

Sloan Forms Information Research Unit

By ROBERT C. DI IORIO
Staff Writer

How can managers best deal with the complex questions surrounding information system effectiveness?

That is the particular concern of the recently established Center for Information Systems Research, part of MIT's Sloan School of Management, which conducted its first major conference last week (April 3-5) on "The Implementation of Computer-Based Decision Aids."

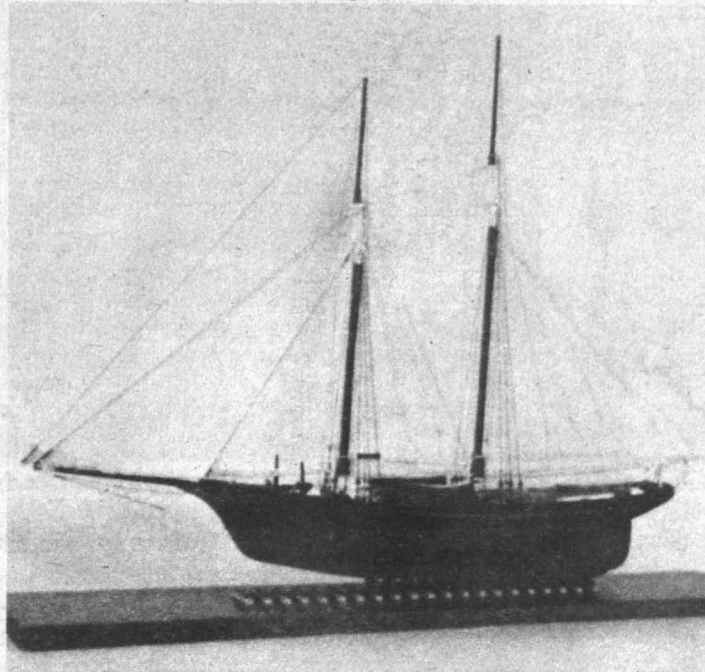
The conference brought together a select group of academic and business practitioners and researchers—attendance was limited to 100—in a workshop environment. Both recent research findings and case studies of successful implementations were presented.

Chairman of the conference, held at the Hotel Sonesta in Cambridge, was Peter G. Keen, assistant professor of organizational psychology and management. His main research interest has been in the effect on the design of systems of the psychological differences between managers and computer specialists.

"There is a real problem in sharing information," Professor Keen said, "both from its theoretical and practical viewpoints, and there's been an increasingly arbitrary dichotomy between research and practice in the computer field. The main aim of the conference and of the CISR has been to get a middle ground. What the practitioner has to offer us is, first of all, his experience, and secondly, to force us to be much more aware of just how managers have to operate. What we obviously bring is theory, a wider frame of reference and, perhaps, some sort of ideal of how systems

(Continued on page 8)

New Ship in Port



A replica of one of the outstanding fishing schooners of the 1890's the *Fredonia*, recently joined MIT's fleet of model fishing vessels in the Hart Nautical Museum.

The original *Fredonia*, built in 1889, was designed by Edward Burgess and constructed in Essex, Mass., where many fishermen for the Boston fleet were constructed.

The *Fredonia's* features were copied widely by other fishing schooner designers as she represented an improvement over the then prevalent shallow hulled clipper type schooner, responsible for loss of life and vessels in the New England fishing fleet of the 1870's and 1880's.

Some of the schooner's design improvements are a pronounced v-shape bottom and a long rockered keel with a cutaway forefoot (where the stem of the ship meets the keel) for easy turning.

The MIT model was built by Erik A.R. Ronnberg, Jr., of Rockport, Mass.

MIT History Journal Plans US Revolution Conference

The *Journal of Interdisciplinary History*, edited and published at MIT, has received a grant from the Rockefeller Foundation to sponsor a conference on new ways of understanding the American Revolution.

Robert I. Rotberg, professor of history and political science in the MIT Department of Humanities, is

the editor of the journal, a quarterly publication of the School of Humanities and Social Science.

The conference, to be held May 16 and 17 in Cambridge at a site to be announced, will explore three controversial aspects of the Revolution:

—The redistribution of wealth
(Continued on page 11)

Ten from Institute Elected to NAE

MIT Chancellor Paul E. Gray and nine others from MIT have been elected to the National Academy of Engineering.

They are among 86 American engineers whose election to the Academy was announced by W.E. Shoupp, acting president. The total membership is now 597.

Election to the Academy is the highest professional distinction that can be conferred on an American engineer and honors those who have made important contributions to engineering theory and practice or who have demonstrated unusual accomplishments in the pioneering of new and developing fields of technology.

Dr. Gray was cited for his "contributions to engineering education and to the management of educational institutions."

The others elected to membership from MIT and their citations:

Dr. Wilbur B. Davenport Jr., professor of engineering and edu-

cation and head of the Department of Electrical Engineering and Computer Science: "Contributions to communications engineering and education and for leadership in continuing engineering education."

Dr. Jacob P. Den Hartog, professor of mechanical engineering, emeritus, and senior lecturer: "Contributions to engineering education and to the technical literature in the field of mechanical vibrations."

Dr. Gerald P. Dineen, director of Lincoln Laboratory and professor of electrical engineering: "Contributions to the design of digital computers and satellite communications systems."

Dr. John F. Elliott, professor of metallurgy: "Contributions as a teacher, engineer and scientist, whose publications serve as basic references for process metallurgy students and researchers."

Dr. W. David Kingery, professor
(Continued on page 8)

Two Receive Guggenheims

Professor Bernard J. Frieden, professor of city planning and director of the Harvard-MIT Joint Center for Urban Studies and Professor Isadore M. Singer, Norbert Wiener Professor of mathematics were recently named recipients of 1975 Guggenheim Fellowship awards.

Professors Frieden and Singer are among 306 scholars, scientists and artists chosen by the selection committee of the John Simon Guggenheim Memorial Foundation to receive awards this year for their research and work.

The grant to Professor Frieden will support his work in drawing up an analysis of future national housing policy. Professor Singer's grant is for his studies on geometric and spectral invariants.

Lectures

Compton: Smith

The third and last 1975 Compton lecture, "Art, Technology and History," will be given by Institute Professor Cyril Smith in Rm. 10-250, Thursday, April 10 at 4:00pm.

Killian: Cohen

Dr. Morris Cohen, Institute Professor and Ford Professor of Materials Science and Engineering at MIT, will give his second James R. Killian Lecture, "Toward a Materials Ethic in National Policies," Tuesday, April 15.

The lecture will be given in Rm. 9-150 at 5:30pm.

Sexism Travels Success Ladder, Sloan Applicants Told

(A panel of Sloan School alumnae from business and government spoke at the graduate school's annual Women's Day program about some of the vital career decisions they faced in reaching the important management posts they currently hold. Their audience included women who have been accepted for the graduate program that begins this year, women students currently at Sloan and other alumnae and faculty. Leslie Clift Hruby, director of placement and assistant to the Dean of the Sloan School, was the coordinator for the day's program. The following account by Susan Trausch of the Boston Globe's financial news staff, appeared in the April 5 edition of that newspaper.)

By SUSAN TRAUSCH
Globe Staff

Prejudice follows a woman up the corporate ladder and she has to deal with it realistically.

That was the word from six women managers speaking yes-

terday at MIT's Alfred P. Sloan School of Management. The panel was part of the graduate school's "Women's Day" open house for about 50 students, applicants and alumnae. There are now 42 women enrolled in the management program that has a total of 200 students.

"A client will look at me as if to say, 'Oh, isn't this cute, a woman consultant,'" said Margaret Herrick, consultant at Arthur D. Little Inc., Cambridge. She has a master's degree in mathematics from University of Hartford.

"I don't get upset and yell and scream," she continued. "I just very coolly and calmly blitz them. I give them technical jargon until they are snowed and they figure maybe I know what I'm talking about. It works. I haven't yet been in a situation where I haven't been able to turn negative attitudes around. Once the ice is broken, I come back down and start talking

(Continued on page 5)



WOMEN'S DAY AT SLOAN—A group of Sloan School alumnae discussed some of the critical career choices they have had to make on their climb to the important corporate and government positions they

now hold. Their audience included women students accepted for the graduate program starting this year at Sloan. The program was held in the Schell Room at E-52.
—Photo by Calvin Campbell

Goro Photographs Included in 'Food' Show

By WILLIAM T. STRUBLE
Staff Writer

Photographs taken around the globe by LIFE science photographer Fritz Goro will be shown as a feature of a large, mixed-media exhibition, "Food," scheduled to be staged in the lobby of MIT's Building 7 today, Wednesday, April 9, through Friday, April 18.

Mr. Goro, whose work appears regularly in *Scientific American* and *Smithsonian*, has prepared an exhibition, "Food: Directly and Indirectly," consisting of 160 slides accompanied by a narration by Ernest R. Pariser; MIT Sea Grant Services advisory officer and senior research scientist in the MIT Department of Nutrition and Food Science.

The color slides, selected by Mr. Goro from his work over the last 30 years, are in two groups. The first deals with scientific aspects of food such as photosynthesis, plant genetics, cholesterol, and experiments in tissue culture. The second "anthropological" group on humans' quest for food is made up of pictures taken "on expeditions all over the world, from Antarctica to the Arctic," Mr. Goro said. In addition, some of Mr. Goro's exhibition prints will be shown.

Mr. Goro studied sculpture and design at the Bauhaus in Germany. He came to the United States with his family in 1936 and later that year began to work for LIFE as its first science photographer. Since then, he has worked on photographic problems in virtually all scientific disciplines. Mr. Goro is also a research associate in marine biology at the Scripps Institution of Oceanography at the University of California at La Jolla and for several semesters he has been a visiting lecturer at Yale University. Mr. Goro is a fellow of

the Biological Photographers Association.

The walk-through "Food" exhibition will include more than 20 displays executed in many media—film and video, "hard" and "soft" sculpture, graphics, sound programs, and photography. The exhibition was designed and directed by Otto Piene, director of the MIT Center for Advanced Visual Studies, Suzanne Weinberg, Lobby 7 coordinator, and by Dr. Pariser. It will also feature special performances, including an appearance by "French Chef" Julia Child.

Scholl Reviewed

A review of *Changing Faces*, a collection of poetry by Betsy Sholl, appeared in the *New York Times Book Review* on March 16, 1975. Ms. Sholl is an instructor in the Department of Humanities, and teaches in the Writing Program.

Jazz Ensemble to Play at Festival

The MIT Festival Jazz Ensemble will perform in the eighth annual Quinnipiac Intercollegiate Jazz Festival at Quinnipiac College in Hamden, Conn., this weekend, April 11-13.

The Quinnipiac festival will be highlighted by a competition among jazz ensembles from Towson State College in Maryland, New Jersey State College, the Philadelphia Musical Academy as well as MIT. The festival will also feature appearances by guest musicians Charles McPhearson, Don Elliot, Chico O'Farrell and Jimmy Heath.

In July, the MIT jazzmen hope to attend the Montreux International Jazz Festival in Switzerland as one of two college jazz groups invited to the prestigious festival held every four years and devoted almost exclusively to performances by leading professional jazz ensembles. If funds for the group's travelling expenses are found, as they were four years ago when the group was first invited to Montreux, the group will perform on three occasions during the July festival.

Begin Exhibition At Faculty Club

Artist Nancy Begin, of Topsfield, Mass., is having an exhibition of her oils, watercolors and etchings in the MIT Faculty Club this month. The paintings—mostly wildlife studies, are located in the Club bar and corridor leading to the private dining rooms.

Tavarelli Drawings in Hayden Corridor

A selection of recent drawings by the Boston area artist Andrew Tavarelli, will be on view in the Hayden Corridor Gallery at MIT from April 4 through May 4.

The exhibition of drawings will be held concurrently with the exhibition *Visual Dharma: The Buddhist Art of Tibet* in Hayden Gallery. Both exhibitions are sponsored by the MIT Committee on the Visual Arts.

Tavarelli's drawings result from his recent interest in textural possibilities of media such as graphite, chalk and conte crayon.

Some of the drawings have a dense, rich surface but are carefully controlled in their geometric structure. In other drawings, the flat, gray-hued planes suggest a more distant and indeterminate space. As in his recent paintings, the interruptions of plane by regular and ordered lines are important to the establishment of spatial relationships.

Recently, in collaboration with poet Russell Banks, Tavarelli has been carrying on a dialogue between printed word and pictorial



Judy Kusnick, a Wellesley junior from Poughkeepsie, N.Y. and John Maurer of Philadelphia, Ohio, looking at "Cakrasamvara" a gilded copper sculpture from the Hartman Rare Art Collection, New York, part of the current Hayden exhibition, "Visual Dharma: the Buddhist Art of Tibet."

Chamber Players to Feature Bartok Sonata

Two prominent concert pianists of the MIT music community will join the MIT Chamber Players in the ensemble's final concert of the season at 8pm Wednesday, April 16, in Kresge Auditorium.

John Buttrick, director of music at MIT, and Beatrice Erdely will participate in a performance of Bartok's Sonata for Two Pianos and Percussion. Mrs. Erdely, who is the wife of violinist Stephen Erdely, MIT associate professor of music, was soloist with the MIT Symphony Orchestra in its March 15 concert and will appear with the orchestra also during its spring concert tour.

Percussionists for the Bartok work will be David Stork, Leslie Markman, and Richard Horn.

The program for the concert will include Hummel's Quartet for Clarinet and Strings, Irving Fine's Quintet for Winds, and Introduction and Allegro by Maurice Ravel.

Violist Marcus Thompson, director of the MIT Chamber Music

Society and organizer of the MIT Chamber Players, will also participate in the concert. Professor Thompson recently gave recitals at Princeton University and Ramapo College and this Saturday will give a recital in the new orchestra hall in Minneapolis.

Mrs. Erdely is currently a member of the piano faculty of the New England Conservatory of Music and also teaches at Brandeis University.

UPI VP to Give Newspaper Seminar

United Press International's vice president for communications, James F. Darr, will discuss the worldwide computerized news-gathering, editing and distribution system of the news service at an April 15 MIT seminar to be held at 4pm in Rm. 9-150. The system which is now in operation is the culmination of several years of effort by UPI to upgrade the quality and speed of the UPI global news service through use of computers, digital communications, and video-display terminals.

The seminar, which is open to the public, is the fourth in a series to be offered over a three-year period at MIT under a grant from the Frank E. Gannett newspaper foundation.

Cumming Reading

Patricia Cumming, assistant professor in the Department of Humanities and co-ordinator of the Writing Program, gave a reading of her poetry at Focus II Coffeehouse in New York City on April 8.

During its 1975 spring tour, the MIT Symphony Orchestra, under the direction of conductor David Epstein, will play concerts at Wellesley College on April 17, at Brown University on April 19, at the University of New Hampshire on April 21, and at the University of Connecticut on April 22.

