apply. Al, x3-6944 or Steve, x3-2083.

Rider to San Fran, lve Aug 17, arrival 30 days later, short of S W, USA. Dennis, 547-9784.

Rmmte to share old hs in Winchester, quiet peaceful, 15 min to MIT. David, x8-1286.

Rider and/or renters of space in a U-Haul truck wanted for around 9/1 - goint to Ann Arbor and N. Chicago areas. Marshall, 354-3836 evgs til midnight.

Typing, general or thesis, reas rates. Jean, x3-2361.

Positions Available

The following positions are on Hold pending final decisions:

73-325-R Executive Officer-DSR Staff

73-479-R Assistant Director - Admin. Staff

73-508-R Assitant Director - Admin. Staff

73-675-R Accounting Assistant - Exempt

73-709-R Dental Hygienist - Exempt

73-619-R Accountant - Admin. Staff

The following positions have been filled since the last Tech Talk and are no longer available:

73-326-R Editorial Director - Admin. Staff

73-642-R Advertising Assistant - Exempt

73-662-R Administrative Assistant V

73519-R Senior Secretary V

73-672-A Sec/Admin. Assistant IV-V

73-342-R Secretary IV-V

73-577-R Dorm Manager - Exempt

73-639-R Assistant Loan Officer - Admin. Staff

73-673-A Admin. Asst./ Exempt P.T.

Employees at the institute should call their Personnel Officer for further information.

Virginia Bishop 3-1591

Mike Parr 3-4266

Phil Knight 3-4267
(Secretary - Priscilla Mah)

Sally Hansen 3-4275

Jack Newcomb 3-4269

Evelyn Perez 3-2928
(Secretary - Mary Ann Foti)

Dick Higham 3-4278

Pat Williams 3-1594

Claudia Liebesny 3-1595
(Secretary Dixie Chin)

New applicants should call the Personnel Office on extension 3-4251 to make appointments and confirm openings.

Special Assistant for Minority Affairs - Admin. Staff - the Special Assistant will advise the President and the Chancellor on minority matters and concerns. He or she will act as advocate for minority interests, with a particular concern for the well-being of minority members of the community - students, faculty, and employees. The Assistant will be expected to speak for the Institute on minority affairs and will be the principal official representative of the Institute to minority communities. Within the Institute the Assistant will be a member ex-officio of the Equal Opportunity Committee, the Administrative Council, and such other MIT groups as may be deemed desirable in order to carry out his or her responsibilities effectively. The Assistant will be a point of appeal for complaints of discrimination because of minority status, with a principal responsibility for the handling of charges of discrimination filed with MCAD, EEOC, HEW or other agency.

Qualifications must include an advanced degree or appropriate equivalent experience and concern with minority problems and interests, and interpersonal skills. It is expected that the Assistant will be familiar with university life and procedures, and will have demonstrated the qualities of judgment and communications skills required by the position. 73-646-R (7/11).

Administrative Staff member in Personnel Development Training Section will instruct employees in the areas of general typing, dictaphone transcription, basic education, and general office practices. Background and experience in tutoring and/or teaching adults helpful. Ability to prepare course plans, and to work independently important. Please submit resume. 73-611-R. (7/11).

Staff Recruiter (Admin. Staff) will report to the Employment Officer will be responsible for coordination of search for well-qualified persons to fill non-academic staff positions. Particular emphasis will be given to assisting laboratories, centers, and departments in fulfilling Affirmative Action Plans with respect to research staff openings. Person will work closely with Personnel Officers and departments in defining description of positions and qualifications required. Frequent travel will be expected. experience in Personnel and/or recruiting required. Technical background with degree in Engineering or Science preferred. Please submit resume. 73-643-A. (7/18).

Administrative Staff member will work in the area of resource development dealing with individual contributors. Develop strategies and programs, prepare reports, provide advice and counsel of a legal nature for resource development activity. Some travel required to represent MIT. Must have legal training and preferably some experience as a counselor in practice or a job situation utilizing legal training. Writing and organizational ability, motivation, enthusiasm required. 73-480-R. (5/30).

Administrative Staff Writer in Resource Planning will provide substantial writing support for resource development activities. Tasks will include preparation of proposals for major private donors, pamphlets supporting planned giving programs and correspondence. The position is sensitive and demanding. College graduate with previous writing experience and a sense of humor required. 73-452-A (7/11).

Director for Alumni Data Resources in the Alumni Association to provide analytical and planning support for the Association. Develop and implement improved systems for researching,

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codifying, storing, recalling and maintaining information on alumni re: their areas of MIT interest. Coordinate with the Corporation, Development office, other Institute offices and data processing group. Coordinate, develop, maintain performance and cost measurements, and statistical support data. Must relate easily to individuals in leadership positions; MIT degree recipient preferred. 73-670-R (7/18).

DSR Staff member will plan, manage, and execute high-quality research projects having a strongly experimental orientation. Familiarity and experience with low-speed flight and wind tunnel testing methods and advanced piloting qualification for particularly general aviation type aircraft; Ph.D in Aerodynamics and five years applicable research and development experience required. 73-488-A. (6/20).

Biochemist - DSR Staff member will participate in lipoprotein studies, and will supervise the activities of several technicians in a clinical research setting. Ph.D or MD in Biochemistry required, as well as experience with lipoprotein and supervising. 73-515-R.

Administrative Staff Project Officer will be principal staff administrator for major funding programs. May support very large campaign such as a building or two, or more smaller projects which are determined by Institute's priorities. Individual will work with Resource Development Office. Will arrange for solicitation visits, provide follow-up and coordinate all activities leading to completion of campaign. Person must have capacity for hard work, often under considerable pressure. Must be well organized and able to work easily with institutional and industrial leaders. Familiarity with MIT desirable 73-600-A. (6/27).

Micro Automation Systems Programmer - DSR Staff member will develop a PDP-10/PDP-11 operating system for the project; design and implement a computer operating system. Experience on the PDP-10 and PDP-11; as well as a background in automata theory is required. 73-512. (6/20).

Administrative Staff member will work with corporations to increase membership in Industrial Liaison Program and related areas. Identify prospective member companies, evolve solicitation strategy travel extensively and establish continuing relations with senior management of member companies. MIT graduate desirable with several years experience in marketing-related fields. Technical background helpful. Must relate easily to senior corporate management. 73-569-A. (6/20).

