MIT TECH TALK
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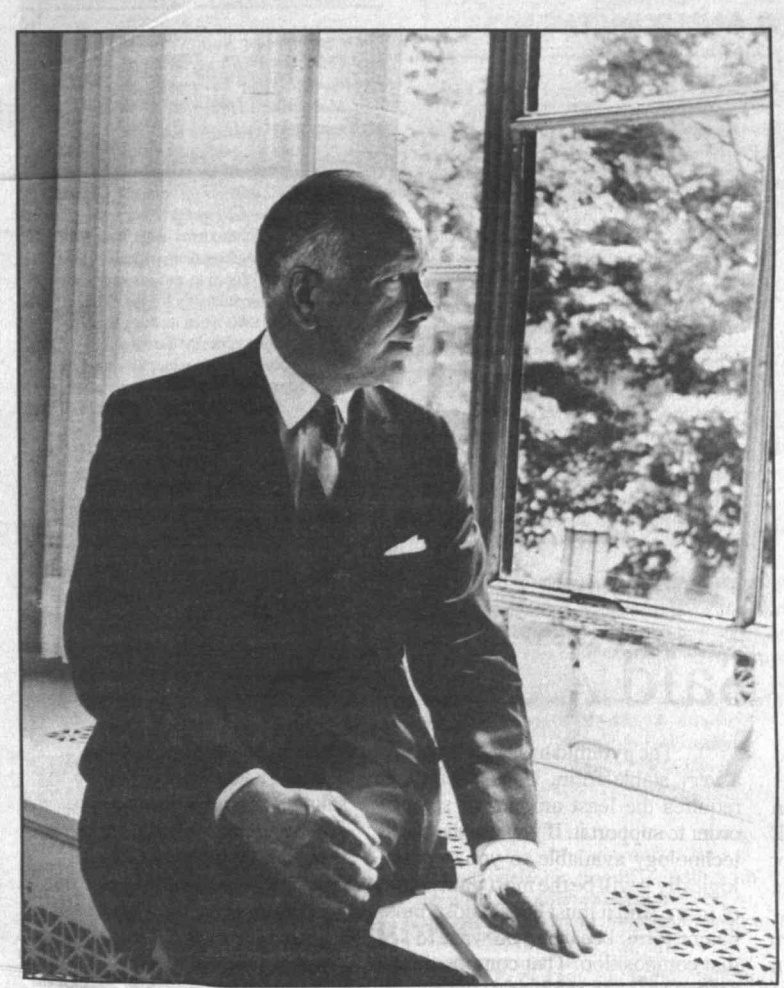
GUIDED MIT'S GROWTH

# President Emeritus Julius Adams Stratton Dies at 93



**PORTRAIT OF A PRESIDENT**—Dr. Julius Adams Stratton in his office in 1975.

A memorial service will be held in the fall for President Emeritus Julius Adams Stratton, an eminent scientist and educator who died June 22 at the age of 93.

Dr. Stratton was president of MIT from 1959-66 and chairman of the board of the Ford Foundation from 1966 to 1971.

Dr. Stratton had been associated with MIT continuously since his enrollment as an undergraduate in 1920, a period of great growth and change at MIT that paralleled significant and far-reaching developments in the fields of science and engineering. Interdisciplinary centers for the earth sciences, the life sciences, space research, materials science and engineering, and advanced engineering study were established and buildings erected to house them.

In addition, he served several administrations through a variety of national boards and committees, participated actively in professional and scientific organizations, and was a trustee of a number of educational and cultural institutions.

Howard W. Johnson, Dr. Stratton's successor, said in a statement,

"Julius A. Stratton's association with MIT spanned more than 70 years, from his days as an undergraduate until his death. His impact and influence on the Institute and all of its parts was a deep and positive one. A distinguished physicist and electrical engineer, his commitment to high standards and insistence on quality performance was a notable characteristic of all that he did and everything that he accomplished. As a professor and as the 11th president of MIT, his lifetime of exemplary achievement will be remembered and revered."

Dr. Paul E. Gray, MIT's 14th president and now chairman of the MIT Corporation, said, "As professor, the first director of the first university interdepartmental laboratory, provost, chancellor, and as president, Jay Stratton provided distinguished, wise and compassionate leadership to the Institute during a time in which the relationship between the research universities and the federal government was in flux, and the complexion and mission of MIT was also in transition. Jay's strong commitment to the arts and humanities at MIT was particularly important in a period when those activities were first flowering."

President Charles M. Vest said, "Jay Stratton's leadership in science and academia helped shape not only MIT, but institutions throughout the nation. Personally, Jay and his wife Kay were extremely gracious to us when my wife Becky and I came to MIT from Michigan in 1990. Their kindness, their friendship, and the value of their counsel to

*(continued on page 4)*

REENGINEERING

# Six Areas Targeted For Redesign Phase

MIT is about the launch the redesign phase of its reengineering project.

Senior Vice President William R. Dickson, who chairs the Reengineering Steering Committee, announced that the initial redesign work will focus on:

—Management reporting
—Supplier consolidation
—The mail service
—Facilities operations
—Information technology
—Appointment process

The redesign teams, whose members will be named shortly, will begin work during the summer. Redesign teams will begin by analyzing their assigned process and consulting with users and providers of the services involved. From that analysis, each team of about eight people will develop a new design. A prototype of the design will be set up in a laboratory setting where people can come to try out and make suggestions on the new design. Following these laboratory tests, the system will be installed on a pilot basis in a small number of the Institute's organizations for fine tuning before being implemented across the Institute.

Professor James D. Bruce, who headed the Core Team and continues as program manager of the reengineering effort, described the scope of the redesign effort to be undertaken at this phase of the reengineering effort.

**MANAGEMENT REPORTING**

Professor Bruce said the management reporting team will design methods to improve tracking, reporting and analysis of information relevant to the effective operation of an Institute department, laboratory, center or administrative unit. The team's initial focus will be on finances, including financial commitments associated with the procurement of goods and services. Later on, its work will focus on other information such as information about personnel, property and space.

**SUPPLIER CONSOLIDATION**

The supplier consolidation team will work to identify MIT's purchasing pat-

*(continued on page 8)*

FUNDING PERIL

# House Bill Would Slash DOD Research

The US House Appropriations Committee has approved for action in the full House of Representatives a bill calling for a drastic 50 to 62 percent reduction in sponsored research spending by the Department of Defense.

The Defense Subcommittee headed by Rep. John Murtha, D-PA, voted to include the reduction in research spending in the appropriations legislation, and the full committee made no changes as it sent the bill to the floor.

Congressional observers believe the bill may pass the House in that form, and those who seek to reverse the cut in DOD research may have to make their case in the Senate and in conference committee negotiations.

As the legislation now stands, MIT could face a reduction from $66 million in DOD research funds on campus in fiscal year 1993 to about $25 million in the fiscal year 1995.

"It is not hyperbole to say that the impact would be devastating," said John C. Crowley, special assistant to MIT President Charles M. Vest and director of the MIT Washington Office. "The research funded by the Defense Department—and the House Defense Appropriations subcommittee—at American research universities in the past two decades has been absolutely critical in building America's computer industry. These cuts, if they stand, will do substantial damage to the nation.

"Technological superiority is essential as our armed forces are downsized. A strong and continuous research base therefore is more impor-

*(continued on page 8)*

## IN BRIEF

**SLOW DOWN!**

Yellow speed bumps to deter speeding vehicles will be installed along Amherst Alley this week. The speed bumps will be placed near the Westgate store, New House, MacGregor House and the duPont Tennis Courts.

**LOOKING AHEAD**

Way ahead, actually. The 1995 Institute-wide Awards Convocation is scheduled for Monday, May 15, at 3:30pm at a place to be confirmed later. Since this is a major change from its traditional date, it is being announced now so that schedule planners can accommodate the new time.

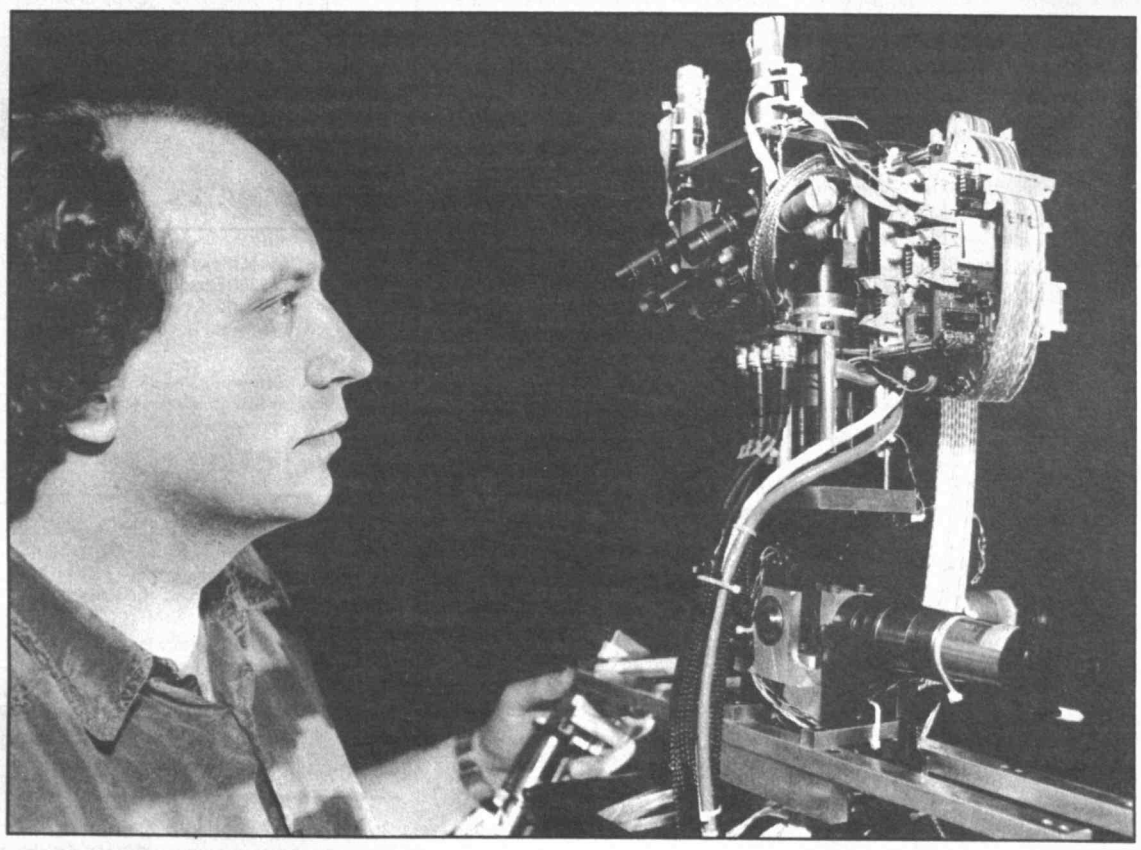
# Can a Robot Teach Us How People Learn?

Cog, the newest and most ambitious robot developed by Professor Rodney Brooks in the Artificial Intelligence Lab, is the personification, in name and aim, of his belief that the development of human cognition is based on "embodiment." The theory of embodiment holds that it is through the interaction of the physical body with its surroundings that tactics are learned, associations made, and cognition ultimately developed.

"Physical grounding is critical," said Professor Brooks, who is the associate director of the AI Lab. "Our goal is to build a system that can operate in the same world we live in."

Cog consists of a torso with two arms, two hands, three degrees of freedom in the neck and the hips, and a computer brain modeled on human neuroanatomy. This physical system will permit testing and observa-

*(continued on page 7)*



**MAN AND MACHINE**—Professor Rodney Brooks of electrical engineering and computer science with Cog, the newest robot in the AI Lab. The goal for Cog is to be able to manifest the intelligence and behavior of a 6-month-old child and ultimately a two-year-old.

**Photo by Donna Coveney**

# Classified Ads

**Tech Talk ads are intended for personal and private transactions between members of the MIT community and are not available for commercial use. The Tech Talk staff reserves the right to edit ads and to reject those it deems inappropriate.**

**INSTRUCTIONS: Ads are limited to one (of about 30 words) per issue and may not be repeated in successive issues. All must be accompanied by full name and extension. Persons who have no extensions or who wish to list only their home telephones, must come in person to Rm 5-111 to present Institute identification. Ads using extensions may be sent via Institute mail. Ads are not accepted over the telephone. Faxes are not accepted.**

**All extensions listed below are campus numbers unless otherwise specified, i.e., Dorm, Lincoln, Draper, etc.**

**MIT-owned equipment may be disposed of through the Property Office.**

**Deadline is noon Friday before publication.**

## ■ FOR SALE

Bridesmaid dress, wedgewood blue, semi-portrait neckline, full length, fits sz 6-10, worn 1x, retail $350, sell for $175, matching shoes, $50. Judy x3-8611 or 577-1136.

Gas grill, Sunbeam model 3069C, self-cleaning, w/ cover, gd cond, $100 or bst. Helen 494-0010.

Technics FM/AM stereo receiver, 45W/channel, exc cond but needs component, $25. Mike x3-5250.

Fisher Price outdoor baby swing, $15; Fisher Price cloth diaper bag, blue, $10; flip-top changing table for bureau w/maple finish & cush pad, pd $100, sell for $50. Cheryl x3-2848 or 438-1908.

Lotus Smart Suite integrated software, new, latest editions of Lotus 1-2-3, Ami-Pro, Approach, Organizer, Freelance Graphics, bst retail $500, askg $350 or bst quick offer. Adriana x8-8532.

DR table, solid teak, Danish, 2 leaves, sts 12, $575 or bst; golf clubs, $35, $65; Parsons corner tables, $15, $25; Cannon electronic typewriter w/correction, $55. Call x3-3175 or 332-8251.

175 s.f. modular dock float, arrage 20" sq modules to desired shape, 6 tons flotation, no maintenance, $2000. Mike x3-7959.

Pioneer AM/FM stereo receiver & headphone, Pioneer cassette tape deck, Bic multiple play turn table, 2 Altec spkrs & teak cabinet; best offer. Call 617-738-8385.

Dining room set, dark solid pine, 42" by 72" oval table, six captains chairs, glass hutch & buffet, mint cond, $900 or bst. Ken x3-8107 or 646-7139.

K-sz soft sider water bed, top of the line, like new, $500; matching set Sears chest of drawers & dresser, $200. Call x5-9608 & lv mssg or <hwtaylor@mit.edu>.