Echoes

April 6-12

50 Years Ago

Advances in the technology of airplane engines was reported in *Tech Engineering News*.

The Dippy Davy Duo was featured at the Spring Concert.

40 Years Ago

An anti-war strike was held in the Great Court to protest the increasing militarization of youth and the preparation for a new imperialistic world slaughter.

Tech fencers ended one of their most successful seasons, having won 6 out of 7 matches.

25 Years Ago

Pulitzer Prize-winning poet, Peter Viereck, talked on "Mid-Century Revolt in American Poetry."

Warren K. Lewis, '05, was chosen by the Engineering Societies of New England as recipient of New England Award for 1950. (Prepared by Ethel Newell of the MIT Historical Collections, x4444)

Humanities State of the Art to be Colloquium Topic

Steven Marcus, director of planning for the National Humanities Center in Washington, D.C., and professor of English literature at Columbia University, will talk on "Humanities, the State of the Art, Implications for Curriculum at MIT," on Tuesday, April 15, at 3pm in the Mezzanine Lounge at the Student Center.

The lecture is the second in a series of three colloquia—on history, humanities and literature

—sponsored by the Department of Humanities.

The colloquia are open to the MIT community. Refreshments are served.

Professor Marcus has recently written: "There is an undercurrent of expectation that the humanities are or should go into the business of creating values, new or old, for society. The expectation in question envisages striking resemblances to what is known in the social sciences as a 'technological fix.' A 'value fix' accordingly would assume that the

present social and cultural crises can be met by finding a short-cut route of somehow providing or promoting new values. This view regards the humanities as being in the business of supplying a value-technology for society.

"A 'value fix' in effect assumes that the 'solution' of cultural and social problems does not consist in real solutions of such problems in their proper realms and by the actual people involved, but that such solutions can, as it were, be applied from the outside. Apart from the question of whether this

should be the proper role for the humanities now or in the future, one should recall that this was in general the path that the established social sciences chose to pursue, and that their way has been increasingly strewn with boulders."

Professor Marcus is the author of *Engels, Manchester and the Working Class*, *The Other Victorians*, and *From Pickwick to Dombey*, and editor of *The Life and Work of Sigmund Freud* by Ernest Jones and *The Continental Op* by Dashiell Hammett.

TECH TALK

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Twenty-two associate professors from 11 academic departments and the Alfred P. Sloan School of Management have been promoted to the rank of full professor at MIT, effective July 1.

They are:

David Adler, Department of Electrical Engineering and Computer Science. Professor Adler began teaching at MIT in 1967 as assistant professor and was appointed associate professor in 1969. He holds the BS degree ('56) from Rensselaer Polytechnic Institute and the AM ('58) and PhD ('64) degrees from Harvard. A member of the Basic Research Committee of the National Research Council, he has taught six introductory electrical engineering subjects over the past 10 years. Areas of particular interest to him are amorphous semiconductor materials and devices, correlations in narrow energy bands, insulator-metal transitions, and electronic phase transitions. Professor Adler is a Fellow of the American Physical Society, and a member of the editorial board of the *Journal of Nonmetals*.

Jonathan Allen, Electrical Engineering and Computer Science. After graduation from Dartmouth in 1956 and receipt of the MS degree in 1957 from Dartmouth's Thayer School of Engineering, Professor Allen came to MIT in 1958 to begin work on his PhD. He left in 1962 to become a member of the human factors research department at Bell Telephone Laboratories, where he remained until the fall of 1967. He subsequently returned to MIT and received his PhD degree in June, 1968. Widely known for his work in natural language processing, including speech synthesis and recognition, he was appointed assistant professor in 1968 and associate professor in 1972. The text-to-speech system developed under his leadership in cooperation with MIT's Research Laboratory of Electronics formed the basis for his talking computer model of the human vocal tract which "speaks" human-sounding sentences.

Suzanne Berger, Department of Political Science. Professor Berger, who held the Edward Kenan Chair at MIT from 1972-74, is a graduate of the University of Chicago (BA '60) and Harvard University (MA '63, PhD '67), where she was an instructor at Harvard from 1966 to 1968. She was appointed assistant professor at

MIT in 1968. A member of Phi Beta Kappa and past recipient of the Woodrow Wilson Fellowship, Frederick Sheldon Traveling Fellowship and a Radcliffe fellowship, Professor Berger is the author of *Peasants Against Politics: Rural Organization in Brittany, 1911-67* (Harvard University Press, 1972) and *The French Political System* (Random House, 1974). She is a trustee of the World Peace Foundation and a member of the executive committee of Harvard's Center for International Affairs, and of the committee of the Center for West European Studies.

Aron M. Bernstein, Department of Physics. Professor Bernstein holds a BS degree (1953) from Union College and a PhD (1958) from the University of Pennsylvania. He was a research associate at Princeton University from 1957-61 and was appointed assistant professor of physics at MIT in 1961. He has held the rank of associate professor since 1966, during which time he spent a year's sabbatical at the Center for Nuclear Study in Saclay, France, on a Guggenheim Memorial Foundation Fellowship.

Jack B. Howard, Department of Chemical Engineering. After graduation from the University of Kentucky (BS '60; MS '61) and Pennsylvania State University (PhD '65), Professor Howard came to MIT in 1965 as assistant professor and Ford Foundation postdoctoral fellow for the two-year period from 1965-67. He was appointed associate professor in 1972. Professor Howard's experience in industry includes jobs with the United Technology Center of United Aircraft Corp. in Sunnyvale, Calif., and Esso Research and Engineering in Baytown, Tex. Professor Howard is the co-author of the book, *New Energy Technology—Some Facts and Assessments* (MIT Press, 1971).

Keith H. Johnson, Department of Materials Science and Engineering. Professor Johnson came to MIT as assistant professor in 1967, after two years of postdoctoral research at the University of Florida and an assistant professorship of physics at Drexel Institute of Technology ('64-65). He received the AB degree from Princeton University and the MA and PhD degrees from Temple University. Theoretical chemical physics and theoretical solid-state physics are the fields of research to which he has devoted the major part of his writings.

Michael Lipsky, Department of Political Science. Educated at Oberlin College (BA '61), the Woodrow Wilson School of Public

and International Affairs at Princeton (MPA '64) and the Department of Politics at Princeton (MA '64; PhD '67), Professor Lipsky was assistant professor of political science at the University of Wisconsin from 1966-69. He has been a member of the executive committee of the Joint Center for Urban Studies at MIT since 1971, and prior to that, was a staff associate at the Institute for Research on Poverty at the University of Wisconsin. A forthcoming book of which he is co-author is entitled *Riot Commission Politics: The 'Processing' of Racial Crisis in America* (Transaction Books). In 1970 he published *Protest in City Politics: Rent Strikes, Housing and the Power of the Poor* (Rand McNally).

James D. Litster, Department of Physics. Professor Litster graduated from McMaster University in 1961 (BEng) and received his PhD degree from MIT in 1965. After a year as instructor at MIT from 1965-66, he joined the research staff of the IBM Thomas J. Watson Research Center, where he later became a consultant to the liquid crystal group in 1969. Professor Litster was appointed assistant professor of physics at MIT in 1966 and associate professor in 1971. He has also been a visiting professor at the University of Paris in Orsay.

Robert D. Logcher, Department of Civil Engineering. Born in The Netherlands, Professor Logcher received all his degrees at MIT (SB '58; SM '60; ScD '62). Concentrating his recent research interests in management information systems, management of construction facility projects and decision methods in construction, he joined MIT's teaching staff as a part-time instructor in 1960, was appointed assistant professor in 1962 and associate professor in 1966. His earlier research involved the development of computer systems for engineering design. His several government committee assignments include the national committee for the CIB National Research Council, and the American Society of Civil Engineers.

Albert R. Meyer, Department of Electrical Engineering and Computer Science. Professor Meyer received all his degrees from Harvard between the years 1963, when he received the BA, and 1972, when he received the PhD. Before his appointment to MIT's faculty in 1969, he was assistant professor of computer science at Carnegie-Mellon University (1967-69). He was appointed associate professor at MIT in 1972. At the present time he is visiting scientist at IBM Research Labs in Yorktown

Heights, N.Y. where his research includes automata, computational complexity, recursive functions and decision procedures in logic. A major topic he will discuss in conferences in Germany and Czechoslovakia this summer is combinatorial algorithms.

D. Quinn Mills, Sloan School of Management. Professor Mills, former special assistant to the director of the Cost of Living Council, received the BA degree from Ohio Wesleyan University in 1963 and the MA and PhD degrees from Harvard in 1965 and 1968 respectively. Before joining the faculty of the Sloan School as assistant professor in 1968 he was assistant professor of economics at Harvard for a year. Between 1968 and 1972, when he was appointed associate professor at the Sloan School, he was a consultant to the US Department of Labor, a member of the Building Research Advisory Board of the National Academy of Sciences, and chairman of the Construction Industry Stabilization Committee. Professor Mills is the author of *Industrial Relations and Manpower in Construction* (MIT Press, 1972).

Michael S. Scott Morton, Sloan School of Management. A former engineer for Rolls-Royce Ltd, in Glasgow, Scotland, and director of data processing for the City of Pittsburgh, Professor Morton holds a DBA ('67) degree from the Harvard Business School and a BS ('61) degree from Carnegie Institute of Technology. He was appointed assistant professor at the Sloan School in 1966 and associate professor of management in 1969. Interested mainly in developing and describing the new field of computer-based decision support systems for managers, Professor Morton is the co-author with John F. Rockart, MIT senior lecturer, of *Computers and The Learning Process in Higher Education* (McGraw-Hill) to be published next month. He has been on sabbatical in Scotland for the past year working on two other books in computer and information systems.

Michael J. Piore, Department of Economics. An economist noted for his research in labor, Professor Piore is a consultant on labor, manpower, and income maintenance for the Commonwealth of Puerto Rico, which he has served in the past as research coordinator. He is a graduate of Harvard (BA '62, PhD '66), where he was a Woodrow Wilson Fellow and a member of Phi Beta Kappa. He was appointed assistant professor of labor economics at MIT in 1966 and associate professor in 1970. Between those years he was a



Yamamoto

consultant to the US Department of Labor, and the Boston Model Cities Administration. Professor Piore is the author of *Internal Labor Markets and Manpower Adjustment* (D.C. Heath and Co., 1971). He is now in Paris conducting research on economic dualism in France—the theory that there are two separate labor markets, the primary and secondary.

Uttam Lal RajBhandary, Department of Biology. Born in Nepal, Professor RajBhandary was educated at the University of Patna, India, (BSc '52), the University of Calcutta (MSc '55) and the University of Durham in England (PhD '62). From 1962-64 he was a senior project associate at the University of Wisconsin's Institute for Enzyme Research, after which he was appointed assistant professor at the University of Wisconsin—a post he held until 1969, when he was appointed associate professor at MIT.

Jose M. Roesset, Department of Civil Engineering. Professor Roesset received the ScD degree from MIT and was appointed assistant professor in 1964, after serving as research assistant and teaching assistant. He completed his CE degree at Escuela Especial de Ingenieros de Caminos Canales y Puertos in Madrid. Recognized for his research in structural mechanics and earthquake engineering, he became an associate professor in 1969, after serving a parallel visiting professorship at the University of Chile and Catholic University in Santiago, Chile.

Fred C. Schweppe, Electrical Engineering and Computer Science. An alumnus of the University of Arizona (BS '55; MS '57) and the University of Wisconsin (PhD '59), Professor Schweppe was a member of the professional staff of Lincoln Laboratory from 1959-68, when he was appointed associate professor at MIT. He held a visiting professorship here from 1966-68 and has taught courses in power and dynamic systems. At present he is conducting research on the analysis and planning of large electric systems, economic environmental tradeoff in electric power systems, and

(Continued on page 12)

22 Are Appointed Full Professors

Employment Q & A

By CLAUDIA LIEBESNY
Office of Personnel Services

Are there any rules governing leaves of absence? Is there a time limit? Does it vary for Biweekly, Exempt and Staff?

The policy with regard to leaves of absence without pay is the same for Biweekly, Exempt and Staff personnel. A request should be made in writing to the immediate supervisor well in advance of the planned date of departure in order to allow sufficient time for consideration, and payroll purposes and whatever benefit arrangements are to be made. Such requests will be evaluated on an individual basis and must state the reason for the leave and the date when the person will return to work. The approvals of the immediate supervisor, department head, Dean or Vice President and the Personnel Office are required. Except under extraordinary circumstances, approval will not be given for a period exceeding one year. Some of the factors to be considered in the evaluation of a leave request are the following: reason for the leave, previous leave history, length of service, period of time requested, and the department's ability to handle work demands in the person's absence.

The granting of such a leave of absence without pay does not necessarily assume reemployment upon termination of leave unless the letter granting the leave expressly makes that commitment. In that event, the employee's job or a job of equivalent classification and pay will be restored by the department or laboratory at the completion of the leave unless the position has been eliminated by reduction in force or operational change under circumstances applying equally to other similar jobs in the department. If the former position has been so affected, efforts will be made to find other suitable employment, first in the department concerned and, secondly, within the Institute as a whole.

Has the Working Group on Office Clerical Issues completed its work?

The members of the Working Group are continuing their study of their long-range goals in the areas of performance evaluation, communications, compensation, and career paths. The recommendations to John Wynne concerning this year's Biweekly Salary Review (see *Tech Talk* supplement, March 5, 1975) were the result of the first phase of the discussions by the group. At the same time there is an Evaluation Subgroup at work, responsible for an evaluation of the review this year, to assess whether it was effective in rewarding individual performance and fostering better communication between employees and supervisors. Their results will be an important input into the Working Group's final recommendations. No timetable has been set by the Group or Mr. Wynne for these recommendations. Some of the issues are complex, and careful and sustained work will be required to develop good long-term solutions.

In light of the fact that Hourly, Biweekly and Exempt percentage increases are published, why hasn't the percentage for the Staff increases been published?

The percentage annual increase given to the Hourly union employees is now and has been by the nature of contractual obligation, public record. This year the members of the Working Group on Office Clerical Issues recommended that the review percentage be published. This recommendation was accepted with the understanding that the pros and cons of publication would be evaluated as part of the overall evaluation of the Working Group recommendations as they pertain to Biweekly employees. The principal concern was that publication would inhibit a true merit review. The review percentage for Exempt personnel was not published, as you indicated, nor was the DSR Staff percentage, and there are no current plans to publish the Administrative Staff percentage.

Is there going to be a Summer Employment Program in 1975? Will it be funded?

Plans to develop summer job opportunities on campus for the youth of Cambridge have already begun. Mr. Herbert Lee, coordinator of this year's program, has met with Personnel Officers and will soon contact individual departments concerning likely summer job opportunities.

Because funding is expected to be scarce this summer, departments are encouraged to consider alleviating staffing problems by reserving any such positions for Cambridge students.

Please contact Mr. Lee at x3-4941, Rm. 20C-232, with further questions or to list job opportunities.