Administrative Staff - Associate in the Analytical Studies and Planning Group which provides staff support to the senior officers and to the Academic Council in the conduct of studies of academic and administrative programs, plans, and organization. The ASPG is a part of the Office of the President and the Chancellor and reports to the Vice President C.B. Simonides. Candidates for this position should have an educational background equivalent to graduate study, and/or working experience in such areas as management, program planning, analysis and evaluation. Systems analysis and computational background and skills would be especially helpful. Superior communication and writing skills are essential. This position offers very useful career preparation for senior responsibility in universities and other complex organizations. 73-461-R (5/30).

Administrative Staff Planner will direct long-range physical planning for the Institute; monitor and coordinate the various efforts of the planning team; develop budgets and schedule of events. Will act as liaison between government agencies and community groups. Must have a Masters degree in Planning and a minimum of 5 years experience. 73-535-R. (6/13).

Application Programmers - Admin. Staff the office of Administrative Information Systems is seeking two Application Programmers to take program specifications and translate them into an efficient computer program. The process includes the evaluation of specifications, flowcharting, coding, testing, debugging and final program documentation. Knowledge of IBM DOS ANS COBOL and/or PL/1. Knowledge of 360 Assembler Language desirable; experience with university accounting or teleprocessing applications helpful. 73-340-R/73-341-R. (5/1).

Systems Analyst - Admin. Staff for the office of Administrative Information Systems will design financial and/or administrative applications to be run on a medium-sized computer. Duties include making feasibility studies, system flowcharting, defining programming specifications, conducting system tests, implementation, documentation and client education. Experience in designing financial applications, teleprocessing applications,

data base management systems and a working knowledge of ANS, COBOL and/or PL/1 is desired. 73-330. (5/1).

Administrative Staff Programmer for the MIT Information Processing Center must have experience and thorough knowledge of large-scale, time-sharing computer system. PL/1 language, documentation and communication skills are necessary qualifications. The Users Services Group requires an individual who understands and is responsive to the needs of the Center's users. This person will be challenged in entering a new area of time-operation for this group which includes the following:

User Assistance - assisting users by providing programming information and debugging help and tracking down special problems.

User information - instructional documentation and conducting seminars, workshops, and other courses. 73-640-A (7/11).

DSR Staff member will perform chemical assays for enzyme and neurotransmitters. SM or MS degree in Chemistry required. 73-590-R. (6/27).

DSR Staff member in Civil Engineering will be administrator for active research group; responsible for fiscal management for research accounts, budgets, payrolls; will compile, edit, compose reports for lay audiences; prepare reports for sponsors; will manage production of all reports; maintain liaison with staff, faculty, students. Much international correspondence. Assist in policy administration. Coordinate a variety of activities; will arrange administrative aspects of workshop and conferences held at MIT. Must have mature, independent judgment; tact; ability to organize. 73-667-A (7/18).

DSR Staff member in the Energy Laboratory will assist in the construction of a mathematical energy model for U.S. supply and demand. Gather data, participate in econometric model building and analysis of various energy sectors. S.B. degree in economics with econometrics and mathematics background desired. Experience in FORTRAN programming and use of Econometric Software Package necessary. Ability to interact and communicate with a large interdisciplinary group working on the project important. 73-752-A (8/8).

DSR STAFF - SYSTEMS ANALYST at Cambridge Project will adapt Time Series Processor programs for use within the Consistent System on Multics. Knowledge of calculus, econometrics, statistics, and linear algebra; extensive PL/1 programming experience on Time Sharing Systems; familiarity with TSP-CSP required. This position is temporary until 7/1/74. (8/8) 73-749-R.

DSR STAFF (temporary until 7/74) at Cambridge Project will direct efforts of 2-3 staff programmers; coordinate project sub-contract work; participate in project planning; advise prospective users of consistent systems capabilities and use. Ph.D in Mathematics (Statistics); experience in time sharing systems (Multics, PL/1 and FORTRAN); knowledge of Behavioral Science applications desired. (8/8). 73-750-R.

INFIRMARY STAFF NURSE - PART-TIME (Exempt staff) will work in the MIT Infirmary on the day shift Sat. and Sun. and one day during the week. Administer first aid and emergency treatment after clinic hours. Mass. Registered Nurse's license required, as is previous nursing experience, preferably emergency room or industrial nursing. This position is on the permanent night shift (11pm-7am) with weekend rotation. (8/8) 73-731-R.

Industrial Hygienist - *Academic Staff will work in the Environmental Medical Service to study and control occupational disease and other environmental factors such as noise, heat, pressure and toxic materials that may be physically or chemically hazardous to employee health. Will work closely with physicians, depts., supervisors. BS. in Chemical Engineering is required. 73-336-A. (4/29).

M E D I C A L T E C H N O L O G I S T / T E C H N I C A L A S S I S T A N T - A C A D E M I C S T A F F in the Clinical Research Center must be ASCP registered or the equivalent to work in the laboratory of a twelve-bed research unit. Experience in clinical chemistry, hematology, and urinalysis; familiarity with laboratory instruments required. A BS degree in Biology or Medical Technology preferred; non-degree candidates will be considered depending on experience. 73-754-R (8/8).

EDP Coordinator - (DSR Staff) will maintain the software systems and expand the operating systems for a computer facility; assist users; determine loads and aid in scheduling. Will work with students and faculty in developing and maintain systems for academic computer usage. Individual must have experience in machine

language programming and operating systems; detailed knowledge about compilers, interpreters, schedulers, priority processors, and basic knowledge of computer hardware. Degree in computer science required. 73-537-R. (6/6).

Computer Systems Analyst - DSR Staff - in Electrical Engineering/Electronic Systems Laboratory will work on research and development projects in information retrieval including networking of I-R systems. Develop systems, research computer interfaces for interconnecting heterogeneous I-R systems, develop information centers by which individuals can access all sources of information. Broad experience with hardware and software computer systems; experience with PL/1, 360/370, MULTICS, or ARPANET systems; programmer supervisory experience and an advanced degree required. 73-691-R. (7/25).