Stamp catalogs, Scott, Vol #1 (US & British): 1994@$15, 1989@$5. Bob x3-3357.

Macintosh printer for sale, StyleWriter ink jet printer, laser printer quality, $120. Call 497-8721.

## ■ VEHICLES

1987 Toyota Camry, exc cond, 65K, orig ownr, auto, ps, a/c, $5200. Michael x3-4335 or 489-4497.

1987 Chevy Cavalier, blue, no dents, 4 spkr AM/FM, some rust spots, all svc records avail, new tires, battery, exh sys, radiator, runs perfectly, exc commuter car, $1500 or bst. Pat x3-0199.

1991 Nissan Stanza XE, 45K, charcoal pearl, a/c, auto, AM/FM/cass, pwr mirrors, tilt, cruise, $9495. Call 617-231-1455.

1992 Honda Civic CX, hatchbk, 48K maj hwy, 45-50+ mpg, 4 new Pirelli trs, 5-sp manual trans, Z-lock, drvr airbag, $6800. Call 508-544-5450, <laura@mgm.mit.edu>.

## ■ HOUSING

Acton: going on sabbatical, my home for rent furn, beginning 8/94, 2.5 acres, 3BR, $1500/mo, flexible arrangements. Call Prof. Marcus x3-5151.

Cambridge: carriage house for rent, unfurn, 2BR, huge master BR w/loft, 1.5b, gas frplc, washer hookup, undergrd prkg, f/b decks, $1600/mo. Call x3-2608.

Cambridge: lrg sunny 5 rms, 2BR, mod eat-in-ktchn, nw bath, hdwd fls, huge porch, 5-min walk to MIT, must see. Call 497-2257, or x3-8809, or <slbrown@mit.edu>.

Cape Cod: W. Dennis, 3BR fully furn house w/ wood flrs, full bath & fplc, 1 mile from beach, $550/wk. Call 617-522-5236.

Cape Cod: Chatham, 3BR, 1.5b, all amenities, well-furn house, 600 yds walk to beaut Hardings Beach, Aug 20-Sept 3, $750/wk. Call x3-7267 or 489-1510.

Charlestown: 1BR, top fl of 3, v sunny, easy access to Cambridge & Boston, roofdeck w/ vw, avail 7/1, $650/mo. Peter 242-9496.

Glencoe, Nova Scotia: vacation retreat, priv 12-acre site overlooking E. River Valley, 2BR, 1/2 loft, swim nrby waterfall pools, relaxation, hiking, $275/wk. Call Linc x3678 or 508-369-3973.

Jamaica Plain: 1BR apt, over 600 s.f., off-st prkg, on T, peaceful hilltop garden, short walk to JP center & Arboretum, pets okay, $675 htd. Call 624-3414 bef 9pm.

Loon Mountain: Lincoln, NH, 2BR, 2b, all amenities, pools, tennis, hiking, etc. Jack x3-2772 or 396-4221 eves.

Loon Mountain: Lincoln, NH, vacation condo, avail spring, summer, fall, 2BR, 2b, riverfront, slps 6, tennis, pool, clubhse on premises, reasonable rates wkdy/wknds. Bill x3-3820.

Mt. Wash. Valley: 4BR lakeside cottage, sandy beach, slps 8, nicely furn, w/w, appliances, rowboat, canoe, avail wk of 7/30, $750/wk. Linc x5431, <efn@wells.haystack.edu> or 508-779-6473.

Somerville: nr Inman Sq, avail 7/2, 2BR apt, hw flrs, lrg eat-in-ktchn, w/d hookup, cellar storage, no pets, $650+, sec dept & refs reqd. Call x3-9380, 438-2025 or <sandyd@mit.edu>.

Somerville: Davis Sq, furn lrg 3BR+, eat-in-ktchn, sunny LR, gas ht porch, prkg 1 car. 3 min walk to T, safe, $1200 + lease for 9 or 12 mos, avail. 9/1. E-mail <doucette@ilp.mit.edu> or 720-6920.

S. Lowell: 2BR, 1.5b townhouse, finished bsmt, lrg wash/util rm, w/d hookup, w/w, grt family community w/low condo fee, conv to train sta, askg $75,500. Call 508-452-0749 aftr 6pm, or wknds.

Vermont: Jay, Northeast Kingdom 4-season resort area, 6-rm contemp home on secluded 1.5 acres, 3BR, 2b, frplc, fully furn, 3.5 hrs from Boston, exc rental income, $100,000. Call x3-7758.

West Newton: townhouse condo w/style, 10 yrs young, 2BR, natural hdwd flrs throughout, huge yd w/garden, 1-car gar, easy commute & train, $189,000. Call 527-1466.

Furnished 1BR apt avail immed, downtown location convenient to T, 15 mins to MIT, 24-hr concierge, health club, modern ktchn & bath, prkg avail, $1200/mo. Andrew x3-6467.

## ■ WANTED

Yellow Labrador Retriever puppy (or part yellow lab puppy) wanted for a small boy to love. Good home provided w/lots of running space. Nancy x3-2827.

Rollerblades, used okay, W's, to fit sz 8.5 foot. Kate x3-2866 or <rubink@mit.edu> or 666-5739.

Furnished apt wanted to sublet for Fall 1994 (Aug 15/ Sept 1 through Dec 31/Jan 15), visiting prof w/ out car nds lodging within commuting range of MIT, 1 or 2BR pref. Call 212-666-8996.

Visiting prof from Spain sks furn sublet July 9-29 for himself, wife & young daughter, exc ref. Milda x3-4827.

6 month let required Jul-Dec for visiting scientist & family, 3BR, furnished, pref Arlington/ Belmont area. Contact <mibs@eecs.mit.edu>.

Visiting prof from UK & family sk furn 3BR house/apt from 8/15 - 9/30. Robin Courchesne x3-2481 or <robin@mit.edu>.

Visiting professors seek housing: visiting prof & wife sk furn house/apt from mid-August to end of Sept; another couple sk furn apt 9/5 - 10/30 Emily Baehr x3-9475 or <efbaehr@athena.mit.edu>.

Visiting prof from Israel sks furn sublet July 24 - Aug 26 for himself, can pay up to $1000. Milda x3-4827.

Prof family (mid 30s, 1 & 4-yr old) returning from 3 yrs in France wishes to rent or housesit in Boston area, 1 yr min, poss to exchange houses, non-smkrs, no pets, ref avail. Call 011-33-1-34-85-14-57.

## ■ ROOMMATES

Cambridge: 24-yr-old F prof sks F professional or grad student to shr 2BR Cent Sq apt July 15 or Aug 15, 1994 to mid-Aug 1995, 4-min walk to T, no smkrs or pets, $375/mo incl ht. Call x3-3959.

Cleveland Circle: roommate needed, F 22-33 yrs old, 3BR apt, nr T, $325 incl ht. Call 731-6651.

## ■ CHILDCARE

MIT dean & professor sk loving individual to care for kindergarten-aged son in Lexington home, noon to 5-6pm, M-F, Sept 94 - June or Aug 1995, salary negot, driver's lic. Call x3-3375.

Experienced non-smkr to care for infant twins & 4-yr old girl in our Winchester home, M-Th 8-6, Sept. start, 1 yr min, own car & refs needed. Call 729-2684 bef 10pm.

## ■ MISCELLANEOUS

Will proofread thesis or manuscript for sentence structure, punctuation, grammar, PhD biologist, exceptionally proficient in English (native spkr), 35-50¢/page. Call 646-8443 bef 9am or aft 11pm.

## Crimewatch

*The following incidents were reported to the MIT Campus Police Department between June 11-23:*

**Jun 11:** *Audrey St.*, '87 Pontiac stolen; *Bldg 66*, fax machine stolen, $300.

**Jun 13:** *Bldg 1*, vandalism; *Bldg 14*, 1) laser printer stolen, unknown value; 2) credit card stolen, $1,800 in merchandise charged; *Burton Hse*, 1) bike stolen, $450.

**Jun 14:** *Bldg NE 43*, harassing phone calls; male arrested near Senior Hse. for attempted larceny of a bicycle.

**Jun 15:** *Bldg 2*, two computer mice stolen, $140; *Westgate*, bike stolen, $100; *Bldg 14*, calculator stolen, $50; Bldg E19, bike stolen $200.

**Jun 17:** *Bldg 37*, checkbook stolen; *Bldg 57*, $200 cash stolen; *Bldg 7*, backpack stolen, $120; *Bldg 4*, $40 stolen.

**Jun 18:** *Bldg 7*, vandalism; *Audrey St.*, break and entry of a car.

**Jun 19:** Three males arrested for attempted larceny of a car on Wadsworth St.; *DKE frat*, three bikes stolen: 1) $200; 2) $260; 3) $300.

**Jun 20:** *Bldg NW14*, vandalism of a bike; *Bldg W13*, TV cable box stolen, $300; *Bldg 3*, bike stolen, $350; *Bldg E40*, bike tire stolen, $40; *DKE frat*, attempted larceny of a bike; *ATO frat*, bike stolen, $140; *Kappa Sigma*, bike stolen, $200.

**Jun 21:** *Bldg 2*, computer mouse stolen, $70; *Westgate*, bike vandalized, $150; *Bldg 4*, suspicious activity; *Bldg 13*, camera stolen, $190; *East Garage*, car stereo stolen, $400; *Kappa Sigma frat*, bike stolen, $100.

**Jun 22:** *New House*, attempted larceny of bike; *Bldg 2*, CD player stolen, $180; *Bldg E51*, tape recorder stolen, $40; *Student Ctr.*, suspicious activity; *Alumni Pool*, lockers broken into, 1) wallet stolen, $40; 2) wallet, $70; 3) wallet, $25; 4) wallet, $55.

**Jun 23:** no reported incidents.

# Student Notices

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

## ■ ANNOUNCEMENTS

**Swapfest*—July 17:** Buy, sell, swap bargain electronics, computers, radio parts, etc., rain or shine, buyers $2 ($1 off w/ MIT ID), sellers $8/space, includes 1 admission, sponsored by W1MX, the MIT Electronics Research Society and W1XM/R and the Harvard Wireless Club, 9am-2pm, Albany & Main Sts. Swapfest takes place 3rd Sunday of each month all summer.

**Talbot House.** Spend time in the Vermont countryside—check out hiking, canoeing, country fairs and antique shops. Many weekdays and weekends are still open. For this time only booking is on a first-come first-served basis with a minimum of two nights stay for groups of 15 adults. Rates are from $60-70 per person which includes three meals. Contact: Sarah, x3-4158, <stom@mit.edu>, or stop by W20-401. Information is also available in TechInfo under Around MIT - Offices and Services.

**A Safe Ride****—Call 253-2997 for a free ride within MIT boundaries. Service operates Sun-Wed 6pm-3am; Thurs-Sat 6pm-4am. Guide to shuttle stops available.

**Free Museum of Science Admission for MIT Students**—With MIT student ID, provided by Mass Beta chapter of Tau Beta Pi, the National Engineering Honor Society. Reduced admission to special exhibits.

**Language Conversation Exchange****—Internationals and Americans are invited to participate in this program which matches persons interested in practicing a language and getting to know someone from another country. Presently, there is a need for English partners to fill continued requests of internationals wanting to practice and improve their English. Persons speaking the following languages who are waiting for partners include: Japanese, Chinese, Korean, and Russian. There is also a need for more English speakers wanting to practice these languages. Sponsored by the Medical Dept., call x3-1614 for more information.

## ■ RELIGIOUS ACTIVITIES

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

**Tech Catholic Community****—Regular weekday mass Tues & Thurs 5:05pm, Friday 12:05pm, Saturday 5pm, Sunday 10am & 5pm. Call x3-2981.

**Graduate Christian Fellowship****—We invite you to join us. Open to believers and seekers, GCF is a group of graduate students, faculty, and staff who desire to know God better and reflect the love and presence of Jesus Christ. Weekly meetings in Student Center, DR 1&2, Thursdays at 6pm. We also have Bible studies and a Faith & Technology Roundtable. Info: Andrew Parris x3-2319.

**Christian Science Organization****—Meetings are Thursdays at 7:30-11pm in the Chapel. We'll share thoughts about God, hear testimonies of Christian healing and read from the Bible. All are welcome! Call x3-8797 or <lnorford@eagle.mit.edu> for further information.

**Friends Worship Group***—Under the care of Friends Meeting at Cambridge, meets Wednesdays during the academic year in Rm 3-137C. Gather at 5pm for unprogrammed ("silent") worship, 5:15-5:45pm.

**MIT Korean Baptist Student Koinonia (KBSK)****—Friday Night Bible Study and Fellowship 7-8:30pm, Private Dining Room #3, 3rd floor of Student Center. Everyone is welcome, refreshments provided. For more information contact Chris Pak x3-9342 or 876-8594.

**Lutheran-Episcopal Ministry at MIT***—Wednesday worship, 5:10pm, MIT Chapel, followed by supper and conversation across the street at 312 Memorial Drive. Contact Rev. Susan P. Thomas x3-2325 or Rev. Scott Paradise x3-2983.

**Lincoln Laboratory Noon Bible Studies***—Tues & Thurs, Kiln Brook III, Rm 239. Annie Lescard, x2899 Linc.

**MIT Muslim Students Association***—*5 daily prayers* in the prayer room, Ashdown House (Bldg W-1) west bsmt. *Friday congregation:* 1:10-1:45pm in Ashdown House (Bldg W-1) west bsmt. Info: x8-9755.

**MIT Orthodox Christian Fellowship****—Meets every Wednesday at 5:30pm in Private Dining Rm #1 in the Student Ctr for dinner/fellowship/discussion followed by Vespers (evening prayer) in the MIT Chapel. Open to Eastern Orthodox Christians and those interested in learning about traditional Christian Faith. Info: Mike Decerbo, Dorm x5-7569.

## ■ INTERNATIONAL

**MIT Language Conversation Exchange****—This service assists members of the MIT community to practice a language with a native speaker and get to know someone from another country. Call x3-1614 for more information.

