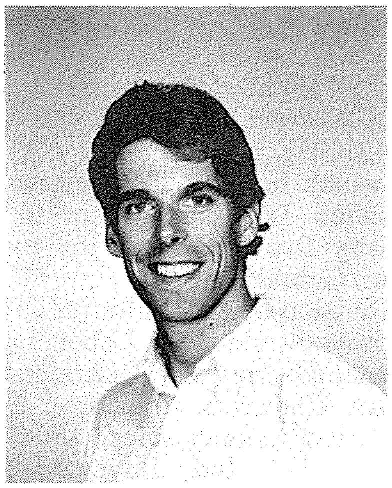
HST in perspective

A newsletter of the Harvard-MIT Division of Health Sciences and Technology

Fall/Winter 1989/90

DR. GLENN RENNELS APPOINTED CABOT PROFESSOR



Several years ago a special HST committee charged with identifying research opportunities appropriate to HST's mission targeted the area of artificial intelligence in medicine. Given the great strengths of MIT in the area of artificial intelligence and the suitability of some areas of medical practice for the application of AI it seemed a most appropriate commitment for HST. Through the generosity of Mr. Thomas Cabot an endowed development professorship in his name was committed to this purpose. A search committee charged with identifying the most appropriate candidate was formed under the chairmanship of Professor Peter Szolovits of the Laboratory of Computer Sciences and included Professors Joel Moses, William Siebert, Patrick Winston, Richard Teplick, and the Co-directors. *(Continued on P. 6)*

Honors and Awards

DR. GEHRKE RECIPIENT OF I.M. LONDON TEACHING AWARD

Excellence and dedication to teaching in the biomedical sciences curriculum are central to the goals of the Harvard-MIT Division of Health Sciences and Technology. To recognize teaching faculty who have made outstanding contributions to the training of HST students, the Irving M. London Teaching Award was established in 1986. Selection of the individual is made by a committee of students who have completed HST Biomedical Sciences courses through Spring of their second year. This committee compiles a list of candidates based on nominations from all HST students; the final selection is based on these nominations, on course reviews, and on student evaluations. Although the selection committee does have a faculty moderator, it is the student membership that chooses that faculty member who "best exemplifies the goals and philosophy of the Harvard-MIT Division of Health Sciences and Technology."
(Continued on P. 8)

THIRD ANNUAL HST FORUM

The third annual HST Student Research Forum was held on October 20, 1989 in the Bartos Theater of the Wiesner Building at MIT. The Forum is held each year to underscore the importance of student research in the HST Division and to provide an opportunity for students to present and discuss their work.

Approximately one hundred students and faculty registered for the Forum, and thirty research papers were delivered as either platform presentations or in poster sessions. The morning platform session was moderated by Vivian S. Lee (M.D. '92) and included talks by Howard Lebowitz, Alice Flaherty, Ahamindra Jain, Tom Wu and Thomas Mullen. A buffet luncheon and poster session were followed by the afternoon meeting, which was moderated by Yaffa K. Weaver. The afternoon presenters were Natacha de Paola, Marvin Appel, Brent Foy, Pietro Mazzoni, and Nancy G. Wolf.

Following the formal research presentations, students and faculty participated in a panel discussion dealing with the topic of "Fraud in Science." The panel was chaired by Dr. Daniel Federman, Dean of Students (HMS) and included Dr. Eleanor Shore, Dean for Faculty Affairs (HMS), Dr. Paul Russel, John Homans Professor of Surgery (MGH and HMS), Dr. David Page, Assistant Professor of Biology at MIT and Associate Member of the Whitehead Institute. Dean Federman initiated the discussion by asking how many participants had been touched by the issue of fraud in their own research experiences. Dean Shore and Dr. Russel described HMS policies for preventing and dealing with research fraud, and Dr. Page described his attitudes on developing a laboratory environment which would help to prevent fraudulent activities.

Several alumni attended the proceedings, including Dr. Michael Kita from Kennebunk, Maine and Dr. Jean Elrick (MGH). The Forum closed with a dinner/dance which featured the presentation of the Irving M. London Teaching Award to Prof. Lee Gehrke. Greg Brown hosted the evening and introduced Prof. Gehrke.