Systems Programmer - DOS - Admin. Staff will provide technical expertise; develop and implement methods of improving computer performance. Minimum of two years S/360 or S/370 BAL (ALP) Assembler Language Programming experience. Knowledge of teleprocessing, and COBOL or PL/1. 73-265-R. (4/2).

Systems Programmer DSR Staff will work in the Program Development Office as a full-time Multics System Programmer. Two or three years experience with the Multics system and PL/1 is required. Other experience in system design and programming desirable. 73-466-R. (5/23)

Administrative Assistant (Exempt) in the Aeronautics Department, Aeroelastic and Structures Research Laboratory will assist the Director with administrative functions. Handle matters relating to payroll procedures, purchasing; prepare and maintain expenditure records on all accounts; prepare proposal summary sheets. Candidate should have some accounting background as well as the ability to handle modest typing assignments. 73-760-R (8/8).

Administrative Assistant V in the Fiscal Planning and Budget Office will assist in data collection; review budget information submitted by departments and labs; maintain logs of expenditures; perform some statistical typing. Ability to work independently is important. 73-757-R (8/8).

Administrative Assistant V will work part-time (15 hours) in the DSR - Patent Administration section. Prepare marketing abstracts and marketing plans based on MIT inventions. Engineering background, combined with marketing research or business background is required. 73-708-R (7/25).

Data Preparation Assistant V will be responsible for all input into the computer system for the book order process: categorize orders, generate invoices, process foreign orders, process special coding and entries, generate new codes and records on new books and accounts, update all computer input. Individual must have ability and interest in Electronic Data Processing. Maturity, a good memory, ability to handle details with precision most important. 73-467-R. (5/30).

Computer Operator IV will operate IBM Model 135 and all peripheral equipment associated with it, including disk drives, tape units, card reader/punch, printers. Must have a good knowledge of DOS job control, multi-programming experience and be capable of understanding operating instructions. 4pm-12:30am shift. 73-443-R. (5/16).

Senior Keypunch Operator III will operate the IBM 029 keypunch machine. Will punch into computer input cards formatted and unformatted documents. Minimum of two years experience operating IBM 029 or comparable equipment; familiarity with the creation of program drum cards desired. 73-574-R (6/27).

SECRETARY V at the Center for Policy Alternatives will act as receptionist and provide secretarial support for three staff members. Excellent typing needed for correspondence and reports. Will assist with other projects as necessary; handle travel arrangements; order laboratory supplies for the center. 75-531-R (7/18).

Senior Secretary V to Civil Engineering Department Head will have contact with a variety of faculty, administrators, and students. Screen phone calls; schedule appointments and meetings; maintain department records of technical reports and research papers, and arrange for their publication and distribution; prepare correspondence for signature. Excellent typing and shorthand; ability to organize and establish priorities; initiative and tact essential. Knowledge of MIT helpful. 73-700-R (7/25).

Secretary IV or Senior Secretary V will be Economics Department Headquarters secretary. Perform general

secretarial duties necessary to the smooth operation of the office; provide assistance to the Administrative Officer; handle graduate registration procedures for the department. Maturity; ability to work with details and recognize priorities; good typing skills required. Knowledge of MIT procedures helpful. There is a lot of contact with students, faculty and visitors in this busy office. 73-263-R (8/1).

Secretary IV in Nuclear Engineering will handle general secretarial duties for four professors. Type technical reports and journal articles from handwritten drafts, dictaphone, and shorthand; maintain student records; schedule appointments. Knowledge of general office procedures, ability to work important. Good typing and shorthand skills required, as is technical typing and dictaphone experience. 73-718-R (8/1).

Secretary IV in the Dean for Student Affairs Office will make appointments, answer routine correspondence, maintain students' files. Opening for one person in 3-secretary team to work for four full-time and one part-time counselling dean. Will have contact with students, faculty, and staff. Good typing skills; ability to write letters, to recognize priorities required. Knowledge of Institute procedures helpful. 73-716-R (8/1).

Secretary IV in the Office of the Council of the Arts will maintain files, do routine typing, assist with accounting and billing procedures. Will also assist with a variety of special projects on papers, and on the Council Newsletter. Knowledge of MIT helpful; shorthand and interest in the arts are desirable; ability to work with a variety of individuals important. 73-712-R. (8/1).

Secretary IV in academic department will type correspondence, proposals, DSR reports, manuscripts, theses (much of it technical). Keep DSR account records; compose routine letters; assist professor with details of registration. Ability to work independently and to write letters important; accurate typing essential; knowledge of shorthand, technical typing and bookkeeping preferred. 73-578-R. (6/27)

Secretary IV in academic department will type manuscripts and correspondence for life science lab; handle operation and renewal of grants; perform all functions of one-secretary office. Excellent typing and dictaphone skills required; ability to organize important. 73-591-R.

Secretary IV to three psychiatrists will handle all secretarial duties; transcribe patient case histories; maintain accurate records. Excellent typing skill, maturity, ability to deal with patients important. 73-525-R. (6/13).

Secretary IV will perform secretarial duties for the administrative officer of an academic department. Maintain department contract and personnel records. Excellent shorthand, dictaphone, typing skills needed. Organizational ability, familiarity with key-punch or computers desirable. 73-390-R. (5/9).

Secretary IV in the Clinical Research Arteriosclerosis Center, will perform secretarial duties for the clinical director. Transcribe from dictaphone, patient records; type manuscripts, speeches, proposals; schedule appointments, maintain bookkeeping records. Knowledge of medical terminology is preferred. Previous medical secretarial experience is desired. 73-698-R (7/25).

Secretary IV in Urban Studies and Planning will handle registration for a special program in regional studies, set up special meetings, type correspondence, act as liaison between the program Fellows and the Program Director. Compose letters by instruction, answers questions related to the program. Good typing skills, ability to take on additional responsibilities; Institute background desirable. 73-699-R. (7/25).

Secretary IV in Psychology will type articles and papers, schedule appointments, handle travel, maintain files, take dictation for one professor. Secretarial training or previous experience important. Maturity and good general skills required. 73-704-R (7/25).

Secretary IV to Associate Director of an Administrative group will type bulletins, correspondence, minutes of meetings; maintain committee records and files; arrange travel; monitor and process solicitation materials returned by alumni. Will also independently answer routine inquiries. Excellent typing, shorthand and a flair for details required. Overtime sometimes necessary. 73-585-R (7/25).