## ■ STUDENT JOBS

*There are more job listings available at the Student Employment Office, Rm 5-119. The Student Employment Office has many "one time only" jobs. Many students find these jobs a good way to earn money fast.*

**Off Campus, Technical, Research**. Small company seeks 2 students for research. One student must have computer systems focus and the other must have EE. Students must be capable of working in an informal atmosphere. Once provided project objective and resources students must work independently for the most part and as a 2 person team when working together. The scope of project concerns the emerging industry of global positioning, geographic mapping, and their integration with vehicle location and tracking systems. Salary is negotiable. Contact: Catherine Pinnock at fax # 449-5506.

**Off Campus, Technical, Programming**. C Shell programmers are needed for 3-6 month job in Salem, New Hampshire. Work will be done on ULTRIX machines. There are four openings. $30.00/hr. salary. Contact Darlene Bruen (617) 937-0249. 444 Washington Street Woburn, MA 01801.

**Off Campus, Non-Technical, Childcare.** Seeking a mature individual to provide loving and responsible childcare for two boys during the afternoons. The family resides in Weston. This is a part time professional position for several hours 2-3 set days weekly. Some flexibility is required with respect to schedule. The individual accepted will have verifiable references, a safe and reliable automobile, good driving record and a sincere love of children. We offer an excellent salary and benefits. Contact: Mr. or Mrs. W.M. Kennard, (617) 647-1180.

**Off Campus, Technical, Summer, Programming**. Agile Networks, a start-up company at the cutting edge of the networking market, has a summer position available for a graduate student or senior level undergraduate in computer science or computer engineering. This position offers the opportunity to gain experience with new technologies including ATM and ethernet switching and to learn network design using bridges and routers. Must have working knowledge of UNIX, DOS/Windows, TCP/IP and programming experience with C. Can be easily reached using commuter rail. Full-time job. Contact Len Evenchik, (508) 287-0700, or fax (508) 287-0606, or email: <levenchik@agile.com>.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CD CHAIRS

# Three Are Appointed To Professorships

Three appointments to career development professorships have been announced by Provost Mark S. Wrighton. All the appointments are for three-year terms.

—Assistant Professor J. Robert Fricke of the Department of Ocean Engineering has been selected to be the next holder of the Atlantic Richfield Career Development Professorship in Energy Studies.

—Assistant Professor Hugh L. McManus of the Department of Aeronautics and Astronautics has been appointed the Class of 1943 Career Development Professor.

—Assistant Professor Paraskevas Sphicas of the Department of Physics has been named to be the next Cecil and Ida Green Career Development Professor.

Professor Fricke received his PhD through the joint MIT-Woods Hole Oceanographic Institution program. He also holds the BS in biomedical engineering (1974) and the MS in electrical engineering (1977) from Vanderbilt University. He focuses his research and teaching on acoustics, numerical modeling and autonomous underwater vehicles. From 1977 to 1985, Professor Fricke was with Atlantic Richfield Co. in Plano, TX, as a research engineer and as director of marine systems and standards, developing support systems for the research vessel M/V *ARCO Resolution*. Since coming to MIT he has developed methods to use acoustics to study the underside of sea ice in the Arctic. In addition, he has developed seismic modeling and processing algorithms for massively parallel computers.

**Fricke**

Professor McManus concentrates his research and teaching on the use of advanced materials in high-performance structures for extreme aerospace environments, with an emphasis on modeling the interaction between material behavior and structural performance. His appointment to the professorship recognizes leadership in heading the Department of Aeronautics and Astronautics initiative in the "implicit curriculum" which encompasses design, modeling skill, self-education, computer literacy, teamwork, communications, and responsibility and social context. He received the SB (1980) and the SM (1981) from MIT in aeronautical engineering and the PhD (1990) from Stanford University in mechanical engineering. He joined MIT in 1991 after seven years with Lockheed Missiles and Space Co. in Sunnyvale, CA, as a structures engineer.

**McManus**

Professor Sphicas, who received the SB (1984) and the PhD (1988) from MIT, is a particle physicist. He led the group of 18 MIT scientists who were part of an international team working at the Fermi Laboratory which recently announced the first direct evidence for the top quark. The top quark is the last to be verified of the six subatomic particles believed to be the building blocks of matter. Before joining MIT, Professor Sphicas was a Wilson Fellow at the Fermi Laboratory (1990-91) and a scientific associate at CERN (1988-90).

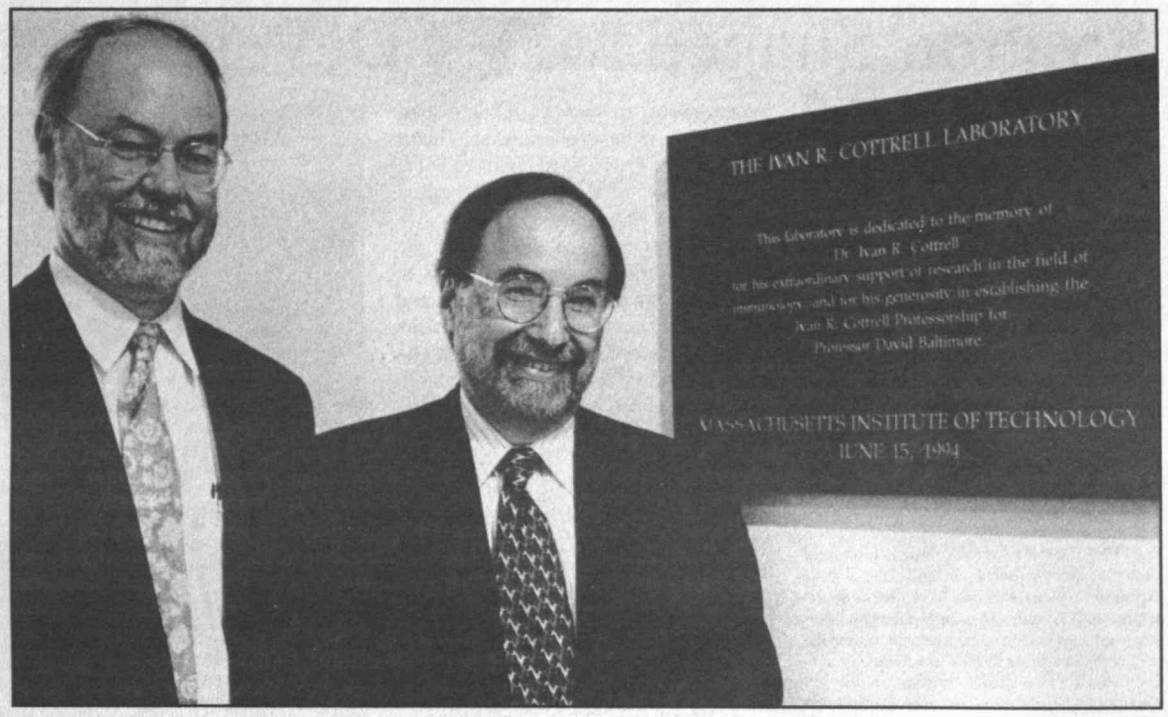
**Sphicas**

## Summer Schedule

Summer issues of MIT Tech Talk, including Positions Available, are scheduled for July 20, August 17 and 31.

Positions Available will be issued separately on July 13 and August 3. Those who subscribe to Tech Talk specifically in order to get Positions Available may call (617) 253-2704 to be sure they are included in the Positions Available mailing list.

Members of the teaching staff and others who schedule events should remember to send in activities early in the term for inclusion in the August 31 Institute Calendar because Tech Talk is not scheduled to appear again until September 14, after the term has begun.




**NEW NAME AT MIT**—Professors Phillip Sharp, head of the Department of Biology, and David Baltimore, pose before the plaque naming the Ivan R. Cottrell Laboratory in the new biology building, where Dr. Baltimore will carry out his research. A retired dentist, Dr. Cottrell became intrigued with immunology and Dr. Baltimore's research, which led to the bequest that made the new laboratory possible. **Photo by Donna Coveney**

HONOR FOR BALTIMORE

# Research Passion Leads to $4M Gift

■ **By Kenneth D. Campbell**
News Office

In 1988, at the age of 98, Ivan R. Cottrell, a retired dentist in Rochester, NY, had been teaching himself molecular biology and immunology for eight years.

"He would sit down in his apartment with a big immunology textbook and a medical dictionary and pore over the latest articles in the professional journals such as Science, Nature, Cell, Scientific American," said David Ferris of Rochester, his attorney. "He would read voraciously, and referred to it as his work. He had been an avid skier and tennis player into his 80s, and now, in his 90s, he would say, 'I can't do physical exercise any more, but I can still do my work.'"

Mr. Ferris was recalling his five-year association with Dr. Cottrell, who died in 1989 at the age of 99, at a June 15 informal celebration at the Ivan R. Cottrell Laboratory in the new MIT biology building. The ceremony was honoring Dr. Cottrell's unsolicited bequest of $4 million to MIT to support both the teaching and research work of Professor David Baltimore. Through investment over three years, the fund has grown to $5 million.

The ceremony was also celebrating Dr. Baltimore's return last month to MIT, where he has been a graduate student, a postdoctoral fellow and since 1968, a faculty member, including eight years as director of the affiliated Whitehead Institute for Biomedical Research. Professor Baltimore won the Nobel Prize in 1975 for his 1970 discovery at MIT of reverse transcriptase, an enzyme that catalyzes the conversion of RNA to DNA and provides a technique for studying the relationship between certain types of viruses and cancer. Dr. Baltimore returned here after nearly four years at Rockefeller University in New York, first as president and later as research scientist.

Dr. Cottrell, who was born in Norwood, MA, in 1890, graduated from the Harvard School of Dental Medicine in 1912. He was a friend of George Eastman, and he recalled to associates Eastman's gift of $20 million to MIT to build the Cambridge campus.

Dr. Cottrell developed his own considerable fortune from his dental practice and from investments. He was a bachelor and had no direct heirs, and he wanted to make sure his money went to a center where there was a critical mass of research in immunology, Mr. Ferris said.

Dr. Erling Johansen, dean of the Tufts University Dental School and formerly head of the Dental School at the University of Rochester, recalled Dr. Cottrell, his friend of 42 years. "He was on my faculty at Rochester and every Tuesday afternoon, he would come to our seminars to discuss recent developments in practice and science.... His basic interest in immunology came from the AIDS epidemic. He was greatly concerned about this threat to humanity."

Dr. Cottrell underlined and clipped the articles that especially attracted his attention, Mr. Ferris said. Asked if there was one particular article that had clinched Dr. Cottrell's decision to leave the money to Dr. Baltimore and MIT—("Yes, I'd like to know that too!" interjected Dr. Baltimore)—Mr. Ferris said there had not been a single article, although Dr. Cottrell had followed Professor Baltimore's work in Science over the years and a 1988 Nature speculation by Dr. Baltimore on the future of gene therapy for HIV-infected patients had greatly fascinated Dr. Cottrell.

Mr. Ferris brought with him Dr. Cottrell's underlined copy of Dr. Baltimore's September, 1988 *Nature* article, "Gene therapy—Intracellular Immunization." Dr. Baltimore wrote in the article (No. 381 of his 491 published articles): "At first blush, it seems hard to think of protecting an individual against an infection by genetically engineering resistance into the person's cells."

After outlining a complex proposed genetic engineering procedure involving bone marrow stem cells, he wrote, "I believe that this type of process has a real chance of success, and propose that it be called intracellular immunization.... I believe intracellular immunization has as good a chance as any other procedure of becoming a real AIDS therapy."

Dr. Baltimore, in the corridor outside the Ivan R. Cottrell laboratory, looked at the six-year-old Nature article anew. "You know," he mused, "when I wrote that, people said, 'Gene therapy—that's pie in the sky!' Now it's a whole industry!"

"There is no higher tribute to a scientist than to be recognized based solely on his or her published work," said Professor Phillip A. Sharp, head of the biology department, in introducing Professor Baltimore. "The Ivan Cottrell professorship at MIT will be a fundamentally important addition to the Department of Biology work in the future." Dr. Sharp praised Professor Baltimore's research in virology, cell biology and immunology and his "major impact" in teaching scientists in his lab, in developing the MIT biology department, in helping establish the Center for Cancer Research, and in bringing the Whitehead Institute to MIT.

About his return to MIT, Dr. Baltimore said, "I came back to MIT, rather than go elsewhere, because I believe that the future of biology is happening here [and] will happen here. I started here as a virologist, and spent 10 years studying the polio virus. This led to the discovery of reverse transcriptase almost as a side issue. I spent 7 to 8 years in the Cancer Center, and began research in immunology in a serious way in the late 1970s."

His philosophy of research, Dr. Baltimore said, is simple: "Research is training in practice. We continually train ourselves to think new things. Research is teamwork. The technical support and office support is critical. Research thrives on commitment; that was key to my decision to come back to MIT to utilize the resources Dr. Cottrell has provided so generously. Research is enhanced by openness and collaboration, and this is a wonderfully open and collaborative building. Research is messy—there are no rules, so long as honesty is the guide. The 'scientific method' is really an invention of the philosophers. Scientists don't have a method; what they have is an immense curiosity, and young people who are willing to immerse themselves in the subject.

"I'm overwhelmed, by the generosity of this gift, and by the fact that somebody sits quietly, over a period of ten years, reading immunology without a direct professional interest," Dr. Baltimore added. "One tends to think of one's publications as going out to the community of scholars, but I've come to realize there exists a whole other audience reading *Science* and *Nature*. That someone is doing that at the age of 90 to 99–I just find that astounding," said the Ivan R. Cottrell Professor of Biology.

ERRATUM

# Wisdom Wins MacArthur Grant

*In the June 15 issue of Tech Talk, part of the article on Professor Jack Wisdom's receiving a MacArthur Grant was inadvertently omitted. Tech Talk regrets the error. That portion is as follows:*

The MacArthur Foundation described Dr. Wisdom as "a physicist who has significantly advanced the understanding of solar system dynamics. Introducing new methods to the study of dynamical problems, he has obtained important and widely cited results that create new insights into order and predictability in the laws of nature."

Professor Wisdom's research flies in the face of 17th century notions of the solar system as immutable celestial clockwork with motions predictable, at least in principle, indefinitely into the future. His work proves that many solar system phenomena are celestial manifestations of "chaos"—a new field of mathematical study with applications to fields as diverse as chemistry, fluid mechanics, biological systems and meteorology.

Using novel algorithms and fast computers, Dr. Wisdom and his colleagues have explored hitherto unknown realms of chaotic dynamical behavior of moons and planets. They have revealed wildly tumbling moons and chaotic orbits in the asteroid belt that explain the origin of meteorites.