The HST Division is grateful for the support of the Forum which was provided by Abbott Laboratories; American Cyanamid Company; Burroughs Wellcome Company; Dow Chemical Company; Eli Lilly & Company; Marion Laboratories, Inc.; Merck & Company, Inc.; Miles, Inc.; Bayer AG; Monsanto Company; Reed & Carnrick Pharmaceuticals; and Squibb Corporation.

NEW JUNIOR FACULTY SEARCH

HST has launched a search for a new junior faculty member to be located at MIT. The Search Committee includes: Profs. William Beck, Richard Cohen, Ernest Cravalho, Forbes Dewey, Jr., Farish Jenkins, Robert Langer, Jr., Thomas Weiss, Felix Villars, Laurence Young, and Roger Mark (Chairman). The official announcement is as follows:

Massachusetts Institute of Technology seeks a junior faculty member in the broad area of biomedical engineering or biomedical physics. The appointee will have major responsibilities in the education of scientists, engineers, and physicians who expect to work at the interface of technology and medicine. The individual's research area is flexible and could range, for example, from molecular biophysics to quantitative systems physiology to innovative diagnostic or therapeutic devices. The individual should possess a doctoral degree in the physical sciences or engineering. A strong background in biological/medical sciences is required. The appointment will be made jointly between the Harvard-MIT Division of Health Sciences and Technology (HST) and an MIT Department in the individual's discipline.

Qualified applicants should send a letter including a two-page statement of current or proposed research, a curriculum vitae, and three letters of reference by April 1, 1990 to:

Prof. Roger G. Mark
Co-director, HST Division
Room E25-519
Massachusetts Institute of Technology
Cambridge, MA 02139

The letters of reference may be sent separately, but the names and addressees of referees must be included in the application. MIT is an affirmative action/equal opportunity employer.

HST MD CLASS OF 1993

Thirty-five students have been accepted into the HST M.D. Class of 1993. The members of the new class, their undergraduate institutions, and majors, are identified below. The class includes one Marshall Scholar and one Rhodes Scholar, and all candidates, regardless of undergraduate major, have strong credentials in the quantitative sciences and mathematics, as assessed by the Admissions Committee. The Admissions Committee was chaired by Dr. Daniel C. Shannon this year.

NAME	INSTITUTION	DEGREE/FIELD
Arany, Zoltan P.	Harvard University	Molecular Genetics
Cheng, George C.	Harvard University	Biomechanics
Chin, Douglas H.	Harvard University	Molecular Biology/Immunology
Dutta, Sanjoy K.	Yale University	Physical Chemistry
Fernandez, Harold A.	Princeton University	Molecular Genetics
Fleming, Mark D.*	Princeton University	Molecular Biology
Gleit, Zachary L.	Harvard University	Math Modeling
Goldstein, Allan M.	Yale University	Molecular Genetics
Goodman, David E.	University of Pennsylvania	Bioengineering
Gozani, Shai N.	UC Berkeley	Neurobiology/Networks
Guyton, Gregory P.	Vanderbilt University	High Energy Physics/Math
Hahn, Samuel S.	University of Pennsylvania	Biomedical Engineering/Modeling
Helman, Joshua B.*	Harvard University	Biochemical Sciences
Hess, Ann C.	Yale University	Epidemiology/History/Soc.Stud.
Huertas, Pedro E.	Harvard University	Biochemistry
Hung, Deborah T.*	Harvard University	Chemistry
Karp, Seth J.	Harvard University	Molecular Genetics
Kerrihard, Thomas N.	UC Berkeley	Biochemistry
Kuo, John S.	Harvard University	Molecular Genetics
Labow, Brian I.	Brandeis University	Biochemistry
Leffler, Christopher	Virginia Polytechnic Institute	Neurochemistry
Li, Peter M.	California Institute of Technology	Biophysical Chemistry
Maggard, Melinda A.	University of Washington	Bioengineering
Mammen, Mathai	Dalhousie University	Biochemistry
Pomerantz, Joel L.	Brandeis University	Molecular Genetics/Immunology
Priebe, Gregory P.	Harvard University	Biochemistry
Reiter, Evan R.	Johns Hopkins University	Bioelectrical Engineering
Shaywitz,David A.	HarvardUniversity	Biochemistry/Immunology
Smith, James S.	Brown University/MIT	Biophysical/Neurophysiology
Song, Lucy C.	Harvard University	Biochemistry
Stufflebeam, Steven*	UC Berkeley	Bioengineering
Szal, Sara E.	University of Washington	Bioengineering/Physiology
Tseng, Elaine E.	MIT	Molecular Genetics/Immunology
Vonderheide, Robert H.*	University of Notre Dame	Chemical Engineering
Wang, Cindy C.	MIT	Biochemistry