What is the policy about being able to take a break? I work part-time, 9-2 and have been taking a ten minute break.

There is no all-Institute policy concerning the establishment of breaks for part-time employees. However, a short break is certainly reasonable for those working a sustained block of time in one day and should be worked out either formally or informally between each supervisor and employee.

Three Black Students Cited

Three MIT students were included in a list of top black college students listed in the March issue of *Black Enterprise* magazine.

They are: Rudolph Miller, III, of Washington, D.C., a senior in mechanical engineering, president of Black Mechanical Engineers and a member of the Black Pre-Medical Society, Tau Beta Pi and Pi Tau Sigma; Bernard Hugh Robinson, of the Bronx, N.Y., a senior

in electrical engineering, co-chairman of MIT's Black Student Union and a member of the Search and Charter Committee for the Office of Minority Education; and Karen Ann Scott, from Buffalo, N.Y., a senior in applied mathematics and coordinator of the Black Student Union tutorial program.

The 75 "top black college students" chosen by *Black Enterprise* were selected from hundreds of college seniors who had excellent academic records as well as outstanding community or school service.



CBS NEWS REPORTER Charles Osgood (second from left) came to MIT Innovation Center last week to interview Director Yao T. Li and student inventors for a TV essay to be aired on the CBS Morning News within the next week. Here, graduate student Jake Moscowitz of Watertown, Mass. (left) demonstrates his wide-band electric guitar—one of the projects closest to completion at the Center—and one of the most different pick-up systems of any available

commercially. Assisted by electrical engineering major Ernest Perevoski of New York (right), Moscowitz shows how the system simulates sounds of other guitars and produces a number of special effects due to the complete separation of signals emanating from the individual strings. Standing to the left of Boston cameraman Dave Marlin is Lamar Washington, Jr., of the Innovation Education Council.

—Photo by Calvin Campbell

Ensemble to Present 'Twelfth Night'

In its premiere production, the newly formed Shakespeare Ensemble at MIT will toast the 411th anniversary of Shakespeare's birth with five performances of *Twelfth Night*.

Performances will be staged in the Sala de Puerto Rico at the MIT

Student Center, Saturday through Wednesday, April 19-23, curtain time 8pm. Champagne will be served to audience and cast at the final performance on Wednesday, April 23, the date of Shakespeare's birthday.

Tickets for the Wednesday performance are \$3.50, all others are \$2.50 with a \$1 discount for Wellesley and MIT students. Tickets can be purchased in the lobby of Bldg. 10 or at the door to the Sala the evening of the performance. For reservations call 742-0681. Group rates are available for parties of 10 or more for all performances except the last.

Twelfth Night is one of Shakespeare's most festive plays, embodying several schools of comedy—as well as a subtle romantic line—as unpredictable as the humor.

"It is an intimate play," according to director Professor Murray J.K. Biggs. "All the scenes have a small group of characters who are engaged in getting to know each other—discovering things they were unaware of before."

To enhance the chamber atmosphere of the play and the relaxed, informal quality of the dialogue, the company has chosen to stage it in the Sala de Puerto Rico which will be fitted with an Elizabethan thrust-stage. No member of the audience will be seated further than 40 feet from the edge of the stage.

The world of the play, set in Illyria in the northwest corner of Yugoslavia, will be simply defined

with backdrops and costumes. There will be a special musical complement for the production, composed and arranged by John Cook, Institute organist and humanities instructor, who has written music for several of the Olivier-Richardson Shakespeare seasons at London's Old Vic and more than a dozen scores to accompany Shakespeare productions at the Stratford Festival in Ontario.

Leads for the play are: Blanche Garfein, a Wellesley freshman from Rome, Italy, Viola; Paul Bradford, an MIT junior from Bedford, Mass., Sir Toby Belch; Hope Costin, a Wellesley sophomore from Bennington, Vt., Olivia; Mitchell Rothstein, an MIT sophomore from Nyack, N.Y., Feste the Jester; Scott Roby, an MIT junior from Shrub Oak, N.Y., Sir Andrew Aguecheek; and John Shelton, an MIT senior from Washington, D.C., Malvolio.

The company was formed last fall by Professor Biggs, assistant professor in humanities, who has had considerable directing experience in England and has also taught a Shakespeare seminar at Oxford University.

The ensemble of 16—with one exception all MIT and Wellesley students—is the newest campus dramatic group and the first at MIT to use a repertory approach. It is also believed to be the only company in Boston dedicated to the extensive performance of Shakespeare's plays.

Senturia, Wedlock Publish Text

Electronic Circuit and Applications, by Stephen D. Senturia, associate professor of electrical engineering, and Bruce D. Wedlock, director of the Lowell Institute School and lecturer in electrical engineering, was recently published by John Wiley & Sons, Inc.

A survey for beginning electrical engineering students, the text ranges from simple to complex circuits, demonstrating practical applications and offering design problems.

Three Win NSF Research Grants

Three assistant professors at MIT, Robert Armstrong, Nils Sandell and Ronald Yeung have received 1975 National Science Foundation research grants for young engineering faculty.

Dr. Armstrong is duPont Assistant Professor of chemical engineering, Dr. Sandell is assistant professor of systems science and engineering and Dr. Yeung is assistant professor of ocean engineering.

The awards, designed to assist young engineering faculty members in their research, were given to a total of 82 young engineering faculty across the country. They were selected on a competitive basis from 258 proposals.

Bond Information Being Distributed

Information on the payroll purchasing of Savings Bonds plus an authorization card will be inserted in MIT pay envelopes this month.

The interest rate of 6% makes this an advantageous time to begin using the Institute's longstanding payroll plan for purchase of US Savings Bonds.

The MIT Payroll Office accepts authorization for payroll deductions for bonds at any time. Campus contact is Edward Matheson, x3-3346; at Lincoln Laboratory, Thomas Saxon, x665.



Scott Roby (top) as Sir Andrew Aguecheek and Paul Bradford as Sir Toby Belch in rehearsal for Shakespeare Ensemble's production of *Twelfth Night*.

—Photo by Joe Schuyler

Silva Spreads Beauty of Upper Volta Worldwide

Folk Art Becomes Cultural Landmark



By ELLEN HOFFMAN
Staff Writer

If Julio Silva, South American architect and MIT alumnus, had never gone to Upper Volta, the world might never have seen the beauty of the West African tribal culture—now colorfully represented in Upper Volta's postage stamps.

The series of nine Upper Voltan stamps depicting everyday scenes and costumes of Upper Volta—facsimiles of sketches by Silva (M. Arch. '62)—not only capture the simple beauty of the country's daily life, but they also represent a cultural landmark for the small West African nation.

Before the Silva stamps were issued in 1972, most of the country's stamps were reproductions of paintings from the Louvre, reflecting the predominance of French culture in Upper Volta.

When Silva went to Upper

Volta in 1967 as a United Nations advisor on low-cost housing, he was immediately impressed by the diversity of customs, the folk art and the beauty of the native housing.

Reporting that "every house is a work of art," Silva quickly dismissed the idea of advising major change in the basic construction of the native mud huts with adobe walls, rounded corners, sunny courts and cone-shaped roofs of hand-woven thatch. He did not feel that it was his mission to replace the adobe huts with look-alike prefabricated structures, but rather suggested improving these unique homes with better sanitation, lighting and ventilation.

Traveling through the underdeveloped districts of the three Volta rivers in his small car—



complete with an MIT decal in the rear window—Silva would meet with members of many of Upper Volta's tribes. After observing their life style and learning the values of their culture, Silva suggested architectural improvements while developing rapport with the tribesmen.

When breaks in his busy work schedule allowed, Silva would return to his headquarters in the capital city of Ouagadougou and would sit in the open-air cafes,

sketching the busy life that surrounded him. Africans in gaily colored costumes making their way through open markets in streets lined with sheep, camels and bicycles proved exciting subject matter for the Uruguayan architect.

Enthralled with Silva's sketching and encouraged by Silva, many young Upper Voltans began imitating him and soon Silva's followers were sufficiently accomplished to sell many of their sketches to tourists.

This art, which reflected African rather than French values, received nation-wide and eventually world recognition for both Silva and Upper Volta. After an exhibit in the French Embassy in Ouagadougou, Silva's paintings were sent to New York, where they were shown at the U.N. headquarters. One painting was retained by the UN

and now hangs in the David Owens Library.

Since his successes in Upper Volta, Silva was transferred by the U.N. to Togoland for a short-term project and then, in 1974, to the Ivory Coast, where he is a U.N. project manager, supervising the construction of public facilities for rural communities and advising the Minister of Planning on construction.

Julio Silva has decided to make West Africa his permanent home. Having grown to think of the migrant tribesmen of Western Africa as "his people," he will continue to work at bridging the gap between the modern cities of Africa and the rural communities—while still preserving and promoting the West African culture.

Despite all he has done, there is always more for a person like Julio Silva to accomplish—after all, some of the Ivory Coast stamps still picture reproductions of paintings from the Louvre.



Mr. Cahill with the new ambulance and its emergency equipment.

Sloan Applicants Conference

(Continued from page 1)

English again and we get along fine."

Kathy Bishop, assistant to the president at Glass Container Corp., New York, said it takes a while for the ice to break. She is a 1971 graduate of the Sloan School.

"There had never been an assistant to the president before," Ms. Bishop said, "and so there were some problems. I was working as a manager with men in their 50s and 60s and was the age of most of their daughters. There was a certain amount of head-patting and 'Now, dear, let me tell you about business.' I handled it by working hard. I had to earn their respect as a fellow worker. The trust and rapport began to build and now I'm one of the gang."

Judy Lewent, assistant treasurer, strategic planning at Bankers Trust Company, New York, said it is important to know when to fight and when to quit. Prior to working in the bank she was in the brokerage business on Wall Street and found she had to get out.

"There are two types of men on Wall Street," said Ms. Lewent, a 1972 Sloan graduate. "There is the kind who will absolutely refuse to deal with a woman manager. And there is the kind that assumes she is there to go to bed with the men."

"I had a choice of staying and sacrificing my life to a fight or getting on with my career. I decided I'd rather be working than wasting a lot of time and money on law suits."

Phyllis Fishman Lantos said an interviewer deliberately provoked her with a prejudiced attitude and then hired her when she lost her temper. She is a budget planner with the New York City Bureau of the Budget and is a 1969 Sloan graduate.

"He said he was testing me, and that anybody working with the New York City budget had to be a

fighter. He hired me on the spot," Mrs. Lantos said.

Emily Leonard, 1969 Sloan graduate, said it was a plus being a woman in a budget job. She is a budget examiner with the US Government Office of Management and Budget in Washington, D.C.

"You are at lunch with a man who wants \$25 million," Ms. Leonard said. "You smile very nicely and say he can't have \$25 million. He smiles and thinks you don't know what you're talking about. If you were a man there'd be a fight. But this way everything is pleasant. By the way, he never gets the \$25 million."

Gudrun Zoeller talked about the problems of a woman being in charge of other women.

"At first I noticed secretaries would get projects done on time for the men managers while they let mine slide," said the assistant product manager at Pfizer Inc., N.Y.

"It was 'Yes, Mr. Smith,' and 'Hey, Gudrun.' I just sat down and talked over the problem with the secretaries. I explained my work and tried to include them in on it. From then on things got better. I think it all boils down to treating people as people."

New Book Out

A new book, *Population Dynamics and International Violence: Propositions, Insights and Evidence*, by Nazli Choucri, associate professor of political science, was recently published by D.C. Heath and Co.

Using specific areas of international conflict as illustrations, Professor Choucri's book reveals how population variables play a significant part in political disputes and acts of violence between nations.

Patrol Inaugurates New Ambulance

Campus Patrol, in conjunction with the Medical Department, has purchased a new "Vanguard" ambulance and hired a Harvard-trained emergency medical technician to operate it.

The new ambulance and attendant comply with 1975 Department of Public Health regulations which specify that anyone providing ambulance service must use a properly equipped vehicle accompanied by specially-trained individuals.

The multi-purpose "ambuette" Campus Patrol has used until now does not provide the required

Book Review

Irma Johnson, Science Librarian, has written a review of a new book, *Educating the Library User* by John Lubin, published in the March issue of *American Libraries*.

space for administering emergency aid to its patients. Also, the new laws require 81 hours of Emergency Medical Training (EMT) in addition to the standard and advanced first-aid and cardiopulmonary training which all Campus Patrolmen receive.

William Cahill, the new attendant, is a certified EMT and American Red Cross instructor, and will be useful in preparing other Campus Patrol personnel to man the ambulance.

Mr. Cahill will serve as a liaison between the medical department and campus patrol. He will work daily from 8am-4pm, when 87 percent of emergency calls are received, thus relieving patrolmen and vehicles for other duties.

Dr. Albert O. Seeler, head of the Medical Department, said there was no question that developing

Campus Patrol's emergency services was preferable to hiring a commercial ambulance service. "It would be difficult to match the exceptionally efficient job Campus Patrol has done so far," he said. "Their familiarity with the Institute, their interest in the patients, their instant response to calls—these qualities cannot be bought."

Henderson Wins Research Grant

Dr. Ellen J. Henderson, assistant professor of chemistry at MIT, has been awarded a grant from the Cottrell Research Grants Program of the Research Corporation. She will study the mechanism by which the binding of cyclic-AMP to a protein on the surface of cellular slime mold alters intracellular metabolism and overall cell behavior.

THE INSTITUTE CALENDAR

April 9
through
April 20

Events of Special Interest

TWO Bake Sale - Thurs, Apr 10 8am, Bldg 10 Lobby. Note: There is free babysitting, so if you would like to participate, bake, help sell, etc, call Camille Flores, 494-8989.

Pre-Retirement Seminars* - Sponsored by the Benefits Office. Thurs, Apr 10: **Health** - Dr. Edward Rendall, medical department; **Wills & Trusts** - Harold E. Dreyer, Draper Lab. Thurs, Apr 17: **AARP (American Association of Retired Persons)** - Albert Sise, MIT retiree, Vermont Regional Representative of AARP. 3pm, Rm 14-0615. Info: x3-4271.

Art, Technology and History* - Cyril S. Smith, Institute Professor, Professor of Metallurgy, and Professor of the History of Science and Technology, Emeritus. Compton Lecture. Thurs, Apr 10, 4-6pm, Rm 10-205.

Electrical Engineering & Computer Science Orientation Program - Thurs, Apr 10, 7:30-9pm, Rm 9-150. Information & discussion about Course VI for freshmen & undesignated students, including aspects of EE, computer science, the cooperative program, in which a student receives academic credit for industrial experience. Info: x3-2592.

Physics Department Open House - For freshmen & sophomores interested in learning about opportunities in physics for a major &/or career. Department faculty and students will be available. Mon, Apr 14, 7-9pm, Stu Ctr Mezzanine Lge. Refreshments.