**Wisdom**

Several years ago an asteroid was named after Dr. Wisdom—it is now Asteroid Wisdom—in recognition of his achievements in the astronomical world.

Professor Wisdom was one of the first to use the theory of chaotic processes in planetary dynamics. By following the evolution of a large number of asteroid orbits over millions of years, he discovered that the boundaries of the famous Kirkwood gaps—they were discovered more than 100 years ago, but have remained unexplained—coincided with the boundaries of the region of chaotic orbits. He proved that the clearing of the gaps is a consequence of mechanics—with no need to appeal to special phenomena such as collisions between asteroids.

More recently, Dr. Wisdom and Professor Gerald J. Sussman of the Department of Electrical Engineering and Computer Science collaborated to demonstrate that the solar system, based on a model developed from their calculations, is chaotic in a mathematical sense.

Professor Wisdom received a BS in physics from Rice University in 1976 and a PhD from the California Institute of Technology in 1981. Following postdoctoral work at the University of California at Santa Barbara and the Observatoire de Nice in France, he came to MIT as a research scientist in 1984 and joined the faculty in 1985.

Dr. Wisdom won the American Astronomical Society's Harold Urey Prize in 1986 and Helen B. Warner Prize in 1987. He was selected as a Presidential Young Investigator in 1988. He is a Fellow of the American Academy of Arts and Sciences.

# Stratton Shaped MIT's Development in Many Capacities

**(continued from page 1)**

both of us have been inestimable."

Dr. Stratton's personal characteristics and values were described in an anecdote told by an alumnus and recounted in *MIT in Perspective,* by Francis E. Wylie, director emeritus of the MIT News Office. The alumnus recalled that Dr. Stratton, his physics professor, once arrived at the classroom and announced, "There will be no class today. I apologize. I have not prepared." Mr. Wylie commented, "There are innumerable ways for a professor to cover up in such a situation—such as giving a quiz. It is characteristic of Stratton that he would not bluff, and this may have been the only occasion in his life that he was not prepared. Earnest and thoughtful, warm yet dignified, impatient only with bad intentions or sloppy work, Stratton was well qualified as the president who would guide MIT into its second century."

## COMMUNICATIONS WORK

Dr. Stratton's early professional contributions centered on the developing field of communications and communication theory in the 1920s. In 1941 he published *Electromagnetic Theory* (New York: McGraw Hill Book Company, 1941), a volume widely acknowledged as a classic in the field. Italian, French, and Czechoslovakian editions have been published.

As World War II approached, and MIT established the Radiation Laboratory in 1940 as the center for radar research in the United States, Dr. Stratton joined the staff as a member of the Theory Group and worked on the development of LORAN (Long Range Navigation), which by the end of World War II covered nearly a third of the globe with radio beams enabling airplanes and ships to determine their location. In 1942 he went to Washington as an expert consultant to Secretary of War Henry L. Stimson. When communications for ferrying planes across the North Atlantic proved unsatisfactory because of the proximity of the magnetic pole, he went to Labrador, Greenland and Iceland to study the problem and subsequently recommended a very low-frequency system. In this post he served also as chairman of committees to improve the effectiveness of all-weather flying systems and of ground radar, fire control and radar bombing equipment. He visited North Africa, Italy and the United Kingdom to study radar bombing and to assist in planning the use of radar in the Normandy invasion. In 1946 he was awarded the Medal for Merit for his services.

The Radiation Laboratory demonstrated impressively the value of interdisciplinary research and, as the end of the war neared, Dr. Stratton and others sought a way in which its momentum and program methods could be sustained for peacetime research. This was effected through the establishment at the Institute of a new Research Laboratory of Electronics, of which he became the first director. Its form of organization was so successful that it soon provided a pattern for interdisciplinary research in a variety of fields at MIT, and its example was followed at other institutions as well.

While serving as director of the laboratory, Dr. Stratton continued to be active as a professor of physics and became increasingly involved in the affairs of the entire Institute. In 1947 he was one of five chosen by the faculty to comprise the Committee on Educational Survey, appointed to review the state of education at MIT, in the light of post-war developments and circumstances. He was chiefly responsible in 1949 for the final preparation of the committee's report, which reaffirmed the original concepts of the Institute, the principles of limited objectives and faculty unity, a continued strong commitment to undergraduate professional education, the partnership of education and research, and the importance of graduate education. In addition to reaffirming the status of science, engineering, and architecture as integral parts of the Institute's mission, the committee recommended that the social sciences and the humanities be strengthened within the context of MIT. In accordance with this recommendation, the School of Humanities and Social Sciences was created in 1950.

Dr. Stratton's wife, Catherine N. Stratton, joined in many of her husband's concerns at MIT, particularly with respect to the arts. Her efforts brought into being a loan/lottery program through which students can obtain original works of art for their campus residences. MIT's Council for the Arts was created in 1971 as a result of her work and more recently she was instrumental in developing an annual seminar series for the MIT community on successful aging.

In 1949 Dr. Stratton was appointed MIT's first provost and received an additional concurrent appointment as vice president in 1951. He was named chancellor in 1956 and became acting president in 1957, when President Killian was appointed special assistant to President Eisenhower for science and technology. In January of 1959, Dr. Stratton became president, with Dr. Killian appointed chairman of the Corporation.

Born in Seattle, on May 18, 1901, Dr. Stratton and his forebears represent a remarkable span in American history. His grandfather was born in 1799, and his father in 1844, in Jefferson County, IN. At the age of nine the latter, with his mother and brothers and sisters, traveled in a covered wagon over the Oregon Trail to the Northwest, where the father had already staked a claim.

When Dr. Stratton was a small boy, the family lived for a time in Dresden and Berlin, where his mother continued her study of music. He began his school days there, acquiring a knowledge of German that later was to prove useful. As a teenager in Seattle he developed a keen interest in the then-new field of radio and built his own set. Too young for military service when World War I began, he hoped that the Navy might overlook his age if he qualified for a commercial radio license, but the war was nearly over before he was ready. However, he secured a post as radio operator on Pacific coastal vessels and then on a ship carrying rails for the South Manchurian Railroad. Returning through the China Sea in a typhoon, young Stratton received an SOS from another ship loaded with Russian refugees which had been blown ashore in Japanese waters. Trying to aid the distressed vessel, his own ship, the *Western Glen,* went aground. Though it managed to extricate itself, it was not soon enough for him to reach home in time to apply for admission in the fall of 1919 to Stanford or Yale.

He entered the University of Washington but after a year there decided to go to MIT, which he had learned about from a fellow student. Typically, he shipped as a radio operator on the Eastern Pilot, bound for New York by way of the Panama Canal, and arrived in Cambridge in September 1920, to find that tuition had been increased by $50 to $300 and that he would be allowed virtually no credit for his freshman year at the University of Washington. He was determined to finish in three years, and the necessary overload did not permit much time for anything but study. He did, however, serve as secretary of the Radio Society which operated a transmitter with a signal powerful enough to be received in Hawaii.

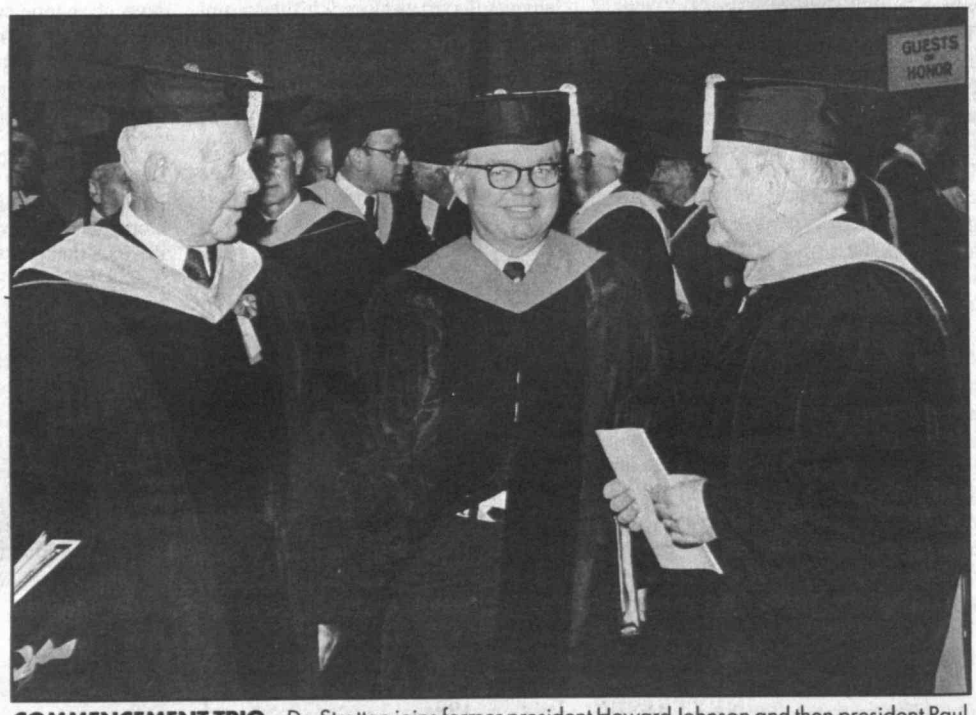
His last trip as a commercial radio operator was in the summer of 1922 on the *President Madison,* its destination China and the Philippines. He was graduated from the Institute in 1923 with an

*(continued on next page)*

**BIRTHDAY CELEBRATION**—Jay Stratton and his wife Kay enjoy themselves at his 90th birthday party in 1991.

**HEAD OF THE INSTITUTE**—Dr. Stratton stands before a bust of himself made by Beatrice Paipert '51.


**STUDENT CENTER GALA**—Dr. Stratton cuts into a cake shaped like the student center that bears his name on the building's 20th anniversary in 1985.




**COMMENCEMENT TRIO**—Dr. Stratton joins former president Howard Johnson and then-president Paul E. Gray at a commencement ceremony in the 1980s.

**ENERGY EFFICIENT**

# MIT Solar-Aided Car Shines in Tour de Sol

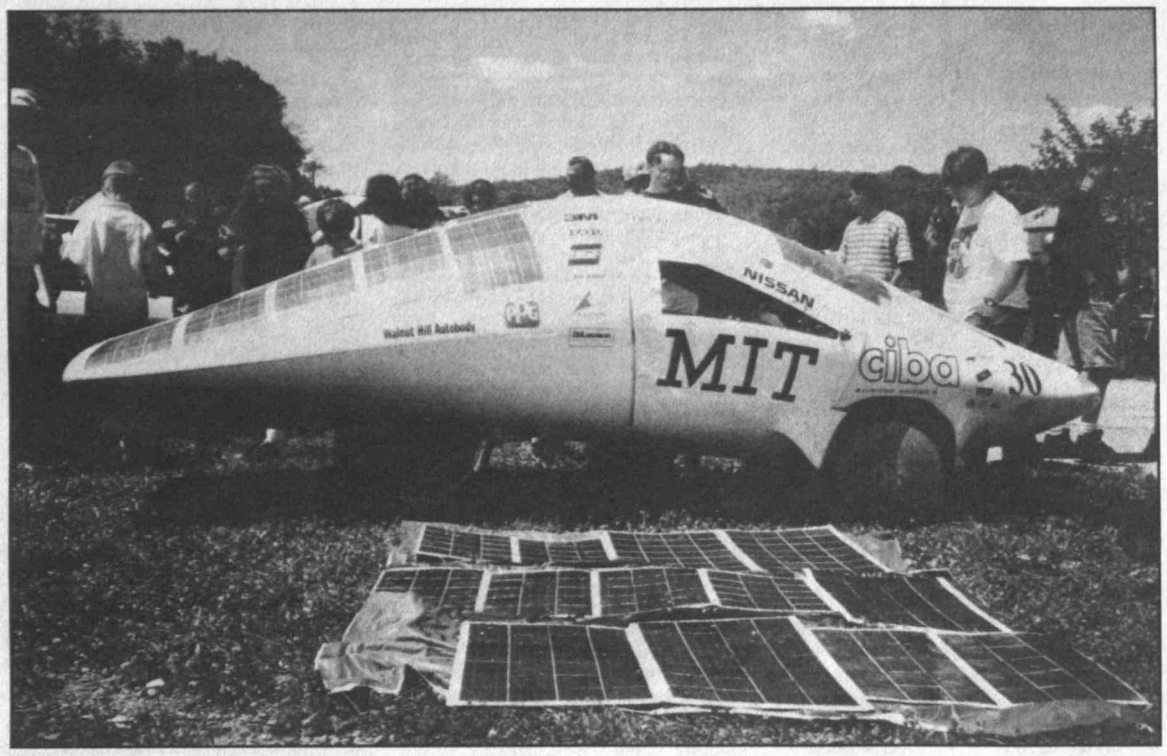
■ **By Alice C. Waugh**
News Office

A vehicle built by members of MIT's Solar Electric Vehicle Club took first place in its category last month in the 1994 American Tour de Sol, the national solar and electric vehicle championship.

The Aztec, a three-wheeled, two-passenger vehicle that runs on batteries assisted by a solar array, finished first in the division of the commuter-car category. It also won an efficiency award by virtue of its energy use of approximately 45 watt-hours per mile during the event, in which cars were raced and showcased over the course of a week between New York's Battery Park City and the Franklin Institute in Philadelphia. The event is organized by the Northeast Sustainable Energy Association of Greenfield, MA.

Also taking honors were vehicles produced by Solectria Corp., an Arlington-based company headed by James Worden, who graduated from MIT in 1989 with an SB in mechanical engineering. The Solectria RS, a modified racing version of the Solectria Force (a Geo Metro altered to run on electricity rather than gas) also won in its commuter-car division (Aztec was entered in a division that set a limit on battery power). In the production vehicle category, the Solectria Long-Range E-10 electric pickup truck took fourth place and was named the event's best vehicle running on lead-acid batteries.

Aztec also runs on lead-acid batteries and has a range of about 140 miles, depending on terrain. Its 45 watt-hours per mile is the equivalent of approximately 735 miles per gallon for a gasoline-powered car. Running on experimental nickel metal hydride batteries, the Solectria Force RS broke the Tour de Sol distance record by going 214 miles on one charge. Although most of the participants were students and entrepreneurs, Ford also had an entry.




**GAS-FREE CAR**—The Aztec, which runs on batteries and solar power (solar arrays are in the foreground), made a good showing during the recent Tour de Sol.