*** Admitted last year but officially assigned to 1993.**

SEPTEMBER 1989 MEMP CLASS

Thirteen new graduate students from eleven institutions joined the HST Medical Engineering/Medical Physics Program (MEMP) in September, 1989. All MEMP students are admitted jointly by HST and a Department of Engineerinng at MIT or by the Division of Applied Sciences of the Graduate School of Arts and Sciences at Harvard.

NAME	INSTITUTION	DEGREE/FIELD
Borchers, Robert E.	Stanford	Mechanical Engineering
Boxerman, Jerrold L.	MIT	Electrical Engineering
Chen, Marilyn	University of Illinois	Electrical Engineering
Chesler, Naomi C.	Swarthmore	Mechanical Engineering
Guo, Ziang-Dong	Peking University	Mechanical Engineering
Huang, Susan M.	MIT	Mechanical Engineering
Powlison, Amy	Michigan State University	Mechanical Engineering
Quinn, Thomas M.	Queen's University, Canada	Mechanical Engineering
Samadami, Rosina	MIT	Mechanical Engineering
Shen, Tueng	Wellesley College	Chemistry
Shieh, Lisa Y.	Purdue University	Chemical Engineering
Wald, Heidi L.	Johns Hopkins University	Chemical Engineering
Wallace, David R.	Carleton University, Canada	Mechanical Engineering

MGH Biomedical Engineering Department News

On December 12, 1989, Professor Ernest G. Cravalho, Edward Hood Taplin Professor of Medical Engineering, Harvard-MIT Division of Health Sciences and Technology and Chief of the Department of Biomedical Engineering, Massachusetts General Hospital, presented the keynote address at the Heat Transfer Division Banquet during the 1989 Winter Annual Meeting of the American Society of Mechanical Engineers in San Francisco. The theme of the annual meeting was Bioengineering and Prof. Cravalho's brief address to the Heat Transfer Division focussed on the heat transfer aspects of bioengineering. In his talk entitled HEAT TRANSFER IN BIOLOGY AND MEDICINE: PAST SUCCESSES AND FUTURE POTENTIAL Prof. Cravalho borrowed a technique frequently used by David Letterman in his late night show. *(continued next page)*

MGH Biomedical Engineering Department News

(Cravalho, continued from P. 4)

Prof. Cravalho listed five current patient care technologies that are based upon heat transfer mechanisms.

HEAT TRANSFER IN MEDICINE: SUCCESSES

1. Frozen biomaterials
2. Hyperthermia
3. Lasers
4. Thermography
5. Electrosurgery

Each of these successes was highlighted with slides showing the technology being applied to patient care. Because Prof. Cravalho's research has been concentrated in cryobiology, he particularly stressed the utilization of frozen biomaterials for transplantation including such applications as embryo transfer in animals and humans, corneal transplants, and skin grafts for the treatment of burns.