Towards a Materials Ethic in National Policies* - Morris Cohen, Institute Professor and Ford Professor of Materials Science and Engineering. James R. Killian, Jr. Faculty Achievement Award Lecture: Materials in the Scheme of Things. Tues, Apr 15, 5:30pm, Rm 9-150.

Seminars and Lectures

Wednesday, April 9

Observations of Currents and Temperature in Shallow Water off the New Jersey Coast: Part II - Bruce Magnell, EG&G Environmental Consultants. Oceanography Sack Lunch Seminar. 12n, Rm 54-311. Coffee, bring lunch.

Where Africa and the Middle East Meet: Consequences of the Ethiopian Crisis* - Colim Legum, African & Middle Eastern correspondent for the London *Observer*; noted author. CIS Seminar. 12n, Rm E53-482.

Boundary Conditions to Replace the Reflector in Transient Reactor Calculations* - Panos Kalambokas, G. Nuclear Engineering Doctoral Seminar. 3pm, Rm NW12-222.

Nonlinear Rotational Instabilities of Inertial Tokamak Equilibrium* - Paul Chrisman, G. Nuclear Engineering Doctoral Seminar 3pm, Rm 38-136.

The Role of the Comptroller in the Defense Decision Process and the FY 1976 Budget* - Hon. Terence E. McClary, assistant secretary of defense. CIS Seminar. 3pm, Rm E53-482.

Reflood Heat Transfer Following a PWR Loba* - W. Kirchner, G. Nuclear Engineering Doctoral Seminar. 4pm, Rm NW12-222.

Uniaxial Stress Waves in Finite Elastic Bars* - Jacob Y. Kazakia, Center for the Application of Mathematics, Lehigh University. Mechanical Engineering Seminar. 4pm, Rm 5-134. Coffee 3:30pm, Rm 1-114.

Dynamic Formation of Twin in a BCC Crystal* - Toshiya Ishioka, Research Institute for Iron, Steel and Other Metals. Mechanical Engineering & Materials Science Special Seminar. 4pm, Rm 13-2101.

Laser Graphic Process for Newspapers of the Future* - Harold I. Becker, Laser Graphic Systems Corp. Laser Applications Seminar. 4pm, Rm 35-225. Coffee 3:30pm.

Cosmic Evolution* - Kenneth Brecher, physics. Undergraduate Physics Colloquium. 4:15pm, Rm 4-339. Social hour 5pm.

Discussion Group on Agriculture: Storage of Food Grains* - S.M. Ahmed, G. Seminar for Foreign Students & Participation in Development. 6pm, Int'l Students Lge. Info: x0650 Dorm.

Thursday, April 10

Report on a Recent Trip to Moscow* - Lincoln Bloomfield, political science. CIS Seminar. 11:30am, Rm E53-482.

Silhouette Photography of Bullets and Shock Waves* - Harold E. Edgerton Institute Professor & Professor of Electrical Measurements, Emeritus. Stroboscopic Light Laboratory Seminar. 12n, Rm 4-402.

Optical Fibers for Transmission* - E.A.J. Marcatili, Bell Telephone Laboratories. Electrical Engineering Optics Seminar. 3pm, Rm 39-400.

Computing System Reliability - Brian Randell, computing science, The University of Newcastle upon Tyne, England. Computer Systems Research Division Seminar. 3pm, NE43-512A. Refreshments 2:30pm.

Laser Application in Environmental Energy and Fluid Mechanics

Research* - C. Forbes Dewey, mechanical engineering. Thermal-Fluids Seminar. 4pm, Rm 3-343. Coffee.

Deformation Mechanisms in Crystalline Polymers* - Robert J. Young, engineering, University of Cambridge. Interdepartmental Polymer Seminar. 4pm, Rm 13-2101.

Drawings of the Abstract Expressionists** - Juan Navarro Baldeweg, CAVS. Student Art Association Lecture with slides. 5:30pm, Stu Ctr Rm 427. Refreshments.

Friday, April 11

Kinetics and Interactions of Simultaneous Hydro-Sulfurization and Hydrodenitrogenation Reactions* - J. Wilkins, G. Chemical Engineering Doctoral Seminar. 2pm, Rm 10-105.

A Fundamental Study of Carbon Monoxide Oxidation on Platinum* - H. Wood, G. Chemical Engineering Doctoral Seminar. 3pm, Rm 10-105.

Design of Para-Transit Systems in an Urban Experiment Station* - Dwight M. Baumann engineering design, Carnegie-Mellon University. Mechanical Engineering Seminar. 3pm, Rm 3-133. Coffee 4pm, Rm 1-114.

Blocking Pairs of Polyhedra* - D. R. Fulkerson, Operations research, Cornell University, Operations Research Center Seminar. 3pm Rm 24-121. Refreshments after, Rm 24-223.

Engineering in Radiation Therapy* - Bengt Bjarngard, Joint Center Radiation Therapy, Harvard Medical School. Biomedical Applications of Radiation Seminar. 3:45pm, Rm NW12-222. Coffee 3:30pm.

Defect Chemistry and Catalysis in Redox Reactions on Perovskite Oxides* - Rudolph Voorhoeve, Bell Laboratories, NJ. Materials Science Colloquium. 4pm, Rm 9-150. Refreshments 3:30pm.

MHD Power Generation - R.J. Rosa, AVCO-Everett Research Laboratory, Inc. Plasma Dynamics Seminar. 4pm, Rm 36-216. Refreshments before.

Monday, April 14

Art in the MIT Environment: Achievements and Purposes** - Wayne V. Andersen, architecture, chairman of CAVS. Technology Matrons Seminar. 10am, Rm 10-342.

Summer Employment Seminar - Sponsored by the Foreign Student Office for all foreign students interested in acquiring jobs this summer. 3pm, Rm 10-340.

Light Water Reactor Safety Research* - L.S. Tong, assistant director, for water safety research, Nuclear Regulatory Commission. Nuclear Engineering ANS Student Branch Seminar. 3:30pm, Rm NW12-222. Coffe & donuts 3pm.

Mathematical Modeling of Air/Gas Dynamics for a Large Utility Furnace* - V. Sumaria, Stone & Webster Engineering Corp. Electrical Engineering & Computer Science Decision & Control Goup Seminar. 4pm, Rm 39-500.

Water Clean-up - Technical or Political Problem* - Gen. F.J. Clarke, executive director, National Commission on Water Quality, Washington, DC. Civil Engineering & Parsons Laboratory, Water Resources & Hydrodynamics Seminar. 4pm, Rm 48-316. Coffee 3:45pm, Rm 48-410.

Nonlinear Evolution Equations* - Alan C. Newell, mathematics, Clarkson College of Technology. Applied Mathematics Colloquium. 4pm, Rm 2-338. Coffee 3:30pm, Rm 2-349.

Anarchism and Revolution in Spain* - William Watson, history (absent). SACC Studies on the Left Lecture & Discussion. 7:30pm, Stu Ctr West Lge. Readings on reserve in Dewey.

Tuesday, April 15

Tracer Concentration Gradients for Diffusion Coefficients Exponentially Dependent Upon Concentration** - George Wei, G. Materials Science & Engineering, Ceramic & Glass Seminar. 9am, Rm 16-310.

Multi-Attribute Utility Functions* - Alan Sicherman, G. Mechanical Engineering Systems & Design Division Seminar. 12n, Rm 3-465. Bring lunch, drink provided.

Humanities, the State of the Art, Implications for Curriculum at MIT* - Steven Marcus, director of planning, National Humanities Center, Washington, DC; English literature, Columbia University. Humanities Lecture. 3pm, Stu Ctr Mezzanine Lge. Refreshments.

UPI's Worldwide News Gathering, Editing and Distribution System* - James F. Darr, vice president for communications, United Press International. ESL & Electrical Engineering Newspaper Technology Seminar. 4pm, Rm 9-150.

Hazards in Molecular Biology: A Report on the Asilomar Conference** - David Baltimore, American Cancer Society Professor of Microbiology. Technology Studies Seminar. 4pm, 3-370. Coffee.

Presumptions and Alternatives in the Regulation of Communications* - Henry Geller, Rand Corporation; Bruce Owen, Stanford University; Clay T. Whitehead, CIS. Research Program on Communication Policy Seminar. 4pm, Rm 9-450. Refreshments.

Stereographic Approach to Plate Tectonics* - John F. Dewey, geological sciences, State University of New York at Albany. Earth & Planetary Sciences Colloquium. 4pm, Rm 54-100. Tea 3:30pm, Rm 54-923.

Medical Studies in Manned Space Flight: Mercury through Skylab - Dr. Sherman Vinograd, director of biomedical research, NASA. Aero/Astro Seminar with Skylab Movie. 4pm, Rm 35-225. Coffee 3:30pm, Rm 33-222.

The Future of Non-Proliferation* - William Epstein, former director of disarmament division, UN Secretariat. New Technologies & International Security Seminar. 4pm, Rm E53-482.

The Birth and Growth of Operations Research* - Philip M. Morse, physics, director of Operations Research Center, emeritus. Operations Research Center Seminar. 4pm, Rm 24-121. Refreshments after, Rm 24-223.

Wednesday, April 16

An Analysis of Ocean Floor Topography and Heat Flow - Barry Parsons, earth and planetary sciences. Oceanography Sack Lunch Seminar. 1n, Rm 54-311. Coffee, bring lunch.

Energy-Saving Improvements to Domestic Heating Systems* - Student presentations of mechanical engineering design projects. Mechanical Engineering Seminar. 1pm, Rm 3-270.

Impurity Particle Instabilities* - Hark C. Chan, G. Nuclear Engineering Doctoral Seminar. 3pm, Rm 38-136.

The Einstein-Podolsky-Rosen Paradox: Measurement and Probability in Quantum Mechanics* - O. Costa de Beauregard, Institute Henri Poincare, University de Paris. Mechanical Engineering Thermodynamics Seminar. 3pm, Rm 3-133.

Urban Emergency Services: A New Computer Implemented Model* - Richard C. Larson, electrical engineering & urban studies. Innovative Resource Planning Project, Operations Research Center Seminar. 3:30pm, Rm 24-121.

Renaissance* - Dirk J. Struik, mathematics, emeritus. Mathematics Department & Concourse Forum, History of Mathematics Lecture. 3:30pm, Rm 10-105.

Rotational and Vibrational Quantum Transitions of H₂ in Collisions with Li⁺: Experiment Versus Theory* - J. Peter Toennies, Max-Planck-Institut fur Stromungsforschung, Gottingen, Germany. Physical Chemistry Special Seminar. 4pm, Rm 6-233.

Multiple Diffractions of Elastic Waves by a Rigid Obstacle* - Marijan Dravinski, Illinois Institute of Technology. Applied Mechanics Seminar. 4pm, Rm 5-134. Coffee 3:30pm, Rm 1-114.

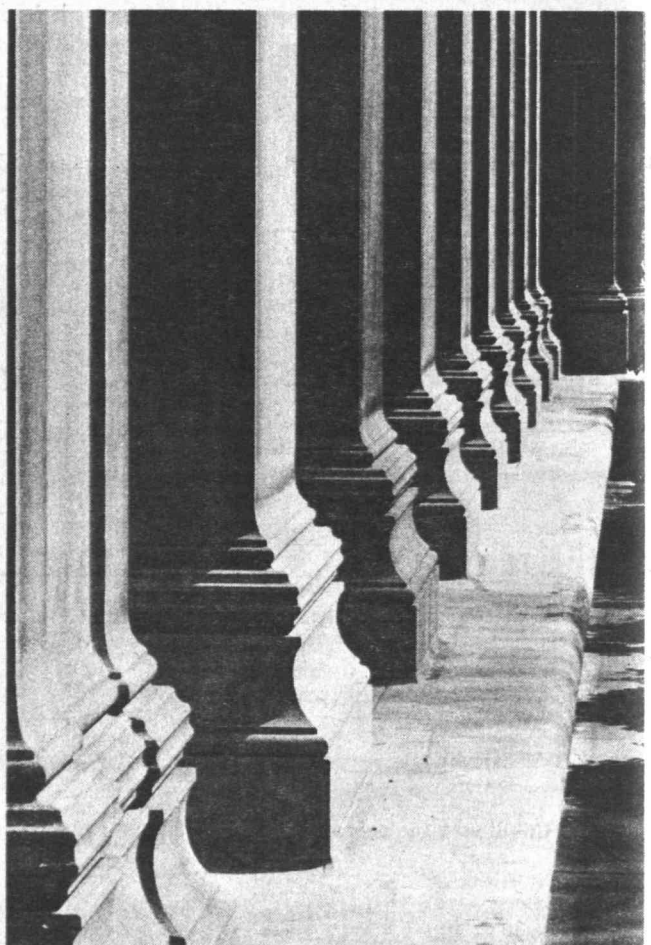
Research in Physics at MIT* - Bernard Burke, Thomas Greytak, Lawrence Rosenson, physics; Francis Low, Karl Taylor Compton Professor of Physics & director of Center for Theoretical Physics. Undergraduate Physics Colloquium. 4:15pm, Rm 4-339. Social hr 5pm.

Gogol and his Relation to Other European Writers* - Panel discussion in English and Russian. Foreign Literatures & Linguistics Seminar. 7:15pm, Rm 8-105.

Thursday, April 17

Computer Experiments in Plastic Anisotropy in BCC Single Crystals* - Shin Takeuchi, mechanical engineering, visiting. Mechanical Engineering & Materials Science Special Seminar. 2pm, Rm 13-2101.

The Politics of Genetic Engineering: Who Decides Who is Defective?* - Jonathan Beckwith, MD, microbiology & molecular



Afternoon sunlight etches the columns of the Maclaurin Building in Killian Court...

genetics. Harvard Medical School. Technology & Culture Seminar. 4pm, Rm 9-150.

The Middle East at the Crossroads* - Nadav Safran, Harvard Center for Middle Eastern Studies. MIT-Harvard Arms Control Seminar. 4-6pm, Faculty Club Penthouse.

Physical Irreversibility Problems* - O. Costa de Beauregard, Institute Henri Poincare, University de Paris. 4pm, Rm 3-343.

Review of Spectral Lowering Techniques for the Hearing Impaired* - Louis Braida, electrical engineering. Interdepartmental Acoustics Seminar. 4pm, Rm 5-134. Coffee 3:30pm, Rm 1-114.

Fusion Power by 1995* - Robert Taylor, physics. Physics Colloquium. 4:15pm, Rm 26-100. Refreshments 3:45pm, Rm 26-110.

Surrealist Painting: The Landscape of the Mind* - Whitney Chadwick, architecture. Humanities Crossroads Lecture. 4:30pm, Rm 3-133.

Socialist Education in the German Democratic Republic* - Waldemar Damp and Dr. Heinz Fischer, 1st Secretaries of the Embassy of the GDR. Foreign Literature & Linguistics Seminar (in English). 8pm, Rm 3-370.