Secretary IV in academic department will handle general secretarial duties for a Biology professor including correspondence and manuscript typing, account maintenance and assistance in operation of training grants. This demanding and interesting position

requires excellent skills for an extremely productive laboratory members. Excellent MIT benefits and competitive salary. 73-591-R.

Senior Clerk III or IV in the Personnel Records Section will process personnel actions; act as liaison with employment sections; answer phone inquiries and follow-up on department problems; generate required statistics or reports. Good typing skills; ability to work with details; minimum of three office/clerical experience required. 73-612-R (7/11).

Sr. Clerk/Media Asst. III-IV at the MIT Press will set up and maintain budgets fiscal records and inventories, process invoices. Will process all reprints and rebinds; deal with printers; binders; handle scheduling and follow-up. Highly organized individual required interested in analyzing and solving problems. Bookkeeping experience helpful; productive manner in extremely busy atmosphere. Interested in learning about book production. 73-663-R (7/18).

Senior Clerk IV will work in the Business Office of the Medical Department. Prepare, process and distribute all clerical and accounting projects for the office. Maintain payroll, vacation, sick leave records; process clinic Infirmary, office supply orders. Previous business office experience (preferably with payroll and accounting procedures) required. Ability to handle a variety of assignments, and to work with detail important. Typing skills will be needed. 73-721-R (8/1).

Technical Typist III in the Research Lab of Electronics will type manuscripts and reports from rough data. Responsible for punctuation and paragraphing, may involve some editing for preparation for publishing. Excellent skills, minimum of one years experience. 73-397-R. (7/27).

Technical Typist III in the Office of Administrative Information Systems will type technical memoranda, data processing control documents and manuals. Maintain documentation library, including filing, organization and maintenance of programmer reference library. Good typing skills, experience in a data processing environment desirable. 73-684-R (7/25).

SENIOR CLERK III in the research Laboratory of Electronics will handle distribution of scientific literature; maintain logs, files, subscriptions; fill requests for publications; type biweekly list of new acquisitions. Will also assist with library cataloging of reports, books and theses; order office and library supplies. Previous clerical experience, ability to type and handle details required. (8/8) 73-751-R.

SENIOR CLERK III in the Accounts Payable Section of the Comptroller's Accounting Office will be liaison between Accounts Payable and Control Section. Batch processed invoices, accumulate hash totals and dollar volume totals, perform other duties in the Section. Minimum 2-years experience in Accounts Receivable or Accounts Payable preferred. Ability to operate a 10 key adding machine desirable. 73-761-R (8/8).

CLERK-TYPIST II in the Admissions Office will perform general clerical duties; answer busy phones; open, sort, deliver over 150,000 pieces of mail yearly. Accurate typing skills, ability to work in a busy office with a variety of details important. 73-745-R (8/8).

CLERK II in the Financial Aid Office will act as office receptionist, answer telephones, handle routine clerical duties. Maturity, ability to handle responsibilities important. 73-734-R (8/8).

CLERK-TYPIST II in the office of Laboratory Supplies will type purchase orders, price requisitions, process invoices, handle other general office duties. Adding machine or calculator experience; ability to operate a no. 32 NCR bookkeeping machine required. 73-736-R (8/8).

Senior Library Assistant IV-V will maintain a library of systems documentation and technical information for the Office of Administrative Information Systems. Circulate professional publications; type write-ups developed by technical support group. Knowledge of basic data processing concepts and terminology; good typing and clerical skills with emphasis in filing and library techniques required. 73-714-A. (8/1).

LIBRARY GENERAL ASSISTANT III will work in circulation at the Rutch Library. Individual will assist with processing of material for course reserves and learn duties for position of Reserve Assistant. Type cards, call slips; maintain statistics; assist at circulation desk. Ability to identify bibliographic references, locate material efficiently, to organize responsibilities important. Previous library experience essential. This position is part-time (25-hours) until 12/31/73. 73-743-R. (8/8).

LIBRARY GENERAL ASSISTANT III at the Science Library will perform circulation desk routines; interpret loan procedures for borrowers; handle overdue procedures; handle renewals, charges, reserves. Will also sort and stack materials; keep statistics; assist with searches. Good clerical aptitude; accurate typing; ability to work without direct supervision required. Individual will work evening hours M-Fri. 73-755-R (8/8)

Library Assistant III in Barker Engineering Library will type biweekly Bulletin; type reference correspondence, literature requests; handle billing for lost books; maintain files. Check in journal issue (approx. 1000); claim missing issues. Flexibility, organizational ability; strong typing skill; able to work with a variety of people. 73-626-R (7/18)

2nd Class Engineer must have a Mass. second class Engineer's license or higher. Individual must be willing to work on any shift. 73-182-R (3/28).

JR. ANIMAL CARETAKER will feed and water animals; change litter material; sweep and mop floors; change animals to clean cages; keep the animal facilities clean, neat and orderly. Candidate will be expected to take training courses beyond high school.

Custodians - We are seeking qualified applicants for our waiting list. Openings will be on the second and third shifts. Candidates must have a steady, reliable work record and good references. The waiting list will be used to fill openings as they occur over the next several months. Interested applicants should fill out an application at the Personnel Office and leave it for consideration. (8/1).

Secretary IV in Laboratory for Nuclear Science will work for group of professors and staff; schedule appointments; type technical reports, correspondence; handle all other general secretarial duties, good secretarial skills (typing and dictaphone); ability to work independently required. Experience typing technical reports very helpful. 73-609-R. (7/11)

Secretary IV to busy professor in Earth and Planetary Sciences will compose correspondence; manage heavy typing load; do some editing and library research; handle general administrative chores necessary in the operation of the office. Excellent typing, (shorthand preferred); ability to edit; tact, good judgment and sense for priorities important. 73-613-R (7/11).

Secretary IV in Administrative Office of Mechanical Engineering will work for three administrators, handling correspondence, calendars, composing letters, departmental records, general accounts. Will order supplies, set up and maintain files, schedule meetings and rooms. Deal frequently with people, answer variety of questions. Shorthand, good typing; knowledge of office procedures; Accurate, cooperative; poised to work with many interruptions. 73-652-R (7/11).