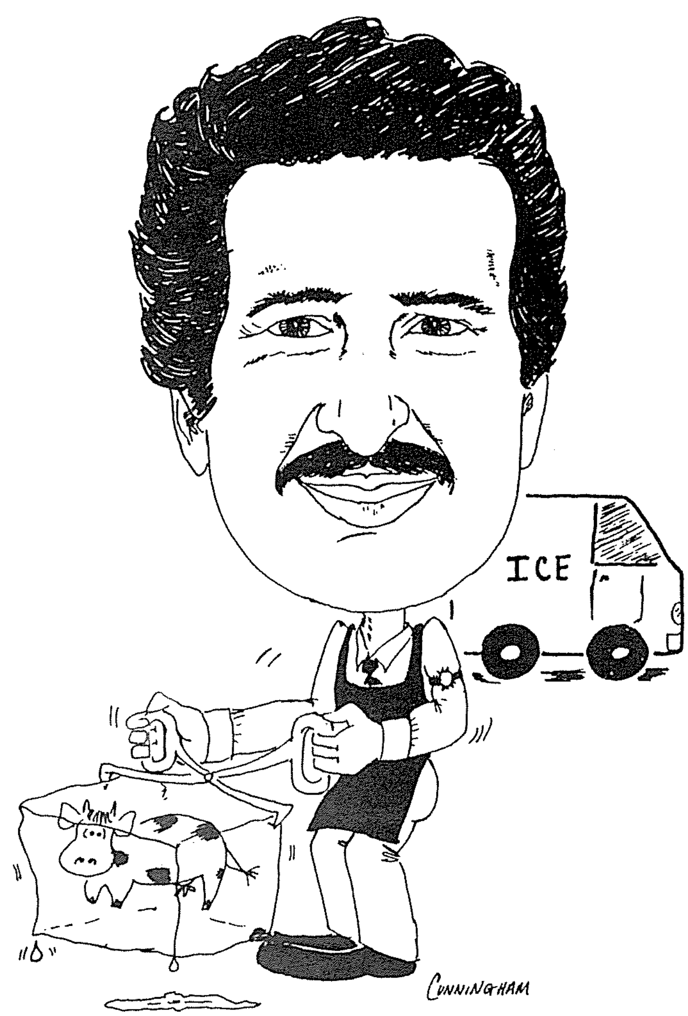
In the second half of his talk, Prof. Cravalho focussed on the future potential of heat transfer processes for patient care and again listed five technologies.

HEAT TRANSFER IN MEDICINE:
FUTURE POTENTIAL

1. Frozen Organs
2. Lasers
3. Burn Therapy
4. Electrical trauma therapy
5. In vitro fertilization

This portion of the presentation concentrated on research in the field and highlighted work by HST faculty and students. Included were the research of Dr. Mehmet Toner, a 1989 graduate of the MEMP Program (IVF and islet transplantation) ; Dr. Raphael Lee, presently of the Department of Surgery, University of Chicago Medical School (electrical trauma therapy) ; Dr. John Burke, HMS, HST, and MGH; Drs. Parrish, Anderson, and Nishioka, HMS, HST, and the Wellman Research Labs, MGH (lasers in surgery and medicine) ; Dr. Carmen Puliafito, HMS, HST and Mass. Eye and Ear Infirmary (laser treatment of pathologies of the eye) ; Dr. Ronald Tompkins, HMS, HST, and MGH (biohybrid artificial liver employing frozen hepatoacytes) .

Prof. Cravalho concluded his talk with brief remarks to the effect that biomedical engineers should take pride in their past contributions to patient care but that the work to be done in the years ahead will be more challenging not only from a technical point of view but also from the point of view of its cost effectiveness and responsiveness to the needs of society. Biomedical engineers can no longer be content with doing things right. They must now do the right thing.



(Rennels, continued from page 1.)

After a world search, the committee unanimously recommended that Glenn D. Rennels, M.D., Ph.D. be appointed as the first Thomas Cabot Assistant Professor in HST. Dr. Rennels joined the HST community last summer.

Glenn is a native of California who obtained his B.A. degree in Mathematics from Dartmouth College in 1977 and is a 1980 graduate of its medical school. He then matriculated to Stanford University and acquired his Ph.D. in medical computer science in 1986. He completed his post-graduate medical training in anesthesiology at Stanford in 1988.

Whereas most medical AI research has focused on the application of "expert knowledge" coded as rules or prototypes, Dr. Rennels' work emphasizes the importance of bringing evidence from clinical trials to bear on the physician's patient-specific decision-making thought. His project concentrates, therefore, on the framework in which the principal results and the methodology of controlled clinical trials are abstracted from the literature and then applied to specific situations in patient care. His program critiques the therapeutic plans of a physician about to undertake care for a cancer patient by pointing out relevant studies from the literature and by discussing the ways in which the experimental methodology of the study may invalidate or modify the applicability of its conclusions to the present patient. By incorporating a fundamental understanding of the design and analysis of multi-arm protocol studies, the program can actually determine not only which studies but which portions of which studies are most relevant to the case at hand. Based on this work, Dr. Rennels is recognized and admired as one of the outstanding new contributors to the medical AI field, not only advancing it along established paths but really paving the way toward new kinds of applications. His laboratories are located in the Laboratory of Computer Sciences, 545 Tech Square.