Preliminary Study of the Applications of Magnetic Separation to Coal Liquefaction* - I. Akoto, G. Chemical Engineering Doctoral Seminar. 2pm, Rm 10-105.

Conversion of Fuel Nitrogen to Nitrogen Oxides to Flames* - B. Taylor, G. Chemical Engineering Doctoral Seminar. 3pm, Rm 10-105.

Generation and Detection of Subnanosecond Pulses at 10.6 um - J. Alcock, National Research Council of Canada. Plasma Dynamics Seminar. 4pm, Rm 36-261. Refreshments before.

Angular Momentum Diffusion and the Initiation of Natural Vortices* - Angus McEwan, Woods Hole Oceanographic Institution. GFD Seminar. 4pm, Harvard University Pierce Hall, Rm 110. Coffee 3:30pm, Pierce Hall faculty coffee rm.

Community Meetings

The Wives' Discussion Group** - Wed, 2:15-4pm, Stu Ctr West Lge. Babysitting in Stu Ctr Rm 473.

Cambridge Business & Professional Women's Club*** - Jack B. Howard, chemical engineering, will speak on "US Energy Problems - The Search for Solutions", at dinner meeting Wed, Apr 9. Social 5:30pm, dinner 6:30pm, Faculty Club. Price: \$7, guests welcome. Reservations: x3-6279.

MIT Club of Boston* - Monthly luncheon meeting. Thurs, Apr 10, guest will be Edward King, former director of Mass Port Authority. 2:15-1:30pm, Aquarium Restaurant, 100 Atlantic Ave, Bos. Cost: \$4, payable at door. Reservations: Ms. Kuirats, x3-3878.

Model Railroad Open House* - come and see the trains Sat, Apr 2, 2-5pm, and 7:30-11pm, Rm 20E-214. Sponsored by Tech Model Railroad Club Free.

Women's Forum** - Meetings Mon, 12n, Rm 10-105. (Tues in case of Mon holiday). **Mon, Apr 14:** Alice Jehelien, special assistant to the president & director of Affirmative Action at Boston College, will speak on her career, which began at MIT as a secretary. Note: Stu Ctr West Lge.

Association for Women Students** - Laya Wiesner will speak on "Women in China" and show slides from her trip to China with resident Wiesner. Mon, Apr 14, 5:30pm, Rm 37-212. Men & women welcome.

Men's (People?) Consciousness Group* - Sponsored by MIT SACC. Discussion of men's relations with others as people. Tues, 5pm, Rm 5-361.

TWO Meeting - Maureen and Adam Yagodka, co-directors of Personnel Development, will speak on job sharing at final General Meeting of the year. Wed, Apr 16, 8pm, President's house, 111 Memorial Drive. Husbands welcome.

Wellesley Events

Photography Within the Humanities* - Exhibition of 100 photographs chosen by the participants, accompanied by daily lecture by one of the photographers or a critic. Exhibit thru Fri, Apr 25, Mon-Fri 8:30am-5pm; Sat 8:30am-12n & 1-5pm; Sun 2-5pm; Wellesley College Museum, Jewett Arts Center. Lectures: 9pm; Wed, Apr 9: Paul Taylor, economist, husband of the late Dorothea Lange, Rm 112E Pendleton Hall. Fri, Apr 11: Gjon Mili, Life photographer & teacher, Jewett Auditorium. Mon, Apr 14: Robert Frank, photographer, filmmaker, author of *The Americans*, Jewett Auditorium. Tues, Apr 15: Frederick Wiseman, filmmaker, latest film "Primate," Jewett Auditorium. Wed, Apr 16: John Szarkowski, curator of photography, Museum of Modern Art, Jewett Auditorium. Fri, Apr 18: W. Eugene Smith, Life photographer, inventor of "picture story," Jewett Auditorium. Free.

Social Events

Strat's Rat - Sat, Apr 12, 8:30pm, Sala. Light & dark beer \$2.5/16oz cup (\$1 for 5) Music by WTBS, requests until 1am. College ID required.

Sala Israel Independence Celebration** - Sponsored by Hillel & Israeli Student organization. Falafel, dancing & entertainment 8pm, Fasset Lge, East Campus. "A Wall in Jerusalem," Israeli movie, will be shown 12n, 2 & 4pm, Rm 1-390. Free. Tues, Apr 15

24 Hour Coffeehouse* - Enjoy relaxing conversation, piano playing, games, inexpensive food, candy & drinks. Open 24 hours per day, 7 days per week, Stu Ctr 2nd fl lge.

Ad-Hoc Over 30's Singles Chowder and Marching Society - Luncheon meeting in Stu Ctr East Lge (small dining room off Lobdell), Fri, 12:30-1:30pm. New members always invited. Look for the table with the red balloon. Suzanne, x3-3131 or Marty 8-1206 Draper.

Movies

Citizen Kane (Wells); Red Desert (Antonioni)* - Film Section. Wed, Apr 9, 7pm, Rm E21-010. Free.

The Heiress* - Humanities film. Wed, Apr 9, 8pm, Rm 14N-0615. Free.

Surface Tension; Low Reynolds Number Flow - Fluid Mechanics film. Thurs, Apr 10, 4pm, Rm 33-319. Free.

Spare Parts for People* - Barker Library Film. Thurs, Apr 10, 5pm, Rm 10-500. Free, coffee served.

Spare Parts for People* - Barker Library Film. Fri, Apr 11, 12n, Rm 10-500. Free, coffee served.

Bang the Drum Slowly** - LSC. Fri, Apr 11, 7 & 9:30pm, Rm 26-100, Admission \$.50, ID required.

The Target (Satyajit Ray) - Film Society. Fri, Apr 11, 7:30 & 9:35pm, Rm 6-120. Admission \$1.

Myth of Naro A; Myth of Naro B* - Humanities film. Fri, Apr 11, 7:30pm, Rm 4-370. Free.

straw Dogs - SCC MidNite Movie. Fri, Apr 11, 9:30pm & 12m, Sala. Free admission with college ID.

M*A*S*H* - LSC. Sat, Apr 12, 7 & 10pm, Rm 26-100. Admission \$.50, ID required.

Premshastra* - Sangam. Indian movie with English subtitles. Sun, Apr 13, 2:30pm, Rm 26-100. Admission \$.50 with ID.

Fists of Fury* - CSC. Sun, Apr 13, 2 & 4pm, Kresge. Admission \$1.

What's Up, Tiger Lily?*** - LSC. Sun, Apr 13, 6:30 & 9pm, Rm 26-100. Admission \$.50, ID required.

An Interview with G. I. Taylor; Rheological Behavior of Fluids* - Fluids Mechanics Films. Mon, Apr 14, 4pm, Rm 33-319. Free.

Crisis (Leacock); Jane (Pennebaker & Ryden)* - Film Section. Tues, Apr 15, 7pm, Rm E21-010. Free.

Eddy; Chiefs; Queen of Apollo (Leacock)* - Film Section. Wed, Apr 16, 7pm, Rm E21-010. Free.

An Interview with G. I. Taylor; Rheological Behavior of Fluids* - Fluid Mechanics Films. Thurs, Apr 17, 4pm, Rm 33-319. Free.

Is There Life Out There?* - Barker Library Film. Thurs, Apr 17, 5pm, Rm 10-500. Free, coffee served.

Rocco and his Brothers* - Humanities Film. Thurs, Apr 17, 7pm, Rm 10-250. Free.

The Life and Times of Judge Roy Bean** - LSC. Fri, Apr 18, 7 & 10pm, Rm 26-100. Admission \$.50, ID required.

Variety Lights (Fellini, Lattuada) - Film Society. Fri, Apr 18, 7:30 & 9:30pm, Rm 6-120. Admission \$1.

The Lavender Hill Mob - SCC MidNite Movie. Fri, Apr 18, 12m, Sala. Admission free w/college ID.

2001: A Space Odyssey** - LSC. Sat, Apr 19, 7 & 10pm, Kresge. Admission \$.50, ID required.

Professor* - Sangam. Indian movie with English subtitles. Sun, Apr 20, 2:30pm, Rm 26-100. Admission \$.50 with ID.

Dr. Strangelove** - LSC. Sun, Apr 20, 6:30 & 9pm, Rm 26-100. Admission \$.50, ID required.

Lobby 7 Events

Food: Mixed Media Show* - Lobby 7 transformed into a multi-media gallery of more than 20 "pocket" participatory displays. Designed & directed by Otto Piene, director of CAVS. Individual displays created by members of the community. Free. Highlights 12n: Thurs, Apr 10: "Words on Food," readings from literature by Shakespeare Ensemble. Fri, Apr 11: Egg Roll, performing ensemble, Paul Earles, fellow, CAVS. Mon, Apr 14: MIT Dance Workshop. Tues, Apr 15: "Out to Lunch" & "The Artist," Kenyon Martin & the National Mime Theatre. Thurs, Apr 17: National Food Day. Friday, Apr 18, Julia Child, author & TV personality.

Music

Noon Hour Concert* - Janet Packer, violin. Thurs, Apr 10, 12n, Chapel. Free.

Guarneri String Quartet* - Humanities Department Abramowitz Memorial Lecture. Concert of Mozart, Beethoven and Mendelssohn. Thurs, Apr 10, 8pm, Kresge. Free, no tickets required.

MIT Chamber Players* - With John Buttrick & Beatrice Erdely. Program of Hummel, Bartok, Janacek, Martinu. Wed, Apr 16, 8pm, Kresge. Free.

Noon Hour Concert* - Rufus Hallmark, tenor. Thurs, Apr 17, 12n, Chapel. Free.

MIT Chamber Music Society Concert* - Wed, 5:15pm, Music library Free.

Theatre and Shows

1776* - MIT Musical Theatre Guild production. Fri, Apr 11 & Sat, Apr 12, 8pm, Kresge. Admission: \$3.50, \$1 discount with ID. Reservations: x3-6294.

Twelfth Night* - Shakespeare Ensemble production. Sat, Apr 19-Wed, Apr 23, 8pm, Sala. Admission \$2.50; except Shakespeare's birthday (Apr 23), \$3.50 (champagne will be served). \$1 off all performances with MIT or Wellesley student ID.

Dance

Folkdancing - International: Sun, 7:30-11pm, Sala. **Balkan:** Tues, 7:30-11pm, Stu Ctr Rm 491. **Israeli:** Thurs, 7:30-11pm Sala. **Noon dancing:** Fri, 12n-1:30pm, Kresge Oval in good weather, otherwise Bldg 7 lobby. Learn & practice more difficult dances Fri, 1:30-3 or 4pm, Stu Ctr 491.

Scottish Country Dancing* - Wed, 8pm, Rm 3-343. Free. Info: Yuval Peduel, x3-7860.

Exhibitions

Photography Exhibition* - Photographs by Roger N. Goldstein, graduate student in architecture. Thru Fri, Apr 18, Rotch Library, Rm 7-238.

Transportable Solar Laboratory* - Sponsored by the Energy Research & Development Administration and Honeywell, Inc. The exhibit will be in the back of Kresge parking lot thru Mon, Apr 21. Hours: 11am-2pm, Mon-Fri; 11am-4pm, weekends.

Photographs by Bob Lyon* - Former special student at the Creative Photography Gallery. Thru Thurs, Apr 24, Lounge Creative Photography Laboratory Bldg W31.

Boston Celebrations: Part I* - Scale models, drawings & conceptual pieces for temporary visual celebrations on specific Boston sites, by

fellows at CAVS. Thur Fri, Apr 25, CAVS.

Geo-Astral Formulations 1969-1972* - Lowry Burgess, CAVS fellow. Weekdays during April 9am-5pm, Center for Advanced Visual Studies (Bldg W11). Free.

Faculty Club Exhibit* - Water color and oil paintings by Nancy Begin. Thurs, Apr 3-Wed, Apr 30, Faculty Club. Free.

Kinetic and Mural Sculpture* - Robin Parkinson. Center for Advanced Visual Studies. 9am-5pm, Wed-Fri only, Apr 11-Apr 30, Bldg W11. Free.

Drawings: Andrew Tavarelli* - Fri, Apr 4-Sun, May 4, Hayden Corridor Gallery. Open daily. Free.

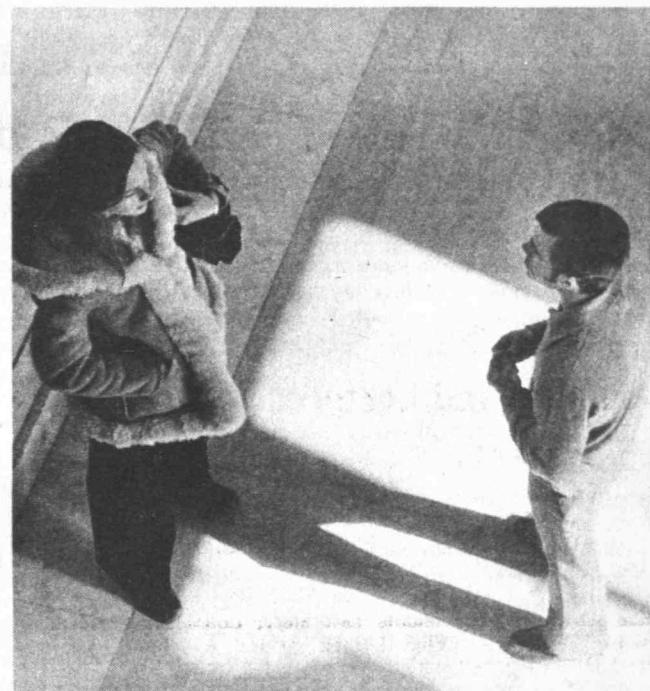
Visual Dharma* - The Buddhist art of Tibet. Sponsored by the Committee on the Visual Arts. Fri, Apr 4-Wed, May 7, daily 10am-4pm, Tues 6-9pm; Hayden Gallery. Public Preview Fri, Apr 4, 8-10pm. Gallery closed Apr 8 & 9.

The Look of Music in the Middle Ages* - Facsimiles of manuscripts and transcriptions into modern notation; pictures of life in the Middle Ages. Open daily, Music Library, Bldg 14E.

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

MIT Historical Collection* - Permanent exhibition, open Mon-Fri, 9am-5pm, Bldg N52, 2nd floor.

Photographs* - Showing the original 19th century MIT buildings in downtown Boston and step-by-step views of construction in Cambridge. Bldg 4 Corridor.