Secretary IV will work in Center for Theoretical Physics for three-four professors. Must be able to work well in busy, pressured office; establish work priorities; type technical manuscripts, correspondence, class notes, papers. Some telephone work. Typing and shorthand skills must be excellent. 73-630-R (7/11).

Secretary IV in Physics Department to head of the Optical Maser group will assume wide responsibilities for output of large volume of work for a very active group. Ability to work under heavy pressure; will coordinate the workload of another secretary. Experience and good shorthand and typing skills are a must. 73-632-R (7/11).

Secretary IV at Project MAC to two professors will handle the preparation of course materials, type technical papers; maintain schedules. Will help coordinate major interdisciplinary research project involving computer scientists, physicians, and graduate students. Ability, motivation to appreciate and master differences between medicine and computer science, and to interface effectively with workers from both areas. Organizational and secretarial skills must be excellent; interest to serve as a valuable assistant to the project. 73-681-A (7/18).

Secretary III-IV in Meteorology will assist with administrative duties and perform secretarial functions for the Executive Office of a large research program in physical oceanography. Handle routine office duties, type correspondence, arrange meetings for program participants from all over the world. Ability to organize office and to communicate with 60 scientists on a regular basis. Good office skills important; interest in physical oceanography desirable. 73-701-R (7/25).

Secretary III or IV to a Professor of computer science and his graduate staff will type quizzes, reports and technical manuscripts. Excellent secretarial skills

and technical typing ability a must. Ability to deal with faculty and students important. 73-545-R. (6/20).

Secretary III-IV opening in an academic department working for 2-3 professors. Good skills of shorthand and typing; organizational ability and experience required. 73-323-R.

Acct. Clk./Secretary III-IV will work for the Administrative Officer in Nuclear Engineering, and his assistant in the Reactor Business Office. Perform all typing, filing; compile data and prepare various records and reports; maintain various departmental budget records; prepare vouchers; process reactor use charge information. Must work with little supervision; accurate typing; dictaphone; must like figures, complex clerical work. 73-653-R (7/18).

Acct. Clk./Secretary IV in Nuclear Engineering for the Administrative Officer will maintain budget records for various departmental accounts including processing statements; maintain various administrative and financial files; originating or answering correspondence and questions concerning monthly statements. Previous experience in secretarial and accounting work required. Dictaphone typing. 73-654-R (7/18).

SECRETARY/SR. CLERK IV in the Medical Department will be responsible for the secretarial and clerical duties for the X-ray and ECG unit. Maintain files; process X-ray reports; transcribe reports; compile statistics; schedule hospital appointments. Work closely with the ECG technician. One part-time typist will provide clerical assistance. Excellent typing and transcription skills. Ability to work with a volume of details. Maturity important in contact with patients and staff, and in coordinating the work of others. 37½j; wprl weel (8:30-5:00) 73-732-R (8/8)

SECRETARY IV in the Division for Study and Research in Education will work for the Executive Officer of this new research group. Type proposals, reports, budgets; establish and maintain office procedures for all administrative functions; arrange schedules and travel. Good typing and shorthand skills a must; organizational ability, initiative, tact important in assisting with the beginning of the headquarters operation. 73-753-A (8/8)

SECRETARY IV to the Associate Director of Admissions will answer busy phones; type correspondence; make travel arrangements; keep records and assist with other functions during peak periods in the office. Excellent typing skills; good spelling, grammar, and office experience important. 73-759-R (8/8)

SECRETARY IV to the Director of Alumni Services will be responsible for all communication regarding the operation of the Alumni Association Office. Maintain records, files, statistics, accounts, assist with a variety of administrative functions serve as recording secretary for a committee; handle circulation responsibilities for the *Technology Review*. Excellent secretarial skills (typing, dictaphone), poise in dealing with people, ability to work independently with good judgment required. 73-740-R (8/8)

SECRETARY IV for two professors and affiliated staff and students at Project MAC will handle all secretarial duties for the office. Type and update technical notes, arrange meetings, schedule conferences, answer routine questions. Excellent technical typing skills are important; ability to transcribe dictation from tapes desired. 73-739-R. (8/8)

SECRETARY IV to two professors in Mechanical Engineering will compose some letters; keep records on research accounts; type papers, proposals, and correspondence; assist with other functions of the office, including activities of registration. Ability to understand academic routines and procedures and to deal effectively with students important. Excellent typing, preferably technical experience; skills in English grammar and composition important. 73-733-R (8/8).

SECRETARY IV to a group of instructors and professors in Mathematics will type papers using technical typing skills; handle general office functions; assist with department duties and help out at peak times. Ability to communicate with faculty and students important. Excellent typing skills and/or technical typing experience required. 73-741-R (8/8).

SECRETARY IV in Mathematics will handle general secretarial duties for a group of professors and instructors. Type mathematical papers, oversee the department Reading Room, make travel arrangements, maintain files and

records. Shorthand, experience or the ability to learn technical typing required. Organizational ability will be important for working for several busy people. 73-742-R (8/8)

SECRETARY IV in the Humanities Department will work for the head of the Literature Section. Type manuscripts and other material, transcribe notes for correspondence, act as liaison between members of the section, coordinate other assignments. Previous secretarial experience and training, excellent skills of shorthand and transcription required. Ability to work with students, faculty and staff important, as well as a strong sense of responsibilities and priorities. 73-746-R (8/8).

Secretary IV to the head of the History Section of the Humanities Department will transcribe notes for correspondence, act as liaison between the section and its head, organize seminars, type manuscripts, and handle other general secretarial duties. Excellent typing and shorthand skills, previous secretarial experience and training required. The ability to organize, recognize priorities, handle responsibilities is needed to maintain smooth operation of the section. 73-747-R (8/8).

Secretary III-IV to two professors and one staff member in the Sloan School of Management. Prepare materials for courses in the management science/marketing field. Type manuscripts (some technical typing), exams, reports; handle all duties in one-secretary office. Excellent typing, shorthand or speedwriting. Ability to work with details important. 73-735-R (8/8)

Secretary IV for Institute Secretary for Corporations will organize and run the office. Very accurate typing needed for some letter-perfect copy; other typing duties require speed. Preliminary research on corporate prospects; gather backup information for visits; draft not-too-technical correspondence. Work closely with other Institute offices in obtaining pertinent data; receive visitors. Flexible, adaptable, good telephone presence. 73-674-R (7/18).