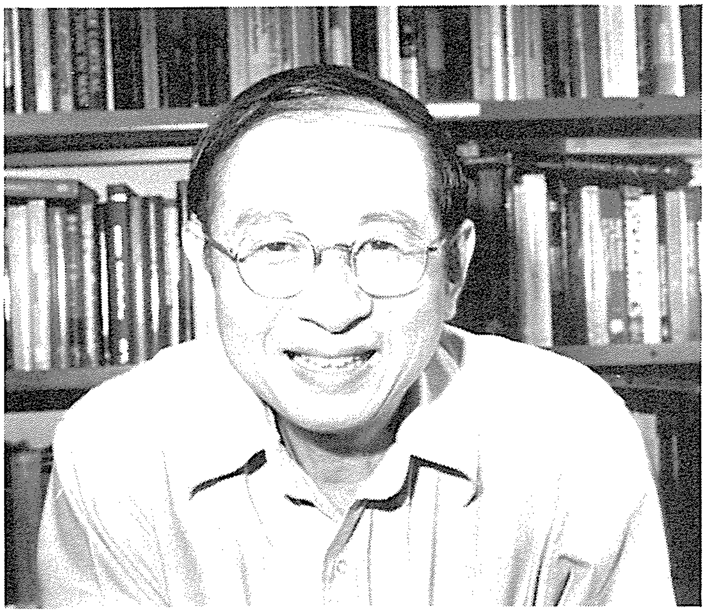
Glenn's recruitment led to a double benefit for MIT. His wife, Dr. Margaret Forsyth, is a graduate of Stanford Medical School whose post graduate medical training was acquired at the University of California at San Francisco in Internal Medicine. We are delighted to report that she has joined the staff of MIT's Medical Department and has her office in E23, the Medical Department building.

Welcome aboard Glenn and Margaret!

Honors and Awards

SYMPOSIUM HONORS DR. KIANG

Dr. Nelson Y.S. Kiang, HMS Professor of Physiology and Director of the Eaton-Peabody Laboratory at the Massachusetts Eye and Ear Infirmary, was recently honored on the occasion of his sixtieth birthday with a symposium celebrating 30 years of research at the lab. Scientists from around the world presented nearly forty papers during the three day symposium held at MIT's Endicott House. Dr. Kiang, whose research has focused on understanding the hearing system and its disorders in clinical medicine, is also a Professor of Brain and Cognitive Sciences and the Eaton-Peabody Professor at the Whitaker College, MIT.



A Message from the Co-Directors

Advisory Committee to Review Student Research

It is most important for all organizations to periodically question first principles, the goals and objectives that emerge from those prinicples and the processes necessary or essential to achieving them. In educational institutions, this periodic audit of its programs and departments is most frequently a function of visiting committees whose members include well-informed alumni and other appropriate experts. Because HST is a Division of both Harvard and MIT, this important function is served by our Advisory Committee. Its chairman is Richard J. Johns, M.D., a distinguished Massey Professor and Director of the Department of Biomedical Engineering at Johns Hopkins. Members include Dr. James B. Bassingthwaighte, Director of the Center of Bioengineering at the University of Washington; Dr. Thomas F. Budinger, Professor of Electrical Engineering and Computer Science at the Lawrence Berkeley Laboratory; Dr. Gilbert Chu, an HST alumnus and Associate Professor in Medicine at Stanford; Dr. Jerome R. Cox, Jr., Chairman of the Department of Computer Science in the School of Engineering at Washington University in St. Louis; Dr. Robert L. Dedrick, Chief of the Chemical Engineering section at the National Institutes of Health; Dr. Peter G. Katona, Professor of Biomedical Engineering at Case Western Reserve University; Dr. John S. Lloyd, an independent educator/statistician; Dr. William P. Murphy, ex-President of Cordis Incorporated; Dr. John Norman, Chairman of the Department of Surgery at Marshall University; Dr. John A. Quinn, Professor of Chemical Engineering at the University of Pennsylvania; Dr. Helen M. Ranney, Professor of Medicine at the University of California, San Diego; Mr. John F. Taplin, Consulting Engineer; Dr. George W. Thorn, Chairman of the Board at the Howard Hughes Medical Institute; Dr. Thomas A. Waldmann, Chief, Metabolism Branch, National Cancer Institute; and Dr. Samuel O. Thier, President, Institute of Medicine.