...and highlights a casual conversation in the Maclaurin lobby. -Photos by Calvin Campbell

Athletics

Home Schedule - Thursday, April 10 - W Tennis. Lowell Tech, 4pm, duPont Courts. **Friday, April 11 - V Baseball.** Bates, 3pm, Briggs Field. **V Tennis.** Bowdoin, 4pm, duPont Courts. **Saturday, April 12 - Hvy Crew.** Columbia, F 9:15am, V 11:15am, Charles River. **W Crew.** Princeton, Yale, JV 10:30am, V 11:45am, Charles River. **V Lacrosse.** Amherst, 2pm, Briggs Field. **JV/F Lacrosse.** Proctor Academy, 2pm, Briggs Field. **W Tennis.** Clark, 3pm, duPont Courts. **Sunday, April 13 - V Sailing.** Geiger Trophy, 9:30am, Charles River. **Monday, April 14 - V Tennis.** Colby, 3pm, duPont Courts. **JV/F Baseball.** Harvard, 3pm, Briggs Field. **Tuesday, April 15 - V Baseball.** Harvard, 3pm, Briggs Field. **Wednesday, April 16 - JV/F Lacrosse.** Phillips Exeter, 3pm, Briggs Field. **Friday, April 18 - V Lacrosse.** Holy Cross, 4pm, Briggs Field. **F Tennis.** Belmont Hill School, 4pm, duPont Courts. **Saturday, April 19 - Lt Crew.** Biglin Cup, F-11am, JV-11:45am, V-12:30pm, Charles River. **Hvy Crew.** Northeastern, BU, F-11am, JV-11:45am, V-12:30pm, Charles River. **W Sailing.** CCT Invitational, Charles River. **Outdoor Track.** Bowdoin, 12:30pm, duPont Oval. **JV/F Lacrosse.** Winchendon School, 2pm, Briggs Field. **F Tennis.** Buckingham, Browne & Nichols, 2pm, duPont Courts. **V Tennis.** Williams, 2pm, duPont Courts.

Summer Softball Umpires - Persons wishing to umpire in the summer fast-pitch softball league (June 9-Aug 15) should sit in on officiating course Tues & Thurs, 12n, duPont conference rm; or 1pm, duPont T-Club Lge. Course now in progress. Info: Sam Benichasa, x8-3686 or x8-3661 Draper.

Soccer Officials Clinic* - Clinics and exams for high school soccer officials Fri, Apr 11. Contact Tom Stagliano, x3-2435 or 661-1926 if interested.

Rugby Football Club Practices** - Tues & Thurs 7:30pm Rockwell Cage. Full medical insurance necessary. Info x3-6221.

Women's Athletic Council* - Meetings 1st & 3rd Tues of each month, 7:30pm, duPont conference rm. Info: Mary Lou Sayles, director of women's athletics, x3-4910.

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

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

Send notices for April 16 through April 27 to the Calendar Editor, Room 5-111, Ext. 3-3279, before noon Friday, April 11.

Crew Win, Postponements Mark Spring Sports Slate

By PETER M. CLOSE
Director of Sports Information

The biggest story on last week's MIT spring sports front was the engineer heavies' impressive win over Coast Guard and the cancellations or postponements of most of Tech's spring varsities due to unseasonable weather.

The MIT heavyweight crew caught a lull in the heavy wind and snow to score a length and a half victory over the US Coast Guard Academy crew. Coach Peter Holland's boat was never behind during the whole race, as junior Peter Beaman (Hampton, N.H.) got MIT moving with a 40 stroke per minute at the start. Then MIT settled to 35 at the 1,000 meter mark—halfway through the race—and were ahead by a length and a half. Beaman dropped Tech to 34 over the final 1,000 meters to give MIT the length and a half win with a clocking of 6:32.1 to coast Guard 6:39. MIT also swept the second varsity and first freshman races.

The Tech heavies host Columbia next Saturday. Last spring, MIT routed Columbia by four and a half lengths.

Baseball Team Loses Opener

Bad weather idled MIT's baseball team on two occasions last week, but the engineers did open their portion of the Greater Boston League last Tuesday, losing to Boston College 10-2. MIT's games against Lowell Tech and Boston State were postponed and will be scheduled at later dates.

Senior captain Herb Kummer (Baltimore, Md.) is leading the engineer batters in practically all the offensive departments. The big first baseman is hitting .405 after Tech's first eight games. Kummer has driven in twelve runs and has a .622 slugging average.

Women's Sailing Prospects Good

The MIT's women's sailing team appears headed for another successful spring. On Saturday, sophomore co-captain Barbara Belt (Severna Park, Mo.) skippered, while freshman Sally Husted (Camarillo, Calif.) crewed MIT to a first place finish in the Regis Bowl. The next day the engineers slipped to a sixth in the Captain's Cup. Barbara Belt and Sally Husted sailed in the "A" Division and Alanna Connors (Greenwich, Ct.) skippered and Julie Keller (Winona, Minn.) crew were Tech's entry in the "B" division.

Sports Sidelights

Boston College lowered Tech's lacrosse record to 1-2, dropping the engineers 12-5 last Saturday...the Tech sailors travelled to Philadelphia for the Owen's Cup. The engineers placed eighth and were skippered by Bill Critch (Winthrop, Mass.) and junior captain Paul Erb (Corpus Christi, Tex.)... A new Cup will be entered into women's crew competition next Saturday as MIT hosts Princeton and Yale. The Eisenberg Cup, named after Carola Eisenberg, MIT Dean of Student Affairs, will go to the winner of the annual regatta. The cup race is scheduled for 11:45am.MIT's track team was also a victim of the spring snow storm last Saturday, cancelling the University of New Hampshire-Tech meet. MIT will attempt to open their season next Saturday at Bates College in Lewiston, Maine...Yale will rejoin MIT's heavyweight crew schedule this spring, after a lay-off of eight years. The Tech heavies will host the Eli eight on Sunday, April 20th at 4:30pm....Tech's lightweight crew, 9-1 in the won/lost record last year, opens their 1975 slate at Yale next Saturday, competing for the Joy Cup. Coach Bill Miller's crew shapes up as another top contender for eastern lightweight crew supremacy.

Information Research Unit

(Continued from page 1)

might be used. We really need each other."

Professor Keen noted that those at the conference were about evenly divided between the "real world" and academia.

Michael S. Scott Morton, associate professor of management at the Sloan School and director of the center, said that effective implementation is a prime concern in the development of computer-based information systems and management science models.

"Though our technical abilities in these areas are quite impressive, implementing these systems is still largely an art...We have

comparatively little conventional wisdom to draw on, and hence few reliable management techniques," he said during a luncheon address on current developments in applied research and implementation at the Center.

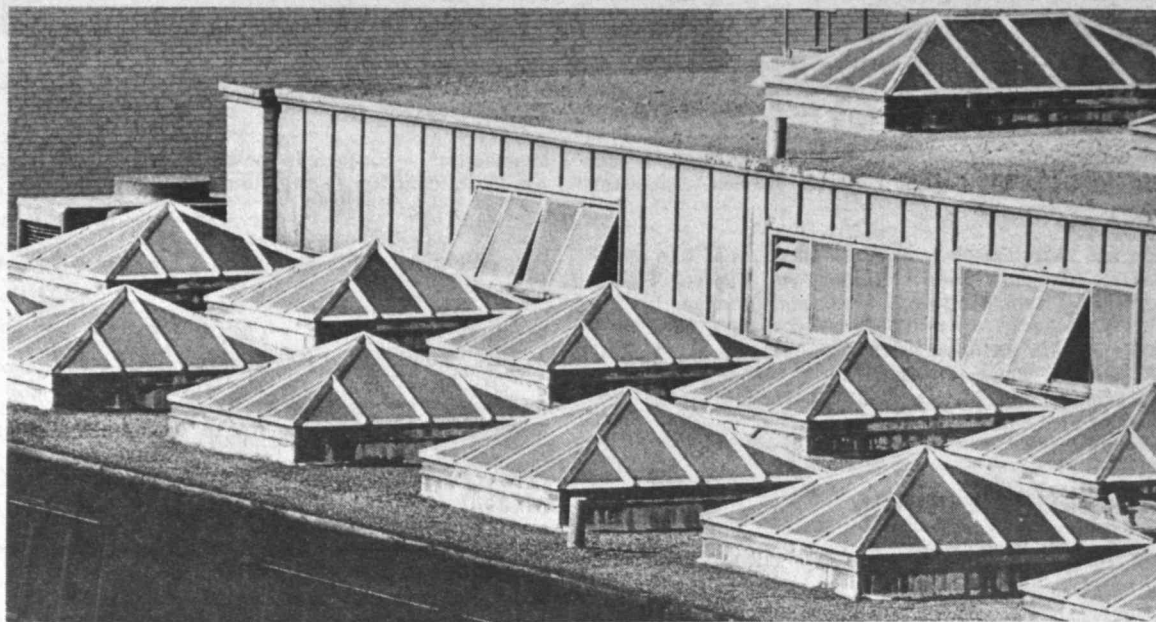
Professor Scott Morton is on sabbatical leave. Acting Director of the Center is Norman L. Rasmussen, a senior research associate at the Sloan School.

Corporate sponsors, who contribute \$20,000 each for unrestricted support of the Center's work, are a major source of funds for the Center's research. Each sponsor may designate a Fellow to the Center to participate in one of the on-going research efforts.

The Center was established because the explosive growth of the electronic computers used in information systems has been accompanied by increasingly complex choices for managers who have to decide which system is best for their needs. "We want to be an impartial source of research-based information which will help managers understand the complex choices and risks associated with acquiring, implementing and absorbing into their organizations computer-based decision support systems," Mr. Rasmussen said.

Trump Honored

Dr. John G. Trump, professor emeritus of electrical engineering, and director of the MIT High Voltage Research Laboratory, has been awarded an Honorary Fellowship in the American College of Radiology for his contributions to radiation therapy, particularly the development of cathode ray therapy for superficial skin malignancies.



SKYLIGHTS atop Building 24—like a Zen rock garden—create patterns with form, light and texture.

—Photo by Calvin Campbell

Alternative Energy Sources Group Formed

In an effort to stimulate the sharing of ideas and information on low-impact alternative energy research among members of the MIT community, an Alternative Energy Interest Group (AEIG) has been formed.

The AEIG, which will explore

NAE Elects 10

(Continued from page 1)

of ceramics: "Leadership in the science and engineering of ceramic materials, spanning the whole spectrum of physical phenomena, structure-property relationships, innovative processing and applications to modern technologies."

Dr. Edward A. Mason, professor of nuclear engineering, on leave, and member of the Nuclear Regulatory Commission: "Contributions to research on fluidized solids, organic-cooled reactors and power system optimization and leadership in complex nuclear projects."

Dr. Warren M. Rohsenow, professor of mechanical engineering: "Contributions to boiling and condensing liquid-heat transfer and the teaching of the concepts of heat and mass transfer."

Dr. David C. White, Ford Professor of Engineering and director of the Energy Laboratory: "Contributions as an engineering educator and leader in energy conversion technology, energy systems analysis and energy planning."

Dr. Robert V. Whitman, professor of civil engineering: "Pioneer in soil dynamics, especially in predicting and controlling earthquake effects on constructed facilities."

the possibilities of developing technologies such as solar energy, wind power and methane generation, was created by several students from the Department of Architecture.

"One of the problems we shared was the feeling that we were alone in our efforts to explore alternative energy sources," according to Douglas Mahone, one of the group's organizers. "Despite all the publicity, it's difficult to locate other individuals working in alternative energy."

The students hope that the AEIG will help increase the sharing of human resources within the MIT community. The group believes that there are many people at MIT with widely varying skills who could contribute to the development of alternative energies.

"Systems analysts, management and marketing people, circuit designers, manufacturing engineers, heat transfer physicists, architectural designers, home hobbyists or plumbers would all have something to offer," said Mahone, "and we'd be interested in having them participate in the group."

In addition to encouraging dialogue in this area, the group has been working with the libraries in an attempt to compile a bibliography of up-to-date sources on alternative energy sources. Members will be given bibliography cards to be filled out when a new source is found. These cards will be filed in the AEIG Information Office.

In order to get the group underway, Mahone and Jorge Peschiera, both graduate students, have

developed a questionnaire for distribution throughout the Institute. The questionnaire, which has already been distributed to some members of the community, asks individuals about their areas of expertise, their interests and about their availability for consultation.

Any member of the MIT community who fills out the questionnaire will become a member of the group and will be informed of group activities. The questionnaire and information on the group can be obtained from the AEIG information office (3-403) or by calling the office, x3-7735. There is also a bulletin board in the hall opposite the office where AEIG information is posted.

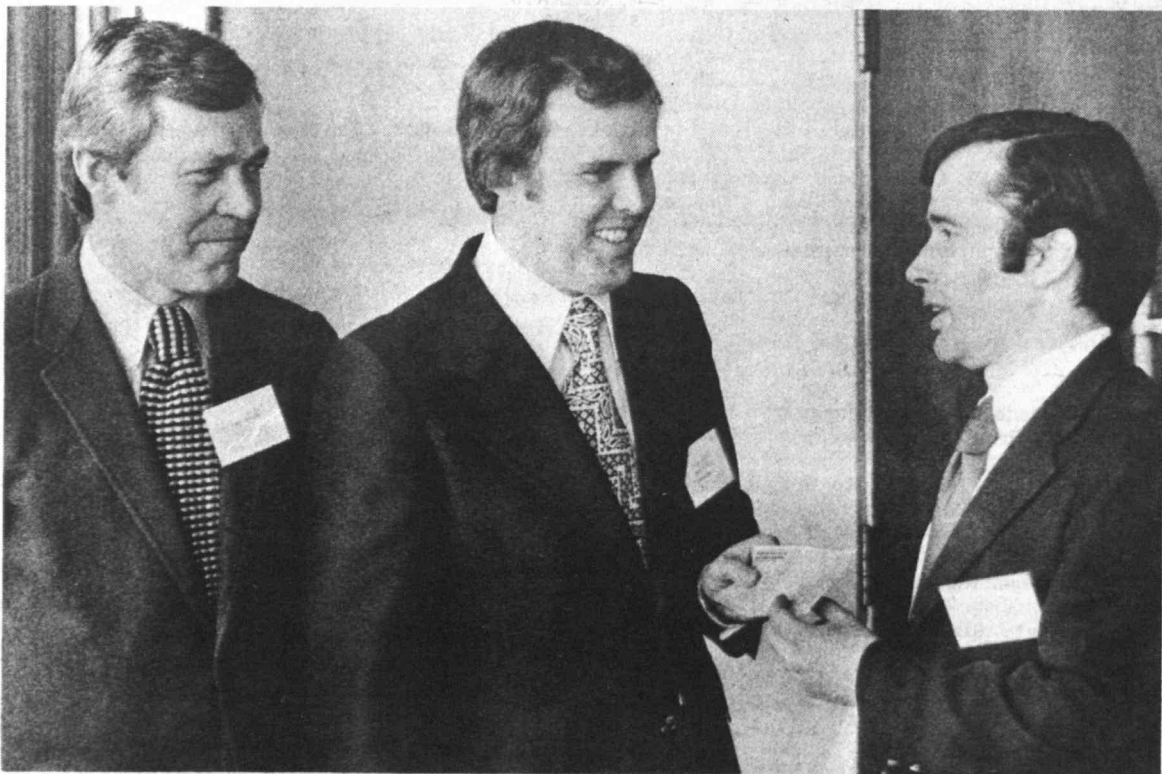
Obituaries

Ann C. LeMieux

Ann C. LeMieux, 59, of Cambridge, a secretary in the Operations Research Center since December, 1965, died on April 6. Mrs. LeMieux, who had been on long-term disability leave since September of 1974, is survived by a son, Charles, of Cambridge, three brothers and three sisters.