During the week-long race, vehicles recharged at night and drove about 60 miles a day toward Philadelphia, then had the opportunity to drive extra laps. Demonstrating additional daily range resulted in overall time reductions un-

*(continued on page 7)*

# Stratton's Achievements as Scholar, Administrator Recalled

**(continued from page 4)**

SB degree in electrical engineering.

In spite of his technical training, Dr. Stratton had developed a strong interest in the humanities, and he enrolled first at the University of Grenoble and then at the University of Toulouse with the intention of undertaking a doctoral dissertation on the influence of science on French literature. But the pull of science and engineering was too great and he returned to MIT for graduate study in electrical engineering. His master's thesis was completed in time for the degree list in January 1926.

Next came the award of an MIT Traveling Fellowship in Mathematics and Physics, which took him to Zurich for doctoral study at the Eidgenössische Technische Hochschule (Swiss Federal Institute of Technology). There he worked under Peter Debye and received an ScD degree in mathematical physics in January 1928. An assistant professorship in electrical engineering brought him back to MIT. In 1930 he transferred to physics, where he became associate professor in 1935 and full professor in 1941.

Much of his research concentrated on the propagation of short waves, about which less was known than the long waves then generally employed in radio transmission. His work and that of his colleagues on microwaves foreshadowed later efforts in the development of radar and the burgeoning of electronics after the war.

### AIDED PHYSICS BLOOM

His early years in physics coincided with a revitalization of that academic department, pressures for which had begun to emerge in the late 1920s and which, with the arrival of physicist Karl T. Compton as president of MIT in 1930, became a major Institute goal. New and far-reaching developments were taking place and the urge for reform and the study of physics for its own sake rather than simply as a service course for engineering students was given further impetus by the ideas and aspirations of young faculty members who, like Dr. Stratton, had recently returned from advanced study in Europe.

In addition to *Electromagnetic Theory*, Dr. Stratton was the author of many articles and technical papers and of *Elliptic Cylinder and Spheroidal Wave Functions* with P.M. Morse, L.J. Chu and R.A. Hutner (1941), and *Spheroidal Wave Functions*, with P.M. Morse, L.J. Chu, J.D.C. Little, and F.J. Corbato (1956). *Science and the Educated Man*, a collection of selected speeches, was published by the MIT Press at the time of his retirement in 1966.

His years as a faculty member and administrator were marked by a deep concern for the individual and a genuine interest in students and their problems. He led major efforts in curriculum revision and in the development of the residential program, including a dormitory for women, apartments for married students, and increased recreational and athletic facilities. In 1965 the new student center was named, at the request of the students, the Julius Adams Stratton Building.

Throughout the years he was an ardent spokesman for the nourishment of quality and a protagonist of the first-rate. He championed the importance of science at all levels of education and the need for humanistic studies in undergraduate scientific and engineering curricula. Above all, he believed firmly in the need for special institutions with well-defined objectives and "an intellectual environment in which imaginations are stirred, which fosters confidence that worthwhile things can be done, and where feelings of freedom and security go hand in hand with a sense of obligation and loyalty."

When Dr. Stratton reached mandatory retirement age in 1966, he was elected a life member of the MIT Corporation and was a life member emeritus at the time of his death.

In 1980, through a gift from William R. Hewlett, vice chairman of the Hewlett-Packard Company and an alumnus of the Institute, the Julius A. Stratton Professorship in Electrical Engineering and Physics was established to be occupied alternately by a faculty member from the Department of Electrical Engineering and Computer Science and the Department of Physics.

In 1966 Dr. Stratton became chairman of the board of the Ford Foundation, which ended with his second retirement in 1971. Here, too, he was remembered for the extraordinary breadth and warmth of his relationship with the staff, as counselor, source of inspiration and friend. Of his 16 years of service as member and as chairman, a trustee resolution on his retirement said in part: "He has demonstrated in every word and action the meaning of the standard to which he has held us all: that we are here to serve not our own ends but those for which the Ford Foundation is chartered. He leaves the Foundation stronger than he found it, and all who care for its work are deeply in his debt."

Dr. Stratton returned to Cambridge in 1971 and in recent years had devoted his time and energies to the preparation of a history of MIT, with particular emphasis on the background of its founding and its development and growth in the 19th century.

Dr. Stratton was elected to membership in the National Academy of Sciences in 1950. In the early 1950s, Congress was pressing for a loyalty oath for individuals receiving federal research grants. In 1955, when the Academy was asked to consider this question, he was appointed chairman of a special committee known as the Committee on Loyalty in Relation to Government Support of Unclassified Research. The Committee outlined criteria for government policy with respect to such matters and recommended against special loyalty requirements for those involved in unclassified scientific research. Its recommendations were accepted by the Eisenhower administration in 1956.

Dr. Stratton served as vice president of the Academy from 1961 to 1965 and during that period chaired an Academy committee which led to the creation under its aegis of the National Academy of Engineering, of which he became a founding member.

### MANY MEMBERSHIPS

He was a member also of the American Philosophical Society and the Council on Foreign Relations; a Fellow of the American Academy of Arts and Sciences, the American Physical Society, and the American Association for the Advancement of Science; a life Fellow of the Institute of Electrical and Electronics Engineers; a member of Sigma Xi, Tau Beta Pi, and an eminent member of Eta Kappa Nu.

He was a Life Trustee and Member of the Corporation of the Boston Museum of Science and member emeritus of the Charles Stark Draper Laboratory, of which he was a director and member of the corporation from 1973 to 1979.

He was a member of the National Science Board from 1956 to 1962 and again from 1964 to 1967, resigning when he was appointed by President Lyndon B. Johnson to serve as chairman of the newly established Commission on Marine Science, Engineering and Resources. After a two-year study the commission issued a landmark report, "Our Nation and the Sea," that resulted in the formation of the National Oceanic and Atmospheric Agency as the central focus for marine activity and in the establishment of such programs as that of Coastal Zone Management. In 1969, he was awarded the Marine Technology Society Citation and was chosen Man of the Year by the National Fisheries Institute. He received the Individual Distinguished Achievement Award of the Offshore Technology Conference in 1971 and the Neptune Award of the American Oceanic Association in 1979.

Dr. Stratton also received the Distinguished Public Service Award of the United States Navy (1957), the Medal of Honor of the Institute of Radio Engineers (1957), the Faraday Medal of the British Institution of Electrical Engineers (1961), the Boston Medal for Distinguished Achievement (1966), the Silver Stein Award of the MIT Center of New York (1967), and the Bronze Beaver of the MIT Alumni Association (1968). Dr Stratton held 17 honorary degrees from colleges and universities in the US, Great Britain and Canada.

His decorations included that of Commander of the Ordén de Boyáca of Colombia (1964), and Knight Commander, Order of Merit, of the Federal Republic of Germany (1966). He was an officer of the French Legion of Honor (1961), an Honorary Fellow of the Manchester (England) College of Science and Technology (1963), and an Honorary Member of the Senate of the Technical University of Berlin (1966). In 1966 he was the recipient of the first Julius Adam Stratton prize for cultural achievement awarded annually by the Friends of Switzerland to Americans or Swiss citizens who have studied or worked in each other's countries and whose achievements exemplify the fruitfulness of this exchange.

Dr. Stratton is survived by his wife, Catherine N. (Coffman) Stratton; three daughters, Catherine Nelson Stratton of London, Mrs. Lew (Cary) F. Boyd of Newbury, MA, and Mrs. Laura Thoresby of London; and a granddaughter, Caroline Stratton Boyd.

Remembrances may be sent to MIT (Treasurer's Office, 238 Main St., Cambridge 02141) for undergraduate scholarships in memory of Julius A. Stratton.

# Service Held for Vera Ballard of Whitaker

A memorial service was held Friday (June 24) for Vera (Johnson) Ballard, assistant director of the Whitaker College of Health Sciences and Technology, who died of cancer on June 17 at the age of 42.

**Ballard**

More than 500 persons filled the MIT Chapel and overflowed onto the adjacent lawn. Others listened to the service in Kresge Auditorium.

Speakers at the service, whose theme was "A Celebration of Life," included Cambridge Mayor Kenneth E. Reeves and Cambridge YMCA President Richard A. Foot. Ms. Ballard lived in Cambridge and was active both in the community and the YMCA. MIT speakers included Joan F. Rice, vice president for human resources; Ramona B. Allen, personnel officer; Evelyn L. Perez, assistant dean of the School of Science, and Kenneth A. Smith, professor of chemical engineering. Officiating was Geoffrey Black, pastor of the Congregational Church of South Hempstead, United Church of Christ.

Ms. Ballard began her career at MIT in 1978 in the Personnel Office, where she worked as a personnel officer and administrator. She became administrative officer at Whitaker College in 1983 and assistant director in 1987.

She was a member of the MIT Equal Employment Opportunity Committee, the MIT Medical Department Consumer Council, and the National Council of University Research Administrators. In 1984, she received recognition of her contributions to the Institute through a Black Achievers Award.

Ms. Ballard was a member of the Cambridge YMCA's board of trustees and several of its committees. She was a recipient of the Volunteer of the Year Award in 1992. She also served on a variety of committees and interest groups for the City of Cambridge.

Ms. Ballard became interested in fitness and weight training about five years ago and in 1993, she became a personal trainer certified by the American Council on Exercise, the International Association of Fitness Professionals, the Aerobics and Fitness Association of America and the Fitness Resource Association. She established her own business, Balanced Fitness, and designed customized fitness programs for people over 40.

Ms. Ballard was born in Roxbury and graduated from Brown University in 1973. In addition to her bachelor's degree, she successfully completed requirements for medical school enrollment at Allegheny Community College. She also received a certificate of special study in administration and management from the Harvard University Extension School.

She leaves her husband, Charles; her mother, Helen Wade Johnson of Boston; a sister, Alyce Johnson of Newton; a brother and sister-in-law, Henry and Naja Johnson of Los Angeles, and many cousins, nieces and nephews.

A memorial fund has been established at MIT. It is an expendable fund to be used in a research project in the life sciences with particular applicability to the health needs of people of color. Donations made be sent to the Vera Ballard Memorial Fund, c/o MIT Treasurer's Office, 238 Main Street, Room 200, Cambridge, MA 02142.

# Institute Calendar

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

## June 29 - July 24

## ■ SEMINARS & LECTURES

### WEDNESDAY, JUNE 29

**Apolipoprotein E4 and Alzheimer's Disease*—Dr. Judes Poirer, Assoc. Director, McGill Center for Studies in Aging, Montreal, Quebec.** Sponsored by the Dept. of Brain and Cognitive Sciences, 12pm, Rm E25-119/121. More info: David Fitzgerald x3-8741 or Richard Wurtman x3-6731.

### THURSDAY, JUNE 30

**Laser Intracavity Spectroscopy and Time-of-Flight Neutral Analysis*—Dr. Jiri Ullschmied, Institute of Plasma Physics, Czech Academy of Sciences.** Plasma Fusion Center Seminar Series, 2pm, Rm NW17-218.

### TUESDAY, JULY 5

**A Proposal to Create a Network-Wide Biodiversity Reserve for Digital Organisms*—Thomas S. Ray, ATR Human Information Processing Research Laboratories, Kyoto.** Sponsored by the MIT Nanotechnology Studey Group, 7:30pm, Bldg NE43, 8th flr playroom.

### THURSDAY, JULY 7

**Conformation and Stability of the Molten Globule State of Proteins*—Dr. Yuji Goto, Dept. of Biology, Osake Univ, Japan.** Whitehead Institute Seminar, 4pm, Whitehead Institute Auditorium.

## ■ COMMUNITY INTEREST

**African American Parenting****—Dates and time to be scheduled. Continuing discussion series, begun in spring 1993, on the special challenges faced by African American families. New members welcome. Cosponsored by the Family Resource Center and the MIT Medical Dept. More info/preregistration: x3-4911.

**Alcoholics Anonymous (AA)***—Meetings every Tues, 12-1pm; Thurs, 12-1pm, Rm E23-364. For info: Alise, x3-4911.

**Women's 12-Step AA***—Meetings every Monday evening, 5:30-7pm, Rm E23-364. More info: Alise, x3-4911.

**Al-Anon***—Meeting every Fri, noon-1pm, Rm E25-117; every Tues, noon-1pm, Rm 66-056; and every Mon, 12-1pm, Lincoln Lab Bldg 1218, Family Support Ctr. The only requirement for membership is that there be a problem of alcoholism in a relative or friend. Call Alise, x3-4911.

**Alcohol Support Group****—Meetings every Wednesday, 7:30-9am, sponsored by MIT Social Work Service. For info call Alise, x3-4911.

**Cancer Support Group****—Meetings every Thursday, 12-2pm, Bldg E51. For those with acute and chronic forms of cancer. Sponsored by the MIT Medical Dept. For information about weekly luncheon meeting, call Dawn Metcalf, Social Work Service, x3-4911.

**Co-Dependents Anonymous (CoDA)***—Meetings every Thurs, 6:30-8pm, Rm 66-168. Info: Alise, x3-4911.

**Eastgate and Westgate Programs****—To obtain a list of programs sponsored by the Family Resource Center at Eastgate and Westgate, call x3-1592.

**Family Resource Center****—In addition to Parenting Workshops and Programs, the Family Resource Center also offers support and training programs for child care providers, workshops at your request, and individual consultations concerning parenting, child care options, and work/family issues. Call x3-1592. Lincoln Lab families can call 981-7028.

**The Furniture Exchange at MIT****—Great buys throughout the store. A service project of the MIT Women's League. Regular hours: Tues/Thu, 10am-4pm. Bldg WW15, 350 Brookline St. Call x3-4293. Also—Wanted: People who like people. Volunteer 3-4 hours a week at the MIT Furniture Exchange. It's fun. Come see us. Plenty of parking.

**Gay, Bisexual, and Lesbian Employees and Supporters (GABLES) at MIT****—Come to discuss and work on issues ranging from domestic partner policies to gays in the military. Take part in varied cultural, educational, and social activities. For info on upcoming events, call x2-1014. To sign up for the staff lesbigay e-mail lists, send e-mail to <gables-request@athena.mit.edu>. If you have questions about GABLES, call Stephen, x3-6736.

**Graduate Student/Postdoc Parenting Discussion Group****—Ongoing meetings weekly on Thursdays, 11am-12pm. New members welcome. No fee. Discussion of special issues for graduate students and postdocs who are parents. Cosponsored by the Family Resource Center and the MIT Medical Dept. More info/preregistration: x3-2916.