The Advisory Committee first met in March of 1988, and in a two-day session reviewed HST's administration and educational programs. Its superb report has suggested current issues that need to be worked and new directions we should consider.

The Committee has scheduled its next visit for March 28-30, 1990. Professor Johns has informed the Co-Directors that the committee will be reviewing student research as a primary focus. He intends to organize the Advisory Committee in teams to listen to student research presentations, visit them in their laboratories, and meet with student groups and members of the faculty to examine all phases of our student research activities. We are now in the process of canvassing all of our faculty who supervise the students' research to seek their counsel as to how we might best identify the 20 or so of our 225 students who will be playing key roles. We have been told by the Advisory Committee to present our best research, and we will need substantial help from our HST faculty, our students, and friends to identify and optimize this opportunity. As before, Dr. Fred Bowman, HST Sr. Academic Admistrator will serve as Executive Secretary to the Advisory Committee and is responsible for all arrangements and other details. Many of you will be hearing from Fred asking for your counsel and participation. All of us are grateful to you for your support.

(Gehrke, continued from P. 1)

The 1989 recipient of the Irving M. London Teaching Award is Lee Gehrke, Ph.D., co-director of HST-010, Human Functional Anatomy. Dr. Gehrke has been associated with this cornerstone of every medical student's education since 1982. Cited for his well-organized and well-prepared lectures, classnotes, and laboratories, Professor Gehrke has also earned praise for his caring attitude: "[He is] an outstanding source of support for students; always willing to give a lot; [he] is one of the things which makes HST so good." In addition to his teaching duties, Dr. Gehrke has received commendation for the organization of an annual student research symposium called the HST Forum, the first of which took place in 1987. This highly organized event offers all HST students an avenue for discussion of their research with each other and their faculty/research mentors. In summing up the qualities that set Lee Gehrke apart from his peers, one student stated that "[Dr. Gehrke is] the man who does <u>everything</u> in HST[!]... and probably knows the students the best! Always willing to help and guide, he embodies the qualities of an ideal teacher."

Born in Joliet, Illinois, Lee Gehrke received his B.S. in zoology at Eastern Illinois University in 1973. He continued his education at the Case Western Reserve University School of Medicine, earning a Ph.D. in Anatomy and Biochemistry in 1980. After graduation, Dr. Gehrke began his association with MIT as a Postdoctoral Fellow (Muscular Dystrophy Association-molecular biology) in the Department of Biology. In 1982, while holding a research fellowship from the National Institutes of Health in molecular biology at MIT (also in the Department of Biology), Dr. Gehrke also became a Research Fellow in Anatomy at the Harvard Medical School. At the same time, Dr. Gehrke was introduced to the Harvard-MIT Division of Health Sciences and Technology as a Lecturer in Anatomy. Since 1985, Dr. Gehrke has held concurrently the titles of Lawrence J. Henderson Assistant Professor of Anatomy in the Harvard-MIT Division of Health Sciences and Technology and of Assistant Professor of Anatomy and Cellular Biology, Harvard Medical School; he was promoted recently to Associate Professor. Dr. Gehrke's commitment to the HST Division extends beyond teaching, however; he has been involved with the HST Admissions Committee since 1982, recruiting suitable candidates for the program. His dedication to the students is manifest in his involvement with all aspects of their careers, from their introduction to the program as candidates, through their course of study at MIT and Harvard, and, occasionally, while research assistants in his laboratory at MIT. Professor Gehrke is actively engaged in research in these two major areas: translation-level regulation of gene expression in eukaryotes; and RNA structure and ribonucleic acid-protein interactions.

Honors and Awards

SHANNON AWARDED 1989 STRITCH MEDAL

On November 21, at a ceremony in the International Ballroom of the Chicago Hilton Hotel, Dr. Daniel C. Shannon was presented with the 1989 Stritch Medal.