SECRETARY III in the Philosophy Department headquarters will type manuscripts and correspondence; act as headquarters receptionist; order textbooks and supplies; schedule films for courses; maintain student records. Good typing essential; shorthand helpful. Previous secretarial experience desired. 73-758-R (8/8).

SECRETARY III to two professors and junior staff in Organization Studies Group of Sloan School of Management. Type correspondence, proposals, research, questionnaires; distribute and receive questionnaires; coordinate coding and keypunching of data. Maintain files on courses, assist with student registration. Good typing, shorthand or speedwriting required. Ability to organize and work with details important. 73-748-R. (8/8).

SECRETARY III to the Vice President for Administration and Personnel and to the Administrative Assistant in that office will handle heavy load of typing, transcribe from dictating equipment, maintain active calendar, serve as office receptionist, maintain files and answer phones. Good language skills, ability to take accurate messages are essential. Knowledge of Institute policy and resources is desirable to provide assistance to a large number of callers and visitors. Will use IBM Executive typewriter. 73-737-A (8/8).

Secretary III in Earth and Planetary Science headquarters office will assist the secretary to the Department Head. Good typing needed for correspondence and manuscripts; handle monthly billing records for Xerox machine, maintain petty cash, purchase office supplies; answer general questions. Ability to deal with all types of people, willingness to work in a busy office with many interruptions 73-706-R. (7/25).

Secretary III-IV in Personnel Benefits Office will answer phones and explain benefits to employees and faculty. Excellent typing skills and shorthand or speedwriting are needed. Knowledge of insurance, pensions or medical plans would be helpful. Initiative, poise and the ability to clearly explain benefits important. 73-687-R (7/25).

Secretary III in the Industrial Liaison Office will take and transcribe dictation, handle travel arrangements, perform secretarial duties for one staff member dealing with major industrial corporations. Secretarial or business school background, 1-2 years experience preferred. Shorthand, good typing, spelling and ability to master office procedures essential. 73-683-R (7/25).

Secretary III will handle reception duties for busy student-oriented administrative office; maintain files and complex schedules. Good typing and dictaphone skills required, as well as previous office experience. 73-429-R (5/16).

Secretary III to a faculty member in the labor relations/law area will handle general secretarial duties. Type correspondence, course material, manuscripts; arrange meetings and maintain calendar. Good typing skills; speedwriting or shorthand would be helpful; secretarial school training preferred. 73-599-R (8/1).

Secretary III - (temporary for 6-8 months) in Urban Systems Lab will type correspondence from handwritten material, maintain accounts, handle travel arrangements and schedule appointments for project staff. Knowledge of medical terminology helpful; familiarity with MIT preferred. Previous secretarial experience desirable. 73-720-A. (8/1).

Secretary III to one staff member will take and transcribe dictation; type correspondence; handle travel arrangements; handle other general office duties. Ability to organize and work independently; good secretarial skills required. Previous working experience and secretarial training preferred. 73-581-R/73-580-R (6/27).

Secretary III in the Office of the President and Chancellor will handle heavy typing of tapes and handwritten material; preparation of speeches; filing; screening phone calls; incoming mail. Will eventually handle complicated travel arrangements. Excellent typing and command of English spelling required; Norelco dictating machine; poise, tact, good telephone presence. Will be second secretary in office. No smoking, due to allergy of other staff member. 73-647-R (7/11).

Secretary III in Metallurgy Department will assist a professor with the coordination and administration of a large undergraduate "service" course; will type all class material, lecture notes, and material for publications. Maintain records of research project expenditures. Shorthand or speedwriting desirable, organizational and administrative skills required. Previous secretarial experience or training essential. Lots of student contact in this job. 73-520-R (7/11).

Secretary III in Physics Department Theoretical Center to work for three-four busy professors. Ability to handle some pressure, decide work priorities, type technical manuscripts and papers, cover phones as needed. Typing skills must be excellent; shorthand preferred, experience necessary. 73-629-R (7/11).

Secretary III to work closely with support staff of Physics Optical Maser group. Second secretary in two-person office will handle heavy volume of correspondence, type proposals and manuscripts; shorthand; experience helpful. 73-631-R (7/11).

Secretary III to the Manager and members of Technical Service Section of the Information Processing Center (about 20 people) will handle correspondence, occasional technical typing; travel arrangements some registration procedures, preparation of course material. Good skills required; shorthand helpful. Must enjoy variety of duties; and interaction with many people. 73-624-R (7/18).

Secretary III in the Sloan School of Management will work for three professors in management science, management information and control, and information systems. Correspondence, typing of class materials, distribution of them; some manuscript typing (occasionally technical); handle secretarial details of a one-secretary office. Shorthand or speedwriting required; able to organize a variety of tasks. 73-664-R (7/18).

Secretary III in the Treasurer's Office will use dictaphone and magna card for security transactions, acknowledgement letters, and general correspondence; type gift records on all security gifts; keep log of MIT Community Service Fund gifts; file. Accuracy with figures and details; good typing and spelling; familiar with corporation names. August 1 opening. 73-671-R. (7/18).

Secretary III to a Contract Administrator in the Office of Sponsored Programs will type letters, keep records on contracts and grants; coordinate routing them for approval; keep accounting statements, government regulation books updated; set up meetings, write letters, arrange travel. Previous secretarial experience; shorthand helpful; careful worker, able to work without close supervision. 73-680-R (7/18).



Captain Kevin J. O'Toole, USN, has been named commanding officer of the Naval Reserve Officers' Training Corps and Naval Administrative Unit at MIT. Captain O'Toole has also been appointed professor of naval science and professor of naval architecture at the Institute. Captain O'Toole comes to MIT from a post as officer in charge of the Annapolis Laboratory of the Naval Ship Research and Development Center.

Flender Named New Treasurer Of Foundation

John O. Flender has been appointed treasurer of the MIT Development Foundation, Inc., succeeding David C. Driscoll who resigned in July in order to devote full time to his position as treasurer of the Charles Stark Draper Laboratory, Inc.

Mr. Flender, of Cambridge, graduated from MIT in 1954. After two years as assistant to the director of Lincoln Laboratory, he became assistant treasurer and business manager of the Scientific Engineering Institute, a small, non-profit research firm in Cambridge.