Charles H. Symones

Charles H. Symones, 67, of Beverly, who retired as a senior technician at Lincoln Laboratory in July, 1973, died on March 19. Mr. Symones came to the Institute in 1954. He leaves his wife, Cynthia, a son, Theodore K. of Beverly, a daughter, Mrs. Thomas S. Foster of Millers Falls, a brother and two sisters.



Richard J. Walters, center, of Martin Marietta Corp., presents a check to Professor Michael S. Scott Morton of the Sloan School of Management. Professor Scott Morton is director of the recently established Center for Information Systems Research. At left is Norman L. Rasmussen, senior

research associate at the Sloan School, who is acting director while Professor Scott Morton is on sabbatical. Martin Marietta is a corporate sponsor of the center. The unrestricted gift will support the center's research program.

Positions Available

(Continued from page 9)

DSR Staff, part-time, in Center for Advanced Engineering Study will conduct research to evaluate nature and usage of cable TV system. Familiarity with questionnaire design and interviewing techniques required. Masters degree in social science or related field or equivalent experience required. 15-20 hrs/wk. Position is for 7/1/75 through 6/30/76. D75-67 (4/9).

Admin. Staff, Applications Coordinator, in Office of Facilities Management Systems (Planning Office) will develop contact and provide application support for non-Institute users of computerized space accounting system (INSITE); assist in formal education programs given by Office. Familiarity with business systems, facilities management and related computer applications, experience in preparation and delivery of technical presentations, Bachelor's degree or equivalent required. MBA, familiarity with education and health-care administration desirable. Travel is required. A75-20 (4/9).

Admin. Staff, Sr. Applications Programmer, in Office of Administrative Information Systems will assist in development of new and modified programs: program, test, debug; establish file requirements and processing techniques for new systems design; contribute to development of programming and documentation standards program. 3 yrs experience with COBOL or PL/1, knowledge of BAL and financial applications required. Knowledge of 1401 Autocoder preferred. A75-19 (4/2).

DSR Staff, Programmer, in Center for Space Research will be responsible for acquisition of data from SAS-C x-ray astronomy satellite on PDP-9 mini computer; arrange for data transmission, organize tape library of data; catalogue computer routines. Knowledge of celestial coordinate systems and coordinate transformations, some knowledge of x-ray sky and scientific content of data, as well as substantial programming experience required. D75-65 (4/2).

DSR Staff in Center for Cancer Research will conduct laboratory research on molecular biology of polio virus: make solutions, assay viruses; prepare infected cells; also order supplies and oversee equipment maintenance. Bachelor's degree in Biology or Biochemistry required. Chemistry, Biochemistry or Microbiology experience helpful. D75-62 (4/2).

DSR Staff in Center for Space Research will participate in preparation, test and calibration of x-ray astronomy satellite experiment (Focal Plane Crystal Spectrometer for High Energy Astronomy Observatory x-ray telescope); prepare data analysis system; participate in scientific planning of observing program; collect, analyze and publish data. Ph.D. in experimental physics, laboratory experience required. Familiarity with X-ray techniques, X-ray astronomy and experience with satellite experiments desirable. D75-58 (3/26).

DSR Staff, temporary in Artificial Intelligence Lab will participate in the design of new learning environments for children and in development of learning theory; design and build equipment; write descriptive material, teach. EE or Physics degree, knowledge of electronics. Computers, machine shop experience, ability to design and build prototype control and sensing circuits required. Temporary through 9/30/75. D75-56.

DSR Staff in Lab for Nuclear Science (Linear Accelerator Lab, Middleton, Ma.) will provide instrumentation development, operation and data handling support for research group in electron scattering and other programs. Strong EE or Physics background at BS level, or equivalent, minimum 5 yrs experience in nuclear instrumentation including Scintillation, Solid State and Multi-wire Proportional Counters, Nanosecond Digital and Analogue Electronics, CAMAC required. PDP 11/45 experience helpful. D75-55 (3/26).

DSR Staff, temporary, Systems Programmer in Lab for Nuclear Science (Linear Accelerator, Middleton, Ma.) will assist in maintaining and extending RT-11 and RSX 11-D real-time operating systems on PDP-11/45 computers with a variety of nonstandard peripherals: intersystem files compatibility on DEC, magnetic tapes, DEC pack and century discs; compatible graphics packages on Tektronix 4010, Gould 5000 and GT-40 graphics hardware. Thorough knowledge of DEC PDP-11 machine code and I/O handling, experience in mini-computer graphics, real time systems and graphics hardware required. Temp. through 8/31/75 D75-57 (3/26).

Admin. Staff, Area Coordinator, Office of Administrative Information Sys-

tems, will analyze and resolve problems of an assigned area of operating business systems: develop modification specifications for present systems; schedule and control tasks to meet deadlines; direct and coordinate work systems analysts, programmers as required. Oversee testing of changed programs, act as client liaison and as applications programmer as required. Applicants should have business and administrative experience, analytical ability and knowledge of programming. A75-15 (3/26).

Admin. Staff, District Officer, in Resource Development will coordinate volunteer solicitors in major geographic areas. Out of town travel necessary 50% of the time. Familiarity with MIT required for effective representation as well as poise and ease in dealing with people, demonstrated initiative and ability to work independently, good oral and written communication skill. A75-16 (3/26).

DSR Staff in Joint Center for Urban Studies will conduct research on real estate economics for study and model development of neighborhood evolution and decline. Ph.D., or equivalent, familiarity with operations of participants in real estate sector of economy (bankers, insurers, builders, etc.), computer programming ability (preferably FORTRAN IV), experience in data gathering and analysis of real estate sector, willingness to assume design and implementation of a component of the overall project required. Position will terminate December 31, 1976. D75-52 (3/12).

DSR Staff, part-time, Tech. Asst., in Arteriosclerosis Center will process plasmas for cholesterol, triglyceride and lipoprotein quantitation procedures; run and maintain Technicon Auto Analyzer I; maintain patient records and run ultracentrifuge. Clinical chemistry and hematology background, ability to work with minimum supervision; previous lab experience desirable. 20 hrs/wk. D75-50 (3/12).

Admin. Staff, Director, Office of Administrative Information Systems/Assistant Director, Information Processing Services will have overall responsibility for operation of 70-employee office which provides information systems services to MIT administrative offices: oversee the delivery of timely, accurate reports to clients; interact with client offices on the development, implementation and design of new systems, ability to identify and resolve problems in service environment, demonstrated skill in management of medium-sized organization required. Familiarity with MIT administrative environment and understanding of computer and information systems desirable. Please submit resume. A75-13 (3/5).

DSR Staff, Economist/Econometrician in Energy Lab will participate in projects on development and application of models of domestic and international energy production and utilization; develop and apply econometric procedures to estimate parameters of simultaneous equation energy models; assist in model formulation and development of energy data and accounts in US and other industrialized countries, supervise junior staff and students, perform related duties as required. Ph.D. Economics, specifically mathematical economics and econometrics, experience in application of functional specifications, such as translog and generalized Leontief, familiarity with economic accounts of at least one foreign industrialized country required. D75-48 (3/5).

DSR Staff, temporary, in Project MAC Planner Group will write and implement programs in PLASMA and LISP. Experience in these languages required. Position runs June-August, 1975. S75-1 (2/26).

DSR Staff, Electrical Engineer, in National Magnet Lab, will perform daily operation of Low Field Lab; maintain sensitive magnetic detectors and display equipment, design and construct new equipment, perform human body measurements. Laboratory-oriented person with knowledge of low-frequency electronics, and experience with magnetics and cryogenics is desirable. Candidate should be able to work with hospital patients and to do occasional evening and weekend work. 50 hr/wk. D75-7 (1/22).

DSR Staff, Biophysicist, in National Magnet Lab will supervise day-to-day magnetic fields produced by the human body are measured, perform specific lab measurements, design lab equipment. Experience with low-frequency electronics, magnetics, heart and lung physiology required. Must be available for occasional evening and weekend work. 40 hr/wk. D75-8 (1/22).

Admin. Staff, Sr. Consultant Trainer, in Office of Personnel Development will have responsibility for planning, design and follow-up services related to training workshops, organization development; perform professional, management and support tasks as a participating team member. Must be knowledgeable and experienced in organization development, career development, adult education, process-oriented

group work with adults, and applied social science survey research. Applicants will present 1-2 hour training activity, including written proposal and report, for staff evaluation. Report, proposal and process documentation writing skill, Master's degree in behavioral science plus facilitation experience required. Knowledge of MIT/academic institutions helpful. A75-1 (1/8).

DSR Staff, in Joint Center for Urban Studies will be principle researcher on development of computer-based manpower information system for construction industry, and ability to supervise program development and operational system required. 74-1484-R (1/8).

DSR Staff in Energy Lab will be involved in developmental work with coal gasification projects. Prior experience in development and related technological processes of coal gasification: computer simulation, construction of pilot equipment with minimal technical assistance and financial resources, data gathering, work with students inexperienced in research activities, and ability to meet project deadlines required. Advanced degree in Chem. Eng. is also necessary. 74-1428-A (12/11).

Subcontract Administrator, Assistant Director in Office of Sponsored Programs will work with project personnel in negotiating complex subcontracts; prepare Requests for Bids; review quotations; arrange for preaudit of proposed costs and negotiation of active awards. Bachelor's degree in Business Administration or equivalent combination of education and experience, subcontracting experience in government agency or university environment, knowledge of procurement regulations of government agencies required. 74-1403-R (11/27).

DSR Staff at the National Magnet Laboratory will work on the Alcatraz thermonuclear experiment. Conceive, design, and carry out plasma diagnostic experiments using neutron, X-ray, optical, electrical, magnetic and micro-analysis and assessment of data. Ph.D. in plasma physics or related area required. Familiarity with tokamak devices desirable. 75-1512-A (1/8).

DSR Staff in the Energy Lab must have minimum of 5 yrs experience in defining, securing, organizing and supervising research in heat transfer related to energy production and utilization. Familiarity with MIT; experience in supervising student theses, research and staff; Ph.D. in Mechanical Engineering required. 74-359-A (5/1).

DSR Staff, Engineer, in the Energy Lab will do experimental research in stratified charge internal combustion engines: design, construct and maintain experimental facilities and conduct basic experiments and data analysis with single cylinder test engine and rapid compression machine. BS in Mechanical or Aeronautic Engineering, some practical experience with mechanical systems and workshop practice required. D75-30 (2/29).

DSR Staff, Programmer in Clinical Decision Making Group, Project MAC will supervise construction and clinical testing of computer system to advise physicians regarding the administration of digitalis. Familiarity with pharmacokinetics of digitalis and its clinical administration, general medical knowledge including cardiovascular physiology, thorough knowledge of LISP 1.5 and ITS operating system required. D75-19 (2/5).

Technical Assistant, Acad. Staff, in Nutrition and Food Science, will perform specialized and routine chemical analyses on body fluids; operate and maintain mass spectrometer, Beckman automated amino acid analyzer; assist in new methodology development; occasionally supervise other lab personnel. BS, chemistry, biology or medical technology and minimum 2 years experience in clinical chemistry required. C75-4 (2/5).

Admin. Asst., Exempt, in Aeronautics and Astronautics will coordinate repair, maintenance and replacement of experimental equipment, organize and manage funds for repair and maintenance of workshop equipment in several dept. locations; assist in laboratory organization; coordinate space allocations, plan and oversee space renovation. Engineering background, preferably plant engineering, knowledge of MIT operations, administrative skill required. Familiarity with OSHA regulations also necessary. E75-10 (4/9).

Exempt, Asst. Account Representative in Comptrollers Acctg. Office will act as Institute liaison with employees, students, organizations in matters of credit and collection through written correspondence and personal contact; prepare aging reports, payroll notices and other related material. 4-5 yrs. accounting experience, specifically in credit, collection required. Tact, good judgment also necessary. E75-8 (3/19).

In-patient Staff Nurse, Exempt, in Infirmary will do bedside nursing and may assist with emergency and first aid treatment. Mass. licensed RN with 2

yrs experience in medical/surgical nursing required. First-aid or emergency clinic experience desirable. Must be able to work all shifts and weekends on rotating basis. (40 hrs) E75-5 (3/5).

Clinic Nurse, Exempt, in Emergency Clinic will evaluate and treat patients, administer first aid and admit patients as necessary. Mass. licensed RN with 2 yrs. clinic experience, preferably in emergency room required. Expertise in physical assessment desirable. Must be able to work permanent evenings (4pm-12am) and rotate all weekend shifts. (40 hrs) E75-6 (3/5).

Engineering Assistant, Exempt in the National Magnet Laboratory will set up experiments and take measurements of magnetic fields produced by humans and animals. Will work with hospital medical groups. Experience in biomedical research; strong experience in low frequency electronics; knowledge of magnetics and cryogenics required. Flexible schedule necessary for occasional evening or weekend work. 74-1033-R (8/28).

Tech. Asst. IV part-time, in Psychology Dept. neurophysiology lab will be involved in mammal motor control and coordination research. Primary duty is care, feeding and training of animals; will also manufacture testing equipment, assist in laboratory procedures, in data analysis and in general upkeep of lab. Familiarity with elementary electronics and digital logic helpful. High school graduate, or equivalent required. 30 hr/wk. B75-79 (3/5).

Secretary V to Director and other professional staff, Planning Office: will compose correspondence independently and from verbal instruction; organize meeting agenda; edit manuscripts including verification of content through varied source; arrange luncheon, dinner meetings without supervision; manage busy appointment schedule; assist other secretaries in routine office duties. High school graduate plus 5 years secretarial experience or equivalent combination of education and experience, ability to use dictating equipment and to work without supervision required. B75-141 (4/9).

Admin. Asst. V in Lab for Nuclear Science will handle secretarial and administrative duties for 40-member research group: type technical material, reports; arrange travel; maintain files; proofread articles for publication. Position requires travel overseas and to other US facilities (NY, Illinois) for varying durations. Applicants should be able to speak and write German and French fluently. B75-112 (3/26).

Secretary V in Resource Development will take and transcribe dictation; maintain busy calendar; schedule meetings; make travel arrangements; maintain files, supervise part-time secretary; independently organize and carry out varied projects including research of topics. Minimum of 2 years experience, shorthand, organization skill required. College training desirable. B75-114 (3/26).