Dr. Shannon received his bachelor's degree from Xavier University, and then earned his M.D. degree from the Stritch School of Medicine of Loyola University in 1960. Since then, he has specialized in pediatrics. After completing his resident training at Massachusetts General, Dr. Shannon rose through the ranks in the pediatrics department at Massachusetts General and is now the director of the hospital's pediatric pulmonary unit. In 1964, Dr. Shannon began his association with Harvard Medical School as a teaching fellow in pediatrics; he currently holds the position of associate professor of pediatrics at Harvard and in The Harvard-MIT Division of Health Sciences and Technology. *(Continued on next page)*

(Shannon, continued from P. 8)

Dr. Shannon has been course director of HST 100, Respiratory Pathophysiology, since 1974. He also serves as a member of the Division's Curriculum and Joint Faculty Committees, and further serves as chairman of the Division's Admissions Committee, as a board member of the National Foundation for Sudden Infant Death Syndrome, and as a consultant in pulmonary medicine to the American Board of Pediatrics. Through his research on Sudden Infant Death Syndrome, Dr. Shannon has identified mechanisms responsible for apnea and helped to develop an apnea monitoring device which alerts parents when their child stops breathing.

Not only is Dr. Shannon recognized as an outstanding physician, but he is also known for his involvement and knowledge in literature and the arts. An active participant in the Boston arts community, Dr. Shannon is a member of the School of the Museum of Fine Arts Medici Society, chairman of the Arts Committee for St. Botolph Club, and member of The Speckled Band-scion of the Baker Street Irregulars, a scholarly group which investigates the activities of Sherlock Holmes and the writings of Arthur Conan Doyle.

The Stritch Medal was named after Samuel Cardinal Stritch, who was particularly dedicated to quality medical education in the Chicago area. Loyola University changed the name of the medical school to honor him in 1948 and awarded the first medal in 1960 at the Annual Awards Dinner. The medal is given annually to "recognize the accomplishments of an outstanding alumnus or faculty member."

New Course for HST

REAL MEDICINE: A longitudinal experience in caring for patients

The new course, HST-230, *Real Medicine*, is designed to provide HST students with clinical experience in long-term management of patients with serious medical problems. Several student group practices will be formed within the HST Division. Each group practice will be established with 6-8 students selected from the 2nd year class. Students are expected to make a commitment to the practice of at least 3 years. In subsequent years, additional second year students will be added until each student group practice reaches steady-state. Students will participate in the care of medically "at risk" out-patients, such as patients who are chronically ill, demented, home bound, in a nursing home, HIV infected, or pregnant. Each student will be supervised by a physician/preceptor, and will initially be assigned four patients. Once a month, students will arrange to meet individually with each patient in order to develop a wide range of clinical skills and to participate in both the out-patient and in-patient management of active medical problems. During the first semester, the visits are to be primarily social in nature. Students will acquire detailed histories from the patients concerning medical, social, economic, familial, and personal issues. Patients who become hospitalized will be visited daily by the responsible student. As their clinical training progresses, third and fourth year students will assume increased responsibility for the clinical management of their patients under the supervision of the primary care physician/preceptor. The student group practice will establish an on-call system in order to provide continuous coverage for their patients.

Each group practice will be under the direction of a carefully selected faculty preceptor who is associated with a primary care practice specializing in caring for a broad cross-section of medically fragile patients in the Boston area. Students will meet monthly with their individual physician/preceptors, and in addition, there will be a monthly group practice dinner meeting to discuss issues that arise in the practice and for more formal instruction on a variety of relevant topics. These discussions will cover a range of medical, social, economic, ethical, legal, and health policy-related subjects.

The initial student group practice, which includes 7 students, has been set up with the Urban Medical Group whose 8 physicians and 7 nurse practitioners provide primary care to a wide variety of medically fragile patients in Boston. The group is affiliated with Boston's Beth Israel Hospital.

Calendar of Events/Deadlines

January 15, 1990	Proposals DUE for the following: Johnson & Johnson Research Fund Whitaker Health Sciences Fund Grants to Boston University School of Medicine, Harvard Medical School, and Tufts University School of Medicine Faculty Collaborating with MIT Faculty on Biomedical Research
January 31, 1990	HST January classes end
February 1, 1990	Proposals DUE for the following: Whitaker Health Sciences Fund M.I.T. and Whitaker College Doctoral Fellowships Whitaker Health Sciences Fund Harvard-MIT M.D./Ph.D. Fellowships Whitaker Health Sciences Fund M.I.T. Faculty Research Grants
February 16, 1990	HST Student Research Papers (4-6 pages) DUE at HST
March 28-30, 1990	HST Advisory Committee Meeting

HST in Perspective is published twice a year by the Harvard-MIT Division of Health Sciences and Technology. News items and editorial comments are welcome.

HST in perspective

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