From 1960 until he joined the MIT Development Foundation, Inc., in 1972, Mr. Flender was associated with several businesses. For ten years he was treasurer of the Hampshire Chemical Corporation, and after its acquisition by W.R. Grace & Co., became a division vice president.

The MIT Development Foundation, Inc., is a charitable corporation designed to foster application of technological innovations to public needs.

Special Delivery Mail Curbed

Special Delivery mail is no longer being received at the Institute after regular working hours and on weekends.

Because of budget restrictions, Physical Plant personnel—who formerly received such mail in conjunction with their primary responsibilities—are no longer available to continue the service.

MIT people are urged to advise their correspondents that no receiving facility exists after 5pm and on holidays and weekends.

On Visual Literacy

A Primer of Visual Literacy, a new book by Donis A. Dondis, assistant professor of communications and acting chairman of the division of Public Communications at Boston University School of Public Communication, is scheduled to be published by MIT Press in July.

Program Aims to Breed 'New Generations of Edisons'

(Continued from page 1) Department of Aeronautics and Astronautics, will be conducted for all students at MIT by the School of Engineering, with the support of the Alfred P. Sloan School of Management.

Directed by Dr. Yao Tzu Li, professor of aeronautics and astronautics, the innovation program will be a supplementary educational system corresponding to the learning-by-doing which medical students experience at teaching hospitals. Like a teaching

hospital, it will function as an income-earning branch of MIT with the objective of being self-supporting after the initial five years.

Earnings and new products that come out of the operation, however, will be only incidental to the real output: new crops of future innovators and entrepreneurs.

"It is a common belief that inventors and entrepreneurs are self-made men born with that talent. Edison, the Wright Brothers—none attended college. Even Dr. Land of Polaroid preferred to quit Harvard to work on his invention," said Dr. Li.

"Indeed, for all the past hundred years of engineering education, students were basically taught various kinds of skills. At first it was manufacturing knowhow. Then during the last three decades, engineering education and thereby lost their attraction to the vivid minds of young students. Worse yet, with limits on natural resources, environmental concern

and the shrinking US share of world market, we simply cannot rely upon the self-breeding process of a few innovators to keep the rest of the educated engineers employed and thereby to support the industry and the well-being of the nation. What we need, therefore, is an organized training ground for innovators and entrepreneurs. became applied science, emphasizing the skill of mathematical modelling and aiming at the refinement of the devices invented

by a few less formally disciplined innovators, and the division of the two functions wasn't bad in those bygone years," he said.

"However, times have changed. On the one hand, the natural stimuli and rewards for breakthrough-types of inventions have dwindled while mathematical modelling techniques in many areas became established routine

"And the method is simple—give the students, in addition to a sophisticated education, the exposure to the need for innovation, a pat on the back when deserved, a hint at the right moment, a possibility for reward, and set them loose to get their hands dirty and fall flat on their faces once in a while.

"But, above all, it is the new academic recognition of the relevant use of technology beyond the glory of pure scientific achievement in a university environment that gives this movement the needed spark."

ON SUMMER JOB AT LOGAN

MIT Student First at Scene of Delta Crash

The first person at the site of the Delta Airlines crash that killed 88 people at Logan Airport last week was an MIT student.

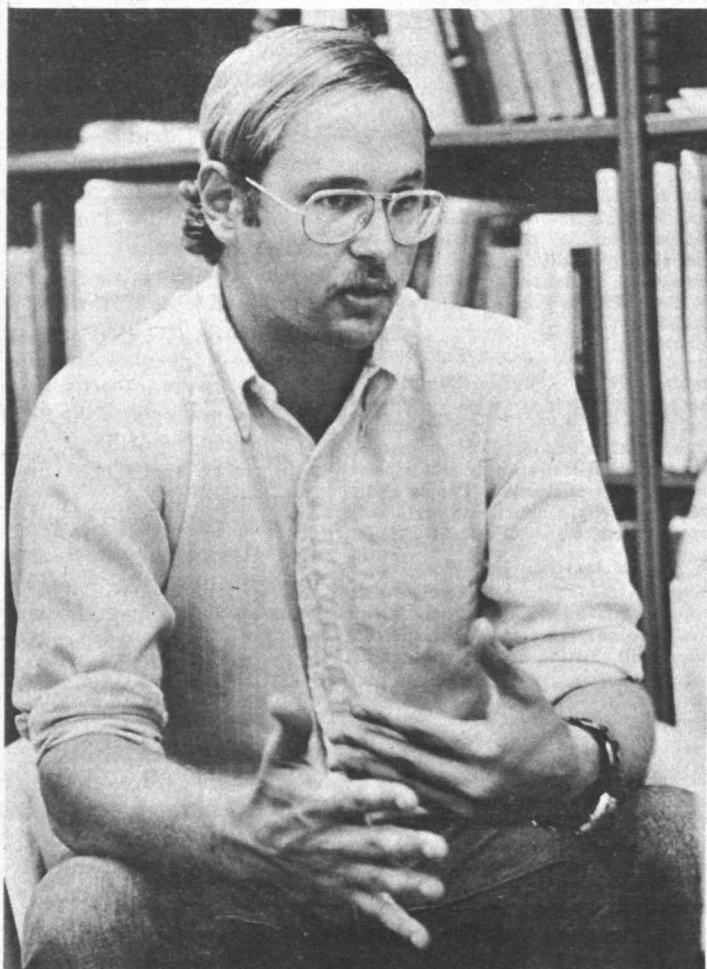
Mark B. Falber, 20, of Terre Haute, Ind., a junior majoring in physics, was working less than a mile away from the end of the runway where Delta Flight 723 smashed down out of the fog.

Minutes later Mr. Falber stood alone in the midst of the burning wreckage, frantically searching for signs of life among the bodies along the runway.

Finally he found Air Force Sgt. Leopold Chouinard, 20, naked, terribly burned, but conscious despite great pain.

"I'm going to die," Sgt. Chouinard said. "There's nobody left."

Dropping to his knees beside the writhing Chouinard, Mr. Falber said determinedly: "You're not going to die. You're going to live."



Mr. Falber

Photo by Susan Pogany

Here is Mr. Falber's account, as related to a Tech Talk reporter:

"I've been working for Fay, Spofford & Thorndike, Inc., this summer at Logan, as an inspector on a land-fill project.