Secretary V to Civil Engineering Department Head will handle standard secretarial duties; act as liaison with public, administration, faculty, students; maintain affirmative action and publication lists; prepare and maintain confidential material and records; handle special projects as required. MIT experience and shorthand are necessary. Bachelors degree preferred. B75-98 (3/12).

Secretary IV-V in Preprofessional Advising and Education Office: arrange schedules and publicity for medical/law school representatives; advise students on professional school application procedures and related matters; compile statistical data from many sources; assist in handbook editing; coordinate IAP activities; perform other standard secretarial duties. Previous secretarial experience, ability to interact with students and faculty required. Non-smoking office. B75-142 (4/9).

Secretary IV-V to Physics department head will maintain calendar, type correspondence and manuscripts, answer phones, handle a variety of independent projects. Position includes large amount of contact with students and other office visitors. Shorthand, technical typing skill required. B75-136 (4/9).

Secretary IV to faculty member and research staff in Urban Studies and Planning will perform varied secretarial duties including technical typing, editing; maintain expense records on accounts; maintain computer lists by keypunching. May do occasional library research and contract administration. Technical typing skill, keypunch ability (or willingness to learn) required. Shorthand skill and economics background helpful. Non-smoking office. B75-130 (4/2).

Secretary IV in Harvard-MIT Program in Health Sciences and Technology will handle varied office duties; type correspondence, proposals; organize symposia and seminars; prepare budgets; administer contracts. Experience in budget and contract maintenance, high level of secretarial and organiza-

tional skills required. Non-smoking office. B75-125 (4/2).

Secretary IV to faculty and research group members in Nutrition and Food Science involved in food and biomedical engineering; perform standard secretarial duties including shorthand and machine dictation; supervise part-time secretary. Secretarial school training, or equivalent, ability to use dictating equipment required. Knowledge of medical/biological and/or technical terminology helpful. B75-116 (3/26).

Secretary IV to Associate Director, Systems Dynamics Group: type and edit correspondence, manuscripts from handwritten and machine dictation; maintain files; arrange travel and appointments; research subjects as required. Excellent typing, organizational skill, command of English grammar and minimum of 2 years secretarial experience required. Shorthand/speedwriting helpful. B75-121 (3/26).

Secretary IV to professor in Nutrition and Food Science will type material including difficult terminology from machine dictation and handwritten copy; do some editing; make appointments. College degree, or equivalent, and at least 3 years responsible experience required. B75-101 (3/19).

Secretary III-IV to a Center for Space Research program manager and other members of research group will type correspondence and technical material, answer phones, make travel arrangements; maintain files and supplies; assist other secretaries as required. Secretarial school or junior college training, or equivalent, required. Technical typing experience also necessary. B75-140 (4/9).

Secretary III-IV to Physics Department Executive Officer will perform standard secretarial duties: handle arrangements for weekly colloquia, including teas, posters, speaker stipend; complete varied projects independently. Position includes frequent student and other visitor contact. Shorthand, typing skill and ability to work under pressure required. B75-137 (4/9).

Secretary III-IV to two faculty members in Artificial Intelligence Lab will type correspondence, technical material; answer phones; maintain files; arrange appointments; perform varied tasks related to lab administration; will be trained to type and edit on computer. Typing, organization skills required. MIT experience helpful. B75-125 (4/2).

Secretary III-IV to two Physics faculty members: will type technical manuscripts; course material; handle sponsored account records; assist students and others visitors to office. Technical typing skill required. B75-113 (3/26).

Secretary III to faculty members in labor management section of Sloan School: will assist in all matters relating to operation of the section: schedule and publicize seminars and conferences; publication distribution; maintenance of section contribution and alumni records; perform other varied duties relating to research programs. Discretion, ability to work independently and to interact effectively with all members of working group, excellent secretarial skills, including shorthand and machine transcription required. MIT experience desirable. B75-138 (4/9).

Secretary III to the Superintendent of Engineering and Construction in Physical Plant will perform general secretarial duties: handle general telephone inquiries; schedule meetings; maintain correspondence files; type blueprint specifications and project reports. Will also type for members of the Engineering and Construction group. Excellent shorthand, typing skills, ability to work independently and previous office experience required. B75-139 (4/9).

Secretary III, temporary, in Student Financial Aid Office will type from handwritten drafts; assist with volume mailings and other general office projects. Typing skill and willingness to handle a variety of duties required. Temp. through 6/30/75. B75-122 (4/2).

Secretary III in Chemical Engineering will handle general secretarial and receptionist duties for several faculty and research staff: type technical reports, course material from handwritten notes and machine dictation. Fast, accurate typing; ability to work independently required. Technical typing skill helpful. B75-117 (3/26).

Lib. Gen. Asst. III-IV part-time, in Earth and Planetary Sciences will develop and maintain cataloging and filing systems for publications and other library materials, trace lost items; monitor condition of materials. Position is normally for 1 day per week, but flexibility to work full-time for 2-3 week intervals to complete special projects required. B75-131 (4/9).

Lib. Gen. Asst., III, part-time, will have responsibility for circulation/reserves desk 2 evenings per week, and handle other varied library duties in daytime hours (process reserve materials, file,

Raising State Income Taxes Will Hurt Economy

By BENNETT HARRISON

When state income taxes are increased, money is taken out of the pockets of everyone, but there is also a downward spiral.

Take money in taxes, and people have less to spend. When people spend less, businesses, naturally, sell less. And those businesses buy less from their suppliers. When businesses are hurting, they lay workers off. And these unemployed, in turn, must drastically reduce their spending. By the time the spiral works itself out, the original tax increase has led to a much greater loss in economic activity.

For instance, a \$100 million tax increase would probably reduce incomes in the Commonwealth by \$140-150 million. and that, in turn, would probably mean that between 14,000-15,000 people—milk-

men, truckdrivers, secretaries—would lose their jobs.

The governor is still struggling with the problem of how to pay for the state deficit, said to be as large as \$400-500 million. A tax increase to pay for the deficit would be a disaster for the state's economy. Such a tax increase would be taking money out of the economy at a time of national recession and regional depression—money that would otherwise be spent on currently produced goods and services, with their associated jobs—all this to pay for activities that happened in the past.

How, then, can the governor reduce the deficit without throwing thousands of people out of work? In the short run, the state probably has no choice but to attempt to sell bonds to the private sector, as a way of raising the

money to pay off the deficit. This may present difficulties of its own. The money that is invested in these bonds by banks, insurance companies and mutual funds might otherwise have gone into building new factories or starting up small businesses, although I personally doubt that this diversion would be serious. Massachusetts capitalists are notorious in their preference for investing in out-of-state as opposed to local ventures. There may also be room for tax reforms which might raise some revenue.

In the long run, the state government should study the possible repeal of constitutional prohibition against running deficits as a tool of economic policy. That prohibition is an archaic holdover from the pre-Keynesian days when governments tried to emulate "good

business practice," which meant always balancing the budget.

Nowadays, it is the practice of even large private corporations—let alone national governments—to deliberately incur deficits from time to time in order to expand their economic activity.

Tax increases are not necessarily bad for the economy, provided the new tax money is spent right away to create jobs. A tax increase used to finance new state spending—on railroads, on public power, on assistance to small business—would not cost us jobs. In fact it would increase employment in the state—and it would provide things that Massachusetts consumers and businesses sorely need.

For example, if that \$100 million tax increase we talked about before were used to finance addi-

tional state spending of \$100 million, overall incomes in the Commonwealth would probably rise by about \$15-20 million. And that would probably create something like 1,500 to 2,000 new jobs—jobs that weren't there before.

The question that we started with was: A tax increase for what? We now have some answers. A tax increase that would destroy jobs in Massachusetts, to pay off an old deficit? No. A tax increase to finance new job-creating state programs? Yes.

(Bennett Harrison is associate professor of economics and urban studies and planning in the MIT Department of Urban Studies and Planning. This commentary was presented recently on the WGBH-TV program, *The Evening Compass*.)

Compromises Needed for International Control

Conference Ponders High Seas Government

By JUDITH T. KILDOW

The second session of the Third Law of the Sea Conference convened in Geneva, Switzerland, this month, continuing discussions begun during the first session in Caracas, Venezuela, last summer.

Delegates from more than 140 nations are once again attempting to assemble a package of compromises that might lead to an official agreement or treaty at some later date. Many issues must be compromised to satisfy the large numbers of nations and interests, but there is one particular problem which seems to be causing an impasse at this meeting: the formation of an International Seabed Regime.

In essence, the nations are trying to set up some kind of world government for the high seas—that area of the oceans that will not fall under the jurisdiction of any one nation. Included in these negotiations is the need to determine who will regulate the mining of manganese nodules, which are mineral-rich rocks found thousands of feet deep lying around on the floor of the ocean. These nodules contain small amounts of

very valuable metals like copper, nickel and cobalt, and large amounts of manganese, which is not so valuable.

There are about a dozen private companies in half a dozen countries which have major investments in mining and processing systems to harvest and refine the ocean's riches. Since these riches lie in areas which are not under any national or international regulatory system, they would normally be free for the taking to anyone who wanted them—and had the ability to get them.

But without a regulatory body to turn to, no one can obtain a permit, license or other guarantee that they will indeed own outright the minerals they harvest. In the absence of such guarantees banks and other financing institutions have not been willing to lend the enormous sums of money necessary to finance these open sea mining ventures, unless there are other submarine spoil to be found as well.

The American companies capable of such ventures operate under traditional private enter-

prise standards. Their officials are suspicious of any international regulation. Since American delegates to the conference represent these American industrial interests, as well as many others, they have been pressing for a weak international seabed regime—a kind of licensing authority without much authority.

However, nations that do not have the ability to mine the nodules—and whatever else may lie out there—want guarantees that they, too, will share in the profits from development of the resources, which a United Nations resolution in 1967 declared to be for the heritage of mankind and, therefore, belonging to everyone. These developing nations want a strong international body to control industry in ways industry has not so far been willing to agree to.

One proposal, authorized by Professor Louis Sohn of the Harvard Law School, has been under intensive consideration by all delegates. It provides that the Seabed Authority would be a type

of enterprise system which would enter into joint ventures with corporations wishing to develop the resources. While Administration of this enterprise system poses immense problems, the general concept appears to have some acceptance among most of the negotiating nations.

It is an interesting compromise. On the one hand it satisfies the capitalist ideology of the industrialized nations—while imposing restrictions on their operations. On the other hand, it satisfies the need for control expressed by the non-industrialized nations—although contrary to their more socialistic ideological bent.

The negotiations are continuing in Geneva. Some feel yet another year will be required before agreement can be reached. If that is indeed the case, US companies, will press for passage of Federal legislation that will provide financial guarantees for their risks, thus opening the way for investment that will bring early exploitation of the nodule riches. Such legislation has been pending for

several years, but has always been tabled in the hopes that international agreement could be reached. If the US took such an unilateral act without international recognition it would incur the anger of more than 100 nations and lead to economic sanctions from some.

Taxpaying citizens should consider carefully whether they wish to put their money behind these corporate giants in the form of guarantees, in view of the clear fact that such unilateral international action will be highly unpopular. Or they might ask themselves whether they would prefer their representatives to await ultimate agreement from a Law of the Sea Conference one day, and stay away from anything that smacks of "might makes right."

(Dr. Judith T. Kildow is assistant professor of ocean policy in the MIT Department of Ocean Engineering. This commentary was presented recently on the WGBH-TV program, *The Evening Compass*.)

22 Are Appointed Full Professors

(Continued from page 3)

estimation, control and decision-making in the presence of uncertainty.

Jeremy F. Shapiro, Sloan School of Management. A former employee of the Hughes Aircraft Company, Professor Shapiro holds a bachelor of mechanical engineering degree (1962) and a master of industrial engineering (1963) from Cornell University. He received a PhD from Stanford in 1967. He was appointed assistant professor at the Sloan School in 1966 and became associate professor three years later. At present he is associate director of MIT's Operations Research Center and senior research associate of the National Bureau of Economic Research.

Nam P. Suh, Department of Mechanical Engineering. Graduated from MIT with SB ('59) and SM ('61) degrees, Professor Suh

received the PhD from Carnegie Institute of Technology in 1964. He was a member of the faculty of the University of South Carolina from 1965-70, when he was appointed associate professor at MIT in 1970. His principal fields of interest include the mechanical behavior and processing of materials, materials engineering and manufacturing technology.

Neil E. Todreas, Department of Nuclear Engineering. Professor Todreas was first affiliated with MIT when he received his ScD degree here in 1966 after graduation from Cornell in 1958 with a bachelor's and master's degree of mechanical engineering. From 1958-62 he was an officer in the Navy working on the design of nuclear propulsion plants in a joint arrangement with the US Atomic Energy Commission. From 1965-70 he was senior reactor engineer in AEC's Division of Reactor Development and Technology. He

was appointed assistant professor of nuclear engineering in 1970 and associate professor in 1971.

Donald R. Uhlmann, Department of Materials Science and Engineering. Professor Uhlmann, a consultant to a number of industrial firms in the areas of glasses, ceramics and polymers, received the BS in physics from Yale and the PhD in applied physics from Harvard. He joined MIT's faculty as assistant professor of ceramics in 1965 after two and a half years as a postdoctoral fellow at Harvard. In July, 1969, he was appointed associate professor of ceramics. He is a member of the National Academy of Sciences, an associate editor of *Materials Science and Engineering*, and co-author with Dr. K.A. Jackson of the forthcoming book, *Fundamental Principles of Crystal Growth*.

Carl I. Wunsch, Department of Earth and Planetary Sciences.

Professor Wunsch received his SB degree in mathematics from MIT in 1962 and his PhD in geophysics here in 1966, after which he became a lecturer in oceanography. He was appointed assistant professor in that field in 1967 and associate professor in 1970. He has also been a senior visiting fellow at the University of Cambridge, in the Department of Applied Mathematics and Theoretical Physics. Professor Wunsch was awarded the James B. Macelwane Award by the American Geophysical Union in 1971.

Richard K. Yamamoto, Department of Physics. Professor Yamamoto joined the research staff at MIT in 1963, after receiving his PhD degree in physics. He received his SB degree from MIT in 1957. Appointed assistant professor in 1965 and associate professor in 1968, he has been a guest professor at the University of Nijmegen in the Netherlands.

APO Swim Classes For 70 Area Scouts

Twelve members of Alpha Phi Omega, MIT's service fraternity, have been working out on Saturday mornings in the MIT Swimming Pool, improving the swimming skills of 70 Cambridge Boy Scouts, aged eleven to seventeen.

The program, organized two months ago by Rachel Morris, a junior in electrical engineering from Lee, Mass., has offered classes for beginning, intermediate and advanced swimmers, as well as life saving instruction and instruction in methods for teaching swimmers.

The participants expect to complete skill awards, swim-merit badges and life-saving merit badges, with 15 Boy Scouts hoping to successfully complete tests leading to Red Cross certification as junior life-savers. The ten-week program will culminate on Saturday, April 5 with a water polo match.