**Guide for Foreign National Spouses Seeking Work****—Guides provide information on topics such as American resumes, job interviews, volunteer work, employment agencies, salary negotiation, visa issues, much more. Free information booklets available in Rm 5-106 (International Students Office), Rm 4-105 (International Scholars Office), and Rm 20A-023 (Office of Special Community Services). Reference binders may be used in Rm 12-170 (Office of Career Services); ask for Cathy Taylor.

**Hosts to International Students Program***—Each year many international students arrive at MIT to study. Far from family, friends and familiar ways, they face a challenging transition. Through the MIT host program one can offer assistance, encouragement and occasional hospitality to our students from around the world. This is not a home-stay program but rather one planned to promote friendship among people from different cultures. Faculty, staff and alumni/ae (singles, couples or families) are particularly encouraged to participate in this most rewarding volunteer opportunity. If you are interested, please call Kate Baty x3-4862.

**Job Search Support Group****—A self-help group for spouses of foreign nationals who are looking for paid or volunteer work. Sponsored by the MIT Wives' Group. More info: Christine 720-2494 or Miho 661-7691.

**Mothers Support Group***—Small intimate group of women lead by a LSW meets Wednesdays from 12-1pm at the MIT Medical Center. We would like to invite 1 or 2 women to join us. More info: Carol x3-7864 or JoAnne 227-6992.

**Narcotics Anonymous***—Meetings at MIT, every Mon, 1-2pm, Rm E23-364 (MIT Medical Dept). Call 569-0021.

**Overeaters Anonymous (OA)***—Meets Thursday, 1-2pm, Rm E23-364. More info: x3-4911.

**New Overeaters Anonymous (OA)***—Meets every Friday, 12-1pm, Rm E23-364, except June 3, Aug 5, Oct 7 and Dec 2. Info: Alise, x3-4911.

**Parenting Children with Special Needs****—Dates and time to be scheduled. Participant-led group for those with children of all ages who have special needs. Sponsored by the Family Resource Center. More info: Mary Hess 617-484-5040 or <hessma@bcvms.bc.edu>.

**Physical Education Summer Classes****—Register now for the July session in the Physical Education Office, Rm W32-125. Activities offered include: aerobics (AM & PM), exercise fitness, step aerobics, conditioning, partner dance, sailing, scuba, sculling, self defense, tennis, weight training. Private lessons area available in tennis and swimming. Classes are open to all members of the community for a modest fee (slightly more for those without athletic cards). More info: x3-4291.

**Playgroups****—The MIT Wives Group, with the cosponsorship of the MIT Family Resource Center, sponsors and provides ongoing support for establishing and maintaining informal parent-child playgroups. Contact Wives Group, Rm E23-376, x3-1614.

**Quarter Century Club**—Aug 16:** QCC Summer Picnic, 4:30-7pm, Johnson Athletics Center. Invitations and further information regarding the even will be sent out in mid-July.

**Single Parents Discussion Group****—Dates and time to be scheduled, group currently being organized. Sponsored by the Family Resource Center and the Medical Dept. More info: Marcia Yousik, x3-2916.

**Tai Chi***—Ancient Chinese art, exercise, stress reduction, anti-aging, no age requirement, MIT affiliation not required, Student Center, West Lounge, meets Wednesdays 5-6pm. More info: x3-4724. Sponsored by the MIT Women's League.

**MIT Toastmasters****—Upcoming meeting: **July 15.** An organization that helps people improve and practice their public speaking skills. 12:05-1:30pm, Rm E19-220. Sponsored by MIT Personnel Office.

**Weight Watchers****—New 8-week session begins May 25. Meets Tuesdays, 12-1pm, Rm 8-219. More info: Leslie Torrance, x3-4965.

**Working Parents Group****—Ongoing meetings weekly on Tuesdays, 12:30-1:30pm. Led by Jackie Buck, Social Worker, MIT Medical Department. Cosponsored by the Family Resource Center and the MIT Medical Dept. New members welcome, no fee, preregistration required, call x3-4911.

## ■ HEALTH EDUCATION

**Nursing Mothers' Support Group****—Third Wednesday of each month, 11am-12pm, Rm E23-297. No fee. No registration. Call x3-2466 for details. Sponsored by the Medical Dept. and the Family Resource Center.

**Childbirth Preparation****—Early Pregnancy, Lamaze Childbirth Preparation, and Lamaze Review classes are offered to patients of the MIT Medical Department's Obstetrics Service. Call x3-1316 for details.

**Tape Time for Health****—A free video loan program. Topics include birth, parenting, baby care, smoking cessation, etc. Visit the Health Resources Center to borrow a tape or call x3-1316 for a list of titles available.

## ■ MITAC

*Location: Room 20A-023, 18 Vassar St, Cambridge - 9:30am to 3:30pm, Monday, Wednesday, Thursday, & Friday. Room LIN-A-218, Lincoln Labs, Lexington - 1:15pm to 4pm; Thursday & Friday. MITAC is closed Tuesday and all Institute Holidays. Call x3-7990 or e-mail <byg@mit.edu> for futher information.*

**Discount Movie Tickets:** Loews Cinemas $4.75 ($4.25 plus 50¢ service charge), Showcase Cinemas $4.75 ($4.25 plus 50¢ service charge), General Cinemas $5.00 ($4.50 plus 50¢ service charge).

**Aquarium Discount Tickets:** $5.50 (for ages 11 and over, valid through May 1995, reg. $8.50).

**Metro Museum Savings Book:** $3 (reg. $5). Great discounts to 9 museums (Children's Museum, Computer Museum, Franklin Park Zoo/Stone Zoo, JFK Museum, Museum of Fine Arts, Museum of Science, Peabody Essex Museum, Plimoth Plantation, and the Sports Museum). Valid through June 1995.

**Water Country Discount Tickets:** $16.50 (reg. $19.95 for 4 feet tall and over), no expiration date.

**Talbot House**—Aug 5-7:** $77 (ages 11 and up), one room available, 2 nights lodging, 2 breakfasts & Saturday casserole dinner. You provide your own transportation. Call x3-7990 for more info.

## ■ SOCIAL ACTIVITIES

**Chinese Lunch Table.** Meets every Tuesday, 12-2pm, Student Center, Rm 439. Bring your own lunch and come practice speaking Chinese. All levels welcome. Sponsored by the Chinese Students Club.

**Esperanto Conversation Group.** Meets Mondays 7:30-9pm in the SCC Coffeeshop in the Student Center. Sponsored by the MIT Societo por Esperanto. More info: <speak@athena.mit.edu>.

**Japanese Lunch Table.** Meets Thursdays 12:30-2:30pm in Rms 407 and 491 in the Student Center. Bring a lunch. The MIT Japanese Wives' Group is eager to welcome all who wish to come and talk—either in English or Japanese. Make new Japanese friends, and learn about Japanese culture and osotraditions. Free babysitting provided. Call x3-2839.

## ■ MUSIC

**Live Jazz at the Muddy Charles*—June 29:** 8:30-10:30pm, Muddy Charles Pub, Walker Memorial. Free. Must be 21 or older to get in. Info: Moto, x3-5050.

**Gamelan Galak Tika Rehearsals/Meetings.** Wednesdays, 7:30-9:30pm, Kresge; Sundays, 5-7pm, Kresge. Info: Evan Ziporyn, x3-9822.

**MIT Guild of Bell Ringers.** Change ringing on hand bells. Beginners always welcome. Will also ring for occasions. Call Ken, x3-7194 or 784- 6114. Meets Mondays, 6:30pm, 2nd floor balcony of Lobby 7.

## ■ THEATER

**Participatory Piano Recital*—July 10:** Daniel Goodman, visiting scientist at the MIT Plasma Center. First half of program will consist of works by Bach, Brahms, and Prokofiev; second half will include improvisations on themes suggested by the audience during intermission, performed in classical, folk, and jazz styles. Sponsored by the Plasma Fusion Center and MIT Hillel, 1:30pm, Killian Hall. Info: 547-1122, 738-1674 or x3-8192.

**"Midsummer Night's Dream" Open Reading*—July 12:** MIT Community Players reading of Shakespeare's comedy, 7pm, Rm 3-133. More info: x3-2530.

## ■ DANCE

**MIT Folkdance Club.** Sun: International Dancing. Early teaching for beginners, 7-8pm; Teaching & requests, 8-11pm, Sala de Puerto Rico or Lobby 13. MIT/Wellesley students free, 25¢ others. Tues: Advanced Balkan Dancing. Regular teaching & requests, 8-11pm, Student Center 4th floor (Rms 491/401). MIT/Wellesley students free, 25¢ others. Weds: Israeli Dancing. Early teaching for beginners, 7-8pm. Teaching & requests, 8-11pm, Sala de Puerto Rico or Lobby 13. Call x3-FOLK for locations on a given week.

**RETIREMENT PLANNING**

# CREF Offers New Choices

TIAA-CREF has announced that two new CREF accounts will be available starting on July 1, 1994.

The CREF Growth Account will seek out companies poised for superior growth in light of economic and market conditions. Its portfolio will contain stocks issued by companies of all sizes, emphasizing small and medium-sized firms in emerging areas of the economy—companies with distinctive products or promising market position.

The account may also invest in foreign stocks, and returns may fluctuate with changes in foreign stock market conditions, currency values, interest rates, government regulations, and political and economic conditions. The Growth Account is for people who can tolerate greater risk and volatility in exchange for higher potential returns over time.

The CREF Equity Index Account will encompass almost the entire range of domestic stock investments, large and small companies alike. The account will invest substantially all its assets in stocks listed in the Russell 3000, a broadly based index of US stocks.

In addition to the largest corporations, the index contains the stocks of medium and small companies, which can offer a greater range of opportunities. Indexed accounts are often attractive to those who believe that investing in broad financial markets, rather than individual companies, is the best way to achieve long-term growth.

For more information about these funds, call TIAA-CREF's Participant Information Center at (800) 842-2776 for a prospectus. Participants may transfer money to these new accounts over the telephone by calling (800) 842-2252. Confirmation of telephone transfers is mailed to participants within one week.

Those who would like to enroll in a TIAA-CREF tax-deferred annuity may call the Benefits Office at the extension listed below that corresponds to the first letter of their last name (A-E, x3-4270; F-K, x3-4260; L-Q, x3-4271, and R-Z, x3-4272) or the Lincoln Benefits Office at x7060.

**MORE NUMBERS, PLEASE**

# Telephone Changes Coming

Watch for this headline, because you will be seeing it from time to time for the rest of your life. It's one of the tolls we will all pay as we wend our way along the ever-expanding information highway.

Next on the docket here at MIT will be the need to add an area code in calls to some communities we have been reaching by dialing 9 + 1 + seven digits, or in some cases, just 9 + seven digits. These are long distance calls even though the communities are within the 617 area code.

The Massachusetts Department of Public Utilities has ordered that all long-distance toll calls placed from within eastern Massachusetts will require dialing 1 + ten digits.

Similar changes have already taken place in western Massachusetts, and will be instituted for telephone lines in area code 508 as well. (See fliers in your NYNEX bill.)

Effective July 15, from MIT you should dial 9 + 1 + 617 + seven digits to reach the following places and exchanges:

| Community | Exchange code |
|---|---|
| Bryantville | 293, 294 |
| Cohasset | 383 |
| Duxbury | 934 |
| Hanover | 826, 829 |
| Kingston | 582, 585, 688 |
| Lynnfield | 334 |
| Marblehead | 631, 639 |
| Marshfield | 834, 837 |
| Norwell | 659 |
| Rockland | 857, 871, 878, 982 |
| Scituate | 544, 545 |
| Sharon | 784 |
| Stoughton | 297, 341, 344 |
| Whitman | 447 |

There will be a grace period until mid-October when calls dialed the old way will go through as they always have. Beginning October 15, those calls will bring a recorded reminder to redial using the area code. People with automatic dialing features need to remember to reprogram their telephones to accommodate the new requirements.

## ■ EXHIBITS

**MIT Museum (N52):** *Light/Space/Time: CAVS/MIT—25 Years.* Retrospective exhibition highlighting the ground-breaking work in art-science-technology and significant artistic contributions of the Center for Advanced Visual Studies at MIT. Show features work by CAVS alumni and faculty in media such as laser, light, video, and computer art. Curated by Otto Piene, Professor Emeritus and past director of the CAVS. Show runs through October 2.

*Holography: Artists and Inventors.* In 1993, the MIT Museum acquired the complete holdings of the Museum of Holography in New YorkQthe largest and most comprehensive collection of holography in the world. The show will explore the history of holography as well as technical and artistic applications. Curated by renowned holographers Professor Stephen Benton, head of MIT's Program in Media Arts and Sciences; and Betsy Connors, a former fellow with the MIT Center for Advanced Visual Studies who has a Master's degree from and is a former instructor with the MIT Media Lab's Spatial Imaging Group.

Ongoing: *Crazy After Calculus: Humor at MIT; Light Sculptures by Bill Parker; Math-in-3D: Geometric Sculptures by Morton C. Bradley, Jr.; MathSpace.* 265 Mass Ave. Tues-Fri 9-5, Weekends 1-5. 253-4444 Compton GalleryPCharles H. Woodbury, Class of 1886: Artist. Exhibition of paintings of one of the premier American impressionists, MIT mechanical engineering graduate Charles H. Woodbury. May 26 through September 16. Mon-Fri, 9-5pm, Compton Gallery (enter 77 Mass Ave). More info: x3-4444.

**Hart Nautical Gallery:** *Course 13, 1893-1993: From Naval Architecture to Ocean Engineering.* The history of the Dept of Ocean Engineering. Includes a prototype autonomous underwater vehicle, designed and built in the 1970s, and current work including research performed by the department for Bill Koch's successful America's Cup campaign with America$^3$. *Permanent Exhibition of MIT Museum's Ship Models. Ongoing.* Weekdays 9-8. More info: x3-5942

**Strobe Alley:** *Doc Edgerton's Strobe Alley.* Photographs, instruments, and memorabilia that document Harold Edgerton's invention of the strobe light. Optical Alchemy. Full-color fluorescent photographs taken at night during underwater dives by Charles H. Mazel, research engineer, MIT Department of Ocean Engineering. Bldg 4, 4th floor. More info: x3-4444.