"About 11am that day Geoffrey Keating (an engineer for the company) and I were together working when Geoff saw a flash of flame near the end of the runway. We were about 4,000 feet west of it at the time.

"The fog was dense and it had been going in and out. Visibility was never more than a mile and at times only one-eighth of a mile.

"Geoff asked me and a bulldozer operator I know only as Jerry if we had seen a flash or anything. We both had seen smoke, so we started out to check."

The trio got into a pick-up truck, and with Mr. Keating at the wheel, drove down a road parallel to the seawall. The seawall is perpendicular to runway 4R where the plane had crashed.

"The fog was still rolling in as we got near the runway. When we were about 200 yards away we could see the tail section of a plane in the road.

"'Oh my God,' Geoff said. Jerry and I got out and Geoff started off in the truck for the fire station.

"We walked at a fast clip toward the tail section. I could see smoke in the air and the fog was thicker than ever. When we got near the tail section Jerry saw part of the rear of the fuselage in the sand between the seawall and the beginning of the runway. 'There's nobody alive in that,' Jerry said, and he left. I didn't see him again for hours. I think the thought of a crash got to him."

Mr. Falber, after checking the tail section for survivors, moved onto the runway.

"There were pieces of metal all around, none bigger than six or seven feet long, except for the four main parts into which the plane had broken. There were sporadic fires, but I saw no bodies. But after I had walked about half the distance along which the wreckage was strewn I began to find bodies. That's when I started yelling: 'Are there any survivors?'"

"But I never got an answer. The only sound was the crackling of the fire. Other than that it was completely still."

At one point that stillness was shattered in a terrifying way as the sudden roar of jet engines buffeted Mr. Falber. The plane, he believes, was the second of two directly behind the Delta flight whose pilots elected not to attempt a landing because of the fog.

"I kept walking. I couldn't believe that nobody was alive. I kept looking at chests and stomachs, trying to find somebody who was breathing. I was on the runway within five minutes of the crash and there was nobody else but me there for several minutes. It seemed like a very long time. I think I had checked 30 or 40 bodies before I saw the Air Force sergeant.

"He was rolling back and forth on his back on the runway. I ran up and told him help was on the way. He was in terrible pain but very rational. 'I'm going to die,' he said. 'There's nobody left.' I got down close to him and said with as much determination as I could: 'You're not going to die. You're going to live.'"

Deciding it was best not to touch the sergeant's burned body, Mr. Falber tried to make him comfortable by placing a folded shirt under his head.

"He was talking wild but he was rational. That really amazed me. He impressed me so much with his bravery and his will to live."

Mr. Falber continued his search for survivors until firemen arrived, then returned to Sgt. Chouinard's side. Harris Cusick of Fay, Spofford & Thorndike now was at the scene and he also talked with the sergeant, trying to bolster his spirits.

Call my family," Sgt. Chouinard said and Mr. Falber tore a page out of a magazine he found on the runway, and Mr. Cusick wrote the sergeant's name and address.

The next day Mr. Falber, checking on Sgt. Chouinard's condition, learned that the sole survivor of the crash had asked about the construction workers.

"Leo wanted to see us. I hope that can be arranged," Mr. Falber said.

Among those killed in the crash was Robert J. Cummings, 30, of Underhill Center, Vt., who was graduated from MIT in 1964 and the Harvard Business School in 1967. Mr. Cummings majored in aeronautics and astronautics.

An IBM executive stationed in Vermont, Mr. Cummings was the son of Boston Police Capt. Joseph J. Cummings, who directed emergency operations at Logan after the crash. Capt. Cummings had been on duty there several hours before learning his son was among the victims.

World Shortage Of Beef Cited By Samuelson

(Continued from page 1)

much to affluence and consequent increasing demand as to shrinking supplies resulting from floods at home and droughts abroad.

"This is the first time in recent economic history that the world has seen simultaneous booms in the business cycles in Asia, Europe and the U.S.," he said. "People have money."

There are record grain-crop prospects in the U.S. right now, Professor Samuelson noted.

If weather conditions continue favorable, these will be bumper crops. Earlier there was a record yield of wheat from the crop that was planted last winter.

Bumper crops, Professor Samuelson said, could lead to larger cattle supplies. But not until after next winter. It takes that much time for feed crops to be felt in the cattle market.

"We are going to have to accept the chance that the end of the beef price freeze will mean higher prices—probably through the winter," Professor Samuelson said. "People are going to have to find beef substitutes or enjoy meatless meals. Maybe it will be healthy in the long run. Physicians say most Americans eat too much beef protein anyway."

Obituaries

W. J. Dumais, 66

William J. Dumais, 66, of Chelmsford, a former administrative assistant in the Division of Sponsored Research headquarters, died on Wednesday, July 25.

Mr. Dumais who retired in 1970 after 23 years at the Institute, leaves a wife, Therese and a son Maurice.

John O'Rourke, 52

John M. O'Rourke, 52, of Burlington, a work-control coordinator in Physical Plant, died unexpectedly on Saturday, August 4.

Mr. O'Rourke joined the Institute in 1947. He leaves his wife, Anne, his sons, John, Robert and James, and his daughters, Kathleen, Patricia and Mary Ellen.

MIT to Establish First Regional Cell Culture Center

(Continued from page 1) composed of Dr. Robbins; Dr. John Littlefield, professor of pediatrics at Harvard Medical School and chief of the Massachusetts General Hospital Pediatric Genetics Unit; Dr. Wang, who is associate professor of nutrition at MIT; Dr. David Baltimore, MIT professor of

microbiology; and Dr. Joel Huberman, assistant professor of biology at MIT. Other scientists in the Boston area who are participating in the activities of the cell facility will rotate onto the committee, but the size will be kept at from five to seven members.

Scientists wishing to utilize the

facility will submit a proposal to the operating committee, which will meet monthly to assign priorities to the proposed work and decide policy matters. According to Dr. Robbins, experience in organizing and managing the Boston area cell facility will be applied to any future such regional facilities.

Studies Playhouse To Give 'Mattress'

The Educational Studies Playhouse will present the musical, *Once Upon a Mattress*, as its 1973 summer production, Friday, August 10, and Saturday, August 11, at 8:30pm in the Sala de Puerto Rico.