## ■ OTHER ARTS

**Videos by Valerie Lalonde and Richard Leacock*—June 29.** Recent shorts, using the smallest, most inconspicuous, mobile Video Hi-8 equipment and edited on Beta-SP or, recently, Beta-Digital: "A Celebration of St. Silas": 30 min. The preparations for and performance of a Mass in honor of St. Silas, who brought the news from Jerusalem, that Gentiles could also become Christians and need not be circumcised. "Hooray! We're Fifty!": 40 min. Valerie's observations of Leacock's 50th class reunion at Harvard. "Le Trou Dans La Mer": 30 min (in French and English). A lighthearted visit at both ends of the Channel Tunnel on the eve of its opening, to sample what just ordinary people think about it. "Eine Besuch Bei Helga Feddersen": 30 min (in German). Leacock visits with an old friend who is "recovering" from eye surgery. She had become Hamburg's leading comedian on stage and television. 6pm, Bartos Theater. More info: x3-1607.

## ■ MOVIES

Admission to below Lecture Series Committe Movies is $2.00, and MIT or Wellesley identification is required. For the latest Lecture Series Committee movie and lecture information, call the LSC Movieline, x8-8881, or check TechInfo.

*All movies are at 8pm in Rm 26-100 unless otherwise indicated.* **July 1:** Top Gun (7pm). Hot Shots! (9pm). **July 8:** Working Girl. **July 9:** The Adventures of Baron von Munchausen. **July 15:** Heathers. **July 16:** Bill and Ted's Excellent Adventure. **July 22:** Fatal Attraction. **July 23:** UHF.

**Send notices for Wednesday, July 20 through Sunday, August 21 to Calendar Editor Rm 5-111, before 12 noon Friday, July 15.**

GALA OCCASION

# 75 Get Certificates At LIS Graduation

At its 89th Graduation Exercises, the Lowell Institute School recently awarded 774 certificates, including 75 to MIT employees.

Dr. Bruce D. Wedlock, director of the Lowell Institute School, presented the certificates at a graduation dinner held at the MIT Faculty Club.

Assisting him was John Lowell, trustee of the Lowell Institute. The graduation ceremonies were held in conjunction with the Annual Meeting of the Alumni Association of the Lowell School.

The guest speaker was Dr. Samuel Jay Keyser, associate provost for Institute life and co-director of the Center for Cognitive Science (see excerpts below).

Recipients from MIT and Lincoln Laboratory were:

Katherine Joy Allen, Linguistics and Philosophy
William G. Byford, Plasma Fusion Center
Alfred Cangeme, Physical Plant
Bartley L. Cardon, Lincoln Lab
Renee A. Caso, Aga Khan Program
William M. Cassidy, Lincoln Lab
Maynard Errol Charles, Comptroller's Accounting Office
Nathanial G. Charles, Sloan School of Management
John J. Chase Jr., Distributed Computing and Network Services
Jianmei Che, Nuclear Reactor Lab
Shu-Zi Chen, Biology
Christodoulou Christodoulos, Mathematics
Anthony Rudolf Clarke, Physical Plant
William F. Colbert, Lincoln Lab
Janet T. Colwell-Popp, Campus Police
William H. Comstock, Microreproduction Lab
James Randall Cook, Center for Space Research
Susan Ann Curry, Lincoln Lab
Susan Jean Dacier, Lincoln Lab
Carol Elizabeth Dawkins, Electrical Engineering and Computer Science
Hans Dietrich, Libraries
John Stephen Dippold, Economics
Mary Ann Donofrio, Comptroller's Accounting Office
Michael C. Doucette, Center for Space Research
Barbara A. Doyle, Bursar's Office
Keith B. Doyle, Lincoln Lab
Viktor Dubrowski, Aeronautics and Astronautics
Shawn Patrick Dunn, Student Financial Aid
Paul Falkos, Spectroscopy Lab
Jun Feng, Plasma Fusion Center
John Alexander Finlayson, Physical Plant
Gillian Finn Galloway, Media Lab
Peter J. Goodwin, Francis Bitter National Magnet Lab
Peter Charles Guiod, Research Lab of Electronics
Arvind Hariharan, Chemical Engineering
Robert Edward Hatch, Lincoln Lab
Mariano P. Hellwig, Center for Space Research
Anthony Francis Hotz, Lincoln Lab
Mark Hamilton Jacobs, Alumni Association
William T. Keating, Plasma Fusion Center
Sarir Ahmad Khamsi, Lincoln Lab
Melissa Ann LaBarge, Laboratory for Computer Science
Scott A. Ladd, Lincoln Lab
Mary Ann Ladd, Lab for Computer Science
James M. Letendre, Aeronautics and Astronautics
Chungpin Liao, Plasma Fusion Center
John Anthony LoRusso, Clinical Research Center
Louise Mathilda MacEachern, Telecommunications Systems
Philip Leo McAlary, Graphic Arts
Paul Joseph McCafferty, Physical Plant
Beth Ann McCain, Energy Lab
Barry L. Millsap, Materials Processing Center
John Paul Moran, Lincoln Lab
Scott Jay Murdock, Lincoln Lab
Scott E. Murray, Lincoln Lab
Steven Michael Nebiolo, Purchasing and Stores
Marla Jean Notaro, Medical Department
Lawrence Walter O'Brien, Laboratory of Nuclear Science
Joan Marie Orvosh, Plasma Fusion Center
Suzanne S. Ourfalian, Lincoln Lab
Robert Frank Paquette, Francis Bitter National Magnet Lab
Joseph Ranjan Perera, Biology
Eupremio Salvatore Piccinonno, Physical Plant
David Alan Pires, Alumni/ae Association
Richard Daniel Shumilla, Physical Plant
David Michael Smith, Brain and Cognitive Sciences
Michael Merle Steeves, Plasma Fusion Center
Susan N. Walsh, Ocean Engineering
Pei Fang Wang, Media Lab
John K. Warger, Lincoln Lab
E. Donald Weiner, Aeronautics and Astronautics
Kenneth Moody Wilson, Haystack Observatory
John Philip Woods, Lincoln Lab
Roberta E. Young, Earth, Atmospheric and Planetary Sciences
Grant Alistair Young, Libraries

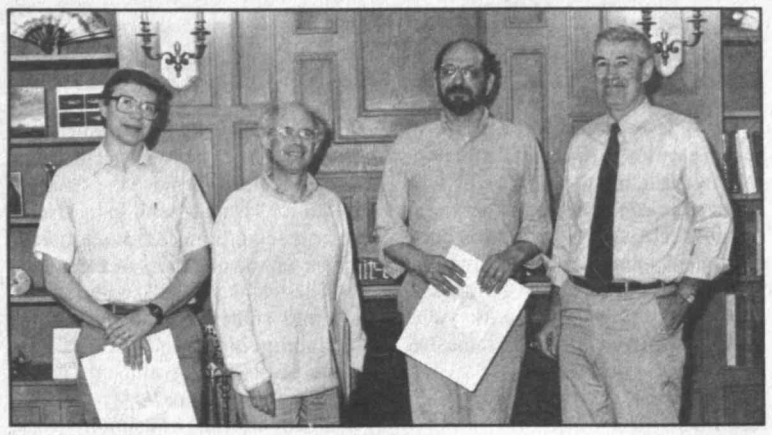
# Three Win Science Teaching Honors

Three faculty members from the School of Science—Professors Thomas Greytak of physics, Victor W. Guillemin of mathematics and Frank Solomon of biology—have received the School's 1994 Teaching Prizes for Excellence in Education.

Professor Greytak, recognized for excellence in undergraduate education, was cited for "his admirable taste and skill in selecting and presenting course material, and for his effectiveness in maintaining intellectual standards while winning the gratitude and affection of his students." The undergraduate prize was established by former Dean and Provost John M. Deutch in 1982.

Professors Guillemin and Solomon were recognized for excellence in graduate education, an honor established by Dean Robert J. Birgeneau in 1992.

Professor Guillemin was cited for "his ability to communicate the deep conceptual architecture of mathematical analysis and to do so with elegance and inventive simplicity," while Professor Solomon won by virtue of "his outstanding success in communicating to graduate students, by word and by example, the enthusiasm, standards and satisfactions of advanced research in biology."



**CLASSROOM KUDOS**—Robert J. Birgeneau, Dean of the School of Science (far right), recently presented the School's 1994 teaching awards to Professors Thomas Greytak of physics (far left), Victor W. Guillemin of mathematics and Frank Solomon of biology.

"One of my greatest pleasures in becoming dean of science has been learning how many truly outstanding teachers there are in the School of Science," Dean Birgeneau said. "The teaching prizes are one of the ways in which we are able to recognize and reward these superb educators. Tom Greytak, Victor Guillemin and Frank Solomon are among the very best teachers in the School of Science. Each of them is deeply committed to education both in and outside the classroom. MIT is fortunate to have them on its faculty."

# Solar-Electric Car Shines in Race

**(continued from page 5)**

der rules of the event. However, organizers mandated minimum times for the on-road segments for reasons of safety. "It's not a speed race, but more of an energy management race," said Goro Tamai, a graduate student in mechanical engineering who has worked on Aztec as a hobby.

The Aztec was first built about three years ago but underwent several improvements in preparation for this year's Tour de Sol. A new motor, transmission and controller gave the vehicle more power, allowing it to accelerate and climb hills faster and run at greater speeds overall, Mr. Tamai said. The braking system has also been improved, with better regenerative braking (when braking, some of the car's kinetic energy is returned to the batteries).

To qualify as a commuter-class car, the 780-pound Aztec seats two people side by side, rather than the more aerodynamic arrangement of one behind the other. It also has headlights, seat belts, a horn and other equipment required by its vehicle registration as an experimental motorcycle.

But that's about where Aztec's resemblance to an ordinary car ends. There are no high-beams on the headlights and no windshield wipers. Instead of a gas gauge, radio and analog speedometer usually found on dashboards, the vehicle has digital readouts of volts and amps along with switches for getting readouts of other information such as motor temperature. Its body is plastered with decals from corporate sponsors who contributed components and services, such as Ciba (composite body materials), Van Dusen (composite oven-curing), True Temper (aircraft steel tubing), Alcan (aluminum), 3M (tape and plastics), Intel (computer technology), and Nissan (funding). Walnut Hill Auto Body of Cambridge provided the paint job.

Aztec's appearance is a definite departure from Detroit standards as well. Its futuristic aerodynamic shape, including the large solar array attached to the sweeping back, attracted quite a few looks on the road during the Tour de Sol. In fact, the vehicle's approach was heralded more by its appearance than by its sound. "Sometimes people wouldn't even hear us coming. From the outside, it was whisper-silent, but inside it was one big echo chamber" because of the lack of an engine firewall, padding and other normal car amenities, Mr. Tamai said.

The car gets only about a tenth of its power from the solar cells, which harness 12 percent of the solar energy hitting them. Solar cells are very expensive; to achieve 17 percent efficiency would cost more than 10 times as much, designers estimate. They are susceptible to damage from common hazards such as rocks tossed up by other cars.

The fragility of solar technology was demonstrated in another race last fall, the 1,860-mile Diado-Hoxan World Solar Challenge through the Australian outback. Team New England (a collaboration between the solar car clubs of MIT and the University of Lowell) entered with high hopes for its unorthodox strategy of driving without collecting solar power and periodically stopping to unfold a large solar array. However, Australia's "dust devils," or small but intense spinning winds, repeatedly damaged the solar array by twisting it, and the car had to withdraw.

"It was a fast and efficient car, but the technology needs refining," said Kathleen Allen, the club's technical instructor and a part-time physics student. "For a car built in 18 weeks with prototype technology, it did very well."

The Solar Electric Vehicle Club's next project is "Manta," a single-seat, three-wheeled car being built this summer in preparation for next summer's Sunrayce '95 from Indianapolis to Colorado. The vehicle will be much lighter than Aztec and will use proportionally five times as much solar power.

## AI's New Robot

**(continued from page 1)**

tion of how rudimentary image-vision processing develops into complex human interaction and eye-hand coordination.

The building of Cog represents a serious attempt to build a robot with something approaching general purpose cognitive abilities. "We want Cog to have the ability to interact with humans in a real sense. We don't want our robots to be aliens," Professor Brooks said.

Since the development of human cognition is so little understood, this project represents a bold tack—admired by some, decried by others. Professor Brooks and his team, which includes Assistant Professor Lynn Stein and graduate student Cynthia Ferrell, are undaunted. "I'll know we've succeeded when the graduate students feel bad about switching off the robot," Professor Brooks said. **Donna Coveney**

AN INITIATION RITE

# Savor the Present, Keyser Advises Lowell Institute Students

■ **By Samuel Jay Keyser**
Associate Provost

Recently a friend told me about something that happened when he was duty officer on an aircraft carrier in the Mediterranean. It was November 22, 1963. He was in the ready room checking the teletype machine as he briefed the carrier pilots just before their next mission.

Suddenly, in the midst of the weather report, this appeared: WE HAVE RECEIVED WORD THAT THE PRESIDENT WAS SHOT IN DALLAS TODAY AND DIED. The message interrupted a report of wind velocity, sea height, barometric pressure and ambient temperature. There was a carriage return and on went the weather report.

The death of the president had come to him in the same way the wind speed had. My friend was stunned, but he could not stop to grieve. Planes were landing and taking off. The assassination of a president was reduced to just one more detail in an already detail-gorged day.

Much of our own lives is like this. We are engulfed in so many details that we have no time for reflection. Nor do we need a national tragedy to see this. How many times have we interrupted a pleasant conversation to answer the telephone? We could let it ring, but most of us don't.

Why? Because we value the future more than the present. And the reason why, I believe, is that we are losing the ability to savor the present.

Two years ago the gifted editorial page editor of The Boston Globe, Kirk Scharfenberg, discovered he had cancer. The sky was the limit and then he was struck down. I did not know Kirk Scharfenberg, but when he died, the papers were filled with poignant memorials. So was the radio. I remember listening to one commentator describing an interview he had had with Scharfenberg about his impending death.

> I have made a pact with myself to spend five minutes each day looking at the world as if my days were numbered.

The commentator asked what Scharfenberg thought he would miss most. He said he would miss the things he had come to take for granted, like the light on the buildings along the Charles just before dusk, or the sight of a little girl dressed for church on Sunday morning, bouncing along behind her mother like a skiff tied to a trawler. I thought how sad it was to wait until you know you are going to die before you pay attention to the moment. So I have made a pact with myself to spend five minutes each day looking at the world as if my days were numbered.

During the recent solar eclipse we were told a safe way to view it was through a pinhole camera. You put a pinhole in a piece of cardboard, hold the cardboard between the sun and a piece of paper and the image of the eclipse is projected onto the paper. Now as it happens, the way leaves on a tree overlap makes a thousand pinhole cameras and I watched a thousand crescent shaped eclipses projected onto the sidewalk by the leaves, turning the concrete into bubble wrap. That was my Scharfenberg moment for that day.

"Commence" comes from the Latin prefix *com-* and the verb *initiare* "to initiate." So a commencement is not so much a beginning or an ending as it is an initiation. Here are my initiation instructions for you. When the ceremony is over and you go on your way, find something you took for granted before your initiation and look at it as if you were seeing it for the last time. Maybe it will become a habit.

*Samuel Jay Keyser is Associate Provost for Institute Life. Adapted from a commencement address delivered to the graduating class of the Lowell Institute School at MIT on May 19, 1994.*

# Six Processes To Be Redesigned by Teams

(continued from page 1)

terns in order to increase effectiveness by reducing the number of suppliers of routine goods and services, and to decrease the Institute's cost. Continued attention will be paid to the Institute's principles of doing business with minority- and women-owned businesses and with businesses located in Cambridge.

**THE MAIL PROJECT**

Work on the mail project will build on the results of a committee appointed by Mr. Dickson well before the start of the reengineering effort. That committee has submitted a report recommending a number of changes in how mail service is provided to the community. Under the auspices of the reengineering project, the mail committee's recommendations will be pilot-tested in one area of the campus.

**FACILITIES OPERATIONS**

In facilities operations, the goals are to improve the quality and responsiveness of service and to reduce the costs of repairing and maintaining our facilities. This work will build upon the long-range planning activities begun under Victoria V. Sirianni, Director of Physical Plant.

**INFORMATION TECHNOLOGY**

Information technology transformation will seek to design and implement a management framework which achieves fundamental improvements in information technology services across the Institute. Specifically, it looks to put in place a framework whereby high-quality, flexible systems of significant value are rapidly put in place to support the new integrated and streamlined administrative processes.

**APPOINTMENT PROCESS**

Last winter, Joan F. Rice, vice president for human resources, chartered a team to examine the steps MIT takes as it makes academic appointments. Team members were academic and administrative staff members who process those appointments. The team recently recommended that the process for *all* appointments—academic, administrative, support and service staff—be redesigned. The goal is a paperless process and work will proceed under the reengineering project.

"The next phase of our reengineering work will involve broad consultation with people throughout the MIT community," Mr. Dickson said. "Redesign team members will include those who use as well as provide the services. In addition, people with expertise in human resources and information technology will be members of the teams.

"The teams will talk with faculty, staff and students throughout MIT, developing ideas and models that people can test and comment on as a way of refining the redesign.

"Reengineering will simplify what we do, thereby making work easier, more effective, more efficient," Mr. Dickson added.

The Steering Committee made its announcement after studying the results of the Reengineering Core Team's extensive review of a number of key administrative processes.

The Core Team, a group of nine MIT staff members which worked nearly full time for more than two months, selected five key processes for closer review. They were student services, support of the research proposal process, facilities operations, management reporting and buying and paying for supplies and services. The team analyzed the processes on the basis of cost, impact on revenue, potential for improvement, significance of changes to MIT's future and the ease of implementing changes.

"Every member of the Core Team has worked incredibly hard to strengthen MIT for the changing times the Institute is coping with," Mr. Dickson said. "This is tough work, not an activity that people undertake for personal glory. Their efforts deserve the highest of accolades from everyone at MIT."

Those areas of the five not selected for the initial redesign work, as well as additional areas, will be considered for reengineering in the future, Mr. Dickson said.

The next phase of the reengineering effort will go forward in several steps. The first phase, design, lasts about three months. In this phase, the redesign team develops a new, more efficient way to accomplish the Institute's goals. The redesigned process then goes into the lab phase for about six months, where the design is tested and redesigned as needed. Throughout the redesign and lab testing, the redesign teams will seek input from the community through participation in the labs and in focus groups.

At the point a final design is agreed upon, a three-month pilot of the process with a small portion of the community will be set up to get out any last kinks. After a successful pilot, the new design will be introduced so the whole community can benefit from the newly redesigned process.

Mr. Dickson said that the Steering Committee will appoint a redesign team for student services in January after the newly created Student Information System is up and running. "This new system was developed over the last three years by the Registrar's Office, in consultation with faculty, students and staff throughout MIT. The system will provide a much more comprehensive and flexible foundation for making significant improvements in MIT's student services," Mr. Dickson said. Student services is the collection of administrative services performed for students from their arrival on campus to graduation. These services include registration for subjects, recording grades, administering financial aid, collecting fees, placement, etc.

MIT President Charles M. Vest has referred to the Institute's reengineering effort as "pure MIT: think big, analyze ourselves, act on what we learn, and show the rest of the academic world how to do it."

This endeavor allows MIT "to think more about ourselves as a system—how one person's work affects that of others throughout the Institute, how a savings in one area makes possible creative investments in another, how to avoid duplicating each others' efforts, and how to do it right and do it once, thus making each individual's work more important."

# DOD Funding Threatened

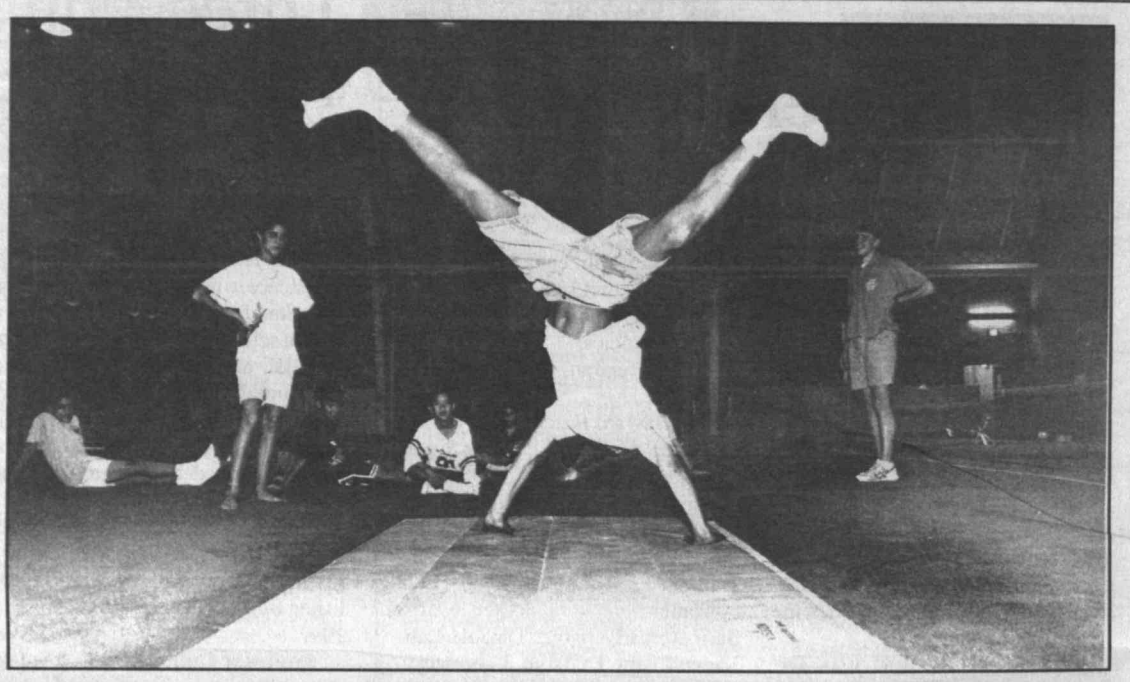
(continued from page 1)

tant than ever. Historically, Congressman Murtha has been a strong supporter of Defense Department research. Despite today's controversy, we hope that he will maintain that support," Mr. Crowley said.

Professor J. David Litster, MIT vice president and dean for research, said the unprecedented cutback "would be a complete disaster for the national university system." Both Mr. Crowley and Professor Litster were interviewed by the Boston Globe last week for an article anticipating the action by the Defense Subcommittee.

The Globe also quoted Sen. Edward M. Kennedy as saying: "Drastic cutbacks like that make no sense. This research represents the backbone of the nation's future high-tech defense capabilities and has far-reaching benefits for the civilian economy too. I'm confident that the full House and Senate will reject these shortsighted subcommittee cuts."

The appropriations bill is expected to be voted on before the House breaks June 30 for its Independence Day holiday. Members are scheduled to return to Washington July 11.



**GOING FOR A SPIN**—Cartwheeling into MIT summer day camp is Justin Fong, 12, who already has the maneuver nearly mastered on the first day of the gymnastics part of camp. **Photo by Donna Coveney**

**CLOSING THE GAP**

# Making the Case for Reengineering

■ **By William R. Dickson**
Senior Vice President, Chair of Reengineering Steering Committee

**and James D. Bruce**
Vice President,
Reengineering Program Manager

We are now beginning to redesign MIT's administrative processes. As we get started with this second phase of our reengineering work, it is important to remind us all why we must undertake such a difficult task.

**WHY DO WE NEED TO DO THIS?**

There are three primary reasons. First, our administrative processes have become complex as they evolved over the years. Second, these processes often do not provide the timely, high-quality results needed by faculty, students, staff and sponsors, even though everyone involved in the processes works hard. Finally, our operating budget has been out of balance, with our costs exceeding our income, for many years. More recently, the size of these annual operating gaps has grown, requiring the Institute to deplete other funds in order to close the gaps.

In redesigning our administrative processes, we seek to simplify our work, to improve the quality of the administrative services that support the Institute's fundamental mission of teaching and research, and to restore balance to our annual operating budget. Reengineering means changing the way we work—what tasks are performed and how information flows—across functional areas and departments. Reengineering MIT's administrative processes will not affect what and how we teach or how we conduct our research.

**INSTITUTIONAL OBJECTIVES**

Our efforts to reengineer MIT's administrative processes are guided by seven institutional objectives set forth by President Charles M. Vest and Provost Mark S. Wrighton. Most recently stated in the March issue of the Faculty Newsletter and in the April 27th edition of TechTalk, these objectives include:

—Maintaining MIT's position as the leading academic institution focused on science and technology

—Maintaining merit-based admission and need-based financial aid for undergraduates

—Tempering the rate of tuition growth

—Enhancing the diversity of our community

—Fully supporting academic year salaries for faculty

—Maintaining competitive salaries

—Maintaining sufficient flexibility to take advantage of new ideas and opportunities advanced by the faculty.

Our ability to make major progress toward these objectives is limited by our fiscal constraints.

**A GROWING FINANCIAL GAP**

For many years, MIT has had a gap between annual income and expenses. Between fiscal 1975 and 1993, a total of $117 million was required to fill these annual gaps. The bulk of these monies, some $90 million, came from unrestricted gifts that were spent in the year they were received. If there had not been an operating gap, these gifts could have been used to build our endowment for professorships and financial aid, as well as to support new initiatives in teaching and research.

From 1975 to 1988, the average annual operating gap was $4 million. Since 1989, the average annual operating gap has been $12 million. In fiscal years 1993 and 1994, to close the operating gaps, we have spent current year unrestricted gifts and other funds. We have also had to decapitalize some unrestricted funds that were set aside in prior years to function as endowment. If we do not reverse these trends, more than $100 million will be required to close operating gaps between 1994 and the turn of the century, a period of only six years. About half of this funding would have to come from decapitalizing funds functioning as endowment. Such a move reduces income available from those funds that would support operations in future years.

> By simplifying our work, we will also significantly reduce our costs.

To avoid such a scenario, and we must avoid it, the Institute must dramatically reduce annual expenses or increase income. However, external forces limit our opportunities to increase income in the years ahead. For example, US research spending is growing at a much slower pace than in earlier decades. Regional economic development considerations may play an increasingly important role in funding decisions by research sponsors. At the same time, the federal government is pressuring the nation's research universities, including MIT, to reduce what we charge for the indirect costs associated with research. In addition, concerns by students, their families, and their prospective employers about the costs of education constrain the rate at which we can increase tuition.

Without significant increases to Institute income, it is estimated that we will have to reduce expenditures by some $40 million a year to eliminate the operating gaps that are forecast for upcoming years. (This figure takes into account decreases in indirect cost recovery that we will experience.) We must reduce our annual expenses by this amount over the next few years. We are committed to get there in a way that will simplify our administrative work and improve our services. If we just make budget cuts without also changing how we do our work, we will soon find ourselves back in financial difficulty. This is exactly what happened after the budget reductions that were made in the 1970s and 1980s.

**OTHER ACTIONS**

Reengineering our administrative processes is one of several efforts to ensure that the Institute responds effectively to the situation and that the Institute's strengths and excellence endure. Some of the other efforts are:

—A committee chaired by Prof. Merton Flemings, examining MIT's relations with industry

—A blue ribbon panel studying healthcare options at MIT

—Sloan School restructured to provide 25 percent more capacity to enable new educational and research programs and increase the quality of student services

—Consolidation of administrative services in the School of Architecture

—A recent study recommending improvements in the cost and effectiveness of campus mail services

—The publications services review group's assessment of the Institute's printing needs in light of changing technology

—A study of the academic appointment process, recommending that the Institute's appointment processes be redesigned.

**ENSURING OUR FUTURE**

In reengineering administrative processes, we aim to simplify the way we conduct our administrative activities and to increase the satisfaction of the people for whom we provide services: the faculty, students, sponsors and other staff. By simplifying our work, we will also significantly reduce our costs.

We are ready to begin the next phase of the reengineering effort and are determined to succeed. There is a bright future for work, study and research at the Institute. It can be a future freed of bureaucratic entanglements, where the best faculty, students and staff work together with adequate funding and tools, as national leaders, not only in research and in teaching, but in how we run our institution.

William Barton Rogers' vision for MIT must live on. MIT must continue to be an independent educational and research institution addressing the challenges of the nation and the world. It is up to us to protect and promote this vision of MIT as a powerful magnet for intellect and creativity, with an emphasis on the pragmatic and the practical. We must work together in the coming months so that our Institute community can define the leading edge of human knowledge and invention for the 21st century.